

METHODOLOGY

Delineation

Commencing August 27, 2003, the preliminary boundary of the area to be remediated, identified in the ESA as an "Area of Concern", was further delineated for excavation through the collection and analysis of field screening samples of surface and subsurface material. Gartner Lee Limited (GLL) sampled the soil in accordance with standard GLL and (Teck Cominco Limited) TCL sampling procedures and protocols. One-hundred and thirteen (113) discrete field screening samples were collected from sixty-three (63) surface samples sites and fourteen (14) test pits. This included eleven (11) field duplicate quality assurance quality control samples. GLL collected the samples at 25 meter spaced intervals and analyzed these samples with the Niton portable X-Ray Fluorescence (XRF) elemental analyzer. The results of the analysis are indicated on Figure LL-18-1. Based on the results of the field screening sampling, GLL modified the area to be excavated as indicated by the "Limit of Remedial Excavation" shown on Figure LL-18-1.

Excavation

The excavation at Loon Lake snow dump commenced June 10, 2004 and was completed by August 8, 2004. Melting of the snow dump was accelerated by spreading the piles of snow and ice around with a bulldozer within the area delineated for excavation. The soil and remaining snow and ice within the excavation boundaries was ripped using a ripper tooth on an excavator, and pushed into stockpiles that were loaded out into trucks with an excavator. Field screening samples were collected across the base of the excavation and analysed on-site for metals using the XRF. Additional excavation was undertaken in areas with contiguous lead concentrations greater than 1,200 mg/kg and zinc concentrations greater than 8,500 mg/kg based on results obtained with the XRF. The areas where additional excavation was required were generally associated with ice patches that had not melted. The material excavated was disposed of in the mine workings in accordance with regulatory approvals.

Confirmation Sampling

Confirmation soil samples were collected across the floor of the excavation limits in accordance with standard GLL and TCL sampling procedures and protocols. Composite confirmation samples were collected from areas of the floor that measured approximately 25 m x 25 m. The soil samples were submitted to the analytical laboratory, ALS Environmental of Vancouver, BC to verify that the remaining concentrations of metals in soil met the SQROs. Upon receipt of the soil results that met the SQROs the final excavation limits were surveyed.

ANALYTICAL RESULTS

Analytical laboratory results are summarized in Table L-18-1, along with the approved Polaris Mine SQROs for lead and zinc. A total of seventy-one (71) confirmation soil samples from the former Loon Lake snow dump area were submitted for laboratory analysis: fifty-eight (58) composite floor samples, seven (7) discrete floor, and six (6) quality assurance quality control (QA/QC) duplicate samples. The soil quality results and the lateral limits of the excavation are shown on Figure LL-18-2, *Loon Lake Snow Dump Conditions After Remediation*.

Quality Assurance and Quality Control (QA/QC)

QA/QC measures associated with collecting and analyzing soil were implemented during the remediation of the Loon Lake snow dump area, including the comparison of on-site field screening samples, the submission of blind duplicates to the analytical laboratory, and the analysis of analytical replicates. Relative percent differences (RpD) have been calculated and compiled in Table LL-18-2 for forty-five (45) on-site field screened duplicates, six (6) analytical laboratory duplicates, three (3) analytical laboratory replicates for a total of fifty-four (54) QA/QC sample sets for lead and zinc concentrations.

Fifty (50) of the sample results and their duplicate/replicate results either returned results below the practical quantitation limit, in which case the RpD value has been identified as "na" (not applicable) or they returned acceptable RpDs below the site specific objective of 50%. Two on-site field screened duplicates, one analytical laboratory duplicate and one of the analytical replicates returned RpDs greater than the objective, 50%.

The variance between the sample and its duplicate or replicate is indicative of sample heterogeneity likely due to the presence of trace amounts of concentrated lead or zinc dust in the sample. Therefore, the metal QA/QC samples from the Loon Lake snow dump area serve to document the variable nature of the metal concentrations in the soil.

Discussion

The seven discrete samples were collected and submitted for laboratory analysis of lead and zinc from six composite sample areas collected in the same area and results were as follows:

**Summary of Discrete Sample Results compared to the corresponding
Composite Sample Results**

Composite Sample ID	Lead (mg/kg)	Zinc (mg/kg)	Discrete Sample ID	Lead (mg/kg)	Zinc (mg/kg)
LL-11737-F-C	680	1780	LL-11423-F-D	73	170
LL-11740-F-C	680	1740	LL-11462-F-D	294	835
LL-11740-F-C	680	1740	LL-11463-F-D	1620	4430
LL-11941-F-C	1940	7460	LL-11502-F-D	<100	210
LL-11954-F-C	310	734	LL-11532-F-D	810	2280
LL-12075-F-C	<50	108	LL-12076-F-D	<100	95
LL-12084-F-C	<100	221	LL-12085-F-D	<100	6

Seventy (70) of the seventy one (71) confirmatory soil sample results from the Loon Lake snow dump area meet the SQROs for lead and zinc. One analytical laboratory duplicate sample (LL-12319-F-Q) returned lead concentrations of 2200 mg/kg, which is greater than the SQRO for lead (2,000 mg/kg). Ten soil samples were analyzed for addition metals. Arsenic concentrations ranged from <10 mg/kg to 14 mg/kg and barium concentrations ranged from 357 mg/kg to 994 mg/kg. The generic Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG) for Parkland land use is 12 mg/kg arsenic and 500 mg/kg barium in soil. The CCME recognizes that local geological conditions may result in elevated background levels of metals above the guidelines.

