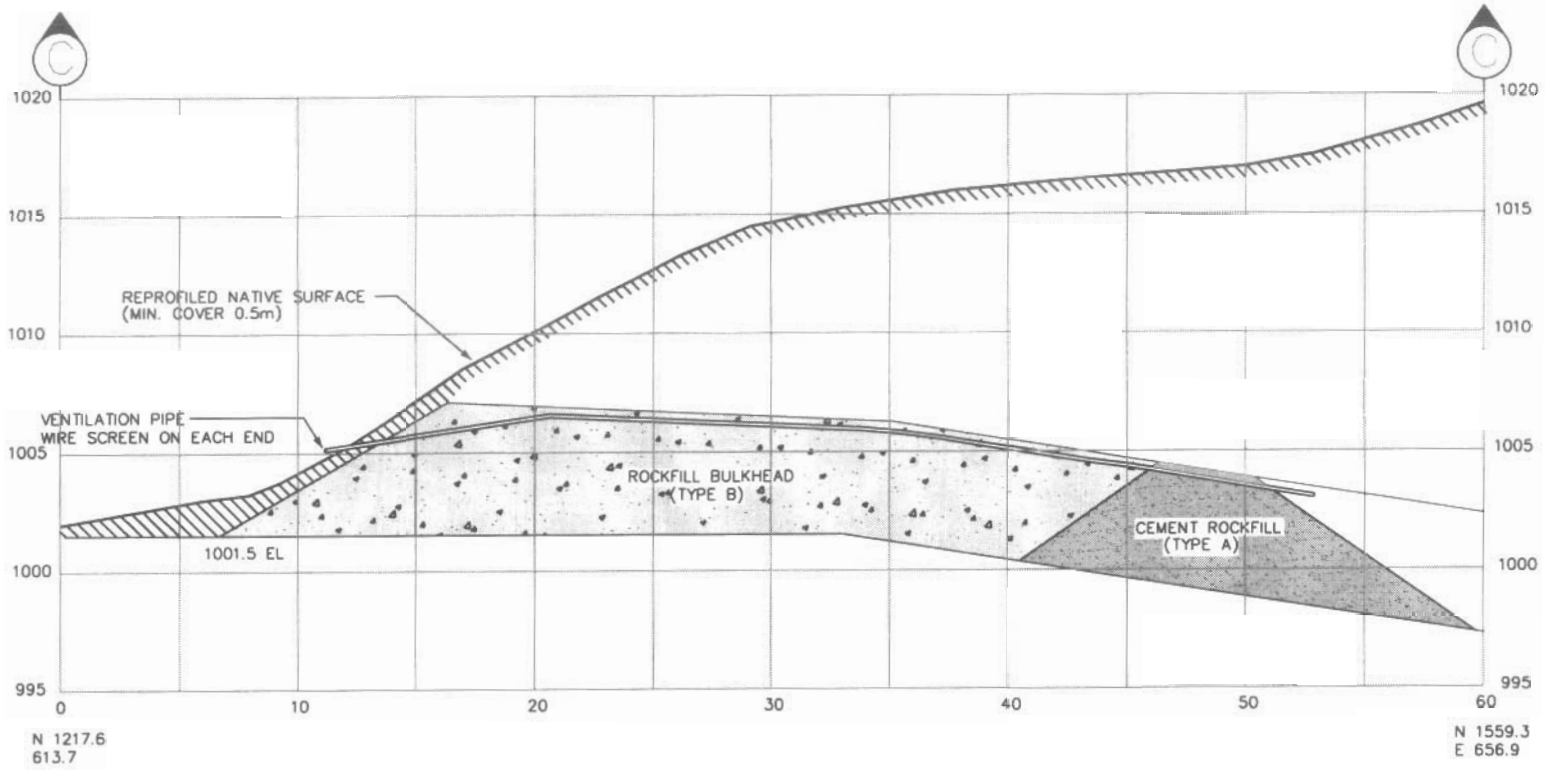


SECTION CC
MAIN PORTAL

teckcominco
POLARIS MINE
NUNAVUT

PROJECT: PORTAL PLUGS

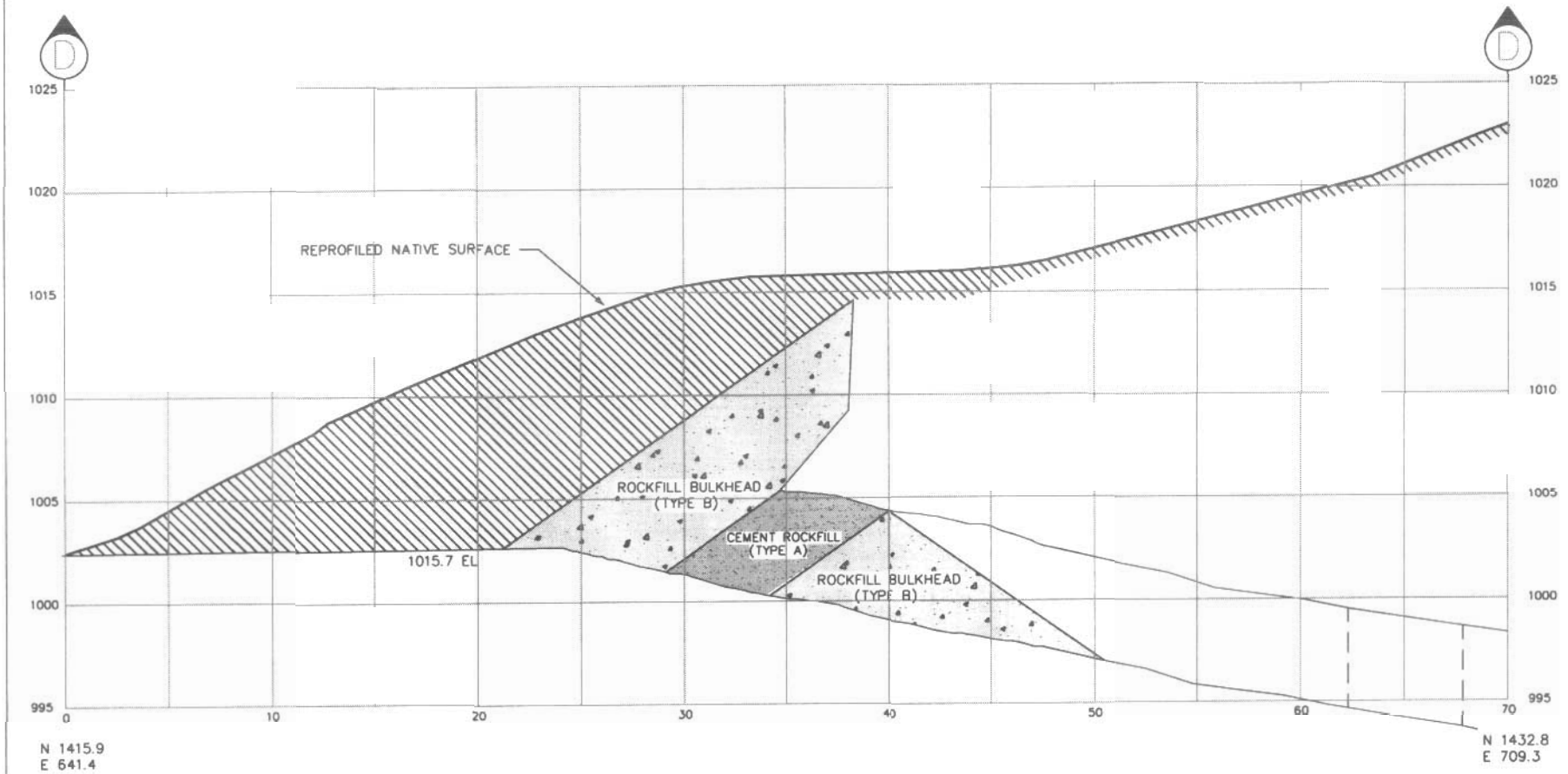
DRAWING: ASBUILT SECTIONS

DATE: May 6, 2005

COMPILED BY:
TM TECH SERVICES
CRANBROOK, B.C.

SCALE: 1:300 (metric)

DRAWING: No. 4
MAIN PORTAL SECT-CC



SECTION DD
CONVEYOR PORTAL

teckcominco	
POLARIS MINE	
NUNAVUT	
PROJECT:	PORTAL PLUGS
DRAWING:	ASBUILT SECTIONS
DATE:	May 6, 2005
COMPILED BY:	TM TECH SERVICES CRANBROOK, B.C.
SCALE:	1:300 (metric)
DRAWING:	No. 5 CONVEYOR PORTAL SECT-DD

APPENDIX 5

GEOTECHNICAL REPORTS

APPENDIX 6

CONTAMINATED SOIL REMEDIATION

2004 CLOSE OUT REPORTS

By

GARTNER LEE LTD.

Contaminated Soil Remediation
2004 Close Out Reports
Polaris Mine, Nunavut

Prepared for
Teck Cominco Limited

Submitted by
Gartner Lee Limited

June 2005

Contaminated Soil Remediation 2004 Close Out Reports Polaris Mine, Nunavut

Prepared for
Teck Cominco Limited

June 2005

Reference: **GLL 50063**

Distribution:
10 Teck Cominco Limited
3 Gartner Lee Limited

Gartner Lee Limited

June 22, 2005

Mr. Bruce Donald
Teck Cominco Limited
Bag 2000
Kimberley, BC V1A 3E1

Dear Mr. Donald:

Re: 50063 - Contaminated Soil Remediation 2004 Close Out Reports
Polaris Mine, Nunavut

On behalf of Gartner Lee Limited, I am pleased to submit the remaining close out reports on the areas of contaminated soil remediated at the Polaris Mine site. These close out reports serve to document the remedial activities that were undertaken and the sample results that verify completion of activities. The areas remediated were identified as Areas of Potential Environmental Concern in the *Polaris Mine Decommissioning and Reclamation Plan*, March 2001. The areas have been remediated to the meet the approved Polaris Mine site specific remedial targets.

Figure 1: *Contaminated Soils Remediation Progress Plan, December 31, 2003* illustrates those areas that were remediated in 2003 and reported previously in the February 16, 2004 Report *23305 – Contaminated Soil Remediation 2003 Close Out Reports, Polaris Mine, Nunavut* (Areas 3, 4, 6, 11, 12, 15, 17, 22, 23, and 24).

Figure 2: *Contaminated Soils Remediation Progress Plan, December 31, 2004* illustrates the areas of contaminated soil remediated subsequently. The results are presented as ten (10) separate appendices to this letter. Each of reports have been subject to detailed peer and management review as follows:

Area 1.	Process Barge, Dr. Dennis Gregor, P.Geol. (NU), Guelph, ON Office Manager
Area 2.	Ship Loading Dock, Dr. Dennis Gregor, P.Geol. (NU)
Area 5.	Accommodation Complex, Robert Dickin, M.Sc., P.Geo. (BC), Burnaby, BC Office Manager, Principal
Areas 7 and 19	Foldaway Buildings, David S. Osmond, B.Sc., R.P.Bio., Principal
Areas 8 and 9:	Tank Farm and Lube Oil Storage, Alistair Kent, P.Eng. (BC), Manager Western Canada Mining Sector
Area 10:	Tailings Pipeline, David S. Osmond, B.Sc., R.P.Bio.
Area 18:	Loon Lake Snow Dump, David S. Osmond, B.Sc., R.P.Bio.

840-7th Avenue SW, Suite 1605, Calgary, Alberta, T2P 3G2 tel 403.262.4299 fax 403.264.8112
www.gartnerlee.com

Area 21:	Firehall, Eric Denholm, B.A.Sc., P.Eng. (NU), Yellowknife, NT Office Manager, Principal
Area 25:	South Shore, Eric Denholm, B.A.Sc., P.Eng. (NU)
Area 26:	North Shore, Dr. Dennis Gregor, P.Geol. (NU)

There are four (4) additional areas that were presented as "Areas of Potential Environmental Concern" in the Polaris Mine Decommissioning and Reclamation Plan, March 2001. These are presented as the following areas on Figures 1 and 2 as Areas 13, 14, 16 and 20. These areas were not targeted for remediation of contaminated soil in the Decommissioning and Reclamation Plan for the following reasons:

Area 13:	Operational and Construction Landfills. These areas were listed as being of potential environmental concern because the Construction Landfill required relocation to the toe of the Operational Landfill and the consolidated landfill area capped with an engineered cover cap.
Area 14:	Fire Training Area. This area was identified as a potential environmental concern in the 1999 Phase 2 Environmental Site Assessment (ESA), which was conducted prior to the development of the risk based site-specific Soil Quality Remediation Objectives (SQRO's). Upon review of the laboratory data gathered during the 1999 Phase 2 ESA it was determined that the laboratory results met the SQRO's and therefore no remediation work was required at this area.
Area 16:	Explosives Storage/Detonator Magazine. This area was listed as being of potential environmental concern due to the presence of hazardous materials (explosives). During demolition the explosives were removed from this area and detonated.
Area: 20:	Surface Above Active Mining Area. These areas were identified as being of potential public safety concern because during the operation of the mine surface subsidence had occurred over certain older underground openings. This is a geotechnical issue, not a contaminated soil issue and is therefore not commented on in this report. Post closure monitoring at the site will include inspection of this area to confirm stability.

As the aforementioned four areas did not require environmental remediation, no Contaminated Soil Remediation Close Out Reports have been prepared.

I trust that this is satisfactory and that you will find the information presented in this report to be complete and thorough. It has been a great pleasure to have had continued involvement in the Polaris Mine Decommissioning and Reclamation project following the development of the plan in 2001 and I look forward to providing on-going support through the post closure monitoring stage.

Yours very truly,
GARTNER LEE LIMITED

Stephen R. Morison, M.Sc., P.Geol. (NU)
Manager Western Canada Business Unit, Project Principal

AL:gc

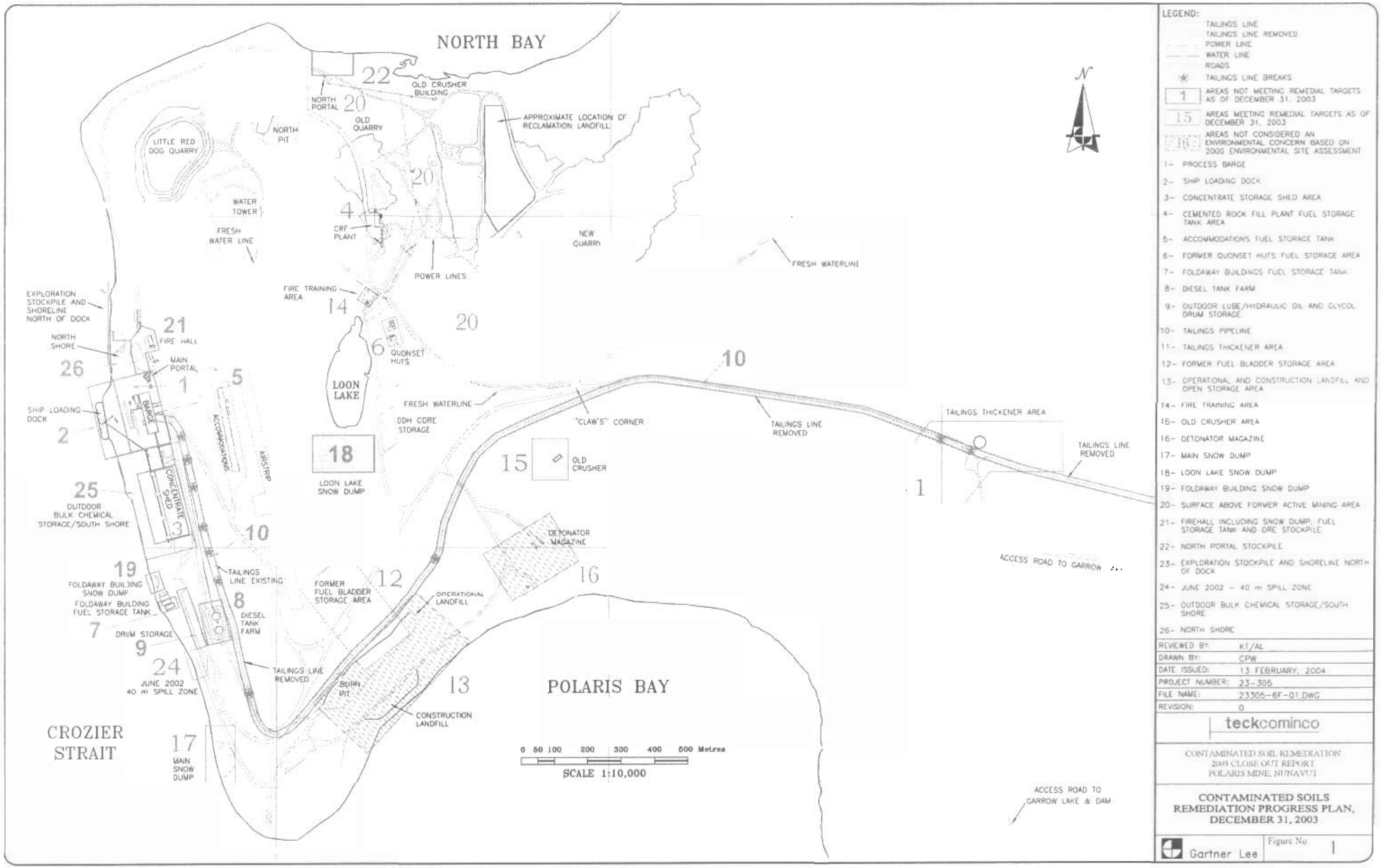
Figures

Figure 1: Contaminated Soils Remediation Progress Plan, December 31, 2003
Figure 2: Contaminated Soils Remediation Progress Plan, December 31, 2004

Enclosures: Polaris Mine Operations Contaminated Soil Remediation Close Out Reports:

Appendix A	Process Barge
Appendix B	Ship Loading Dock
Appendix C	Accommodation Complex
Appendix D	Foldaway Buildings
Appendix E	Tank Farm and Lube Oil Storage
Appendix F	Tailings Pipeline
Appendix G	Loon Lake Snow Dump
Appendix H	Firehall
Appendix I	South Shore
Appendix J	North Shore

CC: E. Denholm, R. Dickin, D. Gregor, A. Kent, A. Laudrum, D. Osmond, T. Pye



LEGEND:

- TAILINGS LINE
- TAILINGS LINE REMOVED
- POWER LINE
- WATER LINE
- ROADS
- TAILINGS LINE BREAKS
- 1 — AREAS NOT MEETING REMEDIAL TARGETS AS OF DECEMBER 31, 2003
- 15 — AREAS MEETING REMEDIAL TARGETS AS OF DECEMBER 31, 2003
- 16 — AREAS NOT CONSIDERED AN ENVIRONMENTAL CONCERN BASED ON 2000 ENVIRONMENTAL SITE ASSESSMENT

1- PROCESS BARGE
2- SHIP LOADING DOCK
3- CONCENTRATE STORAGE SHED AREA
4- CEMENTED ROCK FILL PLANT FUEL STORAGE TANK AREA
5- ACCOMMODATIONS FUEL STORAGE TANK
6- FORMER QUONSET HUTS FUEL STORAGE AREA
7- FOLDAWAY BUILDINGS FUEL STORAGE TANK
8- DIESEL TANK FARM
9- OUTDOOR LUBE/HYDRAULIC OIL AND GLYCOL DRUM STORAGE
10- TAILINGS PIPELINE
11- TAILINGS THICKENER AREA
12- FORMER FUEL BLADDER STORAGE AREA
13- OPERATIONAL AND CONSTRUCTION LANDFILL AND OPEN STORAGE AREA
14- FIRE TRAINING AREA
15- OLD CRUSHER AREA
16- DETONATOR MAGAZINE
17- MAIN SNOW DUMP
18- LOON LAKE SNOW DUMP
19- FOLDAWAY BUILDING SNOW DUMP
20- SURFACE ABOVE FORMER ACTIVE MINING AREA
21- FIREHALL INCLUDING SNOW DUMP, FUEL STORAGE TANK AND ORE STOCKPILE
22- NORTH PORTAL STOCKPILE
23- EXPLORATION STOCKPILE AND SHORELINE NORTH OF DOCK
24- JUNE 2002 - 40 m SPILL ZONE
25- OUTDOOR BULK CHEMICAL STORAGE/SOUTH SHORE
26- NORTH SHORE

REVIEWED BY:	KT/AL
DRAWN BY:	CPW
DATE ISSUED:	13 FEBRUARY, 2004
PROJECT NUMBER:	23-305
FILE NAME:	23305-6F-01.DWG
REVISION:	0

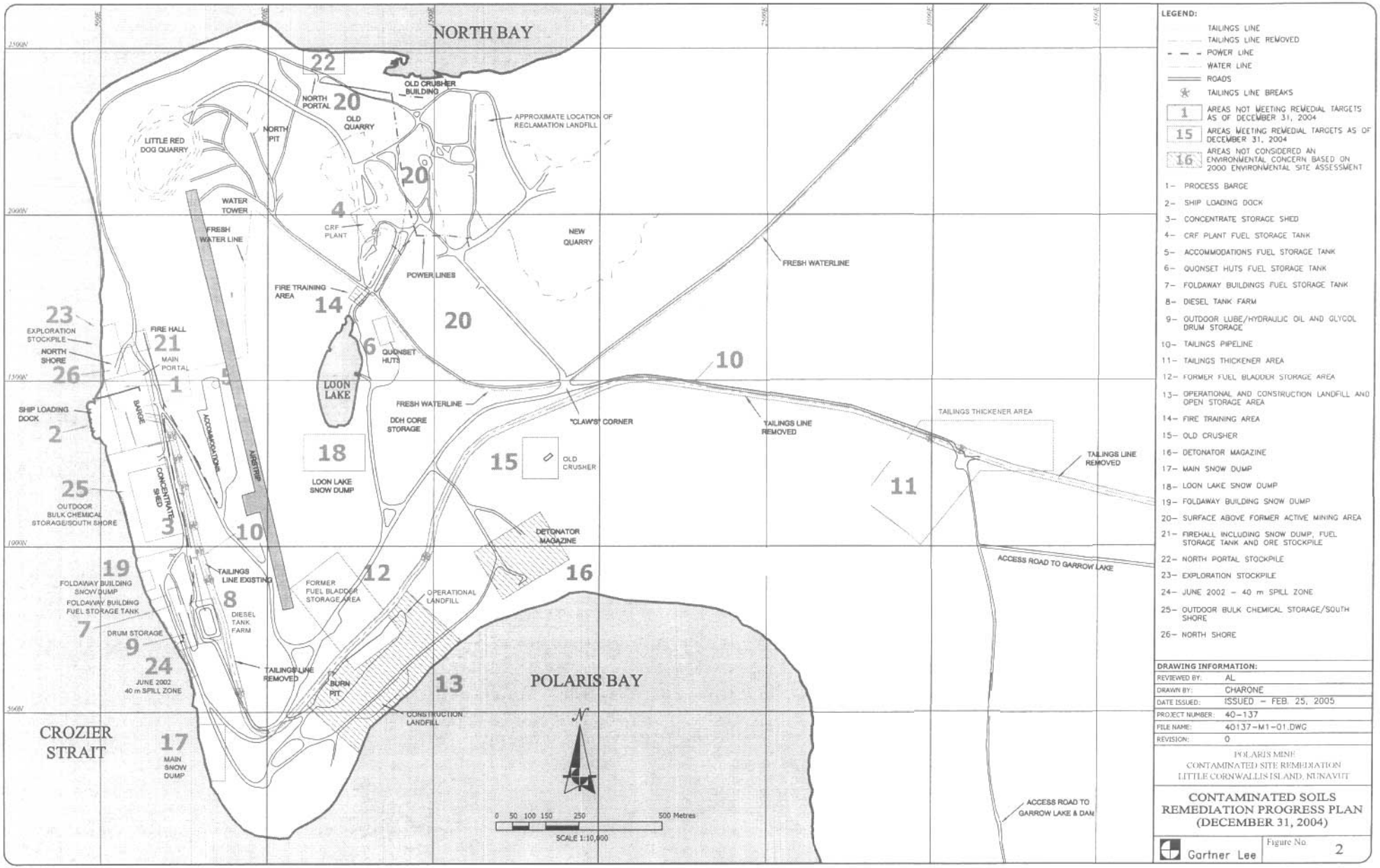
teckcominco

CONTAMINATED SOIL REMEDIATION
2003 CLOSE OUT REPORT
POLARIS MINE, NUNAVUT

CONTAMINATED SOILS REMEDIATION PROGRESS PLAN, DECEMBER 31, 2003

Gartner Lee

Figure No. 1



LEGEND:

- TAILINGS LINE
- TAILINGS LINE REMOVED
- POWER LINE
- WATER LINE
- ROADS
- TAILINGS LINE BREAKS
- 1 — AREAS NOT MEETING REMEDIAL TARGETS AS OF DECEMBER 31, 2004
- 15 — AREAS MEETING REMEDIAL TARGETS AS OF DECEMBER 31, 2004
- 16 — AREAS NOT CONSIDERED AN ENVIRONMENTAL CONCERN BASED ON 2000 ENVIRONMENTAL SITE ASSESSMENT

1– PROCESS BARGE
2– SHIP LOADING DOCK
3– CONCENTRATE STORAGE SHED
4– CRF PLANT FUEL STORAGE TANK
5– ACCOMMODATIONS FUEL STORAGE TANK
6– QUONSET HUTS FUEL STORAGE TANK
7– FOLDAWAY BUILDINGS FUEL STORAGE TANK
8– DIESEL TANK FARM
9– OUTDOOR LUBE/HYDRAULIC OIL AND GLYCOL DRUM STORAGE
10– TAILINGS PIPELINE
11– TAILINGS THICKENER AREA
12– FORMER FUEL BLADDER STORAGE AREA
13– OPERATIONAL AND CONSTRUCTION LANDFILL AND OPEN STORAGE AREA
14– FIRE TRAINING AREA
15– OLD CRUSHER
16– DETONATOR MAGAZINE
17– MAIN SNOW DUMP
18– LOON LAKE SNOW DUMP
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21– FIREHALL INCLUDING SNOW DUMP, FUEL STORAGE TANK AND ORE STOCKPILE
22– NORTH PORTAL STOCKPILE
23– EXPLORATION STOCKPILE
24– JUNE 2002 – 40 m SPILL ZONE
25– OUTDOOR BULK CHEMICAL STORAGE/SOUTH SHORE
26– NORTH SHORE

DRAWING INFORMATION:	
REVIEWED BY:	AL
DRAWN BY:	CHARONE
DATE ISSUED:	ISSUED – FEB. 25, 2005
PROJECT NUMBER:	40-137
FILE NAME:	40137-M1-01.DWG
REVISION:	0

POLARIS MINE
CONTAMINATED SITE REMEDIATION
LITTLE CORNWALLIS ISLAND, NUNAVUT

CONTAMINATED SOILS REMEDIATION PROGRESS PLAN (DECEMBER 31, 2004)

Gartner Lee

Figure No. 2

Appendices

Polaris Mine Operations Contaminated Soil Remediation Close Out Reports:

- **Appendix A** Process Barge
- **Appendix B** Ship Loading Dock
- **Appendix C** Accommodation Complex
- **Appendix D** Foldaway Buildings
- **Appendix E** Tank Farm and Lube Oil Storage
- **Appendix F** Tailings Pipeline
- **Appendix G** Loon Lake Snow Dump
- **Appendix H** Firehall
- **Appendix I** South Shore
- **Appendix J** North Shore

Appendix A

Process Barge

June 10, 2005

Mr. Bruce Donald
Teck Cominco Limited
Bag 2000
Kimberley, BC V1A 3E1

Dear Mr. Donald:

Re: 40137 – Polaris Mine Operations Contaminated Soil Remediation
Close Out Report: Process Barge

BACKGROUND

The Process Barge (shown as Area 1 on Figure 1: *Contaminated Soils Remediation Progress Plan, December 31, 2003* and on Figure 2: *Contaminated Soils Remediation Progress Plan, December 31, 2004*) was located between the main portal and the former concentrate storage shed.

The Process Barge (the "Barge") contained the mill and service facilities (the power house, maintenance shops, warehouse, offices and fuel storage in the bottom of the hull). The Barge was constructed in Quebec and towed to the Polaris Mine Site in August 1981. It was 31 m wide, 122 m long and 18 m high above a 4.3 m deep hull. Prior to the arrival of the Barge a berthing lagoon was excavated south of the main portal. In 1982, the Barge was floated into place. A berm was then constructed across the entrance to the lagoon, the sea water was pumped out and the excavation backfilled.

Infrastructure directly associated with the Barge included a utility corridor that connected it with the Accommodation Complex 200 m to the east. The utilidor was a wooden above ground structure that housed freshwater, sewage, electrical and fuel lines. A CAT generator building and trailers were located 25 m west of the Barge. The Steam Bay and a diesel dispensing tank were located at the northwest corner of the Barge. The diesel tank was 15 m north of the CAT generator building. A sewage holding tank was located at the northeast corner of the Barge and a waste oil collection tank was outside the maintenance bay on the north side of the Barge. The concentrate conveyor way was at the south. On the east side was a second conveyor way that fed ore to the mill from the underground workings through the CV03 portal. The tailings line and reclaim water line were also located on the east side of the Barge.

The Environmental Site Assessment (ESA) conducted in 1999 and 2000 identified petroleum hydrocarbon and Lead and Zinc contamination in the soil surrounding the Barge. Four (4) surface samples were collected, nineteen (19) test pits excavated and four (4) boreholes drilled

during the ESA in the Barge remediation area. The sample results indicated that hydrocarbon contamination was present to a depth of 3.1 m and that lead and zinc contamination was present on surface to a depth of 0.61 m. The soil sample results from the ESA and the original topography of the area prior to site remediation are shown on Figure Barge-01-1: *Barge Conditions Before Remediation*.

METHODOLOGY

Delineation

The preliminary area to be remediated, as identified in the ESA as an "Area of Concern", was further delineated for excavation through the collection and analysis of field screening samples from nineteen (19) boreholes drilled in 2003 and eight (8) boreholes drilled in 2004. The boreholes were advanced with an air rotary quarry drill. The borehole depths ranged from 3 m to 6.7 m. A total of one hundred ninety (190) composite samples were collected from the drill returns that accumulated at the mouth of the boreholes. The composite samples were collected over 0.6 m to 0.8 m intervals. Following the collection of each sample the surface surrounding the borehole was cleared of the drill cuttings, before advancing the hole the next 0.6 m to 0.8 m sample interval.

The visual appearance and odour of the soil, along with field screening measurements obtained from the borehole samples were used to delineate the area to be excavated. The hydrocarbon field screening measurements were obtained using a portable photo-ionization detector (PID) to measure the concentrations of organic vapours in the headspace of the sample bags. The samples were field screened for metals using the Niton X-ray fluorescence (XRF) elemental analyser.

The results from the drilling indicated hydrocarbon contamination to a depth of 4.5 m and metal contamination to a depth of 5.5 m.

Excavation

Excavation of the Barge area commenced August 26, 2003, after the structure was dismantled and the hull of the Barge removed. Excavation in 2003 continued until November 3, 2003. The excavation of the Barge area re-commenced again April 21, 2004 and it was completed July 16, 2004.

During 2003, the contaminated soil under the footprint of the former Barge hull was excavated. Beneath the eastern half of the footprint of the former barge the excavation extended to solid bedrock. Soil within the excavation area was ripped and loaded into trucks with an excavator. A smooth lipped bucket on the excavator was used to clean the residual contaminated soils at the base of the excavation. To direct the excavation activities, samples were collected across the

floor and walls of the excavation and field screened using the PID for hydrocarbons and the XRF analyzer for Lead and Zinc. Upon receipt of field screening results that indicated the Soil Quality Remediation Objectives (SQRO's) were met confirmation samples were collected, the excavation the limits were surveyed and the remediated area was backfilled.

That portion of the Barge excavated in 2003 was backfilled prior to the end of the 2003 work with between 4 m and 7 m of fill. The areas were backfilled in order to prevent spring runoff water in 2004 from flowing across the remaining contaminated soils and then into this area and re-contaminating it. At the north end of the area excavated in 2003 hydrocarbon contamination remained present in the walls. As an additional mitigation measure to inhibit hydrocarbon contaminated spring runoff from re-contaminating the remediated area the walls and adjacent floor of the excavation from the utility corridor north, along the northern face and then south to below the CAT generator building were sprayed with water when the air temperature was below –20°C and a barrier of ice established prior to backfilling.

A 50 m by 50 m area at the south end of the Barge was excavated in October 2003 and it was backfilled prior to the receipt of the analytical laboratory results due to the onset of winter conditions. The analytical laboratory results from the floor of the south end of the 2003 excavation did not meet the SQRO's and the backfilled material was re-excavated and the floor of the excavation dug deeper and additional remediation confirmation samples were collected.

In the spring of 2004 the contaminated soil remaining to the west of the former Barge footprint was excavated while the surface was frozen. The excavation program was guided by observations made on the walls of the excavation in 2003 along with field screening results from the boreholes drilled in 2003 and 2004. Following the removal of contaminated material the floor and walls of the excavation were sampled to determine where additional excavation was required to meet the SQRO's. The excavator with a ripper attachment was used to expand the excavation further where required. The excavated area was then backfilled with between 3 m and 7 m of fill in order to establish the final shoreline configuration.

The limits of the excavation are shown on Figure Barge-01-2: *Barge Conditions After Remediation*. The material excavated was disposed in the mine workings in accordance with regulatory approvals.

Confirmation Sampling

Upon receipt of field screening results that indicated that the material remaining in the excavation would meet the SQRO's, confirmation samples were collected in accordance with Gartner Lee Limited (GLL) and Teck Cominco Limited (TCL) sampling procedures and protocols The excavated area was subdivided into individual composite sampling areas approximately 25 m by 25 m required to cover the area to be sampled. Wall samples were composited over a length of 25 m on the wall of the excavation. Composite samples were created by collecting four or five

evenly spaced aliquots of soil with in the individual composite sample area. A single aliquot of soil from a specific point is a discrete sample and these samples were collected randomly.

The soil samples were collected at the excavation limits and submitted to ALS Environmental (ALS) for analysis of Extractable Petroleum Hydrocarbons (EPH), metals and Polycyclic Aromatic Hydrocarbons (PAH). Additional excavation was undertaken in areas where the laboratory analytical results did not meet the SQRO's and additional confirmatory samples were taken upon completion of the excavation

ANALYTICAL RESULTS

Analytical laboratory results for EPH, metals and PAH are summarized in Tables: BA-01-1, BA-01-2, and BA-01-3 along with the approved Polaris Mine SQRO's for petroleum hydrocarbons and metals. Eighty two (82) hydrocarbon and eighty two (82) metal remediation confirmation samples were submitted from the former Barge area. The hydrocarbon samples were analyzed as follows: fifty (50) floor composite samples, ten (10) wall composite samples, seventeen (17) discrete samples and five (5) quality assurance quality control (QA/QC) samples. All hydrocarbon confirmatory samples were analyzed for EPH, and fourteen (14) of these samples were also analyzed for PAH. The metal samples were analyzed for Lead and Zinc as follows: fifty one (51) floor composite samples, fifteen (15) wall composite samples, ten (10) discrete samples and six (6) quality assurance quality control (QA/QC) samples. Thirteen (13) randomly selected samples were analyzed for total metals. The soils quality results and the lateral limits of the excavation are shown on Figure Barge-01-2.

Quality Assurance and Quality Control (QA/QC)

QA/QC measures associated with the collection and analysis of soil included: the comparison of on-site field screening samples, the submission of blind duplicates to the analytical laboratory, and the analysis of analytical laboratory replicates. Relative percent differences (RpDs) for hydrocarbon concentrations of EPH C_{10}-C_{19} and EPH C_{19}-C_{32} have been calculated and compiled in Table: BA-01-4 for six (6) analytical laboratory duplicates and nine (9) analytical laboratory replicates. RpDs for concentrations of Lead and Zinc have been calculated and compiled in Table: BA-01-5 for six (6) field screening duplicates, six (6) laboratory duplicates and five (5) laboratory replicates. In total thirty two (32) QA/QC sample sets have been evaluated, including eleven (11) remediation confirmation sample sets.

Thirty (30) 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 analytical laboratory duplicates returned results greater than the objective and therefore require further explanation.

The variance between the EPH C_{10}-C_{19} results for sample Barge-362-F-C (3290 mg/kg) and its blind duplicate, Barge-364-F-Q (1930 mg/kg) is considered representative of the heterogeneity of an area prior to achieving the remediation objectives (further excavation was undertaken in this area in order to meet the remediation objective of 1000 mg.kg EPH C_{10}-C_{19}). The variance between Zinc concentrations in sample Barge-11919-F-D (217 mg/kg) and its blind duplicate, Barge-11986-F-Q (472 mg/kg) is considered indicative the heterogeneity present in samples with relatively low concentrations of Zinc at the Polaris Mine Site.

Polaris Mine Soil Quality Remediation Objectives

Seventy five (75) of the eighty two (82) hydrocarbon remediation confirmation samples (91%) returned results below the Polaris Mines SQRO's for EPH. Five floor composite samples, one discrete sample and one QA/QC sample returned EPH C_{10}-C_{19} concentrations greater than the SQRO. Four of the samples were collected from the south end of the former process barge footprint in 2003 (Barge-301-F-C, Barge-360-F-C, and Barge-369-F-C and it's duplicate Barge-370-F-Q) and most of this area was re-excavated in 2004. Samples Barge-11933-F-C and Barge-11935-F-C (which met the SQRO's for EPH C_{10}-C_{19}) were collected from the base of the area re-excavated in 2004, as shown on Figure: Barge-02-1. In addition, QA/QC sample Barge-363-F-Q is a duplicate of sample Barge-360-F-C and the EPH concentrations in this sample met the SQROs.

