40-8943

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

October 4, 1994

Crow Butte Resources, Inc.
ATTN: Stephen P. Collings
President
216 Sixteenth Street Mall, Suite 810
Denver, Colorado 80202

SUBJECT: AMENDMENT 24 TO SOURCE MATERIAL LICENSE SUA-1534, CROW BUTTE RESOURCES, INC. IN SITU MINE, DAWES COUNTY, NEBRASKA

Dear Mr. Collings:

By letter dated May 27, 1994, Ferret Exploration Company of Nebraska, Inc. (FEN) notified the U.S. Nuclear Regulatory Commission that the corporate name had been changed to Crow Butte Resources, Inc. The change in the corporate name requires that Source Material License SUA-1534 be amended accordingly. The NRC has evaluated the amendment request and hereby approves the change to the license.

By letter dated August 24, 1993, FEN (from here forward referred to as Crow Butte Resources, Inc. (Crow Butte) per the amendment request discussed above) requested an amendment to Source Material License SUA-1534 authorizing the use of an underground injection well to dispose of process water produced during extraction operation and restoration. Concurrently, the licensee has applied to the State of Nebraska for a permit to construct and operate the Class I underground injection well at the Crow Butte In Situ Leach Mine. In order to avoid duplication of the review by the State of Nebraska, the NRC staff is relying on the State's technical review and has limited its analysis to a review of the alternative method of waste disposal in accordance with 10 CFR Part 20. The NRC has evaluated the radiological aspect of the amendment request and hereby approves the deep well injection of process fluids, contingent on approval by the State of Nebraska.

In addition, editorial changes were made in the license to reflect the transfer of the licensing activities from the Uranium Recovery Field Office (URFO) to the High-Level Waste and Uranium Recovery Projects Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards. Specifically, the requirement to notify or submit information to URFO in License Conditions 11, 15, 24, 25, 29, 30, 31, 38, 44, 46, 50, and 53, were changed to require notification or submittal of information to the NRC. License Condition 56 was added to provide the correct address for such notifications or submittals.

Therefore, pursuant to 10 CFR Parts 40 and 20, Source Material License SUA-1534 is hereby amended by revising License Conditions 1, 11, 15, 24, 25, 29, 30, 31, 38, 44, 46, 50, 53, and adding License Conditions 55 and 56.

NMSS

All other conditions of this license shall remain the same. Enclosure 1 is a copy of the amended license. The Technical Evaluation Report documenting the staff's basis for this amendment is provided in Enclosure 2.

Sincerely,

Joseph J. Holonich, Chief
High-Level Waste and Uranium
Recovery Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-3943
SUA-1534, Amendment 24
Case Closed: L61150
L51020

Enclosure: As stated (2)

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TECHNICAL EVALUATION REPORT

DOCKET NO. 40-8943 LICENSE NO. SUA-1534

LICENSEE: Crow Butte Resources, Inc.

FACILITY: Crow Butte In Situ Leach Mine

PROJECT MANAGER: Sandra L. Wastler

TECHNICAL REVIEWER(S): S. Wastler
C. McKenney

NAME CHANGE AMENDMENT APPLICATION

SUMMARY AND CONCLUSIONS:

By letter dated May 27, 1994, Ferret Exploration Company of Nebraska, Inc. (FEN) notified the U.S. Nuclear Regulatory Commission that the corporate name had been changed to Crow Butte Resources, Inc. The change in the corporate name requires that Source Material License SUA-1534 be amended accordingly. The NRC evaluated the amendment request and approved the change to the license.

DESCRIPTION OF LICENSEE'S AMENDMENT REQUEST:

FEN informed the NRC that the corporate name had been changed to Crow Butte Resources, Inc. and requested that Source Material License SUA-1534 be amended accordingly. The May 27, 1994 letter also provided a copy of the Articles of Amendment to the Revise Articles of Incorporation. In addition, by letter dated July 5, 1994, the licensee provided a copy of the amendment to the Irrevocable Letter of Credit No. 74504 that changes the name of the company to Crow Butte Resources, Inc. The Irrevocable Letter of Credit is referred to in License Condition 27.

TECHNICAL EVALUATION: The NRC staff has reviewed the information provided by the licensee regarding the corporate name change and the subsequent change to the Irrevocable Letter of Credit. As a result, the staff finds the licensee corporate name change to be appropriate.

