

# Rio Algom Mining LLC

June 25, 2021

**ATTN: Mr. Thomas Lancaster**  
United States Nuclear Regulatory Commission  
Mail Stop T5-A10  
Washington, DC 20555-0001

**Re: Rio Algom Mining LLC – Ambrosia Lake West Mill  
License SUA-1473, Docket No. 40-8905  
2021 Financial Assurance Update**

Dear Mr. Lancaster,

Rio Algom Mining LLC (RAML) respectfully submits the attached *2021 Financial Assurance Update* as required by license condition (LC) 22 of U. S. Nuclear Regulatory Commission (NRC) License SUA-1473. The *2021 Financial Assurance Update* is consistent with 10 CFR 40, Appendix A, Criteria 9 and 10 and incorporates guidance from NUREG-1620, Appendix C.

The purpose of this *2021 Financial Assurance Update* is to update RAML's financial assurance with NRC, consistent with LC 22 and RAML's commitments to NRC staff during clarification calls on 1 and 9 September 2020. The enclosed report describes a *conceptual* plan for completion of decommissioning at RAML's Ambrosia Lake West mill. Based on this conceptual plan, the remaining cost to complete mill decommissioning is \$19,932,824.

The 2021 financial assurance estimate exceeds the amount available via the financial instrument in SUA-1473 LC 22 by \$3,932,824. This increase is due to changes in the aspects listed in 10 CFR 40, Appendix A, Criterion 9(f). The basis for the 2021 estimate is provided in Section 3 of the *2021 Financial Assurance Update*. RAML plans to request that NRC amend LC 22 of SUA-1473 following NRC's acceptance of the *2021 Financial Assurance Update*.

The following are provided as electronic enclosures for NRC staff's review:

- 1) A PDF file "2021 Financial Assurance Update", a report describing RAML's 2021 surety estimate, and
- 2) A supplementary Microsoft Excel workbook "2021 Financial Assurance Update Tables", which is an excel version of the summary tables provided in the surety report.

Contractor-provided estimates have been prepared as Appendix A to this submittal and will be submitted under separate cover. Appendix A contains costing information prepared for RAML by its contractors and is confidential financial information related to RAML's contractors' business practices. RAML therefore requests that Appendix A to this submittal be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4), which permits the nondisclosure of records that are trade secrets and commercial or financial information that is confidential.

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MOD 1  
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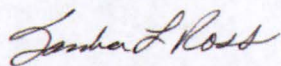


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If you have any questions or need additional information, please do not hesitate to call me at (916) 947-7637.

Sincerely,

A handwritten signature in cursive script, appearing to read "Sandra L. Ross", written in dark ink.

Sandra L. Ross, P.G.  
Site Manager  
Rio Algom Mining, LLC

cc: Document Control



# **Rio Algom Mining LLC**

## **2021 FINANCIAL ASSURANCE UPDATE**

**AMBROSIA LAKE WEST MILL**

**LICENSE SUA-1473, DOCKET NO. 40-8905**



**RIO ALGOM MINING LLC – AMBROSIA LAKE WEST MILL – SUA-1473  
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## **Acronyms and Definitions**

<b>Term</b>	<b>Definition</b>
ACL	alternate concentration limit
ARC	alternate release criteria
CCR	construction completion report
CFR	Code of Federal Regulations
FSS	final status surveys
LC	license condition
NRC	United States Nuclear Regulatory Commission
RAML	Rio Algom Mining LLC
RPEM	radiation protection and environmental monitoring program manual
SDP	Soil Decommissioning Plan
SUA-1473	NRC license SUA-1473 for RAML's Ambrosia Lake West mill facility



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## **1 Introduction**

Rio Algom Mining LLC (RAML) has prepared this *2021 Financial Assurance Update* as required by the U.S. Nuclear Regulatory Commission (NRC) in license condition (LC) 22 of RAML's radioactive materials license SUA-1473 ("the license") (NRC 2020) issued by NRC for RAML's Ambrosia Lake West mill facility ("the mill"). The financial assurance calculations are consistent with 10 CFR 40, Appendix A, Criteria 9 and 10, NUREG-1620, Appendix C (NRC 2003a), and RAML's commitments to NRC staff during clarification calls on 1 and 9 September 2020.

This report outlines a *conceptual* plan for decommissioning<sup>1</sup> at the mill for the purpose of updating RAML's financial assurance *only*. Characterization and decommissioning planning are still ongoing at the mill and the final scope of decommissioning activities may ultimately differ from the conceptual plan presented in this report.

A summary of the conceptual plan for decommissioning, as of 2021, is provided in Section 2(IV) of the *2021 Financial Assurance Update*. A more detailed basis of estimate for the remaining work is provided in Section 0. The major assumptions of the *2021 Financial Assurance Update* are:

- 1) RAML will submit its license termination request for the license in 2030 and transition will occur in 2032.
- 2) Previously completed decommissioning activities are acceptable to NRC and meet the requirements of the relevant plans and 10 CFR 40, Appendix A.
- 3) The scope of decommissioning activities to be completed will follow RAML's NRC-approved plans.
- 4) A new byproduct material<sup>2</sup> repository ("surety repository") will be licensed and constructed at the site.

RAML's independent contractors used the basis of estimate (Section 0) to prepare cost estimates to complete remaining decommissioning activities. Contractors' cost estimates are provided as Appendix A, which RAML has requested be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4). Summaries of cost estimates, consistent with the categories described in NUREG-1620, Appendix C, are provided in Table 1 through Table 6.

Using the basis described above, the remaining cost to complete mill decommissioning is \$19,932,824. The 2021 financial assurance amount exceeds the amount available via the financial instrument in LC 22 by \$3,932,824.

The 2021 financial assurance estimate has increased relative to RAML's 2020 financial assurance estimate (RAML 2021a) due to changes in the aspects listed in 10 CFR 40, Appendix A, Criterion 9(f). These changes are described in Section 3(VIII) and Table 7 of the *2021 Financial Assurance Update*.

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<sup>1</sup> Decommissioning as defined in 10 CFR 40.4.