Soil samples collected during the 2004 vegetation sampling program at Polaris, as documented in the November 24, 2004 Memorandum *2004 Vegetation Sampling Results*, are considered to be representative of background conditions. Samples were collected at the following intervals surface to 0.01 m, 0.01 m to 0.05 m, and 0.05 m to 0.1 m. Concentrations of arsenic and barium greater than generic CCME CEQG Parkland land use were detected in each interval. The variability of arsenic and barium concentrations in those samples is listed in the following table.

Summary of 2004 Background Area Soil Concentrations of Arsenic and Barium

Parameter	n	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Median Concentration (mg/kg)	Mean Concentration (mg/kg +/-SD)	90th Percentile (mg/kg)	75th Percentile (mg/kg)
Arsenic	12	<5	15.1	12	11 +/- 2.7	13	12.25
Barium	12	228	2140	1185	1249 +/-518	1986	1560

n = number of samples.

SD = standard deviation.

The concentrations of arsenic and barium remaining within the footprint of the Loon Lake snow dump after remediation are within the range of the background concentrations. The presence of arsenic and barium concentrations in soil above the generic CCME guidelines for Parkland land use is therefore attributed to natural background mineralogy. In addition, the immobile nature of the arsenic and barium encountered on site was also demonstrated in the 1999 ESA leachate analysis that returned arsenic and barium concentrations at levels less than the detection limit and they were therefore not identified as a contaminants of concern in the Polaris Mine ESA.

The confirmation samples supported by the QA/QC samples from the Loon Lake snow dump area provide confidence that the remediation of the area complies with the SQROs.

CONCLUSIONS

Based on confirmatory sampling consistent with good practice and the approved site specific sampling procedures and protocols, the remediation of the former Loon Lake snow dump area has been completed to meet the Polaris Mine remedial targets, as documented in the approved Polaris Mine Decommissioning and Remediation Plan, March 2001.

LIMITATIONS

This report has been prepared by Gartner Lee Limited and the information in this report is intended for the use of Teck Cominco Metals Ltd. during the decommissioning and reclamation program at the Polaris Mine Site. Any use which a third party makes of this report, or any reliance on or decisions made on the basis of the information in this report is the responsibility of such third parties. Gartner Lee Limited accepts no responsibility for damages, if any, suffered by the third party, based on the use of or reliance on any information contained in this report.

The scope of Gartner Lee Limited's work was limited to that described in this report. The confirmation of environmental conditions at the site of the remedial work is based on sampling at specific wall and floor locations within the excavation limits. Gartner Lee Limited has used judgement in the interpretation of the available information but subsurface physical and/or chemical characteristics may vary between or beyond sampling locations. Gartner Lee Limited is not a guarantor of the environmental condition of the site but warrants only that its work was

undertaken and its report prepared in a manner consistent with the level of skill and diligence normally exercised by competent environmental professionals practicing in the Nunavut Territory.

Yours very truly,
GARTNER LEE LIMITED

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ATTACHMENTS

Tables

Table LL-18-1:	Loon Lake Snow Dump Remediation Confirmation Soil Samples – Metals
Table LL-18-2:	Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples – Metals

Figures

Figure LL-18-1:	Loon Lake Snow Dump Conditions Before Remediation
Figure LL-18-2:	Loon Lake Snow Dump Conditions After Remediation

Table LL-18-1. Loon Lake Snow Dump Remediation Confirmation Soil Samples - Metals

Parameter	Site Specific Remediation Objectives ^a	Polaris Mine Soil Quality Remediation Objectives ^a	Location		Loon Lake Snow Dump								
			Sample ID	Date Sampled	LL-11423-F-D	LL-11462-F-D	LL-11463-F-D	LL-11502-F-D	LL-11532-F-D	LL-11753-F-Q	LL-11605-F-C	LL-11606-F-C	
			ALS File Number	Field Screen Pb (ppm) ^b	Field Screen Zn (ppm) ^b	U5050	U5050	U5050	U5836	U5836	U5050	U5050	
					106	297	1724	59	792	duplicate of	160	209	
					315	848	7123	285	3654	LL-11532-F-D	705	941	
			Analytical Results										
pH					-	-	-	-	-	-	8.7	-	
Metals													
Antimony		20 ^d											
Arsenic		12									<20		
Barium		500									13		
Beryllium		4 ^d									723		
Cadmium		10									<1		
Chromium		64									1.8		
Cobalt		50 ^d									11		
Copper		63									7		
Lead	2000				73	294	1620	<100	810	930	29	140	
Mercury		7									160		
Molybdenum		10 ^d									0.12		
Nickel		50									<8		
Selenium		1									37		
Silver		20 ^d									<4		
Tin		50 ^d									<10		
Vanadium		130									82		
Zinc	10000				170	835	4430	210	2280	2370	507	390	

Bold Concentration greater than or equal to the Soil Quality Remediation Objective (SQRO) for the Polaris Mine Site

Notes:
^a "n" = Less than analytical method detection limit.
^b "n" = Analysis not conducted, or no guideline.