RECOMMENDED LICENSE CHANGE:

Source Material License SUA-1534 shall be amended by revising License Condition No. 1 to read as follows:

1. Crow Butte Resources, Inc.

[Applicable Amendment: 24]

ENVIRONMENTAL IMPACT EVALUATION:

This action is considered procedural in nature, and in accordance with 10 CFR Part 51.22 (c)(11), there is no (i) significant change in the types or significant increase in the amounts of any effluent that may be released offsite, (ii) significant increase in individual or cumulative occupational radiation exposure, (iii) significant construction impact, (iv) significant increase in the potential for or consequences from radiological accidents, due to the implementation of this amendment. Therefore no further environmental review is required.

DEEP WELL INJECTION AMENDMENT APPLICATION

SUMMARY AND CONCLUSIONS:

By letter dated August 24, 1993, FEN (from here forward referred to as Crow Butte Resources, Inc. (Crow Butte) per the amendment request discussed above) requested an amendment to Source Material License SUA-1534 authorizing the use of an underground injection well to dispose of process water produced during extraction operation and restoration. Concurrently, the licensee applied to the State of Nebraska for a permit to construct and operate the Class I underground injection well at the Crow Butte In Situ Leach Mine. The NRC evaluated the radiological aspect of the amendment request and approved the deep well injection of process fluids, contingent on approval by the State of Nebraska.

DESCRIPTION OF LICENSEE'S AMENDMENT REQUEST:

On 24 August 1993, Crow Butte notified the NRC of its intention to apply for a permit to construct and operate a Class I underground injection well at the Crow Butte In Situ Leach Mine in Dawes County, Nebraska. A copy of the Hydrogeologic Review and Engineering Design for the proposed injection well, prepared in support of Crow Butte's application under the Department of Environmental Quality rules and regulations was provided. In addition, Crow Butte requested NRC approval of the underground injection well as a license amendment.

Federal regulations applying to injection of non-hazardous liquids were promulgated under Part C of the Safe Drinking Water Act (40 CFR Parts 144 through 147). The requirements for state programs to obtain primary enforcement authority from the Environmental Protection Agency are set forth in 40 CFR Part 145. The State of Nebraska has developed its own underground injection compliance program in accordance with 40 CFR Part 147.1400 requirements. The requirements for this program are contained in Title 122 - Rules and Regulations for Underground Injection and Mineral Production Wells. In order to avoid duplication of the technical review by the State of Nebraska, the NRC staff has relied on the State's analysis and has limited its review to a review of the alternative method of waste disposal in accordance with 10 CFR Part 20.2002.

Specifically, the licensee proposes to inject process fluids into the basal unit of the Sundance Formation as an alternate method of waste disposal. The

licensee proposes average disposal concentrations of 10 mg/l uranium (6800 pCi/l) and 1000 pCi/l ^{226}Ra. The injection horizon is at a depth of approximately 1143 meters (3750 feet). The licensee currently has not constructed a well into the formation and is basing the data on surrounding oil and gas exploration wells. The aquifer is estimated to have greater than 10,000 ppm Total Dissolved Solids (TDS), as the exploration data ranges from 16,000 to 120,000 ppm TDS. Based on the estimated TDS level, the TDS concentrations exceed the maximum regulatory level (10,000 ppm) for an underground source of drinking water (USDW). The licensee contends that the basal unit of the Sundance Formation is confined, and the potential for migration of injection fluid to usable aquifers is minimal.

TECHNICAL EVALUATION:

If the Sundance Formation is confined, and the potential for migration is minimal, the potential impacts to a member of the public is minimal. Based on the classification of the aquifer as exceeding the definition for an USDW, the potential for exposure of the public to the concentrations disposed is remote. Worker exposure to the fluids can be adequately managed under the current radiation safety program in place by the licensee. The average concentrations limits requested by the licensee are comparable to levels allowed at other in-situ leach operations using deep well injection as a disposal method.

Therefore, the licensee, should be given a conditional amendment to its license to allow deep well injection of process fluids, as described in its letter dated August 24, 1993. This amendment would be conditional on the State of Nebraska issuing an underground injection control permit to the licensee, for the deep well injection process, as described, and, specifically finding that the potential for contamination of other usable aquifers by the deep well injection is minimal.