Seventy nine (79) of the eighty two (82) metals remediation confirmation samples (96%) returned results that met the Polaris Mine SQRO's for Lead and Zinc. Two of the three samples that returned results greater than the SQROs, including Lead concentrations greater than two times the SQRO, were collected from the south end of the former process barge footprint in 2003 (Barge-360-F-C and Barge-361-F-C). Most of the area covered by these two samples was re-excavated in 2004. Sample Barge-11935-F-C, which met the SQRO's for Lead (2000 mg/kg) and Zinc (10000 mg/kg) was collected from the base of the area re-excavated in 2004. The duplicate QA/QC sample Barge-363-F-Q of Barge-360-F-C returned Lead and Zinc concentrations that sample met the SQROs. Lead concentrations in sample Barge-10492-F-C (2500 mg/kg), collected beneath the former diesel dispensing tank exceeded the SQRO.

The approved site-specific remedial objectives allow for minor exceedances in a small percentage of the confirmatory sample area, as long as the concentration is less than twice the remedial target. Since only a small percentage of the remedial area exceeds the SQROs for EPH, Lead and Zinc and given that the area with Lead concentrations greater than two times the remedial target was mostly re-excavated and that a duplicate sample from the area met the objectives the former Barge area is therefore considered to be in accordance with the site specific remedial objectives.

Discrete samples were collected to discern the homogeneity of the sample area represented by the composite samples. The tables below show a variability in the metal and hydrocarbon concentrations of the discrete samples versus the composite areas they represented as the composite samples represent the area as a whole and the discrete samples indicate the homogeneity of the given sample areas.

Summary of Discrete Hydrocarbon Sample Results Compared to Corresponding Composite Sample Results

Composite Sample ID	EPH_{10-19} (mg/kg)	EPH_{19-32} (mg/kg)	Discrete Sample ID	EPH_{10-19} (mg/kg)	EPH_{19-32} (mg/kg)
Barge-175-F-C	<200	<200	Barge-169-F-D	<200	<200
Barge-260-F-C	<200	<200	Barge-182-F-D	724	<200
Barge-220-F-C	208	<200	Barge-194-F-D	<200	<200
Barge-220-F-C	208	<200	Barge-195-F-D	686	<200
Barge-221-F-C	230	<200	Barge-199-F-D	554	<200
Barge-224-F-C	**1340**	<200	Barge-207-F-D	259	<200
Barge-224-F-C	**1340**	<200	Barge-209-F-D	**2380**	<200
Barge-222-F-C	436	<200	Barge-211-F-D	206	<200
Barge-11931-F-C	280	480	Barge-251-F-D	<200	<200
Barge-11931-F-C	280	480	Barge-252-W-D	<200	<200
Barge-261-F-C	<200	<200	Barge258-F-D	<200	<200
Barge-360-F-C	**1160**	230	Barge-345-F-D	330	<200
Barge-10683-F-C	860	270	Barge-347-F-D	450	<200
Barge-11935-F-C	<200	240	Barge-355-F-D	780	230
Barge-11933-F-C	<200	380	Barge-357-F-D	320	<200
Barge-10580-F-C	<200	<200	Barge-10525-F-D	<200	<200
Barge-10648-W-C	<200	268	Shore-11985-F-D	<200	<200

Summary of Discrete Metals Sample Results Compared to Corresponding Composite Sample Results

Composite Sample ID	Lead (mg/kg)	Zinc (mg/kg)	Discrete Sample ID	Lead (mg/kg)	Zinc (mg/kg)
Barge-175-F-C	<100	9	Barge-169-F-D	<100	5
Barge-11931-F-C	<100	55	Barge-174-W-D	<200	5
Barge-224-F-C	<200	2040	Barge-207-F-D	<200	996
Barge-222-F-C	<200	1280	Barge-211-F-D	<200	766
Barge-360-F-C	**5350**	**10200**	Barge-345-F-D	1440	7050
Barge-10684-F-C	970	6930	Barge-347-F-D	720	4660
Barge-10580-F-C	1000	2210	Barge-10525-F-D	370	1480
Barge-11935-F-C	180	653	Barge-11913-F-D	1570	2330
Barge-11933-F-C	120	427	Barge-11919-F-D	<100	217
Barge-11957-F-C	170	469	Shore-12071-W-D	295	473

Generic Federal Soil Quality Guidelines for Parkland Land Use

The concentrations of Barium ranged from 280 mg/kg to 896 mg/kg in the ten remediation confirmation samples analysed for total metals. The generic Canadian Council of Ministers of Environment (CCME) Canadian Environmental Quality Guideline (CEQG) for Parkland land use for Barium in soil is 500 mg/kg. Three of the samples exceeded this generic objective (Barge 10822-F-C, Barge-11919-F-D and Barge-11935-F-C). The CCME recognizes that local geological conditions may result in elevated background levels of metals above the guidelines.

Barium is a common mineral associated with lead sulphides, and it is found in cavities in limestone and dolostone. 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 Barium greater than generic CCME CEQG for Parkland land use were detected in each interval. The variability of Barium concentrations in those samples in listed in the following table.

Summary of 2004 Background Area Soil Concentrations of 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)
Barium	12	228	2140	1185	1249 +/-518	1986	1560

n = number of samples.

SD = standard deviation.