December 22, 2004

Mr. Peter Luthiger
Manager, Radiation Safety
and Environmental Affairs
Rio Algom Mining LLC
P.O. Box 218
Grants, NM 87020

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE CLOSURE PLAN - LINED EVAPORATION PONDS AT RIO ALGOM MINING LLC'S AMBROSIA LAKE FACILITY (TAC LU0070)

Dear Mr. Luthiger:

The staff of the U.S. Nuclear Regulatory Commission (NRC) has reviewed Rio Algom Mining LLC's (Rio Algom) Closure Plan - Lined Evaporation Ponds submitted under letter dated November 1, 2004. The NRC staff has determined that additional information is required before a detailed review can be completed. The associated comments and questions are enclosed in the Request for Additional Information (Enclosure). Please respond to these comments within 30 days of the date of this letter.

In addition to the comments detailed in the enclosure, it is important to note that the Ambrosia Lake financial assurance estimate should be updated to include costs associated with the proposed action. The NRC requested additional information regarding the financial assurance and we understand this information to be forthcoming. Rio Algom should ensure that additional decommissioning work associated with the subject plan is fully incorporated into the financial assurance instrument.

The Closure Plan - Lined Evaporation Ponds references an upcoming soil decommissioning plan that will be submitted to the NRC later this month. Portions of the current plan are based on correlations and analysis included in the forthcoming soil decommissioning plan. The NRC requires that all documents be submitted before an approval of the current plan is granted; therefore, Rio Algom should submit all documentation so that the review will not be delayed.

Lastly, Rio Algom may opt to request a conditional approval of the closure plan that would allow some site work to begin but that would not include any radiological measurements or backfill until an updated Final Site Survey Plan has been approved.

If you have any questions regarding this letter, please contact me at (301) 415-6699 or via email to JSC1@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's Rules of Practice, a copy of this letter will be available electronically from the Publicly Availabe Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible fro the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Please note that on October 25, 2004, the NRC suspended public access to ADAMS, and initiated an additional security review of publicly available documents to ensure that potentially sensitive information is removed from the ADAMS database accessible through the NRC's web site. Interested members of the public may obtain copies of the referenced documents for review and/or copying by contacting the Public Document Room pending resumption of public access to ADAMS. The NRC Public Document Room is located at NRC Headquarters in Rockville, MD, and can be contacted at (800) 397-4209 or (301) 415-4737 or pdr@nrc.gov."

Sincerely,

/RA/

Jill S. Caverly, Project Manager
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
and Safeguards
Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-8905
License No.: SUA-1473

cc: Bruce Law, Rio Algom

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RIO ALGOM LLC -AMBROSIA LAKE FACILITY
CLOSURE PLAN - LINED EVAPORATION PONDS
REQUEST FOR ADDITIONAL INFORMATION

SECTION 2 - Environmental Setting

1. Page 6, Section 2.3 refers to Figure 2-3 showing the mine water drainage channels through the Section 4 Ponds area.

REQUEST: Provide any State map or other source to substantiate the location and use of these specific drainage channels for mine drainage.

2. Page 10, second paragraph refers to results of a gamma survey in Figure 2-7. However, there is no legend to explain the color-coded data points and the scale is so small, single points are difficult to distinguish. Also, the Voght Tank is mentioned without explaining what it is. From Figure 2-8, it appears to be a small reservoir.

REQUEST: Provide a map of the gamma survey results with individual color points visible and an explanation of the gamma range represented by each color. Also, describe the Voght tank.

SECTION 4 - Surface Reclamation Plan

1. Page 6, first paragraph, states that direct radiation surveys will be used to characterize soils below the pond liners unless impaired by mine drainage impact. However, direct gamma or alpha surveys are not adequate to characterize these soils.

REQUEST: Provide the estimated soil sample locations to be used to measure Th-230 from known and probable pond or pipeline leaks.

2. Page 6, fourth paragraph, states that mine water impacted soils will be identified as they contain less Th-230 than pond fluid impacted soil.

REQUEST: Provide the data showing the degree of overlap in Ra-226/Th-230 ratios between the two types of soil to substantiate the value of this method.

3. Page 7, first paragraph, indicates protocols, background values, and gamma guidelines will be per the revised soil cleanup plan (to be submitted).

REQUEST: That information needs to be evaluated before the NRC staff can approve the Closure Plan. The information should indicate why the background values and gamma guidelines are applicable to the Section 4 ponds area, if that area is different from the mill site for any important parameter.

4. Page 10 discusses revegetation activities.

REQUEST: Clarify that the proposed methods (e.g., seed type and rate) meet State regulations.

SECTION 5 - Reclamation Verification

1. Page 1, second bullet, states that for deep soil impacts "...cleanup levels and compliance criteria will not be finalized until further soil characterization can be completed."

REQUEST: Provide the cleanup levels and compliance criteria so that staff can complete its evaluation of this plan.

2. Page 4 indicates the Rio Algom Mining (RAM) will develop a gamma/radium correlation. Also, page 9 (Section 5.3.1.2) states that a correlation **may** be developed.