RECOMMENDED LICENSE CHANGE:

Source Material License SUA-1534 shall be amended by the addition of License Condition No. 55 to read as follows:

55. The licensee, in accordance with its application dated August 24, 1993 and associated report entitled "Hydrogeologic Review and Engineering Design for the Proposed Injection Well, Crow Butte Project, Dawes County, Nebraska," is authorized to inject process fluids into the basal unit of the Sundance Formation, as an alternative method of waste disposal under 10 CFR § 20.2002, provided the following conditions are met:

    a. The State of Nebraska issues an underground injection permit to Crow Butte Resources, Inc. for the deep well injection process described in the above submittal, and

    b. The State of Nebraska finds that the potential for contamination of other usable aquifers by deep well injection is minimal.

    [Applicable Amendment: 24]

ENVIRONMENTAL IMPACT EVALUATION:

Currently, all liquid effluent from the Crow Butte process buildings and other process waste streams, with the exception of sanitary waste, must be returned to the process circuit or disposed of by either wastewater irrigation or discharge to solution evaporation ponds. With regard to wastewater irrigation, the liquid effluent is cleaned up to acceptable standards and used in land irrigation. The solution evaporation ponds allow liquid effluent to evaporate and upon site decommissioning any waste residue is shipped off site for disposal and isolation. However, the capacity of these ponds is less than initially expected, potentially requiring the construction of eight to ten additional ponds during the life of the project. Disposal of the same process fluids by deep well injection is an alternative waste disposal option that would provide dilution and isolation of the liquid effluent in a Class III aquifer. This alternate method reduces the need to build additional ponds constrained by limited space and finances, but does not result in an increase in the amount of effluent being discharged to the environment.

This action is considered a change in process operations which, in accordance with 10 CFR Part 51.22 (c)(11), does not result in (i) significant change in the types or significant increase in the amounts of any effluent that may be released offsite, (ii) significant increase in individual or cumulative occupational radiation exposure, (iii) significant construction impact, or (iv) significant increase in the potential for or consequences from radiological accidents, due to the implementation of this amendment. Therefore the action can be categorically excluded and no further environmental review is required.

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and the Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 39, 40 and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

Licensee

1. Crow Butte Resources, Inc.
[Applicable Amendment 24]

2. 216 Sixteenth Street Mall, Suite 810
Denver, Colorado 80202

3. License number: SUA-1534, Amendment No. 24

4. Expiration date: January 1, 1996

5. Docket or Reference No.: 40-8943

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
a. Natural Uranium b. Byproduct material as defined in §11e(2) of Atomic Energy Act of 1954, as amended.	Any	a. 454,545 kg b. Quantity generated under operations authorized by this license.

9. Authorized place of use shall be the licensee's Crow Butte facilities in Dawes County, Nebraska.

10. For use in accordance with statements, descriptions, and representations contained in Sections 3.0, 4.0, 5.0, and 6.0 of the licensee's Environmental Report submitted by cover letter dated October 7, 1987; as revised by page changes submitted on December 14, 1987; January 22, March 28, and May 18, 1988; November 20, 1991; and November 30, 1992. In addition, the licensee shall conduct its activities in accordance with the provisions in the following:

Submittal Date	Description
May 23, 1988	Enclosed errata sheet, replacement pages, and engineering design report dated April 27, 1988.
May 11, 1992	Cover letter submitting Supplement No. 2 to the Evaporation Pond Engineering Design Report addressing synthetic liners.
June 7, 1993	Cover letter and enclosed waste water irrigation proposal.

Notwithstanding the above, the following conditions shall override any conflicting statements contained in the licensee's application and supplements.

[Applicable Amendments: 1, 2, 3, 4, 6, 10, 11, 15, 17, 20, 21]

11. The licensee is authorized to dispose of waste byproduct material from the Crow Butte facility at the American Nuclear Corporation (ANC) Gas Hills, Wyoming, mill. The licensee's agreement with ANC constitutes an approved waste disposal plan, and the licensee shall be required to maintain the agreement for inspection at its corporate office and onsite. In the event the agreement expires or is terminated, the licensee is required to notify the Nuclear Regulatory Commission within seven (7) working days of the expiration date. A new agreement must be submitted for NRC approval within ninety (90) days of expiration, or the licensee will be prohibited from further lixiviant injection. [Applicable Amendments: 5, 24]

12. The annual throughput shall not exceed a flow rate of 3500 gallons per minute, excluding restoration flow. [Applicable Amendments: 20].

