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

July 8, 1999

Mr. William P. Goranson, Manager
Radiation Safety, Licensing & Regulatory Affairs
Rio Algom Mining Corp.
6305 Waterford Blvd. Suite 325
Oklahoma City, Oklahoma 73118

SUBJECT: AMENDMENT 14 TO SOURCE MATERIAL LICENSE SUA-1548, SMITH RANCH URANIUM PROJECT - WELLFIELD FOUR STARTUP AND ADMINISTRATIVE CHANGES

Dear Mr. Goranson:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of Rio Algom Mining Corp.'s (RAMC's) February 19, 1999, request to amend NRC Source Material License SUA-1548. By this submittal, RAMC requested NRC approval to begin commercial mining operation of Wellfield Four at the Smith Ranch Uranium Project.

The details of the amendment request are discussed in the NRC staff's Technical Evaluation Report (TER). The TER documents the basis for the NRC staff's evaluation of the amendment request and is provided as Enclosure 1. Based on its review, the NRC staff considers that the baseline water quality, upper control limits, and restoration criteria proposed by RAMC for Wellfield Four are acceptable. NRC is satisfied that the perimeter monitoring well locations and screen completion intervals for Wellfield Four will provide adequate lateral excursion detection. In addition, RAMC has an acceptable density of vertical monitoring well pairs and provided reasonable assurance that the production zone is adequately isolated from the adjacent overlying and underlying aquifers.

In addition, by letter dated May 20, 1999, RAMC requested two amendments to SUA-1548, which were administrative changes to two license conditions 10.3 and 11.10, in source material license, SUA-1548. These two changes are to provide language that would clarify the conditions and make them consistent with current operational practices.

Therefore, pursuant to Title 10 of the Code of Federal Regulations, Part 40, Source Material License SUA-1548 is hereby amended by revising License Condition Nos. 10.3, 11.10, and 12.1. All other conditions of this license shall remain the same. The enclosed license is being reissued to incorporate the above modifications (Enclosure 2). An environmental review was not performed since these licensing actions are categorically excluded under 10 CFR 51.22(c)(10) and (c)(11).

These changes to your license were discussed in a telephone conversation on July 8, 1999, between Mr. Marvin Freeman of RAMC and Mr. John Lusher of my staff. If you have any questions concerning this letter or the enclosures, please contact Mr. Lusher, the NRC Project Manager for the Smith Ranch facility, at (301) 415-7694.

Sincerely,

John J. Surmeier, Chief
Uranium Recovery and
Low Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-8964
SUA-1548, Amendment No. 14

Enclosures: As stated (2)

cc: G. Cash, WDEQ
B. Ferdinand, RAMC

TECHNICAL EVALUATION REPORT

DATE: June 29, 1999

DOCKET NO. 40-8964 LICENSE NO. SUA-1548

LICENSEE: Rio Algom Mining Corp.

FACILITY: Smith Ranch Uranium In-Situ Leach (ISL) Project

PROJECT MANAGER: John H. Lusher

TECHNICAL REVIEWERS: Jane Gunn, John H.Lusher

SUMMARY AND CONCLUSIONS:

Rio Algom Mining Corporation submitted a source material license amendment request dated February 16, 1999, for approval to start commercial operation of Wellfield Four at the Smith Ranch ISL Facility. License Condition 10.9 of SUA-1548 requires Rio Algom to identify baseline water quality for the constituents identified in its Source Materials License application dated March 31, 1988, as amended. License Condition 12.1 to SUA-1548 requires Rio Algom to propose, in the form of a license amendment, upper control limits (UCLs) and groundwater restoration criteria for each mining unit at least 2 months prior to lixiviant injection.

In conducting its review, NRC considered data provided in the "Wellfield Four Pre-Operational Data Submittal," dated February 16, 1999. The staff reviewed the material in the referenced submittal for compliance with conditions described in Source Materials License No. SUA-1548 and with commitments made in the Source Materials License application dated March, 1988, as amended.

NRC staff concluded that the baseline water quality, UCLs, and restoration criteria proposed for Wellfield Four are acceptable. NRC is satisfied that the perimeter monitoring well locations and screen completion intervals for Wellfield Four will provide adequate lateral excursion detection. In addition, Rio Algom has an acceptable density of vertical monitoring well pairs and provided reasonable assurance that the production zone is adequately isolated from the adjacent overlying and underlying aquifers.

Additionally, in a letter dated May 20, 1999, Rio Algom proposed administrative changes to two license conditions, 10.3 and 11.10, in source material license, SUA-1548. These two changes are to provide language that would clarify the conditions and make them consistent with current operational practices. Based on these conclusions, NRC approves the requested amendments to License Condition 10.3, 11.10, and 12.1, and with the issuance of this amendment, authorizes commencement of mining operations in Wellfield Four.

DESCRIPTION OF LICENSEE'S AMENDMENT REQUEST:

Wellfield Four is designed to mine in the M Sand aquifer of the Fort Union formation. The M Sand is a braided stream deposit with an average thickness of 107 ft. Due to the fluctuating energy characteristic of braided streams, significant shale breaks ranging from five to thirty feet thick are not uncommon. Depending on location across the wellfield, the entire M Sand interval may be divided into three separate segments, due to interbedded shale lenses. Interbedded shale breaks are more prevalent in the eastern portion of Wellfield Four than in the western half. Vertical excursion monitor wells monitor the adjacent overlying and underlying sandstone aquifers.

The amendment request, Wellfield Four Pre-Operational Data Submittal, February 16, 1999, contains baseline water quality data, proposed UCLs, and proposed groundwater restoration criteria. In addition the submittal contains geologic cross sections, monitor and production well completion data, and data and analyses from two pump tests. UCL parameters were calculated according to the specifications in the approved license application. Statistical analyses were performed on the three excursion parameters: (1) chloride; (2) conductivity; and (3) total alkalinity, for calculating the UCL concentrations. Rio Algom followed WDEQ-LQD Guideline 4 for determination of outliers.

