



# Rio Algom

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RETURN RECEIPT REQUESTED

Mr. Dwight Chamberlain  
Director  
U.S. Nuclear Regulatory Commission  
Region IV  
Division of Nuclear Material Safety  
811 Ryan Plaza Dr., Suite 400  
Arlington TX 76011-8064

**Subject: Responses to NRC Inspection Report 40-8964/00-01**  
**License No. SUA-1548 Docket No. 40-8964**  
**Smith Ranch Facility**

Dear Mr. Chamberlain:

Rio Algom Mining Corp. (RAMC) is providing responses to the above referenced inspection report. RAMC received an inspection report and notice of violation dated February 11, 2000. RAMC has replied separately to the notice of violation in a letter dated March 7, 2000. During the review of the inspection report, RAMC determined that there were several portions of the report that required a response additional follow-up. RAMC does not dispute the findings of the report, but does wish to provide additional information in an effort to clarify some of the findings of the report.

It is RAMC's understanding that the findings in this report will be used in the development of a Technical Assistance Report to aid the NRC staff in determining a standardized "Significant Spill" notification process as is required in most ISL uranium recovery licenses such as RAMC's. However, the tone of some of the comments in the report that deal with spills and spill recovery implies, in RAMC's opinion, that widespread contamination is occurring in the wellfield as a result of these spills. RAMC believes that this is not the case, and has provided some follow-up to the report. Since those elements in the report related to spills will likely affect the ISL operators including RAMC, RAMC believes it is important to respond to some of the findings considered in the development of the Technical Assistance Report.

Sincerely,

William Paul Goranson, P.E.  
Manager, Radiation Safety, Regulatory  
Compliance and Licensing

Enclosures

CC: John Lusher, U.S. NRC  
Georgia Cash, WDEQ-LQD  
Marvin Freeman, RAMC  
Bill Ferdinand, RAMC  
John McCarthy, RAMC  
John Cash, RAMC

## **Response to NRC Inspection Report 40-8964/00-01**

Rio Algom Mining Corp. (RAMC) received an inspection report and notice of violation dated February 11, 2000. RAMC has replied to the notice of violation in a letter dated March 7, 2000. During the review of the inspection report, RAMC determined that there were several other statements in the report that necessitated a response or a clarification. RAMC does not dispute the findings of the report, but does wish to provide additional information in an effort to clarify some of the findings of the report. It is RAMC's understanding that the findings in this report will be used in the development of a Technical Assistance Report to aid the NRC staff in determining a standardized "Significant Spill" notification process as is required in most ISL uranium recovery licenses such as RAMC's

### Section 2.2(b) Management Controls

In the third paragraph of this section, the inspector states that the licensee management (i.e. RAMC) committed to a further review of standard operating procedures (SOPs) that would be conducted and additional procedures for alarm conditions would be implemented as necessary. RAMC is currently in the progress of conducting that SOP review and has developed draft modifications to some SOPs for alarm conditions. Upon completion of the development and internal approval process, the SOPs will be implemented.

### Section 2.3(c) Corrective Action Program

In the third paragraph of this section, the inspector states that an ISO 14000 "Environment Management Systems" audit was conducted by RAMC's parent company, Rio Algom Limited. That statement is incorrect in the fact that the audit was not conducted to the standards under ISO 14000. Rather the audit was conducted to the standards of the Rio Algom Limited Environment, Health and Safety Management System that incorporates some of these elements of ISO 14001 in addition to elements developed by Rio Algom.

RAMC has committed to the inspectors at the exit meeting of NRC inspection 40-8964/00-01 to develop and implement a corrective action program within 3 to 6 months. RAMC is in the process of developing the program and processes/procedures for implementation of the program by June 13, 2000.