13. The licensee shall not possess more than an equivalent of 454,545 kilograms dry U_3O_8 at one time. [Applicable Amendments: 1]

14. The Crow Butte production rate shall not exceed 1,000,000 pounds of U_3O_8 per year.

15. Any significant changes in the process circuit as shown in Figure 3.1-1 of the October 7, 1987, application revised by a submittal dated March 12, 1991, shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 11, 24]

16. Release of equipment or packages from the restricted area shall be in accordance with the attachment to this license entitled, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated September 1984.

17. The licensee is hereby exempted from the requirements of Section 20.203(e)(2) of 10 CFR 20 for areas within the facility, provided that all entrances to the facility are conspicuously posted in accordance with Section 20.203(e)(2) and with the words, "ANY AREA WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."

18. The licensee shall be required to ensure that a Corporate Radiation Safety Officer (CRSO) or an alternate individual meeting the minimum education and experience requirements of a CRSO, shall be assigned full-time to the Crow Butte facility. Documentation of the individuals' training and experience shall be maintained onsite by the licensee. The Health Physics Technician (HPT) shall have four (4) months experience with the CRSO in installation or production operations and a course in respiratory protection, prior to any temporary assignment to the CRSO's duties. In accordance with the recommendations of NRC Regulatory Guide 8.31, the CRSO shall be required to receive biannual refresher training in health physics. [Applicable Amendments: 1, 4]

19. The results of the sampling, analyses, surveys and monitoring, the results of calibration of equipment, reports on audits and inspections, all meetings and training courses required by this license and any subsequent reviews,

investigations and corrective actions, shall be documented. Unless otherwise specified in the NRC regulations, all such documentation shall be maintained for a period of at least 5 years.

20. Standard operating procedures (SOPs) shall be established for all operational process activities involving radioactive materials that are handled, processed or stored. Standard operating procedures for operational activities shall enumerate pertinent radiation safety practices to be followed. Additionally, written procedures shall be established for nonoperational activities to include in-plant and environmental monitoring, bioassay analyses and instrument calibrations. An approved, current copy of each written procedure shall be kept in the process area to which it applies.

    All written procedures for both operation and nonoperational activitie shall be reviewed and approved in writing by the CRSO before implementation, whenever a change in a procedure is proposed and at least annually. to ensure that proper radiation protection principles are being applied.

21. The licensee shall be required to use a Radiation Work Permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written operating procedure exists. All RWPs shall be accompanied by a breathing zone air sample or an applicable area air sample. The RWP shall be issued by the Crow Butte site Health Physics Technician (HPT) or designate, qualified by way of specialized radiation protection training, except when the work to be performed is in the drying and packaging areas. The RWP for these areas shall be issued by the CRSO or designate, qualified by way of specialized radiation protection training equivalent to the CRSO, and shall at least describe the following:

    A. The scope of the work to be performed.

    B. Any precautions necessary to reduce exposure to uranium and its daughters.

    C. The supplemental radiological monitoring and sampling necessary prior to, during and following completion of the work.

    In addition, the CRSO's quarterly review of all nonroutine activities shall be documented.

22. The licensee shall maintain effluent control systems as specified in Section 4.1 of the license application dated October 7, 1987, with the following additions:

    A. Yellowcake drying operations shall be immediately suspended if any of the emission control equipment for the yellowcake drying or packaging areas is not operating within specifications for design performance.

    B. The licensee shall, during all periods of yellowcake drying operations, assure that the manufacturer recommended pressure is maintained in the heating chamber. This shall be accomplished by either (1) performing and documenting checks of air pressure differential approximately every 4 hours during operation, or (2) installing instrumentation which will signal an

audible alarm if air pressure differential falls below the manufacturer's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily.

C. Air pressure differential gauges for other emission control equipment shall be read and the readings documented once per shift during operations.

23. Occupational exposure calculations shall be performed and documented within 1 week of the end of each regulatory compliance period as specified in 10 CFR 20.103(a)(2) and 10 CFR 20.103(b)(2). Routine radon daughter and particulate samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Nonroutine samples shall be analyzed and the results reviewed by the CRSO within two (2) working days after sample collection.