<sup>2</sup> Byproduct material as defined in 10 CFR 40.4.



## **2 Facility Description**

### **(I) Site Location**

RAML's mill is in the southeastern part of McKinley County, New Mexico approximately 25 miles north of Grants on New Mexico Highway 509 (Figure 1).

### **(II) Facility History**

The Ambrosia Lake West mill processed uranium ore from 1957 until 1985. In 1985, the conventional mill was placed in standby status; the mill transitioned to possession-only status in 2003 with Amendment 52 to the license (NRC 2003b). Licensed materials at the mill have largely been reclaimed in accordance with plans previously approved by NRC. Current and future site activities have three objectives: (1) compliance with regulatory requirements, including the completion of mill decommissioning; (2) license termination; and (3) transition of the mill to the appropriate custodian for long-term care and maintenance.

### **(III) Prior Decommissioning**

Decommissioning under the license has consisted of tailings reclamation, soil cleanup, and groundwater remediation and monitoring. Tailings reclamation began in 1986 with NRC approval of the Tailings Stabilization Report (Quivira 1986) and was generally completed by 2000 for the tailings disposal cells (Figure 1, Cells 1 and 2). The mill was demolished in 2003-2004 pursuant to the Mill Demolition Plan (RAML 2002), with further demolition of auxiliary structures from 2014-2016. RAML maintained disposal capacity for byproduct material through 2016 (Tetra Tech 2007, Tetra Tech 2009, RAML 2010). Remediation of mill impacted soil also began in the mid-1980s, and since 2006 has been pursuant to RAML's approved Soil Decommissioning Plan (SDP) (Komex 2006). A groundwater corrective action program took place from 1989 through 2006, followed by approval of alternate concentration limits (ACLs) (AVM & AHA 2000, Maxim 2001, NRC 2006) and continued monitoring.

### **(IV) Summary of Conceptual Decommissioning Plan**

This section presents RAML's *conceptual* plan for completion of mill decommissioning. The conceptual plan consists of work elements related to soils, engineering, and groundwater decommissioning, as well as miscellaneous compliance activities, as described below.

While the conceptual plan presented is fit for use (i.e., to update a financial assurance amount), because characterization and decommissioning planning are still ongoing, the final scope of decommissioning activities may ultimately differ from the conceptual plan presented in this report.

#### **(A) Soils**

For the *2021 Financial Assurance Update*, the scope of soil decommissioning consists of:

- 1) removal of windblown tailings-affected soils above the cleanup criteria in 10 CFR 40, Appendix A (Figure 2) and disposal in the surety repository (Figure 3)
- 2) completion of the alternate release criteria (ARC) remedy in existing and new ARC sites (Figure 4), and
- 3) final status survey implementation and reporting.

The soil decommissioning basis of estimate is described in Sections 3(I) and 3(III) below.

#### **(B) Engineering**

For the *2021 Financial Assurance Update*, the scope of decommissioning for engineering consists of:

- 1) licensing and construction of the surety repository (Figure 3), and



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- 2) submission of a construction completion report for on-site engineered features.

The surety repository cover design is assumed to be identical to the Cell 2 Expansion cover (Tetra Tech 2007). The engineering decommissioning basis of estimate is described in Sections 3(I) and 3(IV) below.

**(C) Groundwater**

For the *2021 Financial Assurance Update*, the scope of decommissioning for groundwater consists of:

- 1) supplementing the approved ACLs to incorporate new constituents and identification, and
- 2) closure of unnecessary monitoring wells.

The groundwater decommissioning basis of estimate is described in Sections 3(II) and 3(IV) below.

**(D) Miscellaneous Compliance Activities**

For the *2021 Financial Assurance Update*, the scope of decommissioning for other miscellaneous compliance activities consists of:

- 1) site routine operations and maintenance,
- 2) license termination and transition activities including National Environmental Policy Act-related activities,
- 3) project management and legal expenses, and
- 4) radiation protection and environmental monitoring

The basis of estimate for miscellaneous compliance activities is described in Sections 3(III), 3(IV), and 3(VI) below.



### **3 Basis of Estimate**

This section presents the costs associated with RAML's conceptual plan for decommissioning consistent with the outline presented in NUREG-1620, Appendix C.

#### **(I) Facility Decommissioning**

Facility decommissioning cost estimates are summarized in Table 2. Contractors' cost estimates are provided as Appendix A, which RAML has requested be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4).

##### **(A) Salvageable buildings**

This estimate assumes remaining site structures (Figure 5) are free-releasable and will not require decontamination, demolition, and/or disposal. Costs for surveys of salvageable buildings are included in line item III(B), and Item I(A) is therefore assigned a cost of \$0.

##### **(B) Non-salvageable buildings**

Mill demolition was conducted in accordance with the Mill Demolition Plan (RAML 2002). This cost estimate assumes no additional demolition of structures and a cost of \$0.

##### **(C) Cleanup of contaminated areas**

Cleanup of contaminated areas is in accordance with the SDP (Komex 2006) and associated submittals (RAML 2005a, RAML 2005b, RAML 2005c, RAML 2006, RAML 2019). These documents require RAML to comply with the soil standard in 10 CFR 40, Appendix A, Criterion 6(6), including excavation of areas of surficial contamination above a gamma guideline value (Figure 2). Assumptions related to cleanup of contaminated areas for the purpose of a cost estimate are as follows:

- Areas below a gamma guideline level of 85 counts per second (RAML 2020) on Figure 2 will meet the soil standard in 10 CFR 40, Appendix A Criterion 6(6).
- Calculated removal volumes are provided on Figure 2. Assumed excavation depth is 1 foot in mill plant (Figure 2), and 0.5 feet elsewhere.
- Material will be disposed of in the surety repository. Assumed distances and available disposal volume are provided on Figure 2.
- Mill-affected areas to the west, north, and east of the mill are as defined in the SDP. The extent of mill-affected land south of the mill has been expanded consistent with RAML's 2021 shielded gamma survey report to NRC (H3 Environmental 2021).

