

Rio Algom Mining LLC

September 3, 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
Question for NRC

Dear Mr. Lancaster,

During a multi-agency call on 11 June 2021, Nuclear Regulatory Commission (NRC) staff requested that Rio Algom Mining LLC (RAML) submit a list of questions related to regulatory jurisdiction in the Ambrosia Lake Valley. The June 2021 call was one of several engagements initiated by RAML over the past 12-24 months between RAML and its regulatory stakeholders, including the State of New Mexico Environment Department, the New Mexico Mining and Minerals Division, the NRC, and the Environmental Protection Agency (EPA). RAML hopes that these engagements will facilitate inter-agency understanding of historical practices related to uranium recovery in the Ambrosia Lake Valley, and ultimately agreement regarding jurisdictional boundaries for future closure work in the Ambrosia Lake Valley.

RAML believes that inter-agency agreement regarding jurisdictional boundaries is critical to timely termination of radioactive materials license (RML) SUA-1473 for the former Ambrosia Lake West (ALW) mill. Therefore, prior to undertaking significant closure work in the Ambrosia Lake Valley, RAML seeks to confirm that there are no additional environmental impacts related to licensed or unlicensed historical practices within the Ambrosia Lake Valley - outside of the ALW conventional mill area - that should, in decommissioning, fall under NRC's jurisdiction.

As background, certain practices that might today meet the definition of uranium milling occurred in the Ambrosia Lake Valley during the period when New Mexico was an Agreement State for uranium milling (1974-1986). These activities were, in part, described in and authorized by State of New Mexico discharge permits (DPs -67, -71, -169, -264, and/or -362), which regulated surface infrastructure associated with and the discharge of material that today would likely be classified as byproduct material¹ (e.g., liquid mill effluent and solid mill tailings). In some cases, RAML's DPs and/or the associated activities were also incorporated into the ALW mill's RML. RAML understands that, pursuant to New Mexico Administrative Code 74-

¹ Used herein as defined in 10 CFR 40.4

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4A-1, New Mexico has relinquished its authority to regulate byproduct material. However, the state continues to regulate RAML via its DPs today.

RAML's specific questions are:

1. Will NRC regulate impacts from all sources of byproduct material in the Ambrosia Lake Valley, some of which are outside of the conventional mill area and are currently regulated under State discharge permits?

RAML has provided a summary (**Attachment A**) of its New Mexico discharge permits and RAML's questions specific to each discharge permit.

2. If dual regulation/jurisdiction is determined, how will inconsistent requirements be resolved?
3. Are there other specific types of materials – present in the Ambrosia Lake Valley - that NRC believes meet the definition of byproduct material? As an example, the EPA has informed RAML that “suspended solids, barium sulfate precipitates, etc.” generated during unlicensed mining operations physically located at the Ambrosia Lake Valley uranium mines for the purpose of removing total suspended solids and/or radium-226/228 from mine water are considered by the EPA to be “mill, i.e., 11e.(2) waste”. Is this interpretation consistent with NRC's interpretation of byproduct material?

I would like to express my gratitude to NRC for their willingness to work with RAML to address jurisdictional questions. If you have any questions or need additional information, please do not hesitate to call me at (916) 947-7637.

Sincerely,



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

cc: Document Control
Attachment A: Description of RAML's New Mexico Discharge Permits

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Rio Algom Mining LLC's (RAML's) New Mexico discharge permits (DP -67, -71, -169, -264, and/or -362) were issued during the period when New Mexico was an Agreement State for uranium milling. Some of RAML's DPs both regulated the surface infrastructure associated with and authorized the discharge of material that today would be classified as byproduct material (e.g., liquid mill effluent and sold mill tailings). In some cases, as described below, RAML's DPs and/or the associated activities were also incorporated into the Ambrosia Lake West (ALW) mill's radioactive material license. However, the State continued to regulate RAML via RAML's DPs after the NRC became the regulatory authority for the ALW mill in 1986.

DP-67 – This DP was approved on 19 August 1985 and originally authorized discharge of treated mine water to a settling pond near the former Section 35 mine. On 13 June 1997, the State renewed and updated the permit to include additional treatment infrastructure that had been previously used to treat mine water but was not described in the original permit. The 1997 approval letter describes the permitted process: "raw mine water from Quivira's Section 35 and Section 36 mine is processed through nine earthen lagoons and an ion exchange (IX) facility for solids settling, uranium removal, and radium precipitation prior to being discharged to the land surface".

The former Section 35 IX facility (the same facility referenced in the 1997 update to DP-67) was first regulated on 1 May 1976 via New Mexico (NM) SUA-616 condition 16. On 21 November 1986, following its resumption of authority over uranium milling in New Mexico, NRC regulated the former Section 35 IX facility via SUA-1473 condition 13. On 1 August 2003, the former Section 35 IX was removed from condition 13 via amendment 52. Condition 13 was deleted from SUA-1473 on 1 September 2020 by amendment 62.

RAML staff believe that the NRC has not previously been involved in decommissioning activities at the former Section 35 IX facility.

Which, if any, facilities, processes, and impacts related to the treatment of water and recovery of source material by IX, including the processes described in DP-67, will NRC regulate in decommissioning?

DP-71 – This DP was issued on 7 August 1979 and initially authorized discharge of liquid effluent from the ALW uranium mill into evaporation ponds 16 and 17 on section 4 of T13N R09W. The permit was subsequently amended several times and by 1980 regulated discharge of mill effluent into 11 evaporation ponds located on section 4 of T13N R09W. The activities and/or environmental impacts regulated by DP-71 were also regulated by SUA-616 conditions 17, 19, 20, 21², 24, 25, 26, 28, 30 (issued

² SUA-616 condition 21 requires compliance with a discharge plan pursuant to the New Mexico Water Quality Control Commission regulations.

between 1976 and 1980) and are regulated today by SUA-1473 condition 42 (issued via amendment 55 on 24 June 2005).