24. The licensee shall submit a detailed decommissioning plan to the NRC for review and approval at least 12 months prior to planned final shutdown of mining operations. [Applicable Amendments: 24]

25. The licensee shall perform and document weekly visual inspections of all evaporation pond embankments, fences, liners, freeboards, and leak detection systems:

A. For the R&D ponds, a minimum freeboard of 3 feet is allowed. Any time 6 inches or more of fluid is detected in the standpipes, it shall be analyzed for specific conductance, chloride, alkalinity, sodium and sulfate.

B. For the commercial ponds, a minimum freeboard of 5 feet is allowed. Any water found in the standpipes shall be analyzed for specific conductance. If water quality is degraded beyond the action level, the water shall be further sampled and analyzed for chloride, alkalinity, sodium and sulfate.

At all times, the licensee shall maintain sufficient reserve capacity in the evaporation pond system to enable transferring the contents of a pond to the other ponds. In the event of a leak and subsequent transfer of liquid, freeboard requirements shall be suspended during repairs.

Upon verification of a liner leak, the fluid level shall be lowered by transferring the pond's contents to an alternate cell. Water quality in the affected standpipes shall be analyzed for the five parameters listed above once every 7 days during the leak period and once every 7 days for at least 2 weeks following repairs. The NRC shall be notified by telephone within 48 hours of leak verification, followed within 30 days by a written report. This report shall include analytical data, describe the cause of the leak and mitigative action, and the results of that action.

[Applicable Amendments: 15, 24]

26. The licensee shall maintain an area within the restricted area boundary for storage of contaminated materials prior to their disposal. All contaminated wastes and evaporation pond residues shall be disposed at a licensed radioactive waste disposal site.

27. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criterion 9, adequate to cover the estimated costs, if accomplished by a third party, for completion of the NRC-approved site closure plan including: above ground decommissioning and decontamination, the cost of offsite disposal of radioactive solid process or evaporation pond residues, soil and water analyses and ground-water restoration as warranted. Within 3 months of NRC approval of a revised closure plan and cost estimate, the licensee shall submit for NRC review and approval, a proposed revision to the financial surety arrangement if estimated costs in the newly approved site closure plan exceed the amount covered in the existing financial surety. The revised surety shall then be in effect within 3 months of written NRC approval.

Annual updates to the surety amount, required by 10 CFR Part 40, Appendix A, Criterion 9, shall be provided to the NRC by October 1 of each year. If the NRC has not approved a proposed revision 30 days prior to the expiration date of the existing surety arrangement, the licensee shall extend the existing arrangement, prior to expiration, for 1 year. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and basis for the cost estimates with adjustments for inflation, maintenance of a minimum 15 percent contingency, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure. Since the NRC has authorized the surety instrument to be held by the State of Nebraska, the licensee shall also provide the NRC with copies of surety related correspondence submitted to the State, a copy of the State's surety review, and the final approved surety arrangement. The licensee must also ensure that the NRC related portion of the surety is expressly identified and covers the above ground decommissioning and decontamination, the cost of the offsite disposal, soil and water sample analyses, and ground-water restoration associated with the site. The basis for the site closure cost estimate is the NRC-approved site closure plan or NRC-approved revisions to the plan. Annual updates and revised site closure plan cost estimates should follow the format in the attachment to this license entitled, "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates."

Ferret Exploration Company of Nebraska's currently approved surety instrument, Irrevocable Standby Letter of Credit No. 74504 issued by First Bank, N.A. in favor of the State of Nebraska, shall be maintained in an amount no less than $5,000,000 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by both the State of Nebraska and the NRC.

[Applicable Amendments: 7, 16]

28. In addition to the inspection and audit program described in Section 5.3 of the application, dated October 7, 1987, the Health Physics Technician (HPT) or designate shall document a daily walkthrough of the facility to determine if radiation control practices are being implemented.

29. The licensee shall submit to the NRC, a copy of the ALARA report as specified in Section 5.3.4 of the application dated October 7, 1987, within 2 months of the end of the reporting period. The report shall also include a summary of the daily walkthrough inspections. [Applicable Amendments: 1, 24]

30. The licensee shall perform monthly surveys for airborne natural uranium in the restricted area. Monitoring shall be done at locations specified in the licensee's submittal dated January 4, 1991, except one monitor location shall be added in the IX column area. Any area meeting the definition of an "airborne radioactive area" as described in 10 CFR 20.203(d), shall be surveyed weekly and the cause of the elevated uranium levels shall be investigated. Results of these investigations shall be furnished to the NRC in the annual ALARA report.

