

# Rio Algom Mining LLC

February 8, 2021

Mr. Thomas Lancaster  
U.S. Nuclear Regulatory Commission  
Mailstop T5-A10  
Washington DC 20555-0001

**Subject: Response to NRC Requests for Additional Information – 2020 Financial Assurance Update**

Rio Algom Mining LLC – Ambrosia Lake Facility  
Radioactive Materials License No. SUA-1473, Docket No. 40-8905

Dear Mr. Lancaster:

This letter is in response to requests for additional information (RAIs) from the Nuclear Regulatory Commission (NRC) regarding RAML's 30 September 2020 resubmission (ML20307A169, ML20307A171) of the Ambrosia Lake West facility's 2020 annual financial assurance update (ML20192A224).<sup>1</sup> RAML received the following three RAIs by email dated 11 January 2021 (ML21012A212):

**RAI 1. Update the revised surety estimate to include sources of unit costs and adequate information to confirm costs are presented in current dollars (Paragraph (b)(3) of 10 CFR Part 40, Appendix A, Criterion 9; Paragraph (f)(1) of 10 CFR Part 40, Appendix A, Criterion 9; Appendix C, NUREG-1620)**

[...]

**To allow the NRC to fully evaluate and confirm the reasonableness of the unit costs relied on in the revised surety estimate, the licensee needs to provide a documented source for all costs. Furthermore, clarification of the source(s) of these costs is needed to determine if the costs represent current dollars or need to be adjusted for inflation.**

To resolve this RAI, RAML has updated **Attachment A** to the 2020 surety resubmission. The updated version indicates, per-line item, the source of each of RAML's cost estimates. **Table 1** provides further specific details about the sources identified in **Attachment A**.

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<sup>1</sup> Pursuant to SUA-1473 license condition 22.

**RAI 2. Update the revised surety estimate to include an estimate of the amount of radioactive contamination in onsite subsurface material (Paragraph (b)(2) of 10 CFR Part 40, Appendix A, Criterion 9)**

**Paragraph (b)(2) of 10 CFR Part 40, Appendix A, Criterion 9 states that each cost estimate must contain an “estimate of the amount of radioactive contamination in onsite subsurface material.” The revised surety estimate does not include an estimate for the amount of radioactive contamination in onsite subsurface material. In accordance with the regulatory requirement, provide an estimate of the amount of radioactive contamination in onsite subsurface material.**

RAML has not provided the requested estimate because the facility’s approved Soil Decommissioning Plan (SDP, ML18166A182) authorizes RAML to cover licensed subsurface radioactive material in excess of the concentrations stipulated in 10 CFR 40 Appendix A, as a part of the Alternate Release Criteria (ARC) remedy. RAML does not anticipate further remedial work in locations where the ARC remedy has been previously implemented. Therefore, there is no expected cost to reclaim the subsurface material where the ARC remedy has been implemented, and the volume is not relevant to the surety estimate.

During 2021, RAML will perform additional characterization to confirm the horizontal and vertical completeness of the ARC remedy. If results of the 2021 characterization show that licensed subsurface radioactive material exists outside of where the ARC remedy has been implemented, RAML’s 2022 financial assurance update will provide a volume estimate and financial assurance amount to remediate licensed radioactive material at depth.

**RAI 3. Provide an explicit statement that there has been no change in various costs or facility conditions since the previous surety estimate (Section (f) of 10 CFR Part 40, Appendix A, Criterion 9)**

[...]

**In order to assess the reasonableness of the surety estimate and in accordance with section (f) of 10 CFR Part 40, Appendix A, Criterion 9, provide explicit statements on whether conditions have changed related to factors four through ten (spills, waste inventory, waste disposal, facility modifications, changes in authorize possession limits, actual remediation costs, onsite disposal, other conditions affecting costs) since the 2019 surety estimate.**

**Table 2** provides the requested information consistent with 10 CFR Part 40, Appendix A, Criterion 9 factors four through ten.

If you have any questions or require additional information, please contact me at (916) 947-7637 or by email at [Sandra.Ross@bhp.com](mailto:Sandra.Ross@bhp.com).

Respectfully submitted,  
**Rio Algom Mining, LLC**

A handwritten signature in cursive script that reads "Sandra L. Ross".