- The Soil Quality Remediation Objectives (SQROs) for the Polaris Mine Site are based on Canadian Council of Ministers of the Environment (CCME) standards and guidelines. The CCME provides criteria based on land use activities and applies the most stringent criteria based on site-specific receptors and exposure pathways.
- Field screening results are measured using a Niton Xl1 700 Series portable X-Ray Fluorescence (XRF) elemental analyser.
- Canadian Environmental Quality Guidelines (CEQG) for Parkland (PL) Land Use. The site-specific factors used for determining the soil quality guideline were: soil ingestion, soil contact and nutrient cycling.
- Interim Remediation Criterion. Soil Quality Guidelines based on the CCME soil protocol have not yet been developed for a given parameter. for a given parameter.

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				Sample ID	Units	LL-11607-F-C	LL-11608-F-C	LL-11609-F-C	LL-11610-F-C	LL-11611-F-C	LL-11612-F-C	LL-11613-F-C	LL-11614-F-C																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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				Sample ID	Date Sampled	ALS File Number	Field Screen Pb (ppm) ^b	Field Screen Zn (ppm) ^b	Units	Analytical Results									
										LL-11615-F-C	LL-11616-F-C	LL-11617-F-C	LL-11618-F-C	LL-11709-F-Q	LL-11619-F-C	LL-11620-F-C	LL-11621-F-C		
				21-Jun-04	21-Jun-04	U5050	21-Jun-04	U5050	21-Jun-04	U5050	21-Jun-04	U5050	21-Jun-04	U5050	21-Jun-04	U5050	21-Jun-04	U5050	
				152	75	302	715	278	duplicate of	54	34	103							
				651				995	LL-11618-F-C	349	198	429							

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				Sample ID	Date Sampled	ALS File Number	Field Screen Pb (ppm) ^b	Field Screen Zn (ppm) ^b	Analytical Results									
Units						LL-11622-F-C 21-Jun-04 U5050	LL-11623-F-C 21-Jun-04 U5050	LL-11697-F-C 28-Jun-04 U5223	LL-11698-F-C 28-Jun-04 U5223	LL-11699-F-C 28-Jun-04 U5223	LL-11737-F-C 28-Jun-04 U5050	LL-11738-F-C 28-Jun-04 U5050	LL-11739-F-C 28-Jun-04 U5050					
pH						67	81	1397	1372	772	-	-	-					
Metals						362	393	5028	6364	3564	-	-	-					
Antimony	-	20 ^d		mg/kg		-	-	-	-	-	-	-	-	-				
Arsenic	-	12		mg/kg		-	-	-	-	-	-	-	-	-				
Barium	-	500		mg/kg		-	-	-	-	-	-	-	-	-				
Beryllium	-	4 ^d		mg/kg		-	-	-	-	-	-	-	-	-				
Cadmium	-	10		mg/kg		-	-	-	-	-	-	-	-	-				
Chromium	-	64		mg/kg		-	-	-	-	-	-	-	-	-				
Cobalt	-	50 ^d		mg/kg		-	-	-	-	-	-	-	-	-				
Copper	-	63		mg/kg		-	-	-	-	-	-	-	-	-				
Lead	2000	-		mg/kg		<100	110	1360	1400	700	680	210	150					
Mercury	-	7		mg/kg		-	-	-	-	-	-	-	-	-				
Molybdenum	-	10 ^d		mg/kg		-	-	-	-	-	-	-	-	-				
Nickel	-	50		mg/kg		-	-	-	-	-	-	-	-	-				
Selenium	-	1		mg/kg		-	-	-	-	-	-	-	-	-				
Silver	-	20 ^d		mg/kg		-	-	-	-	-	-	-	-	-				
Tin	-	50 ^d		mg/kg		-	-	-	-	-	-	-	-	-				
Vanadium	-	130		mg/kg		-	-	-	-	-	-	-	-	-				
Zinc	10000	-		mg/kg		141	344	3150	3560	2220	1780	267	355					

Bold

Concentration greater than or equal to the Soil Quality Remediation Objective (SQRO) for the Polaris Mine Site