The SDP also defines ARC for areas of deeper contamination<sup>3</sup>. The ARC remedy includes specifications for appropriate cover of ARC sites (Figure 4), including application of clean fill and rock (Komex 2006, RAML 2005b). Detailed assumptions related to the ARC remedy for the purpose of a cost estimate are as follows:

- Existing clean cover on the southeastern ARC site is adequate to meet the specifications for the ARC remedy (Figure 4). Completion of the southeastern ARC site includes placement of not less than 1 inch of D<sub>50</sub> 0.5-inch imported rock, as indicated on Figure 4.
- Three newly identified ARC sites will require the ARC remedy (Figure 4). Construction of new ARC cover includes minor regrading and removal of scrub brush, placement of not less than

<sup>3</sup> 10 CFR 40, Appendix A, Criterion 9(b)(2) requires a licensee to provide an estimate of the amount of radioactive contamination in on-site subsurface material. RAML has not provided the requested estimate because the SDP (Komex 2006) authorizes RAML to cover licensed subsurface radioactive material exceeding the concentrations stipulated in 10 CFR 40 Appendix A as a part of the ARC remedy. 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.



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1 foot of clean fill from on-site borrow areas, and placement of 1 inch of D<sub>50</sub> 0.5-inch imported rock in areas indicated on Figure 4.

Construction specifications for the surety repository for the purposes of this estimate are assumed to be identical to the Cell 2 Expansion cover (Tetra Tech 2007). This estimate assumes rock armor is imported from an off-site source, and fill material suitable to construct frost protection and radon barriers is available from on-site borrow areas.

## **(II) Groundwater Cleanup and Well Decommissioning**

Groundwater cleanup and well decommissioning cost estimates are summarized in Table 3. Contractors' cost estimates are provided as Appendix A, which RAML has requested be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4).

### **(A) Method of cleanup**

RAML has approved ACLs (NRC 2006) and does not anticipate future groundwater cleanup; therefore, this line item has been assigned a cost of \$0.

### **(B) Volume of aquifer to be restored**

RAML has approved ACLs (NRC 2006) and does not anticipate future groundwater cleanup; therefore, this line item has been assigned a cost of \$0.

### **(C) Verification sample analysis**

This line item includes a cost estimate for routine groundwater monitoring and reporting through 2032. This task assumes no changes to the groundwater monitoring program required by the license as of 2021, except for approval of ACLs for beryllium, cadmium, and molybdenum. This task assumes new ACLs are not necessary for any other constituents.

### **(D) Well decommissioning**

This task assumes that well network optimization including abandonment of 17 wells occurs in 2029 and that well maintenance and replacement are complete.

## **(III) Radiological Survey and Monitoring**

Radiological survey and monitoring cost estimates are summarized in Table 4. Contractors' cost estimates are provided as Appendix A, which RAML has requested be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4).

### **(A) Soil sampling**

This task includes soil sampling in support of final status surveys (FSS). The methods proposed follow the approved SDP and updated submittals, although the area included in the FSS has been expanded from that in the SDP, consisted with Figure 2Figure 2. The estimate assumes:

- FSS meet all requirements of the approved SDP, except that ranked set sampling and shielded gamma survey will be used, as proposed in RAML's 2019 work plan (RAML 2019);
- FSS include sampling 740 10 by 10-meter grids for coverage of 916 acres to be released;
- The estimate for gamma surveying as part of FSS (Item III(C)) is included in Item III(A).
- No FSS are required for areas that receive the ARC remedy. Characterization of new ARC areas, as required by the SDP, is estimated separately in Item IV(K); and
- The section 4 ponds can be released from the license without additional soil removal following execution of the 2019 supplemental characterization work plan, which is estimated separately in Item IV(K).



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**(B) Decommissioning equipment and building surveys**

As described in Item I(A), this estimate assumes that site structures and equipment (Figure 5) are free-releasable and will not require decontamination, demolition, or disposal.

**(C) Gamma survey**

This estimate assumes sitewide gamma surveying is complete. However, additional gamma surveying will be required to complete FSS in 65 acres where remedial activity is conducted (Figure 2). The estimate for gamma surveying as part of FSS is included in Item III(A), and Item III(C) is assigned a cost of \$0.

**(D) Environmental monitoring**

Environmental monitoring includes passive track etch monitoring for radon-222 in ambient air at the seven locations around the mill consistent with RAML's Radiation Protection and Environmental Monitoring program manual (RPEM) (RAML 2021b), and preparation of the annual land use survey. This estimate assumes no changes to the environmental monitoring program required by the license as of 2021, and the program is maintained through 2032.

**(E) Personnel monitoring**

This task has been generalized to include personnel monitoring (Item III(E)) and radiological safety identified in Item IV(G). This estimate includes external dosimetry for workers, annual procedure updates, records management, routine equipment surveys, and preparation of annual radiation protection program reports consistent with the RPEM. Support for annual NRC inspections, program audits, and miscellaneous NRC engagement is also included. The estimate assumes no changes to the radiation protection program required by the license as of 2021, and the program is maintained through 2032.

**(IV) Project Management Costs and Miscellaneous**

This section is subdivided into several topics with cost estimates summarized in Table 5. Contractors' cost estimates are provided as Appendix A, which RAML has requested be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4).

**Project management**

This task assumes a half-time project manager through 2032 using an estimated labor rate from the U.S. Bureau of Labor Statistics for occupation code #13-1198 *Project Management Specialists and Business Operations Specialists, All Other* (BLS 2021b).

**Engineering design, review, and change**

This line includes design and licensing of a new byproduct material repository in the location identified on Figure 3 and assumes the cover is identical to that constructed during the Cell 2 Expansion (Tetra Tech 2007).

**Mobilization**

Mobilization costs are included in project-specific line-item estimates.

**Legal expenses**

This task, prepared as an internal BHP estimate, assumes one lawyer based in Texas using the labor rate from the U.S. Bureau of Labor Statistics for occupation code #23-1101 *Lawyers* (BLS 2021c).



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**Power during reclamation**

This task assumes power to one site trailer using Continental Divide Electric Cooperative (Grants, NM).