Which, if any, facilities, processes, and impacts related to DP-71, will NRC regulate in decommissioning? How will the closure requirements in 10 CFR 40 Appendix A, as they apply to former mill ponds 11 through 21, be reconciled with the State of New Mexico's closure process for DP-71?

DP-169 – This DP authorized discharges from the ALW mill and mill ponds 1 through 10. DP-169 was originally approved by the State of New Mexico on 30 March 1984.

RAML staff believe that the discharges regulated by DP-169 were never directly incorporated³ into any of the ALW mill's radioactive materials licenses (AEC SUA-616, NM SUA-616, or SUA-1473). However, environmental impacts to soil and groundwater associated with the activities described in DP-169 have been addressed during NRC-led mill decommissioning e.g., in the approved 2006 *Soil Decommissioning Plan* [ML18166A182] and the approved 2001 *Application for Alternate Concentration Limits* [ML011690068].

Which, if any, facilities, processes, and impacts related to DP-169, will NRC regulate in decommissioning? How will the closure requirements in 10 CFR 40 Appendix A, as they apply to former mill ponds 1 through 10, be reconciled with the State of New Mexico's closure process for DP-169?

DP-264 – This DP was originally approved on 27 May 1983 and authorized discharges of tailings sand backfill material into mined out stopes at the former section 35 and 36 mines. Backfilling activities ceased by 1985.

The 22 April 1983 application materials for DP-264 state that tailings backfill had previously occurred at the former Section 22, 30, 30W, 35, and 36 mines. The same submission states that backfill was never used in the former Section 24, 17, 19, or 33 mines. Because backfilling was initiated as early as 1962 and the State of New Mexico first required a discharge permit regulating this activity in 1982, some of the activities associated with backfill placement were not included in DP-264.

The backfilling process consisted of transporting, stockpiling, size separating, slurring, and pumping of native alluvial material and/or classified uranium mill tailings into mine workings. *Surface and subsurface infrastructure* associated with backfilling was located at the ALW mill and the former mines associated with DP-264.

The Department of Energy (1982) estimated that between 1958 and 1980 1,200,000 tons of tailings were used as backfill in the Ambrosia Lake Valley mines. The

³ Discharges from the mill and ponds 1-10 were described in the ALW mill's 1981 and 1983 license renewal applications for the State of New Mexico. The 1983 license renewal application was provided to NRC at the time that NRC resumed authority over uranium milling in New Mexico. However, no license application or renewal has been incorporated by reference into any of the ALW mill licenses.

application materials for DP-264 state that 1,333,000 tons of tailings had been placed underground in the Ambrosia Lake mines as of 1983 and that another 200,000 tons of tailings sands would be placed in mined out stopes following approval of the DP. The 1981 (revised 1983) license design criteria for the ALW mill include the use of 1,000 tons per day (of 7,000 tons per day produced) of tailings solids as mine backfill.

Which, if any, facilities, processes, and impacts related to DP-264, will NRC regulate in decommissioning? How will the closure requirements in 10 CFR 40 Appendix A, as they apply to surface and subsurface areas affected by uranium mill tailings, be reconciled with the State of New Mexico's closure process for DP-264?

DP-362 – This DP was originally approved on 29 July 1985 and authorized mine water recovery of uranium at the former Section 17, 19, 22, 24, 30, 30W, 33 and 35 mines via water fortified with sulfuric acid or sodium bicarbonate and hydrogen peroxide. DP-362 was incorporated by reference into NM SUA-616 condition 39 on 20 August 1985 and SUA-1473 amendment 0 condition 39 on 23 September 1986. Condition 39 was removed from SUA-1473 on 21 November 1986 with amendment 1. Uranium recovery via chemically fortified mine water was re-authorized at the former Section 24 mine on 11 August 1988 via SUA-1473 condition 33. Condition 33 was removed from SUA-1473 by amendment 52 in 2003.

Following approval of DP-362 and beginning in 1985, reports summarizing the use of fortified mine water during the previous quarter at permitted mines were submitted to the State of New Mexico. These reports indicate that injection of fortified mine water (sodium bicarbonate or sulfuric acid) ceased in 1986. Injection of mine water fortified with sodium bicarbonate resumed in 1989 and continued until December 1991. DP-362 reports confirm that chemically fortified water was not injected between December 1991 and June 1999.

On 7 August 1999, the State of New Mexico renewed and modified DP-362, authorizing the recirculation of 7,200,000 gallons per day of mine water fortified with sodium bicarbonate or sulfuric acid. The 1999 permit renewal and modification expanded the area authorized to receive chemically fortified mine water; the expanded area consisted of the former Section 13, 15, 17, 19, 22, 23, 24, 25, 30, 33, and 35 mines. However, conditions 7 and 8 of the permit renewal required the submission of updated groundwater monitoring prior to 1) injection of fortified mine water or 2) mine water recovery of uranium from the expanded area. RAML has no records of these materials being submitted to the State of New Mexico, and as a result RAML staff believe that the expanded activities described in the 1999 DP-362 renewal never occurred.

Citing the discontinuation of site operations, in 2004, RAML requested that the State amend DP-362 to “eliminate the operational aspects and solely include elements associated with closure and possible post closure activities”.

RAML Questions for NRC
Attachment A: Description of RAML's New Mexico Discharge Permits
3 September 2021

Which, if any, facilities, processes, and impacts related to DP-362, will NRC regulate in decommissioning? How will the closure requirements in 10 CFR 40 Appendix A, as they apply to areas affected by the chemically fortified leaching of a uranium ore body, be reconciled with the State of New Mexico's closure process for DP-362?