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Parameter	Site Specific Remediation Objectives ^a	Location Sample ID Date Sampled ALS File Number Field Screen Pb (ppm) ^b Field Screen Zn (ppm) ^b	Loon Lake Snow Dump														
			LL-11740-F-C 28-Jun-04 U5050	LL-11741-F-C 28-Jun-04 U5050	LL-11742-F-Q 28-Jun-04 U5050 duplicate of LL-11741-F-C	LL-11800-F-C 28-Jun-04 U5223	LL-11802-F-C 28-Jun-04 U5223	LL-11939-F-C 8-Jul-04 U5836	LL-11941-F-C 8-Jul-04 U5836	LL-11944-F-C 8-Jul-04 U5615r							
			Units	Units	Units	Units	Units	Units	Units	Units							
pH																	
Metals																	
Antimony	-	20 ^d	mg/kg	7.9	-	-	-	-	-	8.4	-	-	-	-	-	-	-
Arsenic	-	12	mg/kg	<20	-	-	-	-	-	<20	-	-	-	-	-	-	-
Barium	-	500	mg/kg	<10	-	-	-	-	-	<10	-	-	-	-	-	-	-
Beryllium	-	4 ^d	mg/kg	487	-	-	-	-	-	695	-	-	-	-	-	-	-
Cadmium	-	10	mg/kg	<1	-	-	-	-	-	<1	-	-	-	-	-	-	-
Chromium	-	64	mg/kg	8.9	-	-	-	-	-	7.3	-	-	-	-	-	-	-
Chromium	-	64	mg/kg	10	-	-	-	-	-	10	-	-	-	-	-	-	-
Cobalt	-	50 ^d	mg/kg	5	-	-	-	-	-	<4	-	-	-	-	-	-	-
Copper	-	63	mg/kg	24	-	-	-	-	-	19	-	-	-	-	-	-	-
Lead	2000	-	mg/kg	1010	1210	1150	1880	970	1940	255	-	-	-	-	-	-	-
Mercury	-	7	mg/kg	0.08	-	-	-	-	-	0.07	-	-	-	-	-	-	-
Molybdenum	-	10 ^d	mg/kg	<8	-	-	-	-	-	<8	-	-	-	-	-	-	-
Nickel	-	50	mg/kg	26	-	-	-	-	-	21	-	-	-	-	-	-	-
Selenium	-	1	mg/kg	<4	-	-	-	-	-	<4	-	-	-	-	-	-	-
Silver	-	20 ^d	mg/kg	<4	-	-	-	-	-	<4	-	-	-	-	-	-	-
Tin	-	50 ^d	mg/kg	<10	-	-	-	-	-	<10	-	-	-	-	-	-	-
Vanadium	-	130	mg/kg	62	-	-	-	-	-	49	-	-	-	-	-	-	-
Zinc	10000	-	mg/kg	2970	3520	2940	7660	2590	7460	650	-	-	-	-	-	-	-

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Table LL-18-1. Loon Lake Snow Dump Remediation Confirmation Soil Samples - Metals

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- Interim Remediation Criterion. Soil Quality Guidelines based on the CCME soil protocol have not yet been developed for a given parameter, for a given parameter.

Table LL-18-1. Loon Lake Snow Dump Remediation Confirmation Soil Samples - Metals

Parameter		Site Specific Remediation Objectives ^a	CEQG(PL) ^c	Location		Loon Lake Snow Dump													
				Sample ID	Date Sampled	ALS File Number	Field Screen Pb (ppm) ^b		Field Screen Zn (ppm) ^b		Analytical Results								
							LL-12061-F-C	25-Jul-04	LL-12063-F-C	25-Jul-04	LL-12064-F-C	25-Jul-04	LL-12065-F-C	25-Jul-04	LL-12066-F-C	25-Jul-04	LL-12075-F-C	29-Jul-04	LL-12076-F-D
Polaris Mine Soil Quality				U6365r	141	U6365r	111	U6365r	355	U6365r	487	U6365r	-	U6530rr	70	U6530rr	-	U6530rr	160
Remediation Objectives ^a				566	463	1153	1425	-	-	206	-	-	-	-	-	-	-	-	451
Units				Analytical Results															
pH				7.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.8
Metals	Antimony	20 ^d		<20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20
	T-Sb			13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
	T-As			730	-	-	-	-	-	-	-	-	-	-	-	-	-	-	670
	T-Ba	500		<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1
	T-Be	4 ^d		1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
Cadmium	10		15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	
Chromium	64		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	
Cobalt	50 ^d		32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	
Copper	63		140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	
Lead	2000		0.13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<8	
Mercury		7	<8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	
Molybdenum		10 ^d	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
Nickel		50	<14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
T-Ni		1	<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
Selenium		1	<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
T-Se		1	<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
Silver		20 ^d	<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
T-Ag		20 ^d	<4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	
Tin		50 ^d	<10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	
T-Sn		50 ^d	98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91	
Vanadium		130	409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	266	
T-V		130	409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	266	
Zinc	10000	-	406	-	-	-	-	-	-	-	-	-	-	-	-	-	-	266	
T-Zn		-	406	-	-	-	-	-	-	-	-	-	-	-	-	-	-	266	

Concentration greater than or equal to the Soil Quality Remediation Objective (SQRO) for the Polaris Mine Site

Bold

Notes:

^a < " = Less than analytical method detection limit.

^b " = Analysis not conducted, or no guideline.

- The Soil Quality Remediation Objectives (SQROs) for the Polaris Mine Site are based on Canadian Council of Ministers of the Environment (CCME) standards and guidelines. The CCME provides criteria based on land use activities and applies the most stringent criteria based on site-specific receptors and exposure pathways.
- Field screening results are measured using a Niton Xl 700 Series portable X-Ray Fluorescence (XRF) elemental analyser.
- Canadian Environmental Quality Guidelines (CEQG) for Parkland (PL) Land Use. The site-specific factors used for determining the soil quality guideline were: soil ingestion, soil contact and nutrient cycling.
- Interim Remediation Criterion. Soil Quality Guidelines based on the CCME soil protocol have not yet been developed for a given parameter. for a given parameter.

