

Rio Algom Mining LLC

August 29, 2016

ADDRESSEE ONLY

Mr. Jeffrey Whited, Project Manager
Materials Decommissioning Branch
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Two White Flint North, Mailstop T-8F05
11545 Rockville Pike
Rockville, MD 20852

CERTIFIED MAIL

Re: **License SUA-1473, Docket No. 40-8905**
Semiannual Effluent Report – 1st Half 2016

Dear Mr. Whited,

In accordance with license condition #19 of the above referenced source material license and the NRC approved *Health Physics and Environmental Programs Manual*, please find attached the 1st Half 2016 Semiannual Report for the Ambrosia Lake facility.

During the site reclamation project in 2014, the earth moving activities by Conestoga Rovers and Associates (CRA) flattened the sediment sampling location P-0 to where the drainage wash is no longer there. This location is no longer being sampled.

The environmental High Volume air sample results presented in this semiannual report show <1% of their effluent concentration in 10 CFR 20 Appendix B for each isotope with no discernable trend from first to second quarter.

The quarterly dose rates at each monitoring location remained relatively consistent from first to second quarter 2016.

With regard to Lower limits of Detection (LLD's) for the soil sediment and vegetation samples we have been able to successfully identify a laboratory which can meet these LLD's for soil and sediment. However, we have been unsuccessful in finding a laboratory that can consistently meet the stringent LLD's for vegetation as prescribed in Regulatory Guide 4.14.

RAML has submitted a request to terminate this monitoring but continue until NRC approves cessation.

If you have any questions or need additional information, please do not hesitate to call me at (505) 298-4224.

Regards,

A handwritten signature in black ink, appearing to read "Mike Schierman". The signature is fluid and cursive, with a long horizontal stroke at the end.

Mike Schierman
Radiation Safety Officer

Attachment

cc: NRC (document control)
File

High Volume Environmental Air Samples
2016

1st Quarter					2nd Quarter				
Substation									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	2.5E-17	2.8E-16	2.5E-18	< 1.0	U-nat	0.0E+00	1.1E+13	9.6E+10	< 1.0
Th-230	3.9E-18	4.9E-18	7.3E-18	< 1.0	Th-230	1.1E-17	5.8E-18	7.7E-18	< 1.0
Ra-226	4.6E-18	2.1E-18	4.0E-18	< 1.0	Ra-226	2.5E-18	2.5E-18	4.8E-18	< 1.0
Pb-210	8.1E-16	3.8E-17	4.6E-17	< 1.0	Pb-210	7.0E-16	3.2E-17	8.5E-17	< 1.0

1st Quarter					2nd Quarter				
Section 17 VH4									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	2.6E-18	2.9E-16	2.6E-18	< 1.0	U-nat	2.6E-18	1.1E+13	9.7E+10	< 1.0
Th-230	3.3E-18	4.5E-18	7.6E-18	< 1.0	Th-230	9.9E-19	5.2E-18	9.9E-18	< 1.0
Ra-226	7.6E-20	2.0E-18	3.7E-18	< 1.0	Ra-226	3.6E-18	2.3E-18	3.9E-18	< 1.0
Pb-210	7.2E-16	4.4E-17	6.1E-17	< 1.0	Pb-210	7.2E-16	2.8E-17	6.6E-17	< 1.0

1st Quarter					2nd Quarter				
Mill Diversion									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	3.5E-18	2.8E-16	2.5E-18	< 1.0	U-nat	3.7E-18	9.4E+12	8.1E+10	< 1.0
Th-230	1.4E-17	5.4E-18	6.9E-18	< 1.0	Th-230	1.2E-18	6.7E-18	9.1E-18	< 1.0
Ra-226	7.0E-18	2.6E-18	5.8E-18	< 1.0	Ra-226	6.1E-18	2.6E-18	7.0E-18	< 1.0
Pb-210	9.6E-16	4.2E-17	4.6E-17	< 1.0	Pb-210	1.2E-15	3.6E-17	7.5E-17	< 1.0

