

MATERIALS LICENSE

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and the applicable parts of Title 10, Code of Federal Regulations, Chapter I, Parts 19, 20, 30, 31, 32, 33, 34, 35, 36, 39, 40, 51, 70, and 71, 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 LLC	3. License Number SUA-1473, Amendment 54
2. 6305 Waterford Blvd., Suite 400 Oklahoma City, Oklahoma 73118 [Applicable Amendment: 12]	4. Expiration Date Until terminated [Applicable Amend: 29]
	5. Docket No. 40-8905 Reference No.

- | | | |
|--|---|--|
| <p>6. Byproduct Source, and/or Special Nuclear Material</p> <p>Uranium</p> | <p>7. Chemical and/or Physical FormP</p> <p>Any</p> | <p>8. Maximum amount that Licensee May Possess at Any One Time Under This License Unlimited</p> <p>Unlimited</p> |
|--|---|--|
9. Authorized Place of Use: The Licensee's Ambrosia Lake facility located in McKinley, County, New Mexico.
10. This licensee shall maintain a health physics and environmental monitoring program as described within submittals dated August 30, 1990, January 31, 1991, and January 13, 1998. The programs described in these submittals will be reviewed in a manner consistent with the requirements of License Condition 14.
- Any changes to the mill circuit as described in Section 6.2 of the August 30, 1990, submittal or as authorized by subsequent license conditions shall require approval by the NRC in the form of a license amendment.
- [Applicable Amendments: 4, 10, 11, 21, 28, 40, 52]
11. The licensee shall designate a Radiation Safety Officer (RSO) who will be responsible for the establishment and maintenance of a facility radiation protection program including personnel and environmental monitoring programs. The RSO shall possess minimum qualifications as specified in Section 2.4.1 of Regulatory Guide 8.31.
12. The licensee is authorized to possess byproduct material in the form of uranium process tailings and other byproduct wastes generated by the licensee's uranium processing operations. Mill tailings, other than small samples for purposes such as research or analysis, shall not be transferred from the restricted area without prior approval of the NRC in the form of a license amendment.
13. The licensee is authorized to operate mine water uranium recovery treatment facilities at Ambrosia Lake, New Mexico, as part of the corrective action program required under license condition 34(C).

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
SUA-1473Docket or Reference Number
40-8905

Amendment No. 54

The radiological effluent monitoring and radiological safety program in effect at the licensee's mill shall include this mine-water treatment facility. A listing of the individual ion exchange units currently in operation shall be provided by January 1, 1987, and shall be updated at least annually thereafter.

[Applicable Amendment: 52]

14. Written standard operating procedures (SOPs) shall be established for all activities related to the closure of the facility involving radioactive materials that are handled, disposed or stored. These procedures shall specify radiation safety practices to be followed. An up-to-date copy of each written procedure shall be kept in the mill area to which it applies for employee reference. All SOPs shall be reviewed annually to update procedures and be approved by the RSO to ensure that proper radiation protection principles are being applied.

[Applicable Amendment: 52]

15. The licensee shall be required to use a Radiation Work Permit (RWP) for all work where the potential for significant exposure to radioactive material exists and for which no SOPs exist. All RWPs shall be approved by the Radiation Safety Officer (RSO), or his designee qualified by way of specialized radiation protection training. The RWP shall describe the following:
- A. The scope of the work to be performed.
 - B. Any precautions necessary to reduce exposures to radioactive materials.
 - C. Supplemental monitoring required prior to, during, and after the completion of the work.
16. The licensee shall establish written procedures for all surveillance activities including in-plant and environmental monitoring bioassay analysis and radiation monitoring instrument calibration. These procedures shall be reviewed and approved by the RSO annually to ensure that proper and current radiation protection principles are being applied.
17. Occupational exposure calculations shall be performed in accordance with 10 CFR 19.13.b and 10 CFR Part 20, Subpart C and documented in accordance with 10 CFR 20.2106. Routine airborne ore dust and yellowcake samples shall be analyzed in a timely manner to allow exposure calculations to be performed in accordance with this condition. RWP ore dust and yellowcake samples shall be analyzed and the results reviewed by the RSO or his designee within two (2) working days after sample collection. Any time a 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.