Table LL-18-1. Loon Lake Snow Dump Remediation Confirmation Soil Samples - Metals

Parameter	Polaris Mine Soil Quality Remediation Objectives ^a	Site Specific CEQG(PL) ^c	Location		Loon Lake Snow Dump													
			Sample ID	Date Sampled	ALS File Number	Field Screen Pb (ppm) ^b		Field Screen Zn (ppm) ^b		Analytical Results								
						Field Screen Pb (ppm) ^b	Field Screen Zn (ppm) ^b	LL-12078-F-C	LL-12079-F-Q	LL-12080-F-C	LL-12081-F-C	LL-12084-F-C	LL-12085-F-D	LL-12104-F-C	LL-12105-F-C			
pH																		
Metals																		
Antimony	-	20 ^d	T-Sb															
Arsenic	-	12	T-As															
Barium	-	500	T-Ba															
Beryllium	-	4 ^d	T-Be															
Cadmium	-	10	T-Cd															
Chromium	-	64	T-Cr															
Cobalt	-	50 ^d	T-Co															
Copper	-	63	T-Cu															
Lead	2000	-	T-Pb															
Mercury	-	7	T-Hg															
Molybdenum	-	10 ^d	T-Mo															
Nickel	-	50	T-Ni															
Selenium	-	1	T-Se															
Silver	-	20 ^d	T-Ag															
Tin	-	50 ^d	T-Sn															
Vanadium	-	130	T-V															
Zinc	10000	-	T-Zn															

Bold

Concentration greater than or equal to the Soil Quality Remediation Objective (SQRO) for the Polaris Mine Site.

Notes:

"<" = Less than analytical method detection limit.

"n" = Analysis not conducted, or no guideline.

- The Soil Quality Remediation Objectives (SQROs) for the Polaris Mine Site are based on Canadian Council of Ministers of the Environment (CCME) standards and guidelines. The CCME provides criteria based on land use activities and applies the most stringent criteria based on site-specific receptors and exposure pathways.
- Field screening results are measured using a Niton Xl 700 Series portable X-Ray Fluorescence (XRF) elemental analyser.
- Canadian Environmental Quality Guidelines (CEQG) for Parkland (PL) Land Use. The site-specific factors used for determining the soil quality guideline were: soil ingestion, soil contact and nutrient cycling.
- Interim Remediation Criterion. Soil Quality Guidelines based on the CCME soil protocol have not yet been developed for a given parameter, for a given parameter.

Table LL-18-1. Loon Lake Snow Dump Remediation Confirmation Soil Samples - Metals

Parameter		Location		Loon Lake Snow Dump										
		Sample ID	Date Sampled	LL-12110-F-C	LL-12128-F-C	LL-12135-F-Q	LL-12135-F-C	LL-12137-F-C	LL-12138-F-C	LL-12139-F-C				
				ALS File Number	Field Screen Pb (ppm) ^a	Field Screen Zn (ppm) ^a	5-Aug-04 U6770(1)	5-Aug-04 U6770(1)	5-Aug-04 U6770(1) duplicate of	8-Aug-04 U6898	8-Aug-04 U6898	8-Aug-04 U6898		
Polaris Mine Soil Quality Remediation Objectives ^a		Site Specific	CEQG(PL) ^c	Units										
pH														
Metals														
Antimony	-		20 ^d	mg/kg	-	-	-	-	-	-	-	-	-	-
Arsenic	-		12	mg/kg	-	-	-	-	-	-	-	-	-	-
Barium	-		500	mg/kg	-	-	-	-	-	-	-	-	-	-
Beryllium	-		4 ^d	mg/kg	-	-	-	-	-	-	-	-	-	-
Cadmium	-		10	mg/kg	-	-	-	-	-	-	-	-	-	-
Chromium	-		64	mg/kg	-	-	-	-	-	-	-	-	-	-
Cobalt	-		50 ^d	mg/kg	-	-	-	-	-	-	-	-	-	-
Copper	-		63	mg/kg	-	-	-	-	-	-	-	-	-	-
Lead	2000		-	mg/kg	-	-	-	-	-	-	-	-	-	-
Mercury	-		7	mg/kg	-	-	-	-	-	-	-	-	-	-
Molybdenum	-		10 ^d	mg/kg	-	-	-	-	-	-	-	-	-	-
Nickel	-		50	mg/kg	-	-	-	-	-	-	-	-	-	-
Selenium	-		1	mg/kg	-	-	-	-	-	-	-	-	-	-
Silver	-		20 ^d	mg/kg	-	-	-	-	-	-	-	-	-	-
Tin	-		50 ^d	mg/kg	-	-	-	-	-	-	-	-	-	-
Vanadium	-		130	mg/kg	-	-	-	-	-	-	-	-	-	-
Zinc	10000		-	mg/kg	-	-	-	-	-	-	-	-	-	-

Bold

Concentration greater than or equal to the Soil Quality Remediation Objective (SQRO) for the Polaris Mine Site

Notes:

^a < " = Less than analytical method detection limit.

