

Rio Algom Mining LLC

November 20, 2015

Mr. Tom McLaughlin
United States Nuclear Regulatory Commission
Mail Stop T-8F5
Washington, DC 28555

Subject: SUA-1473, Monthly Sampling Results for Third Quarter 2015 for Rio Algom Mining, LLC's Ambrosia Lake Facility

Dear Mr. McLaughlin:

This letter represents reporting of the third quarter 2015 analytical results from monthly sampling for the following constituents, in accordance with Condition 34.F of SUA-1473:

- Gross alpha, beryllium, and cadmium in well 36-06 KD
- Gross alpha in well 31-02 TRB-R
- Molybdenum and nitrate + nitrite as N in well 32-45 KD-R

The tables included in this report summarize the sampling results. Bolded results indicate an exceedance of Groundwater Protection Standards (GPS) or Alternate Concentration Limits (ACL).

Well 36-06 KD

Monthly sampling results from well 36-06 KD show that beryllium (Be) and cadmium (Cd) continue to hover at concentrations near or above the GPS (Table 1). At the time of the original ACL petition, Be and Cd were not present in elevated concentrations. Since the time of the ACL petition (2001), Be and Cd concentrations have increased in a pattern that appears consistent with effects caused by surface reclamation activities. RAML submitted a Corrective Action Plan (CAP) for Be and Cd in 2007 and has been monitoring those two parameters on a monthly basis since then. Since the concentrations are not stabilizing below the GPS, RAML will propose to amend License SUA-1743 to add ACLs for Be and Cd. Until such time as ACLs are granted, monthly monitoring of Be and Cd will continue.

Corrected gross alpha (gross alpha minus the alpha radiation contribution from uranium) was elevated above the GPS of 56 picocuries per liter (pCi/L) in July (100 pCi/L). Alpha emitters analyzed in this well (Ra-226, U, and Th-230) are limited compared to the known number of contributing alpha emitting materials that may add to a gross alpha analysis. The alpha emitters analyzed in this well are not elevated enough to cause the

increase in gross alpha count on their own, therefore, it is likely that other materials are contributing to the elevated gross alpha analysis. There is a significant laboratory error associated with the uncorrected gross alpha value (93 pCi/L), and the following two monthly results remain below the GPS. Gross alpha analysis tends to exceed the GPS sporadically in this well, and the large laboratory uncertainty may be part of the cause. Given these sporadic exceedances, and that all alpha emitters required for analysis have ACLs rather than GPSs, RAML may choose to include gross alpha in the license amendment for additional ACLs.

Table 1. Beryllium, Cadmium, and Gross Alpha in 36-06 KD

Well 36-06 KD			
Date	Beryllium (mg/L)	Cadmium (mg/L)	Corrected Gross Alpha (pCi/L)
GPS	0.01	0.01	56
07/15/15	0.01686	0.0119	100
8/26/15	0.0161	0.0116	-66.1
09/01/15	0.0210	0.011	-135

Well 31-02 TRB-R

Monitoring well 31-02 TRB-R is a replacement well that was installed in December 2012. Original well 31-02 TRB was in accelerated monthly monitoring for uranium (U) and gross alpha (GA). When the well was replaced, RAML continued to monitor for those constituents on a monthly basis. Since 2013, GA concentrations have exceeded the GPS three times, including in February 2015 when the concentration of GA was 21.4 (pCi/L) (Table 2). U concentrations have remained below the ACL since February 2015 and throughout the third quarter of 2015. As proposed in the Second Half of 2014 Groundwater Stability Monitoring Report, monthly monitoring for GA and U in well 31-02 TRB-R will continue throughout 2015 as the well continues to stabilize. This well will likely be removed from monthly monitoring in 2016.

Table 2. Gross Alpha (Corrected) in 31-02 TRB-R

Well 31-02 TRB-R		
Date	Corrected Gross Alpha (pCi/L)	Uranium (mg/L)
GPS / ACL	21.4	0.016
07/15/2015	-6.75	0.0044
8/25/2015	-5.05	0.0041
09/01/2015	-14.9	0.0044

Well 32-45 KD-R

Results for Molybdenum (Mo) and $\text{NO}_3 + \text{NO}_2$ as N are in Table 3. Concentrations in 32-45 KD-R continue to exceed the GPS of 0.06 mg/L. Concentrations of $\text{NO}_3 + \text{NO}_2$ as N have decreased to below the ACL of 22.8 mg/L. The most recent result was orders of magnitude less than expected and may be an outlier. However $\text{NO}_3 + \text{NO}_2$ as N concentrations have been decreasing from a high of 81.9 mg/L in August of 2013. Pursuant to Condition 34.F and Criterion 5D of 40CFR, RAML proposed a CAP to address the exceedances of Mo and $\text{NO}_3 + \text{NO}_2$ as N in well 32-45 KD-R in the *First Half 2014 Groundwater Stability Monitoring Report*. Since well 32-45 KD-R is a newly-installed replacement well (replacing well 32-45 KD), RAML will continue monthly monitoring for these parameters through 2015 in order to evaluate apparent stabilization trends in the data. The ACL for $\text{NO}_3 + \text{NO}_2$ as N was established based on the geochemical conditions present in the groundwater in Dakota wells in 2006. Evidence of temporal and spatial geochemical variability indicates that the ACLs and GPSs established for original well 32-45 KD may not be applicable for compliance in replacement well 32-45 KD-R.

Table 3. Molybdenum and Nitrate in 32-45 KD-R

Well 32-45 KD-R		
Date	Molybdenum (mg/L)	Nitrate+Nitrite as N (mg/L)
GPS / ACL	0.06	22.8
07/15/2015	0.449	10.8
8/24/15	0.471	11.2
9/1/2015	0.324	0.02

Monthly sampling results for the wells and constituents presented above will continue throughout 2015 and will be reported in the Second Half 2015 Semi-Annual Groundwater Stability Monitoring Report. Following analysis through 2015, corrective actions for these wells and constituents will be evaluated and proposed.

Please contact me or Theresa Ballaine at (209)736-4803 with any questions.

Sincerely,
Rio Algoma Mining LLC

Anthony Baus

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Site Manager

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