**Quality control**

Quality control costs are included in project-specific line-item estimates.

**Radiological safety**

Radiological safety costs are included in Item III(E) personnel monitoring.

**Construction completion report**

This task includes finalization of a construction completion report (CCR) for all engineered features and assumes no additional mitigation work (desktop or field) will be required to complete the CCRs.

**License termination activities**

This task includes costs for development of the long-term surveillance plan.

**Well maintenance and replacement**

This task assumes no additional well maintenance or replacement are required.

**Other project costs and assumptions**

This task includes:

- National Environmental Policy Act and Section 106 compliance,
- Completion of the Supplemental Characterization Work Plan for the section 4 ponds area,
- Costs for fencing, internet, and road maintenance,
- Costs for preparation of the ACL revision license amendment, assuming no additional field work is required to support the calculation of new ACLs and the previously approved method for calculating risk-based concentrations for licensed material in groundwater is still acceptable to NRC, and
- Cost to propose areas for new inclusion in the ARC remedy and characterize these areas for dose assessment.

**(V) Labor and Equipment Overhead, Contractor Profit**

Because independent contractor estimates were provided using fully loaded rates, this subsection has been assigned a cost of \$0. Contractor-specific markup information is available in the contractor provided estimates in Appendix A, which RAML has requested be withheld from public disclosure pursuant to 10 CFR 2.390(a)(4).

**(VI) Long-term Surveillance Fee**

The estimated long-term surveillance fee required by 10 CFR 40, Appendix A, Criterion 10 is \$250,000 in 1978 dollars, which was adjusted to \$1,015,633 in 2021 dollars using the U.S Bureau of Labor Statistics Consumer Price Index inflation calculator (BLS 2021a).

**(VII) Contingency**

The minimum contingency amount defined in NUREG-1620, Appendix C (Item VII) is 15% of all other costs, for a total of \$2,599,934.



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**(VIII) Adjustments to Financial Assurance Amounts**

Table 6 provides estimated adjustments for two contractor estimates prepared in 2020 which were retained as line items in the 2021 estimate. Table 7 provides statements comparing all eleven factors for financial assurance adjustments in 10 CFR 40, Appendix A, Criterion 9(f) for 2021.

**4 References**

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- RAML 2005a. *Response to RAI for Soil Decommissioning Plan and Closure Plan - Lined Evaporation Ponds*. Submittal from Peter J. Luthiger (RAML) to Gary S. Janosko (NRC) [ML052060155]. New Mexico: Rio Algom Mining LLC, June 15, 2005.



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**Figures**



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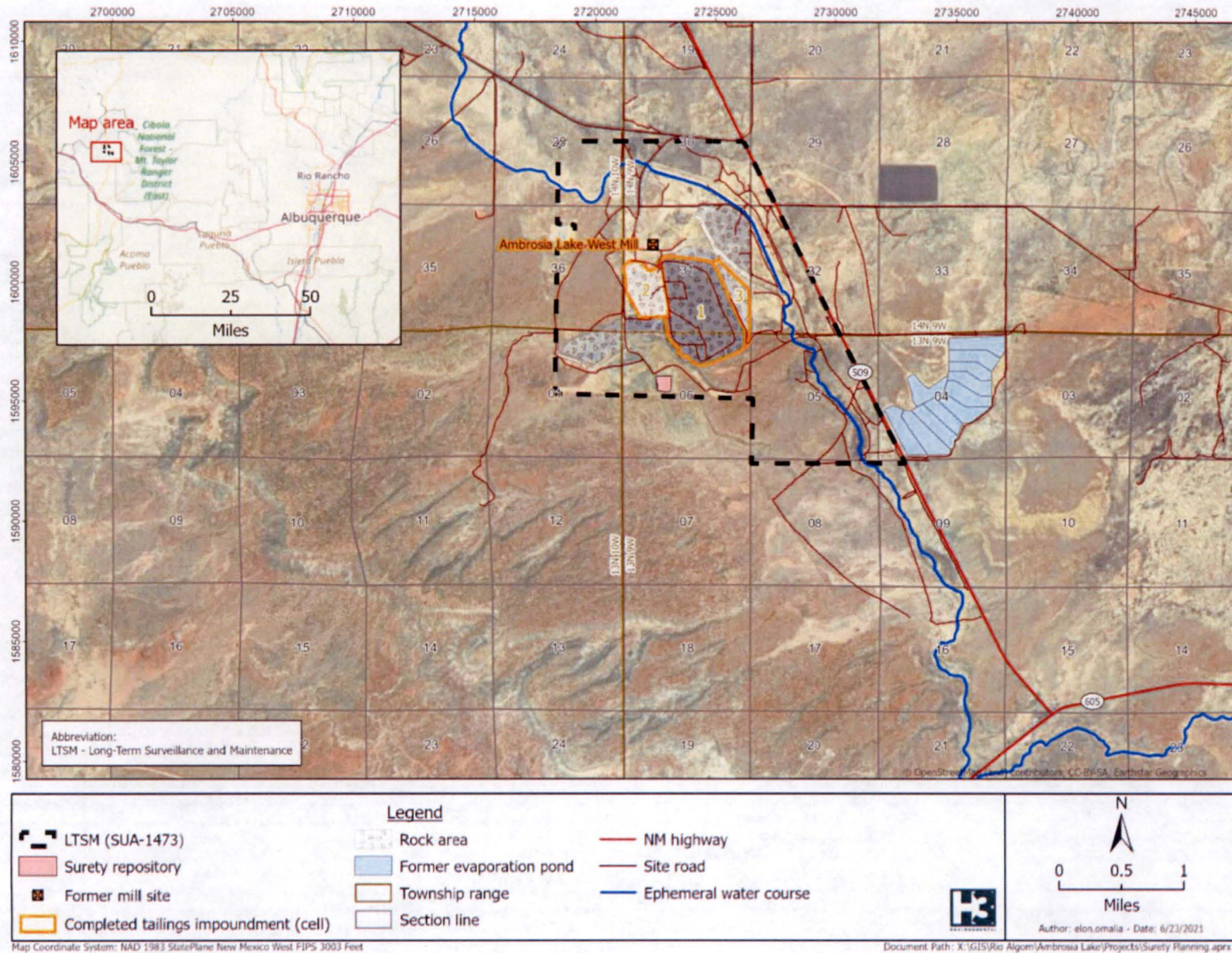