TECHNICAL EVALUATION:

The following technical objectives and types of information were submitted by Rio Algom to support the requested license amendment for Wellfield Four:

- Pump test data to: 1) demonstrate a hydraulic connection between the production zone and the perimeter monitor well ring; and 2) determine the degree of hydrologic communication between the production zone and the adjacent overlying (O Sand) and underlying (K Sand) aquifers.
- Baseline water quality data, proposed UCLs for monitoring wells, and proposed target restoration values;
- Location and completion details for monitoring wells and ore zone baseline water quality wells; and
- Potentiometric surface maps for the mineralized portion of the M Sand, the overlying aquifer (O Sand), the underlying aquifer (K Sand), as developed from pre-mining and post-test conditions.

1) Pump Test Review.

The NRC staff objectives in reviewing the pump tests are to ensure the perimeter monitoring wells are hydraulically connected to the ore unit, and to determine if any hydraulic communication exists between the production zone and the overlying and underlying aquifers. Aquifer properties of the M Sand in Wellfield Four were evaluated using two pump tests conducted in late 1998. Each pump test consisted of one fully penetrating pumping well with multiple observation wells. A

test was conducted at each of the two pumping wells, on the eastern and western end of the wellfield.

The first test, which used well PW4-1 as the pumping well, was designed to define the eastern half of Wellfield 4. The test was conducted over the six days between September 30 and October 6, 1998. Pre-test data was collected for 3 days prior to the initiation of each test. Well PW4-1 was pumped for 72 hours at an average rate of 45.6 gpm, and recovery was observed for 72 hours. Definite drawdown responses in the monitoring ring wells demonstrated an acceptable level of hydraulic connection between the ore unit and the monitoring wells. Drawdown responses to pumping were not observed in the O Sand (upper) or K Sand (lower) aquifer monitor wells during this test.

Data for the PW4-1 pump test show good communication with all the eastern M Sand monitoring wells. A drawdown of at lest nine feet was developed in all of the eastern M Sand wells. Higher drawdowns were observed to the south of the pumping well, indicating higher transmissivities in that direction. Aquifer properties were also determined by the PW4-1 test. Log-log plots of the drawdown data show a transmissivity of 1000 gal/day/ft best represents the variation seen in individual well data, which ranged from 700 to 1390 gal/day/ft. Hydraulic conductivities vary from 1.9 to 4.4 ft/day (0.6 to 1.3 Darcy) with an average of 2.7 ft/day. Storage coefficients vary from 3.8E-05 to 7.3E-05, with 5.0E-05 best representing the M Sand in the Eastern portion of Wellfield 4. These aquifer properties are consistent with the observation of good communication between the pumping well and the monitor wells.

The second test, in which PW4-2 was the pumping well, was designed to define the western half of Wellfield 4. The PW4-2 test was also a six day test with well PW4-2 being pumped for 72 hours at an average rate of 40.6 gpm and recovery observed for 72 hours. The test also had three days of pre-test data collection prior to initiation of the pump test. The PW4-2 test was conducted from October 19 through October 25, 1998. Definite drawdown responses in the monitoring ring wells demonstrated an acceptable level of hydraulic connection between the ore unit and the monitoring wells. Drawdown responses to pumping were not observed in the O Sand (upper) aquifer monitor wells during this test. However, some drawdown was observed late in the test in some K Sand (lower) aquifer monitor wells.

The K Sand is separated from the ore sand (M Sand) by the L shale. The L shale varies in thickness and apparently allows communication between the K and M sands in limited areas. Based on the results of the PW4-2 pump test, the area of communication between the K and M Sands (thinning of the L Shale) is to the southeast of well M-425. An additional K Sand monitoring well was installed north-northwest of M-425 to monitor potentiometric and water quality changes in the K aquifer in the vicinity of the aquifer communication. Additional O Sand and M Sand monitoring wells will be installed in the vicinity of MP-401, to provide additional information on water quality and potential impacts of mining in the southwest end of the wellfield.

Data for the PW4-2 pump test show good communication with all the western M Sand monitoring wells. A drawdown of greater than five feet was developed in all monitoring wells observed as part of the PW4-2 pump test. Therefore, communication between the production zone and ring monitoring wells is adequate. The average transmissivity from log-log plots of test data is 1350 gal/day/foot. The average storage coefficient for the west side is 7.9E-05. Hydraulic

conductivities varied from 1.3 to 2.3 ft/day (0.4 to 0.7 Darcy) with an average value of 1.8 ft/day (0.6 Darcy) being representative for this pump test.

A transmissivity of 1200 gal/day/ft and storage coefficient of 6.5E-05 is thought to represent best the average conditions for Wellfield Four based on both the PW4-1 and PW4-2 multi-well tests. A hydraulic conductivity of 2.3 ft/day (0.7 Darcy) is thought to represent best the average conditions in the M Sand in Wellfield Four.

2) Baseline water quality data, proposed monitoring well UCLs, and proposed restoration objectives.

The results of the baseline water quality analysis, proposed monitoring well UCLs, and proposed restoration objectives are listed in Attachment J of the February 1999 submittal. Baseline water quality has been established for each of the three aquifers in Wellfield Four, with separate analysis for the ore zone and monitoring ring wells in the ore bearing aquifer (M Sand). The wells and monitoring zones are defined as: 1) the MP wells that represent the ore zone; 2) the M wells that are the M Sand ring monitoring wells; 3) the MS monitor wells in the overlying aquifer (O Sand), and; 4) the MD wells that monitor the underlying K Sand. In accordance with License Condition 10.9, the licensee identified baseline water quality using a constituent list and methodology defined in Table 5-1 of the approved license application. In consideration of using the baseline water quality for determining wellfield restoration objectives, baseline water quality was established on the basis of the mining unit as a whole. The staff finds the baseline water quality analysis for Wellfield Four acceptable.

UCL parameters were calculated for three of the well groups according to the specifications in the approved license application. Rio Algm followed WDEQ-LQD Guideline 4 for determination of outliers and statistical analyses for the three excursion parameters in each of the three well groups. The UCLs are: (1) in the M wells, which monitor the M Sand - chloride 19 mg/l, conductivity 708 umhos/cm at 25 C°, total alkalinity 177 mg/l as $CaCO_3$; (2) in the MS wells, which monitor the overlying O Sand - chloride 19 mg/l, conductivity 586 umhos/cm at 25 C°, total alkalinity 171 mg/l as $CaCO_3$; and (3) in the MD wells, which monitor the underlying M Sand - chloride 19 mg/l, conductivity 552 umhos/cm at 25 C°, total alkalinity 172 mg/l as $CaCO_3$.