[Applicable Amendment: 40, 53]

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SUA-1473

Docket or Reference Number
40-8905

Amendment No. 54

18. [DELETED by Amendment No. 4]
19. The results of all effluent and environmental monitoring required by this license shall be reported semiannually and in accordance with 10 CFR 40, Section 40.65, with copies of the report sent to the NRC. Monitoring data shall be reported in the format shown in Regulatory Guide 4.14, Revision 1, April 1980, Table 3.
- [Applicable Amendments: 25, 52]
20. The results of sample analyses, monitoring surveys, equipment calibration, reports of audits and inspections, meetings, and training sessions required by applicable regulations or this license and any subsequent reviews, investigations, and corrective actions shall be documented. Unless otherwise specified in this license or in NRC regulations, all documentation shall be maintained for a period of five (5) years.
21. [DELETED by Amendment No. 52]
22. The licensee shall maintain an NRC-approved financial surety arrangement, consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, adequate to cover the estimated costs, if accomplished by a third party, for decommissioning and decontamination of the mill and mill site, reclamation of any tailings or waste disposal areas, ground water restoration as warranted, and the long-term surveillance fee.

Annual updates to the surety amount, required by 10 CFR 40, Appendix A, Criteria 9 and 10, shall be submitted to the NRC by June 30 of each 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 fee, changes in engineering plans, activities performed, and any other conditions affecting estimated costs for site closure. The basis for the cost estimate is the NRC-approved reclamation/decommissioning plan as supplemented by the NRC assumptions identified in License Condition No. 37, or NRC-approved revisions to the plan. Annual updates should follow Appendix C to NUREG-1620, Rev. I, "Standard Review Plan for the Review of a Reclamation Plan for Mill Tailings Sites Under Title II of the Uranium Mill Tailings Radiation Control Act of 1978."

The licensee's currently approved surety, Irrevocable Letter of Credit issued by the Imperial Bank of Commerce, New York Branch, in favor of the NRC, shall be continuously maintained in an amount no less than \$26,703,452 for the purpose of complying with 10 CFR 40, Appendix A, Criteria 9 and 10, until a replacement is authorized by the NRC.

[Applicable Amendments: 18, 19, 22, 24, 30, 32, 36, 39, 41, 46, 47, 48, 50, 52, 53, 54]

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
SUA-1473Docket or Reference Number
40-8905

Amendment No. 54

23. Prior to termination of this license, the licensee shall provide for transfer of title to byproduct material and land, including any interests therein (other than land owned by the United States or the State of New Mexico), which is used for the disposal of such byproduct material or is essential to ensure the long-term stability of such disposal site to the United States or the State of New Mexico, at the State's option.
24. The licensee shall have a contingency plan for responding to unexpected releases of liquids from the mill facility, and lined evaporation ponds and for the accidental release of uranium concentrates during shipment and transport.
- [Applicable Amendment: 52]
25. Release of equipment or packages from the restricted areas for unrestricted release or disposal shall be in accordance with the attachment to SUA-1473 entitled, "Guidelines for Decontamination for Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct or Source Materials," dated August 1987.
26. Before engaging in any activity other than reclamation and which is not authorized by the license, the licensee shall prepare and record an environmental evaluation of such activity. The licensee shall provide a written evaluation of the activity and obtain prior approval of the NRC in the form of a license amendment.
- [Applicable Amendment: 52]
27. [DELETED by Amendment No. 52]
28. The licensee is hereby exempted from the posting requirements of 10 CFR 20.1902(e) for areas within the mill provided that all entrances to the mill are conspicuously posted in accordance with 10 CFR 20.1902(e) and with the words, "Any area within this mill may contain radioactive material."
29. The licensee shall decommission the mill buildings and related structures according to the Demolition Plan for the Mill Facility submitted December 10, 2002, as modified by pages dated March 27 and September 17, 2003, excluding Appendix C (standard operating procedures), Appendix E (Health Physics and Environmental Programs Manual), and Appendix F of the Plan. Any mill structures remaining/buried on site will meet NRC-approved surface limits under Part 40, Appendix A, Criteria 6(6).
- [Applicable Amendment: 53]
30. Damaged yellowcake drums may be returned for disposal in Tailings Pond No. 2 as described in the licensee's submittal dated January 2, and March 5, 1987, October 6, 1989 and November 16, 1995. All such disposal shall be documented. In addition, no drums shall be disposed within 150 feet of the dam crest. [Applicable Amendments: 2, 14, 34]
31. [DELETED by Amendment No. 52]