Figure 1. General site orientation



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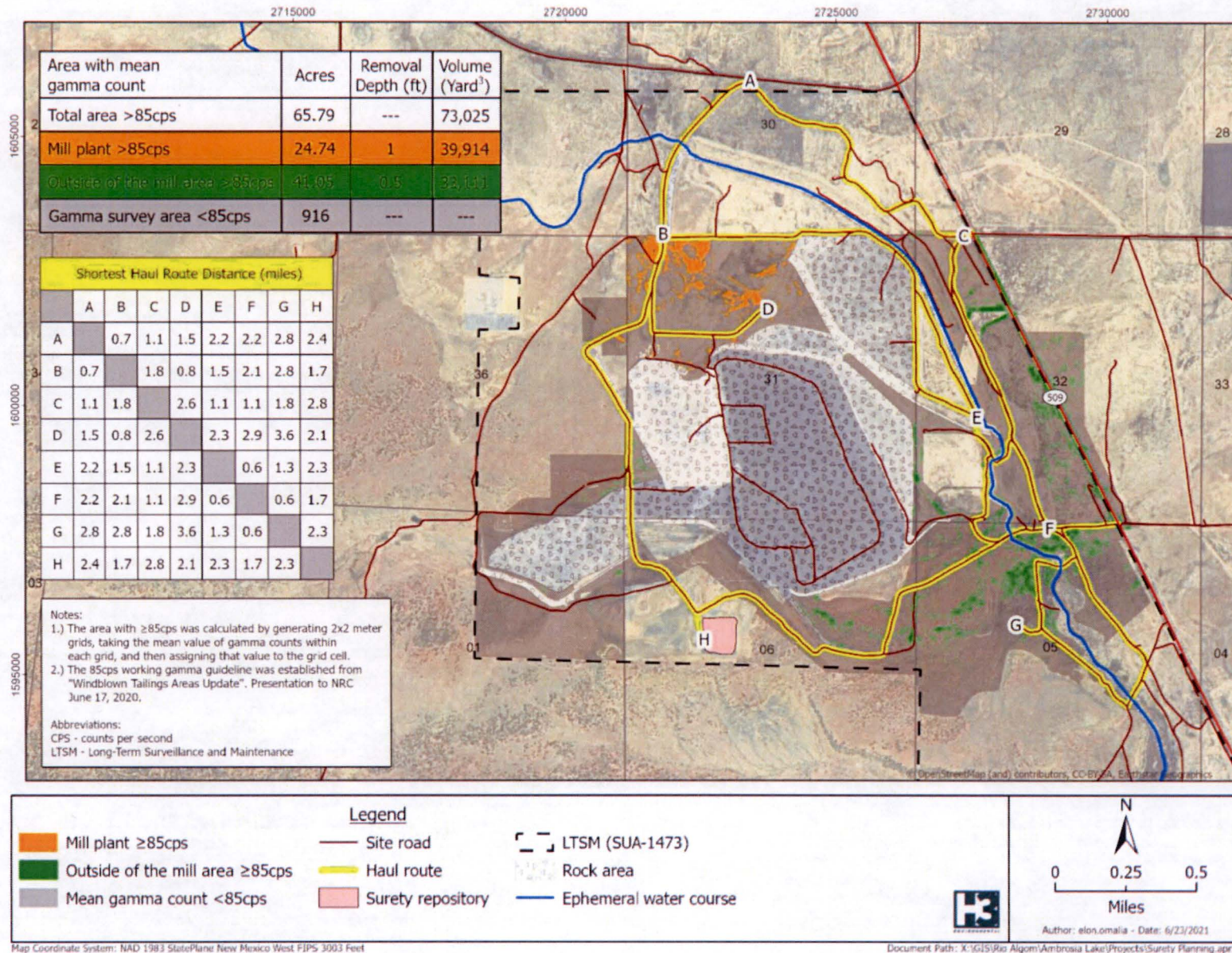