The conductivity and total alkalinity UCLs are established at a concentration of 5 standard deviations above the monitor well group mean concentration, as required by License Condition 12.1. The UCL for chloride was established by adding 15 mg/l to the monitor well group mean concentration. The staff finds the UCLs proposed for Wellfield Four acceptable.

License Condition 12.1 states that Restoration Criteria will be calculated according to the approved license application. The approved application defines baseline as mean baseline + tolerance limits. The primary restoration targets for individual parameters have been calculated as baseline mean. In the event that the primary restoration targets cannot be met, the secondary restoration objective will be to return the condition and quality of groundwater to the pre-mining use suitability standards set by the Wyoming Department of Environmental Quality (WDEQ). The restoration targets for Wellfield Four were determined in accordance with the approved license application. The staff finds the Restoration Criteria proposed for Wellfield Four acceptable.

3) Monitoring well locations and completion details.

The license application states that the perimeter monitoring wells will be approximately 500 feet from the outer limits of the projected mine patterns, and within 500 feet of adjacent ring monitoring wells. Figures in the February 16, 1999, submittal display monitoring well placement that is consistent with the application commitments.

The screened intervals for the perimeter monitor wells surrounding the M Sand production zone are consistent with commitments in Section 5.1.2 of the approved application which indicates that, "All monitor wells will be completed only in the zone to be monitored and the completion zone will be limited to the total thickness of the completion zones of adjacent injection and recovery wells (plus/minus five feet)." Well completion data in conjunction with the wellfield cross-sections provided in the February 1999 submittal were sufficient to determine that all perimeter monitor wells fit the specifications stated in the approved license application. Well completion data and geophysical logs of all perimeter monitoring wells and adjacent ore unit wells were also provided in the submittals. The staff has determined that the perimeter monitoring wells have been acceptably placed.

In the approved application Rio Algom committed to placing vertical excursion wells in the adjacent overlying and underlying aquifers no greater than 1000 feet apart. In the Wellfield Four submittal, no adjacent monitor wells in any single overlying or underlying zone are over 1000 feet apart. Well completion details in the submittal show well completions to be also within requirements. Therefore, the NRC staff finds the monitoring well locations and completions acceptable.

4) Pre-mining potentiometric surface maps.

Premining potentiometric surface maps for the M ,O, and K Sands were developed and submitted. Potentiometric data shows a positive gradient flowing from the K Sand to the M Sand in the area of communication. This gradient should decrease the possibility of mining waters flowing into the K Sand.

ADMINISTRATIVE CHANGES TO SUA-1548

DESCRIPTION OF LICENSEE'S AMENDMENT REQUEST:

By letter dated May 20, 1999, Rio Algom proposed administrative changes to two license conditions, 10.3 and 11.10, in Source Material License, SUA-1548. These two changes are to provide language that would clarify the conditions and make them consistent with current operational practices. These changes also would address issues that were raised during NRC Inspection 99-01.

TECHNICAL EVALUATION:

The technical evaluation of License Conditions 10.3 and 11.10 are based on information supplied by the licensee.

Currently, License Condition 10.3 requires that Rio Algom immediately shut down the dryer in the event that the emission control system does not operate within design performance specifications. This could be interpreted to mean that if the system cannot meet the minimum vacuum requirements for either one of the dryers, then that dryer must be shut down. Rio Algom proposes to change the text of License Condition 10.3 (a.) to allow the dryer to continue to operate to the completion of the drying cycle rather than cease operation. The text change also implements conditions restricting the unloading and loading of the dryer until the emission control system is operating within design specifications.

The dryer manufacturer recommends a minimum vacuum of 5 inches Hg and the typical operating vacuum ranges from 15 to 25 inches Hg. The system is designed such that the only way vacuum cannot be maintained at minimum specifications is if there is a failure in the vacuum source. As long as the vacuum source is functioning properly, there should be minimal vacuum on the dryer, notwithstanding potential air leaks into the system.

In situations in which minimum operating vacuum is not maintained during the drying cycle, Rio Algom believes that it is neither practical nor radiologically and occupationally safer to shut down the dryer immediately. Rather, Rio Algom would continue to operate the dryer, but would not unload it until the emissions control system is functioning as per design specifications. If there is a need to unload the dryer while the emissions controls system is not operating within design specifications, that activity would be performed under a Radiation Work Permit rather than a Standard Operating Procedure. The dryer would not be reloaded until the emissions control system is determined to be operating within design specifications. The rationale for the continuation of the drying cycle is as follows.

1. The yellowcake is dried using a batch process. The yellowcake enters the dryer as a slurry of precipitated yellowcake solids suspended in water, and as heat and vacuum are applied to the system, the water boils off as steam. A typical drying cycle may last from 12 to 20 hours depending on the quantity and moisture content of the yellowcake slurry. During the entire cycle, the yellowcake is agitated to prevent it from settling with large rotating rakes. If the rakes stop rotating, for even a short period of time, the yellowcake will settle and pack around the bottom of the dryer. The density of the yellowcake, after it has settled, can make restarting the rotation of the rakes extremely difficult and can possibly damage the drive system and the rakes on the dryer. In a worst case scenario, it may be necessary to open the dryer and clear the yellowcake manually. By continuously operating the dryer, the yellowcake will remain suspended until conditions are reached that allow the dryer to be unloaded.

2. The unloading and packaging process provides the greatest source of airborne radioactivity in the entire drying process since the yellowcake is physically transferred from one container, the dryer, to another container, the drum. During that transfer, there is an opportunity for fugitive emissions of yellowcake dust, which are controlled by applying a vacuum to the drum loading station under the dryer unloading chute. Because of this, Rio Algom would not unload the dryer under routine or standard operating procedures unless the emission control system is operating within design specifications.

