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REPORT

SUPPLEMENTAL DETAILED SITE INVESTIGATION
UNION BAY WASTE COAL PILE
UNION BAY, BC
BC MOE SITE ID: 4291

SEACOR PROJECT NO: 201.01022.01

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9-6421 Applecross Road
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office: 250.390.5050
fax: 250.390.5042
www.seacorcanada.com

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SEACOR PROJECT: 201.01022.01

Submitted by
SEACOR Environmental Inc.

For

West Fraser Mills Ltd.
501 – 858 Beatty Street
Vancouver, BC
V6B 1C1

Kensington Island Properties
201 – 1830 Riverside Lane
Courtenay, BC
V9N 8C7

August 31, 2006

Prepared by:

Michael McLeay, MSc, RPBio
Environmental Biologist

Michael Sloan, MSc, PEng
Senior Environmental Engineer

James Neville, MEDes, RPBio
Senior Environmental Biologist

Erin Campbell, MEng, EIT
Hydrogeologist

Reviewed by:

Ian Mitchell, M.Sc., P.Geo.
Technical Director, Hydrogeology

J. G. Malick, PhD, RPBio, PAg.
Executive Vice President, Technical Services

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
M. J. SLOAN

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EXECUTIVE SUMMARY

SEACOR, on behalf of West Fraser Mills Ltd. and Kensington Island Properties, has prepared the following supplemental Detailed Site Investigation (DSI) report for submission in support of an application for an Approval in Principle (AIP) for the Union Bay Waste Coal Pile on Crown lease land, for the Kensington properties located to the south and west of the Waste Coal Pile (Areas 1 and 2, respectively) and Crown lands located to the south of the Kensington Property (the Site). This report was prepared to provide additional data and interpretation to supplement the previous work conducted within the area of the Waste Coal Pile, and to summarize the first phase of the Hart Creek realignment project, completed subsequent to the AIP application dated May 31, 2005.

During the period of August 2005 to April 2006 SEACOR conducted additional work recommended by the BC Ministry of Environment (MOE), as well as further work, beyond that recommended by BC MOE, to support the remedial plan for the Waste Coal Pile. The areas addressed during the Supplemental DSI included the Waste Coal Pile; the Baynes Sound intertidal area, which bounds Area 1 and Area 2 to the east and the Waste Coal Pile to the north and east; and Hart Creek (commonly called Washer Creek), which bounds the Waste Coal Pile and Area 1 to the west and Area 2 to the east. The supplemental scope of work included the advancement of three additional groundwater monitoring wells around the eastern perimeter of the Waste Coal Pile; groundwater monitoring and sampling; further hydrogeological assessment and refinement of the water balance estimate for the coal pile; seep water, sediment porewater, and ocean water sampling at the perimeter of the coal pile; quantification of intertidal seep water flow rates; seep area sheen and precipitate/sediment sampling; oyster tissue sampling; and coastal dispersion modelling to evaluate the dispersion of seep water and related contaminants in the aquatic receiving environment.

The results of the investigations provided additional information to support the selected remedial option for the Waste Coal Pile and the expected hydrogeological effects of the cover have been further quantified and defined. A long-term, semi-annual groundwater monitoring program is proposed to evaluate and confirm the changes in loadings of acid rock drainage constituents to the intertidal zone following placement of the cover. The evaluation of loadings from the pile will not be made based on the groundwater concentrations from individual sampling results, but on the trends observed after sufficient data has been collected.

The initial phase of the realignment project for Hart Creek was also completed in September 2005, involving the channel section from the Highway 19A bridge to the eastern extent of Creek Area South (Reach I) and the high-water channel. Phase II of the realignment project will include the remaining section of channel adjacent to the Waste Coal Pile (Creek Areas Central and North; Reach II and Reach III), in conjunction with reshaping of the toe of the Waste Coal Pile. This work is anticipated to be completed during the summer of 2006.

The information described in this Executive Summary is expected to be read in conjunction with the remainder of this report and is subject to the same limitations described in Section 5.0 below.

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1.0 INTRODUCTION

On behalf of West Fraser Mills Ltd. (West Fraser) and Kensington Island Properties (Kensington), SEACOR Environmental Inc. (SEACOR) has prepared the following supplemental Detailed Site Investigation (DSI) report for submission in support of an application for an Approval in Principle (AIP) for the Union Bay Waste Coal Pile on Crown Lease Land, for the Kensington properties located to the south and west of the Waste Coal Pile (Areas 1 and 2, respectively) and Crown lands located to the south of the Kensington Property (the Site). This report was prepared to provide additional data and interpretation to supplement the previous work conducted within the area of the Waste Coal Pile, and to summarize the first phase of the Hart Creek realignment project, completed subsequent to the AIP application dated May 31, 2005. The Site is located in Union Bay, BC, approximately 13 km south of Courtenay, BC and 118 km north of Nanaimo, BC, as shown on Figure 1. The BC Ministry of Environment (BC MOE) Site identification number for the Site is 4291.

1.1 Background

1.1.1 Site History

The Waste Coal Pile occupies approximately 13 hectares of Crown Lease land (Lease No. 101888, Block B, C and D); it is noted that Blocks C and D of the Crown Lease, located along the foreshore of the southern adjacent property have been eroded away by wave action and no longer exist as upland and are thus not further discussed in this report. Waste coal is also present on portions of the southern and western adjacent freehold lands (Kensington Property). The Waste Coal Pile and adjacent lands were originally part of approximately 400 hectares (1000 acres) of land and were purchased by Weldwood of Canada Limited (now West Fraser) from Canadian Collieries Resources in 1966 as part of a larger land acquisition. The original land consisted of:

- The Crown leased land occupied by the Waste Coal Pile (including Blocks C and D);
- Approximately 50 hectares of land located to the south of the Crown Lease and to the east of the Old Island Highway (Hwy 19A) (Kensington Property - Area 1);
- Approximately 70 hectares of land located to the east of Hwy 19A and to the north of Hart Creek (Kensington Property - Area 2); and
- Approximately 280 hectares of land located to the west of Hwy 19A (Area 3).

West Fraser (as Weldwood) sold Areas 1, 2 and 3 to Kensington in 1996; these areas are not discussed in detail in this report. Figure 2 illustrates the Waste Coal Pile and lease area boundaries, as well as adjacent portions of the Kensington Property – Areas 1 and 2, including the realigned section of Hart Creek.

1.1.2 Stage 1 PSI and DSI

During the period of January 2004 to May 2005, SEACOR conducted a Supplemental Stage 1 Preliminary Site Investigation (PSI) and a phased Detailed Site Investigation (DSI) at the Site.

Investigations completed on behalf of West Fraser were conducted to:

- review the Site history as it related to the Waste Coal Pile;
- characterize the Waste Coal Pile and underlying groundwater;
- delineate the extent of the waste coal material on adjacent properties/in adjacent water bodies; and
- support the development of a Remediation Plan for the Waste Coal Pile, for portions of Area 1 and Area 2 where waste coal is present, and for affected areas within adjacent water bodies.

The results of the Supplemental Stage 1 PSI and the DSI were presented in the report *"Stage 1 Preliminary Site Investigation, Detailed Site Investigation, Problem Formulation and Remediation Plan for the Union Bay Waste Coal Pile and Kensington Property – Areas 1 & 2, Union Bay, BC, BC WLAP Site ID – 4291"*, dated May 31, 2005, submitted by SEACOR, SRK Consulting (SRK) and KSW Resources to West Fraser Mills Ltd and Kensington Island Properties. In addition to the results of the Stage 1 PSI and the DSI conducted by SEACOR, this report also included a discussion of the Waste Coal Pile geochemistry prepared by Stephen Day, M.Sc., P.Geo. of SRK, a Problem Formulation and the Remediation Plan (with contributions from Maritz Rykaart, Ph.D., P.Eng. of SRK and Stephen Wilbur, Ph.D., P.Geo., Senior Geomorphologist, of KSW).

Based on the results of the DSI, coal and waste coal were found to exceed Contaminated Sites Regulation (CSR) Residential (RL) and Urban Park (PL) standards. In addition, groundwater beneath the Waste Coal Pile was found to exceed the CSR Aquatic Life freshwater (AWF) and marine (AWM) standards.

1.1.3 Correspondence with the BC Ministry of Environment

Subsequent to the AIP application dated May 31, 2005, BC MOE issued a letter entitled "*Preliminary Comments on Approval in Principle Application for Union Bay Waste Coal Pile and Kensington Property, MOE Site ID 4291*", dated July 8, 2005. SEACOR and various other stakeholders met with the BC MOE on August 9, 2005 to discuss the Union Bay project. During the meeting the BC MOE recommended that further work be conducted to support the Approval in Principle and the Risk Assessment for the Site. A summary of the proposed additional work was sent

to the BC MOE by Dr. Jim Malick of SEACOR in an e-mail dated August 11, 2005. The proposed additional works included the following tasks:

- Follow up meeting with BC MOE regarding Area 3;
- Completion of the waste coal cap design by SRK, based on additional information from SEACOR regarding groundwater flux and predicted metals concentrations beneath the pile after cap emplacement;
- Installation of three additional monitoring wells in the Waste Coal Pile perimeter to gather baseline data for future sentinel well comparison;
- Toxicity testing of perimeter well groundwater, intertidal seep water, and lower intertidal sediment porewater downgradient of seeps;
- Additional sediment toxicity testing focussed in iron-stained seep areas;
- Multiple chemical analysis events to be conducted on intertidal seep water to characterize potential for seasonal changes in seep water chemistry;
- Mapping of on-site iron-stained areas as well as determining if iron staining exists in nearby off-site intertidal areas to the north and south;
- Oblique aerial photography of the site's intertidal and subtidal areas at low tide;
- Collection of oyster samples along the foreshore of the Waste Coal Pile and Area 1, including iron-stained areas;
- Collection of sheen material and precipitate (iron-stained surficial sediment) from seep areas
- Additional soil and/or groundwater sampling in Areas 1 and 2; and
- Advancement of test pits north of Hart Creek in the Kensington Property - Area 2.

Further compilation and assessment of data for the Site has indicated that the "risk-based groundwater remedial target" approach originally proposed for the Site is not appropriate. SEACOR's review of the Site information, as well as information available for similar sites, indicates that a waste load reduction approach is most suitable for the Site.

During the period of August 2005 to April 2006, SEACOR conducted additional work recommended by the BC MOE, as well as further work beyond that recommended by BC MOE to support the remedial plan for the Waste Coal Pile. An interim summary of the completed work was provided to BC MOE in a draft letter dated March 27, 2006, and presented at the follow-up meeting with BC MOE on March 29, 2006. This supplemental DSI report expands upon the summary of the work program conducted during 2005in relation to the Waste Coal Pile assessment, and includes a

summary of the results obtained in the sampling programs conducted between January and April 2006. BC MOE comments relating to terrestrial areas of the Kensington Property beyond the southern toe of the Waste Coal Pile have not been addressed in this report.

1.2 Scope of Work

SEACOR has updated the DSI for the Waste Coal Pile based on discussions with the BC MOE. The scope of work for the Supplemental DSI conducted during the period of August 2005 to April 2006 included:

- Advancement of three monitoring wells (BH20, BH21 and BH22) around the perimeter of the Waste Coal Pile;
- Oyster tissue sampling;
- September 2005 groundwater and seep water monitoring and sampling event;
- Refinement of the water balance for the Waste Coal Pile;
- October 2005 groundwater, seep water and ocean water sampling event;
- December 2005 groundwater, seep water and ocean water sampling event;
- January 2006 groundwater and seep water monitoring and sampling event;
- January 2006 sediment porewater sampling event;
- February 2006 groundwater, seep water and ocean water monitoring and sampling event;
- February 2006 sediment porewater sampling event;
- February 2006 quantification of intertidal seep water flow rates;
- April 2006 groundwater and seep water monitoring and sampling event;
- April 2006 seep area sheen and precipitate/sediment sampling event;
- Further hydrogeological assessment; and
- Coastal dispersion modelling to evaluate the dispersion of seep water and related contaminants in the aquatic marine receiving environment.

The scope of work addressed within this report for the Kensington Property - Area 1 was limited to:

- Completion of the first phase of the Hart Creek Realignment Project.

The results of the Supplemental DSI are presented in Section 2.0. A remedial plan update, including the realignment of Hart Creek, the hydrogeological effects of capping the pile and the proposed post-remedial monitoring plan is discussed in Section 3.0. Site plans and other figures, photographs and chemistry tables are presented following the text portion of the report.

Appendix A presents supporting information for the hydrogeology assessment, Appendix B presents the borehole logs and Appendix C presents the detailed laboratory chemistry reports. Appendix D provides the supporting authorizations and regulatory correspondence for the work, and Appendix E presents the updated Protocol 5 information.

1.2.1 Risk Assessment

SEACOR has completed a Revised Problem Formulation and Preliminary Quantitative Risk Assessment (RPF/PQRA) for the Site. A report entitled "*Revised Problem Formulation and Preliminary Quantitative Risk Assessment, Union Bay Waste Coal Pile, Union Bay, BC"* is being completed under separate cover and is expected to be issued in September 2006. The RPF/PQRA will supplement Section 5.0 of the "*Stage I Preliminary Site Investigation, Detailed Site Investigation, Problem Formulation and Remediation Plan for the Union Bay Waste Coal Pile and Kensington Property – Areas 1 & 2* (SEACOR, May 31, 2005)". The original Problem Formulation will be updated to incorporate additional Site data collected between August 2005 and April 2006, and to address BC MOE comments.

The additional scope of work conducted during the period of August 2005 to April 2006 and reported within the Revised Problem Formulation included:

- An additional round (two previous rounds conducted in April 2004 and February 2005) of marine sediment toxicity testing using the marine polychaete (*Neanthes arenaceodentata*) 28-day survival and growth test;
- An initial round of groundwater and seep water toxicity testing using the echinoderm (*Dendraster excentricus*) fertilization test and the 7-day topsmelt (*Atherinops affinis*) survival and growth test;
- Additional aerial photography and review of the Site's intertidal and subtidal zones at low tide;
- A second round of seep water toxicity testing using the sea urchin (*Strongylocentrotus purpuratus*) fertlization test and the bivalve (*Mytilus galloprovincialis*) larval development test; and
- Due to control failure in the January 2006 sea urchin test, additional samples were collected and the sea urchin (*S. purpuratus*) fertilization test was re-run.

At the request of BC MOE, SEACOR has included in the Revised Problem Formulation the results of quantitative modelling of risks associated with Waste Coal Pile Contaminants of Potential Concern (COPCs) to Site recreational users under baseline (present) Site conditions. This includes media consisting of or potentially impacted by the Waste Coal Pile; namely waste coal, soil, groundwater, sediment/precipitate, seep/ocean water, and shellfish. The results of aquatic toxicity testing of sediments, groundwater and seep water from the Waste Coal Pile, as well as qualitative biological observations for the intertidal area have also been included and discussed in this document.

2.0 SUPPLEMENTAL DETAILED SITE INVESTIGATION

The Supplemental DSI was conducted in phases during the period of August 2005 to April 2006. Work conducted on behalf of West Fraser was limited to the characterization and delineation of the waste coal originating from the Waste Coal Pile and assessment of groundwater, seep water and surface water. The following areas were addressed during the supplemental DSI:

- The Waste Coal Pile;
- Baynes Sound intertidal area, which bounds Area 1 and Area 2 to the east and the Waste Coal Pile to the north and east; and,
- Hart (commonly called Washer) Creek, which bounds the Waste Coal Pile and Area 1 to the west and Area 2 to the east.

The following areas were not addressed during the supplemental DSI and will be addressed in a separate document:

- The Kensington Property – Area 1 (beyond the toe of the Waste Coal Pile);
- Crown land present to the south of the Area 1 (Kensington has plans to purchase this land from the province); and
- The Kensington Property – Area 2.

A summary of the Site investigations conducted within each of the areas addressed is as follows:

The Waste Coal Pile

- Advancement of three monitoring wells (BH20, BH21 and BH22) around the perimeter of the Waste Coal Pile on September 9, 2005;

- Seven groundwater sampling events of select monitoring wells, with samples collected on September 11, 2005, September 17, 2005, October 13, 2005, December 13-14, 2005, January 26, 2006, February 10-11, 2006, and April 4, 2006;
- Hydrogeological assessment; and
- Reassessment of existing soil analytical data based on revised development plans for the Waste Coal Pile.