Figure 2. Remedial area – excavation



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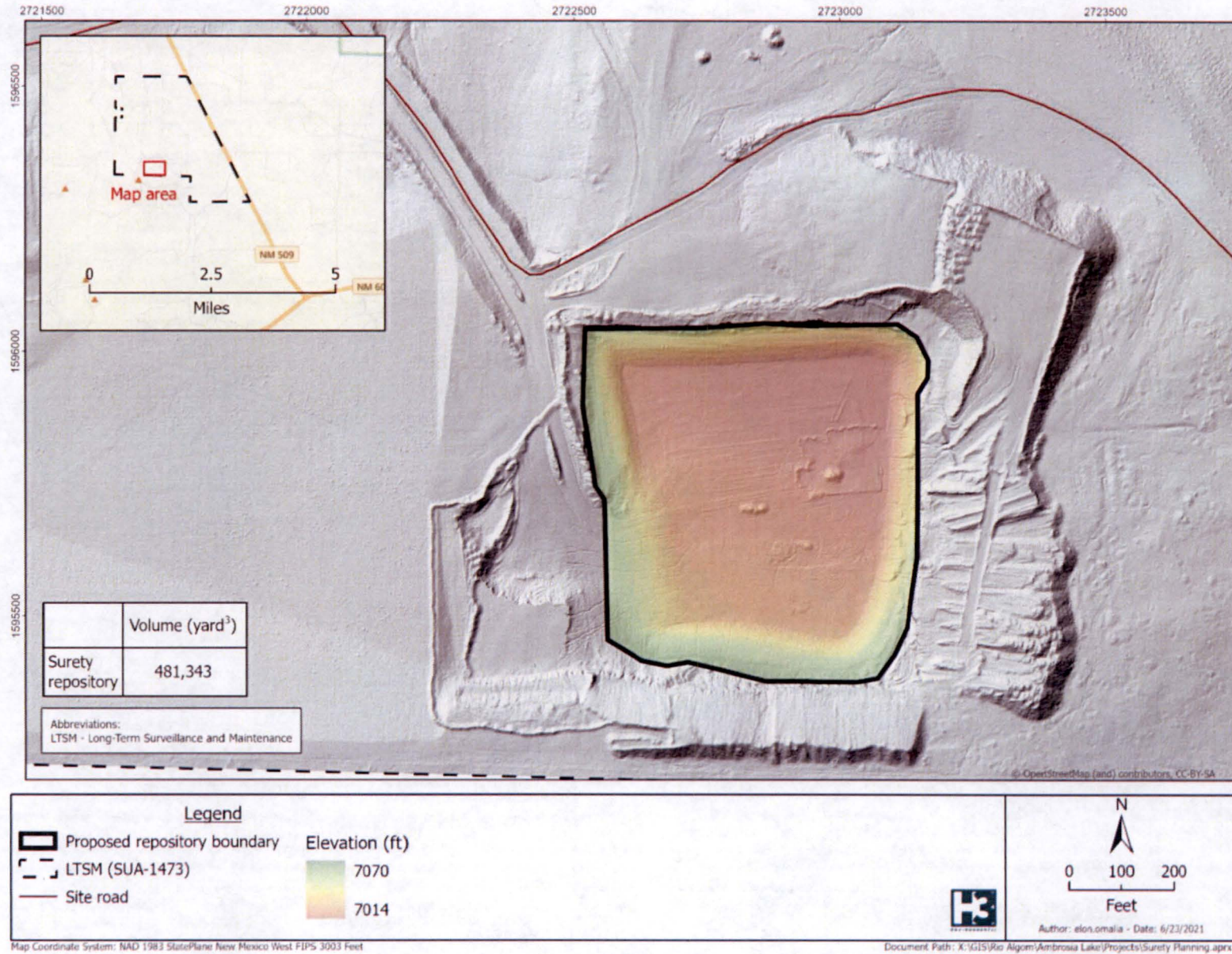


Figure 3. Surety repository location



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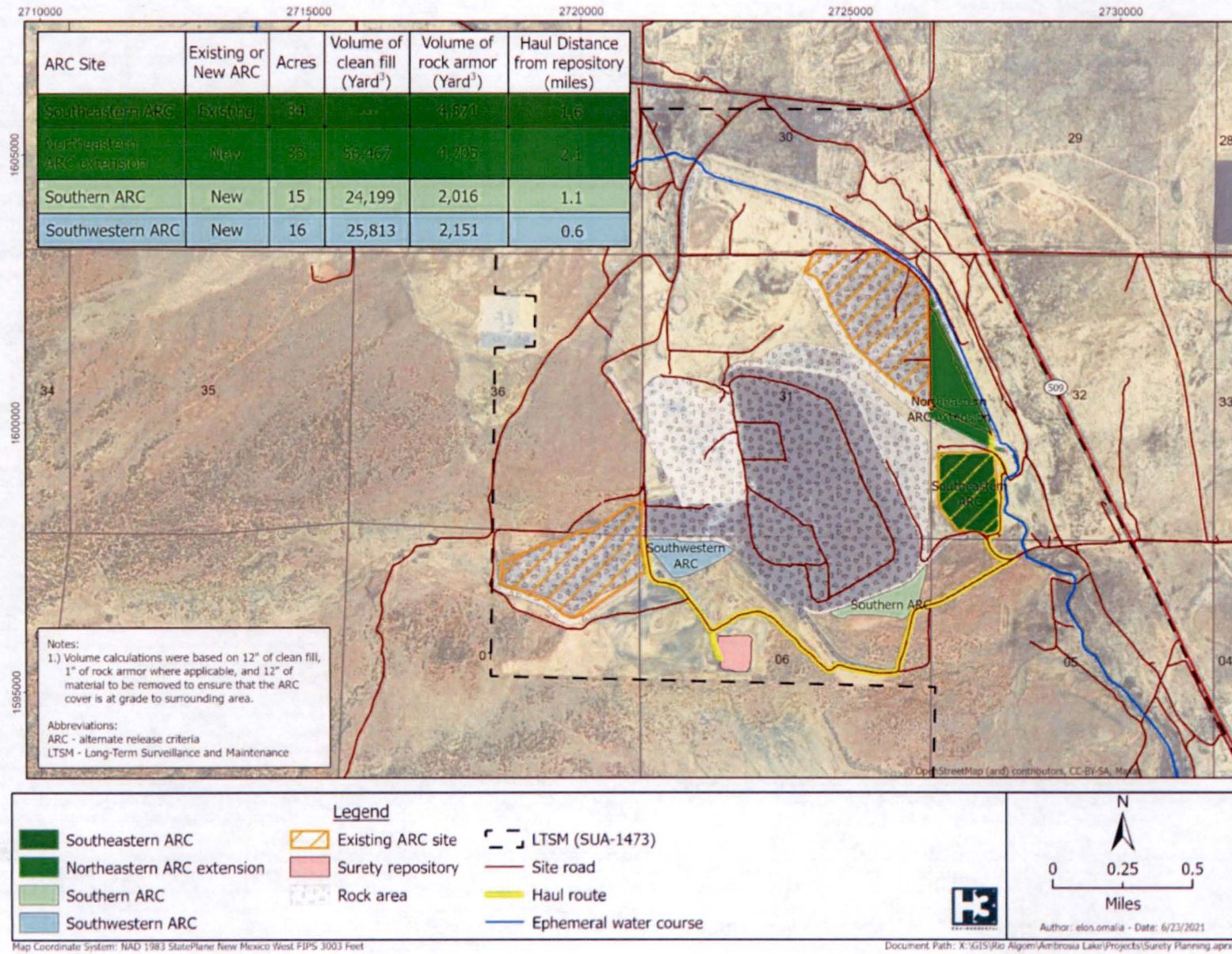