3. In the dryer, the supplied vacuum allows the water vapor to be withdrawn from the material and the vessel faster than it is generated. In a situation where the water vapor is not removed fast enough, pressure will increase in the dryer and will be relieved through

the pressure release lids located on the top of the filtration bag house. Under normal conditions, the lids are held closed by the vacuum system, and if there is a loss of vacuum, they are released. The bag filters in the baghouse are located between the dryer outlet and the pressure release lids and will trap any entrained yellowcake dust as the steam escapes the vessel. Therefore, Rio Algom does not see buildup of pressure as a result of a loss of vacuum to be a significant radiological hazard. The pressure release system is designed for the release of steam and the filtration system prevents any airborne yellowcake from escaping the dryer system.

Therefore, Rio Algom believes that its proposed change to License Condition 10.3(a) allows for a practical and safe completion of the drying cycle in the event of a loss of the emission control system. Rio Algom also believes that the restrictions placed on loading the dryer when the emission control system is operating within design specifications will prevent further dryer operations until the emission controls systems are restored. Additionally, the restrictions on unloading the dryer restricts the routine unloading and packaging operations while the emission control system is not operating at or above minimum vacuum levels.

Rio Algom is currently evaluating the installation of a backup vacuum system. There is more than one concept that is being considered that would allow the routine operation of the dryer to continue and maintain exposures ALARA. After review of the information presented by the licensee. The NRC staff finds this request acceptable

The proposed change to License Condition 11.10 would correct inconsistent language. As currently written, License Condition 11.10 requires that exposure calculations be performed and documented within 1 week of the regulatory compliance period. This requirement is based on the pre-1993 version of 10 CFR 20 that allowed exposures to be determined one quarter after the end of the reporting year as the compliance period. The regulation citations in this license condition were updated in Amendment 12 to this license, but there was no consideration that the definition of the regulatory compliance period had been changed.

During the most recent inspection, 99-01, the inspector pointed out the inconsistent language in License Condition 11.10. After consulting with Region IV and Headquarters, the determination was made that the regulatory compliance period concluded at the end of the calendar year. Rio Algom pointed out that the TLD badge results require a minimum of 30 days for analysis before the results are returned to perform exposure calculations. Typically, these results may take up to 60 days before being returned from the vendor. Therefore, Rio Algom is requesting to extend the exposure calculation and documentation period from 1 week to 1 calendar quarter. The NRC staff finds this request acceptable.

RECOMMENDED LICENSE CHANGES:

Pursuant to Title 10 of the Code of Federal Regulations, Part 40, Source Material License SUA-1548 will be amended by the revising License Condition Nos.10.3, 11.10, and 12.1, as follows:

10.3 The licensee shall maintain effluent control systems as specified in Section 4.1 of the license application dated March 31, 1988, <u>as amended</u>, with the following additions:

a. If during yellowcake drying operations any emission control equipment for the yellowcake drying or packaging areas is not performing within the operational specifications, the

licensee shall not; (1) unload the dryer as part of the routine operations until the emission control equipment has been returned to service within operational specifications; or (2) reload the dryer with yellowcake until the emission control system has been returned to service within its operational specifications.

b. The licensee shall, during all periods of yellowcake drying operations, assure that the manufacture-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 that will signal an audible alarm if air pressure falls below the manufacture's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily during dryer operations.

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

11.10 Occupational exposure calculations shall be performed and documented within one calendar quarter after the end of the regulatory compliance period as specified in 10 CFR 20.2106(b). Routine radon daughter and particulates shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Non-routine samples shall be analyzed and the results reviewed by the RSO or designee within 2 working days after sample collection.

12.1 At least 2 months prior to lixiviant injection in each mining unit, baseline water quality data shall be submitted to the NRC. Upper control limits (UCLs) and restoration criteria shall be calculated in accordance with the licensee's application dated March 31, 1988, as amended.

a. The submittal shall propose, in the form of a license amendment, UCLs for chloride, conductivity, and alkalinity in all monitoring wells for each mining unit.

b. The submittal shall propose, in the form of a license amendment, ground-water restoration criteria for each mining unit.

Current UCLs and groundwater restoration criteria are designated in:

Submittal Date	Wellfield No.
May 27, 1997	1
(Pages F1-F13; Tables F1.2, F2.2, F3.2, F4.2)	
June 1, 1998	3
(Tables H1-2, H2.2, H3.2, and H4.2)	
April 26, 1999	4
(Tables J1-2, J2.2, J3.2, and J4.2)	

[Applicable Amendments: 9, 12, 14]

REFERENCES:

- Rio Algom Mining Corp., Smith Ranch Project, Sequoya Fuels License Application, as amended, March 1988.
- Rio Algom Mining Corp., Smith Ranch Uranium Project, Wellfield Four Pre-Operational Data Submittal, February 16, 1999.
- NRC Source Material License SUA-1548, Rio Algom Mining Corp., Smith Ranch Uranium Project.
- NRC Environmental Assessment For The Rio Algom Mining Corp. License Application, Smith Ranch In Situ Mining Project, Converse County, WY, January 1992.

ENVIRONMENTAL ASSESSMENT EVALUATION:

Neither an environmental assessment nor an environmental report is necessary for this action. An environmental report from the licensee is not required by 10 CFR 51.60(b)(2). The environmental impact of mining in Wellfield Four already has been assessed and determined to be acceptable through NRC's review and approval of the general application to mine all of the wellfields at the Smith Ranch site. Pursuant to the criterion for categorical exclusion in 10 CFR 51.22(c)(11), the issuance of this materials license amendment is eligible for a categorical exclusion from environmental review requirements, since: 1) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite; 2) there is no significant increase in individual or cumulative occupational radiation exposure; 3) there is no significant construction impact; and 4) there is no significant increase in the potential for or consequences from radiological accidents.