Baynes Sound Intertidal Area

- Oyster tissue sampling;
- Seven seep water sampling events, with samples collected on August 19, 2005, September 17, 2005, October 13, 2005, December 13, 2005, January 26, 2006, February 9-10, 2006, and April 4, 2006;
- Four ocean water sampling events, with samples collected on August 19, 2005, October 13, 2005, December 13, 2005 and February 10, 2006;
- Three marine reference station ocean water sampling events, with samples collected on September 17, 2005, January 26, 2006 and February 10, 2006;
- Two sediment porewater sampling events, with samples collected on January 26, 2006 and February 10, 2006;
- Collection of intertidal seep area sheen and precipitate/sediment for chemical analysis.
- Quantification of intertidal seep water flow rates; and
- Coastal dispersion modelling to evaluate the dispersion of seep water and related contaminants in Baynes Sound.

The regulatory framework is summarized in Section 2.1 and the field methodologies utilized during the above-described investigations are presented in Sections 2.2 and 2.3. The results of the Supplemental DSI are provided throughout Sections 2.2 to 2.4.

2.1 Regulatory Framework

The *Contaminated Sites Regulation* (CSR) under the *Environmental Management Act* (EMA) is the principal regulatory document defining requirements for contaminated sites management in British Columbia; the *Hazardous Waste Regulation* (HWR) may also apply. The CSR came into effect on April 1, 1997 and was amended on July 19, 1999, February 4, 2002, November 20, 2003, July 8, 2004, and March 7, 2005. The EMA and CSR provide for both numerical and risk-based approaches to managing site contamination and outline the procedures for site assessment, remediation and

application for environmental closure of a property. Numerical standards are key components of the requirements in the CSR.

Numerical standards for investigating and remediating soils are presented in three CSR schedules (Schedules 4, 5 and 10). Additionally, soil standards that trigger requirements for a Contaminated Soil Relocation Agreement are presented in Schedule 7. Generic Numerical Soil Standards for a variety of inorganic and organic substances are presented in Schedule 4 and Schedule 10 under five classes of land use: Agricultural (AL), Urban Park (PL), Residential (RL), Commercial (CL) and Industrial (IL). Matrix Numerical Soil Standards are presented in Schedule 5 for a number of contaminants and provide both land use and exposure pathway perspectives. As with Generic Numerical Soil Standards, land uses are agricultural, urban park, residential, commercial and industrial. Several mandatory and potentially applicable site-specific factors are used to indicate exposure. Mandatory site-specific factors include: human intake of contaminated soil; and, toxicity to soil invertebrates and plants. Commonly used potentially applicable site-specific factors include: groundwater used for drinking water; and, groundwater flow to surface water used by aquatic life (freshwater or marine).

The presence/absence of hazardous waste soil at a site is determined by reference to standards in the HWR and by Section 13 of the CSR.

Numerical standards for water in the CSR are presented in Schedule 6 that references four classes of water use (Aquatic Life, Irrigation, Livestock, Drinking Water) and corresponding water use standards (i.e., AW, IW, LW, DW). Standards for drinking water are also included in Schedule 10. The water standards apply to surface and groundwater. Ministry of Water, Land and Air Protection (BC WLAP) guidelines dictate that AW standards apply if receiving waters used by aquatic life occur within 1 km of a site and DW standards apply if wells used for drinking water occur within 1.5 km of the site. If detailed evaluation of groundwater travel time shows that travel time from the site to the nearest aquatic receiving environment is more than 50 years, or travel time to the nearest drinking water well is more than 100 years, then the default 1 km and 1.5 km distances need not be applied. The Schedule 6 water quality standards for volatile hydrocarbons and extractable hydrocarbons (VH_w and EH_w, respectively) apply at all sites in BC irrespective of water use. The Schedule 10 Drinking Water Standards apply at all sites where drinking water use is applicable.

Numerical standards for contaminated sites are additionally defined in Protocols pursuant to Sec. 58 of the CSR, as well as in several other BC MOE documents, including:

- Protocol 2 for Contaminated Sites – Site Specific Numerical Soil Standards
- Protocol 4 for Contaminated Sites – Determining Background Soil Quality

- Protocol for Regulation of Petroleum Hydrocarbons in Water Under the Special Waste and Contaminated Sites Regulations (replaced Protocol 7).
- Protocol 9 for Contaminated Sites – Determining Background Groundwater Quality
- Protocol 10 for Contaminated Sites – Hardness Dependent Site-Specific Freshwater Water Quality Standards for Cadmium and Zinc.
- Update on Contaminated Sites – Clarification of Hydrocarbon Analytical Methods and Standards.
- Technical Guidance 14 for Contaminated Sites – Provincial Background Estimate for Cobalt in Water.
- Technical Guidance 18 for Contaminated Sites (applied to Schedule 10 substances rather than non-scheduled toxic substances).

The following standards are being used for comparative purposes for the Site and surrounding lands.

2.1.1 Groundwater Standards

On the basis of current and reasonable potential water use, and considering that:

- None of the conditions in the HWR Procedure that replaced Protocol 7 exist (i.e., protected aquifer; preferential flow pathways) that are likely to cause other water use classes to apply.
- Hart Creek, a freshwater aquatic receiving environment, traverses the Site.
- Baynes Sound, a marine aquatic receiving environment, borders the Site to the north and east.
- No registered groundwater wells were located within the default 1.5 km radius. Local residents are served by Langley Lake through the improvement district.

For the purposes of this document, SEACOR has assumed the following:

- Aquatic Life (AW) standards to protect freshwater (AWF) and marine (AWM) organisms (CSR Schedule 6) apply at the Site.
- Drinking Water, Irrigation and Livestock standards do not apply at the Site as future development of adjacent lands will be residential/commercial and will have a centralized potable water and sewage system.

2.1.2 Soil Standards

Based on the proposed future development plans and land uses for the Site, the following are considered to apply at the Site:

- Commercial (CL) Generic Numerical Soil Standards (CSR Schedule 4 and 10) and the CL Matrix Numerical Soil Standards (CSR Schedule 5) for the mandatory site-specific factors: human intake of contaminated soil; and, toxicity to soil invertebrates and plants; and additionally the factor: groundwater flow to surface water used by freshwater and/or marine aquatic life apply to the portions of the Kensington Property – Area 1 where commercial development is proposed. These standards also apply to all soils greater than 3.0 metres below the final Site grade.
- Urban Park (PL) Generic Numerical Soil Standards (CSR Schedule 4 and Schedule 10) and Matrix Numerical Soil Standards (CSR Schedule 5) (same factors as above) apply to the areas of the Site slated to be parkland, including water front areas, parks and green space throughout the commercial areas (planned for Area 1) and throughout residential areas (Waste Coal Pile and Area 2) and the green space around Hart Creek.
- Residential (RL) Generic Numerical Soil Standards (CSR Schedules 4 and 10) and Matrix Numerical Soil Standards (CSR Schedule 5) (same factors as above) apply to the areas of the Site where residential development is planned, including the Waste Coal Pile and Area 2.
- Industrial (IL) Generic Numerical Soil Standards (CSR Schedules 4 and 10) and Matrix Numerical Soil Standards (CSR Schedule 5) (same factors as above with the exception of human intake of contaminated soil) apply to any public roadways that may occur on the Site.

2.1.3 Sediment Criteria

The BC Generic Numerical Sediment Quality Criteria, as outlined in Schedule 9 of the CSR, are applicable to the water bodies adjacent to the Site. The Freshwater Sediment Criteria for sensitive contaminated sites (FW $SedQC_{scs}$) are applicable to sediments collected from Hart Creek and the Marine Sediment Criteria for sensitive contaminated sites (Marine $SedQC_{scs}$) are applicable to sediments collected from Baynes Sound. The marine sediment criteria for typical contaminated sites (Marine $SedQC_{TCS}$) have been provided for reference purposes.

2.1.4 Surface Water Criteria

The BC Water Quality Guidelines, as outlined in BC MOE's *British Columbia Approved Water Quality Guidelines, 2006 Edition* (BCWQ) and BC MOE's *A Compendium of Working Water*

Quality Guidelines for British Columbia (updated August 2006), are applicable at the Site. The guidelines for the protection of freshwater aquatic life (BCWQ FW) are applicable to surface water samples collected from Hart Creek and the guidelines for the protection of marine aquatic life (BCWQ Marine) are applicable to surface water samples (seep and ocean water) collected from Baynes Sound and the Site's intertidal area.

2.1.5 PCOCs and Geochemical Parameters

Soil (or waste coal), groundwater, surface water (freshwater and marine), seep water, sediment porewater, sediment (freshwater and marine) and/or tissue samples collected during the DSI and Supplemental DSI were submitted to ALS Canada Ltd. (ALS) of Vancouver, BC for selective quantification of one or more of the PCOCs identified during the Stage 1 PSI including:

- PAH [a,b,c,d] – polycyclic aromatic hydrocarbons;
- Metals [a,b,c,d] – dissolved metals in groundwater, total metals in surface water and total metals in soil;
- LEPH/HEPH [a,b] – light extractable petroleum hydrocarbons (C_{10}-C_{19})/heavy extractable petroleum hydrocarbons (C_{19}-C_{32}) (excluding PAH);
- VOC [a,b,d] – volatile organic compounds;
- Nitrate and Nitrite [b,d]; and,
- Sulphate and Sulphite [b,d].

It should be noted that samples may have been submitted for EPH analysis in place of LEPH/HEPH; EPH results include PAH constituents.

In addition to the above parameters, select groundwater, seep water, ocean water and sediment porewater samples collected from the Site were submitted for analysis of the following parameters for geochemical characterization:

- pH;
- Hardness;
- Salinity [b];
- Chloride;

a – parameter regulated in soil;
b – parameter regulated in groundwater;
c – parameter regulated in sediment;
d – parameter regulated in surface water

- Fluoride [b];
- Bromide; and
- Total Alkalinity.

The results for these parameters are discussed throughout Section 2.0. The majority of these parameters (with the exception of salinity and fluoride in groundwater) are not regulated, but were analyzed to allow interpretation of the Waste Coal Pile geochemistry.

2.2 Waste Coal Pile

As previously indicated, the Waste Coal Pile extends beyond the Crown lease boundary onto Kensington Property – Area 1. The limits of the Waste Coal Pile were defined based on topography and the physical presence of waste coal. This section of the report discusses the investigation conducted on the Waste Coal Pile, including the portion of the pile present on the Kensington Property – Area 1.

Three additional boreholes (BH20, BH21 and BH22) were advanced along the perimeter of the Waste Coal Pile between the existing perimeter monitoring wells. All boreholes were completed as groundwater monitoring wells and the locations of the monitoring wells are illustrated on Figure 3.

Boreholes were advanced using an auger drill rig with air rotary capabilities operated by Beck Drilling and Environmental Services Ltd. of Richmond, BC. The boreholes and monitoring wells were advanced to characterize the extent of the waste coal, as well as the nature and extent of associated groundwater contamination.

2.2.1 Field Observations

The boreholes were advanced to a maximum depth of 6.7 metres below grade. The thickness of the waste coal material encountered in the boreholes ranged from 5.2 to 5.5 metres. Native underlying soils consisted of medium to coarse sand and gravel with trace to some silt and/or fine sand. A more detailed summary of the field observations, including a list of the soil samples collected from all historical boreholes, the combustible organic headspace vapour levels for each of the samples and the parameters each of the samples was analyzed for is presented in Table 1 following the text. The waste coal/underlying soil conditions varied locally; reference should be made to the borehole logs presented in Appendix B for a more detailed description of the soil stratigraphy encountered in each borehole. Cross sections illustrating the stratigraphy encountered at the Site, including in the area of the Waste Coal Pile and extending into Baynes Sound, are presented in Figures 6 and 7, with cross-section reference lines presented on Figure 5.

2.2.2 Hydrogeology Assessment

Previous hydrogeological investigations focussed on assessing the hydrologic properties of the waste coal and underlying native stratigraphy, characterizing hydraulic boundary conditions, groundwater chemistry and climate to develop a conceptual model of groundwater flow and a conceptual water balance for the pile. During the period of August 2005 to April 2006, more detailed hydrogeological assessments were undertaken. The objective of these investigations was to more fully understand the evolution of groundwater chemistry under varying tidal conditions and to characterize the spatial and temporal variation in iron loadings via seepage in the intertidal zone. The scope of the detailed hydrogeology assessment comprised the following:

- Literature review of current research addressing contaminant loading in tidally controlled discharge zones (see References - Section 6.0);
- Spatial characterization of seepage chemistry for various seeps observed in the intertidal zone along the perimeter of the pile;
- Temporal characterization of seepage chemistry in seeps with the highest observed concentrations (SW9 and SW11) and in select monitoring wells along the pile perimeter during ebb tide, low tide and flood tide;
- Characterization of seepage flow rates from focussed sites of discharge in the intertidal zone during low tide;
- Shallow depth profiling of sediment porewater chemistry at key locations in the intertidal zone;
- Developing a quantitative water balance for the pile using the HELP (Hydrogeological Evaluation of Landfill Performance) model;
- Updating the conceptual hydrogeological model for the waste pile and assessing the potential reduction in loadings under a cap scenario; and
- Review of the proposed scope and assessment results by Dr. Leslie Smith, Professor and Cominco Chair in Minerals and the Environment, Department of Earth and Ocean Sciences, University of British Columbia.

The conceptual model is described in Section 2.2.2.1 and the results of the detailed hydrogeological investigations are summarized in Sections 2.2.2.2 through 2.2.2.6. A cross-section reference line is presented on Figure 5, with west to east and south to north cross-sections through the pile presented on Figures 6 and 7, respectively.

2.2.2.1 Conceptual Model

The Waste Coal Pile straddles a historical shoreline. The pile is considered to generate its own groundwater flow system, superimposed on the regional flow that underlies it. Based on monitoring data from wells peripheral to the pile, regional flow from upgradient (Q_1) through the base of the pile is considered to be proportionally small compared to groundwater recharge (infiltration) through the pile (Q_2). Tidally induced, cyclic intrusion of seawater into the pile (Q_3) likely dominates groundwater flow at the margins of the pile and volumetrically comprises the largest component of discharge from the pile. Figures 9 and 10 present the conceptual flow model in plan and cross sectional view, respectively.

The Waste Coal Pile is creating an environment where water infiltrating the pile from precipitation (Q_2) is transporting metals and acidity toward the base of the pile. Any metals transported to the base of the pile are combining with the underlying groundwater (depending upon the up- to down-gradient location in the pile) as well as seawater along the north and east edges of the pile. Flow in and out of the pile is reversed with each tidal cycle. As the tide recedes seawater having entered the pile during high tide reverses direction and begins to flow out of the pile. At some point in the ebb tide water from the pile begins to discharge through the seeps that are observable during low tide. The initial part of the discharge is likely made up of mostly seawater and as the ebb tide continues the discharges progress from primarily seawater to seawater mixed with freshwater from the pile. The discharges continue until the tidal cycle has gone from ebb to slack to flood tide and the discharges are inundated with sufficient seawater that the discharges stop (because the hydraulic head in the pile is overcome by the head in the ocean) and seawater begins to re-enter the pile.

The above is repeated each tidal cycle. Within the pile, groundwater from upgradient (Q_1) and seawater from downgradient (Q_3) dilute the infiltrating water (Q_2) and the resultant diluted water appears in the seeps along the foreshore. The concentrations of metals in water in the perimeter wells and the seep discharges are dependent on the amount of up-gradient groundwater and the amount of seawater that enters the pile during a tidal exchange.

Weathering within the pile has resulted in complex geochemical zonation and tidally induced mixing of seawater has resulted in complex and variable metals concentrations within the seeps in the intertidal zone. Literature on tidally controlled groundwater discharge concludes that the magnitude of contaminant fluxes associated with such discharge is difficult to evaluate due to the dispersed nature of the discharge and the range and complexity of processes controlling the flux. It is also widely recognized that such estimates of groundwater discharge are strongly dependent on the evaluation technique (i.e. different evaluation methods often produce results that are not in agreement).

Significant seasonal and spatial variations in groundwater recharge (Q_2) and loadings from the pile are expected. Conceptually, strong flushing events are expected to occur in the fall at the onset of significant precipitation, giving rise to an upward spike in contaminant loadings at the base of the pile. This could be followed by dilutive events associated with storms later in the winter as accumulated secondary minerals may have been depleted from the more active pathways through the pile. A slow decline in loadings would be expected throughout the summer corresponding with lower infiltration to the pile, however, porewater concentrations near the base of the pile are expected to be at or near saturation during this time (see Figure 12). During each of these periods, significant spatial variability in loadings and discharge are expected to occur due to the water table intersecting different geochemical zones at different locations across the base of the pile (analogous to a plane intersecting an onion), in addition to variable tidal cycles and the potential for preferential pathways arising from variations in waste rock grain size and the effects of secondary mineralization.

2.2.2.2 Water Balance

The water balance provided in Section 2.6.2 of the DSI was conceptual in nature. Subsequent to the submission of the report, SEACOR conducted modelling using the numerical software HELP (Hydrogeological Evaluation of Landfill Performance). The refined water balance is more accurate and takes into account site-specific soil and climate conditions to quantify net annual recharge to the pile.

Model inputs included the slope of the pile, vegetation cover, grain size analysis, field capacity and wilting point in the waste coal material, climate normals for the area including precipitation, relative humidity, evapotranspiration and temperature in addition to the results of hydraulic conductivity testing and infiltration testing conducted at surface. The resulting water balance components estimated by the HELP model were subsequently derived using 100-year climate projections for the area and represent the values for an average year based on this data. Baseflow, or upgradient groundwater contribution (Q_1) was determined through hydrogeological assessment of saturated groundwater flow entering the pile at the west perimeter. The resulting estimated water balance for the pile is presented in Table 2.1 below.

TABLE 2.1: REFINED WATER BALANCE FOR THE WASTE COAL PILE

Input	Value	Units
Total Precipitation	139,000	m^3/yr
Evaporation	56,800	m^3/yr
Net Precipitation	82,200	m^3/yr
Runoff	4,200	m^3/yr
Infiltration	78,000	m^3/yr
Upgradient Groundwater	14,000	m^3/yr
Infiltration	56%	of Total Precipitation

The HELP model assumptions and model output report are provided in Appendix A. Figure 13 presents the revised water balance for the pile along cross-section E-E'.

2.2.2.3 Groundwater Flow

Groundwater mounding is expected to occur beneath the centre of the pile and would result in a somewhat radial groundwater flow pattern from the centre of the pile towards the ocean (to the north, east and southeast). However, direct evidence for such mounding has not been observed with the current set of monitoring wells. Groundwater levels at the perimeter of the pile, approximately 15 metres from the foreshore, were observed to fluctuate up to 1.0 metre in response to tidal fluctuations, while groundwater levels at the centre of the pile were observed to fluctuate approximately 0.2 metres. Groundwater elevations at the centre of the pile were also observed to fluctuate approximately 0.8 metres in response to seasonal changes in infiltration.

Depth to groundwater was monitored on September 10, 2005, and December 14, 2005; February 10, 2006, and April 4, 2006. To assess tidal influence on groundwater levels beneath the pile, Solinst leveloggers (pressure transducers with integrated dataloggers) were installed in wells BH5, BH6D and BH8D on February 24, 2006, and removed on February 27, 2006. Based on gravitational filtering techniques (Serfes, 1991), a 72-hour mean water level was determined for each well and a three-point groundwater gradient was calculated for this period. The mean hydraulic gradient was approximately 0.001 m/m to the northeast, towards the ocean. For simplicity, a unidirectional gradient has been assumed. The lag time for tidally propagated water level fluctuations to reach the centre of the pile approximately 200 metres inland was calculated to be about 5 hours. Groundwater elevation data is presented in Tables A-1 and A-2 and the transducer data utilized for determining the mean groundwater gradient across the pile is presented on Plots A-1 through A-4 in Appendix A. A groundwater contour plan for the period of February 24 to 27, 2006 is presented as Figure 4.

It should be noted that monitoring of water levels was conducted at the Site during earlier investigations in January and September 2004. However, it was determined after evaluation of those results that some of the wells in which dataloggers were installed had become pressurized due to water level changes above the well screen. The February 2006 monitoring was completed using vented well caps and therefore, the current data is considered more representative of the hydraulic gradient within the pile. Groundwater flow rates have therefore been revised (below) using the most current data.

Single well response testing conducted during September 2004 yielded estimates for hydraulic conductivity of the saturated waste coal material at the base of the pile that ranged between 3.0×10^{-4} and 3.7×10^{-4} m/s. Hydraulic conductivity of the underlying native silty sand and gravel ranged between 5.5×10^{-5} and 6.5×10^{-5} m/s, approximately one order of magnitude lower than that of the overlying waste coal material. Using the average values derived from the hydraulic conductivity

tests for each unit, an estimated effective porosity of 0.3 and a hydraulic gradient of 0.1% determined from the February 2006 monitoring, the average linear groundwater velocity was estimated to be approximately 35 m/year within the waste coal and approximately 5 m/year within the underlying native material. These velocity estimates are expected to vary seasonally.

2.2.2.4 Seepage Flow

A program to characterize seepage flow rates from discharges within the intertidal zone was implemented during low tide on February 9, 2006. Seepage flow rates were estimated using one of three methods depending upon the nature of the seepage observed. Where natural flow channels were evident, the channel depth was measured at regular intervals across a representative transect and the seepage flow rate was measured at regular intervals across this transect using a Swoffer flow meter. In areas with significant but more diffuse seepage, the flow was channelled through temporarily constructed flumes and measured by timing the filling of a container of known volume (see Photos 1 and 2). A minor proportion of seepage was observed to be diffuse with low flow and the total flow from those areas was visually estimated.

Concentrated zones of seepage occur in two areas: one on the North Face of the pile and another on the East Face of the pile. Both of these areas exhibit significant iron staining, suggesting concentrated seepage. The seepage flow at low tide on the North Face was estimated at 17.0 L/s. The seepage flowrate at low tide on the East Face was measured at 9.2 L/s. An additional 2 L/s of diffuse seeps were visually estimated to occur south of the iron-stained zone on the East Face, and an additional 3 L/s of diffuse seeps were visually estimated to occur north of the iron-stained zone on the East Face. Total seepage flow on the East Face was subsequently estimated to be approximately 14 L/s. Key findings from the seepage flow assessment are summarized as follows:

- Seep from SW9, which typically exhibits the highest iron concentrations on the east side of the pile, had a measured flow rate of 0.2 L/s at low tide, representing less than 1% of the total seepage flows (31.2 L/s) measured in the intertidal zone;
- Seep from SW11, which typically exhibits the highest iron concentrations on the north side of the pile, had a measured flow rate of 1.8 L/s at low tide, representing approximately 5% of the total seepage flows in the intertidal zone; and
- Groundwater discharge from the pile appears to be higher on the North Face than on the East Face. This may be due to a localized increase in hydraulic conductivity, possibly related to the variable depositional history of the waste coal material. Further evidence for this discharge pattern is indicated by a localized increase in seawater intrusion on the north side, reaching as far inland as 75 metres at BH6, in addition to proportionally higher freshwater discharges observed at SW11.

Details of the flow rate measurements and estimates are summarized in Appendix A and the locations of the seeps measured are indicated on Figure 3.

2.2.2.5 Seawater Mixing and Dilution

Detailed characterization of groundwater and seep water chemistry was completed during January and February 2006. Although trends can be observed within this large dataset, significant fluctuations in chemistry occur both spatially and temporally because variable mixing with seawater (Q_3) results in significant dilution before groundwater from beneath the pile discharges as seepage. While seawater intrusion significantly reduces the groundwater concentrations in the discharge zone, it would not affect the average loadings from the pile over several tidal cycles.

To assess the seasonal mixing trends that occur due to the mixing of seawater and groundwater, chloride analyses have been included as part of the groundwater and seep water sampling programs. Figures 8a, 8b, 8c and 8d present chloride concentration contours for the periods September 2004, December 2005/January 2006, February 2006 and April 2006, respectively. Figure 11 presents the inferred 10,000 mg/L chloride concentration isopleth for each of these periods, which approximately represents the mixing boundary between seawater and seawater mixed with groundwater (chloride levels measured in the ocean were approximately 12,000 mg/L). As indicated on Figure 11, seawater intrusion tends to encroach further inland during the summer dry season. This mixing boundary tends to move toward the perimeter of the pile during the winter wet season. Such trends are expected as the hydraulic gradient beneath the pile and the associated groundwater discharges from the pile are expected to be greater in the winter.

Based on chloride analysis in monitoring wells across the pile, seawater intrusion at the base of the pile (Q_3) appears to extend approximately 15 to 20 metres inland on average. This interface is spatially and temporally variable and as a result, the concentrations of acid rock drainage (ARD) constituents in perimeter wells are difficult to predict at any given time. However, by examining the dissolved iron concentration differences observed between perimeter wells and seepages (see Table 2.2 below), an understanding of the approximate dilution ratio between these areas can be derived.

TABLE 2.2: ESTIMATED AVERAGE SEAWATER DILUTION BETWEEN PERIMETER WELLS AND SEEPS BASED ON IRON CONCENTRATIONS

Location	Dissolved Fe (mg/L) *				
	September 2005	October 2005	December 2005	January 2006	February 2006
BH20	475	400	340	480	750
SW9	110	200	85	30	50
Approx. Dilution:	*77%*	*50%*	*75%*	*94%*	*93%*
BH16	960	710	265	185	320
SW11	60	45	20	200	170
Approx. Dilution:	*94%*	*94%*	*93%*	*0%*	*47%*

* Concentrations have been rounded

It should be noted that the dilutions presented in Table 2.2 do not represent total seawater dilutions but relative seawater dilutions between each paired location for the specific time sampled. Thus, at perimeter well locations BH20 and BH16, some additional degree of seawater dilution (up-gradient from these wells) has already occurred that is not accounted for in these calculations.

An alternate method was used to evaluate seawater dilution based on the water balance modelling (Table 2.3, below). By comparing the total measured and estimated seepage flow rates around the perimeter of the pile and comparing those annualized rates to the expected freshwater discharge from the pile, the difference in flow volume may be attributed to seawater dilution. While there is some uncertainty in the seasonal variation in flow rates, this method provides general confirmation that the bulk of seep discharges are derived from recirculating ocean water and the calculated dilution is consistent with published values. Also worth noting is that while seasonal freshwater discharges are expected to vary significantly, the high proportion of seawater dilution suggests that seep discharges may not be significantly reduced during the seasonal low precipitation period in summer (although average loadings are expected to be lower).

TABLE 2.3: ESTIMATED AVERAGE SEAWATER DILUTION BETWEEN PILE AND SEEPS BASED ON WATER BALANCE METHOD

Location	Total Measured Seepage Flow Rates (L/s)	Estimated Total Annual Seepage[1] (m^3/yr)	Estimated Pile Groundwater Discharge[2] (m^3/yr)	Approx. Dilution by Seawater
North Face	17.0	500,000	78,000	84%
East Face	14.2			

[1] Estimated assuming the measured seepage rates apply throughout each low tide cycle (see Appendix A)
[2] Estimated using the HELP model

Evaluation of the iron and chloride concentrations during ebb tide, low tide and flood tide in key seeps and wells during the February 2006 assessment of seawater mixing and dilution is presented on Plots A-7 through A-12, in Appendix A. The following trends are apparent from this assessment:

- During a falling tide, iron concentrations in the seeps generally increase while chloride concentrations generally decrease, indicating an increased proportion of pile water (Q_2) draining at lower tides;
- Iron concentrations in SW9 were approximately 4 times lower than the iron concentrations in SW11. However, significantly higher chloride concentrations were concurrently observed in SW9, suggesting that the difference in iron concentrations may be primarily attributable to higher seawater dilution at SW9; and
- Dissolved iron in perimeter well BH20 (which pairs well with seep SW9 and is located upgradient from it) had significantly higher iron concentrations than perimeter well BH16 located upgradient from seep SW11. In addition, the chloride ratio between SW9 and BH20 was significantly higher than the chloride ratio between SW11 and BH16.

These correlations provide further evidence that more pile water flow (Q_2) tends to discharge on the North Face than the East Face and that spatial and temporal fluctuations in seepage iron concentrations are largely controlled by complex seawater dilution and intrusion patterns. The greater variability in samples from SW11 over those at SW9 reflect these spatial and temporal fluctuations.

2.2.2.6 Porewater Profiling

Samples of porewater were collected from discrete depths within the intertidal zone for analysis of total and dissolved iron, chloride and salinity. Porewater samples were collected using a one-quarter inch diameter stainless steel MHE Products porewater sampling device. The device was inserted into the foreshore sediments at successive 25 cm depth increments to a total depth of 1.75 m below grade, the maximum depth of the instrument. Porewater was extracted from the device at each successive depth using a peristaltic pump for subsequent sampling and analysis (see Photo 3).

Porewater sample depth-profiles were collected at three locations, including one beside SW9 on the East Face (PW3), one beside SW11 on the North Face (PW5) and one located approximately halfway between PW3 and PW5 on the northeast face of the pile in an area where minimal to no seepage has been observed (PW4). At location PW3, the porewater sampling device could not penetrate deeper than 1 metre below grade due to cobbles. The porewater profile results are presented on Plots A-5 and A-6 in Appendix A.

The porewater profiling results for dissolved iron and chloride suggest that loadings from the pile occur predominantly within the top 1 metre of saturated materials in the intertidal zone. This is consistent with literature studies (see section 6.0) and is further supported by the relatively thin layer of saturated waste coal (between approximately 1 to 2.5 metres), which would tend to promote seepage above the lower conductivity native material that underlies the pile. This veneer of higher conductivity waste coal material also suggests that the quantity of discharge, if any, beyond the low tide line would be relatively small.

2.2.3 Waste Coal/Soil Chemistry Results for Waste Coal Pile

As the property development plan for the Waste Coal Pile has been revised from the original plan presented in the DSI, the chemistry results for the samples collected from the Waste Coal Pile were also reassessed. Soil chemistry results for waste coal and/or soil collected from the boreholes advanced across the Waste Coal Pile during the DSI (BH1 to BH9, including BH6S, 6D, 7S, 7D and 8S, 8D; BHK-1 to K-3, K-12 and K-13 and BH15 to BH17) and the two historical boreholes (MW03 and MW04), advanced by Norecol, Dames and Moore and reported in 1995 and 1998 reports, are re-presented in Tables 2 through 4, following the text, and are now compared to CSR RL/PL and CSR CL/IL standards to illustrate the worst case, irrespective of the proposed land development plans.

The applicable standards based on the original land use plan proposed in the DSI, as well as the recently updated land use plan, are summarized in Table 1. It is noted that, in accordance with the CSR, the applicable standards for all samples collected 3.0 metres or more below grade should be CSR CL standards. However, this determination will be based on the final grade of the reconfigured Waste Coal Pile prior to site development.

Forty-one waste coal/soil samples (including 4 duplicate samples) collected from the Waste Coal Pile were submitted for analysis of PAHs. Concentrations of naphthalene and phenanthrene in 13 (including 2 duplicates) and 17 (including 2 duplicates) samples, respectively, were in excess of the CSR RL/PL standards. Concentrations of all other PAHs analyzed were below the CSR RL/PL and CSR CL/IL standards. Of the samples that exceeded CSR PL/RL naphthalene and phenanthrene standards, 4 samples and 8 samples, respectively, were collected from depths greater than 3.0 metres. Each of the samples with concentrations of naphthalene and phenanthrene in excess of the RL/PL standards were waste coal samples. Concentrations of PAHs in the waste coal generally decreased with depth and concentrations of PAHs, including naphthalene and phenanthrene. All samples from native soil underlying the waste coal were below the applicable CSR RL/PL and CL/IL standards.

Forty-five waste coal/soil samples (including 7 duplicates) collected from the Waste Coal Pile were submitted for analysis of total metals. Concentrations of arsenic and copper in 17 (including 3 duplicates) and 6 (including 1 duplicate) waste coal samples, respectively, were in excess of the CSR RL/PL and CL/IL standards; no other metals were measured in excess of the RL/PL or CL/IL standards. Concentrations of metals in the waste coal generally decreased with depth and concentrations of metals in all samples collected from native soils underlying the coal waste were below the applicable CSR RL/PL and CL/IL standards.

2.2.4 Groundwater Chemistry Results for Waste Coal Pile

Groundwater samples were collected from select monitoring wells during seven groundwater sampling events between September 2005 and April 2006. Samples were collected on September 11, September 17, October 13, and December 13-14, 2005, and on January 26, February 10-11, and April 4, 2006.

Groundwater samples were collected from select monitoring wells installed across the Waste Coal Pile during the DSI and Supplemental DSI. Samples were submitted for analysis of dissolved metals, total metals, salinity, chloride, fluoride, bromide, nitrate, nitrite, sulphate, hardness and/or total alkalinity. The groundwater chemistry results are summarized in Tables 5 and 6 following the text portion of the report, with the detailed laboratory chemistry reports presented in Appendix C for reference. A summary of the groundwater chemistry results is also presented on Figure 14.

Concentrations of select dissolved metals in groundwater, including cadmium, cobalt, copper, nickel and zinc, were measured in excess of the CSR AWM and/or AWF standards during the previous DSI. Additional groundwater samples collected and analyzed during the seven sampling events conducted during the Supplemental DSI indicated similar results from all 10 monitoring wells sampled (BH6S, BH6D, BH8S, BH8D, BH15, BH16, BH17, BH20, BH21 and BH22). Concentrations of cadmium were in excess of the CSR AWM and AWF standards in groundwater samples collected from BH6S, BH6D, BH16, BH17, BH20 and BH22, during one or more sampling events; in BH8S and BH15, concentrations of cadmium were in excess of the AWM standard only. Concentrations of cobalt were in excess of the AWM and AWF standards in groundwater samples collected from each of the monitoring wells, with the exception of BH8S. Concentrations of copper and/or the laboratory detection limits were in excess of the CSR AWM and AWF standards in groundwater samples collected from BH16, BH17, BH20 and BH21, during one or more sampling events; in BH6S, BH6D and BH22, concentrations of copper and/or the laboratory detection limits were in excess of the AWM standard only. Nickel was measured in excess of the CSR AWM standard in groundwater samples collected from each of the wells, except from BH8D. Concentrations of zinc in excess of the AWM standard were measured in groundwater samples collected from all of the wells. In addition, one sample analyzed for total chromium, collected from BH17 on February 22, 2005, exceeded the AWF standard for chromium (+6).

Concentrations of sulphate in all groundwater samples analyzed, with the exception of one sample collected from BH20 at high tide on December 14, 2005, were in excess of the CSR AWM and AWF standards.

No groundwater samples were submitted for analysis of PAHs or EPH during the Supplemental DSI, as all samples analyzed during the initial DSI were below the AWM and AWF standards in all of the samples submitted for analysis.

2.3 Baynes Sound

The Supplemental DSI included an assessment of the adjacent marine receiving environment (Baynes Sound) and consisted of a phased sediment investigation, as well as seven seep water, sediment porewater and/or marine surface water (ocean) sampling events.

2.3.1 Marine Sediment Investigation

Additional surface sediment samples were collected from the intertidal zone of the adjacent marine environment. The scope of work included the following:

- Collection of five surface sediment samples (i.e. collected from the surface to depths of 10 to 15 cm) from the mid and lower intertidal zones adjacent to the Waste Coal Pile

(S27 to S31). These samples were collected for the third round of sediment toxicity testing, focussed on iron-stained sediments in the North and East Face seep areas;

- Collection of a single surface sediment sample from S33, a reference site located several kilometres south of the Waste Coal Pile;
- Collection of five surface sediment/precipitate samples from iron-stained seep areas (PSED1 to PSED5). PSED1 consisted of a spread-out wafer-like layer (0-0.01 cm) of precipitate that existed around the SW36 seep location. PSED4 consisted of a piece of mound-like precipitate from the East Face seep area. PSED2, PSED3, and PSED5 consisted of less accreted iron-stained surficial sediment (0-0.01) from seep areas; and
- Collection of 2 samples of a milky white sheen atop pooled water in the North Face and East Face seep areas. These samples, SHEEN(E) and SHEEN(N) were collected by skimming the water's surface with laboratory provided filter paper. The combined filter paper and sheen were together submitted for chemical analysis to determine the composition of the sheen.

The locations of the sediment and sheen samples are provided on Figures 3 and 3b. Observations made during the sediment and sheen investigation are summarized below along with the marine sediment chemistry results. Detailed chemistry results are presented following the text in Tables 7 and 8, and are illustrated on Figure 15. Precipitate and sheen chemistry results are presented in Tables 9 and 10. Laboratory chemistry reports are presented in Appendix C for reference.

2.3.1.1 Sediment Observations

Iron staining in the North and East Face seep areas is generally limited to the uppermost few centimetres of sediment. The iron staining present on the foreshore is likely ferric hydroxide ($Fe[OH]_3$), the result of dissolved ferric iron (Fe2+) in the on-Site groundwater oxidizing/precipitating onto beach gravel upon daylighting into the neutral to slightly alkaline, oxygen rich intertidal environment. This iron is strongly adhered to the beach gravel, driftwood, etc. in the iron-stained areas. Suspended iron floc has also been observed at the ocean edge where seep water and ocean water mix.

The iron staining appears to be limited to the intertidal area. At low tides (~0-0.3 m) the intertidal area on the East Face of the Site extends approximately 100 m from the high tide mark. The iron staining on the East Face appears to be partially banded, with more prominent staining occurring in the mid-intertidal and low-intertidal. SEACOR staff have waded beyond the 0 m tide line on the East Face. Iron staining was not apparent in these subtidal areas. SEACOR believes that the segments of underwater video footage shot by SEACOLOGY in 2005 (reported in the previous DSI) depicting iron staining were within the intertidal areas.

The sheen that sometimes forms on pooled seep water is an opalescent milky white colour. The sheen is not hydrocarbon-like as it is more solid and fracturable. The sheen is only visible in still pools of intertidal seep water.

2.3.1.2 Sediment Chemistry Results

2.3.1.2.1 Intertidal Sediments from Seep Areas for Toxicity Testing

The chemistry results for the five sediment samples (S27 to S31), which were also submitted for toxicity testing, indicated that concentrations of select PAHs, including anthracene, chrysene, fluorene, 2-methylnaphthalene, naphthalene and phenanthrene were in excess of the BC Marine $SedQC_{SCS}$ and/or the BC Marine $SedQC_{TCS}$ criteria. Concentrations of arsenic in select samples were also in excess of the BC Marine $SedQC_{SCS}$ criteria. All concentrations of analyzed PAHs and metals parameters in the reference area sample (S33) were below the BC Marine $SedQC_{SCS}$ criteria.

2.3.1.2.2 Intertidal Precipitate/Sediment

The laboratory analytical results for the precipitate samples (PSED1 to PSED5) indicated that the concentration of arsenic in the PSED2 sample slightly exceeded the BC Marine $SedQC_{SCS}$ criteria. The laboratory results indicated that all other precipitate samples analyzed had metals concentrations below the Marine $SedQC_{SCS}$ criteria.

2.3.1.2.3 Sheen

Calcium, iron, magnesium, manganese, sodium, strontium, magnesium, and zinc were detected in the sheen material. On a mass basis, the sheens appear to consist predominantly of iron and sodium.

2.3.1.3 Sediment Toxicity Test Results

The S27 to S33 samples were non-toxic to the Polychaete *Neanthes arenaceodentata*. The marine worms exposed to Site sediments showed no statistical reduction in survival or growth relative to that in the laboratory control sediments. The detailed results of the sediment toxicity testing are included and discussed in more detail in the *Revised Problem Formulation* document described in section 1.2.1.

2.3.2 Seep and Ocean Water Sampling Program

A seep water and ocean water sampling program was conducted between August 2005 and April 2006. Seep waters were collected for analysis from iron-stained intertidal areas on the East Face and North Face of the Waste Coal Pile. Initial (August, 2005) salinity and pH mapping led SEACOR to focus its sampling at those locations believed to have the least dilution by seawater, namely SW9 (East Face) and SW11 (North Face). However, seep waters were also collected from

other areas. Most of the seep water samples were collected from the mid-intertidal area at tidal heights ranging from 1.5 to 0 m. Seep water samples were collected on August 19, September 17, October 13, and December 13, 2005, as well as on January 26, February 10, and April 4, 2006.

Ocean water samples were collected on three occasions from Baynes Sound downgradient of the seep areas, where seep waters mixed with ocean water (at the shoreline) as well as offshore on two occasions. The samples were collected in areas expected to be strongly affected by seep water mixing, as well as in areas not expected to be significantly affected by mixing. In the earlier stages of the project, both seep and ocean water samples were labelled as surface water (SW) samples. A revised sample labelling protocol was developed in subsequent sampling events, which differentiated seep water (SW) from ocean water (OW) samples, to avoid confusion between the two media. Ocean water samples were collected from approximately the middle of the water column. Water depths were typically 10 to 20 cm in the nearshore ocean samples and 1.0 to 1.5 m in the most offshore ocean water samples. Samples were analyzed for total metals. In some cases, separate samples were collected and field filtered using disposable Nalgene filters for dissolved metal results. Metals analyses were conducted using seawater methods to achieve adequate detection limits.

Seep and ocean water sampling locations are shown on Figure 3; reference station ocean water sampling locations are shown on Figure 3b. The chemistry results for the samples are summarized in Tables 11 to 18 and presented on Figure 16, following the text, with the detailed laboratory chemistry reports provided in Appendix C for reference.

2.3.2.1 Seep and Ocean Water Observations

The East Face seep waters appeared to exit the beach at fairly consistent locations throughout the September 2005 to April 2006 sampling events. Daylighting of seep water occurred over a relatively widespread area. Seep water on the East Face was observed to be free of significant turbidity. Its pH typically ranged from 6 to 7, and its salinity typically ranged from 17 to 24 parts per thousand (ppt).

The North Face seep waters also appeared to exit the beach at fairly consistent locations throughout the September 2005 to April 2006 sampling events. However, there was some variation in the position of channel(s) in which the seeps flowed across the intertidal area. While a regular channel exists close to the Waste Coal Pile, a secondary outer channel was also observed and sampled (SW35) on one occasion. When the secondary channel was dry, it appeared that water that had previously flowed into this channel from the area of sample locations SW10/SW2 had diverted into the SW11 channel close to the Waste Coal Pile. Seep water on the North Face also appeared to be of low turbidity, though sometimes contained fine particles of waste coal. Sand boils of groundwater exiting the beach were observed at SW11. The pH of seep water exiting these sand boils ranged

from 4 to 5, and its salinity was fairly constant at 26 ppt. The pH was more neutral within a few metres downgradient of the immediate area of the SW11 seep.

2.3.2.2 Seep Water Chemistry Results

Comparison of paired total versus dissolved metal results for the same sample/station indicated that many of the metals parameters in the seep water were present in a predominantly dissolved state. In some cases, dissolved metal results were higher than total metal results in separate samples collected during the same event at the same station. The higher dissolved metal results in some samples may be attributed to slight temporal variability within the seep water discharge, as both the dissolved and total metals results appear to be representative of the same dissolved metals concentrations, within acceptable statistical variability limits.

The chemistry results for the East Face seep water samples indicated that total and dissolved concentrations of copper, iron, manganese, nickel, and zinc were in excess of the BCWQ Marine guidelines. The concentration ranges of these metals observed in East Face seep water were as follows: copper (0.32-3.84 µg/L total, 0.44-2.1 µg/L dissolved), iron (5,830-185,000 µg/L total, 9,710-206,000 µg/L dissolved), manganese (344-3,110 µg/L total, 511-3,520 µg/L dissolved), nickel (0.673-42 µg/L total, 4.2-47.2 µg/L dissolved), and zinc (2.09-30 µg/L total, 5.23-543 µg/L dissolved).

The chemistry results for the North Face seep water samples indicated that total and dissolved concentrations of cadmium, copper, iron, manganese, nickel and zinc were in excess of the BCWQ Marine guidelines. Aluminium concentrations were also higher than those in East Face seep water. The concentration ranges of these metals observed in North Face seep water were as follows: cadmium (0.079-2.36 µg/L total, 0.114-1.95 µg/L dissolved), copper (0.54-20.6 µg/L total, 1.35-25.1 µg/L dissolved), iron (2,670-242,000 µg/L total, 7,570-292,000 µg/L dissolved), manganese (48.8-2,450 µg/L total, 256-1,970 µg/L dissolved), nickel (0.57-161 µg/L total, 2.8-127 µg/L dissolved), zinc (2.9-637 µg/L total, 12-480 µg/L dissolved), and aluminium (113-18,100 µg/L total, 275-18,200 µg/L dissolved). It should be noted that the above total and dissolved maximum concentrations were not always present in the same sample.

2.3.2.3 Ocean Water Chemistry Results

The chemistry results for the East Face ocean water samples indicated that total and dissolved concentrations of cadmium, copper, iron, manganese and zinc were in excess of the BCWQ Marine guidelines primarily during low tide events, when seep water was most likely to be discharging into the ocean water. However, total and dissolved metal concentrations in low tide samples collected from ocean water locations more than approximately 50 m from the seep areas did not exceed BCWQ Marine guidelines. The concentration ranges of these metals observed in the East Face

ocean water samples were as follows: Cadmium (0.049-0.233 µg/L total, 0.061-0.071 µg/L dissolved), copper (0.354-6.16 µg/L total, 0.375-0.525 µg/L dissolved), iron (28-6,480 µg/L total, 44-4,570 µg/L dissolved), manganese (3.25-586 µg/L total, 6.16-176 µg/L dissolved), and zinc (0.8-16.2 µg/L total, 2.11-2.95 µg/L dissolved). The above total and dissolved maximum concentrations were not always present in the same sample.

The chemistry results for the North Face ocean water samples indicated that total concentrations of cadmium, chromium, copper, iron, and manganese were in excess of the BCWQ Marine guidelines. The concentration ranges of these metals observed in the North Face ocean water were as follows: cadmium (0.051-0.108 µg/L total), chromium (2.6 µg/L total[a]), copper (1.1-3.39 µg/L total), iron (360-9,720 µg/L total), and manganese (11.3-298 µg/L total).

The chemistry for reference area ocean water samples indicated that concentrations of iron marginally exceeded the 50 µg/L BCWQ Marine guidelines minimal risk level. The maximum iron concentration in reference area ocean water was 222 µg/L total, 13 µg/L dissolved. All other metals in the reference area samples were below the BCWQ Marine guidelines.

2.3.2.4 Groundwater and Seep Water Toxicity Test Results

Site groundwater and seep water were toxic (lethally and sublethally) to aquatic life (Topsmelt, mussel larvae, and sea urchin and sand dollar gametes) at concentrations ranging from < 1% to 10% v/v. The detailed results of the groundwater and seep water toxicity testing will be included and discussed in more detail in the RPF/PQRA report (SEACOR, September 2006).

2.3.3 Porewater Sampling Program

Sediment porewater samples were collected on January 26 and February 9, 2006, as described in section 2.2.2.6. Shallow porewater samples collected on January 26, 2006 (PW1 and PW2) were analyzed for total and dissolved metals, pH, salinity, sulphate, bromide, chloride, fluoride, nitrite and nitrate. Samples collected on February 9, 2006 were analyzed for pH, salinity, chloride, total iron and/or dissolved iron. The results of the analyses are summarized in Tables 19 and 20, and presented on Figure 16; detailed analytical laboratory reports are included in Appendix C for reference. Results indicated that samples PW1 and PW2 exceeded the BCWQ Marine guidelines for total copper, iron and manganese, and samples PW3-75, PW5-25, PW5-50, PW5-150 and PW5-175 exceeded the BCWQ Marine guideline for total iron.

a Only one ocean water sample from the North Face was analyzed for total chromium concentration.

2.3.4 Tissue Chemistry Results

Twelve oyster tissue samples were collected on August 18, 2005 and analyzed for metals. The results were within the BCWQ tissue guidelines for all parameters analyzed. The results, as well as historical clam tissue results from samples collected in February 2005, are presented in Tables 21 to 23, following the text. These results will be discussed in the context of human health risk based on shellfish ingestion and background concentrations in the RPF/PQRA report (SEACOR, September 2006).

2.4 Coastal Dispersion Modelling

A surface water dispersion model was used to examine the behaviour of iron originating from the Waste Coal Pile in the adjacent marine receiving waters (Baynes Sound). The coastal dispersion model used was developed by Lam et al. (1984) and used by Environment Canada during their Canadian Environmental Protection Act (CEPA) assessment of inorganic chloramine (McCullum et al., 1999).

2.4.1 Modelling Approach

The coastal dispersion model assumes steady shore parallel (longshore) currents and continuous source release. It is a two-dimensional mass transport/mixing model (vertical mixing not considered) and the following inputs are required (after Lam et al., 1984):

- Input iron mass loading rate - M_o (µg/s);
- First-order decay coefficient to account for removal of iron from the water column - k (1/s);
- Longshore current velocity - u (m/s);
- Lateral dispersion coefficient - E_z (dispersion along shoreline) (m^2/s); and
- Longitudinal dispersion coefficient - E_x (dispersion away from source) (m^2/s).

Lateral and longitudinal dispersion coefficients were estimated using the February 2006 ocean water sampling data. Sampling data supported lateral and longitudinal dispersion coefficients of 0.6 and 0.2 m^2/s, respectively. These coefficient values are within ranges reported in McCullum et al. (1999) for near-shore ocean environments (0.2 to 5 m^2/s).

Markels and Barber (2001) report a half-life for iron on the order of one hour in an ocean environment. Near-surface ocean environments, as is the case at Union Bay, are highly oxygenated and any dissolved iron tends to be quickly converted to Fe^{3+} with rapid precipitation as iron

hydroxide solid – $Fe(OH)_{3(s)}$. This half-life value was converted to a first-order decay coefficient after Mackay (1991).

Data on longshore current velocities in the Union Bay coastal area or nearby are currently unavailable. SEACOR has assumed a value that we believe is at the low end of the range of conditions expected – 0.1 m/s. A much lower (0.01 m/s) and much higher (1 m/s) current velocity was also examined, to provide a worst-case and best-case scenario, respectively, for the resultant plume dispersion behaviour.

Model runs were conducted by simulating iron in the dissolved form entering surface water at the shoreline at a mass-loading rate of 418,000 and 629,000 µg/s. These loading rates were established to represent the most conservative (highest concentration and volume) combined seep flow inputs to shoreline water observed during field sampling.

2.4.2 Dispersion Model Findings

Several model runs were initially conducted to examine plume dispersion behaviour and ensure that the model was responding properly to changing input conditions. Efforts were made to choose program inputs that would purposely minimize and maximize dissolved iron plume dispersion behaviour.

Once satisfied that the model was responding properly, additional model runs were undertaken that were more relevant to field sampling conditions. The interest here was in identifying the distance from the shoreline and along the shoreline downgradient from the point of release at which the water column concentration of dissolved iron fell below 300 µg/L (Marine BCWQ hazardous level guideline and approximate EC_{20} from toxicity tests). Several model runs that were believed to represent dispersion conditions are shown in Table 2.4 below. These conditions tend to support a rapid dissolved iron concentration reduction within 50 to 100 m of the shoreline in all directions from the point of release.

TABLE 2.4: RESULTS OF COASTAL DISPERSION MODEL RUNS AT UNION BAY.

Parameter	Run 1	Run 2	Run 3
M_o (µg/s)	629,000	629,000	629,000
k (1/s)	0.00019	0.00019	0.00019
u (m/s)	0.01	0.1	1
E_z (m^2/s)	0.6	0.6	0.6
E_x (m^2/s)	0.2	0.2	0.2
D_x[a] (m)	<50	<100	<100
D_z[b] (m)	<100	<50	<50

[a] Distance from shoreline (m) at which dissolved iron water column concentration falls below 300 µg/L.

[b] Distance along shoreline (m) from the point of release at which dissolved iron water column concentration falls below 300 µg/L.

Ocean water sample results observed during February 2006 are shown in Table 2.5 below. While it is acknowledged that these sample results only represent one set of conditions, iron concentrations are within a factor of ten compared to model results—with model results representing more conservative (higher concentration) conditions. This comparison further supports evidence of a rapid dissolved iron concentration reduction within 50 to 100 m of the shoreline.

TABLE 2.5. RESULTS OF OCEAN WATER SAMPLING AT UNION BAY DURING FEBRUARY 2006.

Sample ID	Location from shoreline (m)	Concentration[a] (µg/L)
OW2	62	43
OW5	33	28
OW8	52	32

[a] Concentration reported as total iron (µg/L).

3.0 REMEDIATION PLAN UPDATE

3.1 Remedial Options Evaluation

As requested by BC MOE during the meeting held March 29, 2006, a remedial options evaluation has been completed and submitted under separate cover entitled "*Remedial Options Evaluation, Union Bay Waste Coal Pile, Union Bay, BC"* dated August 2006. This document will provide an evaluation of the feasibility of the remedial options discussed at the March 29 meeting, along with the proposed low permeability soil cover, the recommended option enabling appropriate development and satisfactory management of the Site. The document will include case studies of successful implementations of low permeability soil covers for similar wastes and at sites having a comparable development context. The report will also include reference to USEPA best management practice documents for construction on covers where reduced water penetration is the objective.

3.2 Revised Land Use Management Plan

The proposed land use management plan presented with the 2005 DSI was revised in August 2006 in view of the reshaping of the Waste Coal Pile associated with Phase II of the Hart Creek re-channelling project. The updated land use area boundaries within the Waste Coal Pile are shown in Figure 2 and the applicable standards based on the updated land use plan are indicated in Table 1 following the text. The 2006 revisions to the land use plan did not result in significant changes to the applicable standards, except that the distinctions between Residential and Urban Park land use areas have become better defined. Although areas associated with road use have also become better defined and are indicated on Figure 2, SEACOR has assumed that Residential land use standards

would apply in these areas, rather than Industrial standards, given the relatively small area expected to be devoted to roadway use.

3.3 Realignment of Hart Creek

Hart Creek (also know as Washer Creek) flows into Baynes Sound at Union Bay (see Photo 4), adjacent to the west side of the coal pile (Figures 1 and 2). Re-channelling works are underway along the lower section of the creek that extends downstream from the Highway 19A bridge to the delta.

Re-channelling is being implemented in two phases. Phase I, completed in September 2005, involved the channel section from the Highway 19A bridge to the eastern extent of the wood retaining wall shown in Figure 17, within Creek Area South (Reach I) and the high-water channel. Phase II will entail the remaining section of channel adjacent to the Waste Coal Pile (Creek Areas Central and North; Reach II and Reach III), in conjunction with reshaping of the toe of the Waste Coal Pile. This work is anticipated to be completed during the summer of 2006.

3.3.1 Background

The channel along the lower reaches of Hart Creek has been altered from natural, pre-development conditions. Prior to development, Hart Creek historically occupied an alluvial fan-delta system, suggesting that the mouth position migrated and avulsed over time, depending on flow and sediment-load characteristics. Early plat maps indicate that the creek meandered somewhat in Area 1 of the Kensington property, located immediately downstream of the Highway 19A bridge. To accommodate Union Bay coal operations, the stream was redirected and straightened into a wooden flume. The flume had vertical walls as high as 3 m and at least five separate road and railway bridge crossings. In addition, as the waste-coal pile grew in size, the creek was redirected along the west and northwest margins of the pile (to approximately its present location). Furthermore, upstream of the Highway 19A bridge, the channel was pushed farther northward to create the existing ball field and parking lot. This change resulted in the present high-angle approach to the bridge.

Downstream of the Highway 19A bridge, where the wooden flume is in disrepair, considerable sidewall sloughing was occurring. Downstream of the wooden flume, the creek was split into multiple channels and meandered slightly, near or at the base of the pile, forming steep to nearly vertical waste coal faces (from 6 m to more than 10 m high). At one point the stream made an abrupt, right angle turn westward at the base of the waste coal. At the downstream end of the turn, the creek entered the intertidal zone at a location approximately 35 m upstream of the shoreline. This stream section was characterized by the steeply sloping (from 45% to over 100%) Waste Coal Pile to the east and an undercut streambank with overhanging trees to the west. The shoreline is

marked by a prominent spit that has resulted from erosion of the Waste Coal Pile shoreline and subsequent longshore drift northward associated with the predominant currents in Baynes Sound.

3.3.1.1 Habitat Description

Hart Creek and its three main tributaries, Stray Creek, Van West Tributary, and Trout Tributary, are all important fish habitat. The source of Hart Creek consists of wetlands that also form the headwaters of these tributaries. Most land in the Hart Creek watershed is either private forest or Crown Land.

The Provincial Fisheries Inventory database "FishWizard" identifies 5 species of fish as inhabiting Hart Creek: chum (*Oncorhynchus keta*) and coho salmon (*O. kisutch*) and cutthroat trout (*O. clarki clarki*) and rainbow or steelhead trout (*O. mykiss*). Populations of each of these species would be expected to traverse the section of Hart Creek flowing through the property, with some spawning within the floodplain.

Cutthroat trout, *clarki* subspecies, is considered rare, and requires estuarine habitats and small, low gradient coastal streams that are well shaded, with optimal water temperatures below 18ºC. Some individuals may spend their entire lives in freshwater (many in lakes), but most are anadromous (summer in saltwater). Actual occurrences of this species within the property is not known.

The property lies within the Very Dry Maritime Eastern Subzone of the Coastal Western Hemlock Biogeoclimatic Zone (CWHxm1). However, the site is also in a transition area with characteristics of the Moist Maritime Subzone of the Coastal Douglas-fir Biogeoclimatic Zone (CDFmm), as evidenced by the fairly common presence of grand fir (*Abies grandis*) and electrified cat's tail moss (*Rhytidiadelphus triquetrus*), adding challenge to ecosystem interpretations.

Summer flows in the portion of Hart Creek that crosses the study area are typically very low and, except for a few residual pools, the channel can be dry during extended periods with little rainfall. These conditions may limit the potential for lower sections of Hart Creek to provide spawning, holding, and rearing habitat.

The general area, including the section of Hart Creek being re-channelled, has been significantly altered by logging and other industrial development. Impacts on Hart Creek include channelized and diverted sections and the Waste Coal Pile. One area that has remained relatively intact is the portion of the Hart Creek floodplain upstream of Highway 19A (i.e., upstream of the re-channelized portion), with its mixed deciduous and coniferous forest. The floodplain, mapped as Sitka Spruce-Salmonberry ecosystem, provides important hydrological and ecological functions (wildlife habitat and high potential for rare plants), and is the most environmentally sensitive area within the property. Soils in this ecosystem are deep and medium-textured, with subhygric-hygric soil-moisture regimes.

Three areas within the Union Bay property have been identified as sensitive, through a Sensitive Ecosystem Inventory (SEI). Two are riparian areas along Hart Creek, upstream of Highway 19A, and the third is the estuary wetland at the outlet of Hart Creek.

No plant or animal species listed under the federal *Species at Risk Act*, or provincial red- or blue-listed species, are known or expected to be present along Hart Creek below Highway 19A. This area has been greatly disturbed by past industrial activity, and conditions do not exist for species with specialized ecological-niche requirements.

3.3.2 Project Scope

The Remediation Plan contained in the previous DSI presented two alternative designs for channel realignment. In Alternative A, it was proposed that the then-existing channel alignment would remain substantially unaltered, except at a few locations. In alternative B, it was proposed that some channel would remain in place, but the main flow would be re-directed in ways that more closely resembled a natural flow pattern, and would also have higher flow capacity. Alternative B was chosen as the preferred option.

3.3.2.1 Rationale and Objectives

Hart Creek flows along the western edge of the Waste Coal Pile. Over the last 40 or more years, this watercourse has cut steep-to-nearly-vertical slopes into the pile, a process that has contributed considerable sediment load to the creek and resulted in channel aggradation and migration. The former channel configuration contributed to erosion of the Waste Coal Pile. SEACOR has undertaken re-channelling of the creek, together with plans for pile re-grading and remediation, to prevent further erosion and enhance flow conditions and aquatic habitat. A creek morphology investigation was completed to support the design for re-channelling the creek.

Re-channelling is being undertaken entirely along the section of Hart Creek downstream of Highway 19A, in an area that has been heavily disturbed by the former coal processing plant and numerous rail lines. No areas of the creek that remain in the natural streambed will be affected by these works.

Based on an assessment of the remediation requirements, re-channelling of Hart Creek is intended to:

- minimize erosion of the Waste Coal Pile and associated sediment load to the creek and foreshore;
- ensure long-term bank stability; and

- maintain pre-project streamflow conditions and aquatic habitat suitable for salmonid migration, rearing and spawning, and the present macro-invertebrate assemblage.

These objectives will be assessed further as part of the development of the overall remediation of the Waste Coal Pile and site environment.

3.3.3 Description of the Conceptual Plan

This section describes design considerations for Hart Creek channel realignment and presents a reach-by-reach progress report on work conducted to-date and planned construction. The reaches as defined are depicted in Figure 17.

3.3.3.1 Limitations to Design

The former channel configuration was determined primarily by the Highway 19A bridge, the wooden flume and the Waste Coal Pile. At the bridge, the creek made a very sharp turn under the crossing. The southeast alignment of the creek immediately upstream of the bridge forced the creek up against the south bridge abutment, which then forced flows to impinge along and just downstream of the east bridge wingwall, where riprap has been placed. This configuration is fixed and, as such, limited channel re-alignment options in Reach I. However, various alternative concepts that included modifications to the wooden flume reach and the channel reaches adjacent to the Waste Coal Pile were considered feasible.

Re-alignment of Reaches II and III of Hart Creek is constrained by various existing topographic features that include the re-graded and reclaimed Waste Coal Pile along the east and southeast banks, and irregular but relatively high ground along the west and northwest banks. Locations of the east and southeast banks will be limited by selected-grading requirements for the Waste Coal Pile, including practical and cost-effective locations to accommodate cut volumes and a final slope of the Waste Coal Pile that is proposed to be no greater than 2.5:1. In the immediate vicinity of the Hart Creek channel, bank stability and geometry requirements will dictate the need to cut or fill at specific locations and will govern the geometry of the Waste Coal Pile adjacent to the creek.

The final grade of the Waste Coal Pile will be designed to minimize potential rilling and gullying, but will necessarily have a drainage system configured to minimize the number of inflows to Hart Creek. The main feature of this drainage will be a bench constructed approximately halfway up the excavated slope of the pile. The grade and elevations of the bench will be designed to convey all runoff upslope of the bench toward the north, discharging into the Hart Creek estuary rather than directly into the creek.

The final, regraded surface and cover characteristics will be suitable for requirements of the prescribed revegetation. Any Waste Coal Pile material adjacent to the streambank will be completely excavated.

3.3.3.2 Flow Conditions

The re-channelling system is being designed for a peak-flow condition associated with a 24-hour duration precipitation event in the Hart Creek catchment with a 200-year recurrence interval. Peak design flows and velocities were calculated during the design stage to determine the minimum appropriate diameter of riprap to be placed for toe protection along specific reaches.

Pre-project bank erosion rates were relatively high along Reaches I, II and III, contributing considerable amounts of coarse and fine-grained sediment into the system. This situation resulted in aggraded areas within Reach II, and has forced the creek westward along Reach III, eroding the west bank and toppling trees. With re-channelling, re-grading and bank protection, erosion rates in these reaches will be greatly reduced. Gravel and sediment recruitment will then be largely a function of natural conditions upstream of the bridge.

Base flows continue to decrease after the rainy season due to the apparent low storage capacity in the upper watershed. In addition, the lower reaches of Hart Creek cross an ancient (probably early Holocene) alluvial fan deposit formed of permeable sands and gravels, suggesting that the creek and groundwater have high hydraulic connectivity (to recharge and discharge). When flows are reduced to critical levels during summer, they are then lost into the permeable subsurface but, given the proximity of the creek near the shore, it is likely that the minimum groundwater-table elevation is still fairly close to the channel thalwag. This interpretation is supported by the observation that several small pools remain along the thalwag in some locations during late summer. Thus, the short- and long-term dynamics of the local groundwater table elevation dictate the conditions and time length for maintaining a low-flow channel.

3.3.3.3 Aquatic Habitat Conditions and Considerations

Re-channelling and re-vegetation activities are intended to:

- maintain and create riffle/pool/glide sequences that can support the passage, spawning and rearing of the existing salmonids;
- maintain and establish suitable riparian vegetation that will provide shading and help sustain lower stream temperatures and habitat for macroinvertebrates;

- reduce the fine-grained sediment input from the Waste Coal Pile erosion and re-establish the natural gravelly sandy substrate favoured by salmonids that is apparent upstream of the bridge; and
- maintain or improve (if possible) the low flow conditions (i.e., provide passage for longer periods).

3.3.3.4 Conceptual Plan Details

The channel design has retained some sections of the pre-project channel alignment and created a new channel alignment in specific problem areas. The design included removal of all or part of the dilapidated wooden flume, shifting of the main channel southward, accommodation of a planned road bridge crossing, and shifting the boundary of the new re-graded coal pile eastward. The average instream channel planform (defined by the mean high water) is being widened approximately 15% to 18% in the central and north area reaches and by over 100% in the creek area south. This design will create more floodplain capacity and slower flood velocities than pre-project conditions. Additional high floodplain terraces are also being constructed, and all bank slopes will be reduced (by cutting, re-grading and/or filling) to no steeper than 2.5:1. Although conditions along specific reaches necessitate stabilization measures (i.e., toe armouring with riprap, root wads and large woody debris [LWD] where necessary), the general aim is to create a more natural setting, with a moderate amount of habitat complexity and a vegetated riparian corridor. Measures being implemented to deflect flows away from the banks include a combination of rock groynes and log vanes. This design has several advantages:

- it moves a long section of the main channel a substantial distance away from the Waste Coal Pile, reducing potential interaction of Waste Coal Pile leachate with the creek;
- natural flows are allowed to modify the channel shape with minimal engineering;
- the channel is wide and, therefore, it is likely that peak-flow capacity and velocities will be effectively managed through appropriate engineering methods; and
- materials available on-site will be used as much as possible to create log vanes, habitat boulders, woody debris, root wads, and native trees and shrubs will be retained.

3.3.4 Action Being Taken Along Each Stream Reach

For planning purposes, the Hart Creek channel downstream of the Highway 19A bridge was divided into four reaches based on uniform geomorphic characteristics that will accommodate specific design considerations.

3.3.4.1 Reach I – Creek Area South

Before work was undertaken in Reach I – Creek Area South, or the Wooden flume Reach, it was very straight and extended approximately 150 m northeastward from the bridge to the end of the degraded flume. This reach was characterized by the narrow 6 m wide flume channel and 3 m high vertical flume walls that had degraded in certain locations so that the channel width ranged from 6 m to 14 m. Wall sloughing, overhanging trees and washouts were common. The channel had long riffle and short pool sequences in the upper part of the reach, and a very long and deep pool at the lower end of the reach.

In September 2005, beginning at a point about 5 m downstream from the southeast bridge wingwall, a new, wider channel was cut to a maximum depth of 3 m to 4 m below the existing grade (Photo 5). The new channel extends along an arcuate path to a point approximately 30 m southeast of the wooden flume (i.e., close to the remains of the former washery building). The new channel then rejoins the main channel where the existing wooden flume ends, so that the main flow is now directed into what had been a side channel.

Both banks of the new channel were built with low (0.5 m to 1.0 m) terraces, allowing for a high water overflow channel. Rock groynes, LWD, root wads, log vanes and habitat boulders are being used to deflect flows, protect banks and to create roughness and habitat complexity, as well as to allow for natural formation of riffles and pools. Banks were hydroseeded in fall 2005. The riparian corridor was planted in spring 2006 with willows and other shrubs on lower terraces and mixed shrubs and coniferous and deciduous saplings on higher terraces. Efficacy and sufficiency of measures so far installed are being evaluated during the subsequent work program in 2006.

The entire degraded wooden flume will be removed in 2006. Stockpiled material excavated from the new channel will be used to fill the area along much of the current wooden flume reach. The fill will be capped with gravels and cobbles and graded to a slope no steeper than 2.5:1, and then the slope toe will be armoured with a strip of riprap 1 m to 2 m wide (rocks of approximately 0.5 m diameter). The re-graded slope will merge with the existing vegetated top of bank, and will be planted using willow stakes, hydroseeding and jute mats as appropriate. A vegetated high terrace will be left between the new main channel and the existing channel to provide as many taller trees in the re-configured riparian area as possible.

3.3.4.2 Reach II – Creek Area Central

Reach II – Creek Area Central, or the Multiple Channel Reach, began at the end of the wooden flume, and included the longer (180 m), more sinuous main channel (with a smaller overflow channel) adjacent to the Waste Coal Pile, and the shorter (125 m), straighter northward flowing

minor channel. The main and side channels were separated by a vegetated terrace 0.5 m to 2 m higher than the thalwags of each channel.
The original main channel of Reach II was characterized by high (5 m to 8 m) to very high (over 10 m) and steep (greater than 1:1) to nearly vertical slopes along the Waste Coal Pile (Photo 6), with lower cut banks along the terrace. In the middle of the main channel reach was a small overflow channel that extended along the base of the Waste Coal Pile and was separated from the main channel by an island of willow and alder.

Work along Reach II was also undertaken in September 2005. From the downstream end of Reach I, the main channel was directed into a pre-existing side channel, with the former main channel becoming a high-water overflow channel. The side channel was deepened (0.5 m to 1.5 m depending on location) and widened considerably (from approximately 7 m to 17 m) to accommodate larger flows, and to be on-grade with Reach I. Low terraces were constructed along both banks of the new main channel to provide floodplain storage during high flows. Due to the relatively low elevations of the terraces, cut volumes were not substantial. A decision was made at the outset of construction to clear a substantially smaller area of the pre-existing forest, minimizing disturbance of the natural vegetation. The gravels excavated from this cut were used to fill in portions of the former main channel and merge with the regraded coal pile. As banks of the new channel were constructed fairly low, they needed to be protected in specific areas with a combination of riprap, rock groynes, LWD, log vanes, root wads, and habitat boulders (Photo 7).

The former main channel was converted to a smaller high water channel and built up in a set of successively higher terraces along the east bank of the re-graded Waste Coal Pile. Side channel roughness was increased (to reduce flow velocities) and root wads and habitat boulders were used to increase habitat complexity along the outside bend of the high water channel. Channel banks were built with a hard toe (small boulders) and riprap/LWD, as necessary, in hydraulically sensitive sections.

The high, vegetated terrace that formerly separated the new main channel from the new side channel was cut somewhat to accommodate widening of the new main channel, but was left in its former state to the extent possible to retain the pre-existing mixed conifer-poplar stand. The terrace was lengthened at the northern end by filling the exiting channel to terrace-grade with gravels, capping with local fine-grained soils, and then planted with willow stakes and conifer saplings.

In 2006, the Waste Coal Pile will be cut back considerably along the lower sections of Reach II and the upper sections of Reach III, where the former main channel made an abrupt right-angle turn. In this area, the edge of the Waste Coal Pile will be shifted approximately 20 m to 30 m eastward, and the main channel alignment will be shifted about 10 m to 15 m eastward (which is at the present location of the steep slope of the Waste Coal Pile). This shifting and widening will provide room to develop a relatively sinuous and wide channel (average about 25 m) with room for floodplain

terraces. A four-metre setback allowance will also be maintained in consideration of a lower conductivity wall along the eastern bank of the creek, which will be constructed in conjunction with the planned cover, to reduce the hydraulic connection between groundwater within the Waste Coal Pile and the creek. As with the upper portion of this reach, the toe of the re-graded Waste Coal Pile will be armoured with a combination of riprap, log vanes and root wads to create habitat complexity.

3.3.4.3 Reach III – Creek Area North

Work along Reach III – Creek Area North, or the Main Waste Coal Pile Reach, is also to be undertaken in 2006. This stream section begins after the main and side channels have rejoined and extends approximately 170 m northward to the inlet area. Banks along this reach are steep (from 2:1 to greater than 1:1) and the relatively high bank tops range from 4.5 m to 10 m along the Waste Coal Pile and from 3.0 m to over 6.5 m along the west bank. Bases of the banks along the Waste Coal Pile are typically covered by waste coal talus, indicating that bank erosion along the Waste Coal Pile continues. The accumulation of talus has forced the main channel to erode the opposite west bank, including abrasion of a hard-compact, clayey till unit along the channel floor that has created steep cut banks with over-hanging trees.

In 2006, the Waste Coal Pile will be cut down and its margin pulled back eastward at least 5 m to 10 m to create a wider instream zone (from an average width of about 22 m to 26 m or 18% wider on average) with a newly vegetated riparian zone. The increased width will allow for greater hydraulic capacity, lower stream velocities, slightly greater sinuosity, and gentler streambank slopes, reducing armour requirements. Except where the low permeability wall and cover is planned to be constructed, the entire east bank will be reclaimed with a new mixture of conifers, deciduous trees and shrubs.

The existing main channel gravels are covered and mixed by fine- to coarse-grained waste coal that formed as talus debris at the base of the coal pile. When the Waste Coal Pile is pulled back eastward, this cover will be excavated to expose river gravels. The Waste Coal Pile will then be re-graded in a terraced fashion with slopes no steeper than 2.5:1. A combination of rock groynes, LWD, log vanes, root wads, and habitat boulders will be used to deflect the main flow of the stream off the banks, creating low flow sinuosity and habitat complexity.

Where waste coal material is exposed along the west bank of the creek, the material will be excavated and removed to the Waste Coal Pile. The existing over-steepened west bank areas will be excavated to a maximum 2.5:1 slope, and protected using a 2 m to 3 m wide strip of riprap, composed of rocks approximately 1 m in diameter. Root wads and log vanes will be built into the riprap to increase channel roughness, help deflect flows and create habitat complexity. The existing vegetation along the west riparian strip will be left in its present condition.

3.3.4.4 Reach IV – Baynes Sound Inlet

This stream section begins where the channel opens up into a broad, flat marshy and muddy area. This reach extends through a spit barrier to Baynes Sound. During high tide, the inlet area is underwater and the high tide extends into the lower portions of Reach II. During low tide, the entire inlet area and foreshore area north of the spit barrier are exposed.

Based on recommendations from Fisheries and Oceans Canada (DFO; contact: Scott Northrup), some work has been proposed in Reach IV during 2006. The work area is generally described as approximately 4,200 m^2 of non-vegetated land covered by 0.1 to 1.0 thick layer of coal waste along the inlet foreshore area. The work area occurs within the small inlet that is protected by a large beach barrier during high tides. The work area is bounded to the west by a small intermittent stream channel, to the north by a vegetated inlet area that is exposed during low tides, to the east by Hart Creek, and to the south by forest. The thickest portion of the coal waste (about 0.5 to 1.0 m) is a narrow strip (about 5-10 metres wide) that lies along the forest edge and up to the intermittent channel.

The proposed plan is an amended extension of the restoration work currently being undertaken in Hart Creek in Reaches I, II and III. The conceptual plan is to excavate down to the approximate elevation represented by the elevation of land that lies to the west side of the intermittent channel and which is covered by thick vegetation of primarily indigenous grasses. The excavated coal waste (estimated at between 500 and 750 cubic metres) will be hauled across Hart Creek and used to fill gullies on the Waste Coal Pile, as part of the overall remediation plan.

After the excavation is complete, a thin (0.05 to 0.1 m) cover material comprised of clean well-graded gravels, sands and silts will be spread over the excavated area to encourage rapid colonization by neighbouring indigenous plants. Large and small woody debris salvaged from the excavation area will be distributed (and dug in when necessary) along the new berm area at the forest edge to provide initial protection from inlet waves.

3.3.5 Material Requirements

The design has accommodated reuse of much of the cut material for fill. Any cut material identified for re-use has been inspected and any containing coal waste disposed of to the coal pile. If necessary, new fill will be imported. River gravels, small boulders and large rock to build riprap and rock groynes were imported. Vegetation for new riparian planting undertaken in Spring 2006 was obtained from a local supplier and additional supply will be required as work progresses.

3.3.6 Potential Fish Habitat Impacts

Existing instream and riparian habitat along the subject reaches of Hart Creek has been severely degraded by the continuing erosion of the waste-coal pile. There will be a temporal loss of habitat during the re-alignment project, but this will be of short duration. As Hart Creek becomes dry or flows into the subsurface each summer, construction is being undertaken mainly during this period.

As this project is intended to improve the quality of instream and riparian habitat, it is anticipated that, with the exception of possible effects during construction, the net impacts on fish habitat will be beneficial.

3.3.6.1 Proposed Mitigation

A set of Environmental Best Management Practices (BMPs) is being adhered to during construction of the habitat features. A sediment and erosion control plan has been developed and will be implemented if any construction occurs in the wet. BMPs will be consistent with Environmental Best Management Practices for Urban and Rural Land Development (Ministry of Environment, 2004, Working Draft).

Applicable sediment and erosion control BMPs include:

- halting construction during periods of heavy rainfall;
- ensuring proper storage of all hazardous materials and designing spill prevention and control plans; ensuring no on-site vehicle fuelling or maintenance;
- use of mineral oil as hydraulic fluid in heavy equipment being used for instream work;
- use of silt fencing as applicable during construction;
- isolation of creek flows at the latter stages of channel re-construction when the new channel is being connected to the creek; and
- use of temporary coverings (e.g., plastic sheets) as applicable for soil stockpiles and bare slopes, and surface mulches, including leaves and straw, to control erosion from rainfall.

Applicable vegetation management BMPs include:

- retaining as much natural vegetation as possible and minimizing the size of the cleared area required for construction;
- revegetating the small road used for backhoe access with appropriate riparian plantings;

- preventing any disturbance within the root zone (drip line) of established trees in the riparian zone;
- preserving or reusing snags, downed logs, stumps and other forest features unless they present a danger to workers or the public;
- use of salvaged woody debris (logs, stumps) to enhance riparian habitat;
- use native trees and other plants for riparian planting;
- removal of invasive plants (e.g., Himalayan blackberry) in conjunction with riparian planting; and
- reduction of soil compaction by avoiding machinery use except where necessary.

3.3.6.2 Habitat Compensation Balance

Table 3.1 below provides the habitat compensation balance that was calculated from the conceptual plan. An overall compensation/habitat loss ratio of 1.5:1 will be achieved by providing 1.5:1 compensatory habitat both instream and in the riparian area. Considering the poor quality of habitat as it currently exists, replacement at this ratio is considered to be of great benefit to the overall habitat.

TABLE 3.1: HART CREEK HABITAT COMPENSATION BALANCE

Location	Instream Habitat (m^2)		Riparian Habitat (m^2)		Total (m^2)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Creek Area North	3,006	3,534	3,249	6,796	6,255	10,330
Creek Area Central	3,403	4,027	6,956	10,210	10,359	14,237
Creek Area South	1,604	4,725	6,757	7,985	8,361	12,710
Totals	**8,013**	**12,286**	**16,962**	**24,991**	**24,975**	**37,277**
Compensation Ratios (Proposed/Existing)	**1.5 Instream**		**1.5 Riparian**		**1.5 Total**	

3.3.7 General Construction Sequence of 2005 and Anticipated For 2006

The following general sequence of construction was undertaken in 2005:

1. Prepare final design.
2. Confirm hydraulic and engineering specifications.
3. Develop detailed plans and specifications for bid, to include material requirements, scheduling, and unit rate costs, for example.

4. Conduct onsite pre-bid meeting with potential bidders to outline design issues and construction constraints.
5. Select contractor(s).
6. Identify/quantify material needs and sources.
7. Select Environmental Monitor.
8. Develop BMPs for construction activities (e.g., begin work during dry season when creek has gone subsurface, develop, begin channel and excavation work upstream and work down).
9. Flag various trees for cutting or keeping, and identify potential wood sources (including existing wooden flume) that would be suitable materials for LWD, root wads, and log vanes
10. Identify staging, laydown and stockpile areas.
11. Break down portions of the degraded flume.
12. Survey and stake the new alignment and cut/fill locations along entire new alignment.
13. Implement stormwater runoff control plan (to incorporate any diversions, sediment ponds, silt fences, etc.).
14. Implement Phase I by cutting and shaping the upper channel in Reaches I and II.
15. Build various slope/bank stabilization features and add channel/bank habitat elements as required.
16. Complete final grading and re-vegetation.

In 2006, Phase II will be implemented by proceeding systematically downstream to the lower portion of Reach II, Reach III, and Reach IV, working in conjunction with any on-going Waste Coal Pile regrading activities.

3.3.7.1 Regulatory Approvals and Agency Liaison

Before applying for agency approvals, SEACOR consulted with Fisheries and Oceans Canada (DFO; contact: Doug Swift) regarding the proposed re-channelling of Hart Creek. SEACOR subsequently prepared Applications to Land and Water British Columbia Inc. (LWBC), Transport Canada, and Fisheries and Oceans Canada (DFO) on behalf of West Fraser Mills Ltd. and Kensington Island Properties in 2005. The applications were for implementation of features of a conceptual design for re-channelling of a portion of Hart Creek.

Approval was given by LWBC under Section 9 of the *Water Act* on August 15, 2005. DFO responded to the application indicating that the decision to issue an Authorization under Section 35(2) of the Fisheries Act is a trigger for the Canadian Environmental Assessment Act (CEAA). Following a referral process, the DFO Authorization was signed August 17, 2005. Transport Canada indicated by letter dated September 6, 2005, that an application/approval was not required under the *Navigable Waters Protection Act*, as the creek was considered to be non-navigable. The authorizations and correspondence are provided for reference in Appendix D.

SEACOR has also consulted with the CSRD regarding re-channelling of Hart Creek, which expressed support for the proposed works. The current required streamside setback distance along Hart Creek, as specified by the CSRD is 15 m for all watercourses (Gerard LeBlanc, pers. comm., June 14, 2005). Mr. LeBlanc indicated that the bylaw for these setback distances is currently under review so that it is in compliance with the Provincial Riparian Areas Regulation (RAR). As outlined in subsequent sections of this report, the proposed setback is greater than 15 m.

A Notice of Independent Remediation (NIR) dated September 6, 2005, was submitted by SEACOR to BC MOE, providing information regarding the excavation of waste coal material from the creek re-channelling project. The notice indicated that excavated material would be placed on the pile. SEACOR submitted a subsequent NIR dated August 10, 2006, to BC MOE describing Phase II of the creek re-channelling project and indicating that excavated waste coal would again be placed upon the existing pile. To date, no responses to the notices have been received by SEACOR from BC MOE. The notices are provided for reference in Appendix D.

3.3.7.2 Detailed Implementation Sequence of 2005

Prior to proceeding with construction, appropriate detailed design work was carried out. Table 3.2 below describes the implementation sequence of Phase I in 2005.

TABLE 3.2: IMPLEMENTATION SEQUENCE, HART CREEK REMEDIATION, 2005

Date	Activities
Sept. 2	• clearing and brushing SE of Highway 19A bridge. • trucks hauled in soil and dumped near coal pile for stockpile. • bulldozing and grading roadways for dump trucks to move material from creek excavations to stockpile areas. • low-bed delivered lock-blocks for construction of temporary bridge and bridge area between Reach 1 and 2.
Sept. 3	• temporary bridge laid between Reach 1 and 2. • silt-fences and hay bails placed for sediment control.
Sept. 6	• clearing and brushing along Reach 2.
Sept. 7	• work shut-down for the day due to erosion/sediment concerns; additional silt-fences and hay placed

TABLE 3.2: IMPLEMENTATION SEQUENCE, HART CREEK REMEDIATION, 2005	
Date	**Activities**
	in areas of concern at north end of Reach 2. • hand-cutting of Alder trees at north end near creek due to concern that the excavator's weight would cause soil to erode into creek.
Sept. 8	• silt-fences damaged overnight by vandals were replaced. • an old wooden culvert pipe was discovered that would need to be plugged. • placement of a bail of hay and large cobbles to plug a gulley/path along Reach 1 to prevent sediment flow into creek flume.
Sept. 9	• plans made for removal of the the plug separating the old and new channels.
Sept. 10, 11	• Fish salvaging by electroshocking conducted by the Hart Creek Preservation Society in preparation for removal of the plug.
Sept. 12	• flow dam constructed to prevent tide from reaching excavation area and bringing other fish with it. • excavating to lower the height of the plug to connect old and new channels. • lining of bank near the existing channel with large boulders to prevent erosion. • work moved away from plug area to middle of Reach 2.
Sept. 13	• excavation and stockpiling of creosote ties, wood and metal piping in the area of Reach 1. • final excavation of plug at north end of Reach 2.
Sept. 14	• beginning of work along the south area of Reach 2. • cutting of alder trees beside the temporary bridge. • riprapping of the west bank along Reach 2 to prevent erosion and stabilize the bank. • removal of the temporary bridge and lock-blocks. • placement of hay bails at junction between flume, Reach 1 and 2 to shore up sediment control measures.
Sept. 15	• completion of Reach 2 work.
Sept. 16	• removal from site of the temporary bridge. • removal by excavator of old abandoned cars from Reach 1 creek bed. • excavation of Reach 1.
Sept. 19	• excavation of Reach 1 continued. • flagging and sectioning of the site of a suspected midden. • removal of old pipes approximately 10 m long lying parallel to the creek. • 10 m wide plug left between Reach 1 and existing creek and flume.
Sept. 20	• excavation of an old concrete sump and creosote ties, more logs, piping and other debris.
Sept. 21	• continued excavation and removal of old concrete sump and creosote ties. • excavation and removal of surrounded soils owing to suspected contamination. • resumption of excavation of Reach 1. • creation of plugs at each end of Reach 1; west plug had natural vegetation and was at a higher elevation to limit sediment flowing westward; east plug was also graded higher. • placement of hay bails and silt fencing around plugs to limit sediment flow.

TABLE 3.2: IMPLEMENTATION SEQUENCE, HART CREEK REMEDIATION, 2005	
Date	**Activities**
Sept. 22	• continued excavation of Reach 1.
Sept. 23, 26	• continued excavation of Reach 1. • placement of logs, rock groynes, riprap, and gravel. • inspection by DFO.
Sept. 27	• grading back the coal pile at the junction of Reach 1 and the flume to ensure water flow would not erode coal pile into stream. • salvage of fish west of the flume to enable dismantling of part of the western end of flume to connect Reach 1 (soil was excavated then the flume was cut piece by piece to ensure minimum impact from the flume to the creek). • excavation of a coal seam at plug between Reaches 1 and 2; excavation was filled with a thick layer of gravel and turned into a spawning pool.
Sept. 28	• inspection by MOE.
Sept. 29	• excavation and removal of additional sumps; backfilling with cobbles, gravel, and some sloughed silt.
Oct. 3-4	• hydroseeding of banks as a precaution against erosion over winter.

3.3.8 Revegetation Plan

The goal of revegetation is to establish conditions under which a similar mixed coniferous-deciduous forest will become self-sustaining. The remnant mixed forest that remains in a relatively intact condition on portions of the Hart Creek floodplain serves as a model for rehabilitating riparian vegetation along the realigned sections. At the same time, species choice must be based on other characteristics, such as their contribution to stream bank stabilization, tolerance of site soils, and growth rate. C.E. Jones & Associates Ltd. prepared the revegetation plan for Reaches I and II and began implementation in Spring 2006 (Photos 8 and 9).

The revegetation plan includes a mosaic of species combinations and some clustering of conifers to ensure that canopy gaps will remain as the conifers grow. In this way, conifers will provide a long-term source of LWD to Hart Creek, while shrub communities, vigorous in the open canopy, will provide small organic debris, stream shading and filtering functions of riparian vegetation.

Species planted in the riparian areas along Hart Creek in 2006 are listed in Table 3.3 below, along with the location and number of species planted. These species are all native and typical of riparian areas in the region; most have been identified in the vicinity of the study area. They are also commonly used for revegetation and were available from a local nursery.

TABLE 3.3: SPECIES PLANTED IN 2006		
Common Name	**Scientific Name**	**Number Planted**
Upland Zone, Above the High Water Mark		
Coastal Douglas-fir	*Pseudotsuga menziesii* ssp. *Menziesii*	66
Western Hemlock	*Tsuga heterophylla*	44
Western Redcedar	*Thuja plicata*	22
Bigleaf Maple	*Acer macrophyllum*	44
Black Cottonwood	*Populus balsamifera* spp. *trichocarpa*	114
Red Alder	*Alnus rubra*	90
Oceanspray	*Holodiscus discolor*	60
Thimbleberry	*Rubus parviflorus*	90
Pacific Ninebark	*Physocarpus capitatus*	90
Snowberry	*Symphoricarpos albus*	20
Dull Oregon Grape	*Mahonia nervosa*	50
Salal	*Gaultheria shallon*	130
Transition Zone, Near the High Water Mark		
Red Alder	*Alnus rubra*	111
Pacific Ninebark	*Physocarpus capitatus*	111
Salmonberry	*Rubus spectabilis*	92
Hardhack	*Spiraea douglasii*	55
Wet Zone, Below the High Water Mark (Livestake Cuttings)		
Red-osier Dogwood	*Cornus stolonifera*	890
Willow	*Salix sp.*	1960

3.3.9 Monitoring Program

A monitoring program has been developed and includes Construction Monitoring, Implementation Monitoring and Effectiveness Monitoring. Each of these components is discussed below.

3.3.9.1 Construction Monitoring

A qualified environmental monitor has been scrutinizing construction, ensuring that fish salvages, sediment controls and other BMPs are followed. The monitor has full authority to halt work if proper procedures are not being followed. Monitoring will continue throughout the construction phase of the remediation project.

3.3.9.2 Implementation and Effectiveness Monitoring

The following five-year monitoring program is underway, in accordance with the DFO Authorization requirements:

a) A bi-annual assessment of the compensatory habitat completed by a qualified biologist or other professional that has experience in this area. The new Phase I stream channel and associated riparian habitat was inspected during the following rainy season (approximately October 2005 to December 2005) and during the following spring (March 2006 to June 2006). The Phase II channel will be inspected once during the following rainy season (approximately October 2006 to December 2006) and the following spring (March 2007 to June 2007), and then bi-annually for four additional years (to year 2011). The monitoring period may be amended after two years to once per year should the compensatory habitat be functioning well and considered stable by DFO.

b) Monitoring of habitat features and riparian planting will include the following components:
   I. A photographic assessment of the instream compensation works and riparian plantings conducted during the summer.
   II. An assessment of the survival of the planted vegetation conducted during the summer. A minimum plant survival of 75% is expected. Additional planting is to be conducted should plant survival not achieve 75% success.
   III. An assessment of the structural stability of the instream habitat features, identifying any failures and describing restoration measures taken to remediate failures.

c) A final report is to be submitted to the Comox DFO office at the end of the five-year period, confirming that the habitat compensation works are biologically functioning and that a "No Net Loss" of fish habitat has been achieved.

3.3.10 Archaeology

Baseline Archaeological Services Ltd. completed an Archaeological Impact Assessment of the subject lands in April 2005. Portions of the lands proposed for development and east of Highway 19A were identified as archaeological sites DjSf-25 and DjSf-26. These sites cannot be altered in any way without a Provincial permit being issued under the *Heritage Conservation Act* (*HCA*). If development activities are likely to affect known, intact archaeological remains, those portions of the site will require mitigation in the form of systematic data recovery under authority of a *HCA* Section 14 Heritage Investigation Permit. Development activities that will occur within the boundaries of recorded archaeological sites will require a *HCA* Section 12 Site Alteration Permit. Depending on the location of the developments, the Permit may stipulate monitoring be conducted by a qualified archaeologist or personnel familiar with archaeological remains.

An archaeological monitor was onsite during implementation of the Phase I work in 2005, and will continue overseeing Phase II excavation work in 2006. Work was briefly halted in September 2005 following the discovery of a suspected midden until it was assessed by a qualified archaeologist.

It is anticipated that activities impinging on archaeological sites may occur during Phase II of the project, which entails alterations to the Waste Coal Pile. Required permits will be obtained before any work begins, site workers appropriately briefed, and due diligence applied during construction.

3.3.11 Project Results

The works being undertaken will result in significantly improved fish and wildlife habitat compared to previous conditions. Hart Creek will no longer erode the Waste Coal Pile, and natural qualities of the channel will become self-sustaining. Re-channelling of Hart Creek will satisfy the objectives of:

- reducing erosion of the Waste Coal Pile and resultant sediment load to the creek and foreshore,
- stabilizing streambanks and slopes, and
- maintaining current streamflow conditions and aquatic habitat suitable for salmonid migration, rearing and spawning, and the present macro-invertebrate assemblage.

The re-alignment has already provided community amenities by improving views and the aesthetic quality of Hart Creek and the surrounding area, and will continue to provide opportunities to integrate natural features with the proposed development.

3.4 Expected Hydrogeological Effects of Capping the Pile

As a result of the significant spatial and temporal fluctuations in chemistry that occur due to seawater mixing and the geochemical zonation within the pile, the prediction of dissolved iron concentrations at a specific point in space and time is difficult to substantiate. It is more straightforward to quantify the net average loadings over an extended period of time, and therefore estimate the reduction in annual loadings that may be expected from capping the pile based on a water balance analysis.

In a capping scenario, the cap will be designed to prevent at least 90% of the current water infiltration to the pile (Q_2). With a 90% reduction in infiltration to the pile, the net infiltration after capping would be approximately 5% of total precipitation, or about 7,800 m^3/yr. Since the water passing through the pile today and the water passing through the pile in the future are at saturation for dissolved iron generated in the pile, the concentration of dissolved iron is not predicted to rise in porewater within the pile. Although pile porewater concentrations are expected to remain largely

unchanged within the pile, this significantly reduced volume (Q_2) would be dispersed in the current volume of groundwater flow from upgradient areas (Q_1). As a result, the annual loading of dissolved iron to the groundwater and seawater at the base of the pile is expected decrease by approximately 90%. Also, the hydraulic gradient and groundwater velocity beneath the pile are expected to be reduced.

Mixing with seawater (Q_3) will result in substantial dilution before discharge as seepage. The concentration of dissolved iron in water discharging from the seeps is highly variable in space and time. As a result, it is difficult to predict what these concentrations may be under a post-capping scenario. The current dilution ratios observed between the perimeter wells and seepages (presented in Section 2.2.2.5) provide an understanding of the net attenuation in loadings that can be expected under a cap scenario.

If we can reasonably assume that the range of iron concentrations observed in perimeter well groundwater samples today are representative for evaluating future groundwater concentrations after capping, then the range of iron concentrations within the perimeter of the pile after capping and stabilization is expected to be approximately 2,500 µg/L to 96,000 µg/L. As a result, the annual loading of dissolved iron from the pile is expected to decrease by approximately 90% in the affected intertidal and water column areas.

In general, the following conditions are expected to change after the pile is capped:

- A general decrease in freshwater mounding beneath the pile may give rise to decreased groundwater flow rates (Q_2) and increased seawater intrusion (Q_3). A net average annual increase in chloride levels may be observed in perimeter wells on the north and east side of the pile;
- Currently, the groundwater concentrations in perimeter wells are highly variable through time due to the proximity of the seawater interface. After capping the pile, a net annual decrease in contaminant concentrations is expected to occur at the pile perimeter due to potentially greater dilution by Q_3;
- Seep concentrations in the intertidal zone may be less variable than groundwater at the pile perimeter due to more complete mixing with seawater. However, it should be noted that seep locations and discharge characteristics may change over time; and
- To assess annual loadings from the pile in a meaningful way under a future cap scenario, monitoring data should be reviewed from the perspective of net annual trends as opposed to isolated monitoring events so that short-term variability is placed within context.

3.5 Post Remediation Monitoring

After capping of the pile is completed, a long-term groundwater monitoring program is proposed to evaluate and confirm the changes in loadings of ARD constituents to the intertidal zone. It is expected that a reduction in loadings would be observed within the first year of cover placement, although groundwater concentrations immediately post-capping may increase due to disturbance of the waste material and mobilization of some secondary mineral precipitates. Interim measures being considered to reduce contaminant loading to groundwater during construction include blending disturbed waste coal with lime and or limestone. As the recharge rate is reduced, a drain-down process will begin within the pile as the moisture content lowers to be in equilibrium with the new flux rate. This drain-down is expected to occur within the first year after cap emplacement.

As indicated previously, significant fluctuations in chemistry occur both spatially and temporally due to complex seawater mixing cycles and geochemical zonation within the pile. As a result, the prediction of groundwater concentrations at a specific point in space and time is difficult to substantiate. To assess annual loadings from the pile in a meaningful way under a future cap scenario, monitoring data must be evaluated based on the net average loadings that occur over an extended period of time as opposed to isolated monitoring events so that short-term variability is placed within context.

Seep concentrations in the intertidal zone may be less variable than groundwater at the pile perimeter due to more complete mixing with seawater, however, seep locations and discharge characteristics may change over time. Therefore, groundwater monitoring at the pile perimeter is considered the optimal location for assessing long-term changes in groundwater concentrations. A monitoring well network comprised of 6 wells is proposed to be installed at the perimeter of the pile after the cap is installed. The monitoring wells will be installed at key locations that coincide with existing wells from which data has been collected for the present assessment. The locations of these proposed wells are indicated on Figure 18.

Groundwater samples would be collected from each well for analysis of dissolved iron and chloride on a bi-monthly basis for the first three years after emplacement of the cap (6 sampling events per year). During two of these sampling events, seep discharge samples would also be collected from SW9 and SW11 to evaluate changes in loading and concentration within the intertidal zone after seawater mixing. During the semi-annual monitoring events, the seep and groundwater samples would be analyzed for seawater metals analysis in addition to dissolved iron and chloride. It is proposed that the collection of all seep and groundwater samples be conducted at a consistent point in the tidal cycle. During each monitoring event, samples would be collected during a period of low tide.

The evaluation of loadings from the pile will not be based on the groundwater concentrations from individual sampling results, but on the trends observed after sufficient data has been collected. The net annual loading of dissolved iron will be calculated at the end of each year. In addition, statistical analysis will be conducted on the data to facilitate trend analysis and this evaluation will become more robust as the sample population increases with each successive year of data.

To evaluate the reduction in infiltration through capping and the consequent decrease in flow rates that are expected to occur, semi-annual monitoring of groundwater elevations will be conducted during the three years following placement of the cap. Continuous water level monitoring will be performed for a minimum of 72 hours to filter out tidal effects and determine the mean hydraulic gradient beneath the pile. Semi-annual monitoring and sampling would be conducted during the wet and dry seasons.