Figure 4. Remedial areas – alternate release criteria



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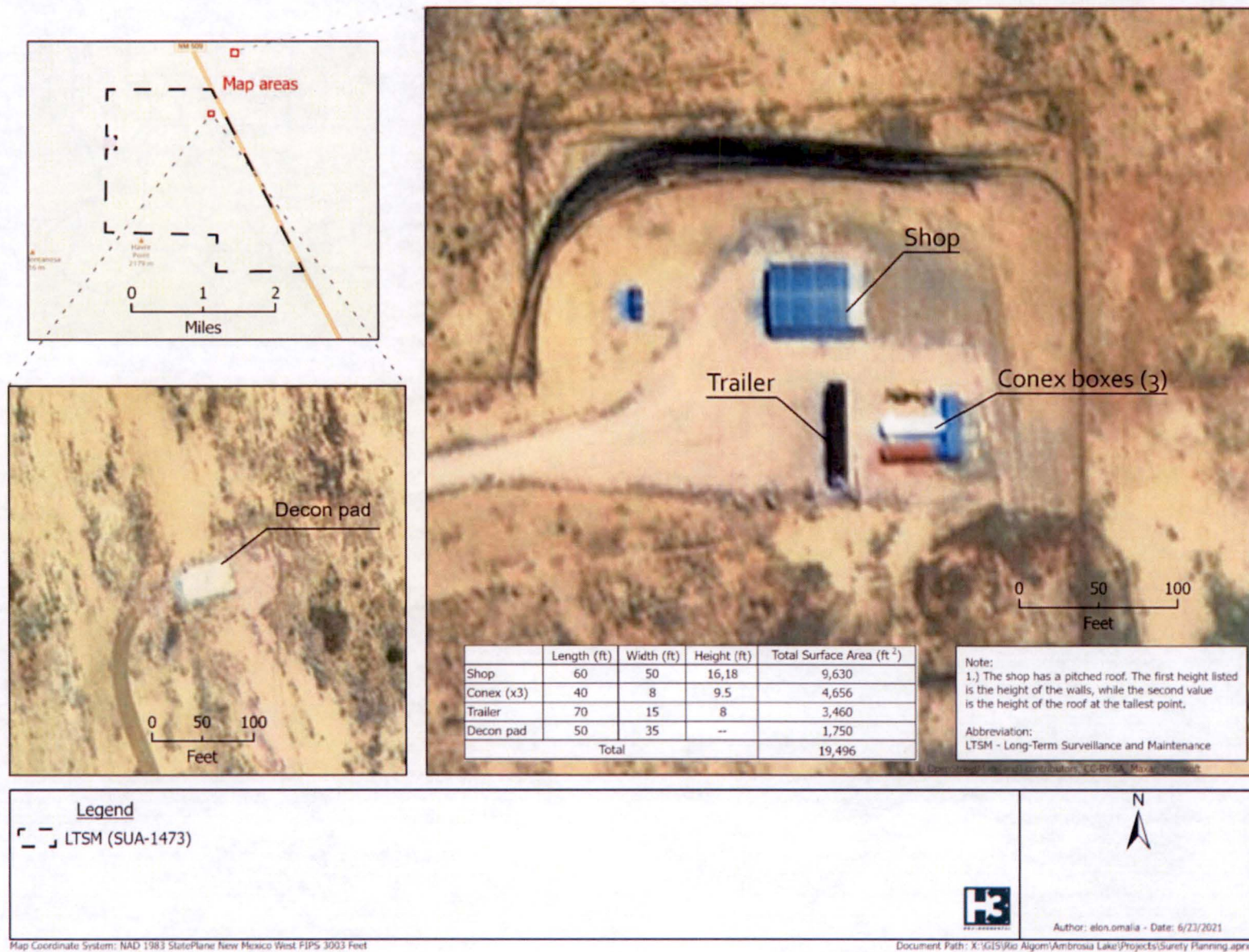


Figure 5. Remedial areas – building surveys required



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**Tables**



**RIO ALGOM MINING LLC – AMBROSIA LAKE FACILITY – SUA-1473  
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*Table 1. Summary of financial assurance elements consistent with NUREG 1620 Appendix C*

<b>NUREG 1620 Appendix C Section</b>	<b>Report Section</b>	<b>Cost</b>
(I) Facility Decommissioning	3(I)	\$ 8,514,309
(II) Ground-Water Cleanup and Well Decommissioning	3(II)	\$ 1,937,741
(III) Radiological Survey and Monitoring	3(III)	\$ 1,442,553
(IV) Project Manager Costs and Miscellaneous	3(IV)	\$ 4,383,950
(V) Labor and Equipment Overhead, Contractor Profit	3(V)	\$ -
(VI) Long-term Surveillance Fee	3(VI)	\$ 1,015,633
(VII) Contingency	3(VII)	\$ 2,599,934
(VIII) Adjustments to Surety Amounts	3(VIII)	\$ 38,704
	<b>TOTAL</b>	<b>\$ 19,932,824</b>



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Table 2. Estimates for (I) Facility Decommissioning

<b>(I) Facility Decommissioning</b>	<b>Estimate Line Item</b>	<b>Status</b>	<b>Notes</b>	<b>Cost</b>
(A) Salvageable building and equipment decontamination.	None	See III(B)	Assumes site structures are free releaseable without decontamination. Survey costs in line item III(B).	\$ -
(B) Non-salvageable building and equipment demolition and disposal.	None	Complete	Assumes no demolition of structures.	\$ -
(C) Cleanup of contaminated areas	None	Estimated		\$ 8,514,309
(1) Cleanup of windblown materials (e.g., volume and area, unit cost per cubic yard)	SOILS.01A SOILS.01B SOILS.01G	Estimated	Includes surface and subsurface excavation, transportation, and disposal in onsite surety repository.	\$ 1,186,452
(2) Placement of borrow materials removal (e.g., rental rate, cost/cubic yard)	SOILS.02A SOILS.02B	Estimated	Includes completion of new and existing alternate release criteria sites with clean cover and rock	\$ 2,731,662
(3) Dust suppression and site maintenance	SOILS.01C	Estimated		\$ 1,266,358
(4) Monitoring and testing of construction	SOILS.01D	Estimated		\$ 1,580,866
(5) Regrading	SOILS.03A	Estimated	Items I(C)(5) through I(C)(8) combined include completion of cover over surety repository.	\$ -
(6) Placement of the frost barrier	SOILS.03A	Estimated		\$ -
(7) Placement of the radon barrier	SOILS.03A	Estimated		\$ -
(8) Installation of erosion protection and armor	SOILS.03A	Estimated		\$ 1,167,196
(9) Installation of any vegetative cover	None	Out of scope	Assumes no vegetative cover is required or used.	\$ -
(10) Design and construction of drainage ditches	None	Complete	Assumes no changes to site diversion channels are required.	\$ -
(11) Recontouring of land surfaces	SOILS.01E	Estimated		\$ 64,277
(12) Revegetation	SOILS.01F	Estimated		\$ 517,500
<b>TOTAL</b>				<b>\$ 8,514,309</b>