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 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. Rio Algom Mining Corp. 2. 6305 Waterford Boulevard, Suite 325 Oklahoma City, Oklahoma 73118	3. License Number SUA-1548, Amendment No. 14 4. Expiration Date March 1, 1997 5. Docket or Reference No. 40-8964

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	a. Any	a. Unlimited
b. Byproduct materials as defined in 10 CFR Part 40.4	b. Unspecified	b. Quantity generated under operations authorized by this license

9. ADMINISTRATIVE CONDITIONS

9.1 Notification to NRC under 10 CFR 20.2202, 10 CFR 40.60, and specific license conditions should be made as follows:

Required written notice to NRC under this license should be given to: Chief, Uranium Recovery Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

Required telephone notification to NRC should be made to the Operations Center at (301) 816-5100.

[Applicable Amendments: 4, 7]

9.2 Authorized place of use shall be the licensee's Smith Ranch facilities in Converse County, Wyoming.

9.3 Authorized use is for uranium recovery from pregnant lixiviant in accordance with statements, descriptions, and representations contained in Sections 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, and 9.0 of the licensee's application submitted by cover letter dated March 31, 1988, as revised by page changes submitted on May 10, June 30, and August 30, 1988; February 15, February 28, March 13, March 20, March 28, April 5, September 30, December 5, and December 10, 1991, and June 25, 1998.

In addition, the licensee shall conduct its activities in accordance with the provisions in the following:

License Number
SUA-1548, Amendment No. 14
Docket or Reference Number
40-8964

MATERIALS LICENSE
SUPPLEMENTARY SHEET

Submittal Date	Description
July 13, 1990	Responses to NRC comments and questions, including aquifer pump-test analyses, and monitor-well-spacing calculations.
October 4, 1990	Cover letter submitting MILDOS-Area Predictions of Radiation Dose.
April 5, 1991	Letter providing proposal for waste byproduct material disposal.
May 7, 1991	Cover letter transmitting consulting historian's report and recommendations, proposing changes to the mine facilities layout.
September 3, 1991	Cover letter assigning new Radiation Safety Officer for the Smith Ranch project.
September 30 and December 16, 1993	Cover letters and enclosures describing O-sand well-field and pilot plant operations.
October 30, 1995	Cover letters and enclosures addressing deep well injection of process waste waters.

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

[Applicable Amendments: 3, 7, 13]

9.4 Any significant changes to the State of Wyoming mining permit area illustrated on Map C-1 of the licensee's March 31, 1988, application shall require approval by the NRC in the form of a license amendment.

9.5 The licensee is authorized to dispose of waste byproduct material from the Smith Ranch facility at the Quivira Mining Corp. tailings pile, New Mexico. In the event this disposal option becomes unavailable, the licensee is required to notify the NRC within 7 working days of the expiration date. A new agreement must be submitted for NRC approval within 90 days of expiration, or the licensee will be prohibited from further lixiviant injection.

Yellowcake and byproduct waste material, other than samples for research, shall be transferred only to other source material licensees unless specific prior approval is granted by the NRC in the form of a license amendment. The licensee shall maintain permanent record of all transfers made under the provisions of this condition.

9.6 Before engaging in any activity not previously assessed by the NRC, including activities outside the State permit area, 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.

9.7 DELETED by Amendment No. 5.

MATERIALS LICENSE
SUPPLEMENTARY SHEET

License Number
SUA-1548, Amendment No. 14
Docket or Reference Number
40-8964

9.8 The licensee shall provide buffer zones and construct its facilities in accordance with the recommendations made in its historical consultant's report submitted May 7, 1991, in order to prevent adverse effects upon historic and prehistoric resources found in the State permit area. Land disturbance plans and well-field facility design shall be coordinated with NRC and the Bureau of Land Management in Mills, Wyoming.

In addition to the May 7, 1991, submittal, in order to assure that no disturbance of cultural resources occurs, the licensee shall have an archeological and historical artifact survey completed prior to disturbing any areas not addressed in its application date March 31, 1988. The results of the surveys, an evaluation of site eligibility for the National Register of Historic Places, and an analysis of the project's effect, shall be submitted to NRC for review and approval. No disturbance shall occur until the licensee has received authorization from NRC to proceed.

In addition, all work in the immediate vicinity of previously undiscovered buried cultural resources unearthed during the disturbance of land shall cease until approval to proceed has been granted by the NRC.

9.9 Release of equipment or packages from the restricted area shall be in accordance with the previously provided guidance 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.

9.10 Standard operating procedures (SOPs) shall be established for all operational activities involving radioactive materials that are handled, processed, stored, or transported by employees. SOPs for operational activities shall enumerate pertinent radiation safety practices to be followed. In addition, written procedures shall be established for non-operational activities to include in-plant and environmental monitoring, bioassay analysis, and instrument calibration. An up-to-date copy of each written procedure shall be kept in each area where it is used.

All written procedures shall be reviewed and approved in writing by the RSO before being implemented and whenever a change in a procedure is proposed. The RSO shall document that all existing facility procedures are reviewed and approved on an annual basis.

[Applicable Amendment: 12]

9.11 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, and ground-water restoration. Within 3 months of NRC approval of a revised site closure plan, 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. A revised surety shall then be in effect within 3 months of written NRC approval.

Annual updates to the surety, required by 10 CFR 40, Appendix A, Criterion 9, shall be provided to the NRC by June 30 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 one year. Along with each proposed revision or annual update, the licensee shall submit supporting documentation showing a breakdown of the costs and the 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. 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 surety, where authorized to be held by the State, expressly identifies the NRC-related portion of the surety and covers the above-ground decommissioning and decontamination, the cost of offsite disposal, soil and water sample analyses, and ground-water restoration associated with the site. The basis for the cost estimate is the NRC-approved site closure plan or the NRC-approved revisions to the plan. The site closure plan, cost estimates, and annual updates should follow the outline in the previously provided guidance entitled "Recommended Outline for Site Specific Reclamation and Stabilization Cost Estimates."

The licensee's currently approved surety, a Parent Company Guarantee issued by Rio Algom Limited, shall be continuously maintained in an amount no less than $10,314,000 for the purpose of complying with 10 CFR 40, Appendix A, Criterion 9, until a replacement is authorized by the NRC. The use of a parent company guarantee necessitates a complete evaluation of the corporate parent by the NRC as part of the annual surety update. In addition to the cost information required above, the annual submittal must include updated documentation of the (1) parent company guarantee, (2) letter from the chief financial officer of the parent company, (3) auditor's special report confirmation of chief financial officer's letter, and (4) schedule reconciling amounts in chief financial officer's letter to amounts in financial statements.