Sandra L. Ross, P.G.  
Site Manager

**Attachment A** – Updated summary tables for line items in NUREG-1620 Appendix C

cc: NRC Document Control

**Table 1.** Specific details concerning estimate sources for SUA-1473 2020 Surety resubmission.

<b>Table Identifier</b>	<b>Company Name</b>	<b>Location</b>	<b>Comments</b>	<b>Cost estimate calculated</b>
RAML Legal	Rio Algom Mining, LLC	Houston, TX	Manager Legal provided estimate based on previous work performed in-house	September 2020
RAML O&M	Rio Algom Mining, LLC	Grants, NM	Site staff based these estimates on historical spend.	September 2020
Ecosphere	Ecosphere Environmental Services	Durango, CO	None	September 2020
GHD	GHD Group Pty Ltd	Niagara Falls, NY	None	September 2020
H3	H3 Environmental, LLC	Albuquerque, NM	None	September 2020
INTERA	INTERA Incorporated	Albuquerque, NM	None	September 2020
SEAS	Stratified Environmental & Archaeological Services	Durango, CO	None	September 2020

**Table 2.** Summary of changes in site conditions relative to factors four through ten 10 CFR Part 40, Appendix A, Criterion 9.

Factor	Factor	RAML Comment
(4)	Spills, leakage or migration of radioactive material producing additional contamination in onsite subsurface material that must be remediated to meet applicable remediation criteria	No change since 2019 financial assurance calculation.
(5)	Waste inventory increasing above the amount previously estimated	No change since 2019 financial assurance calculation.
(6)	Waste disposal costs increasing above the amount previously estimated	Increased financial assurance amount to account for licensing and construction of a new on-site repository.
(7)	Facility modifications	No change since 2019 financial assurance calculation.
(8)	Changes in authorized possession limits	No change since 2019 financial assurance calculation.
(9)	Actual remediation costs that exceed the previous cost estimate	Increased financial assurance amount to account for additional remediation of licensed radioactive material.
(10)	Onsite disposal	Increased financial assurance amount to account for licensing and construction of a new on-site repository.

## **Attachment A**

Updated summary tables for line items in NUREG-1620 Appendix C

NUREG-1620						
Line Item	Title	Status	Amount	Estimate Line Item	Estimate Source	Notes
<b>(I) Facility Decommissioning</b>						
<b>(A)</b>	<b>Salvageable building equipment and equipment decontamination. Provide:</b>	Scope complete		FD.A		Mill demolition is complete.
<b>(B)</b>	<b>Non-salvageable building and equipment demolition and disposal:</b>	Scope complete		FD.B		Mill demolition is complete.
<b>(C)</b>	<b>Cleanup of contaminated areas</b>	In estimate		FD.C		
	Cleanup of windblown materials (e.g., volume and area, unit cost per cubic yard)	In estimate	\$1,477,321	FD.C.1	GHD	Volume of material to be excavated was calculated using the assumptions in the approved <i>Soil Decommissioning Plan</i> . Resulting volume of material is 75,000 CY.
	Placement of borrow materials removal (e.g., rental rate, cost/cubic yard)	In estimate		FD.C.2		Costs included in FD.C.1.
	Dust suppression and site maintenance	In estimate	\$581,625	FD.C.3	GHD	
	Monitoring and testing of construction	In estimate		FD.C.4		Costs included in FD.C.1.
	Regrading	In estimate		FD.C.5		Costs included in FD.C.1.
	Placement of the frost barrier	In estimate	\$243,619	FD.C.6	GHD	
	Placement of the radon barrier	In estimate	\$589,368	FD.C.7	GHD	
	Installation of erosion protection and armor	In estimate	\$813,055	FD.C.8	GHD	
	Installation of any vegetative cover	NA		FD.C.9		No vegetative cover is required or used.
	Design and construction of drainage ditches	NA		FD.C.10		Estimate assumes no changes to site diversion channels are required.
	Recontouring of land surfaces	In estimate	\$23,103	FD.C.11	GHD	
	Revegetation	In estimate	\$375,000	FD.C.12	GHD	

NUREG-1620						
Line Item	Title	Status	Amount	Estimate Line Item	Estimate Source	Notes
<b>(II) Groundwater Cleanup &amp; Well Decommissioning</b>						
<b>(A)</b>	<b>Method of Cleanup</b>	NA		NA		RAML has alternate concentration limits and does not intend to engage in aquifer treatment. ACL activities are accounted for in item GWC-WD.C, below.
<b>(B)</b>	<b>Volume of aquifer to be restored, area and thickness of aquifer, number of required pumping cycles, and cycling time</b>	NA		NA		
<b>(C)</b>	<b>Verification sample analysis</b>	In estimate	\$1,102,338	GWC-WD.C	INTERA	Assumptions described in Attachment B.
<b>(D)</b>	<b>Well decommissioning</b>	In estimate	\$121,524	GWC-WD.D	INTERA	Details requested as sub-items GWC-WD.D.1-3 are provided within the backup documentation for GWC-WD.D.
	Number of drill holes to be plugged	In estimate		GWC-WD.D.1		
	Depth and size of each drill hole	In estimate		GWC-WD.D.2		
	Material to be used for plugging including acquisition, transportation, and plugging	In estimate		GWC-WD.D.3		



NUREG-1620						
Line Item	Title	Status	Amount	Estimate Line Item	Estimate Source	Notes
<b>(III) Radiological Survey and Monitoring</b>						
(A)	<b>Soil samples for radium (and uranium and thorium, if needed) (e.g., number, cost to collect, and analyze)</b>	In estimate	\$270,798	RSM.A	H3	Assumes final status survey is performed as described in the approved <i>Soil Decommissioning Plan</i> .
(B)	<b>Decommissioning equipment and building smear samples and alpha surface surveys</b>	Scope complete		NA		Mill demolition is complete.
(C)	<b>Gamma survey frequency, location, and techniques (e.g., type, number, unit cost)</b>	In estimate	\$552,734	NA	H3	The only surveys remaining are remedial support surveys - funding for these surveys are scoped under task RSM.E.
(D)	<b>Environmental monitoring</b>	In estimate	\$65,720	RSM.D	H3	
(E)	<b>Personnel monitoring</b>	In estimate	\$1,092,778	RSM.E	H3	

NUREG-1620						
Line Item	Title	Status	Amount	Estimate Line Item	Estimate Source	Notes
<b>(IV) Project management and Miscellaneous</b>						
None given	<b>Project management</b>	In estimate	\$385,700	PMCM.1	H3	Half-time project manager for 5 years.
None given	<b>Engineering design, review, and change</b>	In estimate	\$966,770	PMCM.2	INTERA	Licensing of new uranium byproduct material repository.
None given	<b>Mobilization</b>	In estimate		PMCM.3		Included in line-item costs - not a separate line item.
None given	<b>Legal expenses</b>	In estimate	\$100,000	PMCM.4	RAML Legal	Assumptions described in Attachment B.
None given	<b>Power during reclamation</b>	In estimate	\$27,400	PMCM.5	RAML O&M	Assumptions described in Attachment B.
None given	<b>Quality control</b>	In estimate		PMCM.6		Quality control related to radiation surveys (e.g., development of a Quality Assurance Project Plan) is included in RSM.A <i>Soil samples for radium</i> . Quality control for geotechnical work is included in PMCM.8 <i>Construction completion report</i> .
None given	<b>Radiological safety</b>	In estimate		PMCM.7		Included in RSM.E <i>Personnel Monitoring</i> .
None given	<b>Construction completion report</b>	In estimate	\$403,457	PMCM.8	INTERA	Assumptions described in Attachment B.
None given	<b>License termination activities</b>	In estimate	\$90,685	PMCM.9	H3	
None given	<b>Well maintenance &amp; replacement</b>	Assumed complete		PMCM.10		
None given	<b>Other (describe):</b>	In estimate		PMCM.11		
None given	NEPA	In estimate	\$380,000	PMCM.12	Ecosphere	Assumptions described in Attachment B.
None given	Section 106 compliance	In estimate	\$750,000	FD.C.13	SEAS	Assumptions described in Attachment B.
None given	Section 4 ponds	In estimate	\$157,328	PMCM.13	H3	Completion of the section 4 ponds supplemental characterization work plan.
None given	O&M - Misc	In estimate	\$66,000	PMCM.14	RAML O&M	Assumptions described in Attachment B.
None given	ACL revision & licensing	In estimate	\$396,664	GWC-WD.E.1	INTERA	Assumptions described in Attachment B.
None given	Develop LTSP	In estimate	\$64,800	PMCM.15	H3	Assumptions described in Attachment B.

NUREG-1620						
Line Item	Title	Status	Amount	Estimate Line Item	Estimate Source	Notes
<b>(V) Overhead, Contractor Profit</b>						
NA	<b>Overhead costs for labor and equipment and contractor profit</b>	NA		LEOCP.1		Rates are fully loaded, so this line item is out of scope.
<b>(VI) Long-term surveillance fee</b>						
NA	<b>The fee required for 10 CFR Part 40, Appendix A, Criterion 10</b>	In estimate	\$1,039,672	LTSF.1		The fee from 10 CFR 40 Appendix A, adjusted to 2020 dollars using the US Bureau of Labor & Statistics inflation calculator.
<b>(VII) Contingency</b>						
NA	<b>Contingency (15%)</b>	In estimate	\$1,820,619	CONT.1	NA	As described in NUREG-1620
<b>(VIII) Annual Adjustments</b>						
NA	<b>Annual updates.</b>	NA		ASA.1	NA	First year - no adjustments