    The licensee shall perform, at the locations specified in the above submittal, monthly surveys for radon or radon progeny in the restricted area inhabited by workers, with the exception that radon or radon progeny surveys shall be increased to weekly if concentrations are found to exceed 8 pCi/l or 0.08 WL (Working Levels), respectively. Such weekly sampling shall be maintained until four consecutive weekly samples exhibit less than 8 pCi/l or 0.08 WL.

    The calculation of internal exposure to radon progeny or natural uranium shall be based on a Time Weighted Exposure (TWE) calculation, considering both occupancy times and average airborne concentrations.

    If average occupancy times are established for each category of worker, the licensee shall conduct a semiannual time study to establish the basis for averaging occupancy periods.

    If any worker reaches or exceeds 25 percent of the maximum permissible exposure limits as specified in 10 CFR Part 20, based upon a calculated TWE for the week or the calendar quarter, dependent on the solubility of the material, the Health Physics Technician (HPT) shall initiate an investigation of the employee's work record and exposure history to identify the source of the exposure.

    Necessary corrective measures shall be taken to ensure reduction of future exposures to as low as is reasonably achievable. Records shall be maintained of these investigations and results furnished to the NRC in the annual reports.

    [Applicable Amendments: 10, 12, 24]

31. In addition to the bioassay program discussed in Section 5.7.5 of the application, dated October 7, 1987, the licensee shall comply with the following:

    A. Anytime an action level of 15 ug/l uranium for urinalysis is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22, dated

January 1987. This documentation shall be submitted to the NRC as part of the semiannual report required by 10 CFR Part 40.65.

B. Anytime an action level of 35 ug/l for two consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in vivo measurement is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22. This documentation shall be submitted to the NRC within 30 days of exceeding the action level.

C. All in vivo measurements shall be performed in accordance with the recommendations contained in Revision 1 of Regulatory Guide 8.22.

[Applicable Amendments: 24]

32. Employees shall monitor themselves with an alpha survey instrument prior to exiting the restricted area. Should the results of monitoring exceed an action level of 1000 dpm/100 cm^2, employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the CRSO for investigation. Additionally, the CRSO shall perform and document unannounced quarterly spot checks of employees leaving the process area.

33. The licensee shall implement a surface contamination monitoring and control program in compliance with the licensee's application, as updated by the submittal dated November 20, 1991. This program shall be revised by the licensee, and reviewed and approved by NRC in the event the licensee installs and operates a yellowcake dryer. Notwithstanding these submittals, the licensee shall initiate and document cleanup efforts within 24 hours in the event that action levels are exceeded. [Applicable Amendments: 10, 15]

34. All radiation and environmental monitoring, sampling and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer or at least semiannually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source before each day's use.

35. Any corporate organization changes affecting the assignments or reporting responsibilities of the radiation safety staff, as revised by the submittal dated November 20, 1991, shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 4, 11, 15]

36. DELETED by Amendment No. 12.

37. DELETED by Amendment No. 15.

38. Any changes to the permit area described in the license application dated October 7, 1987, shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 24]

39. DELETED by Amendment No. 9.

40. The results of effluent and environmental monitoring described in Table 5.7-5 of the license application, as amended by the submittal dated November 20, 1991, shall be reported in accordance with 10 CFR 40, Part 40.65, to the NRC. The report shall also include injection rates, recovery rates and injection manifold pressures. [Applicable Amendments: 15, 24]

41. Before engaging in any activity not previously assessed by the NRC, the licensee shall prepare and record an environmental evaluation of such activity. When the evaluation indicates that such activity may result in a significant adverse environmental impact that was not previously assessed or that is greater than that previously assessed, the licensee shall provide a written evaluation of such activities and obtain prior approval of the NRC in the form of a license amendment.