[Applicable Amendments: 2, 4, 6, 8, 10, 13]

9.12 DELETED by Amendment No. 12.

9.13 Any changes to the licensee's corporate organizational structure illustrated in Figure 9-4 of the March 31, 1988, application, as amended by the submittal dated December 10, 1991, shall require approval of the NRC in the form of a license amendment. In the event key radiation safety staff are reassigned, their qualifications shall also be reviewed and approved by the NRC.

9.14 In addition to the responsibilities and qualifications specified in Chapter 9 of the licensee's March 31, 1988, application, as amended, the Radiation Safety Officer (RSO) shall be qualified as specified in Sections 1.2 and 2.4.1 of Regulatory Guide 8.31, "Information Relevant to Ensuring that Occupational Radiation Exposures at Uranium Mills will be As Low As Reasonably Achievable," dated May 1983. The RSO shall also receive a minimum of 40 hours of related health and safety refresher training every two years.

The Radiation Safety Technician (RST) shall have the qualifications as specified in Section 2.4.2 of Regulatory Guide 8.31, and the responsibilities as specified in chapter 9 of the licensee's March 31, 1988, application as amended. In addition, the RST shall have access to the RSO at all times.

[Applicable Amendment: 12]

9.15 The licensee shall have a training program for all site employees as described in Section 2.5 of Regulatory Guide 8.31, and as detailed in Section 9.3 of the licensee's March 31, 1988, application, as amended.

9.16 The licensee is hereby exempted from the requirements of Section 20.1902(e) of 10 CFR 20 for posting areas within the facility, provided that all entrances to the facility are conspicuously posted

in accordance with Section 20.1902(e) and with the words, "CAUTION - ANY AREA OR ROOM WITHIN THIS FACILITY MAY CONTAIN RADIOACTIVE MATERIAL."

[Applicable Amendment: 12]

9.17 The licensee shall implement the Emergency Action Plan for Accidents as detailed in Appendix G of the licensee's March 31, 1988, application, as amended.

10. OPERATIONAL LIMITS, CONTROLS, AND RESTRICTIONS

10.1 Commercial processing plant operations shall not exceed an average monthly flow rate of 6000 gallons per minute, or 250 gallons per minute in the pilot plant, exclusive of restoration flow. Annual yellowcake production shall not exceed 2 million pounds.

[Applicable Amendments: 3]

10.2 Any major changes in the fluid-flow balance or processing plant circuit, as illustrated and described in Figures 3-2 and 4-3 of the licensee's March 31, 1988, application, as amended, shall be reviewed by the RSO and shall be submitted to the NRC for prior approval in the form of a license amendment.

10.3 The licensee shall maintain effluent control systems as specified in Section 4.1 of the license application dated March 31, 1988, as amended, with the following additions:

a. If during yellowcake drying operations any emission control equipment for the yellowcake drying or packaging areas is not performing within the operational specifications, the licensee shall not; (1) unload the dryer as part of the routine operations until the emission control equipment has been returned to service within operational specifications; or (2) reload the dryer with yellowcake until the emission control system has been returned to service within its operational specifications.

b. The licensee shall, during all periods of yellowcake drying operations, assure that the manufacture-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 that will signal an audible alarm if air pressure falls below the manufacture's recommended levels. If an audible alarm is used, its operation shall be checked and documented daily during dryer operations.

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

[Applicable Amendment: 14]

10.4 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 95 percent of this pressure for 10 minutes to pass the test. If any well casing failing the integrity test cannot be repaired, the well shall be plugged and abandoned. During wellfield operations, injection pressures shall not exceed the integrity test pressure at the injection well heads.

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

[Applicable Amendments: 8]

10.6 The licensee is prohibited from constructing waste water evaporation ponds prior to NRC review and approval of pond designs and specifications. Pond design shall allow for sufficient reserve capacity in the evaporation pond system to enable the transfer of the contents of any one pond to the other ponds. All retention ponds shall be designed to meet requirements of NRC Regulatory Guide 3.11, Staff Position Paper No. WM-8101, and WDEQ.

10.7 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.

10.8 All liquid effluents stemming from commercial mine units, process buildings and process waste streams, with the exception of sanitary wastes, shall be returned to the process circuit, discharged to the solution evaporation ponds, or deep well injected. Liquid effluent resulting from O-sand R&D well-field production bleed may be treated for radium removal and discharged in accordance with the licensee's submittal dated September 30, 1993.

[Applicable Amendments: 3, 7]

10.9 Prior to mining, baseline water quality data for the constituents identified in Table 5.1 of the application dated March 31, 1988, as amended, shall be established for each mining unit prior to mining at the following points: (a) all mining zone perimeter monitor wells; (b) two upper and two lower aquifer monitor wells per mining unit; and (c) ten production/injection wells per mining unit. For mining units exceeding ten acres in size, baseline water quality data shall be collected from one additional production/injection well for each two acres beyond the ten-acre limit. Baseline production/injection wells shall be evenly distributed across the mining unit.

[Applicable Amendments: 8]

10.10 The licensee is prohibited from conducting well-field installation in the southwestern part of the State of Wyoming permit area, T35N R74W, until aquifer characteristics have been tested, reviewed, and approved by NRC.

10.11 The licensee is prohibited from commencing aquifer restoration prior to review and approval of an occupational safety plan addressing the deployment of chemical reducing agents in the processing plant or well fields.

10.12 For work where the potential for exposure to radioactive materials exists and for which no SOP exists, a radiation work permit (RWP) shall be required. Such permits shall describe the following:

a. The scope of work to be performed.

b. Any precautions necessary to reduce exposure to uranium and its daughters to levels as low as is reasonably achievable (ALARA).

c. Any supplemental radiological monitoring and sampling required during and following completion of the work. Nonroutine maintenance involving exposure of workers to airborne particulates of uranium and its daughters shall require the use of continuous breathing zone monitoring.