REQUEST: Provide the correlation so that staff can complete its evaluation of this plan and/or clarify the statement on page 9.

3. Page 5, second paragraph, states "Field observations will be considered in addition to analytical results and geographic location when determining ... natural and mining-affected background data sets."

REQUEST: Indicate what type of field observations are planned and the basis (justification) for their use.

4. Page 6, first paragraph, states that "If the effects of windblown tailings cannot be distinguished from the effects of uranium mining, these areas will be identified as mining-affected and removed from further consideration." This appears to apply only to Pond 9 as the other ponds are not near the tailings pile, unless the licensee meant to refer to byproduct material.

REQUEST: Clarify which area(s) is referred to in this paragraph. Also, any such areas should be identified as "indistinguishable from mining impacted soils" (since mining-affected can't be justified) and NRC staff will review those data in the final status survey report.

5. Page 6, second paragraph, indicates that a benchmark dose will be developed.

REQUEST: Provide the benchmark dose modeling and proposed soil cleanup criteria for U-nat and Th-230 so that staff can complete its evaluation of this plan.

6. Page 6, third paragraph, indicates that the dose modeling scenario and exposure pathways will be established based partly on SECY 98-046, Attachment 3, Sections 4 and 5 and Tables 1 and 2. However, SECY 98-046 deals with rulemaking for decommissioning funding, while SECY 99-046 is the rulemaking for Part 40, Appendix A, decommissioning criteria. Also, Attachment 3 is the Environmental Assessment so perhaps Attachment 4 (Regulatory Analysis) was intended.

REQUEST: RAM should correct pages 5-6 and indicate why both tables apply to the site.

7. Page 7, Section 5.3, third paragraph, indicates that NRC guidance recognizes an indirect method of compliance with Criterion 6(6) that "incorporates the unity rule inherently." The method, as described in this paragraph, does not meet the regulatory definition concerning

application of the unity rule, and does not reflect the acceptance criteria in the guidance. The alternate approach to converting dose to soil concentration mentioned in the guidance (Section H2.2.1) does not mean that other steps of the procedure can be eliminated. The unity rule (sum of fractions) is applied to individual grids using the established concentration limits and the grid-specific measured values. These limits are based on the site dose assuming Ra-226 was uniformly distributed at 5 pCi/g in contaminated areas, **and then** the application of the as low as reasonably achievable (ALARA) principle. Also, the underlying assumption for the benchmark approach is that areas requiring cleanup for U-nat and Th-230 are much smaller than areas to be remediated for Ra-226.

REQUEST: RAM should revise Section 5.3 on page 7.

8. Page 8, Section 5.3.1.1, indicates that "Alternate Release Criteria (ARC)" will be used to demonstrate compliance for areas of deep impacts, and that a dose assessment will be done for the ponds. Assuming that this refers to an alternative to Criterion 6(6) for the deep Th-230 contamination, the licensee will need to do more than a dose assessment. The introduction to Part 40, Appendix A, discusses what the NRC will consider in evaluating alternate criteria.

REQUEST: Clarify the purpose of this approach and provide justification for an alternate cleanup/release criterion (also see requests 10 and 18 for this section).

9. Page 9, Section 5.4, states that surface soil reclamation includes soil mixing. Section 5.4.1.2 indicates that soil mixing will be considered where removal is not reasonably achievable (cost vs. health benefit) or for worker safety.

REQUEST: Provide the detailed method and justification (the cost vs. benefit analysis) for this approach, including the criteria to determine worker safety. Note that current NRC policy on soil mixing requires application of ALARA, stakeholder involvement, and can be considered only where it can be demonstrated that removal of the soil would not be reasonably achievable (Regulatory Issue Summary 2004-08, May 28, 2004). This is in addition to requiring that the contaminated soil footprint not be enlarged and clean soil not be brought into the footprint.

10. Page 11, Section 5.4.2, indicates that areas of deep impacts (contamination) would be covered by at least one foot of clean soil. This Section cannot be approved in isolation. The discussion should be part of the alternate release criterion (ARC) proposal, where "deep impacts" is clearly defined and the justification for covering the material in place is provided.

REQUEST: RAM should put all information concerning the proposed ARC in one section.

(<u>SECTION 5.5 Final Status Survey (FSS) Plan, pages 11-19</u>)

11. Page 12, first paragraph, states that the plan for surface soil is limited to soil impacted by windblown material.

REQUEST: Indicate why other types of surface contamination are not to be considered. RAM has already indicated that mine water drainage contamination will not be removed if it can be identified. That still leaves spills, leaks, and waterborne byproduct material to consider.

12. Page 13, Table 5-2, indicates that uranium analysis will be by gamma spectrometry with a (maximum) detection limit of 15 pCi/g. However, the surrogate radionuclides to be measured have low yield, low energy gamma emission (long count times needed).

REQUEST: Justify the use of this analytical method.

13. Page 14, second paragraph, indicates that survey procedures have been or will be prepared.

REQUEST: Such procedures must be summarized in sufficient detail in this plan or in the soil decommissioning plan.