^b " " = Analysis not conducted, or no guideline.

- a) The Soil Quality Remediation Objectives (SQROs) for the Polaris Mine Site are based on Canadian Council of Ministers of the Environment (CCME) standards and guidelines. The CCME provides criteria based on land use activities and applies the most stringent criteria based on site-specific receptors and exposure pathways.
- b) Field screening results are measured using a Niton Xl 700 Series portable X-Ray Fluorescence (XRF) elemental analyser.
- c) Canadian Environmental Quality Guidelines (CEQG) for Parkland (PL) Land Use. The site-specific factors used for determining the soil quality guideline were: soil ingestion, soil contact and nutrient cycling.
- d) Interim Remediation Criterion. Soil Quality Guidelines based on the CCME soil protocol have not yet been developed for a given parameter.

Table LL-18-2. Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples - Metals

Location			Loon Lake Snow Dump									
Sample ID			LL-9-I-D	LL-20-I-D	LL-31-I-D	LL-45-I-D	LL-52-I-D	LL-58-I-D	LL-70-I-D	LL-73-I-W-D	LL-75-2-W-D	
Duplicate ID			LL-86-Q	LL-87-Q	LL-88-Q	LL-89-Q	LL-90-Q	LL-91-Q	LL-92-Q	LL-93-Q	LL-94-Q	
Parameter	Units	MDL	PQL	Analytical Results								
On Site Field Screening Duplicates												
Lead (Pb)												
Sample Result	mg/kg	70	350	2765	2250	610	530	461	2493	122	4435	
Duplicate Result	mg/kg	70	350	2636	2534	481	627	529	2372	320	4734	
RpD	%			5%	12%	24%	17%	14%	5%	na	7%	
Zinc (Zn)												
Sample Result	mg/kg	150	750	9669	9729	2734	2247	1155	9569	783	24843	
Duplicate Result	mg/kg	150	750	9135	10463	1862	2452	1506	9039	1318	24653	
RpD	%			6%	7%	38%	9%	26%	6%	51%	1%	
Analytical Laboratory Duplicates												
Lead (Pb)												
Sample Result	mg/kg	100	500	-	-	-	-	-	-	-	-	
Duplicate Result	mg/kg	100	500	-	-	-	-	-	-	-	-	
RpD	%											
Zinc (Zn)												
Sample Result	mg/kg	2	10	-	-	-	-	-	-	-	-	
Duplicate Result	mg/kg	2	10	-	-	-	-	-	-	-	-	
RpD	%											
Analytical Laboratory Replicates												
Lead (Pb)												
Sample Result	mg/kg	100	500	-	-	-	-	-	-	-	-	
Duplicate Result	mg/kg	100	500	-	-	-	-	-	-	-	-	
RpD	%											
Zinc (Zn)												
Sample Result	mg/kg	2	10	-	-	-	-	-	-	-	-	
Duplicate Result	mg/kg	2	10	-	-	-	-	-	-	-	-	
RpD	%											

Field

Det-D Values in quotes are an actual to 5000 and the concentrations of each sample are greater than the det-D

RpD Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL

Bold

Notes:

na Rpl) value is not applicable because one or both results are less than the PQL.

RpD Relative Percent Difference - (Difference/Average)*100.

PQL Practical Quantitation Limit = 5 * Method Detection Limit (MDL).

MDL Method Detection Limit of analysis

Table LL-18-2. Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples - Metals

Location			Loon Lake Snow Dump									
Sample ID		LL-79-2-W-D	LL-83-3-F-D	LL-11427-F-D	LL-11432-F-D	LL-11441-F-D	LL-11452-F-D	LL-11462-F-D	LL-11508-F-D	LL-11518-F-D		
Duplicate ID		LL-95-Q	LL-96-Q	LL-10508-F-Q	LL-11704-F-Q	LL-11705-F-Q	LL-11706-F-Q	LL-11701-F-Q	LL-11702-F-Q	LL-11703-F-Q		
Parameter	Units	MDL	PQL	Analytical Results								
On Site Field Screening Duplicates												
Lead (Pb)	Sample Result	mg/kg	70	350	222	74	126	5039	300	1717	1597	
	Duplicate Result	mg/kg	70	350	350	57	134	4166	310	1708	1824	
	RpD	%		na	4%	na	na	19%	na	0%	13%	
Zinc (Zn)	Sample Result	mg/kg	150	750	689	205	494	27038	1196	5079	6055	
	Duplicate Result	mg/kg	150	750	1108	241	519	22632	830	5271	6584	
	RpD	%		47%	10%	16%	5%	18%	36%	4%	8%	
Analytical Laboratory Duplicates												
Lead (Pb)	Sample Result	mg/kg	100	500	-	-	-	-	-	-	-	
	Duplicate Result	mg/kg	100	500	-	-	-	-	-	-	-	
	RpD	%										
Zinc (Zn)	Sample Result	mg/kg	2	10	-	-	-	-	-	-	-	
	Duplicate Result	mg/kg	2	10	-	-	-	-	-	-	-	
	RpD	%										
Analytical Laboratory Replicates												
Lead (Pb)	Sample Result	mg/kg	100	500	-	-	-	-	-	-	-	
	Duplicate Result	mg/kg	100	500	-	-	-	-	-	-	-	
	RpD	%										
Zinc (Zn)	Sample Result	mg/kg	2	10	-	-	-	-	-	-	-	
	Duplicate Result	mg/kg	2	10	-	-	-	-	-	-	-	
	RpD	%										

Field RpD Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL

- Notes:
- na
 - RpD value is not applicable because one or both results are less than the PQL.
 - RpD Relative Percent Difference (Difference/Average)*100.
 - PQL Practical Quantitation Limit = 5 * Method Detection Limit (MDL).
 - MDL Method Detection Limit of analysis.