The RSO, RST, or their designees shall indicate by signature the review of each RWP prior to the initiation of the work.

10.13 Any visitor, including contractors, shall be required to register at the office and shall be given appropriate instruction in the areas of security, safety, and radiation protection, prior to entering controlled or restricted areas.

10.14 The licensee shall issue to all site employees, either thermoluminescent dosimeters (TLDs) or film-type dosimeters which shall be exchanged and read on a quarterly frequency.

10.15 The licensee shall require that all process and maintenance workers who work in yellowcake areas or work on equipment contaminated with yellowcake wear protective clothing including coveralls and boots or shoe covers. Workers who package yellowcake for transport shall additionally wear gloves.

10.16 Eating shall be allowed only in administrative offices and enclosed lunch areas that are separated from the process areas.

10.17 Before leaving the restricted area, all process workers shall shower or monitor themselves using a calibrated alpha survey instrument. Meeting or exceeding the radiation level of 1000 dpm/100 cm^2 shall require personnel to decontaminate and resurvey themselves. The licensee shall perform spot surveys for alpha contamination at least quarterly on all workers leaving the facility.

10.18 All radiation monitoring, sampling, and detection equipment shall be recalibrated after each repair and as recommended by the manufacturer, or at least annually, whichever is more frequent. In addition, all radiation survey instruments shall be operationally checked with a radiation source each day when in use.

10.19 Effective during the preoperational period of the Smith Ranch commercial project, the licensee's O-sand pilot facility operations shall be conducted in accordance with the licensee's September 30, and December 16, 1993, submittals.

[Applicable Amendment: 3]

11. MONITORING, RECORDING, AND BOOKKEEPING REQUIREMENTS

11.1 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 well heads.

11.2 The licensee shall perform and document daily visual inspections of the evaporation pond embankments, fences and liners, as well as measurements of pond freeboard and checks of the leak detection system. Any time 6 inches or more of fluid is in the leak detection system standpipes, it shall be analyzed for specific conductance and chloride. If action levels for these

parameters are exceeded, a pond leak shall be confirmed. The pond level shall be lowered by transferring its contents into an alternate cell, and repairs undertaken.

11.3 Each monitor well shall be sampled and tested for chloride, conductivity, and alkalinity on a biweekly basis. If two UCLs are exceeded in a well or if a single UCL value is exceeded by five standard deviations or more above baseline monitoring data, the licensee shall take a confirmation water sample within 24 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. During excursion status, sampling and testing frequency shall be increased to weekly for all monitor wells completed in the same monitored zone for the effected mining unit.

11.4 The licensee shall establish an effluent and environmental monitoring program in accordance with Table 5.3 of the application dated March 31, 1988, as amended.

11.5 During the preoperational period of the commercial Smith Ranch project, environmental and in-plant monitoring shall be conducted in accordance with the licensee's September 30, 1993, submittal during O-sand well field and pilot plant operations, and in accordance with the submittal dated July 12, 1991, when the O-sand well field and the pilot plant are in deferred production status. All other monitoring requirements in this license shall be suspended where they differ from either of those submittals until lixiviant injection occurs in commercial well fields. Notwithstanding the July 12, 1991, submittal, the licensee shall implement the following additions to its standby operations:

a. A ground-water bleed rate shall be established in the R&D O-sand well field sufficient to maintain flow into the well field from all directions. Ground-water gradients shall be monitored by observing water levels monthly in wells OM-1 through OM-5, OI-1, OI-2, OI-10, OI-3, and OT-1. Monitoring data with a water-table map shall be provided in each semiannual environmental monitoring report.

b. Environmental gamma monitoring shall continue on a quarterly basis at the downwind and background locations.

c. In-plant gamma surveys shall be completed following completion of yellowcake precipitation and filter press use, or semiannually, whichever is more frequent. Airborne uranium monitoring of the work station and breathing zone shall be conducted on a continuous basis during filter press operation.

d. During the pre-mining baseline data collection period for Wellfield 3 the bi-weekly sampling of the O-sand pilot wells may be discontinued. No more than 21 days prior to the initiation of pre-mining pump tests, the licensee may discontinue the O-sand bleed. The O-sand bleed and the bi-weekly groundwater sampling will resume upon the completion of the fieldwork for the Wellfield 3 pre-mining data collection. The licensee shall document the dates of these activities in the appropriate 40.65 semi-annual effluent monitoring report.

[Applicable Amendment: 3, 11]

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11.6 During commercial production, the RSO, RST, or a trained designee shall perform and document a daily walk-through inspection of all operating areas. The inspection's purpose is to ensure that all radiation protection and monitoring requirements are being followed.

11.7 The licensee shall perform monthly surveys for natural uranium and radon progeny as shown in Figure 9-2 of the licensee's application dated March 31, 1988, as amended. In addition, the licensee shall conduct spot surveys to confirm the adequacy of the yellowcake and radon progeny monitoring plan. If radon or radon progeny concentrations exceed 8 picocuries per liter (pCi/l) or 0.08 working level (WL), respectively, sampling shall be weekly until 4 consecutive weekly samples exhibit less than 8 pCi/l or 0.08 WL. The calculation of internal exposure to radon, radon progeny, or natural uranium shall be based on a Time Weighted Exposure (TWE) calculation incorporating a consideration of both occupancy times and average airborne working levels or activity concentrations. If occupancy times are established as an average for each category of worker, the licensee shall also, by means of a semiannual time study, determine the basis upon which average occupancy periods are established.

If any worker reaches or exceeds 25 percent of the occupational dose limits 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 RSO or designee 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.

[Applicable Amendment: 12]

11.8 The licensee shall perform quarterly gamma radiation surveys in enclosed areas at the locations specified in Figure 9-3 of the licensee's application dated March 31, 1988, as amended. In addition, the licensee shall conduct spot checks to confirm the adequacy of the gamma radiation monitoring plan.

11.9 The licensee shall perform monthly alpha contamination surveys of the facility laboratory and offices and weekly surveys of eating and change areas, as specified in licensee's application dated March 31, 1988, as amended. If samples are analyzed in the facility laboratory, the licensee shall survey all surfaces used for urine sample preparation preceding the analyses as specified in Section 3.5 of Regulatory Guide 8.31.