14. Page 15, Section 5.5.1.2, first paragraph states that "Soil samples will be collected in a known and consistent fashion..."

REQUEST: Indicate how this will be accomplished or reference specific procedures or QA/QC plan section. Some document should indicate the level of management oversight.

15. Page 15, third paragraph, indicates soil samples will be dried, if needed.

REQUEST: Indicate how it will be determined that soil samples need to be dried, how drying is done, and the quality control performed for this process.

16. The top of page 16 states that "Upon termination of reclamation activities, stored samples will be disposed."

REQUEST: Clarify that stored verification soil samples will be stored at least until NRC approval of the FSS Report is provided to RAM.

17. Page 16, third paragraph, states that soil sampling will be completed for 2 percent of the grids in the windblown area.

REQUEST: That low percentage has to be justified by a conservative and reliable gamma guideline. Otherwise, a value of 20 percent or more may be required.

18. Page 17, Section 5.5.2, "Deep Impacts," indicates that more characterization of the Section 4 ponds will be done. If data to support the proposal for ARC needs to be provided after pond remediation has begun, a license condition can be added to state that subsurface soil criteria for Th-230 must be approved before the FFS is completed. However, it may be difficult to justify alternate criteria in an area to be released for unrestricted use.

REQUEST: NRC staff prefers that all supporting information for the ARC be provided in this Closure Plan.

19. Page 18, first paragraph, states that "Scanning surveys will not be performed for areas of deep impacts." Also, sampling will not be by grids or composite samples, and replicate samples will not be collected.

REQUEST: If this means that gamma scans are not effective to delineate areas of elevated Th-230 levels, then say so. If elevated levels of RA-226 are likely, then gamma scanning

should be considered. Also, indicate how soil analytical results will be compared to the Criterion 6(6) requirement for measurements of 100 m^2 areas, and what QA/QC measures will be used, or justify that the sampling pattern will provide representative results for the ARC proposal. RAM can't assume the ARC will be approved so this section should be revised to state that these proposed verification methods are subject to approval of the ARC.

20. The last sentence on page 18 indicates an 80 percent confidence interval will be used to calculate sampling requirements (for surface soil). Page 19, first paragraph, indicates various other methods for deep soil (estimates, professional judgement, or at least 30 samples).

REQUEST: Indicate why 80 percent is a reasonable level and how it compares to the statement on page 16 that 2 percent of the grids will be soil sampled. Also, indicate why the deeper soil is being sampled differently, or if all subsurface contamination will be included in the ARC proposal.

21. Section 5.5, FSS Plan, did not address the methods to be used to verify that soil in the pipe trenches (pipes transferred waste solutions to ponds) meet criteria.

REQUEST: Provide a summary of the gamma survey and soil sampling plan for trenches that meet Criterion 6(6).

22. Page 19 (Section 5.6), indicates that RAM will develop a quality assurance (QA) procedure for the FSS.

REQUEST: Summarize the QA procedure as part of the FSS Plan so that staff can complete its evaluation of the Closure Plan.

23. Page 21, Section 5.7, does not indicate any plan to analyze for heavy metals in the subsurface soil beneath the lined ponds.

REQUEST: Indicate the basis for assuming that non-radiological hazardous constituents don't exist beneath the ponds, or why the Closure Plan would meet Criterion 6(7).

<u>SECTION 6 - Health & Safety & Environment (see Appendix G)</u>

1. Page 14 indicates that wash water will be disposed in lined evaporation cells.

REQUEST: Indicate where these cells will be/are located and where the closure of these cells is discussed.

<u>SECTION 7 - Reclamation Costs</u>

1. Page 1 indicates that some categories of costs such as materials, labor, and taxes are included in the work unit costs. However, the guidance in NUREG-1620, Rev. 1, Appendix C, has not been followed and staff can't determine if the proposed surety amount is adequate for contaminated soils cleanup and site management and HP support that are based on "site experience" (Table 7-1, items 5 and 7).

REQUEST: Provide third party costs for labor, soil analysis, etc. The amount of work should be keyed back to the Closure Plan estimated activities. RAM should not assume that the ARC for the Section 4 ponds is approved.

ENVIRONMENTAL REVIEW REQUIREMENTS

An Environmental Assessment (EA) is required for this action. The following are requests for information needed to complete an environmental review.

1. REQUEST
The U.S. Fish and Wildlife Service has listed the Mexican Spotted Owl, the Southwester Willow Flycatcher, and the Zuni Fleabane as threatened and endangered animals in McKinley County, NM. Please address the impacts of the proposed action on the above noted species including its habitat.

2. REQUEST
The duration and schedule will affect the impacts to the site and should be considered in the EA. Please provide details regarding the phases and duration of the proposed action.

3. REQUEST
Please provide details of measures that will be employed to control surface water runoff, traffic control and safety, dispersion of radiological material, and infiltration of contaminated water into groundwater systems.

4. REQUEST
Please provide information and requirements for permits required for work to be completed across the state highway.

5. REQUEST
Explain how cultural sites will be protected from the impacts of large construction processes during the duration of the proposed project.