42. All liquid effluents from process buildings and other process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit, discharged to the solution evaporation ponds, or land-disposed in accordance with the July 27, 1988, wastewater irrigation proposal, submitted August 3, 1988. [Applicable Amendments: 1]

43. DELETED by Amendment No. 13.

44. At least 2 months prior to mining in each mine unit, the licensee shall submit baseline ground-water quality data to the NRC. The data shall be established in each mine unit at the following minimal density:

A. one production or injection well per acre,

B. one upper aquifer monitor well per 5 acres, and

C. all perimeter monitor wells.

The data shall consist, at a minimum, of the sample analyses indicated in Appendix 2.9(a) of the October 7, 1987, license application. The baseline data shall support a request for a license amendment establishing upper control limits (UCLs) and restoration standards for each mine unit.

Current UCLs, restoration standards, and monitor well locations are designated in:

Submittal Date	Mine Unit No.
December 31, 1990	1
January 23, 1992	2
November 19, 1992	3
February 7, 1994	4

[Applicable Amendments: 13, 19, 23, 24]

45. All designated monitor wells shall be sampled and tested on a biweekly basis. If two UCLs are exceeded in a well or if a single UCL value is exceeded by

January 1987. This documentation shall be submitted to the NRC as part of the semiannual report required by 10 CFR Part 40.65.

B. Anytime an action level of 35 ug/l for two consecutive specimens or 130 ug/l uranium for one specimen for urinalysis or 16 nCi uranium for an in vivo measurement is reached or exceeded, the licensee shall document the corrective actions which have been performed in accordance with Revision 1 of Regulatory Guide 8.22. This documentation shall be submitted to the NRC, within 30 days of exceeding the action level.

C. All in vivo measurements shall be performed in accordance with the recommendations contained in Revision 1 of Regulatory Guide 8.22.

[Applicable Amendments: 24]

32. Employees shall monitor themselves with an alpha survey instrument prior to exiting the restricted area. Should the results of monitoring exceed an action level of 1000 dpm/100 cm^2, employees shall decontaminate themselves to less than the action level. If decontamination cannot be accomplished, the employee shall report the incident to the CRSO for investigation. Additionally, the CRSO shall perform and document unannounced quarterly spot checks of employees leaving the process area.

33. The licensee shall implement a surface contamination monitoring and control program in compliance with the licensee's application, as updated by the submittal dated November 20, 1991. This program shall be revised by the licensee, and reviewed and approved by NRC in the event the licensee installs and operates a yellowcake dryer. Notwithstanding these submittals, the licensee shall initiate and document cleanup efforts within 24 hours in the event that action levels are exceeded. [Applicable Amendments: 10, 15]

34. All radiation and environmental monitoring, sampling and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer or at least semiannually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source before each day's use.

35. Any corporate organization changes affecting the assignments or reporting responsibilities of the radiation safety staff, as revised by the submittal dated November 20, 1991, shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 4, 11, 15]

36. DELETED by Amendment No. 12.

37. DELETED by Amendment No. 15.

38. Any changes to the permit area described in the license application dated October 7, 1987, shall require approval by the NRC in the form of a license amendment. [Applicable Amendments: 24]

39. DELETED by Amendment No. 9.

20 percent, the licensee shall take a confirming water sample within 48 hours and analyze it for the excursion indicators. If the second sample does not indicate exceedance, a third sample shall be taken within 48 hours. If neither the second or third indicate exceedance, the first sample shall be considered in error.

If the second or third sample indicates an exceedance, the well in question shall be placed on excursion status, and the NRC shall be notified by telephone within 24 hours and within 7 days in writing from the time the confirmation sample was taken. Upon confirmation of an excursion, the licensee shall implement a corrective action and increase the sampling frequency for the excursion indicators to once every 7 days. An excursion is considered concluded when the concentrations of excursion indicators are below the concentration levels defining an excursion for three consecutive 1-week samples.

[Applicable Amendments: 10, 13, 19, 23]

46. A written report shall be submitted to the NRC within two (2) months of excursion confirmation. The report shall describe the excursion event, corrective actions taken and results obtained. If the wells are still on excursion at the time the report is submitted, injection of lixiviant within the well field on excursion shall be terminated until such time that aquifer cleanup is complete.

[Applicable Amendments: 24]

47. The licensee shall construct all wells in accordance with methods described in the October 7, 1987, application, as amended by letter dated November 20, 1991. The licensee shall perform well integrity tests on each injection and production well before the wells are utilized and on wells that have been serviced. The integrity test shall pressurize the well to 125 percent of the maximum operating pressure and shall maintain 90 percent of this pressure for 20 minutes to pass the test. At the licensee's option, a single point resistance test may be utilized. If any well casing failing the integrity test cannot be repaired, the well shall be plugged and abandoned.