If the alpha contamination levels exceed those listed in the previously provided guidance 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, the area shall be decontaminated.

11.10 Occupational exposure calculations shall be performed and documented within one calendar quarter after the end of the regulatory compliance period as specified in 10 CFR 20.2106(b). Routine radon daughter and particulates shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. Non-routine samples shall be analyzed and the results reviewed by the RSO or designee within 2 working days after sample collection.

[Applicable Amendments: 12, 14]

11.11 The results of the sampling, analyses, surveys, and monitoring, the 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.

12. REPORTING REQUIREMENTS

12.1 At least 2 months prior to lixiviant injection in each mining unit, baseline water quality data shall be submitted to the NRC. Upper control limits (UCLs) and restoration criteria shall be calculated in accordance with the licensee's application dated March 31, 1988, as amended.

a. The submittal shall propose, in the form of a license amendment, UCLs for chloride, conductivity, and alkalinity in all monitoring wells for each mining unit.

b. The submittal shall propose, in the form of a license amendment, ground-water restoration criteria for each mining unit.

Current UCLs and groundwater restoration criteria are designated in:

Submittal Date	Wellfield No.
May 27, 1997 (Pages F1-F13; Tables F1.2, F2.2, F3.2, F4.2)	1
June 1, 1998 (Tables H1-2, H2.2, H3.2, and H4.2)	3
April 26, 1999 (Tables J1-2, J2.2, J3.2, and J4.2)	4

[Applicable Amendments: 9, 12, 14]

12.2 The results of effluent and environmental monitoring described in Table 5.3 of the license application 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.

12.3 In the event a lixiviant excursion is confirmed by ground-water monitoring, NRC shall be notified by telephone within 24 hours and by letter within 7 days from the time the excursion is confirmed. Upon confirmation of an excursion, the licensee shall immediately implement corrective action. An excursion is considered concluded when the concentrations of excursion indicators are below the concentration levels defining an excursion for three consecutive weekly samples.

12.4 A written report shall be submitted to the NRC within 2 months of excursion confirmation. The report shall describe the excursion event, corrective actions taken and results obtained. If 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 the excursion has ceased and the affected aquifer has been remediated.

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12.5. In the event that evaporation pond standpipe water analyses indicate that a pond is leaking, the NRC shall be notified by telephone within 48 hours of verification. Standpipe water quality samples shall be analyzed for the leak parameters once every 7 days during the leak period and once every 7 days for at least 2 weeks following repairs.

A written report shall be filed with the NRC within 30 days of first notifying the NRC that a leak exists. This report shall include analytical data and describe the mitigative action and the results of that action.

12.6 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.

12.7 Three months prior to commencing ground-water restoration in each well field, the licensee shall submit a restoration plan to the NRC. The restoration plan shall have a goal of returning all affected ground-water constituents to baseline levels on a mining-unit average basis. The licensee shall be required to demonstrate baseline conditions are not achievable in order to apply any alternate standard of performance.

12.8 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.

12.9 The licensee shall perform an annual ALARA audit of the radiation safety program which shall be conducted by the RSO or other authorized individual with equivalent qualifications, in accordance with Section 2.3.3 of Regulatory Guide 8.31. A report of this audit shall be submitted to the NRC within 60 days after conducting the audit. The report shall include detailed summaries of the analytical results of the radiological surveys. In order to evaluate the ALARA objective, the licensee shall, at a minimum, review the following records: (a) Bioassay results including any actions taken when the results exceeded action levels in Table 1 of Regulatory Guide 8.22, "Bioassay at Uranium Mills," dated January 1987; (b) Exposure records of external and internal time-weighted calculations (TWE); (c) Safety meeting minutes, attendance records, and training program records; (d) Daily inspection log entries and summary reports of the monthly reviews; (e) In-plant radiological survey and monitoring data, as well as environmental radiological effluent and monitoring data; (f) Surveys required by radiation work permits; (g) Reports on overexposure submitted to NRC, MSHA, or the State of Wyoming; and (h) Reviews of operating and monitoring procedures completed during the period.

The audit shall also address any noticeable trends in personnel exposures for identifiable categories of workers and types of activities, any trends in radiological effluent data, and the performance of exposure and effluent control equipment as well as its utilization, maintenance, and inspection history. Any recommendations to further reduce personnel exposures or environmental releases of uranium or radon and radon progeny shall be included in the report.

12.10 The licensee shall implement a urinalysis program as outlined in Revision 1 to Regulatory Guide 8.22, with the following additions:

a. Baseline urinalysis shall be performed for all permanent employees prior to their initial assignment at the facility.

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b. Any time uranium in urine reaches or exceeds an action level of 15 micrograms per liter (ug/l) for any worker, the licensee shall provide documentation, in the annual ALARA audit, to the NRC indicating what corrective actions have been performed to satisfy the recommendations of Revision 1 to Regulatory Guide 8.22.

Any time an uranium action level of 35 ug/l for two consecutive urine specimens or 130 ug/l for any one specimen is reached or exceeded, the licensee shall provide documentation within 30 days to the NRC indicating what corrective actions have been performed to satisfy the recommendations of Revision 1 to Regulatory Guide 8.22.

[Applicable Amendments: 8]

FOR THE NUCLEAR REGULATORY COMMISSION

Date: 7/8/99

John Surmeier, Chief
Uranium Recovery and Low Level
Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

These changes to your license were discussed in a telephone conversation on July 8, 1999, between Mr. Marvin Freeman of RAMC and Mr. John Lusher of my staff. If you have any questions concerning this letter or the enclosures, please contact Mr. Lusher, the NRC Project Manager for the Smith Ranch facility, at (301) 415-7694.

Sincerely,

[Signed by]

John J. Surmeier, Chief
Uranium Recovery and
Low Level Waste Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-8964
SUA-1548, Amendment No. 14
Case Closed: L51815

Enclosures: As stated (2)

cc: G. Cash, WDEQ
B. Ferdinand, RAMC

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