Bruce J. Donald
Reclamation Manager

November 10, 2005

Prairie & Northern Region
Environment Canada
Room 200, 4999 98th Ave.
Edmonton, AB, T6B 2X3

Attention: Peter Blackall, Regional Director of Environmental Protection

Dear Peter Blackall;

Re: Polaris Mine 2005 3rd Quarter MMER Report

Please find attached the Metal Mining Effluent Regulation (MMER) Report for Polaris Mine for the 3rd Quarter of 2005. As Polaris is a remote mine and operations on the site have ceased, collection of MMER and Environmental Effects Monitoring (EEM) data for this year was conducted by small field crews stationed onsite for the first part of the season, and then by flying scientists/ technicians to site on a weekly basis for the latter part of the season. Field crews were onsite when flow initiated in Garrow Creek on approximately June 25, 2005. Flow continued through July and August, and Garrow Creek was observed to be frozen on September 13, 2005.

The MMER effluent characterization monitoring, bioassay testing, and environmental effects monitoring were conducted throughout the quarter. Due to the short season of flow, two sets of acute and sublethal toxicity tests were conducted within the quarter on July 16 and August 9, 2005, corresponding to the dates of EEM quarterly water quality monitoring samples collected at effluent, exposure and reference stations. A quarterly effluent sample plus acute and sublethal toxicity samples were also collected on July 6, 2005, but due to fog conditions at the mine, the toxicity samples did not make it to the labs within holding times are were discarded. The effluent sample was analyzed for the MMER and EEM parameters. No exposure or reference samples were collected on July 6, 2005, since Garrow Bay was still ice-covered.

MMER water quality monitoring was conducted on a weekly basis throughout most of the season. Between August 20 – 23 and after August 27, 2005, access to the site was not possible due to weather conditions. Ken Russell and Jenny Ferone were informed of failed sampling attempts and were updated with weather and safety conditions at the site on a regular basis. On September 13, 2005, a quarterly event with acute toxicity testing was planned. However, upon arrival onsite, it was observed that Garrow Creek (final discharge point) was frozen. A chronology of the 2005 sampling season is presented in Appendix I.

There were no exceedances of MMER Schedule 4 Limits for the 2005 season, and there was no acute toxicity in Rainbow trout and *Daphnia* tests. Holding times for nitrate and alkalinity were exceeded in the July 6, 2005 sample due to an oversight by the ALS lab. This situation is explained in a letter from ALS provided in Appendix J, and is not likely to influence the results.

The following information is included in our 2005 3rd Quarter MMER Report:

- Table 1a – Concentrations Of Effluent For MMER Schedule 4 Sampled Weekly
- Table 1b – Monthly Mean Concentrations Of Effluent For MMER Schedule 4
- Table 1c – Mass Loading Of Deleterious Substance For Each Day Sampled
- Table 1d – Mass Loading Per Calendar Month For Each Deleterious Substance
- Table 2 – Results of Acute Lethality Tests and Daphnia Magna Monitoring Tests
- Table 3 – Effluent Characterization Water Quality Results (studies conducted under Part 1, Section 4) (Effluent Characterization) (Table 3, Table 5)
- Table 4 – Water Quality Monitoring in Exposure and Reference Stations (Results of studies conducted under Part 1, Section 7)
- Table 5 – QAQC of Effluent and Water Quality Data

Additional Appendices

- Appendix A – Information specified by Section 8.1 of Reference Method EPS 1/Rm/13: 96 hr acute rainbow trout test
- Appendix B – Information specified by Section 8.1 of Reference Method EPS 1/Rm/14: 72 hr acute *Daphnia magna* test
- Appendix C – 7-d Topsmelt Growth and Survival Sublethal Toxicity Test
- Appendix D – 92-h Echinoderm Fertilization Sublethal Toxicity Test
- Appendix E – 7-d Sublethal Champia (Algae) Sublethal Toxicity Test
- Appendix F – Results of Effluent Characterization, as per Paragraph 15(1)(a)
- Appendix G – Acute Toxicity Testing Reports
- Appendix H – Sublethal Toxicity Testing Reports
- Appendix I – Polaris 2005 Sampling Event Chronology
- Appendix J – Letter from ALS explaining missed holding times of alkalinity and nitrate for July 6,2005 sample

The MMER and EEM data required to be reported in electronic format were submitted electronically through the RISS online system on November 10 2005. In addition to this hardcopy report, an electronic pdf version of this report is being emailed to you (e-mailed November 10, 2005).

If you have any questions regarding the annual report or aspects of the application of the MMER to the Polaris Mine, please feel free to contact me.

Yours truly,

Original signed by B. Donald
Bruce Donald

Attachments: 2005 3rd Quarter Regulatory Data Tables
cc: Randy Baker (Azimuth Consulting Group)
Ken Russell (Environment Canada)
Jenny Ferone (Environment Canada)

Polaris Mine 2005 3rd Quarter MMER Report

Prepared for

Environment Canada, Prairie & Northern Region
Room 200, 4999 98th Ave.
Edmonton, AB, T6B 2X3

November 10, 2005

Teck Cominco
Bag 2000
Kimberley, BC, Canada
V1A 3E1

2005 3rd QUARTER MMER REPORT

LOCATION - FINAL DISCHARGE POINT FROM GARROW LAKE (GARROW LAKE DAM SIPHONS)

Table 1a. CONCENTRATIONS OF EFFLUENT FOR MMER SCHEDULE 4 SAMPLED WEEKLY

Sample Taken During The Week of	Date Sample Taken	DELETERIOUS SUBSTANCE (mg/L)[1] Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[1]	pH[1]	Collection Method
3-Jul-05	6-Jul-05	*0.00020*	0.00024	*0.0050*	0.00017	0.00060	0.0127	4	0.0050	7.49	Grab
10-Jul-05	13-Jul-05	*0.00020*	0.00061	*0.0050*	0.00230	0.00088	0.0205	*3.0*	*0.0050*	7.48	Grab
10-Jul-05	16-Jul-05	*0.00020*	0.00042	0.0444	0.00042	0.00081	0.0179	*3.0*	0.0090	7.59	Grab
17-Jul-05	23-Jul-05	*0.00020*	0.00047	*0.0050*	0.00024	0.00105	0.0325	*3.0*	*0.0050*	7.56	Grab
24-Jul-05	30-Jul-05	0.00021	0.00050	*0.0050*	0.00020	0.00141	0.0405	*3.0*	*0.0050*	7.70	Grab
31-Jul-05	6-Aug-05	*0.00020*	0.00052	*0.0050*	0.00047	0.00166	0.0356	*3.0*	*0.0050*	7.65	Grab
7-Aug-05	13-Aug-05	*0.00020*	0.00052	*0.0050*	0.00111	0.00149	0.0310	*3.0*	0.0080	7.79	Grab
14-Aug-05	24-Aug-05[3]	*0.00020*	0.00101	*0.0050*	0.00093	0.00474	0.0905	4.8	0.0090	8.13	Grab
21-Aug-05	27-Aug-05	*0.00020*	0.00079	*0.0050*	0.00076	0.00356	0.0680	3.7	0.0100	7.92	Grab
28-Aug-05	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]
4-Sep-05	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]
11-Sep-05	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]
18-Sep-05	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]
25-Sep-05	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]

Note[1] - All concentrations are in mg/L except Radium 226 which is Bq/L and pH which is in pH units

Note [2] - "nd" refers to no effluent discharge to sample

Note [3] - due to weather conditions samples could not be collected the week of August 14th, two sets were collected the following week.

Concentrations in italicized font are less than the detection limit shown.

Table 1b. MONTHLY MEAN CONCENTRATIONS OF EFFLUENT FOR MMER SCHEDULE 4

MONTH OF	MONTHLY MEAN CONCENTRATION[1] OF DELETERIOUS SUBSTANCE[3] Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226
July/04	0.0002	0.00045	0.0129	0.00066	0.00095	0.0248	3	0.0058
August/04	0.0002	0.00071	0.00500	0.00082	0.00286	0.0563	3.6	0.0080
September/04	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]	nd[2]

Note[1] - All concentrations are in mg/L except Radium 226 which is Bq/L

Note [2] - "nd" refers to no effluent discharge to sample

Note[3] - Monthly Mean Concentrations - the MEAN value of the concentrations measured in all water samples collected during each month when a deleterious substance is deposited.

Table 1c. MASS LOADING OF DELETERIOUS SUBSTANCE FOR EACH DAY SAMPLED

Sample Taken During The Week of	Date Sample Taken	DAILY MASS LOADING OF DELETERIOUS SUBSTANCE (kg/day)[1]								Average Daily Flow Rate (m^3/day)[4]
		Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[1]	
3-Jul-05	6-Jul-05	0.002	0.002	0.042	0.001	0.005	0.108	34	42,353	8,471
10-Jul-05	13-Jul-05	0.001	0.002	0.018	0.008	0.003	0.075	11	18,178	3,636
10-Jul-05	16-Jul-05	0.001	0.001	0.148	0.001	0.003	0.060	10	30,086	3,343
17-Jul-05	23-Jul-05	0.001	0.003	0.027	0.001	0.006	0.177	16	27,214	5,443
24-Jul-05	30-Jul-05	0.000	0.001	0.011	0.000	0.003	0.092	7	11,299	2,260
31-Jul-05	6-Aug-05	0.001	0.003	0.034	0.003	0.011	0.240	20	33,734	6,747
7-Aug-05	13-Aug-05	0.002	0.006	0.056	0.012	0.017	0.348	34	89,872	11,234
14-Aug-05	24-Aug-05[3]	0.004	0.018	0.089	0.017	0.084	1.604	85	159,501	17,722
21-Aug-05	27-Aug-05	0.003	0.010	0.063	0.010	0.045	0.856	47	125,830	12,583
28-Aug-05	nd[2]	0	0	0	0	0	0	0	0	0
4-Sep-05	nd[2]	0	0	0	0	0	0	0	0	0
11-Sep-05	nd[2]	0	0	0	0	0	0	0	0	0
18-Sep-05	nd[2]	0	0	0	0	0	0	0	0	0
25-Sep-05	nd[2]	0	0	0	0	0	0	0	0	0

Note[1] - Mass Loading is in kilograms per day of the deleterious substance deposited except Radium 226 which is in Bq per day

Note [2] - "nd" refers to no effluent discharge to sample

Note [3] - August 24 data are presented in the week of the August 14th

Note [4] - Discharge for August 6 is an estimate pending verification by Teck Cominco.

Table 1d. MASS LOADING PER CALENDAR MONTH FOR EACH DELETERIOUS SUBSTANCE

CALENDAR MONTH OF	MASS LOADING[1] FOR DELETERIOUS SUBSTANCE (kg/month)[2]								Average Weekly Flow Rate[3] (m^3/week)	Total Monthly Volume[4] (m^3/month)
	Arsenic	Copper	Cyanide	Lead	Nickel	Zinc	TSS	Radium 226[2]		
July/04	0.03	0.06	1.53	0.08	0.12	3.16	483.14	800,602	32,412	143,540
August/04	0.07	0.29	1.87	0.32	1.21	23.62	1,438.14	3,169,267	84,501	374,218
September/04	0	0	0	0	0	0	0	0	0	0

Note[1] - Total Mass Loading for Calendar month calculated by multiplying the Average Daily Mass Loading for the Month x # days in the month

Note[2] - Mass loading units are in kg per month except Radium 226, which is in Bq permonth

Note[3] - Average Weekly Flow Rate calculated by multiplying Average Daily Flow Rate x 7 days per week

Note[4] - Total Monthly Volume calculated by multiplying Average Daily Flow Rate for the month x days in month

Table 2

RESULTS OF ACUTE LETHALITY TESTS AND
DAPHNIA MAGNA MONITORING TESTS

Date Sample Collected	Effluent Acutely Lethal to Rainbow Trout (yes or no)	Effluent Acutely Lethal to *Daphnia magna* (yes or no)
16-Jul-05	No	No
6-Aug-05	No	No

Non-compliance Information

If effluent was non-compliant with the aurthorized limits set out in Schedule4, indicate the cause(s) of non-compliance and remedial measures planned or implemented. Also indicate remedial meaures planned or implemented in response to the failure of acute lethality tests.

There were no non-compliant concentrations, and no failed acute lethality toxicity tests during 2005 3rd Quarter for Polaris Mine.

Table 3. 2005 3rd Quarter Polaris Mine Effluent Characterization Results (Part 1, Section 4)

Effluent Characterization from Final Discharge Point - Garrow Lake Former Dam / Syphons
Northing: 75°22'32"
Easting: 96°48'37"

Facility Name:		Teck Cominco Metals Limited - Polaris Mine (Little Cornwallis Island)				
FDP Name:		Garrow Lake Syphons				
Sample ID:		G Creek	G-Creek	G-Creek		
Sampling Date:		6-Jul-05	16-Jul-05	6-Aug-05		
Sample Method:		Grab	Grab	Grab		
Parameter	**Units**				***Detection Limit***	**Methods[1]**
Hardness	mg/L	149	184	375	*0.54 - 5.4*	Calculation - EPA Method 3005A, ICPOES (EPA Method 6010B)[4]
Alkalinity, Total	mg/L	28.1	29.2	52.5	*2.0*	Colourimetry - APHA Method 2320 (potentiometric titration)
Aluminum, Total	mg/L	<0.20	0.0085	<0.20	*0.001 - 0.2*	ICPMS[3]
Cadmium, Total	mg/L	0.000034	0.000044	0.000097	*0.000020*	SPR-IDA[2], ICPMS[3]
Iron, Total	mg/L	0.012	0.043	0.014	*0.010*	SPR-IDA[2], ICPMS[3]
Mercury, Total	mg/L	<0.000010	<0.000010	<0.000010	*0.000010*	Cold Vapour Atomic Florescence Spectrophotometry
Molybdenum, Total	mg/L	<0.0050	<0.0050	<0.0050	*0.0050*	ICPMS[3]
Ammonia Nitrogen	mg/L	0.036	0.037	<0.020	*0.020*	APHA Method 4500-NH3 (selective ion electrode)
Nitrate Nitrogen	mg/L	0.032	<0.050	0.072	*0.025 - 0.050*	APHA Method 4110 (determination of inorganic ions by ion chromatography)
Arsenic, Total	mg/L	<0.00020	<0.00020	<0.00020	*0.00020*	Hydride-Vapour Atomic Absorption Spectrophotometry
Copper, Total	mg/L	0.000240	0.000424	0.000516	*0.000050*	Chelation SPR-IDA[2], ICPMS[3]
Cyanide, Total	mg/L	<0.0050	0.0444	<0.0050	*0.0050*	Colourimetry - APHA Method 4500-CN (cynate hydrolosis using an ammonia selective electrode
Lead, Total	mg/L	0.000166	0.000415	0.000467	*0.000050*	Chelation SPR-IDA[2], ICPMS[3]
Nickel, Total	mg/L	0.000601	0.000807	0.00166	*0.000050*	Chelation SPR-IDA[2], ICPMS[3]
Zinc, Total	mg/L	0.0127	0.0179	0.0356	*0.00050*	Chelation SPR-IDA[2], ICPMS[3]
Total Suspended Solids	mg/L	4.0	<3.0	<3.0	*3.0*	Gravimetry - APHA Method 2540 (filtration through glass fibre filter)
Radium-226 (a)	Bq/L	0.0050	0.009	<0.0050	*0.0050*	Radio Chemistry[5]
pH	pH units	7.49	7.59	7.65	*0.010*	APHA Method 4500-H (pH electrode meter)

Notes:

< = Less than the detection limit indicated.

(a) Results are expressed as Becquerels per litre (Bq/L). This analysis is subcontracted to SRC, Saskatoon.

[1]Original data reports are available upon request

[2]SPR-IDA = Suspended Particulate Resin consisting of immobilized iminodiacetate on a divinyl benzene polymer is used to chelate and preconcentrate metals in seawater (preparation technique).

[3]Instrumental analysis is by ICPMS = Inductively Coupled Mass Spectrometry.

[4]This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998, published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the USEPA. The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emissionspectrophotometry ICPOES (EPA Method 6010B).

[5]All radium isotopes in the sample solution are separated by coprecipitation with lead sulfate. The precipitate is redissolved and the radium isotopes are separated by coprecipitation with barium sulfate. The precipitate is filtered and mounted on a stainless steel disk. It is then counted on an alpha spectrometer. The radium 226 alpha energy is distinct and the peak can be clearly identified.

Table 4. 2005 3rd Quarter Polaris Mine Water Quality Monitoring Results (Part 1, Section 7)

Station:		Exposure Area		Reference Area			
Description:		Garrow Bay at Mouth of Garrow Creek Confluence		Garrow Bay ~1km NE of exposure station (confluence with Garrow Creek).			
Northing:		75°22'15"		75°22'40"			
Easting:		96°48'30"		96°47'12"			
Facility Name:		Teck Cominco Metals Limited - Polaris Mine (Little Cornwallis Island)		Teck Cominco Metals Limited - Polaris Mine (Little Cornwallis Island)			
FDP Name:		Garrow Lake Syphons		Garrow Lake Syphons			
Area Name:		Garrow Bay Exposure		Garrow Bay Reference			
Sample ID:		G-BAY	G-Bay (b)	T-BAY REF	Ref		
Sampling Date:		16-Jul-05	6-Aug-05	16-Jul-05	6-Aug-05		
Sample Method:		Grab	Grab	Grab	Grab		
Parameters	**Units**					***Detection Limit***	**Methods[1]**
Hardness	mg/L	215	385	271	840	*0.54-5.4*	Calculation - EPA Method 3005A, ICPOES (EPA Method 6010B)[4]
Alkalinity, Total	mg/L	44.2	63.2	23.0	53.5	*2.0*	Colourimetry - APHA Method 2320 (potentiometric titration)
Aluminum, Total	mg/L	0.0519	<0.10	0.0619	<0.10	*0.001-0.2*	ICPMS[3]
Cadmium, Total	mg/L	0.000051	0.000081	<0.000020	<0.000020	*0.000020*	SPR-IDA[2], ICPMS[3]
Iron, Total	mg/L	0.207	0.015	0.217	0.011	*0.010*	SPR-IDA[2], ICPMS[3]
Mercury, Total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	*0.000010*	Cold Vapour Atomic Florescence Spectrophotometry
Molybdenum, Total	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	*0.0050*	ICPMS[3]
Ammonia Nitrogen	mg/L	0.048	<0.020	<0.020	<0.020	*0.020*	APHA Method 4500-NH3 (selective ion electrode)
Nitrate Nitrogen	mg/L	<0.050	0.092	<0.050	0.0261	*0.025*	APHA Method 4110 (determination of inorganic ions by ion chromatography)
Arsenic, Total	mg/L	<0.00020	<0.00020	0.00050	0.00024	*0.00020*	Hydride-Vapour Atomic Absorption Spectrophotometry
Copper, Total	mg/L	0.000748	0.000608	0.000563	0.000305	*0.000050*	Chelation SPR-IDA[2], ICPMS[3]
Cyanide, Total	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	*0.0050*	Colourimetry - APHA Method 4500-CN (cynate hydrolosis using an ammonia selective electrode
Lead, Total	mg/L	0.00147	0.000517	0.000690	0.000078	*0.000050*	Chelation SPR-IDA[2], ICPMS[3]
Nickel, Total	mg/L	0.00126	0.00188	0.000554	0.000412	*0.000050*	Chelation SPR-IDA[2], ICPMS[3]
Zinc, Total	mg/L	0.0154	0.0224	0.00323	0.00122	*0.00050*	Chelation SPR-IDA[2], ICPMS[3]
Total Suspended Solids	mg/L	16.7	<3.0	<3.0	<3.0	*3.0*	Gravimetry - APHA Method 2540 (filtration through glass fibre filter)
Radium-226 (a,b)	Bq/L	0.010	n/a	<0.0050	<0.0050	*0.0050*	Radio Chemistry[5]
pH	pH units	7.64	7.96	7.40	7.89	*0.010*	APHA Method 4500-H (pH electrode meter)
Water Temperature[6]	°C	0.2	0.6	-0.1	0.2	*n/a*	Field - Campbell Scientific Hydrolab Model H20, or YSI Meter Model 85
Dissolved Oxygen[6]	mg/L	13.2	11.6	15.2	13.9	*n/a*	Field - Campbell Scientific Hydrolab Model H20, or YSI Meter Model 85

Notes

The Garrow Bay exposure area (mouth of the creek), and Garrow Bay reference area were frozen during the July 6, 2005 sampling event.

< = Less than the detection limit indicated.

(a) Results are expressed as Becquerels per litre (Bq/L). This analysis is subcontracted to SRC, Saskatoon.

(b) n/a for August 6, 2005 sample = not available, the sample was lost during analysis by SRC with no additional sample remaining to repeat the analysis.

[1]Original data reports are available upon request

[2]SPR-IDA = Suspended Particulate Resin consisting of immobilized iminodiacetate on a divinyl benzene polymer is used to chelate and preconcentrate metals in seawater (preparation technique).

[3]Instrumental analysis is by ICPMS = Inductively Coupled Mass Spectrometry.

[4]This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998, published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the USEPA. The procedures may involve preliminary sample treatment by acid digestion, using either hotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emissionspectrophotometry ICPOES (EPA Method 6010B).

[5]All radium isotopes in the sample solution are separated by coprecipitation with lead sulfate. The precipitate is redissolved and the radium isotopes are separated by coprecipitation with barium sulfate. The precipitate is filtered and mounted on a stainless steel disk. It is then counted on an alpha spectrometer. The radium 226 alpha energy is distinct and the peak can be clearly identified.

[6]Temperature and dissolved oxygen data are estimated pending verification by Teck Cominco.

Table 5. 2005 3rd Quarter Polaris Mine QAQC Sample Results[1] Including Field Duplicates, Field Blanks, and Transport Blanks.

Sample Type:		Field Duplicate	Original Sample		Field Duplicate	Original Sample		Field Duplicate	Original Sample	
Sample ID:		Dup	G Creek		DUP	G-Creek		Dup	Ref	
Location:		Garrow Lake Syphons			Garrow Lake Syphons			Garrow Bay Reference		
Description:		Final Discharge Point		RPD[2]	Final Discharge Point		RPD[2]	~1km NE of confluence with Garrow Creek		RPD[2]
Sampling Date:		6-Jul-05		(%)	16-Jul-05		(%)	6-Aug-05		(%)
Parameters	**Parameter Units**									
Hardness	mg/L	140	149	6.0	187	184	1.6	852	840	1.4
Alkalinity, Total	mg/L	28.0	28.1	0.4	29.0	29.2	0.7	53.8	53.5	0.6
Aluminum, Total	mg/L	<0.10	<0.20	n/a	0.0087	0.0085	2.4	<0.10	<0.10	n/a
Cadmium, Total	mg/L	0.000040	0.000034	17.6	0.000049	0.000044	11.4	<0.000020	<0.000020	n/a
Iron, Total	mg/L	0.013	0.012	8.3	0.043	0.043	0.0	0.011	0.011	0.0
Mercury, Total	mg/L	<0.000010	<0.000010	n/a	<0.000010	<0.000010	n/a	<0.000010	<0.000010	n/a
Molybdenum, Total	mg/L	<0.0050	<0.0050	n/a	<0.0050	<0.0050	n/a	<0.0050	<0.0050	n/a
Ammonia Nitrogen	mg/L	0.032	0.036	11.1	0.044	0.037	18.9	<0.020	<0.020	n/a
Nitrate Nitrogen	mg/L	0.028	0.032	12.5	<0.050	<0.050	n/a	0.0348	0.0261	33.3
Arsenic, Total	mg/L	0.00021	<0.00020	n/a	<0.00020	<0.00020	n/a	<0.00020	0.00024	n/a
Copper, Total	mg/L	0.000295	0.000240	22.9	0.000376	0.000424	11.3	0.000321	0.000305	5.2
Cyanide, Total	mg/L	<0.0050	<0.0050	n/a	0.0058	0.0444	86.9	<0.0050	<0.0050	n/a
Lead, Total	mg/L	0.000241	0.000166	45.2	0.000409	0.000415	1.4	0.000062	0.000078	20.5
Nickel, Total	mg/L	0.000673	0.000601	12.0	0.000819	0.000807	1.5	0.000460	0.000412	11.7
Zinc, Total	mg/L	0.0136	0.0127	7.1	0.0185	0.0179	3.4	0.00165	0.00122	35.2
Total Suspended Solids	mg/L	<3.0	4.0	n/a	<3.0	<3.0	n/a	<3.0	<3.0	n/a
Radium-226 (a,b)	Bq/L	<0.0050	0.0050	n/a	<0.0050	0.009	n/a	0.0060	<0.0050	n/a
pH	pH units	7.62	7.49	1.7	7.58	7.59	0.1	7.80	7.89	1.1
Salinity	o/oo	<1.0	<1.0	n/a	<1.0	<1.0	n/a	4.6	4.6	0.0
Calcium, Total	mg/L	16.5	19.1	13.6	21.4	21.1	1.4	58.1	57.6	0.9
Magnesium, Total	mg/L	24.0	24.6	2.4	32.3	31.9	1.3	172	169	1.8

Notes

[1]QAQC samples were collected during each EEM monitoring event. At least one field duplicate and/or one blank sample was collected during each event.

[2]RPD = Relative Percent Difference = [Absolute value (DUP-ORIG)/ORIG]*100%

Cells in grey shading have RPD values >50% for co-located field duplicates

[3]Distilled water from onsite distiller, stored for 1 year in jerry cans onsite.

[4]Commercial distilled water transported to mine site.

QAQC Results

A total of 3 duplicate samples and 5 blank samples were collected during the 2005 EEM program at Polaris mine. All RPD values were less than 50%, with the exception of one measurement of cyanide on July 16, 2005. Cyanide is not used in the process and is typically measured at less than the detection limit. With the exception of the aforementioned cyanide measurement, which is questionable, the data generally indicate good reproducibility between co-located field duplicates (i.e., low measurement and analytical variability).

Blank samples from the on-site distilled water that had been stored indicated relatively high levels of zinc, copper, and lead. This contamination was considered to be a result of the storage procedure and metal leaching from the metal jerry cans that the water was stored in for the year. The transport blanks using commmercial distilled water indicated low concentrations of all paramters (i.e., typically less than, or slightly higher than detection limits), which reveals no background contamination issues with the analysis.

Table 5. 2005 3rd Quarter Polaris Mine QAQC Sample Results[1] Including Field Duplicates, Field Blanks, and Transport Blanks.

Sample Type:		Field Blank	Field Blank	Field Blank	ALS Travel Blank	ALS Travel Blank
Sample ID:						
Location:		n/a	n/a	n/a	n/a	n/a
Description:		Distilled Water[3]	Distilled Water[3]	Distilled Water[3]	Distilled Water[4]	Distilled Water[5]
Sampling Date:		6-Jul-05	16-Jul-05	6-Aug-05	24-Aug-05	24-Aug-05
Parameters	**Parameter Units**					
Hardness	mg/L	3.07	<0.54	0.85	<0.50	<0.50
Alkalinity, Total	mg/L	3.2	<2.0	<2.0	<2.0	<2.0
Aluminum, Total	mg/L	<0.0010	<0.0050	<0.10	<0.0010	<0.0010
Cadmium, Total	mg/L	<0.000050	<0.000020	<0.000050	<0.000020	<0.000050
Iron, Total	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Mercury, Total	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum, Total	mg/L	<0.000050	<0.0050	<0.0050	<0.000050	<0.000050
Ammonia Nitrogen	mg/L	<0.020	<0.020	<0.020	-	-
Nitrate Nitrogen	mg/L	<0.0050	<0.0050	<0.0050	-	-
Arsenic, Total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Copper, Total	mg/L	0.00484	0.00167	0.0244	<0.000050	<0.00010
Cyanide, Total	mg/L	<0.0050	<0.0050	<0.0050	-	-
Lead, Total	mg/L	0.00212	0.00607	0.0445	<0.000050	<0.000050
Nickel, Total	mg/L	<0.00010	<0.000050	<0.00050	<0.000050	<0.00010
Zinc, Total	mg/L	0.0080	0.00440	0.0040	<0.00050	<0.0010
Total Suspended Solids	mg/L	<3.0	<3.0	<3.0	<3.0	<3.0
Radium-226 (a,b)	Bq/L	<0.0050	<0.0050	<0.0050	-	-
pH	pH units	6.27	5.59	6.17	5.51	5.53
Salinity	o/oo	<1.0	<1.0	<1.0	<1.0	<1.0
Calcium, Total	mg/L	1.23	0.084	0.341	<0.050	<0.050
Magnesium, Total	mg/L	<0.10	<0.10	<0.10	<0.050	<0.050

POLARIS MINE – 2005 3rd QUARTER MMER REPORT

APPENDIX A

i. Information specified by Section 8.1 of Reference Method EPS 1/Rm/13: 96 hr acute rainbow trout test

APPENDIX B

i. Information specified by Section 8.1 of Reference Method EPS 1/Rm/14: 72 hr acute *Daphnia magna* test

APPENDIX C

i. Information specified in Schedule 5 of the MMER (June 2002) for Reference Method EPAW 95-EPA West Coast: 7-day Topsmelt Survival and Growth Tests.

APPENDIX D

i. Information specified in Schedule 5 of the MMER (June 2002) for Reference Method EPS 1/Rm/27-EC: 92 hr Echinoderm (sand dollar) Fertilization Test

APPENDIX E

i. Information specified in Schedule 5 of the MMER (June 2002) for Reference Method EPA/600/4-91-003, Method 1009.0: Algae (*Champia parvula*) 7-day Sublethal Growth Tests

APPENDIX F

i. Results of Effluent Characterization, as per Paragraph 15(1)(a)

APPENDIX G

ii. Acute toxicity testing laboratory reports

APPENDIX H

i. Sublethal toxicity testing laboratory reports

APPENDIX I

i. Polaris 2005 Sampling Event Chronology

APPENDIX J

i. Letter from ALS explaining missed holding times for July 6, 2005 sample

APPENDIX A

96-h Acute Rainbow Trout Toxicity Test

Section 8.1.1 Effluent

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for monthly acute toxicity testing were collected
   - Test 1: Saturday July 16, 2005 – 0900h
   - Test 2: Saturday August 6, 2005 – 1000h

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method

- Water was collected from at least 15cm below the surface using a water pump with silicon tubing
- Water was collected from the upstream direction
- The pump was flushed with site water for at least one minute prior to sample collection
- 2 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Blake Hamer (Gartner Lee) Test 1
   - Brenda Bolton (Gartner Lee) Test 2

vii. Labeling/coding of sample (Sample IDs)
   - Test 1 – G-Creek_Acute_071605
   - Test 2 – Garrow Creek

viii. Date & time of sample receipt
   - Samples for sublethal toxicity testing were received:
     Test 1 – Tuesday July 19, 2005 – 1045h
     Test 2 – Tuesday August 9, 2005 – 1015h

ix. Temperature upon sample receipt at laboratory
   - Test 1 – 12.7 °C
   - Test 2 – 19.0 °C

Section 8.1.2 Test Facilities and Conditions

i. Test type & method
   - 96-hour Rainbow Trout LC_{50}

ii. Indications of deviations from requirements in Sections 2 to 7 of Method EPS 1/RM/13
   - No deviations from requirements

iii. Name and city of testing laboratory

- EVS Environment Consultants, North Vancouver, BC

iv. Source of test species
   - Sun Valley

v. Percent mortality of fish in stock tank(s)
   - Test 1: 0.1%
   - Test 2: 0.1%

vi. Species of test organism
   - Rainbow Trout (*Oncorhynchus mykiss*)

vii. Date and time for start of definitive test
   - Test 1: July 21, 2005 – 1035h
   - Test 2: August 11, 2005 – 1500h

viii. Person(s) performing the test and verifying the results

- Test 1: Marriah Grey, Robert Harrison, Julianna Kalocai
- Test 2: Anja Fouche, Robert Harrison, Julianna Kalocai

ix. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
- Test 1: pH - 7.3, T - 15.0 °C, DO - 10.4 mg/L, C – 1445 µmhos/cm
- Test 2: pH - 7.4, T - 15.0 °C, DO - 10.1 mg/L, C – 2510 µmhos/cm

x. Confirmation that no adjustment of sample or solution pH occurred
- Test 1: No pH adjustment
- Test 2: No pH adjustment

xi. Indication of aeration of test solutions before introduction of fish
- Test 1: 6.5 ± 1 mL/min/L for 30mins
- Test 2: 6.5 ± 1 mL/min/L for 30mins

xii. Concentrations and volumes tested
- Concentrations (% effluent volume / total volume) tested and total volumes used were:
- Control (0%) - 10 L (test 1&2)
- 6.25% - 10 L (test 1&2)
- 12.5% - 10 L (test 1&2)
- 25% - 10 L (test 1&2)
- 50% - 10 L (test 1&2)
- 100% - 10 L (test 1&2)

xiii. Measurements of dissolved oxygen, pH and temperature

Sample Collection Date	Test Concentration (% v/v)	Temperature (0hr) (°C)	Temperture (48 hr) (°C)	Dissolved Oxygen (0hr) (mg/L)	Dissolved Oxygen (48hr) (mg/L)	pH (0hr) pH units	pH (48hr) pH units	Conductivity (0hr) umhos/cm
Test 1	0 (Control)	15	15	10.1	9.7	7	6.7	37
16-Jul-05	6.25	15	15	10.1	9.5	7.1	6.8	194
	12.5	15	15	10.1	9.8	7.1	6.8	301
	25	15	15	10.1	9.8	7.1	6.8	418
	50	15	15	10.1	9.8	7.2	6.9	775
	100	15	15	10.2	9.8	7.3	7	1445
Test 2	0 (Control)	15	15	10.1	9.3	7	7	40
19-Aug-05	6.25	15	15	10.1	9.4	7	7	323
	12.5	15	15	10.1	9.4	7	7.1	535
	25	15	15	10.1	9.6	7	7.1	827
	50	15	15	10.1	9.6	7.2	7.2	1373
	100	15	15	10.1	9.7	7.4	7.3	2510

xiv. Number of fish added to each test vessel
- 10 fish/ 10 L vessel (Test 1 & 2)

xv. Mean and range of fork length of control fish at end of test
- Test 1: 30 mm (25 – 33)
- Test 2: 31 mm (27 – 35)

xvi. Mean wet weight of individual control fish at end of the test
- Test 1: 0.29 g (0.20 – 0.37)
- Test 2: 0.33 g (0.22 – 0.46)

xvii. Estimated loading density of fish in test solutions
- Test 1: 0.29 g/L
- Test 2: 0.33 g/L

Section 8.1.3 Results

i. Number of mortalities of fish in each test solution
   - Results were the same for Test 1, and Test 2, except where noted
   - Control (0%) - 0
   - 6.25% - 0
   - 12.5% - 0
   - 25% - 0
   - 50% - 0
   - 100% - 0

ii. Number of control fish showing atypical/stressed behaviour
   - None in Test 1 or Test 2

iii. Mean mortality rate in solutions of effluent and control water
   - Results were the same for Test 1 and Test 2
   - Control (0%) - 0%
   - 6.25% - 0%
   - 12.5% - 0%
   - 25% - 0%
   - 50% - 0%
   - 100% - 0%

iv. Estimate of 96-h LC50 in multi-concentration tests
   - Results were the same for Test 1 and Test 2
   - 96hr LC_{50} concentration > 100% effluent

v. Most recent 96-h LC50 for reference toxicity test(s)
   - Reference toxicity tests for Toxicant: SDS
   - Test 1 & 2: (Jul-12-03) 96-h LC_{50} = 24mg/L SDS, 95% CL = 18-32mg/L

vi. Reference toxicant warning limits (mean +/- 2SD)
   - Reference toxicity tests for Toxicant: SDS
   - Test 1 & 2: 96-h LC_{50} = 29 +/- 12 mg/L SDS

APPENDIX B

72-h Acute *Daphnia magna* Toxicity Test

Section 8.1.1 Effluent

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for monthly acute toxicity testing were collected
   - Test 1: Saturday July 16, 2005 – 0900h
   - Test 2: Saturday August 6, 2005 – 1000h

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 2 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Blake Hamer (Gartner Lee) Test 1
   - Brenda Bolton (Gartner Lee) Test 2

vii. Labeling/coding of sample (Sample IDs)
   - Test 1 – G-Creek_Acute_071605
   - Test 2 – Garrow Creek

viii. Date & time of sample receipt
   - Samples for sublethal toxicity testing were received:
     Test 1 – Tuesday July 19, 2005 – 1045h
     Test 2 – Tuesday August 9, 2005 – 1015h

ix. Temperature upon sample receipt at laboratory
   - Test 1 – 12.7 °C
   - Test 2 – 19.0 °C

Section 8.1.2 Test Facilities and Conditions

ii. Test type & method
   - 48-hour *Daphnia magna* LC_{50}

iii. Indications of deviations from requirements in Sections 2 to 7 of Method EPS 1/RM/13
   - No deviations from requirements

iv. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

v. Species of test organism
   - *Daphnia magna*

vi. Date and time for start of definitive test
   - Test 1: July 19, 2005 – 1600h
   - Test 2: August 11, 2005 – 1030h

vii. Person(s) performing the test and verifying the results
   - Test 1: Shiva Behnia, Julianna Kalocai
   - Test 2: Shiva Behnia, Julianna Kalocai

viii. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
   - Test 1: pH - 7.3, T – 21.0 °C, DO - 10.8 mg/L, C – 1566 µmhos/cm
   - Test 2: pH - 7.5, T - 21.0 °C, DO - 10.8 mg/L, C – 2850 µmhos/cm

ix. Confirmation that no adjustment of sample or solution pH occurred
- Test 1: No pH adjustment
- Test 2: No pH adjustment

x. Indication of any adjustment of hardness of effluent sample
- Test 1: No hardness adjustment (initial hardness = 160 mg/L)
- Test 2: No hardness adjustment (initial hardness = 300 mg/L)

xi. Indication of any aeration of sample
- Test 1: 25-50 mL/min/L for 12mins
- Test 2: 25-50 mL/min/L for 15mins

xii. Concentrations and volumes tested
- Concentrations (% effluent volume / total volume) tested and total volumes used for both Test 1 and Test 2 were:
- Control (0%) - 200 mL
- 6.25% - 200 mL
- 12.5% - 200 mL
- 25% - 200 mL
- 50% - 200 mL
- 100% - 200 mL

xiii. Measurements of dissolved oxygen, pH and temperature

Sample Collection Date	Test Concentration (% v/v)	Temperature (0hr) (°C)	Temperture (48 hr) (°C)	Dissolved Oxygen (0hr) (mg/L)	Dissolved Oxygen (48hr) (mg/L)	pH (0hr) pH units	pH (48hr) pH units	Conductivity (0hr) umhos/cm	Hardness (0hr) (mg/L)
Test 1	0 (Control)	20	21	9.1	8.7	7.6	7.6	344	94
16-Jul-05	6.25	20	21	9.1	8.7	7.6	7.6	426	
	12.5	20	21.5	9	8.7	7.6	7.7	505	
	25	20.5	21.5	9	8.7	7.6	7.7	648	
	50	20.5	21	9	8.7	7.4	7.7	954	
	100	21	21.5	8.9	8.7	7.4	7.5	1566	160
Test 2	0 (Control)	20	21	9.1	8.6	7.4	7.6	354	94
19-Aug-05	6.25	20	21	9	8.5	7.4	7.7	505	
	12.5	20.5	21	9	8.5	7.5	7.7	654	
	25	20.5	21	8.9	8.5	7.5	7.7	990	
	50	21	21	8.9	8.5	7.5	7.6	1582	
	100	21	21	8.9	8.5	7.6	7.6	2850	300

xiv. Estimates of time to first brood, average number of neonates per brood, and percent mortality during the seven-day period prior to the test
- Test 1: 8 days to brood, >34 neonates/brood, 0% mortality in 7d prior to test
- Test 2: 7 days to brood, >29 neonates/brood, 0% mortality in 7d prior to test

xv. Number of neonates per test vessel and milliliters of solution per daphnid
- Methods for all tests and dilution series were the same:
- 10 neonates per vessel
- 200 mL of solution per vessel
- 20 mL of solution per daphnid

Section 8.1.3 Results

i. Number of dead and/or immobile daphnids in each test solution including controls
   - Results were the same for Test 1 and Test 2
   - Control (0%) - 0 dead / immobile
   - 6.25% - 0 dead / immobile
   - 12.5% - 0 dead / immobile
   - 25% - 0 dead / immobile
   - 50% - 0 dead / immobile
   - 100% - 0 dead / immobile

ii. For single-concentration test the number of daphnids dead in each of three replicate effluent solutions and in each of three replicate control solutions at end of test. Also report the mean value.
   - Single concentration test was not conducted, dilution series tests were conducted

iii. Estimate of 48-h LC50 and 95% confidence limits in multi-concentration tests, 48-h EC50 for immobilization and 95% confidence limits, indication of statistical method on which results are based.
   - Test 1: 48-h LC_{50} = > 100% effluent
   - Test 2: 48-h LC_{50} = > 100% effluent

iv. Most recent 48-h LC50 for reference toxicant test(s), reference chemical(s), date test initiated, historic geometric mean LC50 and warning limits.
   - Reference toxicity tests for Toxicant: Zinc
   - Test 1: (Jul-19-05) 96-h LC_{50} = 426µg/L Zinc, 95% CL = 362 – 504 µg/L
   - Test 2: (Aug-15-05) 96-h LC_{50} = 481µg/L Zinc, 95% CL = 388 – 597 µg/L

v. Reference toxicant warning limits (mean +/- 2 SD)
   - Reference toxicity tests for Toxicant: Zinc
   - Test 1: 96-h LC_{50} = 445 (+/- 280) µg/L Zinc
   - Test 2: 96-h LC_{50} = 445 (+/- 280) µg/L Zinc

APPENDIX C

7-d Topsmelt Growth and Survival Toxicity Test

Effluent Sample

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for sublethal toxicity testing were collected:
     Test 1 – Saturday July 16, 2005 – 0900h
     Test 2 – Saturday August 6, 2005 – 1000h

iii. Type of sample
   - Final effluent water from final discharge point

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 3 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Blake Hamer (Gartner Lee) Tests 1
   - Brenda Bolton (Gartner Lee) Test 2

vii. Labeling/coding of sample (Sample IDs)
   - Test 1 – G-Creek_Sublethal_071605
   - Test 2 – Garrow Creek

viii. Date & time of sample receipt
   - Samples for sublethal toxicity testing were received:
     Test 1 – Tuesday July 19, 2005 – 1045h
     Test 2 – Tuesday August 9, 2005 – 1015h

ix. Temperature upon sample receipt at laboratory
   - Test 1 – 12.7 °C
   - Test 2 – 19.0 °C

Test Organisms Imported from External Supplier

i. Species of test organism
   - Topsmelt (*Atherinops affinis*)

ii. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

iii. Source of test species
   - Aquatic Bio Systems (ABS), Fort Collins, Colorado

iv. Date test species acquired on
   - Test 1 – July 19, 2005
   - Test 2 – August 9, 2005

v. Indications of deviations from EC guidance on the importation of test organisms
   - No deviations from EC requirements

vi. Percent mortality of fish in 24-hour period preceding the test
   - Test 1 - <10% mortality in approximately 450 fish upon receipt
   - Test 2 - <10% mortality in approximately 450 fish upon receipt

vii. Age at start of test
   - Test 1 – 10 days post-hatch
   - Test 2 – 10 days post-hatch

viii. Unusual appearance, behaviour, or treatment of larvae before their use in the test
- Nothing unusual noted for any test

ix. Confirmation that larvae are actively feeding and swimbladders are not inflated
- All tests - Larvae actively feeding and swimbladders not inflated

x. Confirmation that temperature change was <3°C and dissolved oxygen was maintained at >6mg/L during transport
- Temperature change was <2°C and dissolved oxygen supersaturated mg/L during transport

xi. Test organism acclimation rate at the testing laboratory
- For both tests: Organisms were received on the day of set-up
- Organisms were received in holding water conditions of DO=supersaturated, pH = 7.3, T = 21°C, salinity = 33ppt
- Organisms were acclimated to EVS water holding conditions of DO = 7.5 mg/L, pH = 7.8, T=20°C salinity = 28-29ppt,
- Acclimation was conducted in the lab on the day of the test by adding lab seawater at approximately 30 min. intervals. The differences between the water quality upon receipt and EVS holding conditions were minor.

Test Facilities and Conditions

i. Test type & method
- 7-day Topsmelt (*Atherinops affinis*) Survival and Growth Toxicity Test
- Static renewal
- Sample water was renewed daily
- Reference Method - EPA/600/R-95/136 (EPAW 95-EPA West Coast)

ii. Dates or test days during test when subsamples or multiple samples were renewed
- Samples were renewed daily for all tests (Test Day 1,2,3,4,5,6)
- Three subsamples were used on days i) 0-1; ii) 2-3; and iii) 4-5-6-7

iii. Indications of deviations from requirements in Sections 11 of Method EPA/600/R-95/136 (EPAW 95-EPA West Coast)
- No deviations from requirements
- Salinity controls were run
- Sample water salinity for
    - Test 1 was 6 ppt
    - Test 2 was 1.0 ppt

iv. Date and time for start of definitive test
- Test 1 Tuesday July 19, 2005 – 1430h
- Test 2 Tuesday August 9, 2005 – 1500h

v. Date for test completion
- Test 1 July 26, 2005
- Test 2 August 16, 2005

vi. Test vessel description
- For all tests was a 600mL beaker

vii. Person(s) performing the test and verifying the results
- Test 1: Testing and overall setup conducted by: Jenny Shao and QA/QC by: Julianna Kalokai
- Test 2: Testing and overall setup conducted by: Jenny Shao and QA/QC by: Julianna Kalokai

viii. pH, temperature, dissolved oxygen, and conductivity of unadjusted, undiluted effluent
- Test 1: pH 7.7, T 20.0 °C, DO 11.1 mg/L, C 1520 µmhos/cm
- Test 2: pH 7.7, T 20.0 °C, DO 9.8 mg/L, C 2700 µmhos/cm

ix. Confirmation that no adjustment of sample or solution pH occurred
- For both tests, no pH adjustment

x. Indication of aeration of test solutions before introduction of fish
- For both tests, no pre-aeration was conducted, none was required

xi. Indication that EC guidance document for salinity adjustment was followed
- The following was done for all 3 tests:
    - No deviations from EC guidance document on preparation of hypersaline brine (HSB)
    - HSB prepared from natural seawater concentrated to 90ppt (by filtering to at least 10 μm before placing it into the freezer and then freezing/refreezing to remove frozen layer and concentrate salts in the hypersaline brine)
    - No deviations from EC guidance document for salinity adjustment of sample
    - HSB was added to samples to salinity adjust them to ~30ppt
    - For a 200mL volume the concentrations were prepared by adding:
        - Test 1: 143mL of effluent + 57mL of HSB for the highest concentration. This solution was then diluted using natural seawater for the lower test concentrations (i.e., 50% of the highest concentration + 50% of the dilution water, repeated for subsequent dilutions).
        - Test 2: 135mL of effluent + 65mL of HSB for the highest concentration. This solution was then diluted using natural seawater for the lower test concentrations (i.e., 50% of the highest concentration + 50% of the dilution water, repeated for subsequent dilutions).

xii. Type and source of control/dilution water
- For all 3 tests, control/dilution water was UV-sterilized, 0.45μm-filtered natural seawater from the Vancouver Aquarium

xiii. Concentrations and volumes tested:
- Concentrations (% effluent volume / total volume) tested and total volumes used were:
- For Test 1:
    - Control (0%) - 200 mL
    - Salinity Control (0%) - 200 mL
    - 4.5% - 200mL
    - 8.9% - 200mL
    - 17.9% - 200mL
    - 35.7% - 200mL
    - 71.4% - 200mL
- For Test 2:
    - Control (0%) - 200 mL
    - Salinity Control (0%) - 200 mL
    - 4.2% - 200mL
    - 8.4% - 200mL
    - 16.9% - 200mL
    - 33.7% - 200mL
    - 67.4% - 200mL

xiv. Number of replicated per concentration
- For both tests: 5 replicates per concentration

xv. Number of organisms added to each test vessel
- For both tests: 5 fish per vessel

xvi. Manner and rate of exchange of test solutions
- For both tests: Daily renewal

xvii. Measurements of dissolved oxygen, pH and temperature, and salinity for each 24 hr period

- Test 1: See attached photocopied pages 1 and 2 of original laboratory report
- Test 2: See attached photocopied pages 3 and 4 of original laboratory report

Results

i. Number and % of mortalities of fish in each test solution. Note that this data is presented in units of number of SURVIVORS and % MORTLITY. (Data is entered from original handwritten tables in lab reports)

- Test 1: Totals from all 5 replicates are presented:

Concentration		Number of Survivors - Day of Test							% Mortality on the Day of Test						
(% effluent v/v)	Replicate	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
Brine	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
Control	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
4.5%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	4	0	0	0	0	0	0	20
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
8.9%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	4	0	0	0	0	0	0	20
17.9%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
35.7%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
71.4%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	4	0	0	0	0	0	0	20
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0

- Test 2: Totals from all 5 replicates are presented:

Concentration		Number of Survivors - Day of Test							% Mortality - Day of Test						
(% effluent v/v)	Replicate	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0

Concentration		Number of Survivors - Day of Test							% Mortality - Day of Test						
(% effluent v/v)	Replicate	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	B	5	5	5	5	5	5	4	0	0	0	0	0	0	20
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	4	0	0	0	0	0	0	20
Brine	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
Control	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	5	5	5	5	4	0	0	0	0	0	0	20
	E	5	5	4	4	4	4	3	0	0	20	0	0	0	20
4.2%	A	5	5	4	4	4	4	4	0	0	20	0	0	0	20
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	4	4	4	4	4	4	0	20	0	0	0	0	0
	E	5	4	4	4	4	4	4	0	20	0	0	0	0	0
8.4%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	4	0	0	0	0	0	0	20
	D	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
16.9%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	4	4	4	4	4	0	0	20	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	4	4	4	4	3	0	0	20	0	0	0	20
	E	5	5	5	5	5	5	4	0	0	0	0	0	0	20
33.7%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	C	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	D	5	5	4	4	4	4	4	0	0	20	0	0	0	0
	E	5	5	5	5	5	5	5	0	0	0	0	0	0	0
67.4%	A	5	5	5	5	5	5	5	0	0	0	0	0	0	0
	B	5	4	4	4	4	4	4	0	20	0	0	0	0	0
	C	5	5	5	5	5	5	3	0	0	0	0	0	0	40
	D	5	5	5	5	5	5	4	0	0	0	0	0	0	20
	E	5	5	5	5	5	5	4	0	0	0	0	0	0	20

ii. Average dry weight (mg) per original fish in test vessel. No preservation of fish was used. Fish were dried and then weighed.

- Test 1: Mean dry weight (mg) of each replicate and overall means are presented:

Concentration	Replicate					Overall Mean	Standard Deviation
(% effluent v/v)	1	2	3	4	5		
D-Control	0.9600	1.0480	0.7560	1.0100	0.8060	0.9160	0.1284
B-Control	1.0780	1.1300	1.0720	0.9420	0.6900	0.9824	0.1775
4.5	0.7320	0.6840	0.9000	0.5200	1.0080	0.7688	0.1903
8.9	1.0120	1.1320	0.9960	0.5400	0.3960	0.8152	0.3253
17.9	0.9600	1.0280	0.9220	1.2440	0.9020	1.0112	0.1387
35.7	0.8420	1.2900	1.2400	0.9640	0.9900	1.0652	0.1916
71.4	1.2300	0.6620	0.9660	1.1000	0.5680	0.9052	0.2828

- Test 2: Mean dry weight (mg) of each replicate are presented:

Concentration	Replicate						
(% effluent v/v)	1	2	3	4	5	Overall Mean	Standard Deviation
D-Control	0.8000	0.6080	1.0980	0.7760	0.5640	0.7692	0.2105
B-Control	0.8380	1.0760	0.9920	0.8020	0.8620	0.9140	0.1155
4.2	0.8120	0.9280	0.9700	1.0420	0.5720	0.8648	0.1837
8.4	0.8980	0.8560	0.7120	1.0200	1.0200	0.9012	0.1285
16.9	0.9820	0.8880	0.6860	0.5780	0.6420	0.7552	0.1718
33.7	0.7260	0.9700	0.7060	0.6300	0.7240	0.7512	0.1284
67.4	1.0340	0.8380	0.6120	0.8640	0.7040	0.8104	0.1615

iii. Estimate of 7-d LC_{50} (95% CL)

- Test 1: 7-d LC_{50} concentration > 71.4% effluent (highest concentration tested due to dilution for salinity adjustment)
- Test 2: 7-d LC_{50} concentration > 67.4% effluent (highest concentration tested due to dilution for salinity adjustment)
- Quantal statistic methods not applicable

iv. Estimate of 7-d IC_{25} (95% CL) for growth

- Test 1: 7-d IC_{25} concentration > 71.4% effluent (highest concentration tested due to dilution for salinity adjustment)
- Test 2: 7-d IC_{25} concentration > 67.4% effluent (highest concentration tested due to dilution for salinity adjustment)

v. Current reference toxicity tests (95% CL) for 7-d LC_{50} for survival and 7-d IC_{50} for growth

- Test 1 :Reference toxicity tests for Toxicant: Copper
    - Test conducted on July 19, 2005, same day as effluent test
    - Reference toxicant test was conducted on the same batch of externally supplied topsmelt used in the effluent test and under the same experimental conditions as the effluent test
    - 7-d LC_{50} survival = 117 mg/L Cu, 95% CL = 100-136 mg/L
    - 7-d IC_{50} growth = 116 mg/L Cu, 95% CL = 81-156 mg/L
- Test 2 :Reference toxicity tests for Toxicant: Copper
    - Test conducted on August 9, 2005, same day as effluent test
    - Reference toxicant test was conducted on the same batch of externally supplied topsmelt used in the effluent test and under the same experimental conditions as the effluent test
    - 7-d LC_{50} survival = 103 mg/L Cu, 95% CL = 91-118 mg/L
    - 7-d IC_{50} growth = 95 mg/L Cu, 95% CL = 75-127 mg/L

vi. Reference toxicity warning limits (+/- SD) for 7-d LC_{50} for survival and 7-d IC_{50} for growth

- Test 1: Reference toxicity tests for Toxicant: Copper
    - 7-d LC_{50} survival = 133 ± 39mg/L Cu
    - 7-d IC_{50} growth = 132 ± 46mg/L Cu
- Test 2: Reference toxicity tests for Toxicant: Copper
    - 7-d LC_{50} survival = 132 ± 40mg/L Cu,
    - 7-d IC_{50} growth = 133 ± 40mg/L Cu

APPENDIX D

92-h Echinoderm Fertilization Test

Reporting Requirements for Reference Method EPS1/RM/27-EC 92 (Sperm Cell)

Effluent Sample

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75^{o} 22' 32" N, 97^{o} 48' 37" W.

ii. Date & time of sampling
   - Samples for sublethal toxicity testing were collected:
     Test 1 – Saturday July 16, 2005 – 0900h
     Test 2 – Saturday August 6, 2005 – 1000h

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 4 x 20L sample bottles were filled

vi. Name of person submitting samples
   - Blake Hamer (Gartner Lee) Tests 1
   - Brenda Bolton (Gartner Lee) Test 2

x. Labeling/coding of sample (Sample IDs)
   - Test 1 – G-Creek_Sublethal_071605
   - Test 2 – Garrow Creek

xi. Date & time of sample receipt
   - Samples for sublethal toxicity testing were received:
     Test 1 – Tuesday July 19, 2005 – 1045h
     Test 2 – Tuesday August 9, 2005 – 1015h

xii. Temperature upon sample receipt at laboratory
   - Test 1 – 12.7 °C
   - Test 2 – 19.0 °C

Test Organisms

i. Species of test organism
   - Sandollar Echinoid (*Dendraster excentricus*)

ii. Name and city of testing laboratory
   - EVS Environment Consultants, North Vancouver, BC

iii. Source of test species
   - Westwind Sealab, Victoria BC
   - All adults providing gametes are from the same population and source
   - Gametes are spawned in-house at EVS

iv. Date test species acquired on
   - Test 1: July 19, 2005
   - Test 2: August 9, 2005

v. Holding time and conditions for adults
   - Test 1: Adults received at the testing laboratory the day of the test.
   - Test 2: Adults received at the testing laboratory the day of the test.

vi. Indications of deviations from EC guidance on the importation of test organisms
   - Test 1: No deviations from EC requirements
   - Test 2: No deviations from EC requirements

vii. Weekly percent mortality of adults being held over 7d preceding test

Reporting Requirements for Reference Method EPS1/RM/27-EC 92 (Sperm Cell)

- Test 1: <2% per day over the 7 days preceding the test
- Test 2: <2% per day over the 7 days preceding the test

viii. Age of test organisms
- Test 1: < 4 hours after spawning
- Test 3: < 4 hours after spawning

ix. Unusual appearance, behaviour, or treatment of adults or gametes before test start, or anything unusual about the test
- Test 1: Organisms appear healthy, in good condition, nothing unusual about test organisms or test
- Test 2: Organisms appear healthy, in good condition, nothing unusual about test organisms or test

Test Facilities and Conditions

i. Test type & method
- Echinoderm (*Dendraster excentricus*) Fertilization Toxicity Test
- Static
- Reference Method – EPS/1/RM/27 with 1997 amendments

ii. Test duration
- Test 1: 10:10 min (10min sperm + 10min sperm & egg)
- Test 2: 10:10 min (10min sperm + 10min sperm & egg)

iii. Date and time for start of definitive test
- Test 1: Tuesday July 19, 2005 – 1514h
- Test 2: Tuesday August 9, 2005 – 1723h

iv. Test vessel description
- Test 1: 16 x 125mm test tubes
- Test 2: 16 x 125mm test tubes

v. Person(s) performing the test and verifying the results
- Test 1: Testing by Shawn Seguin; QA/QC reviewed by Julianna Kalokai.
- Test 2: Testing by Shawn Seguin; QA/QC reviewed by Julianna Kalokai.

vi. Indication of rate and duration of pre-aeration of test solutions before initiation of test
- Test 1: No pre-aeration
- Test 2: No pre-aeration

vii. Confirmation that no adjustment of sample or solution pH occurred
- Test 1: No pH adjustment
- Test 2: No pH adjustment

viii. Procedure for sample filtration
- Test 1: No sample filtration
- Test 2: No sample filtration

ix. Procedure for preparation of hypersaline brine (HSB) as per EC guidance document on salinity adjustment – July 1997

- Test 1: Hypersaline brine (HSB) was prepared from natural seawater concentrated to 90ppt (by filtering to at least 10 μm before placing it into the freezer and then freezing/refreezing to remove frozen layer and concentrate salts in the hypersaline brine). HSB was added to samples to salinity adjust them to 30ppt. For a 10mL volume the concentrations were prepared by adding 7.28mL of effluent + 2.72mL of HSB for the highest concentration. This solution was diluted using natural seawater for the lower test concentrations (i.e., 50% of the highest concentration + 50% of the dilution water, repeated for subsequent dilutions). No deviations from EC guidance document (July 1997) for salinity adjustment of sample.
- Test 2: Hypersaline brine (HSB) was prepared from natural seawater concentrated to 90ppt (by filtering to at least 10 μm before placing it into the freezer and then freezing/refreezing to remove frozen layer and concentrate salts in the hypersaline brine). HSB was added to samples to salinity adjust them to 30ppt. For a 10mL volume the concentrations were prepared by adding 7.13mL of effluent + 2.87mL of HSB for

the highest concentration. This solution was diluted using natural seawater for the lower test concentrations (i.e., 50% of the highest concentration + 50% of the dilution water, repeated for subsequent dilutions). No deviations from EC guidance document (July 1997) for salinity adjustment of sample.

x. Procedure for salinity adjustment as per EC guidance document on salinity adjustment – July 1997
- No deviations from EC guidance for salinity adjustment
- Test 1: salinity adjusted from 3.0 to 28 ppt
- Test 2: salinity adjusted from 1.0 to 29 ppt

xi. Type and source of control/dilution water
- Test 1: UV-sterilized, 0.45µm-filtered natural seawater from the Vancouver Aquarium
- Test 2: UV-sterilized, 0.45µm-filtered natural seawater from the Vancouver Aquarium

xii. Concentrations and volumes tested
- Test 1: Concentrations (% effluent volume / total volume) tested and total volumes used were:
    - Control (0%) - 10mL
    - Salinity Control (0%) - 10mL
    - 4.6% - 10mL
    - 9.1% - 10mL
    - 18.2% - 10mL
    - 36.4% - 10mL
    - 72.8% - 10mL
- Test 2: Concentrations (% effluent volume / total volume) tested and total volumes used were:
    - Control (0%) - 10mL
    - Salinity Control (0%) - 10mL
    - 4.5% - 10mL
    - 8.9% - 10mL
    - 17.8% - 10mL
    - 35.6% - 10mL
    - 71.3% - 10mL

xiii. Number of replicated per concentration
- Test 1: 4 replicates per treatment concentration
- Test 2: 4 replicates per treatment concentration

xiv. Number of organisms per container
- Test 1: 2000 eggs per vessel (100 counted)
- Test 2: 2000 eggs per vessel (100 counted)

xv. Measurements of pH and dissolved oxygen in sample water before use
- Test 1: pH 8.2, DO 8.5
- Test 3: pH 8.3, DO 8.5

xvi. Measurements of pH, temperature, dissolved oxygen, and salinity during test
- Test 1: pH – 7.9 – 8.3, T - 15.0°C, DO - 8.5mg/L, salinity - 28ppt
- Test 2: pH – 7.5 – 8.4, T - 15.0°C, DO – 7.8 – 8.5mg/L, salinity - 29ppt

Results

i. Number and % of fertilized eggs in each test concentration
- Test 1: (Number is equal to percent since totals were 100)
    - Control (0%): # Fert = 64, 60, 66, 69
    - 4.6%: # Fert = 56, 51, 52, 53
    - 9.1%: # Fert = 39, 37, 37, 36
    - 18.2%: # Fert = 33, 28, 29, 30
    - 36.4%: # Fert = 39, 39, 37, 36

Reporting Requirements for Reference Method EPS1/RM/27-EC 92 (Sperm Cell)

- 72.8%: # Fert = 20, 16, 21, 21

- Test 2: (Number is equal to percent since totals were 100)
  - Control (0%): # Fert = 88, 81, 85, 86
  - Salinity Control: # Fert = 91, 86, 85, 87
  - 4.5%: # Fert = 82, 80, 79,78
  - 8.9%: # Fert = 76, 77, 77, 76
  - 17.8%: # Fert = 64, 59, 63, 61
  - 35.6%: # Fert = 50, 54, 54, 53
  - 71.3%: # Fert = 37, 40, 37,35

ii. Estimate of IC_{25} (95% CL) for fertilization success

- Test 1: IC_{25} concentration = 5.2 (4.4 – 6.0)% v/v effluent
- Test 2: IC_{25} concentration = 15.6 (13.6 – 18.3)% v/v effluent
- Quantitative statistic used to generate IC_{25} values was log-linear interpolation (200 resamples) calculated in ToxCalc v5.0.23 (for both Test 1 and Test 2)

iii. Current reference toxicity tests (95% CL) for IC_{50} for fertilization

- Test 1: Reference toxicity tests for Toxicant: Sodium Dodecyl Sulfate
  - Test conducted on July 19, 2005, same day as effluent test
  - Reference test conducted under same conditions
  - IC_{50} for fertilization = 5.8 mg/L SDS, 95% CL = (5.2 – 6.5)mg/L
- Test 2: Reference toxicity tests for Toxicant: Sodium Dodecyl Sulfate
  - Test conducted on August 9, 2005, same day as effluent test
  - Reference test conducted under same conditions
  - IC_{50} for fertilization = 3.9 mg/L SDS, 95% CL = (3.6 – 4.1) mg/L

iv. Reference toxicant warning limits (+/- 2SD) for IC_{50} for fertilization

- Test 1: 3.6 +/- 4.4 mg/L SDS
- Test 2: 3.9 +/- 4.3 mg/L SDS

APPENDIX E

7-d Sublethal *Champia* (Algae) Toxicity Test

Reporting Requirements for Reference Method EPA/600/4-91-003, Method 1009.0 (*Champia*)

Effluent Sample

i. Name & location of operation generating the effluent
   - Polaris Mine, Little Cornwallis Island, Nunavut
   - Final Discharge Point for Garrow Lake is geo referenced as 75° 22' 32" N, 97° 48' 37" W.

ii. Date & time of sampling
   - Samples for yearly sublethal toxicity testing were collected:
     Test 1 – Saturday July 16, 2005 – 0900h
     Test 2 – Saturday August 6, 2005 – 1000h

iii. Type of sample
   - Final effluent water

iv. Brief description of sampling point
   - 20m downstream of the siphon discharge point at Garrow Lake dam

v. Sampling method
   - Water was collected from at least 15cm below the surface using a water pump with silicon tubing
   - Water was collected from the upstream direction
   - The pump was flushed with site water for at least one minute prior to sample collection
   - 1 x 4L sample bottles were filled

vi. Name of person submitting samples
   - Blake Hamer (Gartner Lee) Tests 1
   - Brenda Bolton (Gartner Lee) Test 2

vii. Temperature of water upon receipt at lab
   - Test 1: 18°C
   - Test 2: 22°C

xiii. Labeling/coding of sample (Sample IDs)
   - Test 1 – G-Creek Sublethal 071605
   - Test 2 – Garrow Creek

xiv. Date & time of sample receipt
   - Samples for sublethal toxicity testing were received:
     Test 1 – Tuesday July 19, 2005 – 1300h
     Test 2 – Tuesday August 9, 2005 – 0900h

Test Organisms

i. Species of test organism
   - Algae (*Champia parvula*)

ii. Name and city of testing laboratory
   - Test 1: Stantec Consulting Ltd, Guelph Ontario
   - Saskatchewan Research Council [SRC], Saskatoon, SK

iii. Source of test species and health of organisms
   - Test 1
     - Source was Stantec in-house culture
     - Batch number CH05-07
     - Sexually mature male and female branches
     - Females have trichogynes, males have sori with spermatia
     - No organisms exhibiting unusual appearance, behaviour or undergoing unusual treatment were used in the test
   - Test 2
     - Sexually mature male and female branches
     - Obtained from USEPA, Hatfield Marine Science Center, Newport Oregon, 1995
     - Appear in excellent health, nothing unusual

- Females have trichogynes, males have sori with spermatia

iv. Any unusual appearance, behaviour, or treatment of test organisms, before their use in test
- Test 1 and Test 2
  - Nothing unusual about the appearance, behaviour, or treatment of test organisms, before their use in test; everything is normal
  - Nothing unusual about the tests

Test Facilities and Conditions

i. Test type & method
- Test 1:
- Test of Sexual Reproduction using the Red Macroalga *Champia parvula*, EPA-821-R-02-014, October 2002 Method 1009.0, with Canadian adaptations (Environment Canada 1998, 1999)
- Static, non-renewal
- 48-hour exposure, followed by 7 day recovery period for cystocarp development
- Test 2:
- Test of Sexual Reproduction using the Red Macroalga *Champia parvula*, Reference Method - EPA/600/4-91/003, Method 1009.0
- Static, non-renewal
- 2 day exposure, followed by 5-7 day recovery period for cystocarp development

ii. Date and time for start of definitive test
- Test 1: Tuesday July 19, 2005 17:45h
- Test 3: Tuesday August 9, 2005 – time not noted but lab notes state tests started within 72 hrs of collection

xviii. Date for test completion
- Test 1 – July 28, 2005
- Test 2 – August 16, 2005

iii. Test vessel description
- Test 1: 270mL transparent polystyrene cups with polystyrene lids
- Test 2: 270mL transparent polystyrene cups with polystyrene lids

iv. Person(s) performing the test and verifying the results
- Test 1: E. Jonczyk/ K. Johnson
- Tests 2: Mary Moody

v. Indication of pre-aeration of test solutions
- Test 1: No pre-aeration
- Test 2: No pre-aeration

vi. Confirmation that no pH adjustment of sample or solution occurred
- Test 1: No pH adjustment
- Test 2: - No pH adjustment

vii. Indication that EC guidance document for salinity adjustment was followed
- Test 1:
  - No deviations from EC guidance document on preparation of hypersaline brine (Environment Canada Salinity Adjustment Guidance Document, revised Dec. 2001)
  - HSB prepared from natural seawater at 90ppt (by filtering to at least 10 μm before placing it into the freezer and then freezing/refreezing to remove frozen layer and concentrate salts in the hypersaline brine)
  - No deviations from EC guidance document for salinity adjustment of sample
  - Salinity adjustment (for a 1000mL volume): 660mL effluent + 330mL HSB + 10mL test nutrient solution

- Salinity of samples adjusted from 0ppt to 32ppt

- Test 2:
  - No deviations from EC guidance document on preparation of hypersaline brine (May 2001)
  - HSB prepared from natural seawater at 90ppt (by filtering to at least 10 µm before placing it into the freezer and then freezing/refreezing to remove frozen layer and concentrate salts in the hypersaline brine)
  - No deviations from EC guidance document for salinity adjustment of sample
  - Salinity adjustment: 600mL effluent + 260mL HSB + 8.6 ml test nutrient solution

Salinity of samples adjusted from 2ppt to 30ppt

viii. Type and source of control/dilution water

- Test 1:
  - Natural seawater collected from Pointe-du-Chene in Shediac Bay, New Brunswick.
  - No chemicals added.
  - Filtered to 0.45µm prior to use
- Test 2
  - Natural seawater collected at the Pacific Environmental Center, Environment Canada, North Vancouver, BC
  - Filtered to 0.2µm and autoclaved prior to use
  - Salinity adjusted as per EC guidance document to 30ppt with HSB from the same source

ix. Type and quantity of any chemicals added to the control dilution water

- Test 1: No chemicals added to dilution water. 10 mL of test nutrients.
- Test 3: No chemicals added. Test nutrients as described in Test Method USEPA/600/4-91/003, Method 1009.0 were added at concentration of 10mL/L, analytical grade, 8.6 mL added

x. Concentrations and volumes of test solutions

- Concentrations (% effluent volume / total volume) tested and total volumes used were:

- Tests 1:
  - Control (Natural Seawater) (0%) - 100mL
  - Salinity Control Brine (0%) - 100mL
  - 2.1% - 100mL
  - 4.4% - 100mL
  - 8.3% - 100mL
  - 16.5% - 100mL
  - 33% - 100mL
  - 66% - 100mL
- Tests 2:
  - Control (Natural Seawater) (0%) - 100mL, 4.5cm depth
  - Salinity Control Brine (0%) - 100mL, 4.5cm depth
  - 4.38% - 100mL, 4.5cm depth
  - 8.75% - 100mL, 4.5cm depth
  - 17.5% - 100mL, 4.5cm depth
  - 35% - 100mL, 4.5cm depth
  - 70% - 100mL, 4.5cm depth

xi. Number of replicates per concentration

- Tests 1& 2: 3 replicates per concentration

xii. Number of organisms per test chamber

- Tests 1 & 2: 5 female branches + 2 male branches per chamber

Reporting Requirements for Reference Method EPA/600/4-91-003, Method 1009.0 (*Champia*)

xiii. Measurements of pH, temperature, dissolved oxygen, and salinity of sample before use
- Test 1 (unadjusted effluent): pH – 8.0, T – 22.0 °C, DO – 10.2mg/L, salinity - 0ppt
- Test 1 (before use): pH – 8.0, T – 22.5 °C, DO – 7.0mg/L, salinity - 32ppt
- Test 2 (unadjusted sample): pH - 7.75, T – 23.0 °C, DO – 8.6mg/L, salinity - 2ppt
- Test 2 (before use): pH – 8.35, T – 23.0 °C, DO – 7.6mg/L, salinity - 30ppt

xiv. Measurements of pH, temperature, dissolved oxygen, and salinity of test solution and controls at 0hr, 48hr, and the beginning and end of recovery period
- Test 1: See attached photocopied page 5 of original laboratory report
- Test 2: See attached photocopied pages 6 of original laboratory report

Results

i. Number and % mortality of female plants after recovery in each test solution
- Totals from all 3 replicates are presented:
- Test 1:
  - Control (0%): 0 (0%) mortality
  - Salinity Control (0%): 0 (0%) mortality
  - 2.1%: 0 (0%) mortality
  - 4.4%: 0 (0%) mortality
  - 8.3%: 0 (0%) mortality
  - 16.5%: 0 (0%) mortality
  - 33%: 0 (0%) mortality
  - 66%: 0 (0%) mortality
- Test 2:
  - Control (0%): 0 (0%) mortality
  - Salinity Control (0%): 0 (0%) mortality
  - 4.38%: 0 (0%) mortality
  - 8.75%: 0 (0%) mortality
  - 17.5%: 0 (0%) mortality
  - 35%: 0 (0%) mortality
  - 70%: 0 (0%) mortality

ii. Mean number of cystocarps per plant in each replicate of each test concentration
- Test 1: (Replicates are A, B, and C)
  - Control (0%): A) 26.8, B) 27.2, C) 26.4
  - Salinity Control (0%): A) 27.6, B) 27.4, C) 28.4
  - 2.1%: A) 29.4, B) 29.0, C) 30.0
  - 4.4%: A) 26.2, B) 26.8, C) 27.4
  - 8.3%: A) 27.6, B) 27.2, C) 28.0
  - 16.5%: A) 25.4, B) 26.4, C) 26.6
  - 33%: A) 18.4, B) 15.0, C) 18.4
  - 66%: A) 0.4, B) 0.2, C) 0.2
- Test 2: (Replicates are A, B, and C)
  - Control (0%): A) 104.0, B) 74.2, C) 79.6
  - Salinity Control (0%): A) 103.8, B) 84.6, C) 99.0
  - 4.38%: A) 89.8, B) 70.0, C) 82.6
  - 8.75%: A) 86.6, B) 98.4, C) 93.6
  - 17.5%: A) 95.6, B) 94.0, C) 88.4
  - 35%: A) 91.8, B) 88.8, C) 67.2
  - 70%: A) 35.0, B) 36.6, C) 28.4

Reporting Requirements for Reference Method EPA/600/4-91-003, Method 1009.0 (*Champia*)

iii. Estimate of IC_{25} (95% CL) for cystocarp development

- Test 1: IC_{25} concentration = 24.6 (22.2 – 27.2)% effluent v/v
- Quantal statistic method was linear interpolation determined using ToxStat 3.5
- Test 2: IC_{25} concentration = 45.3 (27.5 – 52.4)% effluent v/v
- Quantal statistic method was linear interpolation (200 resamples) determined using ToxCalc v5.0.23

iv. Current reference toxicity tests (95% CL) for IC_{50} for cystocarp development

- Reference toxicity tests for Toxicant: Sodium Dodecyl Sulfate
  - Test 1: Test conducted on July 19, 2005, same day as effluent test
    - Reference toxicant test was conducted under the same experimental conditions as the effluent test
    - IC_{50} cystocarp development = 0.134 mg/L SDS, 95% CL = (0.123 – 0.143) mg/L
  - Test 2: Test conducted on August 17, 2005, within 30 days of effluent test
    - Reference toxicant test was conducted under the same experimental conditions as the effluent test
    - IC_{50} cystocarp development = 1.31mg/L SDS, 95% CL = (1.20 - 1.41) mg/L

v. Reference toxicant warning limits (+/- 2SD) for IC_{50} for cystocarp development

- Reference toxicity tests for Toxicant: Sodium Dodecyl Sulfate
- Test 1: 0.155 (0.112 – 0.216) mg/L SDS
- Test 2: 1.41 (1.15 – 1.74) mg/L SDS

Pages 1 to 6 inclusive are included in the hardcopy sent in the mail. This data can also be found in the original lab reports in Appendix H.

APPENDIX F

Results of Effluent Characterization as per Paragraph 15(1)(a)

RESULTS OF EFFLUENT CHARACTERIZATION

AS PER PARAGRAPH 15(1)(a)

Nine MMER effluent samples were collected during the 3nd Quarter of 2005 between July 6, 2005 and August 27, 2005. "Quarterly" EEM samples were collected from the effluent, exposure, and reference stations on July 16, 2005 and August 6, 2005 and analyzed for a wider suite of elements, as per the guidance document. Monthly loadings of metals to Garrow Bay were calculated based on average weekly discharge volumes from Garrow Lake to Garrow Bay via the creek outflow. The August 6, 2005 effluent volume discharge is estimated and will be finalized by Teck Cominco.

Holding times for nitrate and alkalinity were missed during the July 6, 2005 event due to an oversight by the laboratory. The oversight is explained in Appendix I and is not likely to influence results. A quarterly event with toxicity testing was planned for this event; however, due to a delay in shipment because of weather conditions at the mine site, toxicity samples missed holding times and were discarded at the labs. The parameters that missed holding times were "quarterly" parameters, and additional measurements were taken on July 16, 2005, corresponding to acute and sublethal toxicity testing.

Due to the high Arctic, remote location of the mine, travel into or out of the mine site can be hazardous due to weather conditions such as fog and snow. As the mine has ceased operations and little infrastructure exists onsite, sampling this season was conducted by small field crews stationed onsite, or by flying technicians in on a weekly basis to collect the MMER samples. In August and September, several planned MMER sampling attempts did not proceed due to hazardous weather conditions that prevented flights from getting into the mine site or from departing Resolute Bay. MMER samples were collected at the next possible time, and Ken Russell and Jenny Ferone were kept informed of this situation. The 2005 sampling chronology is presented in Appendix I. The last sample was collected on August 27, 2005. After this event, the mine was inaccessible due to weather until September 13, 2005, when Garrow Creek (final discharge point) was frozen with no discharge.

There were no exceedances of any Schedule 4 discharge limits during the quarter.

Water samples for acute and sublethal toxicity testing were collected using a pump system from about 20 m downstream of the historic dam location on Garrow Lake, within the main flow of the creek. Acute Lethality Testing was conducted on samples collected July 16, 2005 and August 6, 2005. There were no adverse effects observed for either the 96-hr Rainbow Trout toxicity test, or the 48-hr *Daphnia magna* toxicity test. LC_{50} values were >100% effluent for both species in all testing events.

Sublethal Toxicity Testing was conducted on samples collected July 16, 2005 and August 6, 2005. As this is considered a marine discharge, marine species were used for sublethal testing following brine adjustment of the brackish effluent (as per EC test protocols). Testing for fish (7-d Topsmelt growth and survival) and invertebrates (Sand dollar) was conducted at EVS Environment Consultants, Vancouver, BC, while algae (48-h *Champia*) testing was undertaken at Stantec Guelph, ON, for the July test, and at the Saskatchewan Research Council, Saskatoon SK, for the August test.

There were no effects observed in the Topsmelt Survival and Growth Test at the highest concentrations tested (>71.4%, and >67.4% effluent v/v).

Sublethal effects were observed for the echinoid and algal species in both tests. In the echinoid *(Dendraster excentricus)* fertilization test,

- the IC_{25}'s were 5.2, and 15.6% v/v, and
- the IC_{50}'s were 13.2, and 55% v/v

In the *Champia parvula* sexual reproduction test

- the IC_{25}'s were 24.6, and 45.3% v/v,
- the IC_{50} was 61.4% v/v in the second test (not reported in the first test).

Zinc is the primary contaminant of potential concern (COPC) identified in mine effluent. Concentrations of zinc during 2005 averaged 39 µg/L and ranged between 13 and 91 µg/L, which are well below the MMER effluent limit of 500µg/L. These concentrations are also lower than those measured in 2003, 128µg/L (range 48 – 186µg/L), and in 2004, 72 µg/L (range 35 – 198 µg/L), and show a decreasing pattern over the last three years. Note the CCME guideline for zinc is 30 µg/L and the BC AWQG guidelines are 7.5 and 33 µg/L, for the chronic and acute guidelines, respectively. Concentrations of zinc in Polaris mine effluent were not substantially higher than these guidelines in 2005.

On July 16, 2004 and August 6, 2005, the concentrations of zinc in the effluent were 17.9 and 35.6 µg/L, respectively. The echinoid test endpoints converted into concentrations of zinc results in values of 0.93 and 5.5 µg Zn/L for the IC_{25}'s, and 2.4 and 19.6 µg Zn/L for the IC_{50}. Reference toxicity tests of zinc on *Dendraster* fertilization give mean EC_{50} concentrations of 8.5 – 60 µg Zn/L (Dinnel et al. 1983). The reported range of *Dendratster* EC_{50}'s correspond to the August 6, 2005 IC_{50} of 19.6 µg Zn/L. The IC_{50} zinc concentration in the July 16, 2005 sample is lower than the literature EC_{50}'s and may indicate that other substances in the effluent were contributing to the sublethal effects in this sample. The echinoid test is quite sensitive to zinc, with IC25 (converted) zinc concentrations being less than the BC AWQG chronic guideline of 7.5 µg/L.

Endpoints for the *Champia* test in terms of zinc concentrations were 4.4 and 16.1 µg Zn/L (IC_{25}'s), and 21.9 µg Zn/L (IC_{50} in the August 6, 2005 sample). The reference IC_{25} endpoint for zinc in the *Champia* test performed in-house at SRC, reported in 2003, was 27 µg Zn/L (95% confidence limits 16-42µg/L). This reference concentration is similar to the zinc concentrations corresponding to the IC25 an IC50 in the August 6, 2005 sample. Like the echinoid results, the IC25 converted zinc concentration in the July 16, 2005 sample was lower than reference endpoints and may indicate that other substances in this sample were contributing to toxicity. *Champia* also appears to be sensitive to zinc concentrations between the BC AWQG chronic guideline of 7.5 µg/L and maximum guideline of 33 µg/L.

Given the similarity between zinc concentrations in the effluent samples and the effects concentrations of zinc in reference tests, it is likely that zinc is responsible for the sublethal effects observed in both the *Dendraster* and *Champia* tests.

Reference: Dinnel, P.A., Q.J. Stober, J.M. Link, M.W. Letourneau, W.E. Roberts, S.P. Felton, and R.E. Nakatan. 1983. Methodology and Validation of a Sperm Cell Toxicity Test for Testing Toxic Substances in Marine Waters. Final Report, FRI-UW-8306, Fisheries Research Inst., School of Fisheries, University of Washington, Seattle, WA :208. Source: EPA EcoTox database.

APPENDIX G

Acute Toxicity Testing Laboratory Reports

EVS environment consultants
A member of the Golder group of companies

Golder Associates

Golder Associates Ltd.

195 Pemberton Avenue
North Vancouver, British Columbia, Canada V7P 2R4
Telephone 604-986-4331
Fax 604-662-8548

E/05/0336
04-1424-044

August 17, 2005

Azimuth Consulting Group
218 – 2902 West Broadway
Vancouver, BC V6K 2G8

Attention: Ms. Cheryl Mackintosh

RE: WORK ORDERS: 0500296, 297
TOXICITY TEST RESULTS ON THE SAMPLES COLLECTED JULY 16, 2005

Dear Ms. Mackintosh

We are pleased to provide you with the results of the toxicity tests performed on the effluent sample identified as G-Creek-acute-071605 collected July 16, 2005. The sample was tested with the 48-h *Daphnia magna* and the 96-h rainbow trout LC50 toxicity tests. The tests were performed according to the Environment Canada protocol for conducting acute toxicity tests using *D. magna* (EPS 1/RM/14, Second Edition, 2000) and rainbow trout (EPS 1/RM/13, Second Edition, 2000). An independent EVS/Golder QA/QC review confirmed that all acceptability criteria specified by the protocol were met. The results of these tests are summarized from the appended data and are presented in Table 1.

Should you have any questions or comments regarding this report, please do not hesitate to contact the undersigned at 604-986-4331.

Yours very truly,
EVS ENVIRONMENT CONSULTANTS
A Member of the Golder Group of Companies

for Jennifer Young, B.Sc.
Bioassay Team Leader – Cladoceran Team

Verified By:

QA/QC Committee:
Cathy McPherson, B.Sc.
Julianna Kalocai, M.Sc.

Attachment: Table 1
RH/clz
O:\Data\Final\2004\1424\04-1424-044\LET 0817 2005 Tox Test WO 0500296 297 1.doc

Table 1
Toxicity Test Results

SAMPLE ID	SAMPLE DATE	48h *Daphnia magna* LC50 (95% CL) % (v/v)	96-h Rainbow Trout - LC50 (95% CL) % (v/v)
G-Creek-Acute-071605	July 16, 2005	>100	>100

CL – confidence limits.

EVS ENVIRONMENT CONSULTANTS
48-h *Daphnia magna* TOXICITY TEST DATA SUMMARY

Client: Azimuth
EVS Project No.: 04-1424-044
EVS Work Order No.: 0500297
EVS Analysts: SXB
Test Type: 48h LC50
Test Initiation Date: 19 July 05

SAMPLE INFORMATION

Identification: G-Creek-Acute-071605
Amount Received: 1x2L Subsampled from 1x20L RBT
Date Collected: 16 July 05
Date Received: July 19, 2005
Temperature (°C): 21.0
pH: 7.3 ① 7.4
Dissolved Oxygen (mg/L): 10.8 ① 8.9
Conductivity (µmhos/cm): 1566
Hardness (mg/L as $CaCO_3$): 160
Alkalinity (mg/L as $CaCO_3$): —
Ammonia (mg/L N): —
Chlorine (mg/L Cl): —

pH adjustment details: —
① Pre-aeration rate and duration: 12 min @ 25-50 mL/min/L

DILUTION/CONTROL WATER (initial water quality)

Water Type: moderately Hard water (July13B)
Temperature (°C): 20.0
pH: 7.6
Dissolved Oxygen (mg/L): 9.1
Conductivity (µS/cm): 344
Hardness (mg/L as $CaCO_3$): 94
Alkalinity (mg/L as $CaCO_3$): 64
Other: —

TEST SPECIES INFORMATION

Broodstock Culture ID (in-house culture): 05 July A/B
Age (on Day 0): < 24hr
Days to First Brood: 8
Avg. Young/Brood (after 1st brood): 34
% Mortality in 7 d Before Test: 0
Reference Toxicant: Zinc
Current Reference Toxicant Result
Reference Toxicant Test Date: July 19, 2005
48-h LC50 and 95% CL: 426 (362-504) mg/L Zn
Reference Toxicant Warning Limits (mean ± 2SD) and CV
445 ± 280 mg/L Zn ; CV = 31

TEST CONDITIONS

Temperature Range (°C): 20.0 - 21.0
pH Range: 7.4 - 7.7
Dissolved Oxygen Range (mg/L): ~~5~~ 8.7 - 9.1
Conductivity Range (µS/cm): 344 - 1566
Photoperiod (L:D h): 16:8
No. Organisms/Volume: 10/200ml
Other: —

TEST RESULTS: The 48hr LC50 of G-Creek-Acute-071605 is >100% (V/V).

Data Verified By: [signature]
Date Verified: Aug. 16/05

EVS ENVIRONMENT CONSULTANTS
48-h *Daphnia magna* ACUTE TOXICITY TEST DATA

Client: Azimuth
Sample ID: G-Greek-Acute-071605
EVS Project No.: 04-1424-044
Date Collected: 16 July 05
EVS Work Order No.: 0500297
Test Initiation Date/Time: 19 July 05 @ 16:00
Daphnid Broodstock Batch: 05 July A/B
No. Organisms/Volume: 10/200 ml

Concentration % (v/v)	Number of Survivors (1 to 48 h)					Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Conductivity (µmhos/cm)	
	1	2	4	24	48	0	24	48	0	24	48	0	24	48	0	48
Control				10	10	9.1	8.7	8.7	20.0	21.0	21.0	7.6	7.5	7.6	344	344
6.25				10	10	9.1	8.8	8.7	20.0	21.0	21.0	7.6	7.5	7.6	426	425
12.5				10	10	9.0	8.8	8.7	20.0	21.0	21.5	7.6	7.5	7.7	505	506
25				10	10	9.0	8.7	8.7	20.5	21.0	21.5	7.6	7.5	7.7 SDZ	948	647
50				10	10	~~8.8~~ 9.0	8.7	8.7	20.5	21.0	21.0	7.4	7.5	7.7	958	944
100				10	10	8.9	8.7	8.7	21.0	21.0	21.5	7.4	7.4	7.5	1566	1532
Technician Initials					TL	SXB	SXB	TL	SXB	SXB	TL	SXB	SXB	TL	SXB	TL

Sample Description: clear - colourless
WQ Instruments Used: Temp. Calibrated Hg thermometer pH II-A-020501 DO II-A-011201 Cond. IIA-990901
Comments:

Test Set Up By: SXB Data Verified By: [signature] Date Verified: Aug. 16/05

EVS ENVIRONMENT CONSULTANTS
RAINBOW TROUT ACUTE TOXICITY TEST DATA SUMMARY

Client: Azimuth
EVS Project No.: 04-1424-044 (Golder ~~EVS~~ REA)
EVS Work Order No.: OS00296
EVS Analysts: MJG, REA
Test Type: 96-h LC50
Test Initiation Date: July 21/05 @ 1035

SAMPLE
Identification: G-Creek 071605 Acute
Amount Received: 2 x 20L
Date Collected: July 16/05
Date Received: July 19/05
Other:

DILUTION/CONTROL WATER (initial water quality)
Fresh Water (dechlorinated): ✓
Temperature (°C): 15
pH: 7.0
Dissolved Oxygen (mg/L): 10.1
Conductivity (µS/cm): 37
Hardness (mg/L as $CaCO_3$): 14
Alkalinity (mg/L as $CaCO_3$): 8
Other:

TEST SPECIES INFORMATION
Source: Sun Valley
Collection Date/Batch: 062205
Control Fish Size (mean, SD and range measured at end of test)
Date Measured: July 25/05
Fork Length (mm): 30 ± 3 (25-33)
Wet Weight (g): 0.29 ± 0.07 (0.20-0.37)
Reference Toxicant: SDS
Current Reference Toxicant Result
Reference Toxicant Test Date: July 12/05
Duration of Acclimation (days): 20
96-h LC50 (and 95% CL): 24 (18 and 32)
Reference Toxicant Warning Limits (mean ± 2SD) and CV
29 ± 12 mg/L SDS CV: 21%

TEST CONDITIONS
Dissolved Oxygen Range (mg/L): 9.5-10.2
Temperature Range (°C): 15
pH Range: 6.7-7.3
Conductivity Range (µS/cm): 37-1463
Aeration Provided? (give rate): 6.5 ± 1 mL/min/L
Photoperiod (L:D h): 16:8
No. Organisms/Volume: 10/10L
Loading Density (g/L): 0.29
Acclimation Before Testing (days): 29
Mortality In Previous Week of Acclimation (%): 0.1
Other: ✓

TEST RESULTS The 96-h LC50 is estimated to be > 100% (v/v)

Data Verified By: Ralph K
Date Verified: Aug. 4/05

EVS ENVIRONMENT CONSULTANTS
RAINBOW TROUT ACUTE TOXICITY TEST DATA

WHOLE SAMPLE WATER QUALITY

	Initial	pH Adjustment[1]	After 30-min Pre-aeration
Temp. (°C)	15		15
pH	7.3		7.3
DO (mg/L)	10.4		10.2
Cond. (µS/cm)	1445		1445

1. Document pH adjustment procedure (if used) under "Comments".

Client: Azimuth
Golder ~~EVS~~ Project No.: 04-1424-044
EVS Work Order No.: 05002296
Trout Batch No. and 7-d Acclimation Mortality: 062205/0.5%
No. Fish/Volume: 10/10L
Sample ID: G-Creek 071605 Acute
Date/Time Collected: July 16/05 @ 0900
Test Initiation Date/Time: July 21/05 @ 1035

Total Pre-Aeration Time: 30 min

Concentration % (v/v)	Number of Survivors (1 to 96 hours)							Dissolved Oxygen (mg/L)					Temperature (°C)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	10.5	9.8	9.6	9.5	9.7	15	15	15	15	15	7.0	6.8	6.9	7.0	6.7	37	41
6.25				10	10	10	10	10.1	10.0	9.8	9.6	9.5	15	15	15	15	15	7.1	6.9	6.9	6.9	6.8	194	197
12.5				10	10	10	10	10.1	9.9	9.8	9.6	9.8	15	15	15	15	15	7.1	6.9	6.9	6.9	6.8	301	305
25				10	10	10	10	10.1	9.9	9.9	9.6	9.8	15	15	15	15	15	7.1	7.0	7.1	7.0	6.8	418	423
50				10	10	10	10	10.1	9.9	9.8	9.6	9.8	15	15	15	15	15	7.2	7.0	7.1	7.0	6.9	775	784
100				10	10	10	10	10.2	10.0	9.6	9.8	9.8	15	15	15	15	15	7.3	7.1	7.2	7.2	7.0	1445	1463
Technician Initials				RDH	MC	MC	RDH	RDH	RDH	MC	MC	RDH	RDH	RDH	MC	MC	RDH	RDH	RDH	MC	MC	RDH	RDH	RDH

WQ Instruments Used: Temperature calibrated Hg thermometer pH II-A-030302 DO II-A-3 Conductivity II-A-030363
Sample Description: clear
Comments:

Test Set Up By: RDH Data Verified By: [signature] Date Verified: Aug. 4/05

CHAIN-OF-CUSTODY/TEST REQUEST FORM

EVS environment consultants
195 Pemberton Avenue
North Vancouver, BC
Canada V7P 2R4
Tel: 604-986-4331
Fax: 604-662-8548
www.evsenvironment.com

Please see instructions for completion on back. Shaded areas to be completed by EVS Laboratory upon sample receipt.

Client Name: Teck Cominco
Client Contact Name: Bruce Donald
Ship to: BILL TO AZIMUTH CONSULTING GROUP.
Address: Bag 2000
Kimberley, BC
V1A 3E1
Phone: (250)427-8405
Fax: (250)427-5451
Sampled By: Blake Hamer
Attn: Edmond Canuia
Shipping Date: July 16/05

Collection Date (dd/mmm/yy)	Time (24-h clock)	Sample Identification	1 Type of Each Sample	Material Safety Data Sheet Attached? (✓)	Sample Collection Method G = grab; C = composite	Number of Sample Containers x Volume of Sample Container (i.e., 1 x 20 L)	2 Sample Container Type by Code	Test(s) Requested: 96-hr LC50 Rainbow Trout	48-hr LC50 Daphnia Magna	7-Day Toxicity Test	20 min. Echinoderm Fertilization			3 Notes? (e.g. preserved, saltwater, freshwater, may contain sewage)	Receipt Sample Temp. (°C)	4 Condition/Integrity
For composite sample record date & time starting and ending																
16/07/05	0900	G-Creek_Acute_071605	E		G	2×20	P	X	X					Effluent Water		
16/07/05	0900	G-Creek_Sublethal_071605	E		G	3×20	P			X	X			Effluent Water		

EVS Receipt Check List - SAP
EVS Project #: 04-1424-DQ049
EVS Workorder #: 0500296/7/8/9
Sample Storage Location: 4°C [X] Chemical [ ] Other
Supporting documentation/other information attached if applicable:

1.	Signatures & dates correct?	Y N
2.	Chain-of-custody fully completed?	Y N
3.	Containers arrived in good condition (unbroken)?	Y N
4.	Container labels completed (i.e., dates, ID's)?	Y N
5.	Container labels agreed with custody papers?	Y N
6.	Sample receipt temperature within acceptable range?	Y N
7a.	Sediment testing going to be initiated within 14 days?	Y N
7b.	If no, are samples under Nitrogen? If not, why?	Y N
8.	Chain-of-custody generated upon receipt.	[ ]
9.	Sample containers originate from EVS.	[ ]

PO/Reference No.:
Project Title: Polaris MMER -
Results Needed By: Routine Turn Around.

Comments/Instructions: Bill to: Azimuth Consulting Group. Temp: 12.7°C
Electronic Results, to: Cheryl Mackintosh, Azimuth, cmackintosh@azimuthgroup.ca
Bruce Donald, Teck Cominco, ~~bdonald~~ bruce.donald@teckcominco.com.

A) Released By: Blake Hamer Date: July 16, 2005
Company: GLL Time: 1030
Courier name:
Shipping containers secured by: ~~Tape~~ Straps Lock Other (circle one)
Custody seals used? Yes No

B) Received by: SAP Date: 19 July 05
Company: Golder Time: 10:45
Shipping containers received secure? Yes No
Custody seals intact? Yes No N/A

C) Released By: Date:
Company: Time:
Courier name:
Shipping containers secured by: Tape Straps Lock Other (circle one)
Custody seals used? Yes No

D) Received by: Date:
Company: Time:
Shipping containers received secure? Yes No
Custody seals intact? Yes No N/A

1 Receiving Water (RW); Effluent (E); Elutriate (ELU); Sediment (SED); Chemical (CHEM); Stormwater (SW); Other (Please Specify)
2 Collapsible Carboy (CC); Glass Jar (GJ); Jerry Can (JC); Plastic HDPE (P); Plastic Bucket (PB); Other (Please Specify)
3 Please note any conditions the lab should be aware of for safety and storage concerns
4 Acceptable (A); Unacceptable (U). Please note specifics (e.g., broken, leaking, lid not on) under Comments/Instructions

Revision Date: Sept. 25, 2000

Distribution of copies:
White, yellow, pink - accompany the shipment
Orange - retained by consignor (e.g., shipper)
Yellow - retained by consignee (e.g., receiver)
Pink - for use as needed
White - returned to consignor by consignee

EVS environment consultants
A member of the Golder group of companies

Golder Associates

Golder Associates Ltd.

195 Pemberton Avenue
North Vancouver, British Columbia, Canada V7P 2R4
Telephone 604-986-4331
Fax 604-662-8548

E/05/0341
04-1424-044

August 31, 2005

Azimuth Consulting Group
218 – 2902 West Broadway
Vancouver, BC V6K 2G8

Attention: Ms. Cheryl Mackintosh

RE: WORK ORDERS: 0500334, 335
TOXICITY TEST RESULTS ON THE SAMPLES COLLECTED AUGUST 6, 2005

Dear Ms. Mackintosh

We are pleased to provide you with the results of the toxicity tests performed on the effluent sample identified as Garrow Creek collected August 6, 2005. The sample was tested with the 48-h *Daphnia magna* and the 96-h rainbow trout LC50 toxicity tests. The tests were performed according to the Environment Canada protocol for conducting acute toxicity tests using *D. magna* (EPS 1/RM/14, Second Edition, 2000) and rainbow trout (EPS 1/RM/13, Second Edition, 2000). An independent EVS/Golder QA/QC review confirmed that all acceptability criteria specified by the protocol were met. The results of these tests are summarized from the appended data and are presented in Table 1.

Should you have any questions or comments regarding this report, please do not hesitate to contact the undersigned at 604-986-4331.

Yours very truly,
EVS ENVIRONMENT CONSULTANTS
A Member of the Golder Group of Companies

Jennifer Young, B.Sc.
Bioassay Team Leader – Cladoceran Team

Verified By:

QA/QC Committee:
Cathy McPherson, B.Sc.
Julianna Kalocai, M.Sc.

Attachment: Table 1
RH/clz
O:\Data\Final\2004\1424\04-1424-044\LET 0831 2005 Tox Test 0500334 335 .doc

Table 1
Toxicity Test Results

SAMPLE ID	SAMPLE DATE	48h *Daphnia magna* LC50 (95% CL) % (v/v)	96-h Rainbow Trout - LC50 (95% CL) % (v/v)
Garrow Creek	August 6, 2005	>100	>100

CL – confidence limits.

Toxicity testing was carried out in accordance with applicable test methodologies and/or standards of practice. Our liability is limited solely to the cost of re-testing in the event of non-compliance with such test specifications or standards of practice. Golder/EVS accepts no responsibility or liability for the interpretation or use of these testing results by others, nor for any delay, loss, damage or interruptions of testing, collection, preparation, and delivery of samples or test results resulting from events or circumstances beyond our control.

EVS ENVIRONMENT CONSULTANTS
48-h *Daphnia magna* TOXICITY TEST DATA SUMMARY

Client: Azimuth Consulting Group
EVS Analysts: SXB
EVS Project No.: 04-1424-044
Test Type: 48h LC50
EVS Work Order No.: 0500335
Test Initiation Date: 11 Aug 05

SAMPLE INFORMATION

Identification: Garrow Creek
Amount Received: 5x20L
Date Collected: 06 Aug 05
Date Received: 09 Aug 05
Temperature (°C): 21.0 → 21.0
pH: 7.5 → 7.6
Dissolved Oxygen (mg/L): 10.8 → 8.9
Conductivity (µmhos/cm): 2850
Hardness (mg/L as $CaCO_3$): ~~300~~
Alkalinity (mg/L as $CaCO_3$): —
Ammonia (mg/L N): —
Chlorine (mg/L Cl): —

pH adjustment details: none
Pre-aeration rate and duration: 15 Min @ 25 to 50 ml/L/min

DILUTION/CONTROL WATER (initial water quality)

Water Type: Moderately Hard water (July 30 C)
Temperature (°C): 20.0
pH: 7.4
Dissolved Oxygen (mg/L): 9.1
Conductivity (µS/cm): 354
Hardness (mg/L as $CaCO_3$): ~~300~~ 94
Alkalinity (mg/L as $CaCO_3$): ~~of~~ 70
Other: —

TEST SPECIES INFORMATION

Broodstock Culture ID (in-house culture): 18 July A/B/C
Age (on Day 0): <24hr
Days to First Brood: 7.0
Avg. Young/Brood (after 1st brood): ~~7~~ 29
% Mortality in 7 d Before Test: 0
Reference Toxicant: ZinC
Current Reference Toxicant Result
Reference Toxicant Test Date: Aug 15, 2005
48-h LC50 and 95% CL: 481 (388-597) mg/L Zn
Reference Toxicant Warning Limits (mean ± 2SD) and CV
445 ± 280 mg/L Zn ; CV = 31

TEST CONDITIONS

Temperature Range (°C): 20.0-21.0
pH Range: 7.4-7.7
Dissolved Oxygen Range (mg/L): 8.5-9.1
Conductivity Range (µS/cm): 350-2850
Photoperiod (L:D h): 16:8
No. Organisms/Volume: 10/200ml
Other: —

TEST RESULTS The 48hr LC50 of Garrow Creek is >100% (v)

Data Verified By: Ralph
Date Verified: Aug. 31/05

EVS ENVIRONMENT CONSULTANTS
48-h *Daphnia magna* ACUTE TOXICITY TEST DATA

Client: Azimuth Consulting Group
Sample ID: ~~6 Creek~~ Garrow Creek
EVS Project No.: 04-1424-044
Date Collected: 06 Aug 05
EVS Work Order No.: 0500335
Test Initiation Date/Time: 11 Aug 05 @ 10:30
Daphnid Broodstock Batch: 18 July A/B/C
No. Organisms/Volume: 10/200 ml

Concentration % (v/v)	Number of Survivors (1 to 48 h)					Dissolved Oxygen (mg/L)			Temperature (°C)			pH			Conductivity (µmhos/cm)	
	1	2	4	24	48	0	24	48	0	24	48	0	24	48	0	48
Control				10	10	9.1	8.9	8.6	20.0	21.0	21.0	7.4	7.7	7.6	354	350
6.25				10	10	9.0	8.8	8.5	20.0	21.0	21.0	7.4	7.7	7.7	505	508
12.5				10	10	9.0	8.8	8.5	20.5	21.0	21.0	7.5	7.7	7.7	654	667
25				10	10	8.9	8.8	8.5	20.5	21.0	21.0	7.5	7.7	7.7	990	992
50				10	10	8.9	8.7	8.5	20.5	21.0	21.0	7.5	7.7	7.6	1458	1593
100				10	10	8.9	8.7	8.5	21.0	21.0	21.0	7.6	7.7	7.6	2850	2766
Technician Initials				SXB	SXB	SXB	SXB	SXB	SXB	SXB	SXB	SXB	SXB	SXB	SXB	SXB

Sample Description: clear - colourless
WQ Instruments Used: Temp: Calibrated Hg thermometer pH II-A-020501 DO II-A-011201 Cond. IIA-990901
Comments:

Test Set Up By: SXB Data Verified By: [signature] Date Verified: Aug 31/05

EVS ENVIRONMENT CONSULTANTS
RAINBOW TROUT ACUTE TOXICITY TEST DATA SUMMARY

Client: Azimuth
EVS Project No.: 04-1424-044 (Golder Ref)
EVS Work Order No.: 0500334

EVS Analysts: AXF, RCH
Test Type: 96-h LC50
Test Initiation Date: Aug 11/05 @ 1500

SAMPLE
Identification: Garrow Creek
Amount Received: 5 + 20L
Date Collected: Aug 6/05
Date Received: Aug 9/05
Other: —

DILUTION/CONTROL WATER (initial water quality)
Fresh Water (dechlorinated): ✓
Temperature (°C): 15
pH: 7.0
Dissolved Oxygen (mg/L): 10.1
Conductivity (µS/cm): 40
Hardness (mg/L as $CaCO_3$): 14
Alkalinity (mg/L as $CaCO_3$): 8
Other: —

TEST SPECIES INFORMATION
Source: Sun Valley
Collection Date/Batch: 062205
Control Fish Size (mean, SD and range measured at end of test)
Date Measured: Aug 15/05
Fork Length (mm): 31 ± 3 (27 and 35)
Wet Weight (g): 0.33 ± 0.08 (0.22 and 0.46)
Reference Toxicant: SDS
Current Reference Toxicant Result
Reference Toxicant Test Date: July 12/05
Duration of Acclimation (days): 20
96-h LC50 (and 95% CL): 24 (18 and 32)
Reference Toxicant Warning Limits (mean ± 2SD) and CV
29 ± 12 mg/L SDS CV: 21%

TEST CONDITIONS
Dissolved Oxygen Range (mg/L): 9.0 – 10.1
Temperature Range (°C): 15
pH Range: 6.8 – 7.4
Conductivity Range (µS/cm): 40 – 2850
Aeration Provided? (give rate): 6.5 ± 1 mL/min/L
Photoperiod (L:D h): 16:8
No. Organisms/Volume: 10 / 10L
Loading Density (g/L): 0.33
Acclimation Before Testing (days): 50
Mortality In Previous Week of Acclimation (%): 0.1
Other: —

TEST RESULTS: The 96-h LC50 is estimated to be > 100% (v/v)

Data Verified By: [signature] Date Verified: Aug. 30/05

EVS ENVIRONMENT CONSULTANTS
RAINBOW TROUT ACUTE TOXICITY TEST DATA

WHOLE SAMPLE WATER QUALITY

	Initial	pH Adjustment[1]	After 30-min Pre-aeration
Temp. (°C)	15		15
pH	7.4		7.4
DO (mg/L)	10.1		10.1
Cond. (µS/cm)	2510		2510

1. Document pH adjustment procedure (if used) under "Comments".

Total Pre-Aeration Time 30 min

Client ~~EVS~~ Golder Azimuth
Project No. 04-1424-044
EVS Work Order No. 0500334
Trout Batch No. and 7-d Acclimation Mortality 062205/0.1%
No. Fish/Volume 10 / 10L
Sample ID Garron Creek
Date/Time Collected Aug 6/05 @ 1100
Test Initiation Date/Time Aug 11/05 @ 1500

Concentration % (v/v)	Number of Survivors (1 to 96 hours)							Dissolved Oxygen (mg/L)					Temperature (°C)					pH					Conductivity (µS/cm)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
control				10	10	10	10	10.1	9.2	9.4 8	10.0 ~~10.4~~ AXF	9.3	15	15	15	15	15	7.0	7.1	6.8	6.9	7.0	40	51
6.25				10	10	10	10	10.1	9.0	10.0	10.0 ~~10.2~~	9.4	15	15	15	15	15	7.0	7.1	6.9	7.0	7.0	323	349
12.5				10	10	10	10	10.1	9.2	10.0	10.0 ~~10.2~~	9.4	15	15	15	15	15	7.0	7.1	6.9	7.1	7.1	535	571
25				10	10	10	10	10.1	9.4	10.0	10.0 ~~10.2~~	9.6	15	15	15	15	15	7.0	7.1	6.9	7.1	7.1	827	864
50				10	10	10	10	10.1	9.4	10.1 ~~10.4~~ AXF	10.1 ~~10.3~~ AXF	9.6	15	15	15	15	15	7.2	7.2	7.0	7.1	7.2	1373	1431
100				10	10	10	10	10.1	9.8	10.1 ~~10.8~~ AXF	10.1 ~~10.5~~ AXF	9.7	15	15	15	15	15	7.4	7.3	7.0	7.1	7.3	2510	2850
Technician Initials				ReA	AXF	AXF	ReA	ReA	ReA	AXF①	AXF①	ReA	ReA	ReA	AXF	AXF	ReA	ReA	ReA	AXF	AXF	ReA	ReA	ReA

WQ Instruments Used: Temperature calibrated Hg thermometre pH II-A-030302 DO II-A-3 Conductivity II-A-030304

Sample Description clear

Comments ① Re-calibrated D.O. meter

Test Set Up By ReA Data Verified By [signature] Date Verified Aug 30/05

No 0743

CHAIN-OF-CUSTODY / TEST REQUEST FORM

Golder Associates
195 Pemberton Avenue
North Vancouver, B.C.
Canada V7P 2R4
Tel: 604-986-4331
Fax: 604-662-8548
www.golder.com

Client Name: Teck Cominco
Address: Box 2000
Kimberley BC
V1A 3G1

Client Contact: Bruce Donald
Phone: 250-427-8405
Fax: 250-427-8451
Sampled by: B.Bolton

Ship to:

Attn.: Edmund Canaria

Shipping Date: Aug 6/05

Collection Date (DD/MMM/YYYY) [1]	Time (24-h clock) [1]	Sample Identification	Type of Each Sample [2]	Material Safety Data Sheet Attached? (✔)	Sample Collection Method G=grab C=composite	Number of Sample Containers x Volume of Sample Containers (1 x 20L)	Sample Container Type by Code [3]	Test(s) Requested: Sublethal toxicity					Sample Notes (preserved, saltwater, freshwater, may contain sewage...) [4]
06/Aug/05	10:00 am	Garrow Creek	E		G	1x20L		X					Client is actually Azimuth Consulting

PO/Reference No.
Project Title
Results Needed By

Comments/Instructions

1) Released by: B.Bolton Date: Aug 6/05
Company: Gartner Lee Ltd. Time: 14:00 hrs
Courier Name:

1) Received by: (SRS) Date: 9 Aug 05
Company: Golder Time: 10:15

2) Released by: Date:
Company: Time:
Courier Name:

1) Received by: Date:
Company: Time:

Shaded area to be completed by Golder Laboratory upon sample receipt.
Golder Project No. 0500327/328/334/33
Golder Work Order No. 04-1424-044
Condition Upon Receipt: Good
Receipt Sample Temp. (°C): 19.0

1 For composite effluent or water samples, the sample collection date/time is the **end** of the compositing period.
2 Receiving Water (RW): Effluent (E); Elutriate (ELU); Sediment (SED); Chemical (CHEM); Stormwater (SW); Other (Please Specify)
3 Collapsible Carboy (CC); glass jar (GJ); Jerry Can (JC); Plastic HDPE (P); Other (Please Specify)
4 Please note any conditions the lab should be aware of for safety and storage concerns

Distribution of copies:
White, Yellow — accompany the shipment
Pink — kept by consignor (e.g. shipper)
Yellow — kept by consignee (e.g. receiver)
White — returned to consignor by consignee

Please see instructions for completion on back of form

APPENDIX H

Sublethal Toxicity Testing Laboratory Reports

APPENDIX I

Polaris 2005 Sampling Event Chronology

Appendix I - Polaris 2005 Sampling and Event Chronology

Becasue mine activities at the Polaris Mine Site ceased during the 2005 season, collection of the MMER and EEM data was conducted by small field crews stationed on-site for limited time periods (early season) and then by flying technicians into the site on a weekly basis in the latter part of the season. Because of the remote location of the high Arctic mine site and the unpredictable weather conditions, sample shipping and transport issues typically arise throughout the season. This season there were several flight attempts into the mine site during the latter part of the season that were unsuccessful due to hazardous weather conditions. The following is a chronology of the 2005 MMER/EEM sampling program, including sample attempts that were prevented due to weather conditions and/or shipping difficulties.

Date	Event Type	Observation/ Comments
Sat. Jun-25-05	-	Flow initiated in Garrow Creek
Wed. Jun-29-05	Monthly/Quarterly	FDP accessible; exposure (Garrow Bay) and reference (Garrow Bay) stations were ice covered precluding sample collection; no exceedances of MMER Schedule 4 limits; T-Hg, alkalinity and nitrate were analyzed after holding times due to an oversight by the ALS lab; a letter explaining this oversight was included in the 2nd quarter report. The EVS and Stantech labs were not able to accommodate a toxicity testing program for this event, as samples would have arrived during a statutory holiday (i.e., Friday July 1, 2005)
Wed. Jul-06-05	Monthly/Quarterly Failed attempt for collecting toxicity samples	FDP accessible; exposure (Garrow Bay) and reference (Garrow Bay) stations were ice covered precluding sample collection; no exceedances of MMER Schedule 4 limits; alkalinity and nitrate were analyzed after holding time due to an oversight by the ALS lab; a letter explaining this oversight is included in the 3nd quarter report Samples for toxicity testing were collected. However, due to fog conditions at the mine site, the flight into and out of the mine site was delayed and missed the connecting flight out of Resolute Bay. Toxicity samples missed holding times and were discarded by the labs, or stopped en-route.
Wed. Jul-13-05	Weekly	A weekly sample was collected as the program schedule was adjusted to Saturday collections to enable sample delivery to the labs earlier in the week (i.e., Tuesday). Although this shipping schedule adds an extra day in transit, if there are no weather delays, then samples should arrive at the labs within the holding time for all toxicity tests.
Sat. Jul-16-05	Monthly/Quarterly Acute Toxicity Sublethal Toxicity	All effluent and water quality monitoring stations were accessible for sample collection. Samples arrived at the labs on Tuesday July 19, 2005 within holding times for all tests. No exceedances of Schedule 4 limits. No acute toxicity.
Sat. Jul-23-05	Weekly	No exceedances of Schedule 4 limits.
Sat. Jul-23-05	Weekly	No exceedances of Schedule 4 limits.
Sat. Jul-23-05	Weekly	No exceedances of Schedule 4 limits.
Sat. Aug-06-05	Monthly/Quarterly Acute Toxicity Sublethal Toxicity	All effluent and water quality monitoring stations were accessible for sample collection. Samples arrived at the labs on Tuesday August 9, 2005 within holding times for all tests. No exceedances of Schedule 4 limits. No acute toxicity.
Sat. Aug-13-05	Weekly	No exceedances of Schedule 4 limits.
Sat. Aug-20-05	Failed attempt for Weekly sample	Flight to Polaris Mine site from Resolute was attempted but did not land due to thick fog and therefore unsafe landing conditions. Jenny Ferone and Ken Russell were notified of this and the following failed attempts on August 29, 2005.
Sun. Aug-21-05	Failed attempt for Weekly sample	Flight to Polaris Mine site from Resolute was attempted but did not land due to thick fog and therefore unsafe landing conditions. Jenny Ferone and Ken Russell were notified of this and the following failed attempts on August 29, 2005.
Mon. Aug-22-05	Failed attempt for Weekly sample	Fog conditions from satellite photos indicated weather was the same or worse than the previous 2 days. No flight attempted over to site due to unsafe landing conditions. Jenny Ferone and Ken Russell were notified of this and the following failed attempts on August 29, 2005.
Tue. Aug-23-05	Failed attempt for Weekly sample	Fog conditions from satellite photos indicated weather was the same or worse than the previous 3 days. No flight attempted over to site due to unsafe landing conditions. Jenny Ferone and Ken Russell were notified of this and the following failed attempts on August 29, 2005.
Wed. Aug-24-05	Weekly	The sample attempt made on Wed August 24, 2005, was successful, following the failed attempts since the previous Saturday. No exceedances of Schedule 4 limits.
Sat. Aug-27-05	Weekly	No exceedances of Schedule 4 limits.

Date	Event Type	Observation/ Comments
Wed. Aug-31-05	Failed attempt for Weekly sample	An attempt to fly into Polaris was made. However, due to fog conditions at the mine site, and the plane was unable to land. Ken Russell and Jenny Ferone were notified of this failed attempt on September 1, 2005.
Sat. Sep-03-05	Failed attempt for Weekly sample	Thick fog and poor visibility prevented the plane from leaving Resolute. Ken Russell and Jenny Ferone were notified of this failed attempt on September 6, 2005.
Wed. Sep-07-05	Failed attempt for Weekly sample	The planned flight into Polaris was cancelled by the pilot due to snow conditions (5-10cm) in Resolute and potentially unsafe conditions for landing at the mine site. Ken Russell and Jenny Ferone were notified of this failed attempt on September 7, 2005.
Sat. Sep-10-05	Failed attempt for Weekly sample	A monthly chemistry plus acute toxicity testing event was planned. However, due to blowing snow conditions, it was deemed by the pilot too hazardous to land an aircraft at the mine site. Ken Russell (Environment Canada) was informed on September 13, 2005.
Tue. Sep-13-05	-	A monthly chemistry plus acute toxicity testing event was planned. However, upon arrival at the mine site, the creek was found to be frozen. Ken Russell was informed on September 13, 2005

APPENDIX J

Letter from ALS explaining missed holding times for July 6, 2005 sample