Table LL-18-2. Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples - Metals

Location			Loon Lake Snow Dump									
Sample ID			LL-11530-F-D	LL-11532-F-D	LL-11609-F-C	LL-11618-F-C	LL-11741-F-C	LL-11800-F-C	LL-11800-F-C	LL-11946-F-C	LL-12050-F-C	
Duplicate ID			LL-11700-F-Q	LL-11753-F-Q	LL-11708-F-Q	LL-11709-F-Q	LL-11742-F-Q	QC# 393918	LL-11719-F-Q	QC# 396124	LL-12318-F-Q	
Parameter	Units	MDL	Analytical Results									
On Site Field Screening Duplicates												
Lead (Pb)	Sample Result	mg/kg	70	350								
	Duplicate Result	mg/kg	70	350								
	RpD	%										
Zinc (Zn)	Sample Result	mg/kg	150	750								
	Duplicate Result	mg/kg	150	750								
	RpD	%										
Analytical Laboratory Duplicates												
Lead (Pb)	Sample Result	mg/kg	100	500								
	Duplicate Result	mg/kg	100	500								
	RpD	%										
Zinc (Zn)	Sample Result	mg/kg	2	10								
	Duplicate Result	mg/kg	2	10								
	RpD	%										
Analytical Laboratory Replicates												
Lead (Pb)	Sample Result	mg/kg	100	500								
	Duplicate Result	mg/kg	100	500								
	RpD	%										
Zinc (Zn)	Sample Result	mg/kg	2	10								
	Duplicate Result	mg/kg	2	10								
	RpD	%										

Bold

RepD Value is greater than or equal to 50% and the concentrations of both samples are greater than the PCL

RpD Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL.

Notes:

na RpD value is not applicable because one or both results are less than the PQL.

RpD Relative Percent Difference = (Difference/Average)*100.

PQL Practical Quantitation Limit = 5 * Method Detection Limit (MDL).

MDL Method Detection Limit of analysis.

Table LL-18-2. Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples - Metals

Location				Loon Lake Snow Dump											
Sample ID		Sample ID		LL-12052-F-C	LL-12053-F-C	LL-12054-F-C	LL-12056-F-C	LL-12057-F-C	LL-12058-F-C	LL-12059-F-C	LL-12061-F-C	LL-12062-F-C			
Duplicate ID		Duplicate ID		LL-12323-F-Q	LL-12327-F-Q	LL-12320-F-Q	LL-12319-F-Q	LL-12325-F-Q	LL-12329-F-Q	LL-12328-F-Q	LL-12326-F-Q	LL-12316-F-Q			
Parameter	Units	MDL	PQL	Analytical Results											
On Site Field Screening Duplicates															
Lead (Pb)				1266	3250	494	1697	3566	2936	3106	141	3621			
Sample Result	mg/kg	70	350	1287	3300	408	1393	3513	3573	2633	182	4531			
Duplicate Result	mg/kg	70	350	2%	2%	19%	20%	1%	20%	16%	na	22%			
Rpd															
Zinc (Zn)				3717	11998	1424	4846	14783	11141	10875	566	14985			
Sample Result	mg/kg	150	750	4091	15473	1231	4725	15669	14330	10524	605	17555			
Duplicate Result	mg/kg	150	750	10%	25%	15%	3%	6%	25%	3%	na	16%			
Rpd															
Analytical Laboratory Duplicates															
Lead (Pb)				-	-	-	1980	-	-	-	-	-			
Sample Result	mg/kg	100	500	-	-	-	2200	-	-	-	-	-			
Duplicate Result	mg/kg	100	500	-	-	-	11%								
Rpd															
Zinc (Zn)				-	-	-	3020	-	-	-	-	-			
Sample Result	mg/kg	2	10	-	-	-	4100	-	-	-	-	-			
Duplicate Result	mg/kg	2	10	-	-	-	30%								
Rpd															
Analytical Laboratory Replicates															
Lead (Pb)				-	-	-	-	-	-	-	-	-			
Sample Result	mg/kg	100	500	-	-	-	-	-	-	-	-	-			
Duplicate Result	mg/kg	100	500	-	-	-	-	-	-	-	-	-			
Rpd															
Zinc (Zn)				-	-	-	-	-	-	-	-	-			
Sample Result	mg/kg	2	10	-	-	-	-	-	-	-	-	-			
Duplicate Result	mg/kg	2	10	-	-	-	-	-	-	-	-	-			
Rpd															

Bold

Rpd Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL

RpD Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL.