1st Quarter					2nd Quarter				
Section 30 West VH6									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	1.8E-17	5.1E-15	4.6E-17	< 1.0	U-nat	1.0E-14	1.3E+12	2.0E+12	< 1.0
Th-230	1.3E-17	1.5E-17	2.3E-17	< 1.0	Th-230	2.7E-17	2.3E-17	3.2E-17	< 1.0
Ra-226	2.6E-17	1.1E-17	1.2E-17	< 1.0	Ra-226	1.5E-17	1.1E-17	1.2E-17	< 1.0
Pb-210	7.8E-16	8.9E-17	1.5E-16	< 1.0	Pb-210	9.1E-16	9.1E-16	7.9E-17	< 1.0

High Volume Environmental Air Samples
 2016

1st Quarter					2nd Quarter				
North Fence									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	1.8E-17	5.1E-15	9.1E-18	< 1.0	U-nat	9.0E-18	6.4E+11	1.1E+09	< 1.0
Th-230	4.0E-17	2.0E-17	2.8E-17	0.20%	Th-230	6.7E-18	1.6E-17	2.5E-17	0.0%
Ra-226	2.3E-17	9.4E-18	1.5E-17	< 1.0	Ra-226	1.9E-17	6.7E-18	1.3E-17	< 1.0
Pb-210	8.8E-16	1.1E-16	1.9E-16	< 1.0	Pb-210	8.1E-16	8.4E-17	2.7E-16	< 1.0

1st Quarter					2nd Quarter				
KGL - North									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	2.5E-18	2.8E-16	2.5E-18	< 1.0	U-nat	4.8E-18	1.1E+13	9.3E+10	< 1.0
Th-230	1.8E-17	5.8E-18	6.7E-18	0.09%	Th-230	1.3E-17	6.4E-18	7.6E-18	< 1.0
Ra-226	4.3E-18	1.9E-18	1.9E-18	< 1.0	Ra-226	7.9E-18	2.6E-18	2.3E-18	< 1.0
Pb-210	6.6E-16	3.6E-17	4.4E-17	< 1.0	Pb-210	7.9E-16	3.2E-17	7.9E-17	< 1.0

1st Quarter					2nd Quarter				
KGL - South									
Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit	Nuclide	Conc. (uCi/ml)	Error (uCi/ml)	LLD (uCi/ml)	% Limit
U-nat	4.5E-18	2.8E-16	2.5E-18	< 1.0	U-nat	4.6E-18	1.0E+13	1.0E+11	< 1.0
Th-230	5.7E-18	6.2E-18	7.4E-18	< 1.0	Th-230	1.1E-17	6.1E-18	9.4E-18	< 1.0
Ra-226	8.1E-18	2.4E-18	1.8E-18	< 1.0	Ra-226	7.4E-18	2.9E-18	7.9E-18	< 1.0
Pb-210	9.6E-16	4.1E-17	4.7E-17	< 1.0	Pb-210	9.4E-16	3.6E-17	8.0E-17	< 1.0

Environmental Radon
 2016

1st Quarter
 Sample Media: Track Etch

Location:	Rate pCi/L	Error pCi/L
Substation	0.4	0.1
Mill Diversion	2.4	0.2
Section 30W VH6	3.0	0.2
North Fence	2.7	0.2
Section 17 VH4	0.8	0.8
KGL - North	2.2	0.2
KGL - South	0.5	0.1

2nd Quarter
 Sample Media: Track Etch

Location:	Rate pCi/L	Error pCi/L
Substation	0.5	0.1
Mill Diversion	1.7	0.1
Section 30W VH6	2.1	0.1
North Fence	1.1	0.1
Section 17 VH4	0.8	0.1
KGL - North	1.3	0.1
KGL - South	1.1	0.1

Notes:

Environmental Gamma Radiation
2016

1st Quarter		2nd Quarter	
Sample Media: Gamma		Sample Media: Gamma	
Date: 1/1/2016 - 3/31/2016		Date: 4/1/2016 - 6/30/2016	
Location:	Rate (mrem/qtr)	Location:	Rate (mrem/qtr)
Substation	4.4	Substation	4.0
Mill Diversion	7.7	Mill Diversion	7.1
Section 30W VH6	52.8	Section 30W VH6	55.8
North Fence	3.3	North Fence	6.6
Section 17 VH4	5.5	Section 17 VH4	7.5
Section 4 - #1	7.2	Section 4 - #1	7.4
Section 4 - #2	10.0	Section 4 - #2	17.2
Section 4 - #3	7.9	Section 4 - #3	3.6

Notes:
Values are net after subtraction of control value

Vegetation
2016

1st Quarter

Location:		Substation	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	No Vegetation Samples 1st Quarter		
Th-230			
Ra-226			
Pb-210			

2nd Quarter

Location:		Substation	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	8.1E-05	6.2E-06	3.4E-05
Th-230	2.5E-04	8.4E-04	1.5E-03
Ra-226	8.2E-04	5.0E-04	5.0E-04
Pb-210	-3.6E-03	3.1E-03	7.6E-03

Location:		Mill Diversion	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	No Vegetation Samples 1st Quarter		
Th-230			
Ra-226			
Pb-210			

Location:		Mill Diversion	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	4.7E-05	3.6E-06	4.1E-05
Th-230	-4.9E-04	7.4E-04	1.4E-03
Ra-226	2.3E-03	5.6E-04	3.2E-04
Pb-210	3.1E-03	4.9E-03	1.1E-02

Location:		Section 30 West VH6	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	No Vegetation Samples 1st Quarter		
Th-230			
Ra-226			
Pb-210			

Location:		Section 30 West VH6	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	3.7E-03	2.8E-04	3.4E-05
Th-230	3.9E-03	1.3E-03	1.6E-03
Ra-226	2.5E-03	5.4E-04	3.6E-04
Pb-210	-7.0E-03	3.9E-03	9.8E-03

Location:		North Fence	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	No Vegetation Samples 1st Quarter		
Th-230			
Ra-226			
Pb-210			

Location:		North Fence	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	1.6E-04	1.2E-05	3.4E-05
Th-230	8.8E-04	9.4E-04	1.4E-03
Ra-226	1.0E-03	4.9E-04	3.0E-04
Pb-210	-1.3E-03	3.6E-03	8.5E-03

Vegetation
 2016

1st Quarter

Location:		Section 17 VH4	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat			
Th-230	No Vegetation Samples		
Ra-226	1st Quarter		
Pb-210			

Location:		KGL - North	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat			
Th-230	No Vegetation Samples		
Ra-226	1st Quarter		
Pb-210			

Location:		KGL - South	
Date:			
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat			
Th-230	No Vegetation Samples		
Ra-226	1st Quarter		
Pb-210			

2nd Quarter

Location:		Section 17 VH4	
Date:		23-Jun-16	
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	4.7E-05	3.6E-06	3.4E-05
Th-230	-3.1E-04	8.9E-04	1.8E-03
Ra-226	5.2E-04	5.7E-04	1.1E-03
Pb-210	-2.0E-03	4.6E-03	1.4E-02

Location:		KGL - North	
Date:		23-Jun-16	
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	1.6E-04	1.2E-05	4.1E-05
Th-230	-4.7E-04	1.0E-03	1.7E-03
Ra-226	7.8E-04	3.6E-04	6.2E-04
Pb-210	-3.5E-03	4.9E-03	1.2E-02

Location:		KGL - South	
Date:		23-Jun-16	
Nuclide	Conc. (uCi/kg)	Error (uCi/kg)	LLD (uCi/kg)
U-nat	6.1E-05	4.6E-06	3.4E-05
Th-230	6.1E-03	1.9E-03	1.8E-03
Ra-226	1.0E-03	4.0E-04	2.6E-04
Pb-210	-3.0E-03	4.1E-03	9.9E-03