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SUA-1473

Docket or Reference Number
40-8905

Amendment No. 54

32. The licensee is authorized to dispose of and bury contaminated waste materials resulting from past milling operations into the disposal areas in accordance with the submittals dated July 20, 1995. The licensee may also dispose of and bury within these areas, byproduct materials as authorized by license conditions 30, 36, and 41. In addition, the licensee shall adhere to the following requirements. The licensee shall maintain detailed disposal records indicating quantities and locations of all waste material disposed in the disposal areas and prior to the disposal of any wastes, the licensee shall establish a detailed procedure to describe the handling, preparation, placement and covering of wastes in the specified disposal areas. The final design of the disposal areas, including drawings, calculations, analyses, and a list of materials included in the disposal areas, will be submitted to the NRC for approval prior to placement of the final cover.

[Applicable Amendments: 6, 33, 37]

33. [DELETED by Amendment No. 52]

34. The licensee shall implement a groundwater compliance monitoring program containing the following:

- A. Sample Dakota Sandstone wells 17-01, 30-02, 30-48, 32-45, and 36-06 for antimony, arsenic, beryllium, cadmium, cyanide, lead, molybdenum, nickel, selenium, combined radium-226 and -228, natural uranium, thorium-230, lead-210, gross alpha, chloride, sulfate, nitrate, pH, and electrical conductivity.

Sample Tres Hermanos A wells 31-01 and 33-01 for cyanide, molybdenum, nickel, selenium, radium-226 and -228, natural uranium, thorium-230, lead-210, gross alpha, chloride, sulfate, nitrate, pH, and electrical conductivity.

Sample Tres Hermanos B wells 19-77, 31-66, 31-67, 36-01 and 36-02 for cyanide, molybdenum, nickel, selenium, combined radium-226 and -228, natural uranium, thorium-230, lead-210, gross alpha, chloride, sulfate, nitrate, pH, and electrical conductivity.

Sample alluvium wells 5-03, 32-59, 31-61, and MW-24, for molybdenum, nickel, selenium, combined radium-226 and -228, thorium-230, natural uranium, lead-210, gross alpha, chloride sulfate, nitrate, pH, and electrical conductivity.

- B. Comply with the following groundwater protection standards at Dakota Sandstone point of compliance well 30-02, 30-48, 32-45, and 36-06, with background being recognized at well 17-01: antimony = 0.05 mg/l; arsenic = 0.1 mg/l, beryllium = 0.01 mg/l; cadmium = 0.01 mg/l; cyanide = 0.04 mg/l; lead = 0.14 mg/l; molybdenum = 0.06 mg/l; nickel = 0.03 mg/l, selenium = 0.04 mg/l; gross alpha = 56 pCi/l; combined radium-226 and -228 = 5.0 pCi/l natural uranium - 0.02 mg/l; thorium-230 = 2.3 pCi/l; lead-210 - 1.9 pCi/l.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SUA-1473

Docket or Reference Number
40-8905

Amendment No. 54

Comply with the following groundwater protection standards at Tres Hermanos A point of compliance well 31-01, with background being recognized at well 33-01: cyanide = 0.01 mg/l; molybdenum - 0.03 mg/l; nickel = 0.05 mg/l; selenium - 0.03 mg/l; gross alpha = 18.0 pCi/l; combined radium-226 and -228 = 5.0 pCi/l; natural uranium - 0.01 mg/l; thorium-230 = 4.3 pCi/l; lead-210 = 4.14 pCi/l.