Additionally, flow rates on each injection and recovery well, and manifold pressures on the entire system, shall be measured and recorded daily. During well-field operations, injection pressures shall not exceed the integrity test pressure at the injection well heads.

[Applicable Amendments: 14]

48. The licensee shall utilize sodium carbonate/bicarbonate as the lixiviant with an oxygen or hydrogen peroxide oxidant. Any variation from this combination shall require a license amendment.

49. DELETED by Amendment No. 15.

50. The licensee shall maintain a log of all significant solution spills and notify the NRC by telephone within 48 hours of any failure which may have a radiological impact on the environment. Such notification shall be followed, within 7 days, by submittal of a written report detailing the conditions leading to the failure

or potential failure, corrective actions taken and results achieved. This requirement is in addition to the requirements of 10 CFR Part 20.

[Applicable Amendments: 24]

51. Ground-water restoration and post-restoration monitoring shall be conducted in each mine unit consistent with the provisions in the licensee's application and Environmental Report dated October 7, 1987, as amended by its submittal dated November 1, 1993. Notwithstanding the above references, the licensee shall include sodium in its restoration monitoring and demonstration program. The goal of restoration shall be returning ground-water quality, on a mine unit average, to baseline conditions. [Applicable Amendments: 22]

52. The licensee is authorized to use respiratory protection equipment and implement protection factors for the purpose of assigning an exposure to airborne radionuclides provided that the respiratory protection program specified in the licensee's submittal dated May 14, 1991, is implemented. The Radiation Safety Officer shall implement the program in accordance with 10 CFR 20.103, and the program shall follow the guidelines provided in NRC Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection." [Applicable Amendments: 12]

53. The licensee shall submit by November 1, 1992, for NRC review and approval, an onsite inspection program which meets, as a minimum, the guidelines found in Regulatory Guide 3.11.1, "Operational Inspection and Surveillance of Embankment Retention Systems for Uranium Mill Tailings." Training of field personnel who will perform the systematic inspections shall be done annually, as a minimum. In addition, the individual performing the annual inspection and technical evaluation shall be a registered professional engineer experienced in dam safety. The result of the annual inspection shall be a technical evaluation of the hydraulic and hydrologic capacities and structural stability of the embankments. Review and evaluation of the required surveillance and inspection reports shall also be included as part of the report. A copy of each annual technical evaluation report shall be submitted to the NRC within 1 month of the inspection. [Applicable Amendments: 18, 24]

54. The licensee shall construct ponds 1, 2, and 5 in accordance with their submittal dated May 23, 1988, as modified by their July 16, 1992, submittal. In addition, the ponds shall be constructed as follows:

A. Fill material shall be classified as a SM material in accordance with the Unified Soil Classification System.

B. Quality control of the fill shall be performed in accordance with the guidance provided for radon barrier materials in the Staff Technical Position on Testing and Inspection, 1989.

C. As-built drawings shall be submitted to NRC within 3 months of completion of construction of each pond.

[Applicable Amendments: 18]

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License number: SUA-1534, Amendment No. 24

Docket or Reference number: 40-8943

55. The licensee, in accordance with its application dated August 24, 1993 and associated report entitled "Hydrogeologic Review and Engineering Design for the Proposed Injection Well, Crow Butte Project, Dawes County, Nebraska," is authorized to inject process fluids into the basal unit of the Sundance Formation, as an alternative method of waste disposal under 10 CFR § 20.2002, provided the following conditions are met:

a. The State of Nebraska issues an underground injection permit to Crow Butte Resources, Inc. for the deep well injection process described in the above submittal, and

b. The State of Nebraska finds that the potential for contamination of other usable aquifers by deep well injection is minimal.

[Applicable Amendments: 24]

56. All notices or submittals to the NRC required under this license shall be addressed to the Chief, High-Level Waste and Uranium Recovery Projects Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards.

[Applicable Amendments: 24]

FOR THE NUCLEAR REGULATORY COMMISSION

Joseph J. Holonich

Dated Oct. 6, 1994

Joseph J. Holonich, Chief
High-Level Waste and Uranium Recovery
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards