Resort Municipality of Whistler 2010 Landfill Annual Environmental Monitoring Report

Whistler, BC

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MORRISON HERSHFIELD

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1.0 Introduction

This annual report summarizes monitoring data collected at the Resort Municipality of Whistler (RMOW) Landfill for the reporting year 2010. The RMOW site is located approximately 8 km west of Whistler, and is accessed off Highway 99 on Cheakamus Lake Road. The location of the site is illustrated in Figure 1.

The Whistler landfill opened in 1977 and accepted industrial, commercial and institutional waste. In 1988, additional permitting was received to accept construction and demolition waste. The landfill site was closed in October 2005, primarily for accommodating plans to use the area east of the site as the location of the Athletes' Village for the 2010 Winter Olympic Games. Between 1977 and 2005 approximately 350,000 tonnes of waste was disposed of at the Whistler Landfill (CH2M Hill, 2008a).

Construction of residential and commercial buildings in the area did not commence until 2007, after a cover system and landfill gas (LFG) collection system was installed in 2006.

The LFG collection system consists of the following components:

- Thirteen vertical LFG extraction wells connected to horizontal LFG collection trenches covering the landfill cell footprint;
- A 200mm diameter header approximately 800m in length that carries the LFG from the vertical well and horizontal trench network to a flare station;
- A LFG abstraction plant on the north side of the property that burns the collected LFG in a candle-stick flare;
- Twenty-one monitoring probes (MP) located around the perimeter of the landfill cell; and
- Approximately 91 test ports within selected buildings and residences in close proximity to the landfill

Morrison Hershfield was retained by RMOW in June 2010 to complete the annual environmental monitoring and reporting requirements as set out in Section 3.31 of the 2005 Whistler Landfill Operational Certificate (MR-04693) and the Whistler Landfill Closure Plan (CH2M Hill, 2006a).

This report completed by Morrison Hershfield (MH) presents the groundwater, surface water, leachate and landfill gas (LFG) conditions based on the data collected in 2010.

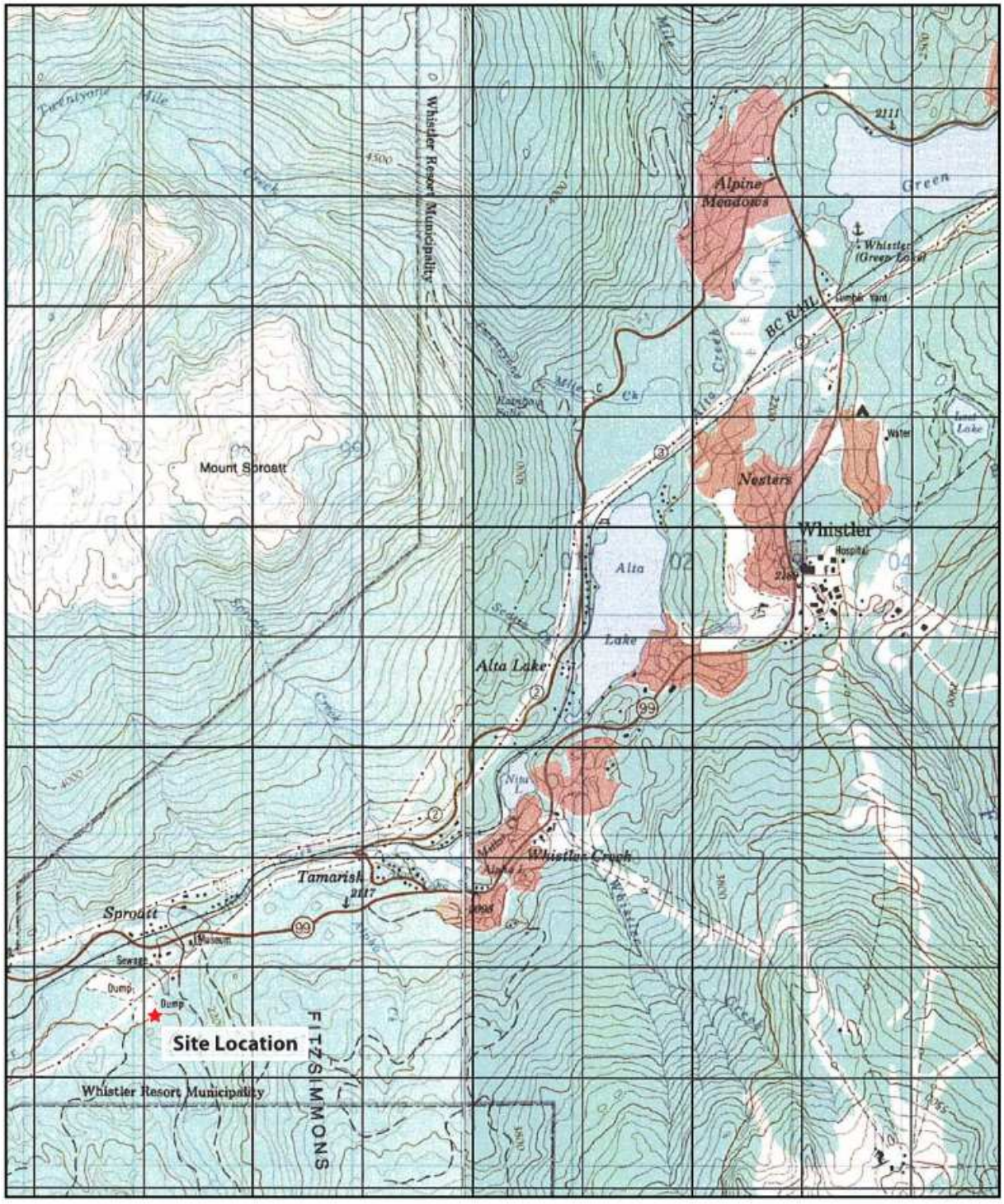

Figure 1. RMOW landfill project location (obtained from CH2M Hill, 2006a).

1.1 Program Objectives

The overall objective of the Whistler landfill monitoring program is to monitor post-closure impacts of landfill gas and leachate on the surrounding environment.

The objectives of the Surface Water and Groundwater Monitoring Program are to:

- Allow improved characterization of groundwater and surface water;
- Determine if the landfill is negatively affecting local groundwater and surface water quality; and
- Apply corrective measures as necessary to minimize landfill effects on groundwater and surface water.

The objectives of the landfill gas (LFG) monitoring program are as follows:

- Monitor levels of gas migration offsite;
- Assess the overall collection performance of the Landfill Gas Collection System (LFGCS) and identify the presence of potentially unsafe concentrations of LFG within the soil at monitoring probe locations; and
- Adjust LFGCS as necessary based on monitoring data results, to minimize gas migration.

As outlined in the Closure Plan, the monitoring program will be re-evaluated following the completion of monitoring over a 2-year period. This evaluation will be conducted following the end of the 2011 monitoring year. Based on that evaluation, recommendations for revising the monitoring program will be submitted to the Ministry.

1.2 Report Purpose

The purpose of this annual report is to provide the B.C. Ministry of Environment with:

- A review and interpretation of the analytical data resulting from 2010 post-closure monitoring;
- A summary of maintenance carried out at the site during the year, and any planned maintenance for the upcoming year; and
- An outline of any environmental issues and corrective actions taken in 2010.

2.0 Site Description

2.1 Hydrological Conditions

The site is located within the Cheakamus watershed. The Cheakamus River is located approximately 300m north of the waste mass and flows along the eastern boundary of the Athletes' Village (CH2M Hill, 2006a). Due to the topography and the storm water infrastructure from the Athlete's Village, the flowing surface water features are primarily along the perimeter of the site.

2.2 Geological Conditions

The following description of geological conditions associated with the site was obtained from CH2M Hill (2008a).

In general, the site topography slopes from south to north. As described in the Whistler Landfill Closure Plan, within areas on the site and within adjacent lands, aggregate extraction activities have removed much of the natural overburden materials for use as industrial aggregates and replaced them with imported fill materials. As a result, the present ground surface associated with the landfill has likely been altered by industrial activities. As part of historical aggregate extraction activities conducted at the site, much of the natural overburden materials had been removed from the area and replaced with imported fill, resulting in a disturbance of the natural topography of the site. Exposed bedrock surface, characterized by glaciated surfaces and steep inclines, are present throughout the site. Areas between the exposed bedrock are infilled by coarse and medium grain sediments.

Based on the results of the borehole investigation conducted by CH2M Hill in January 2006, the top layer of the site stratigraphy is composed of sand, gravel, cobbles, and boulders (fill material), followed by a gravel-sand layer. The subsurface includes a poorly graded fine sand layer with some silt, followed by still sandy silt located above the bedrock (green basalt) (CH2M Hill, 2006a).

Overburden at the site was generally found to be consistent across the advanced boreholes and is characterized by progressively finer particle size of the sediments with increasing depth. Overburden thickness is highly variable, ranging from 0 to greater than 21 m. The overburden is consistent with fluvial or near-shore lacustrine deposition environments.

2.3 Hydrogeological Conditions

The following description of hydrogeological conditions associated with the site was obtained from CH2M Hill (2006a).

A single unconfined aquifer is within the overburden on the site. The saturated zone in most locations extends from the bedrock surface at depth to within less than one metre of the ground surface. Bedrock in the area was found to be relatively dry and presented no visual indication of water bearing fractures. Groundwater flow is generally in a south to north direction, consistent with the surface topography.

2.4 Climate

The long-term average climatic conditions (1971 – 2000) recorded at the Whistler meteorological station (approximately 8 km from the site) was reviewed. Based on this data, the recorded daily average annual temperature in the area is 6.3^{o}C, and the mean annual precipitation is 1229.1 mm. The precipitation can be further divided into an average of 850.1 mm of rainfall, and 411.2 cm of snowfall.

3.0 Monitoring Requirements

The following documents form the basis of the post-closure monitoring program and associated requirements, included parameters to be monitored. They are frequently referenced throughout this report.

- *Whistler Landfill Closure Plan, Final Report* (CH2M HILL, 2006a)
- *Whistler Landfill Gas Pre-Design Memorandum* (CH2M HILL, 2006b)
- *Landfill Operational Certificate MR*-04692 (B.C. Ministry of Environment, 2005)
- *Mitigation and Safety Measures for Reduction of Landfill Gas Migration Risks* (CH2M HILL, 2008a)
- *Landfill Gas Collection System Operation and Maintenance Manual* (CH2M HILL, 2008b)
- *Monitoring and Reporting Requirements* (CH2M HILL, 2008c)

Portions of text contained in these documents were extracted and included in this report.

4.0 Methodology

4.1 Sample Locations

Groundwater, surface water, leachate and landfill gas (LFG) monitoring locations are indicated on Figure 2. Groundwater monitoring locations are identified as MW (monitoring well) followed by a number or number / letter combination (e.g. MW-4, MW-2S), with the letter added when both a shallow (S) and a deep (D) well were installed within a single borehole. Surface water sample locations are identified as SFC, followed by a number or number / letter combination (e.g. SFC-2, SFC-2B), where the letter is used to indicate a second surface water sample on the same watercourse. L1 is the single leachate collection point.

The landfill gas monitoring probes around the circumference of the landfill mass are identified as MP followed by a number (e.g. MP14). Also identified on the figure are the several components of the landfill gas collection system, including: thirteen LFG extraction wells (labeled as “W” followed by a number (e.g. W11)), the flare station, and header valves.

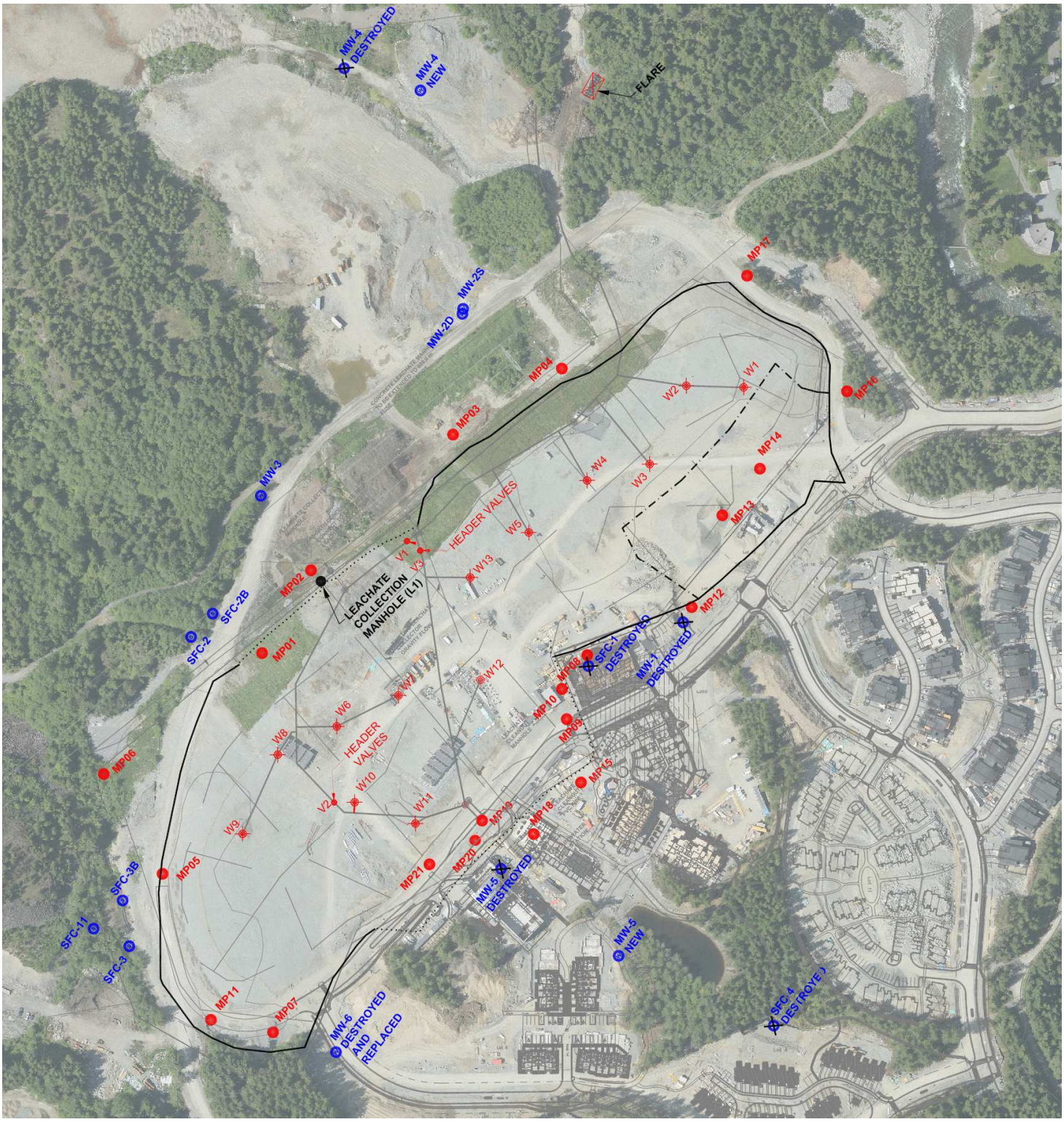

Figure 2. Whistler landfill post-closure monitoring sample sites.

As per the requirements outlined in CH2M Hill (2008c), groundwater and surface water monitoring is being conducted quarterly for the first two years of post-closure monitoring. Quarterly monitoring is tracked and reported based on a calendar year. Morrison Hershfield began work on the project in June, 2010; as a result, no groundwater, surface water or leachate samples were obtained in Quarter 1, 2010. The three sampling events for groundwater, surface water and leachate for 2010 are as follows:

- Quarter 2 (Q2) June 22, 2010
- Quarter 3 (Q3) October 27, 2010
- Quarter 4 (Q4) December 21, 2010

The LFG monitoring program has been in effect since 2009. Landfill gas data is collected by Norseman Engineering Ltd. on a minimum monthly basis. During the winter months monitoring has occurred on a weekly basis when there is snow cover on the landfill or frozen ground (i.e. conditions that would facilitate subsurface LFG migration). Weekly sampling was completed in January, February, March and December, in 2010. Monthly sampling was completed for the remainder of the year.

4.2 Groundwater and Leachate Quality Monitoring

CH2M HILL originally installed eight monitoring wells; two of these were nested wells, where two monitoring wells were installed to different depths within a single borehole. Monitoring wells were constructed with 50 mm (2”) diameter new PVC pipe. Screen intervals were constructed with 50 mm (2”) diameter #10 slot PVC screen. The depth and screen length of each well was selected in the field based on observations made during drilling. Bentonite seals were installed (as required) to prevent infiltration of surface water into the well (CH2M Hill, 2006a).

The groundwater monitoring locations are situated both up and down gradient of the landfill to monitor the potential migration of any leachate and to be able to separate groundwater impacts of residential and commercial development from impacts of the landfill.

The installation of these wells by CH2M Hill was conducted prior to the extensive grading that occurred preceding construction on the site. During these grading and construction operations four of the existing wells were destroyed: MW1, MW4, MW5 and MW6. The four destroyed wells are indicated in Figure 2 with the monitoring well name followed by “destroyed” (i.e. MW1 DESTROYED).

Three of the four destroyed monitoring wells (MW4, MW5, and MW6) were replaced to prevent data gaps in the monitoring program. MW1 was not replaced as it was felt that successful siting at this location was unlikely (prevalence of large boulders) and that up gradient conditions could be adequately monitored with MW5 and MW6. The monitoring wells were replaced prior to the Q3 sample event. Refer to Appendix A for borehole logs associated with each of the three wells installed in 2010. MW4 was installed and completed using the same practices as CH2M Hill used for the original wells. Sampling at MW4 resumed for Q3 and Q4. MW5 and MW6 were installed as flush mount wells to accommodate

the land use in the area. Both MW5 and MW6 were not sampled during Q4, as the wells could not be located due to excessive snow coverage.

Table 1 provides a summary of groundwater wells monitored in Quarters 2, 3 and 4 in 2010.

Table 1. Groundwater monitoring events for 2010.

Site	Q2	Q3	Q4
MW2S and 2D	X	X	X
MW3	X	X	X
MW4		X	X
MW5		X	
MW6		X	

Groundwater samples were collected using dedicated high-density polyethylene tubing and footvalves.

A single leachate collection point located on the down gradient side of the landfill cell (Figure 2) was sampled in Quarters 2 through 4 to provide an indicator of the elevated concentration of target parameters within the landfill cell. Leachate samples were obtained using disposable bailers.

The procedure for the collection of all groundwater and leachate samples follows that described in CH2M Hill (2008c) (provided in Appendix B). Laboratory analysis for all of the samples was performed by ALS Laboratory Group (ALS) in Vancouver, BC. Parameters associated with groundwater/leachate quality monitoring are outlined in Appendix C. ALS follows a quality control program (ISO 17025) to ensure a high degree of accuracy and precision in their results.

Surface water, groundwater and leachate samples collected in Quarter 2 for dissolved metals analysis were field filtered, while samples collected in Quarters 3 and 4 were filtered in the laboratory.

In addition to the samples for laboratory analysis, standard water quality parameters were collected at each sample location during sampling events. The parameters measured include: pH, temperature (^{o}C), dissolved oxygen (mg/L), and conductivity (µS/cm). The depth to static water level was also recorded for each Monitoring Well.

Groundwater and leachate quality monitoring results were compared to Schedule 6, Column V (Generic Numerical Water Standards for Drinking Water) of the Contaminated Sites Regulation B.C. Reg. 375/96. Exceedance of any compliance criteria for a period of two consecutive sampling events at any one monitoring location will trigger contingency planning (as outlined in the Closure Plan).

4.3 Surface Water Monitoring

Five surface water sites were monitored in Quarter 2 through 4 in 2010. Following Quarter 2 sampling, it was determined that SFC-3B should be moved upstream of the tributary sampled at SFC-11, such that impacts of the nearby gravel quarry (measured at SFC-11) could be distinguished from impacts of the

landfill to surface water. Table 2 provides a summary of the surface water sites sampled in Quarter 2 through Quarter 4, 2010.

Table 2. Surface water monitoring events for 2010.

Site	Q2	Q3	Q4
SFC11	X	X	X
SFC2a	X	X	X
SFC2b	X	X	X
SFC3	X	X	X
SFC3B	X		

CH2M Hill initially had identified two additional surface water monitoring locations: SFC1 and SFC4 (for locations see Figure 2). However, the watercourses associated with these sites were buried as a result of construction of commercial and residential buildings in the area.

Surface water samples were collected following the techniques outlined in CH2M Hill (2008c) (Appendix B). Field data collected for surface water included: pH, temperature (^{o}C), dissolved oxygen (mg/L), and conductivity (µS/cm).

Similar to the groundwater samples, all surface water samples were sent to ALS in Vancouver, BC for analysis. Parameters associated with surface water quality monitoring are outlined in Appendix D.

Surface water quality results are compared to Schedule 6, Column II (Generic Numerical Water Standards for Aquatic Life) of the Contaminated Sites Regulation B.C. Reg. 375/96. Exceedance of any compliance criteria for a period of two consecutive sampling events at any one surface water monitoring location will trigger contingency planning (as outlined in the Closure Plan).

Monitoring Undertaken by Whistler Waste Water Treatment Plant Staff

The Whistler Waste Water Treatment Plant (WWWTP) has been conducting sampling at two surface water sites since 2005. The first sampling point, labeled as SFC-4 on Figure 3, is located approximately 50 m upstream of the leachate pumping station and is taken from an exposed ½ culvert. The second site, SFC-4B (Figure 3) is taken from Crater Creek downstream of the leachate pump station where Jane lakes Road crosses the creek.

The samples have been collected on a monthly basis by WWWTP staff and are analyzed for the following parameters:

- Turbidity
- Conductivity
- Phosphate
- Sulphate
- Chloride
- Total metals
- Nitrate
- Nitrite
- Ammonia
- pH
- Acidity

Laboratory analysis for the samples was completed at Maxxam Analytics.

Figure 3. Locations of surface water sites being sampled on a monthly basis by Whistler Waste Water Treatment Plant staff.

4.4 Landfill Gas Monitoring

Landfill Gas monitoring at the 21 monitoring probes and approximately 91 test ports within selected buildings and residences in close proximity to the landfill has been completed by Norseman Engineering Ltd. on a weekly (winter months) to monthly basis from April 2009 to present.

Standard monitoring procedures were followed for LFG monitoring.

To date, the LFG monitoring program obtained the following data:

- Methane content at the subsurface probes;
- Methane and oxygen contents, flow rate, inlet suction and low temperature re-start period at the flare station; and
- Valve position (percent open), methane content and suction at each of the extraction wells (monitored for assessing the operational efficiency of the LFG collection system).

Pressure at the wells is measured using 0 – 5" in. w.c. or 0 – 0.5" in. w.c. Magnahelic pressure gauges. Methane content is detected using a Gastech device, model NP204. Other parameters measured at the flare station are obtained from the Programmable Logic Controller (PLC) associated with the LFG collection system. The data gathered are important for determining the overall function of the LFG collection system, particularly the concentration of methane present in the landfill for flaring, and to determine if the gas is escaping into the atmosphere or migrating off-site.

Triggers levels indicating when additional action is required based on LFG monitoring results are based on the BC Environmental Monitoring Guidelines, and provided in the Operation and Maintenance Manual for the project (CH2M Hill, 2008b). They are as follows:

- Methane gas concentrations in excess of, or predicted to exceed, 10% LEL (5%) in subsurface soils at the eastern and southern property boundaries of the Whistler Landfill (MP 8 through MP 21, excluding MP 11)
- Methane gas concentrations in excess of, or predicted to exceed, 25% LEL in soils at the western and northern property boundaries (MP1 through MP7, and MP 11).

As per CH2M Hill (2008b), the frequency of LFG monitoring should increase from monthly or weekly to daily in the event of LFG collection system malfunction or maintenance requirements, or if detection of methane in excess of the trigger level (10% Lower explosive limit (LEL)[1]) are observed. CH2M Hill (2008b) notes that, following detection of methane in excess of the trigger levels, monitoring should be increased to daily until three consecutive days of undetectable methane concentrations have been recorded. If gas concentrations at the property boundaries remain above recommended trigger limits for more than 2 days, additional measures may need to be implemented.

4.5 Sample Analysis and Quality Control

In addition to using an accredited laboratory, QA/QC samples were collected to certify the accuracy and precision of the field sampling and the laboratory testing procedures. For each surface and groundwater sampling event a sample replicate and a travel blank were submitted for analysis. Replicate samples are collected from a single monitoring location; the duplicate is identified on the sample containers with the addition of an "R" at the end of the station name. Travel blanks are used to confirm that the primary samples have not been contaminated during transportation. They are transported in the same manner as monitoring sample bottles to and from the site, and remain closed and are only reopened in the lab for analysis.

[1] A concentration of 5% methane in the air is "the lower explosive limit" (LEL), and concentrations equal to or greater than the LEL are considered hazardous (BC MOE, 1996)

5.0 Results

5.1 Groundwater

The complete analytical results for groundwater quality monitoring are presented in Appendix E. As noted above, the results from the quarterly sampling for groundwater were compared to Schedule 6, Column V (Generic Numerical Water Standards for Drinking Water) of the Contaminated Sites Regulation B.C. Any exceedances noted have been summarized in Table 3.

Table 3. Summary of groundwater exceedances for 2010.

Analyte	Units	BCCSR Sched. 6 Standards for Drinking Water	Q2 June 22/10	Q3 Sept. 27/10	Q4 Dec. 21/10
MW2D					
Manganese (Mn)-Dissolved	mg/L	0.05	1.48	1.61	1.63
Iron (Fe)-Dissolved	mg/L	0.3	79.3	46.8	-
Arsenic (As)-Dissolved	mg/L	0.010	0.0254	-	-
MW2S					
Iron (Fe)-Dissolved	mg/L	0.3	44.5	27.8	-
Manganese (Mn)-Dissolved	mg/L	0.05	1.97	2.17	2.29
Arsenic (As)-Dissolved	mg/L	0.01	0.011	-	-
Benzo(a)pyrene	mg/L	0.00001	0.000013	-	-
MW3					
Manganese (Mn)-Dissolved	mg/L	0.05	0.554	3.29	2.67
Iron (Fe)-Dissolved	mg/L	0.3	-	-	0.742
MW4 (New)					
Iron (Fe)-Dissolved	mg/L	0.3	Not Sampled	34.5	-
Manganese (Mn)-Dissolved	mg/L	0.05		2.47	3.89
MW5(New)					
No exceedances reported			Not sampled	-	Not sampled
MW6(New)					
Manganese (Mn)-Dissolved	mg/L	0.05	Not sampled	3.62	Not sampled

Results associated with groundwater data collected in the field are presented in Appendix F.

Iron and Manganese were the only parameters for which exceedances were noted for a period of two consecutive sampling events at any one groundwater well. Iron and manganese are also elements found naturally in undisturbed soils throughout BC. Iron and manganese naturally occur in groundwater that has little or no oxygen and in areas where groundwater flows through soils rich in organic matter. According to BC Ministry of Environment concentrations that exceed the drinking water guideline can occur anywhere in the province.

The elevated levels of iron and manganese levels are notably higher than the standards, particularly for MW2D and 2S. However based on the results in CH2M Hill (2006a), these concentrations are consistent with their findings, and more than likely are reflective of baseline geological conditions rather than impacts from the landfill.

The elevated level of Arsenic noted in Quarter 2 at MW2S was only marginally higher than the CSR Drinking Water Standard, and, as with Iron and Manganese, likely reflective of baseline conditions. In contrast, the single exceedance of the standard noted for Benzo(a)pyrene in Quarter 2 at the same well is more likely to be attributed to the landfill. While elevated levels of Benzo(a)pyrene can be of concern, this exceedance was only marginally above the standard and not found in subsequent sampling trips.

5.2 Surface Water

Analytical results for surface water monitoring at SFC-11, 2, 2b, 3, and 3b are presented in Appendix G. As noted above, all surface water quality results have been compared to Schedule 6, Column II (Generic Numerical Water Standards for Aquatic Life) of the Contaminated Sites Regulation. Any exceedances of the standards are summarized in Table 4 below.

Table 4. Summary of surface water exceedances for 2010.

Analyte	Units	BCCSR Sched. 6 Standards for Freshwater Aquatic Life	Q2	Q3	Q4
			June 22/10	Sept. 27/10	Dec. 21/10
SFC11					
No exceedances reported					
SFC2					
No exceedances reported					
SFC2B					
Cadmium (Cd)-Dissolved	mg/L	0.0006	-	-	0.00062
Cobalt (Co)-Dissolved	mg/L	0.04	-	-	0.0453
SFC3B					
No exceedances reported					
SFC4[1]					
No exceedances reported					
SFC4B[1]					
No exceedances reported					

[1] *Refer to Appendix G for exceedances noted in 2005 – 2009.*

Results associated with surface water data collected in the field are presented in Appendix F.

Single occurrence exceedances of the Cadmium and Cobalt aquatic life standards were noted in Quarter 2 at SFC-2B. Exceedances are only slightly above the CSR standards for aquatic life, and were not noted further downstream on the same watercourse at SFC-2, likely due to the influence of stormwater from a culvert running underneath the landfill from the up gradient residential / commercial development area, and discharging between SFC-2B and SFC-2.

WWTP Surface Water Results

Analytical results for surface water monitoring conducted by Whistler WWTP staff (SFC-4 and 4B) are provided in Appendix H. All surface water quality results have been compared to Schedule 6, Column II (Generic Numerical Water Standards for Aquatic Life) of the Contaminated Sites Regulations. No exceedances of the standards were observed in 2010 (Table 4 above).

The leachate collection system was installed in 2008. Prior to this, a formal collection system was not installed, and higher levels of contaminants were entering the environment (refer to Appendix H for analytical results obtained from 2005 – 2008). During 2005 a variety of analytes were in exceedance of the guidelines, and in 2006 and 2007 there were consistent exceedances of Cadmium (Table 5). Cadmium is commonly found in various household as well as construction and demolition waste such as paint, batteries, and electronics; it may therefore be an indicator of leachate contamination.

Table 5. Cadmium exceedances for 2005 to 2010 at 4 and 4B surface monitoring locations.

Parameter	Units	Water Quality Standards - BCCSR, Schedule 6, Aquatic Life	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
			Site 4, 50m Upstream of Landfill Leachate Pump Station												Site 4B, Creek 200m Downstream of Landfill Leachate Pump Station											
2009																										
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)			0.03	0.06																				
2008																										
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)		0.1	0.1	0.1								1.0	0.0	0.1	0.1	0.1								
2007																										
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)	<0.1	<0.1	0.2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	<0.1	0.1000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			
2006																										
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)			<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2005																										
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)				<0.1	<0.1											<0.1	<0.1							

In 2008, the incidences of exceedances greatly decreased and were only observed in the spring months, when there is high runoff and precipitation, thus increasing the mobility of contaminants. In 2009, only two incidences of exceedances were recorded for Cadmium. And in 2010 there were no parameters in exceedance of the guidelines. It would therefore appear that the leachate collection system has greatly reduced the impact of leachate on surface water upstream (SFC-4) and downstream (SFC-4B) of the leachate pump station.

5.3 Leachate

The complete analytical results for leachate monitoring are presented with groundwater quality results in Appendix E. Leachate samples were collected for all three sample events in 2010. As noted above, the results of the leachate sample analysis has been compared to the Schedule 6, Column V (Generic Numerical Water Standards for Drinking Water) of the Contaminated Sites Regulation.

To date, slightly elevated levels of Nitrate (Quarter 2 and 3), Manganese (Quarters 2, 3, and 4), Chlorine (Quarter 4), Iron (Quarter 2 and 4), and Sodium (Quarter 4) have been noted relative to the CSR Standard for Drinking Water.

Results associated with leachate data collected in the field are presented with groundwater field data in Appendix F.

5.4 Landfill Gas

Both 2009 and 2010 monitoring results associated with LFG post-closure monitoring are presented in this report.

The LFG monitoring from the monitoring probes as well as the ports in the local buildings have been used as the indicator for off-site migration of gas. To date, there have been no readings of methane concentrations in the 91 sample ports in adjacent buildings. Complete results for LFG monitoring of soil probes are presented in Appendix I.

Several exceedances of methane trigger levels were noted in 2009, particularly at MP 17 where all samples taken in 2009 were substantially higher than associated trigger levels. Figure 4 provides a graphical representation of methane concentrations noted at MP 17 between May 21, 2009 (first sampling event) and December 29, 2009. Lower explosive limit (5% Methane concentration) and trigger level associated with MP 17 (10% LEL) are also provided.

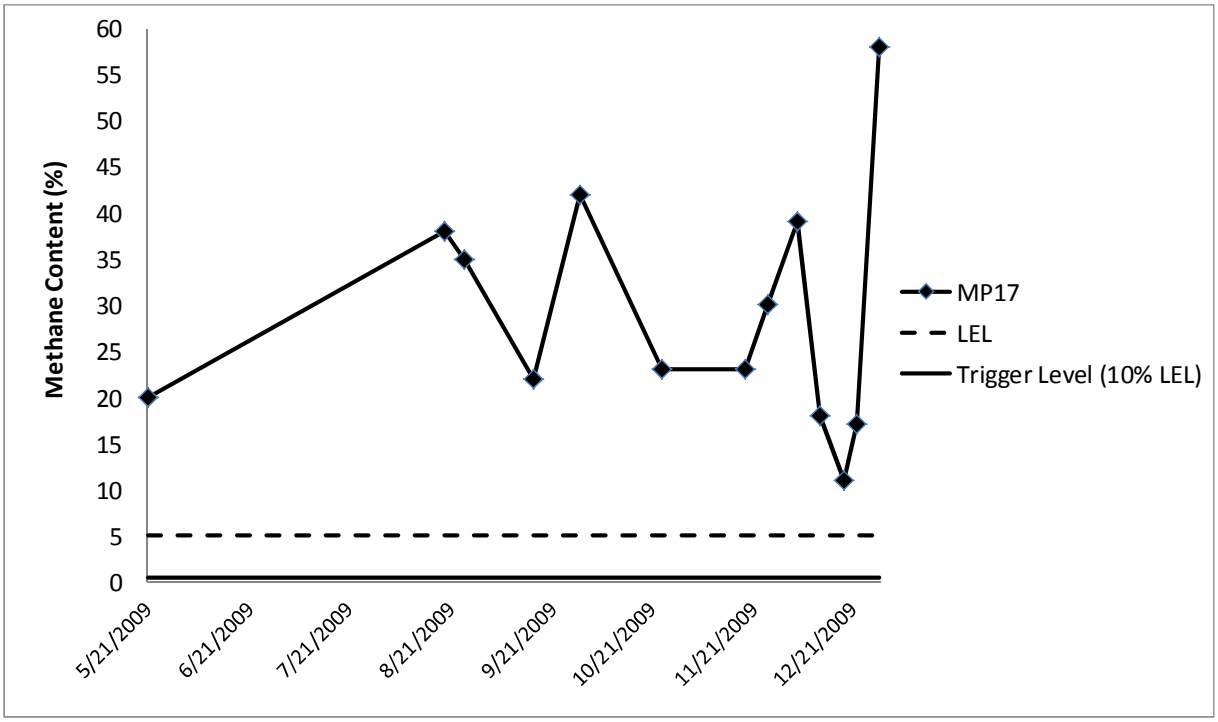

Figure 4. Methane concentrations associated with samples obtained from MP 17 in 2009.

Table 6 provides a summary of methane content in excess of trigger levels noted in 2009 for all other monitoring probes.

Table 6. Methane concentrations above trigger levels noted at all monitoring probes (excluding MP 17) during 2009 sampling.

Monitoring Probe	Sampling Date	Methane Concentration (%)	Trigger Level (Methane Concentration (%))
MP1	12/29/2009	5	1.25 (25% LEL)
MP3	11/18/2009	1.5	1.25 (25% LEL)
MP3	11/25/2009	5	1.25 (25% LEL)
MP3	12/29/2009	4	1.25 (25% LEL)
MP7	11/18/2009	1.5	1.25 (25% LEL)
MP7	11/25/2009	5	1.25 (25% LEL)
MP7	12/11/2009	5	1.25 (25% LEL)
MP7	12/22/2009	5	1.25 (25% LEL)
MP7	12/29/2009	5	1.25 (25% LEL)
MP11	11/18/2009	1.5	1.25 (25% LEL)
MP11	11/25/2009	5	1.25 (25% LEL)
MP12	12/29/2009	12	0.5 (10% LEL)
MP14	8/19/2009	2.5	0.5 (10% LEL)
MP14	11/18/2009	1.5	0.5 (10% LEL)
MP21	12/22/2009	17	0.5 (10% LEL)

For the most part, methane concentrations noted at the monitoring probes have not exceeded trigger levels in 2010. Exceptions to this are a single elevated concentration noted during the January 6, 2010 sampling event at MP 14 (17% Methane concentration), as well as multiple exceedances of the relevant trigger level (10% LEL) noted at MP 17 through 2010 (Figure 5). There are no buildings or facilities within approximately 200 m of MP 17, in the northeast end of the property (Figure 2).

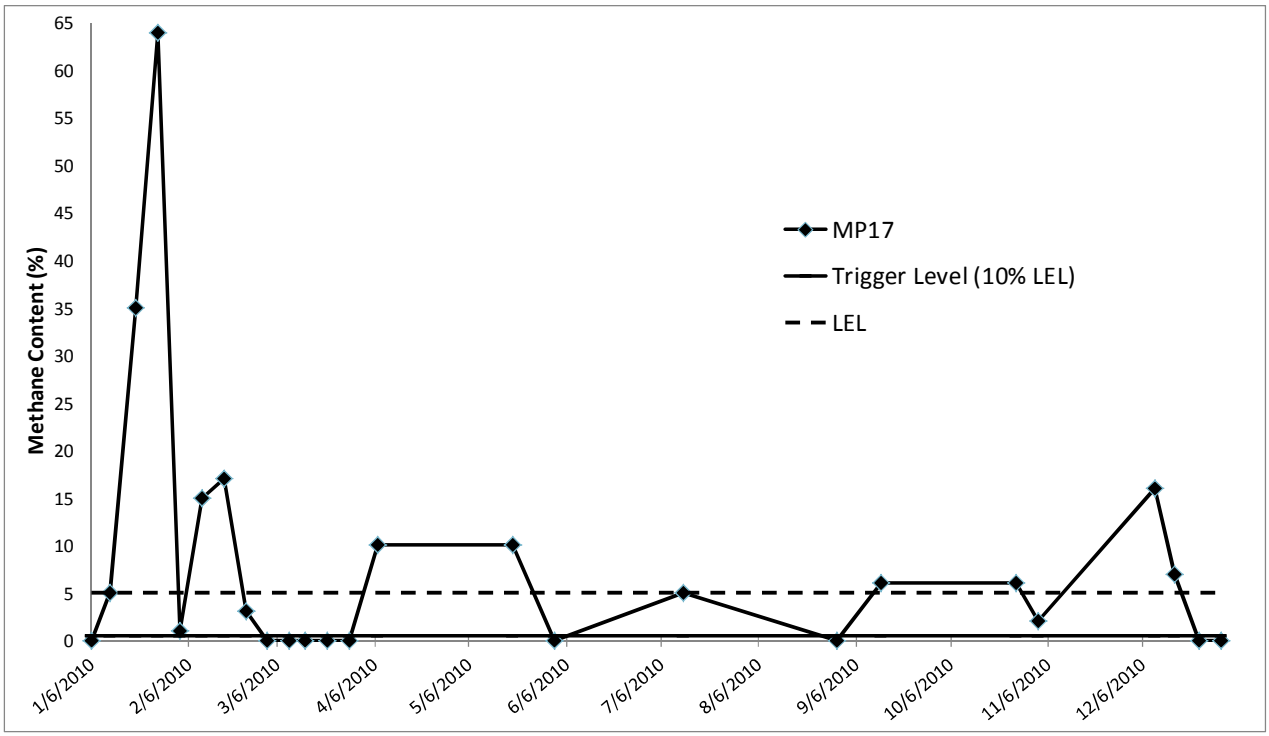

Figure 5. Methane concentrations associated with samples obtained from MP 17 in 2010.

It is important to note that RMOW has experienced difficulty in maintaining continuous operation of the LFG flare due to the low methane content (on average 22% between April 2009 and June 2010). Non-continuous operation of the flare is of potential concern because unburned LFG is emitted to the atmosphere for a short period of time during its cool-down (Golder Associates, Landfill Gas Management System, Former Whistler Landfill, Whistler B.C. Preliminary Assessment, 2010). In addition, inconsistent operation leads to a higher potential for LFG to accumulate in the Landfill and to migrate off-site because LFG is not consistently extracted from the waste. This issue may help to explain the elevated methane levels noted at MP 17 in 2009 and 2010.

A detailed review of LFG monitoring data obtained between April 2009 and June 2010 was undertaken by Golder Associates in 2010 to obtain a better understanding of LFG collection and flare operation efficiencies. During this review, suctions measured at extraction wells were compared with the outlet suctions observed at the flare station. The outlet suction at the flare station mostly varied from 4 to 9 in. w.c., whereas the suctions recorded at the extraction wells only varied from 0 to 3 in. w.c. These observations suggest that head losses of up to about 5 in. w.c. have occurred in the system conveyance piping.

In addition, the total LFG flow at extraction wells estimated from differential pressure measurements is 76 cfm, which is only 54% of the flow rate registered at the flare station at the time of monitoring (i.e., approximately 140 scfm). A plausible explanation for the discrepancy between these two total flows is related to the central horizontal collector connected to the 200 mm diameter header pipe near the north end of the landfill. This horizontal collector is not equipped with any valves, sampling ports or flow measuring devices that allow determination of the quantity of LFG extracted by this pipe and the secondary collector trenches connected to it. It is possible that LFG is being extracted by this collector and its adjoining trenches, but its quantity cannot be determined and is not accounted for in this assessment.

6.0 2010 Post-Closure Maintenance Activities

The following post-closure maintenance activities were undertaken in 2010:

- Three groundwater monitoring wells (MW4, 5, and 6) destroyed as a result of development of the Olympic Athletes Village were replaced.
- The Resort Municipality of Whistler has made regular modifications to flare operation throughout 2009 and 2010 to minimize flare shut-down, but is seeking better longer-term solutions for more efficient collection of LFG and flare operation.
- Currently the Municipality operates the flare with a valve regulating the propane supply to be on continuously for 5 seconds and then off for 20 seconds. This system has decreased the shut-down period however it has increased the fuel consumption as well as the system operating costs.

7.0 Summary of Environmental Issues and Actions Taken

For the surface water and groundwater monitoring undertaken in 2010, the only parameters that exceeded the relevant CSR standard for a period of two consecutive sampling events were Iron and Manganese, and only for samples taken from groundwater wells. These exceedances are not surprising, and likely attributed to natural geological conditions in the area. This assumption will be considered further in 2011, once a larger dataset is available for monitoring wells up gradient of the landfill site (i.e. MW5 and MW6). With the exception of Iron and Manganese, elevated levels of various parameters noted in the leachate samples were not found in any of the surface water or groundwater samples taken, indicating adequate management of leachate from the landfill site.

To address the issue of LFG collection and flare operation efficiencies, a detailed review of the monitoring data obtained between April 2009 and June 2010 was undertaken. Results of this review are summarized below (Golder Associates, 2010):

- Methane and oxygen contents of the collected LFG at the flare station varied from 18% to 30% (with an average of about 21.6%), and 0% to 3.8% (with an average of about 1.4%), respectively;
- Flow rate varied from 107 to 151 scfm (with an average of about 138 scfm), and remained relatively constant at about 140 scfm over most of the monitoring period, except in July and August 2009, when flow rates as low as 107 scfm were observed;
- Methane content of the LFG at the thirteen extraction wells varied from less than 10% at four wells (three of these wells were fully closed) to about 50% at one well; and
- No significant correlation was observed between methane content and LFG flow rate.

Data collected from April 2009 to June 2010 indicate that the LFG collected from the Landfill generally has methane contents lower than those of typical LFG generated under anaerobic conditions. Typical LFG generally contains 40% to 60% methane by volume, while the LFG collected from the site only has 18% to 30% methane by volume. The low methane contents observed at the site indicate that the landfill is possibly overdrawn, and / or leaks or preferential pathways are present at the site to allow air entry to the system.

Based on the data from April 2009 to June 2010 the average methane content in the LFG is only 22%. For optimal continuous operation of the candlestick flare, this methane concentration is too low. Discontinuous flaring is a concern because it can potentially result in the escape of LFG into the atmosphere. In addition, decreasing the operation of the flare can cause LFG to accumulate in the landfill and potentially migrate off-site.

Recommended actions to be undertaken in 2011 for optimizing the LFG collection system are provided in Section 8 of this report. It is expected that, once issues with the LFG collection system are addressed, the flow of LFG within the landfill can be better controlled. Methane levels at MP 17 will be closely monitoring following upgrades to the system, and adjustments to LFG extraction at nearby wells will be made as necessary. Further corrective measures will be taken in the event exceedances are still found after LFG collection system upgrades.

8.0 Recommendations

The following is a summary of recommendations in relation to post-closure monitoring at the RMOW landfill in 2011:

- Whistler WWTP staff will continue sampling at SFC-4B; however, this sampling will be reduced to quarterly monitoring rather than monthly monitoring.
- Monitoring at SFC-4 by Whistler WWTP staff can be discontinued. Similar information is already being collected on a quarterly basis for this watercourse by Morrison Hershfield at SFC-3.
- Clear marking of the locations of MW 5 and MW 6 will be undertaken to ensure these sites can be found during winter months when there is a large amount of snow on the site.
- To allow for calculations of residual balance gas contents and flow rates in extraction wells, and a more comprehensive assessments of LFG collection system performance, the following additional information will be acquired in 2011 LFG monitoring rounds (Golder 2010):
    - Carbon dioxide content and LFG temperature at the flare station;
    - Oxygen and carbon dioxide contents, differential pressure and LFG temperature at each extraction well;
    - Local weather conditions (e.g. atmospheric pressure, ambient temperature, precipitation, snow thickness); and
    - General conditions (i.e. integrity) of the extraction wells and monitoring probes; and
    - Hydrogen sulphide for a minimum of two rounds to confirm that hydrogen sulphide is not a parameter of potential concern.
- The following upgrades to the LFG collection system, and associated follow-up actions will be undertaken:
    - Installation of an isolation valve on the horizontal collector associated with the LFG collection system, to be supervised and reported on by a LFG specialist; this is a key recommendation that is expected to allow much better control (and optimization) of LFG extraction;
    - Field testing of LFG wellfield optimization strategies following completion of system modifications and repairs;
    - Complete revisions to LFG Operating Procedures based on results of wellfield optimization field testing; and
    - Continued identification and addressing of minor repairs to the LFG collection system.

9.0 References

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APPENDIX A

Borehole Logs for Groundwater Wells Installed in 2010.

MORRISON HERSHFIELD

WELL NUMBER MW-4

CLIENT Regional Municipality of Whistler
PROJECT NAME RMOW Landfill Management and Monitoring
PROJECT NUMBER 510404600
PROJECT LOCATION Whistler, British Columbia
DATE STARTED 16/8/10 **COMPLETED** 16/8/10
GROUND ELEVATION 596.53 m **HOLE SIZE** 0.15 m
DRILLING CONTRACTOR Sonic Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger 2"
AT TIME OF DRILLING ---
LOGGED BY S. Black **CHECKED BY**
AT END OF DRILLING ---
NOTES 5547877.45 E, 496856.42 N
AFTER DRILLING 3.05 m / Elev 593.48 m

DEPTH (m)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
						Casing Top Elev: 596.53 (m) Casing Type: PVC
		GP		(GP) Coarse Gravel Cobbles		
				1.52	595.01	
2		SP		(SP) Coarse Sand		
				3.05 ▽	593.48	
		GP		(GP) Cobble/Gravel Zone with Coarse Sand		← Bentonite Seal
4						
				5.49	591.04	
6		CL		(CL) Fine-grained Sand		
				6.10	590.43	
		SP		(SP) Medium Coarse Sand (Wet)		
				7.32	589.21	
8		CL		(CL) Fine/Medium Sand		
				8.53	588.00	
		SP		(SP) Medium Sand to Sandy Gravel		← Sand Fill ← 2"-15' Screen, Shed 40, 10 Slot, 10/20 Sand
10						
				11.89	584.64	

Bottom of hole at 11.89 m.

GENERAL BH / TP / WELL WHISTLER LANDFILL MONITORING.GPJ GINT STD CANADA LAB.GDT 2/3/11

MORRISON HERSHFIELD

WELL NUMBER MW-5

CLIENT Regional Municipality of Whistler
PROJECT NAME RMOW Landfill Management and Monitoring
PROJECT NUMBER 510404600
PROJECT LOCATION Whistler, British Columbia
DATE STARTED 17/8/10 **COMPLETED** 17/8/10
GROUND ELEVATION 610.82 m **HOLE SIZE** 0.15m
DRILLING CONTRACTOR Sonic Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger
AT TIME OF DRILLING ---
LOGGED BY S. Black **CHECKED BY**
AT END OF DRILLING ---
NOTES 496982.68 E, 5547303.76 N
AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
		GP		(GP) Clean Granular Fill	Casing Top Elev: 610.82 (m) Casing Type: PVC Bentonite Seal
				1.52 609.30	
2		GP		(GP) Rocky	Sand Fill
				3.05 607.77	
		SM		(SM) Coarse Sand (Wet)	2"-15' Screen, Shed 40, 10 Slot, 10/20 Sand
				3.96 606.86	

Bottom of hole at 3.96 m.

MORRISON HERSHFIELD

WELL NUMBER MW-6

CLIENT Regional Municipality of Whistler
PROJECT NAME RMOW Landfill Management and Monitoring
PROJECT NUMBER 510404600
PROJECT LOCATION Whistler, British Columbia
DATE STARTED 17/8/10 **COMPLETED** 17/8/10
GROUND ELEVATION 610.88 m **HOLE SIZE** 0.15
DRILLING CONTRACTOR Sonic Drilling Ltd.
GROUND WATER LEVELS:
DRILLING METHOD Hollow Stem Auger 2"
AT TIME OF DRILLING ---
LOGGED BY S. Black **CHECKED BY**
AT END OF DRILLING ---
NOTES 496771.95 E, 5547262.6 N
20hrs AFTER DRILLING ---

DEPTH (m)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM
						Casing Top Elev: 610.88 (m) Casing Type: PVC
2		GP		(GP) Clean Granular Fill		
				3.05	607.83	
		SP		(SP) Organic Material (dark brown/black/dump)		← Bentonite Seal
				3.66	607.22	
4		SW		(SW) Medium Sand (reddish)		
				4.27	606.61	
		GP		(GP) Cobbles/Coarse Sand (clay lenses-reddish orange)		
6				6.25	604.63	
		SP		(SP) Brown/Grey Poorly Graded Sand, Gravelly and Silty Zones (Wet)		← Sand Fill
8				8.23	602.65	← 2"-15' Screen, Shed 40, 10 Slot, 10/20 Sand
		GW		8.53 (GW) Gravel	602.35	
		SP		(SP) Brown/Grey Poorly Graded Sand		
				9.15	601.73	

Bottom of hole at 9.15 m.

APPENDIX B

Monitoring and Reporting Requirements (CH2M Hill, 2008c)

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Volume 2

Monitoring and Reporting Requirements

Prepared for

WHISTLER

Resort Municipality of Whistler
British Columbia

January 2008

Prepared by

CH2MHILL

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Contents

Exhibits

Appendices

1. Background

1.1 Introduction

This manual describes the environmental monitoring requirements for the Resort Municipality of Whistler's (RMOW's) Whistler Landfill (the Site). The environmental monitoring program is based on the Whistler Landfill Closure Plan (CH2M HILL, 2006), which was approved by the British Columbia (BC) Ministry of Environment (MoE) in its letter, dated January 10, 2007. This site monitoring manual encompasses monitoring and reporting procedures for ground water, surface water, leachate, landfill gas (LFG), and cover system integrity.

Operation and maintenance (O&M) requirements and procedures for the landfill gas collection system (LFGCS) are presented under a separate document.

This monitoring manual describes the site-specific monitoring requirements for post-closure monitoring, including:

- Sampling and monitoring location (groundwater, surface water, LFG)
- Sampling protocols (collection techniques, equipment, preservatives, sample storage, and chain of custody)
- Laboratory analysis requirements
- Quality assurance and quality control (QA/QC)
- Data Interpretation and Reporting Requirements

LFG migration monitoring and O&M requirements and procedures for the LFGCS are presented in Volume 1 – Landfill Gas Collection System Operation and Maintenance Manual and this, Volume 2 – Monitoring and Reporting Requirements.

1.2 Safety

Safety is a very serious concern in a landfill environment; many potential life-threatening hazards are present. O&M of the system may involve exposure to refuse, leachate (water that has come into contact with waste and may contain a wide variety of contaminants that may be harmful to human health or the environment), LFG, and LFG condensate. O&M of the system may also require confined space entry.

Before undertaking work, a written health and safety plan (HASP) must be prepared to address task-specific hazards associated with the work. The HASP should be based on the Occupational Health and Safety Regulations, BC Regulation 296/97, published by the Workers Compensation Board of British Columbia.

2. Site Location and History

The RMOW owns and operates the Site, which is located approximately 8 km west of Whistler and accessed via Highway 99 and the Cheakamus Lake Road, see Exhibit A-1 (Appendix A). The Site was initially permitted in 1977 for the disposal of refuse from residential and Industrial, Commercial, and Institutional (ICI) sources. In 1988, a second permit was issued to authorize the discharge of construction and demolition (C&D) waste in a separate cell of the Site. In 2005, the RMOW decided to close the landfill to accommodate development of the adjacent land to serve as the Athletes' Village during the 2010 Winter Olympic Games. Disposal at the landfill ceased in October 2005.

The landfill closed, and a final cover system was installed in 2006. During construction of the final cover, an active LFG collection and flare system was installed to manage LFG generated by the waste and to control emissions. Development of commercial and residential buildings on the lands directly east of the landfill footprint began in 2007.

3. Site Hydrology and Hydrogeology

Details of the hydrogeology are provided in the Closure Plan (CH2M HILL, 2006). A single, unconfined aquifer was identified within the overburden. The saturated zone in most locations extended from the bedrock surface at depth to within less than 1 m of the ground surface. Detailed description of the stratigraphy and groundwater monitoring well details are presented in Appendix B.

Groundwater elevations measured during a single water level monitoring event ranged between 606.78 and 593.98 m above mean sea level (AMSL). Flow generally follows the topography approximately south to north toward the Cheakamus River, Exhibit C-1 (Appendix C).

Small surface streams are present within the landfill limits and surrounding the landfill. Small streams located downgradient from the landfill likely receive some base flow as a result of seasonal groundwater discharge. Locations of the surface water features are shown in Exhibit D-1 (see Appendix D).

4. Groundwater Monitoring Program

The groundwater monitoring well locations are shown in Exhibit D-1 (Appendix D), and hydraulic location, monitoring frequency, and field measurements as well as IDs of the wells to be monitored, are presented in Exhibit 4-1.

EXHIBIT 4-1
Well Location IDs and Parameters to be Analyzed

Location ID	Hydraulic Location Relative to Waste	Monitoring Frequency	Field Measurements	Laboratory Analysis
MW-1 (destroyed) MW06-16	Upgradient	Spring, Fall	Water level Temperature pH Conductivity Oxidation Reduction Potential (ORP) Dissolved Oxygen	See Exhibit E-1 (Appendix E)
MW-2s MW-2d MW-3 MW-4	Downgradient	Spring, Fall	Water level Temperature pH Conductivity ORP Dissolved Oxygen	See Exhibit E-1 (Appendix E)

The groundwater monitoring network includes monitoring wells located upgradient and downgradient of the landfill cell. These wells are utilized to monitor groundwater levels and groundwater quality.

Groundwater levels will be monitored at all wells available at the Site to allow assessment of groundwater flow and seasonal variation of the groundwater table elevation.

Groundwater quality will be assessed upgradient of the landfill to determine the baseline water quality and provide a basis for the evaluation of groundwater quality downgradient of the landfill. Downgradient groundwater quality will be assessed to determine if the landfill is resulting in impacts to groundwater quality.

5. Surface Water

Surface water will be collected from four locations within flowing water courses. The surface water monitoring locations are shown in Exhibit D-1 (Appendix D) and are relative to the presence of surface water. In the case that surface water is not available, field staff will seek for other sources that cover the studied area.

Surface water quality data will be compared to Schedule 6, Column I (Generic Numerical Standards for Aquatic Life) of the Contaminated Sites Regulation BC Regulation 375/96 to determine the quality of surface water at the Site and to identify if unacceptable impacts are present.

Surface water quality will be assessed upstream of the landfill to determine the baseline surface water quality and provide a basis for the evaluation of surface water quality downstream of the landfill. Due to the direct exposure of surface water to potential sources of contamination other than the leachate derived from the landfill, surface water quality results based on a single round of samples should be interpreted with caution.

It must be noted that surface water flow rates will not be measured during this investigation.

Surface water sampling locations and their specific conditions are described as follows and detailed in Exhibit 5-1:

- SFC-4 is located upstream of the Site, within a stream that flows towards the eastern side of the landfill and runs under the waste. At SFC-4, water flows towards the north and discharges at SFC-2B, north of the waste footprint.
- SFC-2 is located downstream of SFC-4. The water course runs under the waste mass through a culvert between the two sampling locations. SFC-2 is situated at the discharge point of the culvert. The culvert was installed along the approximate alignment of the natural watercourse prior to the development of the Site. In the absence of leakage into the culvert underlying the landfill, SFC-2 is not connected to surface water overland flow that is generated within the waste footprint. It should be noted that the condition of the culvert has not been assessed. Discharged groundwater may contribute to the stream base flow.
- SFC2-B is located within the stream north of the waste footprint. It receives water from the SFC-2 sampling location from overland flow generated by the surrounding lands south of the waste footprint, and likely from some groundwater discharge. High topographic relief isolates SFC2-B from the surface water that is generated within the waste footprint. Based on comparison of the elevations of surface water in the creek and of static groundwater measured at nearby groundwater wells, groundwater discharge may represent a significant portion of the stream's base flow.
- SFC-3 is located within a stream flowing west of the former compost and biosolids storage area.

Exhibit 5-1 presents the hydraulic location of the sample, the frequency for sampling, and the parameters analyzed on the field and by the laboratory.

EXHIBIT 5-1
Surface Water Sampling Information

Location ID	Hydraulic Location Relative to Waste	Monitoring Frequency	Field Measurements	Laboratory Analysis
SFC-1 (dry) SFC-4	Upstream	Spring, Fall	Temperature pH Conductivity ORP Dissolved Oxygen Total water depth at sample location	See Exhibit E-2 (Appendix E)
SFC-2 SFC-2b SFC-3	Downstream	Spring, Fall	Temperature pH Conductivity ORP Dissolved Oxygen Total water depth at sample location	See Exhibit E-2 (Appendix E)

6. Leachate

One borehole was advanced at the highest point of the Site within the oldest waste during the field investigation. The leachate observation well was designed not to reach the groundwater table to prevent accidental contamination of groundwater.

A leachate observation well (LW-1, shown in Exhibit 6-1) was installed within the waste to permit leachate sampling. Monitoring performed to-date suggests that the waste is not continuously saturated throughout the year at this location. As a result, sufficient leachate is not always available to provide a sample. Since the well was installed, the landfill cap has been constructed and is expected to reduce leachate generation at the site. This reduction in leachate availability may result in less frequent sample collection requirements in the future.

The leachate level in the well should be monitored as scheduled, and sample collection should be undertaken when sufficient leachate accumulation is detected. See Exhibit 6-1 for parameters.

EXHIBIT 6-1
Leachate Sampling Point and Parameters

Location ID	Hydraulic Location Relative to Waste	Monitoring Frequency	Field Measurements	Laboratory Analysis
LW-1	Leachate	Spring, Fall	Water level Temperature pH Conductivity	See Exhibit E-2 (Appendix E)

7. Maintenance of Monitoring Wells

The structural integrity of the groundwater monitoring well system must be maintained in such a way as to prevent surface water and contaminant from entering the well. Prior to sampling, a visual inspection of the exterior monitoring well must be conducted that includes the following observations:

- Well labelling
- Damage to protective casing
- Settling and cracking of surface seal

If a groundwater monitoring well becomes damaged and requires more than just replacement of a well cap or lock, then a new replacement monitoring well must be installed.

8. Monitoring and Sampling Procedures

The following section details the procedures that are to be followed for undertaking surface water, groundwater, and leachate sampling programs at the Site.

8.1 Personnel

Team members must be familiar with the sampling and handling procedures included in this document and with health and safety procedures applicable to the sampling work (in accordance with Provincial and Federal regulations) prior to commencement of activities. All team members should be aware of potential site hazards and proper emergency procedures before sampling begins. A task-specific health and safety plan should be developed by a qualified professional familiar with the monitoring program.

8.2 Preparations for Sampling

Preparations for sampling include coordination with the laboratory and facility personnel, procuring field equipment, and calibrating field instruments.

8.2.1 Procuring Field Equipment

Gather equipment to be used for sampling and appropriate health and safety equipment. Field personnel should check to ensure that all equipment functions properly. Check well maintenance records or field logs generated during previous field investigations to determine the condition of wells and identify additional operational requirements.

8.2.2 Calibrating Field Equipment

Calibration requirements for field instruments are instrument-specific. The manufacturer's instructions must be followed for all calibration requirements.

At a minimum, equipment should be calibrated daily. A calibration check using standard reference solutions of known composition should be conducted more frequently to confirm that calibration is maintained throughout the working day. Calibration and calibration check results will be recorded in the field notes. Additional periodic calibration checks will occur if meter readings appear to drift or batteries require replacement.

Field measurement equipment that is out of calibration and cannot be calibrated or that malfunctions during use will be removed from service and repaired by a qualified technician. Field equipment conditions will be recorded in the field notes and should describe the following: dates and types of equipment malfunction and type, location, and dates of repairs.

The field meters and water-level indicator operate on batteries that will be checked routinely for integrity. Some meters with rechargeable batteries have a battery check

function for convenient determination of the battery charge level. Battery replacement dates will be recorded on the field equipment log.

8.3 Pre-sampling Inspection

Prior to undertaking sampling, each of the wells and surface water stations will be inspected to provide an assessment of the condition of the sampling location. Record observations regarding the condition including, but not limited to, the following inspection items:

- Groundwater Well Inspection
  - Condition of the protective casing and lock, including evidence of tampering
  - Condition of the surface seal
  - Any obstructions in the well
  - Condition of dedicated sampling equipment in the well
- Surface Water Station Inspection
  - Tampering, litter, or debris near the sample location
  - Presence or absence of flow
  - Approximate flow depth

8.4 Groundwater and Leachate Level Measurements

Discrete water levels are to be recorded following the pre-sampling inspection. Water levels in each of the wells will be measured as the initial step in sampling to calculate the volume of water to be evacuated. Exhibit F-1 (Appendix F) shows the water/leachate level readings taken during sampling visits.

Water levels should be measured at all wells within 24 hours of the measurement at the first well.

8.4.1 Equipment and Materials

The following equipment is required:

- Electronic water-level meter (Solinst or equivalent) with a minimum 50-m tape; the tape should have graduations in increments of 0.01 m or less
- Distilled water for decontamination
- Gloves – powderless Nitrile

8.4.2 Procedure

1. Verify that the unit is turned on and functioning properly.
2. Slowly lower the probe on its cable into the well until the probe makes contact with the water's surface; the unit will respond with a tone and/or light signal.
3. Measure the depth to the water level to within 0.01 m with an electronic water-level indicator from the reference point on the top of the casing indicated by a mark on the casing

- *Optional measurements:*

  1) The depth of the well
  2) The distance from the reference point to the top of the protective casing
  3) The distance to the surface of the concrete pad or to ground.

  These measurements are useful for assessing changes to the condition of the well and verifying the well's identification through comparison to the as-constructed measurements, should the well's ID tag be illegible.

4. Record the time, date, and water level measurements in the field log.
5. Thoroughly spray or wash portions of the instrument that were inserted into the well with distilled water after the measurements are performed and prior to coiling the line back onto the spool.

8.5 Groundwater and Leachate Well Purging and Sampling

Prior to sample collection, each well will be purged to remove stagnant water within the well and provide samples that are more representative of *in situ* conditions. The volume of water to be evacuated from each well prior to its sampling will be calculated in the field and recorded on the groundwater sampling form.

8.5.1 Equipment and Materials

The following equipment is required for well purging and sampling:

- Sampling pump:
  - Waterra inertial pump (foot valve) with tubing or equal
    - Pump and tubing are to be dedicated to each well
- Graduated bucket
- Water quality instrument:
  - Portable instrument capable of measuring
    - Temperature
    - pH
    - Specific conductance
    - Oxidation/reduction potential
  - distilled water for instrument decontamination
  - flow-through cell (optional)
- Sample containers
- Groundwater field filter 0.45 µ (single-use filter – Waterra or equal)
- Gloves – Nitrile, disposable, powderless

8.5.2 Purging and Field Parameter Measurement

The following procedures are to be followed while purging each well:

1. Record the well number, site, date, and condition in the field logbook.
2. Confirm that the water level has been recorded.

3. Confirm that a dedicated pump is installed in the well and that it is functional. Install a new pump if no pump is present or damage is suspected.
4. Ensure that instruments are calibrated according to the manufacturer's instructions.
5. Calculate the total depth of water in the well based on the water level measurement and total well depth. The depth of water is calculated as follows:

   Depth of water (m) = Depth to water (m) – Total Depth of Well (m)

6. Calculate the volume of water to be purged using the water level data collected. The volume in litres of water in the well casing is calculated as follows:

   $(\pi r^2 h)/1000$ = *Volume in litres*

   where: $\pi = 3.14$
   r = Radius of the well pipe in mm
   h = Height of water in well in m

   The volume of water in typical well casings may be calculated as follows:

   50-mm-diameter (2-inch) diameter well:
   2 L/m x Depth of water (m) = litres

7. Purge sufficient water from the well to allow the initial field parameters to be measured and recorded in the field logbook.
   - Capture and measure the volume of the purge water in the graduated bucket to determine the volume purged from the well.
   - Measure the field parameters, and record the results in the field logbook. Field parameters are listed in Exhibit 4-1 of this plan.
     – It is preferred to measure field parameters using a flow-through cell to minimize contact of the water with atmosphere. Follow the manufacturer's recommendations for use of the flow-through cell. The purged groundwater is directed through the flow-through cell, allowing measurements to be collected before the water contacts the atmosphere.
     – Alternatively, field parameters may be measured directly from the graduated bucket.
8. Continue purging well for 3 to 6 well volumes.
   - Measure and record field parameters after each well volume at a minimum.
   - Purge the well until field parameters have stabilized over three consecutive well volumes or parameters stabilize to with 10% of the previous readings. In general, field parameters are considered stabilized when pH measurements agree within 0.1 units, specific conductance measurements agree within 10%, ORP measurements agree within 10 mV, and turbidity is as low as practicable given sampling conditions.
   - Record the stabilized readings in the field logbook.

8.5.3 Sample Collection

The following procedures are to be followed for collection of groundwater samples immediately following well purging:

1. Put on new, clean Nitrile gloves.
2. Operate the pump in a smooth, consistent manner to achieve an appropriate flow rate that does not result in excessive turbidity or aeration of the water. Reduce the pumping rate to the extent possible to reduce sample turbidity.

   Note: *Alternatively, Waterra High Density Polyethylene (HDPE) tubing can be used, along with a foot valve mounted at the bottom of tubing.*
3. Collect sample directly from the pump tubing to the sample container. Care must be taken not to introduce contaminants from the sampler, surface, or atmosphere during sample collection. Handle the sample container lids with caution during sampling.
   - Samples should be collected in a particular order to assure that those samples most likely to change rapidly when exposed to the atmosphere are collected first. Exhibit D-1 (Appendix D) presents the parameters to be analyzed.
   - Care must be taken to minimize sample disturbance when collecting volatile organic compound (VOC) samples. Each VOC bottle will be filled such that a positive meniscus is established and will be checked for the presence of air bubbles after the bottle is capped. If air bubbles appear, the bottle cap will be removed, water from the pump will be added so that the bottle overflows slightly, and the bottle will be recapped. All samples will be collected using dedicated Waterra pumps or another engineering-approved sampling device.
   - Samples for total dissolved metals analysis must be filtered during collection using a 0.45 µ disposable groundwater field filter.
     - Remove new filter from packaging.
     - Insert filter into sample tubing in the proper flow orientation.
     - Record filter lot number in the field notes, and dispose of filter.
4. Ensure the sample is preserved per the laboratory's requirements for each analyte.
5. Ensure the sample is labelled appropriately, including: sample ID, date, time, and project/site reference.
6. Place samples in a cooler containing ice immediately after they are collected. Samples should be maintained at approximately 4°C and must be maintained under chain-of-custody procedures from the time of collection through delivery to a laboratory for analysis (see Appendix G for Chain-of-Custody forms). The cooler temperature should be monitored to ensure the internal temperature does not exceed 10°C.
7. Record date, time, field measurements, and additional observations in the field logbook.

9. Surface Water Sample Collection

9.1 Equipment and Materials

The following equipment is required for sampling:

- Water quality instrument:
  - Portable instrument capable of measuring
    - Temperature
    - pH
    - Specific conductance
    - Oxidation/reduction potential
- Sample containers
- Gloves - Nitrile, disposable, and powderless

9.2 Sample Collection

The following procedure is to be followed for collection of surface water samples:

1. Put on new, clean Nitrile gloves.
2. Select the location for water sampling. Location should have flowing water deep enough to allow collection of surface water without entraining bottom sediments.
3. Approach the location from downstream in a manner that avoids disturbance of bottom sediments as much as possible.
4. Using a clean sample bottle with no preservative, gently submerge the bottle, with the mouth pointed upstream, and the bottle tilted slightly downstream. Bubbles and floating materials should be prevented from entering the bottle.
5. When the bottle is full, gently remove it from the water. If sample preservatives are required, transfer the sample to a bottle pre-charged with preservative, or add preservatives to the sample bottle.
6. Measure dissolved oxygen, specific conductance, temperature, and pH at the sampling location.
7. Record date, time, field measurements, and additional observations in the field logbook. Record depth of flow and approximate stream width at sample location.

10. QA/QC Samples

A field QA/QC protocol is necessary to verify the precision and accuracy of the combined field sampling/handling and laboratory procedures and to assess reproducibility of the sampling and analytical procedures. QA/QC samples will include the following:

- Blind replicate sample (split sample):
  - Frequency: 1 Blind replicate per 10 samples
  - Analytical Parameters: Same as samples
  - Collection technique:
    - Collect identical field samples by equally splitting collected sample between two bottle sets.
    - Label one bottle set with the well ID and the second set with a unique identifier.
    - Record the date and sample identifications of the collected samples in the field logbook.
- Field blank samples:
  - Frequency: 1 field blank per 10 samples
  - Analytical Parameters: Same as samples
  - Collection technique:
    - Laboratory reagent (deionized) water will be carried through sample collection and handling (including preservation) to check for contamination, purity of preservatives, and other systematic errors occurring from time of sampling.

A total of two QA/QC samples are expected per sampling event.

11. Sample Handling

The following section provides an overview of the sample handling procedures.

11.1 Sample Parameters, Containers, Holding Times, and Methods

Exhibit 11-1 summarizes the bottle requirements, holding times, analytical methods, and preservation requirements for samples to be collected during sampling events. The analytical laboratory should be consulted to ensure that the requirements meet current standards and recommended practices.

EXHIBIT 11-1
Sample Handling Information

Parameters	(#) Containers	Preservation	Holding Times	Comments
VOCs	(2) 40 ml VOA	Pre-treated with HCl. Cool to 4°C.	14 days	USEPA Method 8240 or 624
PCBs, Chlorinated Phenols, PAHs	(3) 1 L amber glass	Cool to 4°C.	14 days	PCBs – Method 628 Chlorinated phenols – 604 PAHs – 625
General Water Quality Parameters[1]	(1) 1 L polyethylene	Pre-treat with H_2SO_4. Cool to 4°C.	28 days	ITAP Standard Methods, APHA 18th Ed.
Major Ions[2]	(1) 250 ml polyethylene	Cool to 4°C.	6 months	ITAP Standard Methods, APHA 18th Ed.
Dissolved Metals[3]	(1) 250 ml polyethylene	Acid-washed, field filter, cool to 4°C.	6 months	ITAP Standard Methods, APHA 18th Ed. – ICP
Coliform	(1) 100 ml polyethylene, wide-mouth	Pre-sterilized, cool to 4°C.	6 hours (24 hours max.)	USEPA and APHA Methods 9222 and 9223B

[1] COD, hardness, fluoride, nitrite (as N), nitrate (as N), ammonia (as N), phosphorus, alkalinity (as $CaCO_3$), sulphate

[2] Magnesium, chloride, bicarbonate

[3] Aluminum, beryllium, barium, chromium, copper, lead, manganese, molybdenum, silver, arsenic, boron, cadmium, cobalt, iron, magnesium, nickel, zinc, calcium, potassium

Should chemical preservative be needed, the laboratory will provide bottles with appropriate preservatives already added. Bottles prepared with preservatives will be prelabelled and identified as "preserved" in order to distinguish them from nonpreserved bottles.

11.2 Sample Packaging and Shipping

Samples and empty sample containers will be packaged and shipped in conformance with International Air Transportation Association (IATA) and Transport of Dangerous Goods regulations, as applicable. The following procedures for sample packaging and shipping will be followed to maintain sample quality and to minimize container breakage during transport to the laboratory.

Before packaging samples, the exterior of the sample container will be checked to verify that it is clean and that the sample identification number is legible. The sample packaging and shipping containers will be constructed and packed to meet the following requirements:

- There will be no release of materials to the environment. Inner containers that are breakable must be packaged to prevent breakage.
- Only waterproof ice chests and coolers are acceptable shipping containers and must be packaged to prevent breakage and leakage.

After documentation, samples will be handled as follows:

1. Seal drain plug in cooler.
2. Place vermiculite (cushioning and absorbent material) in bottom.
3. Wrap glass bottles with bubble wrap, and place in cooler that is partially filled with vermiculite or other inert packing material. If bubble wrap is not available, place the containers in Ziploc-type plastic bags, and set in waxed cardboard holders that have been set up inside the cooler.
4. Fill space between bottles with vermiculite or other inert packing material.
5. Add ice in plastic bags.
6. Place the chain-of-custody form in plastic bag attached to inside of cooler lid.
7. Attach chain-of-custody seals at both the front and back of container so that the seals must be broken if the cooler is opened.
8. Place name and address of receiving laboratory in a position clearly visible on the outside of the cooler.
9. Secure the lid with fibre tape.

Samples will be delivered directly by the sampling team or shipped via overnight courier to the contracted laboratory for analysis. All air bills should be kept on file as part of chain-of-custody documentation, and the laboratory will be informed by telephone each time samples are shipped.

11.3 Sample Custody

The management of samples collected in the field must follow specific procedures to assure sample integrity. The possession of samples must be traceable from the time they are

collected through the time that they are analyzed in the laboratory. All groundwater samples will be collected under chain-of-custody procedures. Chain-of-custody forms are provided by the laboratory for this purpose. An example chain-of-custody form is shown in Appendix G.

Custody of a sample is defined by the following criteria:

- The sample is in a person's view while in his/her possession.
- Any sample in a person's possession and not in view is locked up or transferred to a designated secure area.

Each time the samples change hands, both the sender and receiver sign and date the chain-of-custody form and specify what item has changed hands. When a sample shipment is sent to the laboratory, the top signature copy is enclosed in plastic and secured to the inside of the cooler lid. The second copy of the chain-of-custody form must be retained in the project files. A chain-of-custody record must be completed for each shipping container, and the information must be consistent with the sample identification matrix (see Appendix G, page 2).

The following information is to be included in the chain-of-custody form:

- Sample number
- Signature of sampler
- Date and time of collection
- Place of collection
- Type of sample
- Sample identification number
- Type of container
- Inclusive dates of possession
- Signature or initials of the receiver

In addition to the labels, seals, and chain-of-custody form, other components of sample tracking include the field data sheets, sample shipment receipt, and laboratory logbook.

11.4 Field Documentation

Specific information and observations should be recorded on the groundwater sampling field data sheets during sampling. At minimum, the following information is to be documented on the data sheet:

- Sampling team personnel and their designated responsibilities (for example, team leader or assistant).
- The make, model number, serial number, and calibration information for each meter used in the field (that is, temperature, specific conductance, pH, and all health and safety monitoring equipment).
- Well evacuation data (including evacuation rate, total volume removed during evacuation, and water levels at the beginning and end of well evacuation).

- Field parameters (temperature, pH, and specific conductance).
- Management of purge water (for example, discharge onto the ground or into drums for holding and future analysis).
- Sampling data, including: sample identification, types of bottles filled, and analyses to be performed on each bottle; method of collection (pump or bailer); visual description of the water; and the date and time the samples were collected.

Decontamination procedures and times when specific equipment where required should be recorded, although it may be convenient to keep a log of decontamination activities in a separate log book.

11.5 Decontamination of Groundwater Sampling Equipment

Any wells that do not contain dedicated sampling equipment will be sampled with disposable polyethylene or Teflon bailers or will have a dedicated foot valve pump installed during the monitoring event. No decontamination of groundwater sampling equipment is expected.

11.6 Management of Purge Water and Field-derived Wastes

Field-derived wastes generated during the groundwater sampling effort will include purge water and disposable personal protection and sampling equipment. All purge water will be discharged onto the ground. Disposable equipment will be disposed of at the onsite waste transfer station or, alternatively, bagged and disposed of properly.

12. Landfill Gas

An active LFGCS has been installed at the Site. However, subsurface landfill migration monitoring probes have not yet been installed.

Detailed description of the system and the O&M requirements are presented in Volume 1 – Landfill Gas Collection System Operation and Maintenance Manual.

13. Reference List

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APPENDIX A

SITE LOCATION

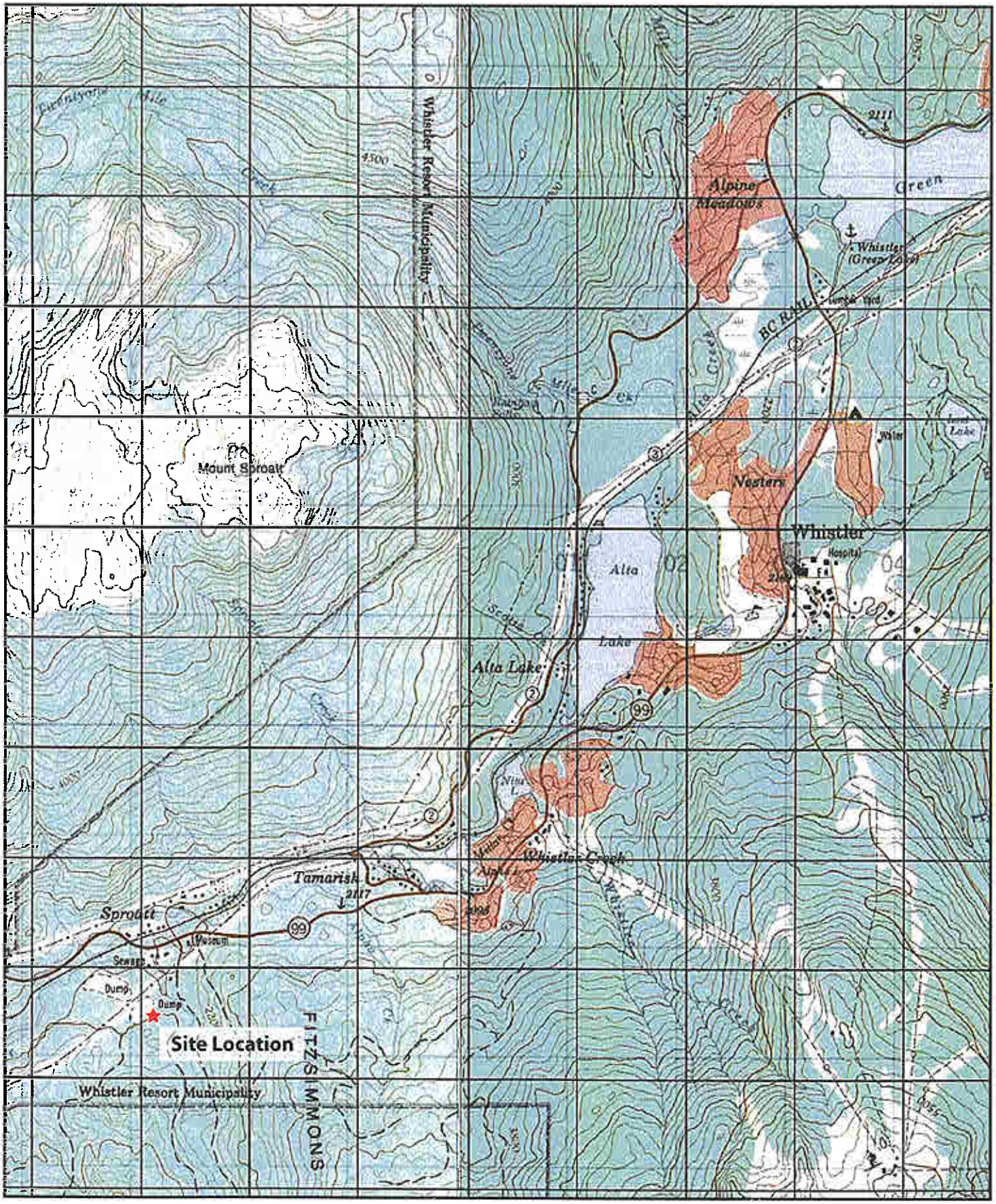

Exhibit A-1
Site Location Map
Whistler Landfill Closure Plan

APPENDIX B

BOREHOLE LOGS AND MONITORING WELL DETAILS

CH2MHILL

SHEET 1 OF 1

RECORD OF BOREHOLE: BH 1-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE

LOGGED BY: PP | GROUND ELEVATION: | DATUM:

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	BOREHOLE BACKFILL DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 20 40 60 80
0	195			sandy **SOIL (FILL)**				
1								
2	61			**ROCK**: Fine grain basalt		2.07		
3				End of borehole at 3.05 mbgs		3.05		
4								
5								

CH2MHILL

SHEET 1 OF 1

RECORD OF BOREHOLE: BH 2-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE

LOGGED BY: PP | GROUND ELEVATION: | DATUM:

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	BOREHOLE BACKFILL DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 20 40 60 80
0	122			sandy **SOIL**: Brown				
1				**ROCK**: Fine grain basalt		0.91		
2	30							
3	18							
4				End of borehole at 3.96 mbgs		3.96		
5								

CH2MHILL

SHEET 1 OF 2

RECORD OF BOREHOLE: BH 3-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE

LOGGED BY: PP | GROUND ELEVATION: | DATUM:

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	BOREHOLE BACKFILL DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 20 40 60 80
1	170			gravelly **SAND (FILL)**: Brown				
				silty **SAND**: Grey and brown		1.22		
2				**SAND and GRAVEL**: Cobbles and boulders, poor recovery		2.13		
3	55			**ROCK**: Fine grain basalt		3.05		
				End of borehole at 3.35 mbgs		3.35		
4								
5	30			**ROCK**: Coarse grained granite boulder		4.88		

CH2MHILL

SHEET 2 OF 2

RECORD OF BOREHOLE: BH 3-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE

LOGGED BY: PP | GROUND ELEVATION: | DATUM:

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	BOREHOLE BACKFILL DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 20 40 60 80
7								
8								
9								
10								
11								

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SHEET 1 OF 2

RECORD OF MONITORING WELL: LW1-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling
DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 615.42 mASL
LOGGED BY: PP
GROUND ELEVATION: 614.54 mASL
Datum: X 496996.58 Y 5547611.001

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
0	201	1		**GRANULAR (FILL)**: Grey, black			Concrete seal	
1							Bentonite pellet seal	
2								
3						611.19		
4	195	2		Mixed waste, dry		3.35	10/20 Sand	
5							2" diameter PVC, Sch. 40, No. 10 slot well screen	
6	122	3				608.14		
7				**GRANULAR (FILL)**: Black, damp		6.40		
8	0	4		Mixed waste with granular fill, wet		606.61 7.93		
9								

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SHEET 2 OF 2

RECORD OF MONITORING WELL: LW1-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 615.42 mASL

LOGGED BY: PP
GROUND ELEVATION: 614.54 mASL
Datum: X 496996.58 Y 5547611.001

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
10	146	5						
11						603.26 / 11.28		
12				gravelly **SAND**: Black, wet				
13								
14						600.52 / 14.02		
				End of borehole at 14.02 mbgs				
15								
16								
17								
18								

CH2MHILL

SHEET 1 OF 2

RECORD OF MONITORING WELL: MW 1-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE | TOP OF PIPE: 608.81 mASL

LOGGED BY: PP | GROUND ELEVATION: 607.99 mASL | Datum: X 497024.932 Y 5547525.992

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
0				sandy **SOIL**: Some roots, brown		607.38	Concrete seal	
				gravelly **SAND**: Some cobbles, some silt, trace clay, brown/orange, sub-rounded grain shape roots and wood throughout		0.61		
1				Grey mottling for 20 cm			Bentonite pellet seal Sand	
2						605.59		
				sandy **SOIL**: A lot of wood, brown/black		2.40	Bentonite pellet seal	
						605.12		
3				silty **SAND**: Grey gravelly **SAND**: Well graded, rounded/sub-rounded grain, orange some cobbles throughout Brown/grey		2.87 605.07 2.92	10/20 Sand 2" diameter PVC, Sch. 40, No. 10 slot well screen	
4						604.03		
				gravelly **SAND**: Poorly graded, medium sand, small rounded gravel		3.96		
						603.63	Water level measured at 4.25 mbgs	
				fine silty **SAND**: Some small gravel, brown/grey, some orange mottling, poorly graded		4.36		
5						603.11		
				Boulder, coarse grained		4.88	Bentonite pellet seal	
						602.50		
				gravelly **SAND**: Well graded, some cobbles, medium sand, small rounded/sub-rounded grains, orange/grey		5.49		
6						601.44		
				ROCK: Fine grained		6.55		
7								
8								
9								

CH2MHILL

SHEET 2 OF 2

RECORD OF MONITORING WELL: MW 1-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 608.81 mASL

LOGGED BY: PP
GROUND ELEVATION: 607.99 mASL
Datum: X 497024.932 Y 5547525.992

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
					+ ' + ' +	598.39		
				End of borehole at 9.6 mbgs		9.60		
10								
11								
12								
13								
14								
15								
16								
17								
18								

SCANMW 335612LANDFILL.GPJ CG&S.GDT 28/2/06

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SHEET 1 OF 3

RECORD OF MONITORING WELL: MW 2D-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 604.9 mASL

LOGGED BY: PP
GROUND ELEVATION: 603.84 mASL
Datum: X 496883.455 Y 5547729.553

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
1	244	1		sandy **GRAVEL**: Brown			Concrete seal	
							Bentonite pellet seal	
						602.32 / 1.52		
2				medium **SAND**: Poorly graded, brown/orange laminations for 0.61m				
3	305	2						
4								
5								
						598.11		
				SILT: Grey, soft, thin orange laminations		5.73		
6	305	3		gravelly **SAND**: Well graded coarse sand to fine gravel, sub-rounded to round, grey		597.96 / 5.88	Water level measured 5.77 mbgs	
7								
				Orange				
8								
				Grey, fine Silt, some fine, angular gravel, some sand, soft for 5 cm				
9	146	4						

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SHEET 2 OF 3

RECORD OF MONITORING WELL: MW 2D-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 604.9 mASL

LOGGED BY: PP
GROUND ELEVATION: 603.84 mASL
Datum: X 496883.455 Y 5547729.553

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	ORGANIC VAPOUR READINGS PID (ppm)
10								
11								
12								
13	305	6						
14								
15								
16	183	6					10/20 Sand 2" diameter PVC, Sch. 40, No. 10 slot well screen	
17				**SILT**: Stiff		587.07 / 16.77		
18				**ROCK**: Fine grain basalt		585.85 / 17.99		
	36	7						

ORGANIC VAPOUR READINGS PID (ppm): 30, 60, 90, 120

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RECORD OF MONITORING WELL: MW 2D-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 604.9 mASL

LOGGED BY: PP
GROUND ELEVATION: 603.84 mASL
Datum: X 496883.455 Y 5547729.553

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
20						583.72		
				End of borehole at 20.12 mbgs		20.12		
21								
22								
23								
24								
25								
26								
27								
28								

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SHEET 1 OF 2

RECORD OF MONITORING WELL: MW 2S-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 604.94 mASL

LOGGED BY: PP
GROUND ELEVATION: 603.84 mASL
Datum: X 496883.455 Y 5547729.553

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	ORGANIC VAPOUR READINGS PID (ppm)
0	244	1		sandy **GRAVEL**: Brown		602.32	Concrete seal	
1							Bentonite pellet seal	
1.52				medium **SAND**: Poorly graded, brown/orange laminations for 0.61m				
2								
3	305	2						
4								
5							Water level measured 5.28 mbgs	
5.73				**SILT**: Grey, soft, thin orange laminations		598.11		
5.88				gravelly **SAND**: Well graded coarse sand to fine gravel, sub-rounded to round, grey		597.96		
6	305	3						
7				Orange			10/20 Sand	
8				Grey, fine			2" diameter PVC, Sch. 40, No. 10 slot well screen	
9	146	4						

30 60 90 120

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SHEET 2 OF 2

RECORD OF MONITORING WELL: MW 2S-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 604.94 mASL

LOGGED BY: PP
GROUND ELEVATION: 603.84 mASL
Datum: X 496883.455 Y 5547729.553

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
10								
11								
12								
13	305	5						
14								
15								
16	36	6						
17				End of borehole at 16.77 mbgs		587.07 / 16.77		
18								

CH2MHILL

SHEET 1 OF 2

RECORD OF MONITORING WELL: MW 3-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 601.47 mASL

LOGGED BY: PP
GROUND ELEVATION: 600.61 mASL
Datum: X 496751.391 Y 5547609.577

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	ORGANIC VAPOUR READINGS PID (ppm)
0	170	1		**COBBLE and GRAVEL (FILL)**: Grey		600.00	Concrete patch	
				??		0.61		
1						599.39	Slough	
				gravelly **SAND**: Well graded coarse sand to fine gravel, sub-rounded particles		1.22		
2						598.62	Bentonite pellet seal	
				sandy **GRAVEL**: Well graded, sub-rounded particles		1.99		
	305	2		Cobble				
3							10/20 Sand	
				Cobble		596.95		
				medium **SAND**: Poorly sorted, Brown, occasional pebble		3.66		
4								
							2" diameter PVC, Sch. 40, No. 10 slot well screen	
5				Cobble				
	305	3						
6								
7				Orange				
8				Grey				
	305	4						
9							Slough/cave bottom of hole	

CH2MHILL

SHEET 2 OF 2

RECORD OF MONITORING WELL: MW 3-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 601.47 mASL

LOGGED BY: PP
GROUND ELEVATION: 600.61 mASL
Datum: X 496751.391 Y 5547609.577

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm)
10	305	5						
11								
12								
13	305	6						
14								
15						585.37 / 15.24		
				End of borehole at 15.24 mbgs				
16								
17								
18								

30 60 90 120

SCANMW 335612LANDFILL.GPJ CG&S.GDT 28/2/06

CH2M HILL Canada Limited

CH2MHILL

SHEET 1 OF 2

RECORD OF MONITORING WELL: MW 4-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE | TOP OF PIPE: 595.48 mASL

LOGGED BY: PP | GROUND ELEVATION: 594.60 mASL | Datum: X 496800.883 Y 5547890.701

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	(masl) ELEV. / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
0	1.22	1		sandy **GRAVEL (FILL)**: Brown		593.99	Concrete seal	
				SILT, SAND, GRAVEL, COBBLE (FILL): Grey		0.61		
1	53	2					Bentonite pellet seal	
							Water level measured 1.497 mbgs	
						592.77		
2				**ROCK, COARSE GRAIN GRANITE**		1.83		
	15	3						
	24	4		Soft to 3.2 mbgs				
3								
	61	5						
4								
						590.03		
				gravelly **SAND**: Well graded, medium sand to medium gravel, brown		4.57		
5	122	6						
						589.18		
				SAND and GRAVEL (FILL): Brown		5.42		
6								
	305	7						
7							10/20 Sand	
							2" diameter PVC, Sch. 40, No. 10 slot well screen	
8								
						586.29		
				sandy **GRAVEL**: Well graded, rounded gravel to medium sand		8.31		
				Oxidation				
9						585.66		
				SAND: Medium to fine, poorly graded, grey Thin oxidation lamination to 13.11 mbgs		8.94		
	305	8						

CH2MHILL

SHEET 2 OF 2

RECORD OF MONITORING WELL: MW 4-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 595.48 mASL

LOGGED BY: PP
GROUND ELEVATION: 594.60 mASL
Datum: X 496800.883 Y 5547890.701

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm)
10								30 60 90 120
11								
12								
13	305	9		sandy **SILT**: Grey		581.49		
						13.11		
				SAND: Fine		581.39		
				End of borehole at 13.21 mbgs		13.21		
14								
15								
16	305	10						
17								
18						576.60		
						18.00		

CH2MHILL

SHEET 1 OF 2

RECORD OF MONITORING WELL: MW 5-06

LOCATION: Landfill | PROJECT NUMBER: 335612 | DRILLER: Sonic Drilling

DATE DRILLED: | BORING METHOD: HSA/HQ-CORE | TOP OF PIPE: 604.65 mASL

LOGGED BY: PP | GROUND ELEVATION: 603.98 mASL | Datum: X 496906.423 Y 5547367.257

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
0	305	1		**SAND and GRAVEL (FILL)**: Some cobble, some silt			Concrete seal	
1							Bentonite pellet seal	
							10/20 Sand	
2							Water level measured 1.855	
						601.31	Bentonite pellet seal	
3				sandy **GRAVEL**: Well graded, coarse sand to medium gravel, some cobble, rounded to sub-rounded partcles, some silt orange/brown		2.67	10/20 Sand	
	305	2					2" diameter PVC, Sch. 40, No. 10 slot well screen	
4								
5	152	3				598.85		
				SAND: Coarse, well graded, grey		5.13		
				SAND: Medium to fine, some silt, occasional gravel, grey, some oxidation zones		598.80 5.18		
6								
						597.38		
	206	4		sandy **SILT**: Fine angular gravel, stiff, grey, with some oxidation mottling		6.60		
						597.05		
7				sandy **GRAVEL**: Silty, brown		6.93		
				Boulder		596.93 7.05		
	8	5				596.30		
				sandy, gravelly **SILT**: Stiff		7.68		
8						596.11		
				ROCK: Fine grain basalt		7.87		
9								

CH2MHILL

SHEET 2 OF 2

RECORD OF MONITORING WELL: MW 5-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 604.65 mASL

LOGGED BY: PP
GROUND ELEVATION: 603.98 mASL
Datum: X 496906.423 Y 5547367.257

DEPTH (mbgs)	SAMPLES: RECOVERY(cm)	SAMPLES: TYPE	SAMPLES: BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
10						593.88 / 10.10		
				End of borehole at 10.2 mbgs				
11								
12								
13								
14								
15								
16								
17								
18								

SCANMW 335612LANDFILL.GPJ CG&S.GDT 28/2/06

CH2MHILL

SHEET 1 OF 1

RECORD OF MONITORING WELL: MW 6-06

LOCATION: Landfill
PROJECT NUMBER: 335612
DRILLER: Sonic Drilling

DATE DRILLED:
BORING METHOD: HSA/HQ-CORE
TOP OF PIPE: 610.05 mASL

LOGGED BY: PP
GROUND ELEVATION: 609.3 mASL
Datum: X 496799.226 Y 5547249.454

DEPTH (mbgs)	SAMPLES RECOVERY(cm)	SAMPLES TYPE	SAMPLES BLOWS/0.15 m	SOIL DESCRIPTION	STRATA PLOT	ELEV. (masl) / DEPTH (mbgs)	WELL CONSTRUCTION DETAILS	⊕ ORGANIC VAPOUR READINGS PID (ppm) 30 60 90 120
0	1.82			**SAND, GRAVEL, COBBLE**		608.39	Concrete seal	
1				**ORGANIC SOIL**: Black, wood fragments		0.91	Bentonite pellet seal	
2								
3	305						▽ Water level measured 3.271 mbgs	
4								
5				**SAND**: Occasional gravel, well graded, some silt		604.25 5.05	10/20 Sand; 2" diameter PVC, Sch. 40, No. 10 slot well screen	
6	305							
7				gravelly, silty **SAND**: Fine, dense, orange to 8.23 mbgs		602.59 6.71		
8	122			Grey to bottom				
9				End of borehole at 9.15 mbgs		600.15 9.15		

SCANMW 335612LANDFILL.GPJ CG&S.GDT 28/2/06

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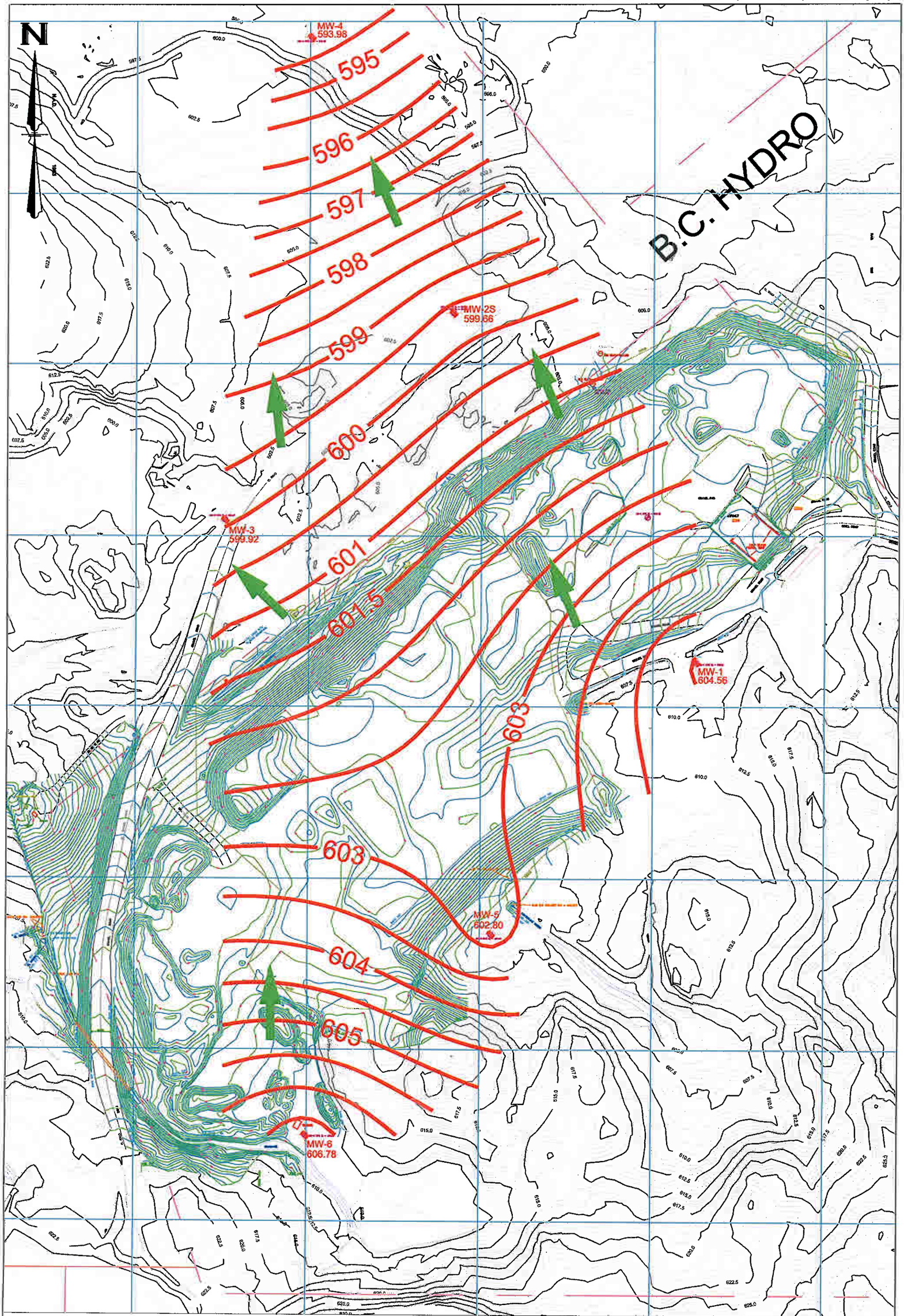
APPENDIX C

GROUNDWATER FLOW

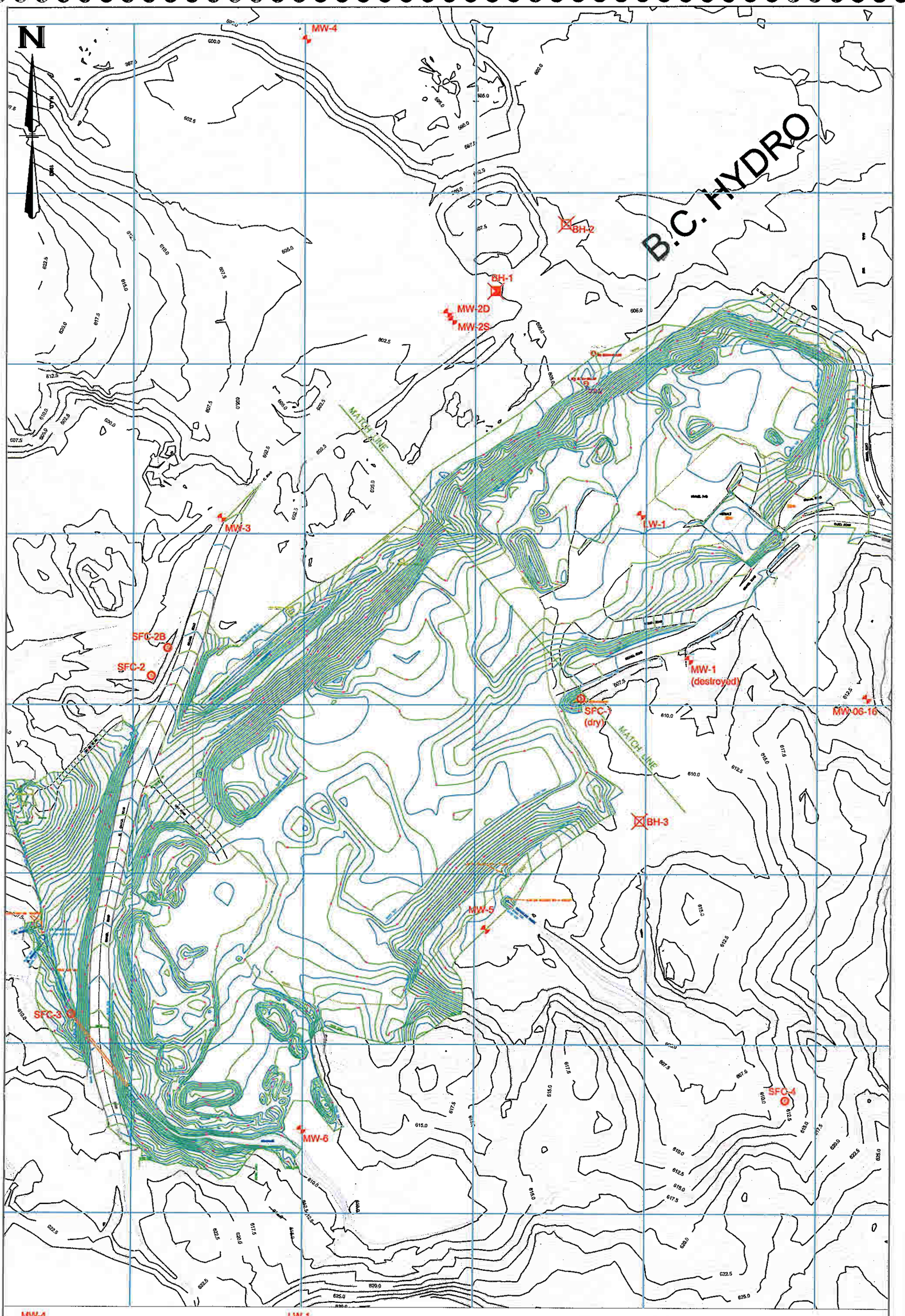


Resort Municipality of Whistler
Exhibit C-1: Groundwater Flow

CH2MHILL

APPENDIX D

SAMPLING LOCATION



Resort Municipality of Whistler

Exhibit D-1: Whistler Landfill - Sampling Location

CH2MHILL

APPENDIX E

PARAMETERS TO BE ANALYZED

EXHIBIT E-1

Groundwater – Parameters to be Analyzed

General Chemistry	Volatiles	Polycyclic Aromatics Hydrocarbons	Dissolved Metals
Misc. Inorganics	Purgeable VPH (VHW6 to 10 - BTEX)	Low Molecular Weight PAHs	**Misc. Inorganics**
Bromide (Br)	CSR VH C6-C10	High Molecular Weight PAHs	Dissolved Hardness ($CaCO_3$)
Anions	**Chlorobenzenes**	Total PAH	**Dissolved Metals by ICP**
Nitrite (N)	1,2-dichlorobenzene	Naphthalene	Dissolved Barium (Ba)
Calculated Parameters	1,3-dichlorobenzene	Quinoline	Dissolved Beryllium (Be)
Nitrate (N)	1,4-dichlorobenzene	2-Methylnaphthalene	Dissolved Bismuth (Bi)
Misc. Inorganics	Chlorobenzene	Acenaphthylene	Dissolved Boron (B)
Alkalinity (Total as $CaCO_3$)	**Monocyclic Aromatics**	Acenaphthene	Dissolved Calcium (Ca)
Alkalinity (PP as $CaCO_3$)	Benzene	Fluorene	Dissolved Iron (Fe)
Bicarbonate (HCO_3)	Ethylbenzene	Phenanthrene	Dissolved Magnesium (Mg)
Carbonate (CO_3)	m & p-Xylene	Anthracene	Dissolved Manganese (Mn)
Hydroxide (OH)	o-Xylene	Acridine	Dissolved Molybdenum (Mo)
Anions	Styrene	Fluoranthene	Dissolved Nickel (Ni)
Dissolved Sulphate (SO_4)	Toluene	Pyrene	Dissolved Phosphorus (P)
Dissolved Chloride (Cl)	Xylenes (Total)	Benzo(a)anthracene	Dissolved Potassium (K)
Nutrients	**Parameter**	Chrysene	Dissolved Silicon (Si)
Total Kjeldahl Nitrogen (Calc)	4-Methyl-2-pentanone (MIBK)	Benzo(b&j)fluoranthene	Dissolved Sodium (Na)
Ammonia (N)	**Volatiles**	Benzo(k)fluoranthene	Dissolved Strontium (Sr)
Nitrate plus Nitrite (N)	1,1,1,2-tetrachloroethane	Benzo(a)pyrene	Dissolved Sulphur (S)
Total Nitrogen (N)	1,1,1-trichloroethane	Indeno(1,2,3-cd)pyrene	Dissolved Tin (Sn)
Total Phosphorus (P)	1,1,2,2-tetrachloroethane	Dibenz(a,h)anthracene	Dissolved Titanium (Ti)
Physical Properties	1,1,2-trichloroethane	Benzo(g,h,i)perylene	Dissolved Vanadium (V)
Conductivity	1,1-dichloroethane		Dissolved Zinc (Zn)
pH	1,1-dichloroethene	HEPH (C19-C32 less PAH)	Dissolved Zirconium (Zr)
	1,2-dichloroethane	LEPH (C10-C19 less PAH)	**Dissolved Metals by ICPMS**
	1,2-dichloropropane	**Ext. Pet. Hydrocarbon**	Dissolved Aluminum (Al)
	2-Butanone (MEK)	EPH (C10-C19)	Dissolved Cadmium (Cd)
	Acetone	EPH (C19-C32)	Dissolved Antimony (Sb)
	Bromodichloromethane		Dissolved Arsenic (As)
	Bromoform		Dissolved Chromium (Cr)
	Bromomethane		Dissolved Cobalt (Co)
	Carbon tetrachloride		Dissolved Copper (Cu)
	Chlorodibromomethane		Dissolved Lead (Pb)
	Chloroethane		Dissolved Lithium (Li)
	Chloroform		Dissolved Selenium (Se)
	Chloromethane		Dissolved Silver (Ag)
	cis-1,2-dichloroethene		Dissolved Thallium (Tl)
	cis-1,3-dichloropropene		Dissolved Uranium (U)
	Dibromoethane		**Mercury by CVAA**
	Dichloromethane		Dissolved Mercury (Hg)
	Methyl-tert-butylether (MTBE)		
	Tetrachloroethene		
	trans-1,2-dichloroethene		
	trans-1,3-dichloropropene		
	Trichloroethene		
	Trichlorofluoromethane		
	Vinyl chloride		

EXHIBIT E-2

Surface Water and Leachate – Parameters to be Analyzed

General Chemistry	Volatiles	Polycyclic Aromatics Hydrocarbons	Total Metals
Misc. Inorganics	Purgeable VPH (VHW6 to 10 - BTEX)	Low Molecular Weight PAHs	**Misc. Inorganics**
Bromide (Br)	CSR VH C6-C10	High Molecular Weight PAHs	Total Hardness ($CaCO_3$)
Anions	**Chlorobenzenes**	Total PAH	**Total Metals by ICP**
Nitrite (N)	1,2-dichlorobenzene	Naphthalene	Total Barium (Ba)
Calculated Parameters	1,3-dichlorobenzene	Quinoline	Total Beryllium (Be)
Nitrate (N)	1,4-dichlorobenzene	2-Methylnaphthalene	Total Bismuth (Bi)
Misc. Inorganics	Chlorobenzene	Acenaphthylene	Total Boron (B)
Alkalinity (Total as $CaCO_3$)	**Monocyclic Aromatics**	Acenaphthene	Total Calcium (Ca)
Alkalinity (PP as $CaCO_3$)	Benzene	Fluorene	Total Iron (Fe)
Bicarbonate (HCO_3)	Ethylbenzene	Phenanthrene	Total Magnesium (Mg)
Carbonate (CO_3)	m & p-Xylene	Anthracene	Total Manganese (Mn)
Hydroxide (OH)	o-Xylene	Acridine	Total Molybdenum (Mo)
Anions	Styrene	Fluoranthene	Total Nickel (Ni)
Total Sulphate (SO_4)	Toluene	Pyrene	Total Phosphorus (P)
Total Chloride (Cl)	Xylenes (Total)	Benzo(a)anthracene	Total Potassium (K)
Nutrients	**Parameter**	Chrysene	Total Silicon (Si)
Total Kjeldahl Nitrogen (Calc)	4-Methyl-2-pentanone (MIBK)	Benzo(b&j)fluoranthene	Total Sodium (Na)
Ammonia (N)	**Volatiles**	Benzo(k)fluoranthene	Total Strontium (Sr)
Nitrate plus Nitrite (N)	1,1,1,2-tetrachloroethane	Benzo(a)pyrene	Total Sulphur (S)
Total Nitrogen (N)	1,1,1-trichloroethane	Indeno(1,2,3-cd)pyrene	Total Tin (Sn)
Total Phosphorus (P)	1,1,2,2-tetrachloroethane	Dibenz(a,h)anthracene	Total Titanium (Ti)
Physical Properties	1,1,2-trichloroethane	Benzo(g,h,i)perylene	Total Vanadium (V)
Conductivity	1,1-dichloroethane		Total Zinc (Zn)
pH	1,1-dichloroethene	HEPH (C19-C32 less PAH)	Total Zirconium (Zr)
	1,2-dichloroethane	LEPH (C10-C19 less PAH)	**Total Metals by ICPMS**
	1,2-dichloropropane	**Ext. Pet. Hydrocarbon**	Total Aluminum (Al)
	2-Butanone (MEK)	EPH (C10-C19)	Total Cadmium (Cd)
	Acetone	EPH (C19-C32)	Total Antimony (Sb)
	Bromodichloromethane		Total Arsenic (As)
	Bromoform		Total Chromium (Cr)
	Bromomethane		Total Cobalt (Co)
	Carbon tetrachloride		Total Copper (Cu)
	Chlorodibromomethane		Total Lead (Pb)
	Chloroethane		Total Lithium (Li)
	Chloroform		Total Selenium (Se)
	Chloromethane		Total Silver (Ag)
	cis-1,2-dichloroethene		Total Thallium (Tl)
	cis-1,3-dichloropropene		Total Uranium (U)
	Dibromoethane		**Mercury by CVAA**
	Dichloromethane		Total Mercury (Hg)
	Methyl-tert-butylether (MTBE)		
	Tetrachloroethene		
	trans-1,2-dichloroethene		
	trans-1,3-dichloropropene		
	Trichloroethene		
	Trichlorofluoromethane		
	Vinyl chloride		

APPENDIX F

GROUNDWATER AND LEACHATE LEVELS

EXHIBIT F-1

Groundwater/Leachate Levels

Whistler Landfill

Date	MW-1 Ground Elev. = 607.99 Riser Elev. = 608.81		MW-2S Ground Elev. = 603.84 Riser Elev. = 604.94		MW-2D Ground Elev. = 603.84 Riser Elev. = 604.90		MW-3 Ground Elev. = 600.61 Riser Elev. = 601.47		MW-4 Ground Elev. = 594.60 Riser Elev. = 595.48		MW-5 Ground Elev. = 603.98 Riser Elev. = 604.65		MW-6 Ground Elev. = 609.30 Riser Elev. = 610.05		MW06-16 Ground Elev. = 613.89 Riser Elev. = 614.34		LW-1 Ground Elev. = 614.54 Riser Elev. = 615.42	
dd-mmm-yy	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)
27-Jan-06	4.25	604.56	5.28	599.66	5.77	599.13	1.55	599.92	1.50	593.98	1.86	602.80	3.27	606.78	NM	-	9.61	605.81
20-Apr-06	4.80	604.01	6.12	598.82	6.88	598.02	1.58	599.89	2.54	592.94	1.97	602.68	3.43	606.62	3.23	611.11	NM	-
1-Nov-06	DRY	-	6.83	598.11	6.79	598.11	2.10	599.37	1.87	593.61	DEC	-	DEC	-	NM	-	8.13	607.29
21-Jun-07	1.89	606.93	6.56	598.38	6.53	598.37	5.43	596.04	**2.57**	592.91	DEC	-	DEC	-	NM	-	7.79	607.63
15-Aug-07	DRY	-	6.80	598.14	6.77	598.14	2.12	599.36	**2.34**	593.14	DEC	-	DEC	-	NM	-	9.31	606.11
12-Dec-07	DEC	-	6.41	598.53	6.27	598.63	1.70	599.77	**2.70**	592.78	DEC	-	DEC	-	2.48	611.86	NM	-

mBTR – Metres Below Top of Riser
mASL – Metres Above Sea Level (Mean Sea Level)
NM – Not Measured
DEC – Decommissioned
DRY – Well Dry at Bottom
2.34 Riser (0.88m) trimmed to ground surface, inferred water table

EXHIBIT F-1

Groundwater/Leachate Levels

Whistler Landfill

Date	MW-1 Ground Elev. = 607.99 Riser Elev. = 608.81		MW-2S Ground Elev. = 603.84 Riser Elev. = 604.94		MW-2D Ground Elev. = 603.84 Riser Elev. = 604.90		MW-3 Ground Elev. = 600.61 Riser Elev. = 601.47		MW-4 Ground Elev. = 594.60 Riser Elev. = 595.48		MW-5 Ground Elev. = 603.98 Riser Elev. = 604.65		MW-6 Ground Elev. = 609.30 Riser Elev. = 610.05		MW06-16 Ground Elev. = 613.89 Riser Elev. = 614.34		LW-1 Ground Elev. = 614.54 Riser Elev. = 615.42	
dd-mmm-yy	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)	Depth to Water (mBTR)	Static Water Level (mASL)
27-Jan-06	4.25	604.56	5.28	599.66	5.77	599.13	1.55	599.92	1.50	593.98	1.86	602.80	3.27	606.78	NM	-	9.61	605.81
20-Apr-06	4.80	604.01	6.12	598.82	6.88	598.02	1.58	599.89	2.54	592.94	1.97	602.68	3.43	606.62	3.23	611.11	NM	-
1-Nov-06	DRY	-	6.83	598.11	6.79	598.11	2.10	599.37	1.87	593.61	DEC	-	DEC	-	NM	-	8.13	607.29
21-Jun-07	1.89	606.93	6.56	598.38	6.53	598.37	5.43	596.04	**2.57**	592.91	DEC	-	DEC	-	NM	-	7.79	607.63
15-Aug-07	DRY	-	6.80	598.14	6.77	598.14	2.12	599.36	**2.34**	593.14	DEC	-	DEC	-	NM	-	9.31	606.11
12-Dec-07	DEC	-	6.41	598.53	6.27	598.63	1.70	599.77	**2.70**	592.78	DEC	-	DEC	-	2.48	611.86	NM	-

mBTR – Metres Below Top of Riser
mASL – Metres Above Sea Level (Mean Sea Level)
NM – Not Measured
DEC – Decommissioned
DRY – Well Dry at Bottom
2.34 Riser (0.88m) trimmed to ground surface, inferred water table

APPENDIX G

CHAIN-OF-CUSTODY FORMS

A70,1028

Maxxam Analytics Inc
8577 Commerce Court
Burnaby, BC, V5A 4N5
www.maxxamanalytics.com
Phone: (604) 444-4808
Fax: (604) 444-4511
Toll Free: 1-800-440-4808

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PAGE 1 OF 1

ANALYSIS REQUEST F 91533

COMPANY NAME: CH2M Hill	PH. #: 604-439-2368 E-mail: mbudzik@ch2m.com FAX #: 604-684-3292
COMPANY ADDRESS: Suite 2100 - 4720 Kingsway Burnaby BC V5H 4N2	CLIENT PROJECT ID: (#) 367242.A1.01
SAMPLER NAME (PRINT): Cristofor Ursache	PROJECT MANAGER: Mike Budzik

	FIELD SAMPLE ID	MAXXAM LAB # (Lab Use Only)	MATRIX: GROUND WATER	SURFACE WATER	SOIL	OTHER	# CONTAINERS	SAMPLING: DATE DD/MM/YY	TIME	HEADSPACE VAPOUR	General chemistry	VOC / BTEX	EPH	Dissolved Metals	Total Metals	PAH	Alkalinity	Anions	Phosphorus Total	LAB USE ONLY
1	MW-2S		X				6	12/12/07	9am			X	X	X		X	X	X	X	
2	MW-2D						7		9:30		X	X								
3	MW-3						7		10am		X	X								No. Preserves.
4	MW-4						7		10:30		X	X								
5	MW06-16						7		3pm		X	X								
6	1972						7		3pm		X	X								
7	SFC-2			X			6		1pm						X					
8	SFC-2B						6		1:30											
9	SFC-3						6		2:30											
10	SFC-4						6		2:45											
11	LW-1 (Pump)					X	5		3:30			X								
12																				

TAT (Turnaround Time)

<5 DAY TAT MUST HAVE PRIOR APPROVAL

*some exceptions apply please contact lab

STANDARD 5 BUSINESS DAYS ☐
RUSH 3 BUSINESS DAYS ☐
RUSH 2 BUSINESS DAYS ☐
URGENT 1 BUSINESS DAY ☐

OTHER BUSINESS DAYS _____

CUSTODY RECORD

P.O. NUMBER / QUOTE NUMBER: 367242-A1-01

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE: LW-1 (Pump) = Leachate

☐ CCME
☒ CSR DW/AW
☐ ALBERTA TIER 1
☐ OTHER

ACCOUNTING CONTACT: Resort Municipality of Whistler: 604-935-8109

SPECIAL REPORTING OR BILLING INSTRUCTIONS: Billing Resort Municipality of Whistler

JARS USED:

LAB USE ONLY

ARRIVAL TEMPERATURE °C:	DUE DATE:	LOG IN CHECK:
10, 7, 6 3, 10, 7		

RELINQUISHED BY SAMPLER: CGU	DATE: DD/MM/YY 13/12/07	TIME:	RECEIVED BY:	
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:	
RELINQUISHED BY:	DATE: DD/MM/YY	TIME: 10:25	RECEIVED BY LABORATORY: A. M	

COCFORM - BC - 05/06

ORIGINAL - MAXXAM YELLOW - MAXXAM PINK - CLIENT

Maxxam Analytics Inc

8577 Commerce Court
Burnaby, BC V5A 4N5
www.maxxamanalytics.com

Phone: (604) 444-4808
Fax: (604) 444-4511
Toll Free: 1-800-440-4808

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

PAGE ____ OF ____

ANALYSIS REQUEST

F 88365

LAB USE ONLY

COMPANY NAME:	PH. #: E-mail: FAX #:
COMPANY ADDRESS:	CLIENT PROJECT ID: (#)
SAMPLER NAME (PRINT):	PROJECT MANAGER:

FIELD SAMPLE ID	MAXXAM LAB # (Lab Use Only)	MATRIX: GROUND WATER	MATRIX: SURFACE WATER	MATRIX: SOIL	MATRIX: OTHER	# CONTAINERS	SAMPLING: DATE DD/MM/YY	SAMPLING: TIME	SAMPLING: HEADSPACE VAPOUR
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

TAT (Turnaround Time)

<5 DAY TAT MUST HAVE PRIOR APPROVAL

**some exceptions apply please contact lab*

STANDARD	5 BUSINESS DAYS	☐
RUSH	3 BUSINESS DAYS	☐
RUSH	2 BUSINESS DAYS	☐
URGENT	1 BUSINESS DAY	☐

OTHER BUSINESS DAYS _____

CUSTODY RECORD

P.O. NUMBER / QUOTE NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

☐ CCME
☐ CSR
☐ ALBERTA TIER 1
☐ OTHER

ACCOUNTING CONTACT:

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

JARS USED:

LAB USE ONLY

ARRIVAL TEMPERATURE °C:	DUE DATE:	LOG IN CHECK:

RELINQUISHED BY SAMPLER:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY LABORATORY:

APPENDIX C

Analytical Parameters Associated with Groundwater / Leachate Quality Monitoring

Misc. Inorganics	Misc. Inorganics	Polycyclic Aromatics	Volatiles
Bromide (Br)	Dissolved Hardness (CaCO3)	Low Molecular Weight PAH`s	Purgeable VPH (VHW6 to 10 - BTEX)
ANIONS	Dissolved Metals by ICP	High Molecular Weight PAH`s	CSR VH C6-C10
Nitrite (N)	Dissolved Barium (Ba)	Total PAH	Chlorobenzenes
Calculated Parameters	Dissolved Beryllium (Be)	Naphthalene	1,2-dichlorobenzene
Nitrate (N)	Dissolved Bismuth (Bi)	Quinoline	1,3-dichlorobenzene
Misc. Inorganics	Dissolved Boron (B)	2-Methylnaphthalene	1,4-dichlorobenzene
Alkalinity (Total as CaCO3)	Dissolved Calcium (Ca)	Acenaphthylene	Chlorobenzene
Alkalinity (PP as CaCO3)	Dissolved Iron (Fe)	Acenaphthene	Monocyclic Aromatics
Bicarbonate (HCO3)	Dissolved Magnesium (Mg)	Fluorene	Benzene
Carbonate (CO3)	Dissolved Manganese (Mn)	Phenanthrene	Ethylbenzene
Hydroxide (OH)	Dissolved Molybdenum (Mo)	Anthracene	m & p-Xylene
Anions	Dissolved Nickel (Ni)	Acridine	o-Xylene
Dissolved Sulphate (SO4)	Dissolved Phosphorus (P)	Fluoranthene	Styrene
Dissolved Chloride (Cl)	Dissolved Potassium (K)	Pyrene	Toluene
Nutrients	Dissolved Silicon (Si)	Benzo(a)anthracene	Xylenes (Total)
Total Kjeldahl Nitrogen (Calc)	Dissolved Sodium (Na)	Chrysene	Parameter
Ammonia (N)	Dissolved Strontium (Sr)	Benzo(b&j)fluoranthene	4-Methyl-2-pentanone (MIBK)
Nitrate plus Nitrite (N)	Dissolved Sulphur (S)	Benzo(k)fluoranthene	Volatiles
Total Nitrogen (N)	Dissolved Tin (Sn)	Benzo(a)pyrene	1,1,1,2-tetrachloroethane
Total Phosphorus (P)	Dissolved Titanium (Ti)	Indeno(1,2,3-cd)pyrene	1,1,1-trichloroethane
Physical Properties	Dissolved Vanadium (V)	Dibenz(a,h)anthracene	1,1,2,2-tetrachloroethane
Conductivity	Dissolved Zinc (Zn)	Benzo(g,h,i)perylene	1,1,2-trichloroethane
pH	Dissolved Zirconium (Zr)		1,1-dichloroethane
	Dissolved Metals by ICPMS	HEPH (C19-C32 less PAH)	1,1-dichloroethene
	Dissolved Aluminum (Al)	LEPH (C10-C19 less PAH)	1,2-dichloroethane
	Dissolved Cadmium (Cd)	Ext. Pet. Hydrocarbon	1,2-dichloropropane
	Dissolved Antimony (Sb)	EPH (C10-C19)	2-Butanone (MEK)
	Dissolved Arsenic (As)	EPH (C19-C32)	Acetone
	Dissolved Chromium (Cr)		Bromodichloromethane
	Dissolved Cobalt (Co)		Bromoform
	Dissolved Copper (Cu)		Bromomethane
	Dissolved Lead (Pb)		Carbon tetrachloride
	Dissolved Lithium (Li)		Chlorodibromomethane
	Dissolved Selenium (Se)		Chloroethane
	Dissolved Silver (Ag)		Chloroform
	Dissolved Thallium (Tl)		Chloromethane
	Dissolved Uranium (U)		cis-1,2-dichloroethene
	Mercury by CVAA		cis-1,3-dichloropropene
	Dissolved Mercury (Hg)		Dibromoethane
			Dichloromethane
			Methyl-tert-butylether (MTBE)
			Tetrachloroethene
			trans-1,2-dichloroethene
			trans-1,3-dichloropropene
			Trichloroethene
			Trichlorofluoromethane
			Vinyl chloride

APPENDIX D

Analytical Parameters Associated with Surface Water Monitoring

Appendix D
Analytical Parameters for Surface Water

Misc. Inorganics	Misc. Inorganics	Polycyclic Aromatics
Bromide (Br)	Dissolved Hardness (CaCO3)	Low Molecular Weight PAH`s
ANIONS	Dissolved Metals by ICP	High Molecular Weight PAH`s
Nitrite (N)	Dissolved Barium (Ba)	Total PAH
Calculated Parameters	Dissolved Beryllium (Be)	Naphthalene
Nitrate (N)	Dissolved Bismuth (Bi)	Quinoline
Misc. Inorganics	Dissolved Boron (B)	2-Methylnaphthalene
Alkalinity (Total as CaCO3)	Dissolved Calcium (Ca)	Acenaphthylene
Alkalinity (PP as CaCO3)	Dissolved Iron (Fe)	Acenaphthene
Bicarbonate (HCO3)	Dissolved Magnesium (Mg)	Fluorene
Carbonate (CO3)	Dissolved Manganese (Mn)	Phenanthrene
Hydroxide (OH)	Dissolved Molybdenum (Mo)	Anthracene
Anions	Dissolved Nickel (Ni)	Acridine
Dissolved Sulphate (SO4)	Dissolved Phosphorus (P)	Fluoranthene
Dissolved Chloride (Cl)	Dissolved Potassium (K)	Pyrene
Nutrients	Dissolved Silicon (Si)	Benzo(a)anthracene
Total Kjeldahl Nitrogen (Calc)	Dissolved Sodium (Na)	Chrysene
Ammonia (N)	Dissolved Strontium (Sr)	Benzo(b&j)fluoranthene
Nitrate plus Nitrite (N)	Dissolved Sulphur (S)	Benzo(k)fluoranthene
Total Nitrogen (N)	Dissolved Tin (Sn)	Benzo(a)pyrene
Total Phosphorus (P)	Dissolved Titanium (Ti)	Indeno(1,2,3-cd)pyrene
Physical Properties	Dissolved Vanadium (V)	Dibenz(a,h)anthracene
Conductivity	Dissolved Zinc (Zn)	Benzo(g,h,i)perylene
pH	Dissolved Zirconium (Zr)	
Physical Properties	Dissolved Metals by ICPMS	HEPH (C19-C32 less PAH)
Total Suspended Solids	Dissolved Aluminum (Al)	LEPH (C10-C19 less PAH)
	Dissolved Cadmium (Cd)	Ext. Pet. Hydrocarbon
	Dissolved Antimony (Sb)	EPH (C10-C19)
	Dissolved Arsenic (As)	EPH (C19-C32)
	Dissolved Chromium (Cr)	
	Dissolved Cobalt (Co)	
	Dissolved Copper (Cu)	
	Dissolved Lead (Pb)	
	Dissolved Lithium (Li)	
	Dissolved Selenium (Se)	
	Dissolved Silver (Ag)	
	Dissolved Thallium (Tl)	
	Dissolved Uranium (U)	
	Mercury by CVAA	
	Total Mercury (Hg)	

APPENDIX E

Laboratory Analytical Results for Groundwater and Leachate Quality Monitoring

Q2 (June 22, 2010) Groundwater and Leachate Results

				BCCSR-Schedule 6	Sample ID				
Analyte	**Units**	**LOR**	**Lower Limit**	**Drinking Water**	**MW-2D**	**MW-2S**	**L-1**	**MW-3**	**TRAVEL BLANK**
Conductivity	uS/cm	2	-	-	1140	585	1740	315	<2.0
Hardness (as CaCO3)	mg/L	1.1	-	-	425	171	604	132	<1.1
pH	pH	0.1	6.5	8.5	6.95	6.94	7.05	7.07	5.8
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	418	201	308	54.6	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	418	201	308	54.6	<1.0
Ammonia as N	mg/L	0.01	-	-	22.8	13.8	13	0.023	<0.010
Bromide (Br)	mg/L	0.05	-	-	6.2	<1.0	<1.0	0.208	<0.050
Chloride (Cl)	mg/L	0.5	-	250	43	20	190	32.7	<0.50
Fluoride (F)	mg/L	0.02	-	1.5	<0.40	<0.40	<0.40	0.023	<0.020
Nitrate (as N)	mg/L	0.005	-	10	<0.10	0.35	14.1	3.35	<0.0050
Nitrite (as N)	mg/L	0.001	-	3.2	<0.020	<0.020	0.032	0.0041	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.05	-		26	17.4	33	<0.10	<0.050
Total Nitrogen	mg/L	0.06	-		30.2	17.7	47.1	3.36	<0.060
Total Phosphate as P	mg/L	0.002	-		0.995	0.94	0.0356	0.619	<0.0020
Sulfate (SO4)	mg/L	0.5	-	500	139	63	300	35.8	<0.50
Aluminum (Al)-Total	mg/L	0.01	-	0.2	-	-	-	-	<0.010
Antimony (Sb)-Total	mg/L	0.0005	-	-	-	-	-	-	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.01	-	-	-	-	<0.0010
Barium (Ba)-Total	mg/L	0.02	-	1	-	-	-	-	<0.020
Beryllium (Be)-Total	mg/L	0.005	-		-	-	-	-	<0.0050
Bismuth (Bi)-Total	mg/L	0.2	-		-	-	-	-	<0.20
Boron (B)-Total	mg/L	0.1	-	5	-	-	-	-	<0.10
Cadmium (Cd)-Total	mg/L	0.00005	-	0.005	-	-	-	-	<0.000050
Calcium (Ca)-Total	mg/L	0.1	-	-	-	-	-	-	<0.10
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	-	-	-	-	<0.00050
Cobalt (Co)-Total	mg/L	0.0005	-		-	-	-	-	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	-	-	-	-	<0.0010
Iron (Fe)-Total	mg/L	0.03	-	0.3	-	-	-	-	<0.030
Lead (Pb)-Total	mg/L	0.001	-	0.01	-	-	-	-	<0.0010
Lithium (Li)-Total	mg/L	0.05	-		-	-	-	-	<0.050
Magnesium (Mg)-Total	mg/L	0.1	-	100	-	-	-	-	<0.10
Manganese (Mn)-Total	mg/L	0.01	-	0.05	-	-	-	-	<0.010
Mercury (Hg)-Total	mg/L	0.0002	-		-	-	-	-	<0.00020
Molybdenum (Mo)-Total	mg/L	0.001	-	0.25	-	-	-	-	<0.0010
Nickel (Ni)-Total	mg/L	0.005	-	-	-	-	-	-	<0.0050
Phosphorus (P)-Total	mg/L	0.3	-		-	-	-	-	<0.30
Potassium (K)-Total	mg/L	2	-		-	-	-	-	<2.0
Selenium (Se)-Total	mg/L	0.001	-	0.01	-	-	-	-	<0.0010
Silicon (Si)-Total	mg/L	0.05	-	-	-	-	-	-	<0.050
Silver (Ag)-Total	mg/L	0.00005	-	-	-	-	-	-	<0.000050
Sodium (Na)-Total	mg/L	2	-	200	-	-	-	-	<2.0
Strontium (Sr)-Total	mg/L	0.005	-	-	-	-	-	-	<0.0050
Thallium (Tl)-Total	mg/L	0.0002	-	-	-	-	-	-	<0.00020
Tin (Sn)-Total	mg/L	0.03	-		-	-	-	-	<0.030
Titanium (Ti)-Total	mg/L	0.05	-	-	-	-	-	-	<0.050
Uranium (U)-Total	mg/L	0.0002	-	0.02	-	-	-	-	<0.00020
Vanadium (V)-Total	mg/L	0.03	-	-	-	-	-	-	<0.030
Zinc (Zn)-Total	mg/L	0.005	-	5	-	-	-	-	<0.0050
Aluminum (Al)-Dissolved	mg/L	0.01	-	0.2	7.7	<0.010	0.083	<0.010	-
Antimony (Sb)-Dissolved	mg/L	0.0005	-	-	<0.0010	<0.00050	<0.0025	<0.00050	-
Arsenic (As)-Dissolved	mg/L	0.001	-	0.01	0.0254	0.011	<0.0050	<0.0010	-
Barium (Ba)-Dissolved	mg/L	0.02	-	1	0.214	0.166	0.132	0.083	-
Beryllium (Be)-Dissolved	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	-
Bismuth (Bi)-Dissolved	mg/L	0.2	-		<0.20	<0.20	<0.20	<0.20	-
Boron (B)-Dissolved	mg/L	0.1	-	5	0.5	0.28	<0.10	<0.10	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	0.005	0.0003	<0.000050	0.00039	0.00024	-
Calcium (Ca)-Dissolved	mg/L	0.1	-	-	142	57.6	211	41.2	-
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	<0.014	<0.0020	<0.0050	<0.00090	-
Cobalt (Co)-Dissolved	mg/L	0.0005	-		0.029	0.00279	0.0098	0.00394	-

Q2 (June 22, 2010) Groundwater and Leachate Results

				BCCSR-Schedule 6	Sample ID				
Analyte	Units	LOR	Lower Limit	Drinking Water	MW-2D	MW-2S	L-1	MW-3	TRAVEL BLANK
Copper (Cu)-Dissolved	mg/L	0.001	-	1	0.106	<0.0010	0.033	0.0015	-
Iron (Fe)-Dissolved	mg/L	0.03	-	0.3	79.3	44.5	1.04	<0.030	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.01	0.0082	<0.0010	<0.0050	<0.0010	-
Lithium (Li)-Dissolved	mg/L	0.05	-		<0.050	<0.050	<0.050	<0.050	-
Magnesium (Mg)-Dissolved	mg/L	0.1	-	100	17.3	6.48	18.5	7.03	-
Manganese (Mn)-Dissolved	mg/L	0.01	-	0.05	1.48	1.97	7.89	0.554	-
Mercury (Hg)-Dissolved	mg/L	0.0002	-		<0.00020	<0.00020	<0.00020	<0.00020	-
Molybdenum (Mo)-Dissolved	mg/L	0.001	-	0.25	0.0138	0.0048	<0.0050	0.0011	-
Nickel (Ni)-Dissolved	mg/L	0.005	-	-	0.012	<0.0050	<0.025	<0.0050	-
Phosphorus (P)-Dissolved	mg/L	0.3	-		1.01	<0.30	<0.30	<0.30	-
Potassium (K)-Dissolved	mg/L	2	-		36.4	16.7	12	2.9	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.01	<0.0020	<0.0010	<0.0050	<0.0010	-
Silicon (Si)-Dissolved	mg/L	0.05	-	-	24.4	10	9.35	7.99	-
Silver (Ag)-Dissolved	mg/L	0.00005	-	-	<0.00010	<0.000050	<0.00025	<0.000050	-
Sodium (Na)-Dissolved	mg/L	2	-	200	49.2	17.6	99.1	9.7	-
Strontium (Sr)-Dissolved	mg/L	0.005	-	-	0.869	0.323	0.863	0.261	-
Thallium (Tl)-Dissolved	mg/L	0.0002	-	-	<0.00040	<0.00020	<0.0010	<0.00020	-
Tin (Sn)-Dissolved	mg/L	0.03	-		<0.030	<0.030	<0.030	<0.030	-
Titanium (Ti)-Dissolved	mg/L	0.05	-	-	0.216	<0.050	<0.050	<0.050	-
Uranium (U)-Dissolved	mg/L	0.0002	-	0.02	0.00135	<0.00020	<0.0010	<0.00020	-
Vanadium (V)-Dissolved	mg/L	0.03	-	-	<0.030	<0.030	<0.030	<0.030	-
Zinc (Zn)-Dissolved	mg/L	0.005	-	5	0.0323	<0.0050	0.0199	<0.0050	-
COD	mg/L	20	-		151	112	114	87	<20
Benzene	mg/L	0.0005	-	0.005	0.00062	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	mg/L	0.001	-	0.016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	0.001	-	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromomethane	mg/L	0.001	-		-	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Butadiene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Carbon Tetrachloride	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chlorobenzene	mg/L	0.001	-		0.0034	<0.0010	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	0.001	-		<0.0020	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1,2-Dichlorobenzene	mg/L	0.001	-	0.003	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Dichlorobenzene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethylene	mg/L	0.001	-	0.014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,2-Dichloroethylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dichloromethane	mg/L	0.005	-	0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1,2-Dichloropropane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,3-Dichloropropylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,3-Dichloropropylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ethylbenzene	mg/L	0.0005	-	0.0024	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Methyl t-butyl ether (MTBE)	mg/L	0.001	-	0.015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Styrene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tetrachloroethylene	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.001	-	0.024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethylene	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,4-Trimethylbenzene	mg/L	0.001	-		-	<0.0010	<0.0010	<0.0010	<0.0010
1,3,5-Trimethylbenzene	mg/L	0.001	-		-	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl Chloride	mg/L	0.001	-	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
ortho-Xylene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
meta- & para-Xylene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes	mg/L	0.001	-	0.3	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
4-Bromofluorobenzene (SS)	%	Surrogate	-		102	106	106	110	104
1,4-Difluorobenzene (SS)	%	Surrogate	-		108	107	113	108	106
EPH10-19	mg/L	0.25	-	5	<0.25	<0.25	<0.25	<0.25	<0.25
EPH19-32	mg/L	0.25	-		<0.25	<0.25	0.25	<0.25	<0.25
LEPH	mg/L	0.25	-		<0.25	<0.25	<0.25	<0.25	<0.25
HEPH	mg/L	0.25	-		<0.25	<0.25	0.25	<0.25	<0.25
Volatile Hydrocarbons (VH6-10)	mg/L	0.1	-	15	<0.10	<0.10	<0.10	<0.10	<0.10
VPH (C6-C10)	mg/L	0.1	-		<0.10	<0.10	<0.10	<0.10	<0.10
3,4-Dichlorotoluene (SS)	%	Surrogate	-		86	95	90	92	95

Q2 (June 22, 2010) Groundwater and Leachate Results

				BCCSR-Schedule 6	Sample ID				
Analyte	**Units**	**LOR**	**Lower Limit**	**Drinking Water**	**MW-2D**	**MW-2S**	**L-1**	**MW-3**	**TRAVEL BLANK**
Acenaphthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acenaphthylene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acridine	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benz(a)anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.00001	-	0.00001	<0.000010	0.000013	<0.000010	<0.000010	<0.000010
Benzo(b)fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(k)fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chrysene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dibenz(a,h)anthracene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluorene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Naphthalene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Pyrene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Quinoline	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
d10-Acenaphthene (SS)	%	Surrogate	-	-	93	91	99	93	96
d9-Acridine (SS)	%	Surrogate	-	-	93	93	95	91	91
d12-Chrysene (SS)	%	Surrogate	-	-	89	90	87	83	85
d8-Naphthalene (SS)	%	Surrogate	-	-	95	90	87	89	91
d10-Phenanthrene (SS)	%	Surrogate	-	-	96	96	94	95	97
Applied Guideline:	**British Columbia Contaminated Sites Regulation (JUN, 2010) - BCCSR-Schedule 6 Drinking Water**								

Color Key:
Exceeds Lower Threshold
Within Guideline
Exceeds Guideline
LOR exceeds Guideline

Q3 (September 27, 2010) Groundwater and Leachate Results

				BCCSR-Schedule 6	Sample ID								
Analyte	Units	LOR	Lower Limit	Drinking Water	MW-2D	MW-2S	L1	MW-4	MW-3	MW-5	MW-3 REPLICATE	MW-6	TRAVEL BLANK
Conductivity	uS/cm	2	-	-	1240	620	2220	387	431	-	433	465	<2.0
Hardness (as CaCO3)	mg/L	0.5	-		408	182	972	94.4	138	-	134	125	<0.50
pH	pH	0.1	6.5	8.5	7.05	6.91	6.41	6.88	6.82	-	6.89	6.55	5.74
Alkalinity, Total (as CaCO3)	mg/L	2	-		393	207	78.9	91.6	44.2	-	43.7	29.7	<2.0
Ammonia as N	mg/L	0.005	-		2.83	8.28	4.69	0.0693	0.182	-	0.161	0.0207	<0.0050
Bromide (Br)	mg/L	0.05	-		<1.0	<0.50	<2.5	<0.50	<0.050	-	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L	0.5	-	250	40	22.9	79	36.8	61.6	-	61.6	35.6	<0.50
Fluoride (F)	mg/L	0.02	-	1.5	<0.40	<0.20	<1.0	<0.20	0.036	-	0.039	0.033	<0.020
Nitrate (as N)	mg/L	0.005	-	10	<0.10	1.018	159	<0.050	0.384	-	0.387	0.0174	<0.0050
Nitrite (as N)	mg/L	0.001	-	3.2	<0.020	1.101	0.743	<0.010	0.0015	-	0.0017	0.0013	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.05	-		26.6	12.4	13.4 *	3.84	0.341	-	0.347	<0.25 *	<0.050
Total Nitrogen	mg/L	0.0025	-		26.6	12.6	173	3.84	0.726	-	0.736	<0.063	<0.0025
Total Phosphate as P	mg/L	0.002	-		2.39	0.24	0.486	0.281	0.0202	-	0.0265	8.5	<0.0020
Sulfate (SO4)	mg/L	0.5	-	500	193	54.9	369	22	59.8	-	60.6	129	<0.50
Aluminum (Al)-Total	mg/L	0.01	-	0.2	-	-	-	-	-	-	-	-	<0.010
Antimony (Sb)-Total	mg/L	0.0005	-		-	-	-	-	-	-	-	-	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	-	-	-	<0.0010
Barium (Ba)-Total	mg/L	0.02	-	1	-	-	-	-	-	-	-	-	<0.020
Beryllium (Be)-Total	mg/L	0.005	-		-	-	-	-	-	-	-	-	<0.0050
Bismuth (Bi)-Total	mg/L	0.2	-		-	-	-	-	-	-	-	-	<0.20
Boron (B)-Total	mg/L	0.1	-	5	-	-	-	-	-	-	-	-	<0.10
Cadmium (Cd)-Total	mg/L	0.00005	-	0.005	-	-	-	-	-	-	-	-	<0.000050
Calcium (Ca)-Total	mg/L	0.1	-		-	-	-	-	-	-	-	-	<0.10
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	-	-	-	-	-	-	-	-	<0.00050
Cobalt (Co)-Total	mg/L	0.0005	-		-	-	-	-	-	-	-	-	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	-	-	-	-	-	-	-	-	<0.0010
Iron (Fe)-Total	mg/L	0.03	-	0.3	-	-	-	-	-	-	-	-	<0.030
Lead (Pb)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	-	-	-	<0.0010
Lithium (Li)-Total	mg/L	0.05	-		-	-	-	-	-	-	-	-	<0.050
Magnesium (Mg)-Total	mg/L	0.1	-	100	-	-	-	-	-	-	-	-	<0.10
Manganese (Mn)-Total	mg/L	0.01	-	0.05	-	-	-	-	-	-	-	-	<0.010
Mercury (Hg)-Total	mg/L	0.0002	-		-	-	-	-	-	-	-	-	<0.00020
Molybdenum (Mo)-Total	mg/L	0.001	-	0.25	-	-	-	-	-	-	-	-	<0.0010
Nickel (Ni)-Total	mg/L	0.005	-		-	-	-	-	-	-	-	-	<0.0050
Phosphorus (P)-Total	mg/L	0.3	-		-	-	-	-	-	-	-	-	<0.30
Potassium (K)-Total	mg/L	2	-		-	-	-	-	-	-	-	-	<2.0
Selenium (Se)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	-	-	-	<0.0010
Silicon (Si)-Total	mg/L	0.05	-		-	-	-	-	-	-	-	-	<0.050
Silver (Ag)-Total	mg/L	0.00005	-		-	-	-	-	-	-	-	-	<0.000050
Sodium (Na)-Total	mg/L	2	-	200	-	-	-	-	-	-	-	-	<2.0
Strontium (Sr)-Total	mg/L	0.005	-		-	-	-	-	-	-	-	-	<0.0050
Thallium (Tl)-Total	mg/L	0.0002	-		-	-	-	-	-	-	-	-	<0.00020
Tin (Sn)-Total	mg/L	0.03	-		-	-	-	-	-	-	-	-	<0.030
Titanium (Ti)-Total	mg/L	0.05	-		-	-	-	-	-	-	-	-	<0.050
Uranium (U)-Total	mg/L	0.0002	-	0.02	-	-	-	-	-	-	-	-	<0.00020
Vanadium (V)-Total	mg/L	0.03	-		-	-	-	-	-	-	-	-	<0.030
Zinc (Zn)-Total	mg/L	0.005	-	5	-	-	-	-	-	-	-	-	<0.0050
Aluminum (Al)-Dissolved	mg/L	0.01	-	0.2	<0.020 *	<0.010	<0.050 *	<0.010	0.027	-	0.026	0.253	-
Antimony (Sb)-Dissolved	mg/L	0.0005	-		<0.0010 *	<0.00050	<0.0025 *	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Arsenic (As)-Dissolved	mg/L	0.001	-	0.01	0.005	<0.0010	<0.0050 *	<0.0010	<0.0010	-	<0.0010	0.0011	-
Barium (Ba)-Dissolved	mg/L	0.02	-	1	0.102	0.145	0.15	0.124	0.114	-	0.11	0.109	-
Beryllium (Be)-Dissolved	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	-
Bismuth (Bi)-Dissolved	mg/L	0.2	-		<0.20	<0.20	<0.20	<0.20	<0.20	-	<0.20	<0.20	-
Boron (B)-Dissolved	mg/L	0.1	-	5	0.48	0.28	<0.10	<0.10	<0.10	-	<0.10	<0.10	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	0.005	<0.00010 *	<0.000050	0.00057	<0.000050	0.000678	-	0.000682	0.000453	-
Calcium (Ca)-Dissolved	mg/L	0.1	-		140	61.6	338	30.8	43	-	41.6	39.6	-
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	<0.0010 *	<0.00050	<0.0025 *	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Cobalt (Co)-Dissolved	mg/L	0.0005	-		0.0198	0.00294	0.0032	0.0245	0.0134	-	0.0125	0.0241	-
Copper (Cu)-Dissolved	mg/L	0.001	-	1	<0.0020 *	<0.0010	0.0333	<0.0010	0.0037	-	0.0037	0.0034	-
Iron (Fe)-Dissolved	mg/L	0.03	-	0.3	46.8	27.8	0.067	34.5	0.041	-	<0.030	1.65	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.01	<0.0020 *	<0.0010	<0.0050 *	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Lithium (Li)-Dissolved	mg/L	0.05	-		<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	-
Magnesium (Mg)-Dissolved	mg/L	0.1	-	100	14.5	6.92	31.2	4.23	7.49	-	7.41	6.31	-
Manganese (Mn)-Dissolved	mg/L	0.01	-	0.05	1.61	2.17	3.15	2.47	3.29	-	3.5	3.62	-
Mercury (Hg)-Dissolved	mg/L	0.0002	-		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Molybdenum (Mo)-Dissolved	mg/L	0.001	-	0.25	0.0176	0.004	<0.0050 *	0.0223	0.0016	-	0.0017	0.0016	-
Nickel (Ni)-Dissolved	mg/L	0.005	-		<0.010 *	<0.0050	<0.025 *	<0.0050	<0.0050	-	<0.0050	0.0165	-
Phosphorus (P)-Dissolved	mg/L	0.3	-		<0.30	<0.30	<0.30	<0.30	<0.30	-	<0.30	<0.30	-
Potassium (K)-Dissolved	mg/L	2	-		33.7	16.6	19	6.1	4.3	-	4.1	4.9	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.01	<0.0020 *	<0.0010	<0.0050 *	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Silicon (Si)-Dissolved	mg/L	0.05	-		14.4	9.55	18	7.72	8.64	-	8.66	9.81	-
Silver (Ag)-Dissolved	mg/L	0.00005	-		<0.00010 *	<0.000050	<0.00025 *	<0.000050	<0.000050	-	<0.000050	<0.000050	-
Sodium (Na)-Dissolved	mg/L	2	-	200	42.8	17.2	72.1	11.1	30.9	-	26.4	38.6	-
Strontium (Sr)-Dissolved	mg/L	0.005	-		0.791	0.327	1.36	0.197	0.301	-	0.292	0.499	-
Thallium (Tl)-Dissolved	mg/L	0.0002	-		<0.00040 *	<0.00020	<0.0010 *	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Tin (Sn)-Dissolved	mg/L	0.03	-		<0.030	<0.030	<0.030	<0.030	<0.030	-	<0.030	<0.030	-
Titanium (Ti)-Dissolved	mg/L	0.05	-		<0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	-

Q3 (September 27, 2010) Groundwater and Leachate Results

				BCCSR-Schedule 6	Sample ID								
Analyte	**Units**	**LOR**	**Lower Limit**	**Drinking Water**	**MW-2D**	**MW-2S**	**L1**	**MW-4**	**MW-3**	**MW-5**	**MW-3 REPLICATE**	**MW-6**	**TRAVEL BLANK**
Uranium (U)-Dissolved	mg/L	0.0002	-	0.02	0.00046	<0.00020	<0.0010 *	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Vanadium (V)-Dissolved	mg/L	0.03	-		<0.030	<0.030	<0.030	<0.030	<0.030	-	<0.030	<0.030	-
Zinc (Zn)-Dissolved	mg/L	0.005	-	5	<0.0050	<0.0050	0.135	<0.0050	0.0062	-	0.0063	0.0064	-
Benzene	mg/L	0.0005	-	0.005	0.00062	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	mg/L	0.001	-	0.016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	0.001	-	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Carbon Tetrachloride	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chlorobenzene	mg/L	0.001	-		0.0031	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	0.001	-		0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1,2-Dibromoethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.001	-	0.003	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Dichlorobenzene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichloroethane	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethylene	mg/L	0.001	-	0.014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,2-Dichloroethylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dichloromethane	mg/L	0.005	-	0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1,2-Dichloropropane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,3-Dichloropropylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,3-Dichloropropylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ethylbenzene	mg/L	0.0005	-	0.0024	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Methyl t-butyl ether (MTBE)	mg/L	0.001	-	0.015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Styrene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tetrachloroethylene	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.001	-	0.024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethylene	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl Chloride	mg/L	0.001	-	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
ortho-Xylene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
meta- & para-Xylene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes	mg/L	0.00071	-	0.3	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071	<0.00071
4-Bromofluorobenzene (SS)	%	Surrogate	-		89	89	90	90	89	87	89	91	91
1,4-Difluorobenzene (SS)	%	Surrogate	-		104	101	100	103	102	104	102	102	103
EPH10-19	mg/L	0.25	-	5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
EPH19-32	mg/L	0.25	-		0.33	<0.25	0.37	<0.25	0.25	0.34	<0.25	<0.25	<0.25
LEPH	mg/L	0.25	-		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
HEPH	mg/L	0.25	-		0.33	<0.25	0.37	<0.25	0.25	0.34	<0.25	<0.25	<0.25
Volatile Hydrocarbons (VH6-10)	mg/L	0.1	-	15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
VPH (C6-C10)	mg/L	0.1	-		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
3,4-Dichlorotoluene (SS)	%	Surrogate	-		102	98	93	97	93	98	95	95	98
Acenaphthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acenaphthylene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acridine	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benz(a)anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.00001	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(b)fluoranthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(k)fluoranthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chrysene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dibenz(a,h)anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluoranthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluorene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Naphthalene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Pyrene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Quinoline	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
d10-Acenaphthene (SS)	%	Surrogate	-		84	92	76	94	98	92	99	97	79
d9-Acridine (SS)	%	Surrogate	-		100	105	81	105	107	90	112	95	75
d12-Chrysene (SS)	%	Surrogate	-		92	97	78	96	99	93	100	96	78
d8-Naphthalene (SS)	%	Surrogate	-		82	89	73	93	94	89	98	96	75
d10-Phenanthrene (SS)	%	Surrogate	-		93	101	80	103	106	99	106	104	83

* = Detection Limit Adjusted for Required Dilution.

Applied Guideline: **British Columbia Contaminated Sites Regulation (JUN, 2010) - BCCSR-Schedule 6 Drinking Water**

Color Key:

Exceeds Lower Threshold

Within Guideline

Exceeds Guideline

LOR exceeds Guideline

Q4 (December 21, 2010) Groundwater and Leachate Results

				BCCSR-Schedule 6	Sample ID					
Analyte	Units	LOR	Lower Limit	Drinking Water	MW-2D	MW-2S	MW-3	MW-4	L1	TRAVEL BLANK
Conductivity	uS/cm	2	-	-	1240	673	368	663	2990	<2.0
Hardness (as CaCO3)	mg/L	0.5	-		399	191	111	166	620	<0.50
pH	pH	0.1	6.5	8.5	7.09	7.11	6.56	6.86	7.17	5.62
Alkalinity, Total (as CaCO3)	mg/L	2	-		363	207	34.7	121	1030	<2.0
Ammonia as N	mg/L	0.005	-		23.8	12.1	0.378	5.39	24	<0.0050
Bromide (Br)	mg/L	0.05	-		<1.0	<0.50	0.195	<0.50	<1.0	<0.050
Chloride (Cl)	mg/L	0.5	-	250	42	40.4	61.1	81.5	254	<0.50
Fluoride (F)	mg/L	0.02	-	1.5	<0.40	<0.20	0.044	<0.20	<0.40	<0.020
Nitrate (as N)	mg/L	0.005	-	10	<0.10	<0.050	0.422	<0.050	9.05	<0.0050
Nitrite (as N)	mg/L	0.001	-	3.2	<0.020	<0.010	0.002	<0.010	0.152	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.05	-		27.3	14.4	0.406	5.54	113	<0.050
Total Nitrogen	mg/L	0.0025	-		27.3	14.4	0.83	5.54	122	<0.0025
Total Phosphate as P	mg/L	0.002	-		0.24	0.022	<0.0020	0.006	0.116	<0.0020
Sulfate (SO4)	mg/L	0.5	-	500	213	55.1	46.8	42	184	<0.50
Aluminum (Al)-Total	mg/L	0.01	-		-	-	-	-	-	<0.010
Antimony (Sb)-Total	mg/L	0.0005	-		-	-	-	-	-	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	<0.0010
Barium (Ba)-Total	mg/L	0.02	-	1	-	-	-	-	-	<0.020
Beryllium (Be)-Total	mg/L	0.005	-		-	-	-	-	-	<0.0050
Bismuth (Bi)-Total	mg/L	0.2	-		-	-	-	-	-	<0.20
Boron (B)-Total	mg/L	0.1	-	5	-	-	-	-	-	<0.10
Cadmium (Cd)-Total	mg/L	0.00005	-	0.005	-	-	-	-	-	<0.000050
Calcium (Ca)-Total	mg/L	0.1	-		-	-	-	-	-	<0.10
Chromium (Cr)-Total	mg/L	0.0005	-	0.05	-	-	-	-	-	<0.00050
Cobalt (Co)-Total	mg/L	0.0005	-		-	-	-	-	-	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	1	-	-	-	-	-	<0.0010
Iron (Fe)-Total	mg/L	0.03	-	0.3	-	-	-	-	-	<0.030
Lead (Pb)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	<0.0010
Lithium (Li)-Total	mg/L	0.05	-		-	-	-	-	-	<0.050
Magnesium (Mg)-Total	mg/L	0.1	-	100	-	-	-	-	-	<0.10
Manganese (Mn)-Total	mg/L	0.01	-	0.05	-	-	-	-	-	<0.010
Mercury (Hg)-Total	mg/L	0.0002	-		-	-	-	-	-	<0.00020
Molybdenum (Mo)-Total	mg/L	0.001	-	0.25	-	-	-	-	-	<0.0010
Nickel (Ni)-Total	mg/L	0.005	-		-	-	-	-	-	<0.0050
Phosphorus (P)-Total	mg/L	0.3	-		-	-	-	-	-	<0.30
Potassium (K)-Total	mg/L	2	-		-	-	-	-	-	<2.0
Selenium (Se)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	<0.0010
Silicon (Si)-Total	mg/L	0.05	-		-	-	-	-	-	<0.050
Silver (Ag)-Total	mg/L	0.00005	-		-	-	-	-	-	<0.000050
Sodium (Na)-Total	mg/L	2	-	200	-	-	-	-	-	<2.0
Strontium (Sr)-Total	mg/L	0.005	-		-	-	-	-	-	<0.0050
Thallium (Tl)-Total	mg/L	0.0002	-		-	-	-	-	-	<0.00020
Tin (Sn)-Total	mg/L	0.03	-		-	-	-	-	-	<0.030
Titanium (Ti)-Total	mg/L	0.05	-		-	-	-	-	-	<0.050
Uranium (U)-Total	mg/L	0.0002	-	0.02	-	-	-	-	-	<0.00020
Vanadium (V)-Total	mg/L	0.03	-		-	-	-	-	-	<0.030
Zinc (Zn)-Total	mg/L	0.005	-	5	-	-	-	-	-	<0.0050
Aluminum (Al)-Dissolved	mg/L	0.01	-	0.2	<0.020 *	<0.010	0.087	<0.010	<0.050 *	-
Antimony (Sb)-Dissolved	mg/L	0.0005	-	-	<0.0010 *	<0.00050	<0.00050	<0.00050	<0.0025 *	-
Arsenic (As)-Dissolved	mg/L	0.001	-	0.01	0.0057	<0.0010	<0.0010	<0.0010	<0.0050 *	-
Barium (Ba)-Dissolved	mg/L	0.02	-	1	0.088	0.121	0.062	0.237	0.13	-
Beryllium (Be)-Dissolved	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Bismuth (Bi)-Dissolved	mg/L	0.2	-		<0.20	<0.20	<0.20	<0.20	<0.20	-
Boron (B)-Dissolved	mg/L	0.1	-	5	0.5	0.28	<0.10	0.11	2.46	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	0.005	<0.00010 *	<0.000050	0.000461	<0.000050	<0.00025 *	-
Calcium (Ca)-Dissolved	mg/L	0.1	-	-	136	64.7	33.8	53.6	193	-
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.05	<0.0010 *	0.00111	<0.00050	<0.00050	<0.0025 *	-
Cobalt (Co)-Dissolved	mg/L	0.0005	-		0.0219	0.0031	0.0212	0.0401	0.0044	-
Copper (Cu)-Dissolved	mg/L	0.001	-	1	<0.0020 *	<0.0010	0.0097	0.0047	<0.0050 *	-
Iron (Fe)-Dissolved	mg/L	0.03	-	0.3	49.5	18.4	0.742	55.4	17	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.01	<0.0020 *	<0.0010	<0.0010	<0.0010	<0.0050 *	-
Lithium (Li)-Dissolved	mg/L	0.05	-		<0.050	<0.050	<0.050	<0.050	<0.050	-
Magnesium (Mg)-Dissolved	mg/L	0.1	-	100	14.6	7.18	6.49	7.79	33.5	-
Manganese (Mn)-Dissolved	mg/L	0.01	-	0.05	1.63	2.29	2.67	3.89	4.38	-
Mercury (Hg)-Dissolved	mg/L	0.0002	-		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-
Molybdenum (Mo)-Dissolved	mg/L	0.001	-	0.25	0.0196	0.0036	<0.0010	0.0139	<0.0050 *	-

Q4 (December 21, 2010) Groundwater and Leachate Results

Analyte	Units	LOR	Lower Limit	BCCSR-Schedule 6 Drinking Water	Sample ID MW-2D	MW-2S	MW-3	MW-4	L1	TRAVEL BLANK
Nickel (Ni)-Dissolved	mg/L	0.005	-	-	<0.010 *	<0.0050	<0.0050	0.0064	<0.025 *	-
Phosphorus (P)-Dissolved	mg/L	0.3	-		<0.30	<0.30	<0.30	<0.30	<0.30	-
Potassium (K)-Dissolved	mg/L	2	-		32.3	16.5	3.4	8.5	104	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.01	<0.0020 *	<0.0010	<0.0010	<0.0010	<0.0050 *	-
Silicon (Si)-Dissolved	mg/L	0.05	-	-	14.5	8.67	7.89	9.17	8.44	-
Silver (Ag)-Dissolved	mg/L	0.00005	-	-	<0.00010 *	<0.000050	<0.000050	<0.000050	<0.00025 *	-
Sodium (Na)-Dissolved	mg/L	2	-	200	42.8	19	29	18.9	245	-
Strontium (Sr)-Dissolved	mg/L	0.005	-	-	0.759	0.351	0.217	0.352	1.1	-
Thallium (Tl)-Dissolved	mg/L	0.0002	-	-	<0.00040 *	<0.00020	<0.00020	<0.00020	<0.0010 *	-
Tin (Sn)-Dissolved	mg/L	0.03	-		<0.030	<0.030	<0.030	<0.030	<0.030	-
Titanium (Ti)-Dissolved	mg/L	0.05	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	-
Uranium (U)-Dissolved	mg/L	0.0002	-	0.02	0.00066	<0.00020	<0.00020	<0.00020	<0.0010 *	-
Vanadium (V)-Dissolved	mg/L	0.03	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	-
Zinc (Zn)-Dissolved	mg/L	0.005	-	5	<0.0050	<0.0050	0.0116	<0.0050	0.0233	-
Acetone	mg/L	0.05	-		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzene	mg/L	0.0005	-	0.005	0.00058	<0.00050	<0.00050	<0.00050	0.0005	<0.00050
Bromodichloromethane	mg/L	0.001	-	0.016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromoform	mg/L	0.001	-	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bromomethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Butadiene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Carbon Tetrachloride	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chlorobenzene	mg/L	0.001	-		0.003	0.0013	<0.0010	<0.0010	<0.0010	<0.0010
Dibromochloromethane	mg/L	0.001	-	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.001	-	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloromethane	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibromomethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2-Dichlorobenzene	mg/L	0.001	-	0.003	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,3-Dichlorobenzene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	0.0013	<0.0010
1,2-Dichloroethane	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-Dichloroethylene	mg/L	0.001	-	0.014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,2-Dichloroethylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,2-Dichloroethylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Dichloromethane	mg/L	0.005	-		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1,2-Dichloropropane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
cis-1,3-Dichloropropylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
trans-1,3-Dichloropropylene	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ethylbenzene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	0.00161	<0.00050
Methyl t-butyl ether (MTBE)	mg/L	0.001	-	0.015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Styrene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tetrachloroethylene	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Toluene	mg/L	0.001	-	0.024	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,1-Trichloroethane	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1,2-Trichloroethane	mg/L	0.001	-	0.03	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichloroethylene	mg/L	0.001	-	0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Trichlorofluoromethane	mg/L	0.001	-		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Vinyl Chloride	mg/L	0.001	-	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
ortho-Xylene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	0.00073	<0.00050
meta- & para-Xylene	mg/L	0.0005	-		<0.00050	<0.00050	<0.00050	<0.00050	0.0018	<0.00050
Xylenes	mg/L	0.00071	-	0.3	<0.00071	<0.00071	<0.00071	<0.00071	0.00253	<0.00071
4-Bromofluorobenzene (SS)	%	Surrogate	-		101	102	101	100	102	107
1,4-Difluorobenzene (SS)	%	Surrogate	-	-	99	100	99	99	100	99
EPH10-19	mg/L	0.25	-	5	<0.25	<0.25	<0.25	<0.25	0.82	<0.25
EPH19-32	mg/L	0.25	-		<0.25	<0.25	<0.25	<0.25	0.73	<0.25
LEPH	mg/L	0.25	-	-	<0.25	<0.25	<0.25	<0.25	0.82	<0.25
HEPH	mg/L	0.25	-	-	<0.25	<0.25	<0.25	<0.25	0.73	<0.25
Volatile Hydrocarbons (VH6-10)	mg/L	0.1	-	15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
VPH (C6-C10)	mg/L	0.1	-		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
3,4-Dichlorotoluene (SS)	%	Surrogate	-		97	97	91	92	96	93
Acenaphthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000070 *	<0.000050
Acenaphthylene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acridine	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benz(a)anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.00001	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(b)fluoranthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(k)fluoranthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chrysene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dibenz(a,h)anthracene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluoranthene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluorene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Naphthalene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	0.000283	<0.000050
Phenanthrene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Pyrene	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Quinoline	mg/L	0.00005	-		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
d10-Acenaphthene (SS)	%	Surrogate	-		87	82	87	86	93	86
d9-Acridine (SS)	%	Surrogate	-		68	66	66	65	73	66
d12-Chrysene (SS)	%	Surrogate	-		88	84	89	86	96	87
d8-Naphthalene (SS)	%	Surrogate	-		87	83	89	86	91	88
d10-Phenanthrene (SS)	%	Surrogate	-		89	85	88	85	96	86

* = Detection Limit Adjusted for Required Dilution.

Applied Guideline: British Columbia Contaminated Sites Regulation (JUN, 2010) - BCCSR-Schedule 6 Drinking Water

Color Key:

- Exceeds Lower Threshold
- Within Guideline
- Exceeds Guideline
- LOR exceeds Guideline

Appendix F

Field Data Collection Results for Groundwater, Leachate and Surface Water Monitoring

Field Measurements - Q2 (June 22, 2010)

		Groundwater Levels				Water Quality			
Well ID	**Date**	**Ground Surface elevation**	**Top of Well Riser Elevation**	**Depth to Water**	**Static Water Level Elevation**	**pH**	**D.O.**	**Temp**	**Conductivity**
		mASML	**mASML**	**m below top of well riser**	**mASL**		mg/L	C	uS/cm
MW2S	6/22/2010	603.84	604.94	6.67	598.27	6.2	2	9.46	496
MW2D	6/22/2010	603.84	604.9	6.63	598.27	6.2	2	9.01	918
MW3	6/22/2010	600.61	601.47	1.68	599.79	5.5	1.6	8.5	261
L1	6/22/2010					6.2	3	11.4	1319
SFC-2	6/22/2010					5.82	6.6	9.37	356
SFC-2B	6/22/2010					5.07	5.49	13.8	593
SFC-3	6/22/2010					5.74	8.85	8.09	137
SFC-11	6/22/2010					5.84	8.81	7.15	119

Field Measurements - Q3 (September 27, 2010)

		Groundwater Levels				Water Quality			
Well ID	**Date**	**Ground Surface elevation**	**Top of Well Riser Elevation**	**Depth to Water**	**Static Water Level Elevation**	**pH**	**D.O.**	**Temp**	**Conductivity**
		mASML	**mASML**	**m below top of well riser**	**mASL**		mg/L	C	uS/cm
MW2S	9/27/2010	603.84	604.94	6.75	598.19	6.73	4.2	9.07	698
MW2D	9/27/2010	603.84	604.9	6.72	598.18	6.57	3.3	8.94	1287
MW3	9/27/2010	600.61	601.47	1.56	599.91	5.95	2.6	10.15	436
MW4	9/27/2010	596.54	597.4	3.87	593.53	6.97	2.4	8.39	465
MW5	9/27/2010	610.82	610.82	3.07	607.75	-	-	-	-
MW6	9/27/2010	610.88	610.88	4.29	606.59	5.83	3.9	10.46	478
L1	9/27/2010					5.94	2.1	14.04	2198
SFC-2	9/27/2010					6.37	11.4	9.95	792
SFC-2B	9/27/2010					6	11.2	14.34	1158
SFC-3	9/27/2010					6.28	11.6	10.7	554
SFC-11	9/27/2010					6.97	14.9	9.91	140

Field Measurements - Q4 (December 21, 2010)

		Groundwater Levels				Water Quality			
		Ground Surface elevation	**Top of Well Riser Elevation**	**Depth to Water**	**Static Water Level Elevation**	**pH**	**D.O.**	**Temp**	**Conductivity**
Well ID	**Date**	**mASML**	**mASML**	**m below top of well riser**	**mASL**		mg/L	C	uS/cm
MW2S	12/21/2010	603.84	604.94	6.32	598.62	6.66	4.2	6.94	843
MW2D	12/21/2010	603.84	604.9	6.28	598.62	6.43	4.3	7.4	1334
MW3	12/21/2010	600.61	601.47	1.48	599.99	5.82	3.1	8.49	409
MW4	12/21/2010	596.54	597.4	4.14	593.26	6.66	7.3	5.62	671
MW5	12/21/2010	610.82	610.82	-	-	-	-	-	-
MW6	12/21/2010	610.88	610.88	-	-	-	-	-	-
L1	12/21/2010					6.7	2.4	8.96	3107
SFC-2	12/21/2010					6.55	8	5.8	577
SFC-2B	12/21/2010					6.31	7.08	1.08	1345
SFC-3	12/21/2010					6.85	10.11	3.13	394
SFC-11	12/21/2010					6.98	10.59	3.84	1118

APPENDIX G

Laboratory Analytical Results for Surface Water Quality Monitoring

Q2 (June 22, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID				
Analyte	**Units**	**LOR**	**Lower Limit**	**Aquatic Life**	**SFC-2**	**SFC-2B**	**SFC-3**	**SFC-11**	**TRAVEL BLANK**
Conductivity	uS/cm	2	-	-	474	679	141	140	<2.0
Hardness (as CaCO3)	mg/L	1.1	-	-	166	237	48.4	48.4	<1.1
pH	pH	0.1	6.5	8.5	7.2	6.34	7.3	7.26	5.8
Alkalinity, Bicarbonate (as CaCO3)	mg/L	1	-	-	67.8	29.2	27.1	27.5	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	1	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	1	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	1	-	-	67.8	29.2	27.1	27.5	<1.0
Ammonia as N	mg/L	0.01	-	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	1.15	1.72	<0.010	<0.010	<0.010
Bromide (Br)	mg/L	0.05	-	-	<0.50	<1.0	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L	0.5	-	1500	66.3	62	12.4	12.9	<0.50
Fluoride (F)	mg/L	0.02	-	2	<0.20	<0.40	0.043	0.04	<0.020
Nitrate (as N)	mg/L	0.005	-	400	0.266	0.23	0.344	0.311	<0.0050
Nitrite (as N)	mg/L	0.001	-	0.2	<0.010	<0.020	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	1.26	18.2	<0.050	<0.050	<0.050
Total Nitrogen	mg/L	0.06	-	-	1.56	18.4	0.344	0.311	<0.060
Total Phosphate as P	mg/L	0.002	-	-	0.0045	4.24	0.0053	0.0042	<0.0020
Sulfate (SO4)	mg/L	0.5	-	1000	60.6	225	20.3	19.1	<0.50
Aluminum (Al)-Total	mg/L	0.01	-	-	-	-	-	-	<0.010
Antimony (Sb)-Total	mg/L	0.0005	-	0.2	-	-	-	-	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.05	-	-	-	-	<0.0010
Barium (Ba)-Total	mg/L	0.02	-	10	-	-	-	-	<0.020
Beryllium (Be)-Total	mg/L	0.005	-	0.053	-	-	-	-	<0.0050
Bismuth (Bi)-Total	mg/L	0.2	-	-	-	-	-	-	<0.20
Boron (B)-Total	mg/L	0.1	-	50	-	-	-	-	<0.10
Cadmium (Cd)-Total	mg/L	0.00005	-	0.0001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	-	-	-	-	<0.000050
Calcium (Ca)-Total	mg/L	0.1	-	-	-	-	-	-	<0.10
Chromium (Cr)-Total	mg/L	0.0005	-	0.01	-	-	-	-	<0.00050
Cobalt (Co)-Total	mg/L	0.0005	-	0.04	-	-	-	-	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	0.02 (H <50), 0.03 (H 50 -<75), 0.04(H 75 - <100), 0.05(H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 0.09 (H ≥ 200)	-	-	-	-	<0.0010
Iron (Fe)-Total	mg/L	0.03	-	-	-	-	-	-	<0.030
Lead (Pb)-Total	mg/L	0.001	-	0.04 (H <50), 0.05 (H 50 - <100), 0.06 (H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	-	-	-	-	<0.0010
Lithium (Li)-Total	mg/L	0.05	-	-	-	-	-	-	<0.050
Magnesium (Mg)-Total	mg/L	0.1	-	-	-	-	-	-	<0.10
Manganese (Mn)-Total	mg/L	0.01	-	-	-	-	-	-	<0.010
Mercury (Hg)-Total	mg/L	0.0002	-	0.001	-	-	-	-	<0.00020
Molybdenum (Mo)-Total	mg/L	0.001	-	10	-	-	-	-	<0.0010
Nickel (Ni)-Total	mg/L	0.005	-	0.25 (H < 60) 0.65 (H 60 -<120) 1.10 (H 120 - <180) 1.50 (H > 180)	-	-	-	-	<0.0050
Phosphorus (P)-Total	mg/L	0.3	-	-	-	-	-	-	<0.30
Potassium (K)-Total	mg/L	2	-	-	-	-	-	-	<2.0
Selenium (Se)-Total	mg/L	0.001	-	0.01	-	-	-	-	<0.0010
Silicon (Si)-Total	mg/L	0.05	-	-	-	-	-	-	<0.050
Silver (Ag)-Total	mg/L	0.00005	-	0.0005 (H ≤ 100), 0.015 (H > 100)	-	-	-	-	<0.000050
Sodium (Na)-Total	mg/L	2	-	-	-	-	-	-	<2.0
Strontium (Sr)-Total	mg/L	0.005	-	-	-	-	-	-	<0.0050
Thallium (Tl)-Total	mg/L	0.0002	-	0.003	-	-	-	-	<0.00020
Tin (Sn)-Total	mg/L	0.03	-	-	-	-	-	-	<0.030
Titanium (Ti)-Total	mg/L	0.05	-	1	-	-	-	-	<0.050
Uranium (U)-Total	mg/L	0.0002	-	3	-	-	-	-	<0.00020
Vanadium (V)-Total	mg/L	0.03	-	-	-	-	-	-	<0.030
Zinc (Zn)-Total	mg/L	0.005	-	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.90 (H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	-	-	-	-	<0.0050
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.163	0.095	0.032	0.022	-
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.2	<0.00050	<0.00050	<0.00050	<0.00050	-
Arsenic (As)-Dissolved	mg/L	0.001	-	0.05	<0.0010	<0.0010	<0.0010	<0.0010	-
Barium (Ba)-Dissolved	mg/L	0.02	-	10	0.092	0.052	<0.020	<0.020	-
Beryllium (Be)-Dissolved	mg/L	0.005	-	0.053	<0.0050	<0.0050	<0.0050	<0.0050	-
Bismuth (Bi)-Dissolved	mg/L	0.2	-	-	<0.20	<0.20	<0.20	<0.20	-
Boron (B)-Dissolved	mg/L	0.1	-	50	0.12	<0.10	<0.10	<0.10	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	0.0001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	0.000074	0.000224	<0.000050	0.000055	-
Calcium (Ca)-Dissolved	mg/L	0.1	-	-	57.2	74.9	15.2	15.3	-
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.01	<0.0010	<0.0010	<0.00050	<0.00050	-
Cobalt (Co)-Dissolved	mg/L	0.0005	-	0.04	0.0121	0.032	<0.00050	<0.00050	-

Q2 (June 22, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID				
Analyte	Units	LOR	Lower Limit	Aquatic Life	SFC-2	SFC-2B	SFC-3	SFC-11	TRAVEL BLANK
Copper (Cu)-Dissolved	mg/L	0.001	-	0.02 (H <50), 0.03 (H 50 -<75), 0.04(H 75 - <100), 0.05(H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 0.09 (H ≥ 200)	0.0012	0.013	<0.0010	<0.0010	-
Iron (Fe)-Dissolved	mg/L	0.03	-	-	8.43	16.5	0.066	<0.030	-
Lead (Pb)-Dissolved	mg/L	0.001	-	0.04 (H <50), 0.05 (H 50 - <100), 0.06 (H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	<0.0010	<0.0010	<0.0010	<0.0010	-
Lithium (Li)-Dissolved	mg/L	0.05	-	-	<0.050	<0.050	<0.050	<0.050	-
Magnesium (Mg)-Dissolved	mg/L	0.1	-	-	5.58	12.2	2.53	2.5	-
Manganese (Mn)-Dissolved	mg/L	0.01	-	-	2.88	5.2	0.017	<0.010	-
Mercury (Hg)-Dissolved	mg/L	0.0002	-	0.001	<0.00020	<0.00020	<0.00020	<0.00020	-
Molybdenum (Mo)-Dissolved	mg/L	0.001	-	10	0.0021	<0.0010	<0.0010	<0.0010	-
Nickel (Ni)-Dissolved	mg/L	0.005	-	0.25 (H < 60) 0.65 (H 60 -<120) 1.10 (H 120 - <180) 1.50 (H > 180)	<0.0050	0.01	<0.0050	<0.0050	-
Phosphorus (P)-Dissolved	mg/L	0.3	-	-	<0.30	<0.30	<0.30	<0.30	-
Potassium (K)-Dissolved	mg/L	2	-	-	5.8	7.9	<2.0	<2.0	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.01	<0.0010	<0.0010	<0.0010	<0.0010	-
Silicon (Si)-Dissolved	mg/L	0.05	-	-	4.74	5.56	9.26	9.59	-
Silver (Ag)-Dissolved	mg/L	0.00005	-	0.0005 (H ≤ 100), 0.015 (H > 100)	<0.000050	<0.000050	<0.000050	<0.000050	-
Sodium (Na)-Dissolved	mg/L	2	-	-	22	37	7.6	7.4	-
Strontium (Sr)-Dissolved	mg/L	0.005	-	-	0.334	0.4	0.184	0.188	-
Thallium (Tl)-Dissolved	mg/L	0.0002	-	0.003	<0.00020	<0.00020	<0.00020	<0.00020	-
Tin (Sn)-Dissolved	mg/L	0.03	-	-	<0.030	<0.030	<0.030	<0.030	-
Titanium (Ti)-Dissolved	mg/L	0.05	-	1	<0.050	<0.050	<0.050	<0.050	-
Uranium (U)-Dissolved	mg/L	0.0002	-	3	<0.00020	<0.00020	<0.00020	<0.00020	-
Vanadium (V)-Dissolved	mg/L	0.03	-	-	<0.030	<0.030	<0.030	<0.030	-
Zinc (Zn)-Dissolved	mg/L	0.005	-	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.90 (H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	0.0143	0.0163	<0.0050	<0.0050	-
COD	mg/L	20	-	-	20	711	<20	<20	<20
Benzene	mg/L	0.0005	-	4	-	-	-	-	<0.00050
Bromodichloromethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
Bromoform	mg/L	0.001	-	-	-	-	-	-	<0.0010
Bromomethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
1,3-Butadiene	mg/L	0.001	-	-	-	-	-	-	<0.0010
Carbon Tetrachloride	mg/L	0.001	-	0.13	-	-	-	-	<0.0010
Chlorobenzene	mg/L	0.001	-	0.013	-	-	-	-	<0.0010
Dibromochloromethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
Chloroethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
Chloroform	mg/L	0.001	-	0.02	-	-	-	-	<0.0010
Chloromethane	mg/L	0.005	-	-	-	-	-	-	<0.0050
1,2-Dichlorobenzene	mg/L	0.001	-	0.007	-	-	-	-	<0.0010
1,3-Dichlorobenzene	mg/L	0.001	-	1.5	-	-	-	-	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	-	0.26	-	-	-	-	<0.0010
1,1-Dichloroethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
1,2-Dichloroethane	mg/L	0.001	-	1	-	-	-	-	<0.0010
1,1-Dichloroethylene	mg/L	0.001	-	-	-	-	-	-	<0.0010
cis-1,2-Dichloroethylene	mg/L	0.001	-	-	-	-	-	-	<0.0010
trans-1,2-Dichloroethylene	mg/L	0.001	-	-	-	-	-	-	<0.0010
Dichloromethane	mg/L	0.005	-	0.98	-	-	-	-	<0.0050
1,2-Dichloropropane	mg/L	0.001	-	-	-	-	-	-	<0.0010
cis-1,3-Dichloropropylene	mg/L	0.001	-	-	-	-	-	-	<0.0010
trans-1,3-Dichloropropylene	mg/L	0.001	-	-	-	-	-	-	<0.0010
Ethylbenzene	mg/L	0.0005	-	2	-	-	-	-	<0.00050
Methyl t-butyl ether (MTBE)	mg/L	0.001	-	34	-	-	-	-	<0.0010
Styrene	mg/L	0.0005	-	0.72	-	-	-	-	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
Tetrachloroethylene	mg/L	0.001	-	1.1	-	-	-	-	<0.0010
Toluene	mg/L	0.001	-	0.39	-	-	-	-	<0.0010
1,1,1-Trichloroethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
1,1,2-Trichloroethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
Trichloroethylene	mg/L	0.001	-	0.2	-	-	-	-	<0.0010
Trichlorofluoromethane	mg/L	0.001	-	-	-	-	-	-	<0.0010
1,2,4-Trimethylbenzene	mg/L	0.001	-	-	-	-	-	-	<0.0010
1,3,5-Trimethylbenzene	mg/L	0.001	-	-	-	-	-	-	<0.0010
Vinyl Chloride	mg/L	0.001	-	-	-	-	-	-	<0.0010
ortho-Xylene	mg/L	0.0005	-	-	-	-	-	-	<0.00050
meta- & para-Xylene	mg/L	0.0005	-	-	-	-	-	-	<0.00050
Xylenes	mg/L	0.001	-	-	-	-	-	-	<0.0010
4-Bromofluorobenzene (SS)	%	Surrogate	-	-	-	-	-	-	104
1,4-Difluorobenzene (SS)	%	Surrogate	-	-	-	-	-	-	106
EPH10-19	mg/L	0.25	-	5	<0.25	-	<0.25	<0.25	<0.25
EPH19-32	mg/L	0.25	-	-	<0.25	-	<0.25	<0.25	<0.25
LEPH	mg/L	0.25	-	0.5	<0.25	-	<0.25	<0.25	<0.25
HEPH	mg/L	0.25	-	-	<0.25	-	<0.25	<0.25	<0.25
Volatile Hydrocarbons (VH6-10)	mg/L	0.1	-	15	-	-	-	-	<0.10
VPH (C6-C10)	mg/L	0.1	-	1.5	-	-	-	-	<0.10
3,4-Dichlorotoluene (SS)	%	Surrogate	-	-	-	-	-	-	95
Acenaphthene	mg/L	0.00005	-	0.06	<0.000050	-	<0.000050	<0.000050	<0.000050
Acenaphthylene	mg/L	0.00005	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050
Acridine	mg/L	0.00005	-	0.0005	<0.000050	-	<0.000050	<0.000050	<0.000050
Anthracene	mg/L	0.00005	-	0.001	<0.000050	-	<0.000050	<0.000050	<0.000050
Benz(a)anthracene	mg/L	0.00005	-	0.001	<0.000050	-	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.00001	-	0.0001	<0.000010	-	<0.000010	<0.000010	<0.000010
Benzo(b)fluoranthene	mg/L	0.00005	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050

Q2 (June 22, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID				
Analyte	**Units**	**LOR**	**Lower Limit**	**Aquatic Life**	**SFC-2**	**SFC-2B**	**SFC-3**	**SFC-11**	**TRAVEL BLANK**
Benzo(g,h,i)perylene	mg/L	0.00005	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050
Benzo(k)fluoranthene	mg/L	0.00005	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050
Chrysene	mg/L	0.00005	-	0.001	<0.000050	-	<0.000050	<0.000050	<0.000050
Dibenz(a,h)anthracene	mg/L	0.00005	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050
Fluoranthene	mg/L	0.00005	-	0.002	<0.000050	-	<0.000050	<0.000050	<0.000050
Fluorene	mg/L	0.00005	-	0.12	<0.000050	-	<0.000050	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	0.00005	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050
Naphthalene	mg/L	0.00005	-	0.01	<0.000050	-	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	0.00005	-	0.003	<0.000050	-	<0.000050	<0.000050	<0.000050
Pyrene	mg/L	0.00005	-	0.0002	<0.000050	-	<0.000050	<0.000050	<0.000050
Quinoline	mg/L	0.00005	-	0.034	<0.000050	-	<0.000050	<0.000050	<0.000050
d10-Acenaphthene (SS)	%	Surrogate	-	-	96	-	100	94	96
d9-Acridine (SS)	%	Surrogate	-	-	90	-	97	85	91
d12-Chrysene (SS)	%	Surrogate	-	-	83	-	88	80	85
d8-Naphthalene (SS)	%	Surrogate	-	-	90	-	97	90	91
d10-Phenanthrene (SS)	%	Surrogate	-	-	96	-	100	93	97
Applied Guideline:	**British Columbia Contaminated Sites Regulation (JUN, 2010) - BCCSR-Schedule 6 Freshwater Aquatic Life**								

Color Key:
Exceeds Lower Threshold
Within Guideline
Exceeds Guideline
LOR exceeds Guideline

Q3 (September 27, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID				
Analyte	**Units**	**LOR**	**Lower Limit**	**Aquatic Life**	**TRAVEL BLANK**	**SFC-11**	**SFC-2**	**SFC-2B**	**SFC-3**
Conductivity	uS/cm	2	-	-	<2.0	139	769	1140	569
Hardness (as CaCO3)	mg/L	0.5	-	-	<0.50	44.4	303	441	195
pH	pH	0.1	6.5	8.5	5.74	7.42	7.21	6.66	6.99
Alkalinity, Total (as CaCO3)	mg/L	2	-	-	<2.0	26.4	102	37.9	46.7
Ammonia as N	mg/L	0.005	-	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	<0.0050	<0.0050	0.353	6.99	<0.0050
Bromide (Br)	mg/L	0.05	-	-	<0.050	<0.050	<0.50	<0.50	<0.050
Chloride (Cl)	mg/L	0.5	-	1500	<0.50	5.52	85.8	60.5	50
Fluoride (F)	mg/L	0.02	-	2	<0.020	0.035	<0.20	<0.20	0.074
Nitrate (as N)	mg/L	0.005	-	400	<0.0050	1.17	1.21	16.7	1.23
Nitrite (as N)	mg/L	0.001	-	0.2	<0.0010	<0.0010	<0.010	0.15	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	<0.050	0.073 *	0.512	6.5	0.136
Total Nitrogen	mg/L	0.0025	-	-	<0.0025	1.24	1.72	23.3	1.37
Total Phosphate as P	mg/L	0.002	-	-	<0.0020	0.019	0.0092	0.682	0.0077
Sulfate (SO4)	mg/L	0.5	-	1000	<0.50	23.8	145	386	139
Aluminum (Al)-Total	mg/L	0.01	-	-	<0.010	-	-	-	-
Antimony (Sb)-Total	mg/L	0.0005	-	0.2	<0.00050	-	-	-	-
Arsenic (As)-Total	mg/L	0.001	-	0.05	<0.0010	-	-	-	-
Barium (Ba)-Total	mg/L	0.02	-	10	<0.020	-	-	-	-
Beryllium (Be)-Total	mg/L	0.005	-	0.053	<0.0050	-	-	-	-
Bismuth (Bi)-Total	mg/L	0.2	-	-	<0.20	-	-	-	-
Boron (B)-Total	mg/L	0.1	-	50	<0.10	-	-	-	-
Cadmium (Cd)-Total	mg/L	0.00005	-	0.0001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	<0.000050	-	-	-	-
Calcium (Ca)-Total	mg/L	0.1	-	-	<0.10	-	-	-	-
Chromium (Cr)-Total	mg/L	0.0005	-	0.01	<0.00050	-	-	-	-
Cobalt (Co)-Total	mg/L	0.0005	-	0.04	<0.00050	-	-	-	-
Copper (Cu)-Total	mg/L	0.001	-	0.02 (H <50), 0.03 (H 50 -<75), 0.04(H 75 - <100), 0.05(H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 0.09 (H ≥ 200)	<0.0010	-	-	-	-
Iron (Fe)-Total	mg/L	0.03	-	-	<0.030	-	-	-	-
Lead (Pb)-Total	mg/L	0.001	-	0.04 (H <50), 0.05 (H 50 - <100), 0.06 (H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	<0.0010	-	-	-	-
Lithium (Li)-Total	mg/L	0.05	-	-	<0.050	-	-	-	-
Magnesium (Mg)-Total	mg/L	0.1	-	-	<0.10	-	-	-	-
Manganese (Mn)-Total	mg/L	0.01	-	-	<0.010	-	-	-	-
Mercury (Hg)-Total	mg/L	0.0002	-	0.001	<0.00020	-	-	-	-
Molybdenum (Mo)-Total	mg/L	0.001	-	10	<0.0010	-	-	-	-
Nickel (Ni)-Total	mg/L	0.005	-	0.25 (H < 60) 0.65 (H 60 -<120) 1.10 (H 120 - <180) 1.50 (H > 180)	<0.0050	-	-	-	-
Phosphorus (P)-Total	mg/L	0.3	-	-	<0.30	-	-	-	-
Potassium (K)-Total	mg/L	2	-	-	<2.0	-	-	-	-
Selenium (Se)-Total	mg/L	0.001	-	0.01	<0.0010	-	-	-	-
Silicon (Si)-Total	mg/L	0.05	-	-	<0.050	-	-	-	-
Silver (Ag)-Total	mg/L	0.00005	-	0.0005 (H ≤ 100), 0.015 (H > 100)	<0.000050	-	-	-	-
Sodium (Na)-Total	mg/L	2	-	-	<2.0	-	-	-	-
Strontium (Sr)-Total	mg/L	0.005	-	-	<0.0050	-	-	-	-
Thallium (Tl)-Total	mg/L	0.0002	-	0.003	<0.00020	-	-	-	-
Tin (Sn)-Total	mg/L	0.03	-	-	<0.030	-	-	-	-
Titanium (Ti)-Total	mg/L	0.05	-	1	<0.050	-	-	-	-
Uranium (U)-Total	mg/L	0.0002	-	3	<0.00020	-	-	-	-
Vanadium (V)-Total	mg/L	0.03	-	-	<0.030	-	-	-	-
Zinc (Zn)-Total	mg/L	0.005	-	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.90 (H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	<0.0050	-	-	-	-
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	-	0.038	0.022	0.088	0.043
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.2	-	<0.00050	<0.0010 *	<0.0010 *	<0.00050
Arsenic (As)-Dissolved	mg/L	0.001	-	0.05	-	<0.0010	<0.0020 *	<0.0020 *	<0.0010
Barium (Ba)-Dissolved	mg/L	0.02	-	10	-	<0.020	0.118	0.08	0.079
Beryllium (Be)-Dissolved	mg/L	0.005	-	0.053	-	<0.0050	<0.0050	<0.0050	<0.0050
Bismuth (Bi)-Dissolved	mg/L	0.2	-	-	-	<0.20	<0.20	<0.20	<0.20
Boron (B)-Dissolved	mg/L	0.1	-	50	-	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	0.0001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	-	<0.000050	0.00022	0.00095	0.000256
Calcium (Ca)-Dissolved	mg/L	0.1	-	-	-	13.6	106	149	68.1
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.01	-	<0.00050	<0.0010 *	<0.0010 *	<0.00050
Cobalt (Co)-Dissolved	mg/L	0.0005	-	0.04	-	<0.00050	0.0155	0.0628	0.022

Q3 (September 27, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID				
Analyte	Units	LOR	Lower Limit	Aquatic Life	TRAVEL BLANK	SFC-11	SFC-2	SFC-2B	SFC-3
Copper (Cu)-Dissolved	mg/L	0.001	-	0.02 (H <50), 0.03 (H 50 -<75), 0.04(H 75 - <100), 0.05(H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 0.09 (H ≥ 200)	-	0.0013	0.0151	0.0857	0.0436
Iron (Fe)-Dissolved	mg/L	0.03	-	-	-	<0.030	0.089	3.29	<0.030
Lead (Pb)-Dissolved	mg/L	0.001	-	0.04 (H <50), 0.05 (H 50 - <100), 0.06 (H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	-	<0.0010	<0.0020 *	<0.0020 *	<0.0010
Lithium (Li)-Dissolved	mg/L	0.05	-	-	-	<0.050	<0.050	<0.050	<0.050
Magnesium (Mg)-Dissolved	mg/L	0.1	-	-	-	2.52	9.1	16.9	6.11
Manganese (Mn)-Dissolved	mg/L	0.01	-	-	-	<0.010	1.24	3.03	0.604
Mercury (Hg)-Dissolved	mg/L	0.0002	-	0.001	-	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum (Mo)-Dissolved	mg/L	0.001	-	10	-	<0.0010	<0.0020 *	<0.0020 *	0.0055
Nickel (Ni)-Dissolved	mg/L	0.005	-	0.25 (H < 60) 0.65 (H 60 -<120) 1.10 (H 120 - <180) 1.50 (H > 180)	-	<0.0050	<0.010 *	0.033	0.0075
Phosphorus (P)-Dissolved	mg/L	0.3	-	-	-	<0.30	<0.30	<0.30	<0.30
Potassium (K)-Dissolved	mg/L	2	-	-	-	<2.0	8.5	13.1	5.3
Selenium (Se)-Dissolved	mg/L	0.001	-	0.01	-	<0.0010	<0.0020 *	<0.0020 *	<0.0010
Silicon (Si)-Dissolved	mg/L	0.05	-	-	-	8.56	5.1	9.59	6.86
Silver (Ag)-Dissolved	mg/L	0.00005	-	0.0005 (H ≤ 100), 0.015 (H > 100)	-	<0.000050	<0.00010 *	<0.00010 *	<0.000050
Sodium (Na)-Dissolved	mg/L	2	-	-	-	9	42.4	51.7	35.7
Strontium (Sr)-Dissolved	mg/L	0.005	-	-	-	0.148	0.571	0.561	0.427
Thallium (Tl)-Dissolved	mg/L	0.0002	-	0.003	-	<0.00020	<0.00040 *	<0.00040 *	<0.00020
Tin (Sn)-Dissolved	mg/L	0.03	-	-	-	<0.030	<0.030	<0.030	<0.030
Titanium (Ti)-Dissolved	mg/L	0.05	-	1	-	<0.050	<0.050	<0.050	<0.050
Uranium (U)-Dissolved	mg/L	0.0002	-	3	-	<0.00020	<0.00040 *	<0.00040 *	<0.00020
Vanadium (V)-Dissolved	mg/L	0.03	-	-	-	<0.030	<0.030	<0.030	<0.030
Zinc (Zn)-Dissolved	mg/L	0.005	-	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.90 (H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	-	<0.0050	0.0532	0.0914	0.0251
Benzene	mg/L	0.0005	-	4	<0.00050	-	-	-	-
Bromodichloromethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
Bromoform	mg/L	0.001	-	-	<0.0010	-	-	-	-
Carbon Tetrachloride	mg/L	0.001	-	0.13	<0.0010	-	-	-	-
Chlorobenzene	mg/L	0.001	-	0.013	<0.0010	-	-	-	-
Dibromochloromethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
Chloroethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
Chloroform	mg/L	0.001	-	0.02	<0.0010	-	-	-	-
Chloromethane	mg/L	0.005	-	-	<0.0050	-	-	-	-
1,2-Dibromoethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.001	-	0.007	<0.0010	-	-	-	-
1,3-Dichlorobenzene	mg/L	0.001	-	1.5	<0.0010	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.26	<0.0010	-	-	-	-
1,1-Dichloroethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
1,2-Dichloroethane	mg/L	0.001	-	1	<0.0010	-	-	-	-
1,1-Dichloroethylene	mg/L	0.001	-	-	<0.0010	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	0.001	-	-	<0.0010	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	0.001	-	-	<0.0010	-	-	-	-
Dichloromethane	mg/L	0.005	-	0.98	<0.0050	-	-	-	-
1,2-Dichloropropane	mg/L	0.001	-	-	<0.0010	-	-	-	-
cis-1,3-Dichloropropylene	mg/L	0.001	-	-	<0.0010	-	-	-	-
trans-1,3-Dichloropropylene	mg/L	0.001	-	-	<0.0010	-	-	-	-
Ethylbenzene	mg/L	0.0005	-	2	<0.00050	-	-	-	-
Methyl t-butyl ether (MTBE)	mg/L	0.001	-	34	<0.0010	-	-	-	-
Styrene	mg/L	0.0005	-	0.72	<0.00050	-	-	-	-
1,1,1,2-Tetrachloroethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
Tetrachloroethylene	mg/L	0.001	-	1.1	<0.0010	-	-	-	-
Toluene	mg/L	0.001	-	0.39	<0.0010	-	-	-	-
1,1,1-Trichloroethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
1,1,2-Trichloroethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
Trichloroethylene	mg/L	0.001	-	0.2	<0.0010	-	-	-	-
Trichlorofluoromethane	mg/L	0.001	-	-	<0.0010	-	-	-	-
Vinyl Chloride	mg/L	0.001	-	-	<0.0010	-	-	-	-
ortho-Xylene	mg/L	0.0005	-	-	<0.00050	-	-	-	-
meta- & para-Xylene	mg/L	0.0005	-	-	<0.00050	-	-	-	-
Xylenes	mg/L	0.00071	-	-	<0.00071	-	-	-	-
4-Bromofluorobenzene (SS)	%	Surrogate	-	-	91	-	-	-	-
1,4-Difluorobenzene (SS)	%	Surrogate	-	-	103	-	-	-	-
EPH10-19	mg/L	0.25	-	5	<0.25	<0.25	<0.25	<0.25	<0.25
EPH19-32	mg/L	0.25	-	-	<0.25	0.28	<0.25	0.36	<0.25
LEPH	mg/L	0.25	-	0.5	<0.25	<0.25	<0.25	<0.25	<0.25
HEPH	mg/L	0.25	-	-	<0.25	0.28	<0.25	0.36	<0.25
Volatile Hydrocarbons (VH6-10)	mg/L	0.1	-	15	<0.10	-	-	-	-
VPH (C6-C10)	mg/L	0.1	-	1.5	<0.10	-	-	-	-
3,4-Dichlorotoluene (SS)	%	Surrogate	-	-	98	-	-	-	-
Acenaphthene	mg/L	0.00005	-	0.06	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acenaphthylene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acridine	mg/L	0.00005	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Anthracene	mg/L	0.00005	-	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

Q3 (September 27, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID				
Analyte	**Units**	**LOR**	**Lower Limit**	**Aquatic Life**	**TRAVEL BLANK**	**SFC-11**	**SFC-2**	**SFC-2B**	**SFC-3**
Benz(a)anthracene	mg/L	0.00005	-	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.00001	-	0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(b)fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(k)fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chrysene	mg/L	0.00005	-	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dibenz(a,h)anthracene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluoranthene	mg/L	0.00005	-	0.002	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluorene	mg/L	0.00005	-	0.12	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Naphthalene	mg/L	0.00005	-	0.01	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	0.00005	-	0.003	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Pyrene	mg/L	0.00005	-	0.0002	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Quinoline	mg/L	0.00005	-	0.034	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
d10-Acenaphthene (SS)	%	Surrogate	-	-	79	99	88	95	83
d9-Acridine (SS)	%	Surrogate	-	-	75	111	94	105	88
d12-Chrysene (SS)	%	Surrogate	-	-	78	99	85	94	90
d8-Naphthalene (SS)	%	Surrogate	-	-	75	99	86	91	78
d10-Phenanthrene (SS)	%	Surrogate	-	-	83	107	93	99	88

* = Detection Limit Adjusted for Required Dilution.

Applied Guideline:	**British Columbia Contaminated Sites Regulation (JUN, 2010) - BCCSR-Schedule 6 Freshwater Aquatic Life**

Color Key:

Exceeds Lower Threshold
Within Guideline
Exceeds Guideline
LOR exceeds Guideline

Q4 (December 21, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID					
Analyte	Units	LOR	Lower Limit	Aquatic Life	SFC-2	SFC-2B	SFC-3	SFC-11	SFC-11 REPLICATE	TRAVEL BLANK
Conductivity	uS/cm	2	-	-	553	1300	377	110	110	<2.0
Hardness (as CaCO3)	mg/L	0.5	-	-	203	476	97.2	36.9	36.8	<0.50
pH	pH	0.1	6.5	8.5	7.18	6.89	7.36	7.38	7.44	5.62
Alkalinity, Total (as CaCO3)	mg/L	2	-	-	88.6	141	41	23.1	22.7	<2.0
Ammonia as N	mg/L	0.005	-	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	2.68	17.8	0.126	0.009	<0.0050	<0.0050
Bromide (Br)	mg/L	0.05	-	-	<0.050	<0.50	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L	0.5	-	1500	39.8	65.5	55.9	6.94	6.91	<0.50
Fluoride (F)	mg/L	0.02	-	2	0.076	<0.20	0.024	0.041	0.041	<0.020
Nitrate (as N)	mg/L	0.005	-	400	3.14	21.1	0.262	0.44	0.44	<0.0050
Nitrite (as N)	mg/L	0.001	-	0.2	0.0226	0.172	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	3.27 **	19.2	0.141	0.103	0.089	<0.050
Total Nitrogen	mg/L	0.0025	-	-	6.43	40.5	0.404	0.543	0.528	<0.0025
Total Phosphate as P	mg/L	0.002	-	-	0.0057	0.0161	0.0023	0.0047	0.0057	<0.0020
Sulfate (SO4)	mg/L	0.5	-	1000	124	366	54.4	17.9	17.8	<0.50
Aluminum (Al)-Total	mg/L	0.01	-	-	-	-	-	-	-	<0.010
Antimony (Sb)-Total	mg/L	0.0005	-	0.2	-	-	-	-	-	<0.00050
Arsenic (As)-Total	mg/L	0.001	-	0.05	-	-	-	-	-	<0.0010
Barium (Ba)-Total	mg/L	0.02	-	10	-	-	-	-	-	<0.020
Beryllium (Be)-Total	mg/L	0.005	-	0.053	-	-	-	-	-	<0.0050
Bismuth (Bi)-Total	mg/L	0.2	-	-	-	-	-	-	-	<0.20
Boron (B)-Total	mg/L	0.1	-	50	-	-	-	-	-	<0.10
Cadmium (Cd)-Total	mg/L	0.00005	-	0.0001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	-	-	-	-	-	<0.000050
Calcium (Ca)-Total	mg/L	0.1	-	-	-	-	-	-	-	<0.10
Chromium (Cr)-Total	mg/L	0.0005	-	0.01	-	-	-	-	-	<0.00050
Cobalt (Co)-Total	mg/L	0.0005	-	0.04	-	-	-	-	-	<0.00050
Copper (Cu)-Total	mg/L	0.001	-	0.02 (H <50), 0.03 (H 50 -<75), 0.04(H 75 - <100), 0.05(H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 0.09 (H ≥ 200)	-	-	-	-	-	<0.0010
Iron (Fe)-Total	mg/L	0.03	-	-	-	-	-	-	-	<0.030
Lead (Pb)-Total	mg/L	0.001	-	0.04 (H <50), 0.05 (H 50 - <100), 0.06 (H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	-	-	-	-	-	<0.0010
Lithium (Li)-Total	mg/L	0.05	-	-	-	-	-	-	-	<0.050
Magnesium (Mg)-Total	mg/L	0.1	-	-	-	-	-	-	-	<0.10
Manganese (Mn)-Total	mg/L	0.01	-	-	-	-	-	-	-	<0.010
Mercury (Hg)-Total	mg/L	0.0002	-	0.001	-	-	-	-	-	<0.00020
Molybdenum (Mo)-Total	mg/L	0.001	-	10	-	-	-	-	-	<0.0010
Nickel (Ni)-Total	mg/L	0.005	-	0.25 (H< 60) 0.65 (H=60 - <120) 1.1 (H = 120-<180) 1.5 (H ≥ 180)	-	-	-	-	-	<0.0050
Phosphorus (P)-Total	mg/L	0.3	-	-	-	-	-	-	-	<0.30
Potassium (K)-Total	mg/L	2	-	-	-	-	-	-	-	<2.0
Selenium (Se)-Total	mg/L	0.001	-	0.01	-	-	-	-	-	<0.0010
Silicon (Si)-Total	mg/L	0.05	-	-	-	-	-	-	-	<0.050
Silver (Ag)-Total	mg/L	0.00005	-	0.0005 (H ≤ 100), 0.015 (H > 100)	-	-	-	-	-	<0.000050
Sodium (Na)-Total	mg/L	2	-	-	-	-	-	-	-	<2.0
Strontium (Sr)-Total	mg/L	0.005	-	-	-	-	-	-	-	<0.0050
Thallium (Tl)-Total	mg/L	0.0002	-	0.003	-	-	-	-	-	<0.00020
Tin (Sn)-Total	mg/L	0.03	-	-	-	-	-	-	-	<0.030
Titanium (Ti)-Total	mg/L	0.05	-	1	-	-	-	-	-	<0.050
Uranium (U)-Total	mg/L	0.0002	-	3	-	-	-	-	-	<0.00020
Vanadium (V)-Total	mg/L	0.03	-	-	-	-	-	-	-	<0.030
Zinc (Zn)-Total	mg/L	0.005	-	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.90 (H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	-	-	-	-	-	<0.0050
Aluminum (Al)-Dissolved	mg/L	0.01	-	-	0.012	0.039	<0.010	0.045	0.049	-
Antimony (Sb)-Dissolved	mg/L	0.0005	-	0.2	<0.00050	<0.0010 *	<0.00050	<0.00050	<0.00050	-
Arsenic (As)-Dissolved	mg/L	0.001	-	0.05	<0.0010	<0.0020 *	<0.0010	<0.0010	<0.0010	-
Barium (Ba)-Dissolved	mg/L	0.02	-	10	0.072	0.079	0.045	<0.020	<0.020	-
Beryllium (Be)-Dissolved	mg/L	0.005	-	0.053	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Bismuth (Bi)-Dissolved	mg/L	0.2	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	-
Boron (B)-Dissolved	mg/L	0.1	-	50	<0.10	0.27	<0.10	<0.10	<0.10	-
Cadmium (Cd)-Dissolved	mg/L	0.00005	-	0.0001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	0.00016	0.00062	<0.000050	<0.000050	<0.000050	-
Calcium (Ca)-Dissolved	mg/L	0.1	-	-	69.1	156	32.9	11.4	11.3	-
Chromium (Cr)-Dissolved	mg/L	0.0005	-	0.01	<0.00050	<0.0010 *	<0.00050	<0.00050	<0.00050	-
Cobalt (Co)-Dissolved	mg/L	0.0005	-	0.04	0.015	0.0453	0.002	<0.00050	<0.00050	-
Copper (Cu)-Dissolved	mg/L	0.001	-	0.02 (H <50), 0.03 (H 50 -<75), 0.04(H 75 - <100), 0.05(H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 0.09 (H ≥ 200)	0.0131	0.0676	0.0038	<0.0010	<0.0010	-
Iron (Fe)-Dissolved	mg/L	0.03	-	-	0.362	1.06	<0.030	<0.030	<0.030	-

Q4 (December 21, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID					
Analyte	Units	LOR	Lower Limit	Aquatic Life	SFC-2	SFC-2B	SFC-3	SFC-11	SFC-11 REPLICATE	TRAVEL BLANK
Lead (Pb)-Dissolved	mg/L	0.001	-	0.04 (H <50), 0.05 (H 50 - <100), 0.06 (H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	<0.0010	<0.0020 *	<0.0010	<0.0010	<0.0010	-
Lithium (Li)-Dissolved	mg/L	0.05	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	-
Magnesium (Mg)-Dissolved	mg/L	0.1	-	-	7.41	21	3.66	2.08	2.09	-
Manganese (Mn)-Dissolved	mg/L	0.01	-	-	2.03	5.85	0.112	<0.010	<0.010	-
Mercury (Hg)-Dissolved	mg/L	0.0002	-	0.001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-
Molybdenum (Mo)-Dissolved	mg/L	0.001	-	10	0.0016	<0.0020 *	<0.0010	<0.0010	<0.0010	-
Nickel (Ni)-Dissolved	mg/L	0.005	-	0.25 (H < 60) 0.65 (H 60 -<120) 1.10 (H 120 - <180) 1.50 (H > 180)	0.0057	0.022	<0.0050	<0.0050	<0.0050	-
Phosphorus (P)-Dissolved	mg/L	0.3	-	-	<0.30	<0.30	<0.30	<0.30	<0.30	-
Potassium (K)-Dissolved	mg/L	2	-	-	7.2	20.4	2.8	<2.0	<2.0	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.01	<0.0010	<0.0020 *	<0.0010	<0.0010	<0.0010	-
Silicon (Si)-Dissolved	mg/L	0.05	-	-	4.99	10.3	6.95	7.99	8.06	-
Silver (Ag)-Dissolved	mg/L	0.00005	-	0.0005 (H ≤ 100), 0.015 (H > 100)	<0.000050	<0.00010 *	<0.000050	<0.000050	<0.000050	-
Sodium (Na)-Dissolved	mg/L	2	-	-	24.8	57.3	34.8	6.5	6.5	-
Strontium (Sr)-Dissolved	mg/L	0.005	-	-	0.356	0.619	0.243	0.12	0.121	-
Thallium (Tl)-Dissolved	mg/L	0.0002	-	0.003	<0.00020	<0.00040 *	<0.00020	<0.00020	<0.00020	-
Tin (Sn)-Dissolved	mg/L	0.03	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	-
Titanium (Ti)-Dissolved	mg/L	0.05	-	1	<0.050	<0.050	<0.050	<0.050	<0.050	-
Uranium (U)-Dissolved	mg/L	0.0002	-	3	<0.00020	<0.00040 *	<0.00020	<0.00020	<0.00020	-
Vanadium (V)-Dissolved	mg/L	0.03	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	-
Zinc (Zn)-Dissolved	mg/L	0.005	-	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.90 (H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	0.0212	0.0627	0.006	<0.0050	<0.0050	-
Acetone	mg/L	0.05	-	-	-	-	-	-	-	<0.050
Benzene	mg/L	0.0005	-	4	-	-	-	-	-	<0.00050
Bromodichloromethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Bromoform	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Bromomethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
1,3-Butadiene	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Carbon Tetrachloride	mg/L	0.001	-	0.13	-	-	-	-	-	<0.0010
Chlorobenzene	mg/L	0.001	-	0.013	-	-	-	-	-	<0.0010
Dibromochloromethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Chloroethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Chloroform	mg/L	0.001	-	0.02	-	-	-	-	-	<0.0010
Chloromethane	mg/L	0.005	-	-	-	-	-	-	-	<0.0050
Dibromomethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
1,2-Dichlorobenzene	mg/L	0.001	-	0.007	-	-	-	-	-	<0.0010
1,3-Dichlorobenzene	mg/L	0.001	-	1.5	-	-	-	-	-	<0.0010
1,4-Dichlorobenzene	mg/L	0.001	-	0.26	-	-	-	-	-	<0.0010
1,1-Dichloroethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
1,2-Dichloroethane	mg/L	0.001	-	1	-	-	-	-	-	<0.0010
1,1-Dichloroethylene	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
cis-1,2-Dichloroethylene	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
trans-1,2-Dichloroethylene	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Dichloromethane	mg/L	0.005	-	0.98	-	-	-	-	-	<0.0050
1,2-Dichloropropane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
cis-1,3-Dichloropropylene	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
trans-1,3-Dichloropropylene	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Ethylbenzene	mg/L	0.0005	-	2	-	-	-	-	-	<0.00050
Methyl t-butyl ether (MTBE)	mg/L	0.001	-	34	-	-	-	-	-	<0.0010
Styrene	mg/L	0.0005	-	0.72	-	-	-	-	-	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
1,1,2,2-Tetrachloroethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Tetrachloroethylene	mg/L	0.001	-	1.1	-	-	-	-	-	<0.0010
Toluene	mg/L	0.001	-	0.39	-	-	-	-	-	<0.0010
1,1,1-Trichloroethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
1,1,2-Trichloroethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Trichloroethylene	mg/L	0.001	-	0.2	-	-	-	-	-	<0.0010
Trichlorofluoromethane	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
Vinyl Chloride	mg/L	0.001	-	-	-	-	-	-	-	<0.0010
ortho-Xylene	mg/L	0.0005	-	-	-	-	-	-	-	<0.00050
meta- & para-Xylene	mg/L	0.0005	-	-	-	-	-	-	-	<0.00050
Xylenes	mg/L	0.00071	-	-	-	-	-	-	-	<0.00071
4-Bromofluorobenzene (SS)	%	Surrogate	-	-	-	-	-	-	-	107
1,4-Difluorobenzene (SS)	%	Surrogate	-	-	-	-	-	-	-	99
EPH10-19	mg/L	0.25	-	5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
EPH19-32	mg/L	0.25	-	-	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
LEPH	mg/L	0.25	-	0.5	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
HEPH	mg/L	0.25	-	-	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Volatile Hydrocarbons (VH6-10)	mg/L	0.1	-	15	-	-	-	-	-	<0.10
VPH (C6-C10)	mg/L	0.1	-	1.5	-	-	-	-	-	<0.10
3,4-Dichlorotoluene (SS)	%	Surrogate	-	-	-	-	-	-	-	93
Acenaphthene	mg/L	0.00005	-	0.06	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acenaphthylene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Acridine	mg/L	0.00005	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Anthracene	mg/L	0.00005	-	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benz(a)anthracene	mg/L	0.00005	-	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(a)pyrene	mg/L	0.00001	-	0.0001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(b)fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Benzo(k)fluoranthene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Chrysene	mg/L	0.00005	-	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Dibenz(a,h)anthracene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluoranthene	mg/L	0.00005	-	0.002	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Fluorene	mg/L	0.00005	-	0.12	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	0.00005	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Naphthalene	mg/L	0.00005	-	0.01	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Phenanthrene	mg/L	0.00005	-	0.003	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Pyrene	mg/L	0.00005	-	0.0002	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Quinoline	mg/L	0.00005	-	0.034	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
d10-Acenaphthene (SS)	%	Surrogate	-	-	80	85	81	89	90	86
d9-Acridine (SS)	%	Surrogate	-	-	64	66	62	68	69	66

Q4 (December 21, 2010) Surface Water Results

				BCCSR-Schedule 6	Sample ID					
Analyte	**Units**	**LOR**	**Lower Limit**	**Aquatic Life**	**SFC-2**	**SFC-2B**	**SFC-3**	**SFC-11**	**SFC-11 REPLICATE**	**TRAVEL BLANK**
d12-Chrysene (SS)	%	Surrogate	-	-	82	85	82	91	90	87
d8-Naphthalene (SS)	%	Surrogate	-	-	82	84	83	92	92	88
d10-Phenanthrene (SS)	%	Surrogate	-	-	82	85	82	90	91	86
* = Detection Limit Adjusted for Required Dilution.										
** = Reported Result Verified By Repeat Analysis.										
Applied Guideline:	**British Columbia Contaminated Sites Regulation (JUN, 2010) - BCCSR-Schedule 6 Freshwater Aquatic Life**									

Color Key:
Exceeds Lower Threshold
Within Guideline
Exceeds Guideline
LOR exceeds Guideline

APPENDIX H

Laboratory Analytical Results for Surface Water Monitoring Conducted by Whistler WWTP Staff Between 2005 and 2010 (SFC-4 and SFC 4B).

2005		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Apr	May	Nov	Dec	Jan	Feb	Apr	May	Nov	Dec
Parameter	Unit		Site 4, 50m Upstream of Landfill Leachate Pump Station						Site 4B Creek 200m Downstream of Landfill Leachate Pump Station					
Specific Conductance	uS/cm		79	114	121	138	174		138	146	118	183	160	
Total Hardness (CaCO3)	mg/L	-	24	40.7					45.1	53.1				
Turbidity	NTU	-					93						80	18
Total Suspended Solids	mg/L	-						10						
Acidity pH 4.5	mg/L	-	<0.5	<0.5	<0.5	<0.5			<0.5	<0.5	<0.05	<0.5		
Acidity pH 8.3	mg/L	-	2.3	2.9	1.9	1.5			3	3.3	2	1.7		
pH	ph	8.50					7.1						7	
Chloride dissolved	mg/L	1500	5.6	6.5	9.5	7.6			8.3	9.7	9.5	15.3		
Total Inorganic Nitrogen (N)	mg/L		1	0.23					0.19	0.43				
Ammonia Nitrogen (N)	mg/L	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	0.834	0.009	0.082	0.006	2.23		0.029	0.203	0.124	0.066	1.21	
Nitrate Nitrogen Dissolved (N)	mg/L		0.17	0.22	0.18	0.12	0.18		0.16	0.23	0.21	0.28	0.26	
Nitrate+Nitrite (N)	mg/L		0.17	0.22	0.18	0.12	0.21		0.16	0.23	0.21	0.29	0.28	
Nitrite Nitrogen (N)	mg/L		<0.005	<0.005	<0.005	<0.005	0.026		<0.005	<0.005	<0.005	0.006	0.017	
Ortho-Phosphorous (P)	mg/L	-	0.007	<0.005	0.045	0.006	0.034	0.029	0.006	<0.005	0.023	0.006	0.011	0.018
Total Phosphorus (P)	mg/L							0.061						0.054
Sulfate	mg/L		13.6	22.6	18.5	28			18.5	20.1	15.3	23.5		
Aluminium	mg/L	-	1.18	0.27	1	0.11			0.72	0.18	0.6	0.1		
Antimony	mg/L	2	<0.05	<0.05	<1	<1			<0.05	<0.05	<1	<1		
Arsenic	mg/L	0.05	<0.05	<0.05	<1	<1			<0.05	<0.05	<1	<1		
Barium	mg/L	10	0.018	0.015	0.021	0.015			0.023	0.018	0.02	0.017		
Beryllium	mg/L	0.053	<0.0002	<0.0002	<.0002	<0.0002			<0.0002	<0.0002	<0.0002	<0.0002		
Bismuth	mg/L	-	<0.05	<0.05	<0.05	<0.05			<0.05	<0.05	<0.05	<0.05		
Boron	mg/L	50	<0.008	<0.008	<0.008	<0.008			0.065	0.043	0.026	0.057		
Cadmium	mg/L	0.00001(H ≤ 30), 0.0003 (H 30 to <90), 0.0005 (H 90 to <150), 0.0006 (H 150 to <210)	<0.0001	<0.0001	<0.1	<0.1			<0.0001	<0.0001	<0.1	<0.1		
Calcium	mg/L	-	7.18	12.9	12.1	16.4			15	17.8	13.7	23.1		
Chronium	mg/L	0.01	<0.005	<0.005	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005		
Cobalt	mg/L	0.04	<0.005	<0.005	<0.5	<0.5			<0.005	<0.005	1.1	0.6		
Copper	mg/L	0.02 (H <50), 0.03 (H 50 -<75), 0.04 (H 75 - <100), 0.05 (H 100 - <125), 0.06 (H 125 - <150), 0.07 (H 150 - <175), 0.08 (H 175 - <200), 90 (H ≥ 200)	0.0081	0.0025	0.008	<0.005			0.0064	0.0018	<0.005	<0.005		
Iron	mg/L	-	0.705	0.326	0.723	0.075		0.707	1.13	0.618	0.85	0.374		2.38

2005		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Apr	May	Nov	Dec	Jan	Feb	Apr	May	Nov	Dec
Parameter	Unit		Site 4, 50m Upstream of Landfill Leachate Pump Station						Site 4B Creek 200m Downstream of Landfill Leachate Pump Station					
Lead	mg/L	0.04 (H <50), 0.05(H 50 - <100), 0.06(H 100 - <200), 0.11 (H 200 - <300), 0.16 (H ≥ 300)	<0.0005	<0.0005	0.5	<0.5			<0.0005	<0.0005	<0.5	<0.5		
Magnesium	mg/L		1.48	2.07	2.16	2.55			1.85	2.09	1.89	2.66		
Manganese	mg/L	-	0.056	0.019	0.068	0.008			0.276	0.401	0.279	0.024		
Molybdenum	mg/L	10	<0.005	<0.005	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005		
Nickel	mg/L	0.25 (H < 60) 0.65 (H 60 -<120) 1.10 (H 120 - <180) 1.50 (H > 180)	<0.008	<0.008	<0.008	<0.008			<0.008	<0.008	<0.008	<0.008		
Phosphorous	mg/L		0.1	<0.1	<0.1	<0.1			0.1	<0.1	<0.1	<0.1		
Potassium	mg/L	-	<1	<1	1	1			2	1	1	2		
Seleium	mg/L	0.01	<0.03	<0.03	1	<1			<0.03	<0.03	2	<1		
Silver	mg/L	0.0005 (H ≤ 100), 0.015 (H > 100)	<0.01	<0.01	<0.1	<0.1			<0.01	<0.01	<0.1	<0.1		
Sodium	mg/L	-	6.03	6.79	8.76	6.98			7.94	7.61	7.91	9.75		
Strontium	mg/L	-	0.064	0.112	0.108	0.16			0.102	0.14	0.117	0.219		
Sulfur	mg/L	-	4.9	7.9	6.8	10.2			6.8	7.1	5.8	8.6		
Tellurium	mg/L	-	<0.05	<0.05					<0.05	<0.05				
Thallium	mg/L	0.003	<0.03	<0.03	<0.1	<0.1			<0.03	<0.03	<0.1	<0.1		
Tin	mg/L	-	<0.02	<0.02	<0.02	<0.02			<0.02	<0.02	<0.02	<0.02		
Titanium	mg/L	1	0.034	0.005	0.027	<0.003			0.016	<0.003	0.015	<0.003		
Vanadium	mg/L	-	<0.005	<0.005	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005		
Zinc	mg/L	0.075 (H < 90) 0.15 (H = 90 - < 100) 0.9(H = 100 - < 200) 1.65 (H = 200 - < 300) 2.40 (H = 300 - < 400)	0.009	0.003	0.008	<0.005			0.021	0.004	0.009	<0.005		
Zirconium	mg/L	-	<0.005	<0.005	<0.005	<0.005			<0.005	<0.005	<0.005	<0.005		

Notes: parameteres highlighted in blue are missing Hardness values, therefore the most conservative guidelines value has been applied.
parameters highlighted in red exceed the CSR Schedule 6 Column II standard.

2006		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Mar	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Mar	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Parameter	**Units**		**Site 4, 50m Upstream of Landfill Leachate Pump Station**								**Site 4B Creek 200m Downstream of Landfill Leachate Pump Station**							
Conductivity	uS/cm		124	129	139	135	336	130	131	134	123	162	241	287	139	298	190	180
Nitrate (NO3)	mg/L	400	0.26	0.07	0.19	0.25	1.25	0.28	0.27	0.29	0.17	0.20	0.59	0.79	0.23	1.18	0.92	0.96
Nitrite (NO2)	mg/L	0.2	0.183	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.008	<0.005	0.006	0.005	0.008	<0.005	<0.005	0.011	0.007
Ammonia (NH3)	mg/L	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	0.142	0.028	0.026	<0.005	0.015	<0.004	<0.005	<0.005	0.031	0.087	0.030	0.03	<0.005	<0.005	0.303	0.304
Dissolved Sulphate (SO4)	mg/L	1000	19.7	25.5	24.4	18.3	28.0	17.1	29.3	31.3	21.3	23.2	22.9	22.6	16.4	22.3	30.5	30.2
Dissolved Chloride (Cl)	mg/L	1500	9.9	6.1	9.8	10.8	43.1	11.2	6.6	6.2	9.4	11.9	26.4	36.3	11.0	43.4	11.7	10.4
Orthophosphate	mg/L	-	0.019	0.006	0.013	0.021	<0.005	0.013	0.007	0.019	0.028	0.006	0.013	0.016	<0.005	0.010	0.007	0.016
Total Iron (Fe)	mg/L	-	0.972	0.143	0.219	0.056	0.149	0.036	0.102	0.079	0.991	0.505	0.843	0.274	0.052	0.109	0.866	0.829
Total Copper (Cu)	ug/L	20 (H <50), 30 (H 50 -<75), 40 (H 75 - <100), 50 (H 100 - <125), 60 (H 125 - <150), 70 (H 150 - <175), 80 (H 175 - <200), 90 (H ≥ 200)	5.8	1.6	4.9	1.4	0.4	0.4	3.3	1.9	7.90	1.50	7.10	1.80	<0.2	0.70	4.10	2.40
Total Manganese (Mn)	ug/L	-	0.352	0.034	0.031	0.009	0.172	0.006	0.007	0.006	0.166	0.232	0.355	0.261	0.008	0.149	0.569	0.505
Total Lead (Pb)	ug/L	40 (H <50), 50(H 50 - <100), 60(H 100 - <200), 110 (H 200 - <300), 160 (H ≥ 300)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Zinc (Zn)	ug/L	75 (H < 90) 150 (H = 90 - < 100) 900(H = 100 - < 200) 1650 (H = 200 - < 300) 2400 (H = 300 - < 400)	16.0	<1	45.0	<1	<1	2.0	4.0	2.0	21.0	<1	3.0	2.0	<1	2.0	11.0	6.0
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Notes: parameteres highlighted in blue are missing Hardness values, therefore the most conservative guidelines value has been applied.
parameters highlighted in red exceed the CSR Schedule 6 Column II standard.

2007		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Parameter	Units		Site 4, 50m Upstream of Landfill Leachate Pump Station												Site 4B Creek 200m Downstream of Landfill Leachate Pump Station											
Conductivity	uS/cm		135	145	103	86	129	132	149	140	233	132	150	140	213	277	127	170	195	207	224	238	132	219	200	53
Nitrate (NO3)	mg/L	400	0.32	0.25	0.21	0.1	0.09	0.08	0.21	0.23	0.38	0.20	0.20	0.23	0.87	0.60	0.39	0.34	0.46	0.43	0.49	0.49	0.24	0.81	0.58	0.16
Nitrite (NO2)	mg/L	0.2	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	0.0	0.010	<0.005	0.015	0.006	<0.005	0.005	<0.005	<0.005	0.009	<0.005	<0.005
Ammonia (NH3)	mg/L	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.056	0.035	1.260	1.440	0.128	0.80	0.046	0.023	0.052	<0.005	<0.005	0.160	0.218	0.136
Dissolved Sulphate (SO4)	mg/L	1000	18.2	29.8	19.5		25.4	26.5	37.6	23.2	26.4	26.7	34.8	30.0	29.1	39.5	17.9		26.5	29.1	45.3	27.9	21.9	43.9	40.5	5.4
Dissolved Chloride (Cl)	mg/L	1500	14.6	10.5	6	5.8	6.7	27.9	7.8	10.5	29.4	8.8	6.7	6.6	19.7	20.4	6.9	11.2	15.5	44.3	17.5	27.4	10.3	15.5	11.1	1.2
Orthophosphate	mg/L	-	0.015	0.006	0.009	0.034	0.005	0.008	0.008	0.012	0.043	0.030	0.020	0.015	0.017	<0.005	0.006	0.020	<0.005	<0.005	0.005	0.007	0.054	0.019	0.018	0.011
Total Iron (Fe)	mg/L	-	0.331	0.084	0.751	0.867	0.187	0.431	0.173	0.054	0.044	0.681	0.239	0.131	0.961	1.650	0.722	1.510	0.443	0.349	0.363	0.139	0.118	0.630	0.526	0.079
Total Copper (Cu)	ug/L	20 (H <50), 30 (H 50 -<75), 40 (H 75 - <100), 50 (H 100 - <125), 60 (H 125 - <150), 70 (H 150 - <175), 80 (H 175 - <200), 90 (H ≥ 200)	4.8	2.4	9.9	11.2	1.8	3	2.1	0.4	0.5	6.8	2.5	1.8	4.30	2.90	5.60	6.70	1.50	1.40	2.20	0.60	0.40	6.40	5.00	0.90
Total Manganese (Mn)	ug/L	-	0.025	0.007	0.085	0.010	0.008	0.017	0.024	0.016	0.009	29.000	0.057	0.041	0.396	0.716	0.242	0.384	0.195	0.250	0.175	0.122	0.111	296.000	0.368	0.007
Total Lead (Pb)	ug/L	40 (H <50), 50(H 50 - <100), 60(H 100 - <200), 110 (H 200 - <300), 160 (H ≥ 300)	<0.5	<0.5	<0.5	0.7000	<0.5	<0.5	<0.5	<0.5	<0.5	0.5000	<0.2	<0.2	<0.5	<0.5	<0.5	0.6000	<0.5	<0.5	<0.5	<0.5	<0.5	0.2000	0.3000	<0.2
Total Zinc (Zn)	ug/L	75 (H < 90) 150 (H = 90 - < 100) 900(H = 100 - < 200) 1650 (H = 200 - < 300) 2400 (H = 300 - < 400)	9.0	4.0	17.0	7.0	4.0	5.0	3.0	2.0	1.0	5.0	7.0	21.0	12.0	9.0	10.0	7.0	5.0	5.0	4.0	2.0	2.0	7.0	7.0	<5.0
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)	<0.1	<0.1	0.2000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0400	0.0400	0.0300	<0.1	<0.1	0.1000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0400	0.0400	<0.01

Notes: parameteres highlighted in blue are missing Hardness values, therefore the most conservative guidelines value has been applied.
parameters highlighted in red exceed the CSR Schedule 6 Column II standard.

2008		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Parameter	Units		Site 4, 50m Upstream of Landfill Leachate Pump Station												Site 4B Creek 200m Downstream of Landfill Leachate Pump Station											
Conductivity	uS/cm		150	200	160	110	80	140	150	150	140	170	130	160	210	250	230	180	130	360	390	390	400	310	220	310
pH		8.50		7.70	7.70		7.50	7.70	7.40	7.70	7.70	7.70	7.60	7.50		7.6	7.6		7.6	8.0	7.6	7.6	7.8	7.7	7.7	7.6
Turbidity	NTU		2.40	4.40	12.70	100.00	5.50	1.30	0.70	0.50	0.50	1.10	16.60	6.90	2.6	4.5	6.3	63.1	4.6	4.9	2.7	4.8	0.8	1.6	12.4	9.2
Nitrate (NO3)	mg/L	400	0.22	0.38	0.25	0.22	0.06	0.09	0.19	0.21	0.21	0.16	0.29	0.32	0.48	0.94	0.51	0.30	0.17	0.56	1.28	1.77	1.54	1.33	0.49	0.59
Nitrite (NO2)	mg/L	0.2	0.005	0.005	0.005	0.036	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.008	0.005	0.025	0.005	0.006	0.021	0.030	0.018	0.008	0.005	0.005
Ammonia (NH3)	mg/L	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	0.119	0.14	0.038	0.059	0.017	0.005	0.005	0.005	0.005	0.007	0.034	0.013	0.301	1.510	0.680	0.21	0.142	1.660	0.005	1.480	0.450	0.250	0.590	0.920
Dissolved Sulphate (SO4)	mg/L	1000	26.8	27.8	21.9	19.7	14.0	28.0	23	24.0	26.0	34.0	27.0	38.0	40.4	43.7	42.2	36.1	20.0	50.0	43.0	52.0	50.0	48.0	48.0	66.0
Dissolved Chloride (Cl)	mg/L	1500	8.3	20.3	18.7	9.9	4.0	6.3	9.6	9.4	8.5	8.1	6.1	6.1	12.9	20.6	19.2	11.3	7.4	27.0	37.0	29.0	37.0	20.0	14.0	18.0
Orthophosphate	mg/L	-	0.008	0.005	0.012	0.005	0.010	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.006	0.005	0.009	0.005	0.007	0.005	0.005	0.005	0.005	0.085	0.005	0.005
Hardness							24.9	43.4	50.5	46.5	56.5	62.6	52.7	58.6					45	117	135	137	151	124	92	128
Total Aluminum (Al) ug/L	ug/L	-	143	183	539	5180	379	61	42	29	35	74	1560	467	205	520	556	2650	372	74	45	201	20	102	1140	435
Total Antimony (Sb) ug/L	ug/L	200	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Total Arsenic (As)	ug/L	50	0.10	0.20	0.30	0.50	0.20	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.20	0.20	0.30	0.20	0.10	0.10	0.10	0.10	0.10	0.20	0.10
Total Barium (Ba)	ug/L	10000	19.0	29.0	24.0	46.0	10.0	14.0	14.0	13.0	14.0	21.0	27.0	24.0	24.0	26.0	29.0	40.0	14.0	35.0	34.0	38.0	31.0	31.0	33.0	41.0
Total Beryllium (Be)	ug/L	53	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Bismuth (Bi)	ug/L	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	50.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Boron (B)	ug/L	50000	11.0	8.0	5.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	0.1	29.0	23.0	31.0	50.0	50.0	105.0	123.0	114.0	102.0	50.0	50.0	62.0
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Total Chromium (Cr)	ug/L	10	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Cobalt (Co)	ug/L	40	0.5	0.7	0.8	1.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.1	3.4	3.1	1.9	0.8	0.8	0.5	1.6	0.5	1.4	4.2	3.7
Total Copper (Cu)	ug/L	20 (H <50), 30 (H 50 -<75), 40 (H 75 - <100), 50 (H 100 - <125), 60 (H 125 - <150), 70 (H 150 - <175), 80 (H 175 - <200), 90 (H ≥ 200)	1.4	2.6	6.8	30.9	3.2	0.8	0.5	0.4	0.4	1.1	9.3	3.6	3.2	10.6	7.7	17.4	3.5	1.4	1.3	5.4	1.1	2.6	11.2	6.4
Total Iron (Fe)	ug/L	-	280	544	1260	2840	267	78	65	54	54	103	919	278	481	1110	1190	2040	625	940	505	1150	211	265	1380	1490
Total Lead (Pb)	ug/L	40 (H <50), 50(H 50 - <100), 60(H 100 - <200), 110 (H 200 - <300), 160 (H ≥ 300)	0.2	0.2	0.3	2.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6	0.2	0.2	0.2	0.3	1.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
Total Manganese (Mn)	ug/L	-	98.0	166.0	144.0	162.0	20.0	11.0	16.0	19.0	12.0	36.0	48.0	16.0	401	437	518	414	191	501	484	640	376	341	595	809
Total Mercury		1			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.20
Total Molybdenum (Mo)	ug/L	10000	1.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

2008		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Parameter	Units		Site 4, 50m Upstream of Landfill Leachate Pump Station												Site 4B Creek 200m Downstream of Landfill Leachate Pump Station											
Total Nickel (Ni)	ug/L	250 (H < 60) 650 (H 60 -<120) 1100 (H 120 - <180) 1500 (H > 180)	1.0	1.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	2.0	2.0
Total Selenium (Se)	ug/L	10	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Silicon (Si)	ug/L	-	8720	7340	8540	13700	5090	8210	8680	8720	10900	8690	10500	9210	6360	5510	7220	9010	5160	6860	6800	6680	8070	7620	8140	8100
Total Silver (Ag)	ug/L	0.5 (H ≤ 100), 15 (H > 100)	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total Strontium (Sr)	ug/L	-	183.0	195.0	153.0	145.0	74.0	143.0	185.0	171.0	202.0	190.0	167.0	175.0	243	217	218	188	120	341	439	394	450	364	243	317
Total Thallium (Tl)	ug/L	3	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Tin (Sn)	ug/L	-	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Titanium (Ti)	ug/L	1000	6.0	7.0	25.0	130.0	11.0	5.0	5.0	5.0	5.0	5.0	50.0	12.0	5.0	6.0	14.0	65.0	13.0	5.0	5.0	11.0	5.0	5.0	30.0	5.0
Total Uranium (U)	ug/L	3000	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Vanadium (V)	ug/L	-	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Zinc (Zn)	ug/L	75 (H < 90) 150 (H = 90 - < 100) 900(H = 100 - < 200) 1650 (H = 200 - < 300) 2400 (H = 300 - < 400)	5.0	6.0	7.0	20.0	5.0	5.0	5.0	5.0	5.0	5.0	6.0	6.0	5.0	12.0	156.0	14.0	5.0	5.0	5.0	7.0	5.0	5.0	8.0	13.0
Total Zirconium (Zr)	ug/L	-	0.5	0.5	0.5	3.3	0.5	0.5	0.5	0.5	0.5	0.5	0.9	0.5	0.5	0.5	0.5	2.1	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.5
Total Calcium (Ca) mg/L	mg/L	-	20.1	22.5	17.7	14.7	7.7	13.7	16.2	14.9	18.1	20.0	16.3	18.4	28.9	29.4	31.1	23.8	14.7	39.5	46.4	47.0	52.4	42.3	30.5	43.2
Total Magnesium (Mg) mg/L	mg/L	-	2.79	2.77	2.20	2.87	1.37	2.22	2.42	2.28	2.73	3.10	2.94	3.10	3.3	3.3	3.1	3.1	1.9	4.5	4.7	4.8	5.0	4.5	3.8	4.9
Total Potassium (K) mg/L	mg/L	-	1.17	1.58	1.42	1.77	0.56	0.55	0.69	0.65	0.74	0.98	1.13	0.93	2.2	2.6	2.8	2.2	1.2	3.8	5.1	5.5	4.6	3.1	2.5	3.4
Total Sodium (Na) mg/L	mg/L	-	8.56	11.50	14.10	8.32	3.97	5.28	6.85	6.18	7.30	8.59	7.74	7.49	8.9	10.1	13.0	8.4	5.7	15.2	21.6	18.1	20.4	13.7	9.1	12.9
Total Sulphur (S) mg/L	mg/L	-	10.0	9.0	8.0	6.0	4.0	8.0	6.0	8.0	9.0	11.0	10.0	15.0	14.0	14.0	15.0	12.0	7.0	17.0	12.0	20.0	18.0	22.0	16.0	28.0
Total Phosphorus (P)	ug/L	-	16.0	10.0											14.0	37.0										

Notes: parameteres highlighted in blue are missing Hardness values, therefore the most conservative guidelines value has been applied.
parameters highlighted in red exceed the CSR Schedule 6 Column II standard.

2009		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Dec	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Dec
Parameter	Units		Site 4, 50m Upstream of Landfill Leachate Pump Station									Site 4B Creek 200m Downstream of Landfill Leachate Pump Station								
Acidity (pH 4.5)	mg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acidity (pH 8.3)	mg/L		<0.5	0.8	<0.5	1.6	<0.5	1.5	2.1	1.4	<0.5	1.7	2.0	<0.5	3.7	<0.5	2.1	2.2	1.6	<0.5
Nitrite (N)	mg/L	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nitrate (N)	mg/L	400	0.27	0.39	0.21	0.22	0.25	0.29	0.24	0.98	0.54	0.95	0.55	0.38	0.40	0.39	0.38	0.44	1.25	0.60
Dissolved Sulphate (SO4)	mg/L	1000	31	25	20	20	19	18	22	32	15	52	40	29	33	29	31	55	59	30
Dissolved Chloride (Cl)	mg/L	1500	20	18	9.4	14	13	12	11	12	11	31	18	13	21	27	29	25	16	14
Orthophosphate (P)	mg/L	-	<0.005	0.026	0.013	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.021	0.008	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ammonia (N)	mg/L	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	<0.005	0.032	<0.005	0.014	<0.005	0.020	0.037	0.085	<0.005	0.72	0.301	0.085	0.039	<0.005	0.021	0.116	0.348	0.081
Nitrate plus Nitrite (N)	mg/L	-	0.27	0.39	0.21	0.22	0.25	0.29	0.24	0.98	0.54	0.96	0.55	0.38	0.40	0.39	0.38	0.44	1.25	0.60
Conductivity	uS/cm	-	190	170	120	160	150	144	153	203	132	330	220	170	250	250	264	309	290	180
Turbidity	NTU	-	0.7	26.2	7.7	1.8	1.0	1.1	0.8	47.6	8.7	1.4	30.1	7.2	2.3	1.1	0.8	0.4	21.6	8.4
Total Hardness (CaCO3)	mg/L	-	62.0	48.8	25.1	16.5	54.3	47.4	55.7	72.3	41.4	119	70.1	35.0	51.8	95.2	90.6	116	108	60.3
Total Aluminum (Al)	ug/L	-	63	1910	390	147	69	131	55	3080	444	98	1610	385	147	53	10	32	1470	435
Total Antimony (Sb)	ug/L	200	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Arsenic (As)	ug/L	50	<0.1	0.2	0.1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1
Total Barium (Ba)	ug/L	10000	21	34	16	17	15	15	16	49	19	32	33	20	20	17	17	23	45	22
Total Beryllium (Be)	ug/L	53	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Bismuth (Bi)	ug/L	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Boron (B)	ug/L	50000	<50	<50	<50	<50	<50	<50	<50	<50	<50	63	<50	<50	<50	<50	50	<50	<50	<50
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)	0.06	0.26	0.03	0.06	0.09	0.08	0.08	0.07	0.03	0.04	0.17	0.02	0.04	<0.01	<0.01	0.02	0.08	0.03
Total Chromium (Cr)	ug/L	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Cobalt (Co)	ug/L	40	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	2.4	<0.5	1.1	3.5	1.8	0.7	<0.5	<0.5	<0.5	3.7	2.1
Total Copper (Cu)	ug/L	20 (H <50), 30 (H 50 -<75), 40 (H 75 - <100), 50 (H 100 - <125), 60 (H 125 - <150), 70 (H 150 - <175), 80 (H 175 - <200), 90 (H ≥ 200)	0.8	14.7	3.2	1.8	0.8	1.6	0.6	18.7	3.6	1.9	18.6	5.0	2.8	1.3	1.2	1.2	15.0	5.9
Total Iron (Fe)	ug/L	-	45	1420	274	175	82	308	82	2720	316	456	2420	574	451	215	110	179	1370	499
Total Lead (Pb)	ug/L	40 (H <50), 50(H 50 - <100), 60(H 100 - <200), 110 (H 200 - <300), 160 (H ≥ 300)	<0.2	0.9	0.3	<0.2	<0.2	<0.2	<0.2	1.1	0.2	<0.2	0.7	0.3	<0.2	0.3	<0.2	<0.2	0.5	0.2
Total Manganese (Mn)	ug/L	-	6	152	15	28	31	67	18	170	41	461	390	259	213	146	125	153	368	216

2009		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Dec	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Dec
Parameter	Units		Site 4, 50m Upstream of Landfill Leachate Pump Station									Site 4B Creek 200m Downstream of Landfill Leachate Pump Station								
Total Mercury (Hg)	ug/L	1	0.02	0.03	0.05	0.04	<0.02	0.03	<0.02	<0.02	<0.02	0.03	0.04	0.04	0.04	<0.02	0.02	<0.02	<0.02	<0.02
Total Molybdenum (Mo)	ug/L	10000	<1	1	<1	<1	<1	<1	<1	2	1	<1	<1	<1	<1	<1	<1	<1	1	<1
Total Nickel (Ni)	ug/L	250 (H < 60) 650 (H 60 -<120) 1100 (H 120 - <180) 1500 (H > 180)	<1	2	<1	<1	<1	<1	<1	2	<1	1	2	1	<1	<1	<1	<1	3	1
Total Selenium (Se)	ug/L	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Silicon (Si)	ug/L	-	9600	9090	7250	8900	11000	10600	10500	11300	6840	7440	7060	6410	6680	9110	8470	8010	7950	5880
Total Silver (Ag)	ug/L	0.5 (H ≤ 100), 15 (H > 100)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Strontium (Sr)	ug/L	-	220	147	114	192	195	195	212	200	115	355	179	174	294	329	373	385	279	153
Total Thallium (Tl)	ug/L	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Tin (Sn)	ug/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Titanium (Ti)	ug/L	1000	<5	65	<5	<5	<5	<5	<5	95	11	<5	38	<5	<5	<5	<5	<5	31	6
Total Uranium (U)	ug/L	3000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Vanadium (V)	ug/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Zinc (Zn)	ug/L	75 (H < 90) 150 (H = 90 - < 100) 900(H = 100 - < 200) 1650 (H = 200 - < 300) 2400 (H = 300 - < 400)	6	22	7	<5	6	5	5	15	5	5	20	9	<5	<5	<5	<5	12	15
Total Zirconium (Zr)	ug/L	-	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5
Total Calcium (Ca)	mg/L	-	19.5	15.1	10.9	16.6	17.5	15.2	17.6	23.1	13.5	39.9	23.1	20.5	28.8	32.8	31.0	39.1	36.2	20.2
Total Magnesium (Mg)	mg/L	-	3.24	2.67	1.89	2.53	2.55	2.30	2.90	3.55	1.86	4.62	3.01	2.56	3.32	3.23	3.23	4.44	4.16	2.39
Total Potassium (K)	mg/L	-	0.90	1.48	0.82	0.86	0.71	0.69	0.78	2.24	1.22	2.94	1.91	1.69	2.07	1.88	1.85	2.42	3.09	1.77
Total Sodium (Na)	mg/L	-	10.2	12.5	7.51	9.01	8.17	7.20	8.42	10.7	8.54	15.3	10.8	8.72	11.2	13.0	12.9	13.1	11.0	8.99
Total Sulphur (S)	mg/L	-	11	9	4	6	3	4	7	15	6	19	16	10	11	12	10	20	25	11

Notes: parameters highlighted in red exceed the CSR Schedule 6 Column II standard.

2010		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Nov
Parameter	**Units**		**Site 4, 50m Upstream of Landfill Leachate Pump Station**											**Site 4B Creek 200m Downstream of Landfill Leachate Pump Station**											**Leachate**
Acidity (pH 4.5)	mg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acidity (pH 8.3)	mg/L		<0.5	<0.5	1.7	1.7	1.2	2.0	1.0	2.1	2.6	<0.5	0.9	<0.5	<0.5	1.4	1.8	0.8	3.4	1.3	2.8	3.9	1.2	1.0	34.3
Nitrite (N)	mg/L	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 (1)	<0.005	<0.005 (1)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005 (1)	<0.005	<0.005 (1)	0.009	0.007	0.005	<0.005
Nitrate (N)	mg/L	400	0.45	0.48	0.39	0.25	0.26	0.44	0.41	0.42	0.34	0.47	0.36	0.68	0.58	0.52	0.43	0.44	0.53	0.42	0.56	1.49	1.53	0.88	<0.02
Dissolved Sulphate (SO4)	mg/L	1000	15	16	22	25	23	19	18	20	30	26	24	30	34	40	44	44	36	38	71	66	75	50	170
Dissolved Chloride (Cl)	mg/L	1500	15	12	10	12	12	13	15	12	14	12	16	27	23	26	32	33	36	49	55	35	25	22	79
Orthophosphate (P)	mg/L	-	<0.005	0.011	<0.005	0.04 (1)	<0.005	0.037	<0.05 (2)	0.59 (2)	0.067	0.049	0.060	<0.005	0.311	0.229	0.03 (1)	0.050	0.033	0.041	0.12	0.39	0.75	0.47	3.3
Ammonia (N)	mg/L	1.31 (pH >8.55), 3.7 (pH 8 - 8.55), 11.3 (pH 7.5 - 8.05), 18.5(pH 7.0 - 7.55)	0.005	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	<0.005	0.167	0.008	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.006	<0.005	<0.005
Nitrate plus Nitrite (N)	mg/L		0.45	0.48	0.39	0.25	0.26	0.44	0.41	0.42 (1)	0.34	0.47	0.36	0.68	0.58	0.52	0.43	0.44	0.53	0.42	0.56 (1)	1.50	1.54	0.88	<0.02
Conductivity	uS/cm		135	137	135	148	150	147	149	152	188	164	166	230	232	243	281	293	306	329	309	361	337	265	916
pH	pH units	8.5	7.5	7.7	7.5	7.4	7.7	7.53	7.67	7.66	7.60	7.60	7.59	7.5	7.8	7.5	7.7	7.8	7.66	7.59	7.60	7.59	7.59	7.58	6.95
Turbidity	NTU	-	7.8	4.7	5.2	1.3	0.6	0.5	0.8	0.9	2.1	2.4	3.8	9.5	6.2	7.6	1.6	1.1	0.6	0.5	5.9	1.7	5.3	7.4	150
Total Hardness		-	39.2	54.2	35.8	50.9	45.7	43.4	44.7	49.6	52.7	47.8	46.5	71.7	94.0	68.9	99.4	91.5	86.8	101	139	108	108	85.6	312
Total Aluminum (Al)	ug/L	-	572	328	441	78	41	28	21	36	150	140	246	740	766	540	86	43	19	10	157	126	601	826	32
Total Antimony (Sb)	ug/L	200	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Arsenic (As)	ug/L	50	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Barium (Ba)	ug/L	10000	21	24	17	16	16	11	12	13	22	19	18	29	37	28	26	26	19	23	31	35	36	28	106
Total Beryllium (Be)	ug/L	53	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Bismuth (Bi)	ug/L	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Boron (B)	ug/L	50000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	54	65	<50	<50	<50	175
Total Cadmium (Cd)	ug/L	0.01(H ≤ 30), 0.3 (H 30 to <90), 0.5 (H 90 to <150), 0.6 (H 150 to <210)	0.03	0.06	0.07	0.06	0.04	0.02	0.05	0.03	0.03	0.02	0.04	0.05	0.11	0.07	0.03	0.02	<0.01	0.03	0.03	0.05	0.06	0.08	<0.01
Total Chromium (Cr)	ug/L	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Cobalt (Co)	ug/L	40	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.6	4.0	5.5	3.0	1.9	0.8	<0.5	<0.5	0.9	2.8	5.0	4.3	2.7
Total Copper (Cu)	ug/L	20 (H <50), 30 (H 50 -<75), 40 (H 75 - <100), 50 (H 100 - <125), 60 (H 125 - <150), 70 (H 150 - <175), 80 (H 175 - <200), 90 (H > 200)	4.3	3.9	3.4	0.9	0.9	<0.2	3.2	0.7	3.2	2.8	4.0	9.8	11.0	6.9	2.5	1.3	1.0	0.8	3.7	4.4	9.2	12.5	0.8
Total Iron (Fe)	ug/L	-	333	230	328	66	48	26	30	84	259	206	219	1020	1220	686	261	196	93	90	465	276	906	829	24000
Total Lead (Pb)	ug/L	40 (H <50), 50(H 50 - <100), 60(H 100 - <200), 110 (H 200 - <300), 160 (H ≥ 300)	0.3	0.5	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Manganese (Mn)	ug/L	-	20	29	17	12	10	11	9	16	42	26	45	365	539	327	327	201	90	98	269	383	640	381	3700
Total Mercury (Hg)	ug/L	1	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Molybdenum (Mo)	ug/L	10000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Nickel (Ni)	ug/L	250 (H < 60) 650 (H 60 -<120) 1100 (H 120 - <180) 1500 (H > 180)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2	2	1	1	<1	<1	<1	1	2	2	2	2
Total Selenium (Se)	ug/L	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Silicon (Si)	ug/L	-	8040	9770	7500	9190	8760	10300	9560	10800	8770	7450	6830	6870	8260	4840	7200	7140	8150	7340	8270	6740	6060	6480	7650

2010		Water Quality Standards - BCCSR, Sch. 6, Aquatic Life	Jan	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Nov
Parameter	**Units**		**Site 4, 50m Upstream of Landfill Leachate Pump Station**											**Site 4B Creek 200m Downstream of Landfill Leachate Pump Station**											**Leachate**
Total Silver (Ag)	ug/L	0.5 (H ≤ 100), 15 (H > 100)	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Strontium (Sr)	ug/L	-	115	167	107	177	178	182	202	211	189	163	128	177	244	174	294	313	334	407	398	313	293	194	754
Total Thallium (Tl)	ug/L	3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Tin (Sn)	ug/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Titanium (Ti)	ug/L	1000	17	10	15	<5	<5	<5	<5	<5	<5	<5	<5	7	5	8	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Uranium (U)	ug/L	3000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Vanadium (V)	ug/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Zinc (Zn)	ug/L	75 (H < 90) 150 (H = 90 - < 100) 900(H = 100 - < 200) 1650 (H = 200 - < 300) 2400 (H = 300 - < 400)	5	5	<5	<5	<5	<5	<5	<5	<5	<5	6	9	9	7	<5	<5	<5	<5	<5	<5	10	11	30
Total Zirconium (Zr)	ug/L	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Calcium (Ca)	mg/L	-	12.5	17.4	11.2	16.2	14.4	13.8	14.2	15.8	16.8	15.2	15.0	23.9	31.5	23.0	33.7	30.7	29.5	34.5	48.2	36.1	36.6	28.4	106
Total Magnesium (Mg)	mg/L	-	1.95	2.63	1.88	2.53	2.37	2.17	2.23	2.48	2.61	2.39	2.22	2.91	3.74	2.75	3.72	3.60	3.17	3.54	4.64	4.24	4.11	3.59	11.5
Total Potassium (K)	mg/L	-	1.08	1.38	0.82	0.81	0.75	0.61	0.67	0.82	1.18	1.03	1.25	2.00	2.74	1.85	2.41	2.34	2.03	2.28	3.51	3.27	3.02	2.60	7.90
Total Sodium (Na)	mg/L	-	10.4	12.6	9.37	8.36	7.37	6.68	6.60	7.78	10.3	10.3	11.4	14.5	15.6	13.9	14.2	13.4	14.4	15.3	21.7	18.3	14.9	13.9	40.3
Total Sulphur (S)	mg/L	-	5	9	6	8	8	5	3	8	11	8	9	12	17	10	15	13	11	11	22	21	21	18	65

Notes: parameters highlighted in red exceed the CSR Schedule 6 Column II standard.

APPENDIX I

Landfill Gas Monitoring Probe Results (2009 – 2010)

Sample Date	Monitoring Point (MP)																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
17-Apr-09												0						0	0	0	0
21-May-09	0	0		0	0	0	0		0	0	0	0	0	0.2			20	0	0	0	0
19-Aug-09	0	0	0	0	0	0	0		0		0	0	0	25	0	0	38	0	0	0	0
25-Aug-09														0			35				
15-Sep-09	0	0	0	0	0	0	0		0		0		0		0	0	22	0	0	0	0
29-Sep-09												0	0	0			42				
24-Oct-09	0	0	0	0	0	0	0		0		0	0	0	0	0	0	23	0	0	0	0
18-Nov-09	0	0	1.5	0	0	0	1.5	0	0	0	1.5		0	1.5	0	0	23	0			0
25-Nov-09	0		5	0	0	0	5	0		0	5	0	0	0		0	30	0	0	0	0
4-Dec-09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0
11-Dec-09	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	18	0	0	0	0
18-Dec-09	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	11	0	0	0	0
22-Dec-09	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	17	0	0	0	17
29-Dec-09	5		4	0		0	5	0	0	0	0	12	0	0	0	0	58	0	0	0	0
6-Jan-10	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	5	0	0	0	0
12-Jan-10	0		0	0	0	0	1	0	0	0	0	0	0	0	0	0	35	0	0	0	0
20-Jan-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0
27-Jan-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
3-Feb-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0
10-Feb-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	0	0	0
17-Feb-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
24-Feb-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Mar-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Mar-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15-Mar-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22-Mar-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29-Mar-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0
7-Apr-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0
20-May-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-Jun-10	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0
13-Jul-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31-Aug-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0
14-Sep-10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	6	0	0	0	0
27-Oct-10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	2	0	0	0	0
3-Nov-10			0	0	0	0	0	0	0	0	0		0	0	0	0	16	0	0	0	0
10-Dec-10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	7	0	0	0	0
16-Dec-10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
24-Dec-10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
31-Dec-10	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0

Notes: Highlighted cells denote exceedance of: a) trigger level of 10% LEL (MP8 through MP21, excluding MP 11), or b) trigger level of 25% LEL (MP1 through MP7, and MP 11)