Comply with the following groundwater protection standards at Tres Hermanos B point of compliance wells 31-66, 31-67, 36-01, and 36-02, with background being recognized at well 19-77: cyanide = 0.01 mg/l; molybdenum = 0.08 mg/l; nickel = 0.06 mg/l; selenium = 0.04 mg/l; gross alpha = 21.0 pCi/l; combined radium-226 and -228 = 7.4 pCi/l; natural uranium = 0.02 mg/l; thorium-230 = 2.2 pCi/l; lead-210 = 0.9 pCi/l.

Comply with the following groundwater protection standards at alluvium point of compliance wells 32-59, 31-61, and MW-24, with background being recognized at well 5-03: molybdenum = 0.06 mg/l; nickel = 0.06 mg/l; selenium = 0.05 mg/l; gross alpha - 57 pCi/l; combined radium-226 and -228 = 5.0 pCi/l; thorium-230 = 3.1 pCi/l; natural uranium = 0.06 mg/l; lead-210 = 4.9 pCi/l.

- C. Implement a corrective action program as described in the September 25, 1989, submittal with the objective of returning the concentrations of hazardous constituents to the concentration limits specified in Subsection (B). The program shall, at a minimum, consist of mine dewatering and maintenance and operation of the interceptor trench.
- D. Submit, by August 1 of each year, a review of the corrective action program and its effect on the aquifers.
- E. [DELETED BY Amendment No. 42]

[Applicable Amendments: 9, 11, 13, 15, 25, 35, 40, 42]

35. [DELETED by Amendment No. 52]

36. The licensee is authorized to dispose of byproduct material waste from the Rio Algom Mining Corp. Smith Ranch in-situ leach facility in accordance with the submittals dated, February 19, 1990, and September 26, 1991, with the following modifications or additions:

- A. The written procedures, included in the February 19, 1990, submittal shall be reviewed and revised in accordance with License Condition No. 14.
- B. Prior to disposal of drums containing sludge material, the licensee shall obtain written confirmation from Rio Algom Mining Company that the drums have been verified to be full or the verification shall be performed by Ambrosia Lake personnel.
- C. Drums containing wastes other than sludges shall be opened and the wastes disposed directly into excavated trenches.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
SUA-1473Docket or Reference Number
40-8905

Amendment No. 54

- D. All disposal activities shall be documented. [Applicable Amendments: 16, 23]
37. The licensee shall reclaim the disposal area as stated in the September 24, 1990, January 7, 1994, May 16, 2002, and September 26, 2002, submittals as supplemented by the following conditions. Though recognized as conservative, these conditions were assumed when evaluating the acceptability of the reclamation plan as submitted, and are identified pending submittal of acceptable design alternatives. Justification for any design alternatives must be submitted for NRC review and approval prior to implementation.
- A. The radon barrier shall be constructed as specified in the licensee's September 28, 1990, submittal, as amended by the February 7, August 2, September 2, and November 4, 1994, submittals. Prior to placement of any material onto the interim cover, the procedure defined in the licensee's October 4, 1990, submittal for establishing the integrity of the in-place material must be performed.
- B. [DELETED by Amendment No. 19]
- C. The relocated contaminated material shall be placed in lifts not to exceed 12 inches and compacted to at least 90 percent of the maximum standard dry density after a stable work base has been established.
- D. In place density and moisture laboratory compaction, soil classification, and rock quality testing shall be performed in accordance with the licensee's September 23, 1990, submittal. If test procedures other than the sand cone test or oven dry moisture are used in the construction quality control, procedures that will be used to establish correlation between the tests must be submitted for NRC review and approval prior to implementation.
- E. A detailed cover design for Ponds 11-21 must be submitted for NRC review and approval. All contaminated materials in Pond 3 that are not covered by the reclaimed Pond 1 outslope shall be relocated to Pond 2 unless an erosion protection plan is submitted for NRC review and approval.
- F. The settlement survey data shall be submitted for NRC review and approval prior to placement of the radon barrier on the interim cover.
- G. The fresh water dam mill reservoir must be breached during final reclamation activities.
- H. Settlement monuments shall consist of a steel bar welded to a 1-foot square steel plate, or equivalent, placed at least 3 feet below the surface.
- I. The fill associated with the Pond 1 spillway shall be constructed to the same specifications and quality control program as the radon barrier material.
- J. If a rock source other than the Homestake Quarry is selected, the licensee shall submit the results of durability tests as outlined in the Final Staff Technical Position on Design of Erosion Protection, August 1990, for NRC review and approval prior to placement of any of the material.
- K. All rip rap shall be placed in a manner that prevents segregation of the material. The material placed shall be reasonably well graded and shall be within the following gradation specifications.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SUA-1473

Docket or Reference Number
40-8905

Amendment No. 54

D₅₀ = 1.0"

D₅₀ = 3.2"

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>	<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
3 inch	100	6 inch	100
2 inch	70-100	5 inch	78-100
1 inch	25- 55	4 inch	35-100
¾ inch	15- 40	3 inch	12- 45
½ inch	0- 25	2 inch	0- 20

D₅₀ = 7.7"

<u>Sieve Size</u>	<u>Percent Passing (by weight)</u>
13 inch	100
12 inch	80-100
10 inch	49-100
8 inch	26- 54
6 inch	7- 32
4 inch	0- 13

- L. A minimum 6-inch bedding layer with a D₅₀ of 1 inch shall be placed under all riprap on the disposal area having a D₅₀ of 2 inches or larger.

The bedding material shall be reasonably well graded to prevent migration of the base material into the riprap. The quality of the bedding material shall be equivalent to that of the riprap.

- M. A riprap filled toe trench shall be placed on the West side of Pond 2 where the existing steep slopes transition onto the flatter surface of Pond 2.

The licensee shall submit a proposed design of the trench for NRC review and approval prior to construction.

- N. The spillway riprap shall be extended 45 feet onto the top of Pond 1 to prevent erosion.

- O. Riprap with a D₅₀ of 1 inch shall be placed in all areas of the South Diversion Ditch which are not excavated in rock.

- P. As an alternative to the erosion protection design of the top surfaces of Ponds 1 and 2, which was approved in Amendment No. 18, the licensee may use a 3-inch layer of riprap having a minimum median stone diameter (D₅₀) of 1-inch.

[Applicable Amendments: 18, 19, 29, 31, 51]

38. [DELETED BY Amendment No. 52]

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number
SUA-1473

Docket or Reference Number
40-8905

Amendment No. 54

39. The licensee shall conduct an annual survey of land use (grazing, residences, water supply wells, etc.) in the area within two miles of the mill and submit a report of this survey annually to the NRC. This report shall indicate any differences in land use from that described in the licensee's previous annual report, and shall specifically address occupancy of the Berryhill Ranch. The report shall be submitted by July 1 of each year.

[Applicable Amendments: 21]

40. The licensee shall complete site reclamation in accordance with an approved reclamation plan and groundwater corrective plan, as authorized by License Condition Nos. 37 and 34, respectively, in accordance with the following schedules.
- A. To ensure timely compliance with target completion dates established in the Memorandum of Understanding with the Environmental Protection Agency (56 FR 55432, October 25, 1991), the licensee shall complete reclamation to control radon emissions as expeditiously as practicable, considering technological feasibility, in accordance with the following schedule:

- (1) Windblown tailings retrieval and placement on the pile - December 31, 1999. Areas inaccessible due to activities authorized by this license will be addressed during final mill decommissioning.

[Applicable Amendments: 38, 43]

- (2) Placement of the interim cover to decrease the potential for tailings dispersal and erosion -

For impoundment No. 1 - Completed October 1990

For impoundment No. 2, excluding portions used for approved byproduct material disposal - Completed December 1992

[Applicable Amendment: 44]

- (3) Placement of a final radon barrier designed and constructed to limit radon emissions to an average flux of no more than 20 pCi/m²/s above background -

For impoundment No. 1 - Completed September 1996.

For impoundment No. 2, excluding portions used for approved byproduct material disposal - Completed September 1996.

[Applicable Amendment: 44].

- B. Reclamation, to ensure required longevity of the covered tailings and groundwater protection, shall be completed as expeditiously as is reasonably achievable, in accordance with the following target dates for completion:

- (1) Placement of erosion protection as part of reclamation to comply with Criterion 6 of Appendix A of 10 CFR Part 40 -

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
SUA-1473Docket or Reference Number
40-8905

Amendment No. 54

For impoundment No. 1 - December 31, 2001

For impoundment No. 2, excluding portions used for approved byproduct material disposal - December 31, 2003

[Applicable Amendment: 45, 49]

- (2) Projected completion of groundwater corrective actions to meet performance objectives specified in the groundwater corrective action plan - December 31, 2008.
- C. Any license amendment request to revise the completion dates specified in Section A must demonstrate that compliance was not technologically feasible including inclement weather, (litigation which compels delay to reclamation, or other factors beyond the control of the licensee).
- D. Any license amendment request to change the target dates in Section B above, must address added risk to the public health and safety and the environment, with due consideration to the economic costs involved and other factors justifying the request such as delays caused by inclement weather, regulatory delays, litigation, and other factors beyond the control of the licensee.
41. In accordance with the licensee's submittals dated November 20, 1995, May 9, 1996, January 24, 1997, and February 13, 1997, the licensee is hereby authorized to dispose of 11e.(2) byproduct materials that are similar in physical, chemical, and radiological characteristics to the 11e.(2) byproduct material and associated wastes already within the impoundment subject to the following:
- A. "Prior to the receipt of any material under this condition, the licensee shall provide an analysis of the costs of reclamation based on the disposal of the amount of byproduct authorized by this condition on a five (5) year forward basis and include that analysis into the annual surety update required by License Condition 22.
- [Applicable Amendments: 37, 44]
- B. [DELETED by Amendment No. 44]
- C. Total annual receipt and disposal of 11e.(2) byproduct material shall not exceed 100,000 cubic yards (76,500 m³) from all generators.
- D. The total 11e(2) byproduct material to be disposed of from all generators is limited to 5.3 million tons (3.8 million yds³).
- E. Average annual Ra-226 concentrations of disposed material shall not exceed 1100 pCi/g (41 Bq/g) from any generator.
- F. All contaminated equipment shall be dismantled, crushed, perforated or placed to minimize void spaces. Barrels shall be verified to be full prior to disposal. Barrels not completely full shall be filled or emptied and crushed prior to final disposal.

**MATERIALS LICENSE
SUPPLEMENTARY SHEET**License Number
SUA-1473Docket or Reference Number
40-8905

Amendment No. 54

- G. Byproduct material shall be free of standing liquids.
- H. All disposal activities shall be documented. The documentation shall include a description of the byproduct material, the disposal locations, and the results of pre-acceptance testing. The licensee shall maintain documentation until license termination.
- I. The licensee shall submit a final reclamation report upon the end of receipt operations.

FOR THE NUCLEAR REGULATORY COMMISSION

Dated: 4/7/05/RA/

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