### Section 3.2(b)(2) Spill Reports and Regulatory Requirements

In the third paragraph, the inspector discusses the spill records, and in that discussion, the inspector states, "However, the licensee had not consistently included specific location and amount of property impacted by the spill." RAMC does not believe that this statement is correct. RAMC records the point source of the spill, whether it is a well, pipeline, header, or etc, and references it to a known location on a facility map. Typically, the spills originate from a wellhead or headerhouse that is surveyed in on a map. That location is also referenced in the report to a specifically defined area whether that is a wellfield or a ¼ - ¼ section tract of land. In the spill file, a map describing the extent of the spill relative to the point source is included to determine the extent of the spill and locating it for decommissioning purposes. This information has been recorded on every spill to comply with the requirements of the Wyoming Department of Environmental Quality - Land Quality Division permit held by RAMC.

Further in the same paragraph, the inspector states, " However, the licensee's records did not provide the total amount of radium-226 and natural uranium activity involved in a contamination event in order to determine reporting compliance with 10 CFR 40.60(b)." It is necessary that RAMC clarify its position on this report determination. Prior to this inspection, it was RAMC's interpretation of 10 CFR 40.60 b(1)(ii) that the determination was based on an intake in excess of 5 times ALI rather than total radioactivity in excess of 5 times ALI. RAMC did perform the report determination for 10 CFR 40.60 b(1)(ii) using intake, but based on the conclusions of this inspection, RAMC has changed its reporting process to use total radioactivity. Further, as stated in the third bullet item, RAMC did not require implementation of

personnel access, work, or radiological controls as a result of the spill. It is clear under 10 CFR 40.60(b) that all three criterions must be met to reach the reporting requirements, and in all of the spills, only one of those criteria was met. Therefore, RAMC was not out of compliance of 10 CFR 40.60(b) even though the inspector implies that there was no determination of compliance.

In the fifth bullet item after the third paragraph, the inspector notes that RAMC did not determine the concentration of natural uranium contamination in a spill area. RAMC believes that this item is misleading. In cases where a wellfield spill has occurred, the uranium concentration in the lixiviant is very dilute, and all of these spills have been contained within the license area. RAMC has taken soil samples and analyzed them for uranium, though not on a regular basis since the concentration of uranium in the lixiviant has been very low in most cases and with these conditions, there is any reason to assume that the soil concentration will fluctuate significantly. The reason for this sampling was to determine the concentration of uranium in soil relative to background, and the analytical results indicated that there has been no significant elevation of uranium concentration over background. The inspector also notes that this information is necessary to determine if the area would need to be remediated. RAMC plans to remediate all areas of contamination over background at closure of the wellfield. Gamma measurements of the spill areas have historically shown no noticeable elevation of exposure in excess of background.

The sixth bullet item after the third paragraph of this section, states, "The licensee did not routinely collect soil samples for determining the concentration of contamination in the soil because the licensee had developed a calculation based on soil sample analyses performed in late 1997." RAMC would like to clarify its position on this statement. In fact RAMC has taken some soil samples to track levels of soil contamination in spill areas for reclamation purposes. However, these analyses are expensive, and since the concentration of the contaminants present in a lixiviant spill do not vary significantly in the various historic spills, the usefulness of repeated sample analysis add no benefit to the information in the file. RAMC will ensure at closure of the wellfield that all of the contaminant concentrations in soil are in compliance with the release limits.

Further, the inspector's statement is misleading in that could be interpreted to imply that RAMC uses a calculation for the determination of soil contamination for remediation, and that is not correct. The calculation that the inspector is referring to be used for reporting and notification determination purposes only. The 1997 sample analysis that the inspector refers to was used to confirm the results of the calculation to actual measurements to ensure that there was enough conservatism for an appropriate basis for notification. RAMC instituted this calculation in its spill notification process in response to a letter dated April 8, 1998 which described what NRC considered a "Significant Spill" for compliance with license condition 12.6. That letter described one of the criteria of significance was the exceedance of the decommissioning standard that RAMC interpreted as 5 pCi/g Ra-226 plus background as per Criterion 6(6) of 10 CFR 40 Appendix A.. Due to the time required for analytical work to be completed for radium in soil, RAMC determined that a calculation would be appropriate to ensure timeliness of reporting, and that was consistent with RAMC's understanding of what other ISL licensee's were doing for their determination of significance for notification.

### Section 3 Spill Remediation and Corrective Actions

In the first paragraph, the inspector discusses RAMC's remedial action and corrective actions to prevent a reoccurrence of the circumstances that caused the spills. Based on earlier reviews, RAMC has determined that the greatest impact resulting from the spills to the environment is erosion and topsoil loss. The table shown below provides some data on of what the soil sample analyses showed for some recent spills.

Date of Spill	U <sub>nat</sub> in water (μCi/ml)	U <sub>nat</sub> in soil bkgrd* (pCi/g)	U <sub>nat</sub> in soil measured* (pCi/g)	Ra-226 in water (μCi/ml)	Ra-226 in soil bkgrd* (pCi/g)	Ra-226 in soil msd* (pCi/g)
12/16/97	1.35x10 <sup>-6</sup>	2.12	3.15	1.56x10 <sup>-6</sup>	2.50	2.40
7/21/99	3.97x10 <sup>-5</sup>	N/A	N/A	N/A	1.30	4.13
12/11/99	3.79x10 <sup>-6</sup>	1.67	2.46	3.30x10 <sup>-6</sup>	0.93	3.95
12/31/99	3.05x10 <sup>-6</sup>	2.44	3.43	3.30x10 <sup>-6</sup>	1.65	4.62
01/17/00	1.76x10 <sup>-6</sup>	1.96	4.44	3.30x10 <sup>-6</sup>	1.32	3.04

\* - Denotes that these are averages of the background samples taken upstream of the point source of the spill and the measured soil concentration within the spill area.

Based on the results above, there is no measured build-up of contaminants in soil that would indicate the significant contamination. Additionally, though there is a slight increase in the Ra-226 concentration in soil, there is no noticeable increase in the direct measurement of gamma radiation over background within the spill areas.

The inspector states, "However, the inspectors' review of the information in these spill reports revealed that the contamination may have been significant." RAMC believes that the inspector is basing this statement solely on an estimate of the volume of water and an estimate of the concentration of the contaminant in the lixiviant that is used for the determination of notification. RAMC has established that this calculation is very conservative, and in fact the actual measured contamination has not reached a level that RAMC considers being "significant". RAMC does not sample every spill area, because the majority of the spills involve injection fluids that are relatively consistent through the operational history of the facility, and, as seen above, do not appear to increase the contamination of the soils to a level that would cause a significant closure problem. Additionally, the necessary records are maintained for all spills, as per 10 CFR 40.36, to ensure that all such areas will be reevaluated and decontaminated as necessary at closure.

In the last part of the second paragraph, the inspector writes, "However, the licensee's investigation did not address the radiological impact to the environment from the two spills." This statement is in reference to a discussion of RAMC's corrective action for spills that occurred on December 4 and 11 in headerhouse 1-2. RAMC believes that it has assessed the radiological impact by using historical data to establish that injection solutions have not increased contaminant levels in soil significantly and that the spills did not leave areas under RAMC's control within the license area.

In the last sentence of the first paragraph, the inspector writes, "The spill records required by 10 CFR 40.36(f) will be assessed by the NRC to determine whether soil remediation will be required prior to license termination." RAMC is unclear as to the intent of this statement. It is RAMC's understanding that at closure, prior to license termination, RAMC will be required to demonstrate that the areas where licensed activities occurred will be cleaned up to a level acceptable for unrestricted use. It is also RAMC's understanding that prior to license termination, the NRC has the option to verify the soil cleanup.

In conclusion, RAMC believes that it is necessary to provide a response to clarify some of key portions of this inspection report that deal specifically with spills and spill reporting. RAMC understands that the NRC will be completing a staff guidance document to provide a consistent reporting requirement for all ISL uranium recovery licensees. However, some of the comments in the report that deal with spills and spill recovery could be interpreted to imply, in RAMC's opinion, that widespread contamination is occurring when in fact it is not. Since those elements in the report related to spills will likely affect the ISL operators including RAMC, it is important that RAMC provide its response to some of the findings to be considered in the development of the Technical Assistance Report.