Notes:

na

RpD value is not applicable because one or both results are less than the PQL.

Relative Percent Difference = (Difference/Average) * 100.

PQL

Practical Quantitation Limit = 5 * Method Detection Limit (MDL).

MDL

Method Detection Limit of analysis

Table LL-18-2. Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples - Metals

Location			Loon Lake Snow Dump								
Sample ID			LL-12063-F-C	LL-12064-F-C	LL-12065-F-C	LL-12077-F-C	LL-12078-F-C	LL-12080-F-C	LL-12082-F-C	LL-12111-F-C	LL-12128-F-C
Duplicate ID			LL-12324-F-Q	LL-12317-F-Q	LL-12322-F-Q	QC# 399317	LL-12079-F-Q	LL-12335-F-Q	LL-12083-F-Q	LL-12112-F-Q	LL-12135-F-Q
Parameter	Units	MDL	PQL								
On Site Field Screening Duplicates											
Lead (Pb)											
Sample Result	mg/kg	70	111	355	487	-	180	173	3290	3300	82
Duplicate Result	mg/kg	70	150	345	469	-	172	162	5912	3279	108
RpD	%		na	na	4%	-	na	na	57%	1%	na
Zinc (Zn)											
Sample Result	mg/kg	150	463	1153	1425	-	564	482	10060	11102	142
Duplicate Result	mg/kg	150	564	1197	1681	-	601	415	16436	10186	98
RpD	%		na	4%	16%	-	na	na	48%	9%	na
Analytical Laboratory Duplicates											
Lead (Pb)											
Sample Result	mg/kg	100	-	-	-	-	<100	-	-	-	<100
Duplicate Result	mg/kg	100	-	-	-	-	120	-	-	-	<100
RpD	%						na				na
Zinc (Zn)											
Sample Result	mg/kg	2	-	-	-	-	261	-	-	-	89
Duplicate Result	mg/kg	2	-	-	-	-	357	-	-	-	148
RpD	%						31%				50%
Analytical Laboratory Replicates											
Lead (Pb)											
Sample Result	mg/kg	100	-	-	-	<100	-	-	-	-	-
Duplicate Result	mg/kg	100	-	-	-	<100	-	-	-	-	-
RpD	%					na					
Zinc (Zn)											
Sample Result	mg/kg	2	-	-	-	266	-	-	-	-	-
Duplicate Result	mg/kg	2	-	-	-	267	-	-	-	-	-
RpD	%					0%					

Field

RepD Value is greater than or equal to .50% and the concentrations of both samples are greater than the PQL

Notes:
 na Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL.
 RpD Relative Percent Difference = (Difference/Average) * 100.
 PQL Practical Quantitation Limit - 5 * Method Detection Limit (MDL).
 MDL Method Detection Limit of analysis

Table LL-18-2. Loon Lake Snow Dump Quality Assurance and Quality Control Remediation Soil Samples - Metals

Location				Loon Lake Snow Dump					
Sample ID		PQL		LL-12136-F-C	LL-12137-F-C	LL-12138-F-C	LL-12138-F-C	LL-12139-F-C	
Duplicate ID		PQL		LL-12357-F-Q	LL-12358-F-Q	LL-12134-F-Q	LL-12359-F-Q	LL-12360-F-Q	
Parameter	Units	MDL	PQL	Analytical Results					
On Site Field Screening Duplicates									
Lead (Pb)				378	408	159	398	420	
Sample Result	mg/kg	70	350	435	436	<100	396	398	
Duplicate Result	mg/kg	70	350	14%	7%	na	1%	6%	
Rpd									
Zinc (Zn)				1206	1417	460	1524	1443	
Sample Result	mg/kg	150	750	1339	1381	87	1568	1391	
Duplicate Result	mg/kg	150	750	10%	3%	na	3%	4%	
Rpd									
Analytical Laboratory Duplicates									
Lead (Pb)				-	-	-	-	-	
Sample Result	mg/kg	100	500	-	-	-	-	-	
Duplicate Result	mg/kg	100	500	-	-	-	-	-	
Rpd									
Zinc (Zn)				-	-	-	-	-	
Sample Result	mg/kg	2	10	-	-	-	-	-	
Duplicate Result	mg/kg	2	10	-	-	-	-	-	
Rpd									
Analytical Laboratory Replicates									
Lead (Pb)				-	-	-	-	-	
Sample Result	mg/kg	100	500	-	-	-	-	-	
Duplicate Result	mg/kg	100	500	-	-	-	-	-	
Rpd									
Zinc (Zn)				-	-	-	-	-	
Sample Result	mg/kg	2	10	-	-	-	-	-	
Duplicate Result	mg/kg	2	10	-	-	-	-	-	
Rpd									

Hold

Rpd Value is greater than or equal to 50% and the constraints of both samples

RpD Value is greater than or equal to 50% and the concentrations of both samples are greater than the PQL.

Bold

Notes:

na

RpD value is not applicable because one or both results are less than the PQL.

RpD Relative Percent Difference = (Difference/Average)*100.

PQL Practical Quantitation Limit = 5 * Method Detection Limit (MDL).

MDL Method Detection Limit of analysis.