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Table 3. Estimates for (II) Groundwater Cleanup and Well Decommissioning

<b>(II) Groundwater Cleanup and Well Decommissioning</b>	<b>Estimate Line Item</b>	<b>Status</b>	<b>Notes</b>	<b>Cost</b>
(A) Method of Cleanup	None	Out of scope	RAML has alternate concentration limits and does not intend to engage in aquifer treatment.	\$ -
(B) Volume of aquifer to be restored, area and thickness of aquifer, number of required pumping cycles, and cycling time	None	Out of scope	RAML has alternate concentration limits and does not intend to engage in aquifer treatment.	\$ -
(C) Verification sample analysis	LICOM.01A	Estimated	Routine groundwater monitoring and reporting	\$ 1,754,049
(D) Well decommissioning	GW.02A GW.02B	Estimated		\$ 183,692
<b>TOTAL</b>				<b>\$ 1,937,741</b>

Table 4. Estimates for (III) Radiological Survey and Monitoring

<b>(III) Radiological Survey and Monitoring</b>	<b>Estimate Line Item</b>	<b>Status</b>	<b>Notes</b>	<b>Cost</b>
(A) Soil samples for radium (and uranium and thorium, if needed) (e.g., number, cost to collect, and analyze)	SOILS.04A	Estimated	Items III(A) and III(C) combined include final status survey soil sampling and gamma survey	\$ 433,356
(B) Decommissioning equipment and building smear samples and alpha surface surveys	SOILS.04B	Estimated		\$ 36,564
(C) Gamma survey frequency, location, and techniques (e.g., type, number, unit cost)	SOILS.04A	Estimated	Items III(A) and III(C) combined include final status survey soil sampling and gamma survey	\$ -
(D) Environmental monitoring	LICOM.02A LICOM.02B	Estimated		\$ 121,088
(E) Personnel monitoring	LICOM.03A LICOM.03B LICOM.03C	Estimated		\$ 851,545
<b>TOTAL</b>				<b>\$ 1,442,553</b>



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Table 5. Estimates for (IV) Project Management Costs and Miscellaneous

<b>(IV) Project Management Costs and Miscellaneous</b>	<b>Estimate Line Item</b>	<b>Status</b>	<b>Notes</b>	<b>Cost</b>
(A) Project management	MISC.01A	Estimated		\$ 969,210
(B) Engineering design, review, and change	CONST.02A	Estimated		\$ 938,976
(C) Mobilization	None	Out of scope	Included in project-specific line item costs.	\$ -
(D) Legal expenses	MISC.02A	Estimated		\$ 220,000
(E) Power during reclamation	LICOM.04A	Estimated		\$ 19,496
(F) Quality control	None	Out of scope	Included in project-specific line item costs.	\$ -
(G) Radiological safety	None	See III(E)	Costs included in III(E) Personnel monitoring.	\$ -
(H) Construction completion report	CONST.01A	Estimated		\$ 415,520
(I) License termination activities	LICOM.05A	Estimated		\$ 91,500
(J) Well maintenance & replacement	None	Complete		\$ -
(K) Other (describe):	None	Estimated		\$ 1,729,248
National Environmental Policy Act	None	Estimated	Retained from 2020 estimate.	\$ 380,000
Section 106 compliance	SOILS.06A	Estimated	Retained from 2020 estimate.	\$ 750,000
Section 4 ponds Supplemental Characterization Work Plan	SOILS.05A SOILS.05B	Estimated		\$ 124,316
Operations & Maintenance Miscellaneous	LICOM.04B LICOM.04C LICOM.04D	Estimated	Fencing; Internet; Road maintenance	\$ 117,807
Alternate concentration limit revision and licensing	GW.01A	Estimated		\$ 265,100
Alternate release criteria area characterization and proposal	SOILS.02C	Estimated		\$ 92,025
<b>TOTAL</b>				<b>\$ 4,383,950</b>



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Table 6. Estimates for (VIII) Adjustments

<b>(VIII) Adjustments</b>	<b>Estimate Line Item</b>	<b>Status</b>	<b>Notes</b>	<b>Cost</b>
(A) Adjustments for inflation		Estimated		\$38,704
IV(K) National Environmental Policy Act	NEPA	Estimated	Increase from 2020 estimate \$380,000	\$ 13,016
IV(K) Section 106 compliance	SOILS.06A	Estimated	Increase from 2020 estimate \$750,000	\$ 25,689
TOTAL				\$38,704



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Table 7. Summary of adjustments consistent with 10 CFR 40, Appendix A, Criterion 9(f)

<b>Factors for Surety Adjustments</b>	<b>2021 Comment</b>
(1) Inflation	Major costs updated as of June 2021. Two costs, NEPA and SOILS.06.A were inflation adjusted from September 2020.
(2) Changes in engineering plans	New location and geotechnical details for surety repository.
(3) Activities performed	New scope for soil cleanup and application of alternate release criteria remedy based on more current characterization data.
(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	No change since 2019 financial assurance calculation.
(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	New location for surety repository and addition of new areas for alternate release criteria remedy.
(11) Any other conditions affecting costs	Change in projected decommissioning timeline including license termination from 2025 to 2030 and transition from 2025 to 2032.