After three years of data have been collected, the net average reduction in loadings from the pile will be evaluated for conformance with predicted loadings. Based on these analyses, the need for contingency measures will be subsequently evaluated. After this initial three-year period, the monitoring results will also be evaluated and a decision made with input from MOE as to whether monitoring may be reduced in frequency to seasonal sampling events (3 to 4 times per year), and whether any changes in the analytical schedule are warranted. In addition, the appropriateness of seep sampling locations will be evaluated and modified if necessary as the character and location of seeps may change over time.

4.0 PROFESSIONAL STATEMENT

The "*Supplemental Detailed Site Investigation, Union Bay Waste Coal Pile, Union Bay BC*" report, dated August 31, 2006, was prepared by SEACOR in accordance with all requirements in the Environmental Management Act and the Contaminated Sites Regulation. The authors of the report, Ms. E. Campbell, M.Eng., E.I.T.; Mr. Michael McLeay, M.Sc., R.P.Bio.; Mr. Ian Mitchell, M.Sc., P.Geo.; Mr. J. Neville, M.E.Des., R.P.Bio.; Mr. M. Sloan, M.Sc., P.Eng.; and Dr. J. G. Malick, R.P.Bio., P.Ag. have over 80 years of combined experience in the assessment and remediation of contaminated sites and are familiar with the works carried out at the Site.

5.0 STATEMENT OF LIMITATIONS

This report has been prepared and the work referred to in this report has been undertaken by SEACOR for West Fraser and Kensington. It is intended for the sole and exclusive use of West Fraser and Kensington and its authorized agents for the purpose(s) set out in this report. Any use of, reliance on or decision made based on this report by any person other than West Fraser and Kensington for any purpose, or by West Fraser and Kensington for a purpose other than the purpose(s) set out in this report, is the sole responsibility of such other person or West Fraser and

Kensington. West Fraser and Kensington and SEACOR make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, any decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by SEACOR with respect to this report and any conclusions or recommendations made in this report reflect SEACOR's judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report, on information available at the time of preparation of this report, on the interpretation of data collected from the field investigation, and on the results of laboratory analyses, which were limited to the quantification in select samples of those substances specifically identified in the report. This report has been prepared for specific application to this site and it is based, in part upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site; substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken. SEACOR expresses no warranty with respect to the accuracy of the laboratory analyses, methodologies used, or presentation of analytical results by the laboratory. Actual concentrations of the substances identified in the samples submitted may vary according to the extraction and testing procedures used.

As the evaluation and conclusions reported herein do not preclude the existence of other chemical compounds and/or that variations of conditions within the site may be possible, this report should be used for informational purposes only and should absolutely not be construed as a comprehensive hydrogeological or chemical characterization of the site. If Site conditions change or if any additional information becomes available at a future date, modifications to the findings, conclusions and recommendations in this report may be necessary.

Nothing in this report is intended to constitute or provide a legal opinion. Other than as required by provisions of the BC Contaminated Sites Regulation and the BC Environmental Management Act, SEACOR makes no representation as to the requirements of or compliance with environmental laws, rules, regulations or policies established by federal, provincial or local government bodies. Revisions to the regulatory standards referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by West Fraser and Kensington and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of SEACOR.

West Fraser and Kensington may submit this report to the British Columbia Ministry of Environment (BC MOE) and/or related British Columbia environmental regulatory authorities or persons for review and comment purposes provided that SEACOR receives a copy of all correspondence between BC MOE and/or related British Columbia environmental regulatory authorities or persons and West Fraser and Kensington pertaining to the report or project in question.

Regulatory authorities are authorized to rely on the information contained in this report for the purpose of determining whether West Fraser and Kensington is fulfilling or has fulfilled its obligations with respect to the applicable environmental statutory or regulatory requirements. Any use or reliance upon this report by any other third party in not authorized (without West Fraser and Kensington's and SEACOR's consent) and is at the sole risk of such third party.

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TABLE 1: SOIL ANALYTICAL SCHEDULE

Borehole	Sample ID	Sample Depth (m)	Sample HSVL (ppmv)	Applicable CSR Standards - 2005[1]	Revised Applicable CSR Standards - 2006[2]	Submitted for Chemical Analysis of:
BH 1	BH 1 0-3	0.0-0.9	n.r.	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	BH 1 3-6	0.9-1.8	25	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	SA1	2.1-3.1	125	Residential/Urban Park	Residential	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA2	6.7-7.6	100	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA3 (SA2 Dup)	6.7-7.6	100	Commercial	Commercial	Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA4	11.3-12.2	550	Commercial	Commercial	PAHs, Metals
	SA5 (SA4 Dup)	11.33-12.2	550	Commercial	Commercial	PAHs, Metals
	SA6	12.2-12.8	375	Commercial	Commercial	PAHs, Metals
BH 2	BH 2 0-3	0.0-0.9	100	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	BH 2 3-6	0.9-1.8	n.r.	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	SA1	2.1-3.1	160	Residential/Urban Park	Residential	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA2 (SA1 Dup)	2.1-3.1	160	Residential/Urban Park	Residential	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA3	6.7-7.6	120	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA4	11.6-12.5	120	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA5	14.3-15.2	100	Commercial	Commercial	PAHs, Metals
	SA6	15.8-16.8	70	Commercial	Commercial	PAHs, Metals
	SA7 (SA6 Dup)	15.8-16.8	70	Commercial	Commercial	Metals
BH 3	BH 3 0-3	0.0-0.9	n.r.	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	BH 3 3-6	0.9-1.8	75	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	SA1	2.4-3.4	100	Residential/Urban Park	Residential	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA2	6.1-6.9	100	Commercial	Commercial	PAHs, Metals
	SA4	7.3-8.2	100	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA5	12.2-13.1	125	Commercial	Commercial	PAHs, Metals
	SA6	13.1-14.0	60	Commercial	Commercial	Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA7	16.2-17.4	80	Commercial	Commercial	PAHs, Metals
BH 4	BH 4 0-3	0.0-0.9	n.r.	Residential/Urban Park	Residential/Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	BH 4 3-6	0.9-1.8	70	Residential/Urban Park	Residential/Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	SA1	3.7-4.6	110	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA2 (SA1 Dup)	3.7-4.6	110	Commercial	Commercial	PAHs, Metals
	SA3	7.3-8.2	125	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA4	10.2-11.0	425	Commercial	Commercial	PAHs, Metals
	SA5	13.4-14.3	550	Commercial	Commercial	PAHs, Metals
BH 5	BH 5 0-4	0.0-1.2	n.r.	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	BH 5 4-7	1.2-2.1	n.r.	Residential/Urban Park	Residential	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	SA1	1.2-2.1	80	Residential/Urban Park	Residential	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA2	4.3-5.2	120	Commercial	Commercial	PAHs, Metals
	SA3	7.3-8.2	80	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA4	10.4-11.3	25	Commercial	Commercial	PAHs, Metals
	SA6	13.4-14.3	90	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO4, Water Ext SO4, TOC, Total InOrg. C)[3]
	SA5	16.5-17.4	n.r.	Commercial	Commercial	
	SA7	19.5-20.4	550	Commercial	Commercial	PAHs, Metals
	SA8	22.6-23.5	80	Commercial	Commercial	PAHs, Metals
BH 6S						
BH 6D	0-3'	0.0-0.9	n.r.	Residential/Urban Park	Urban Park	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	3-6'	0.9-1.8	n.r.	Residential/Urban Park	Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	6-9'	3.7-4.6	n.r.	Commercial	Commercial	
	12-15'	3.7-4.6	n.r.	Commercial	Commercial	
	18-21'	5.5-6.4	n.r.	Commercial	Commercial	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	24-27.5'	7.3-8.4	n.r.	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	28.5-31.5'	8.7-9.6	n.r.	Commercial	Commercial	
BH 7S						
BH 7D	0-3'	0.0-0.9	n.r.	Residential/Urban Park	Urban Park	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	3-6'	0.9-1.8	n.r.	Residential/Urban Park	Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	7-10'	2.1-3.1	n.r.	Residential/Urban Park	Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	10-12'	3.1-3.7	n.r.	Commercial	Commercial	PAHs, Metals
	12-12.5'	3.7-3.8	n.r.	Commercial	Commercial	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
BH 8S						
BH 8D	0-3'	0.0-0.9	n.r.	Residential/Urban Park	Urban Park	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	3-6'	0.9-1.8	n.r.	Residential/Urban Park	Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	7.5-10.5'	2.3-3.2	n.r.	Residential/Urban Park	Urban Park	
	11.5-14'	3.5-4.3	n.r.	Commercial	Commercial	
	14-16'	4.3-4.9	n.r.	Commercial	Commercial	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	16-19'	4.9-5.8	n.r.	Commercial	Commercial	PAHs, Metals, (ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH)[3]
	19-20.5'	5.8-6.3	n.r.	Commercial	Commercial	

Table continued on next page...

TABLE 1 (continued): SOIL ANALYTICAL SCHEDULE

Borehole	Sample ID	Sample Depth (m)	Sample HSVL (ppmv)	Applicable CSR Standards - 2005[1]	Revised Applicable CSR Standards - 2006[2]	Submitted for Chemical Analysis of:
BH 9	SA1	0.1-0.6	30	Residential/Urban Park	Urban Park	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH, EC)[3]
	SA2	0.6-1.2	60	Residential/Urban Park	Urban Park	(Rinse pH, EC)[3]
	SA3	1.5-2.1	60	Residential/Urban Park	Urban Park	(Rinse pH, EC)[3]
	SA4	2.3-2.9	75	Residential/Urban Park	Urban Park	(Rinse pH, EC)[3]
	SA5	3.1-3.7	85	Commercial	Commercial	(Rinse pH, EC)[3]
	SA6	3.7-4.3	80	Commercial	Commercial	(ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C, Paste pH, Rinse pH, EC)[3]
BH 15 through BH 17 - NO SOIL SAMPLES PREVIOUSLY COLLECTED FOR ANALYSIS[4]						
BH 20	0-5'	0.0-1.5	n.r.	Residential/Urban Park	Urban Park	NO SOIL SAMPLES COLLECTED FOR ANALYSIS[4]
	5-10'	1.5-3.1	n.r.	Residential/Urban Park	Urban Park	
	10-15'	3.1-4.6	n.r.	Residential/Urban Park	Commercial	
	15-20'	4.6-6.1	n.r.	Residential/Urban Park	Commercial	
BH 21	0-5'	0.0-1.5	n.r.	Residential/Urban Park	Urban Park	NO SOIL SAMPLES COLLECTED FOR ANALYSIS[4]
	5-10'	1.5-3.1	n.r.	Residential/Urban Park	Urban Park	
	10-20'	3.1-6.1	n.r.	Residential/Urban Park	Commercial	
BH 22	2-7'	0.6-2.1	n.r.	Residential/Urban Park	Urban Park	NO SOIL SAMPLES COLLECTED FOR ANALYSIS[4]
	7-12'	2.1-3.7	n.r.	Residential/Urban Park	Urban Park	
	12-17'	3.7-5.2	n.r.	Residential/Urban Park	Commercial	
BH K-2	SA1	0.0-0.6	n.r.	Residential/Urban Park	Residential	
	SA2	1.1-1.4	n.r.	Residential/Urban Park	Residential	PAHs, arsenic and copper
	SA3	1.8-2.1	n.r.	Residential/Urban Park	Residential	
BH K-3	SA1	0.0-0.6	100	Commercial	Urban Park	
	SA2	0.8-1.4	40	Commercial	Urban Park	
	SA3	1.5-2.1	100	Commercial	Urban Park	PAHs, arsenic and copper, (ABA, Total S, Weak Acid Sol SO_4, Water Ext SO_4, TOC, Total InOrg. C)[3]
	SA4	2.3-2.9	20	Commercial	Urban Park	
	SA5	3.1-3.7	15	Commercial	Commercial	
	SA6	3.8-4.4	20	Commercial	Commercial	PAHs, arsenic and copper
BH K-12	SA1	0.0-0.6	n.r.	Residential/Urban Park	Urban Park	
	SA2	0.8-1.4	n.r.	Residential/Urban Park	Urban Park	
	SA3	1.5-2.1	n.r.	Residential/Urban Park	Urban Park	
	SA4	2.3-2.9	n.r.	Residential/Urban Park	Urban Park	PAHs, arsenic and copper
BH K-13	SA1	0.0-0.6	n.r.	Residential/Urban Park	Urban Park	
	SA2	0.8-1.4	n.r.	Residential/Urban Park	Urban Park	PAHs, arsenic and copper

Notes:
ppmv - parts per million by volume
1 - applicable standards are based on proposed land use as of May 2005, samples greater than 3 m in depth below grade were compared to Commercial Land Use standards as per Section 17 of the BC CSR
2 - revised applicable standards are based on proposed land use as of August 2006, samples greater than 3 m in depth below grade were compared to Commercial Land Use standards as per Section 17 of the BC CSR
3 - geochemistry and acid/base accounting parameters (in parenthesis) were previously reported in Table 7 of the May 2005 DSI report
4 - no soil samples were collected for analysis during the advancement of these boreholes due to limitations presented by the air-rotary drilling method.
n.r. - no readings
Dup - blind field duplicate sample
PAHs - polycyclic aromatic hydrocarbons
ABA - acid base accounting
Total S - total sulphur
Weak Acid Sol SO4 - weak acid soluble sulphate
Water Ext SO4 - water extractable sulphate
TOC - total organic carbon
Total InOrg. C - total inorganic carbon
EC - electrical conductivity

TABLE 2: WASTE COAL PILE HISTORICAL SOIL CHEMISTRY RESULTS - METALS (mg/kg)				
Sample ID	**MW03**	**MW04**	**BC CSR Standard**	
Date	**July 1995**	**July 1995**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**1.0-2.0**	**1.0-2.0**		
pH	--	--	Avg** = 5.1	Avg** = 5.1
Antimony	2.4	<1.5	20[a]	40[a]
Arsenic	9	***22.1***	20[b]	20[b]
Barium	75.3	186	500[a]	2000[a]
Beryllium	0.5	0.5	4[a]	8[a]
Cadmium	1	<0.1	2[b,c]	2[b,c]
Chromium (total)	21.4	16.6	60[b,c]	60[b,c]
Cobalt	16.2	4.4	50[a]	300[a]
Copper	69.6	25.9	100[b,c]	100[b,c]
Lead	5	6	150[b,c]	150[b,c]
Mercury	<0.05	0.26	15[e]	40[e]/150[d]
Molybdenum	<0.4	0.9	10[a]	40[a]
Nickel	25.1	9.6	100[a]	500[a]
Selenium	0.4	0.4	3[a]	10[a]
Silver	<1	<1	20[a]	40[a]
Tin	6	<2	50[a]	300[a]
Zinc	64.2	28.6	150[b,c]	150[b,c]

Notes:
all samples collected by Norecol, Dames and Moore and reported in 1995 and 1998 reports
m - metres
mg/kg - milligrams per dry kilogram
** - average pH of 47 soil samples collected from the Waste Coal Pile is 5.1
< - less than analytical detection limit indicated
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Freshwater)
c - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Marine)
d - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
e - CSR, Schedule 5 Matrix Numerical Soil Standards - intake of contaminated soil
n.s. - no standard listed
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 3: WASTE COAL PILE SOIL CHEMISTRY RESULTS - PAHs (mg/kg)												
Sample ID	**BH1 SA1**	**BH1 SA2**	**BH1 SA4**	**BH1 SA5 (SA4 Dup)**	**BH1 SA6**	**BH2 SA1**	**BH2 SA2 (SA1 Dup)**	**BH2 SA3**	**BH2 SA4**	**BH2 SA5**	**BC CSR Standard**	
Date	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**2.1-3.1**	**6.7-7.6**	**11.3-12.2**	**11.3-12.2**	**12.2-12.8**	**2.1-3.1**	**2.1-3.1**	**6.7-7.6**	**11.6-12.5**	**14.3-15.2**		
Acenaphthene	<0.4	<0.35	<0.04	<0.04	<0.04	<0.45	<0.5	<0.4	<0.6	<0.04	n.s.	n.s.
Acenaphthylene	<0.3	<0.08	<0.05	<0.05	<0.05	<0.35	<0.4	<0.15	<0.1	<0.05	n.s.	n.s.
Anthracene	0.134	0.143	<0.05	<0.05	<0.05	0.182	0.209	0.202	0.234	<0.05	n.s.	n.s.
Benzo(a)anthracene	0.301	0.248	<0.05	<0.05	<0.05	0.378	0.43	0.359	0.427	<0.05	1[a]	10[a]
Benzo(a)pyrene	0.11	0.117	<0.05	<0.05	<0.05	0.151	0.178	0.169	0.201	<0.05	1[b]	10[b]
Benzo(b)fluoranthene	0.207	0.155	<0.05	<0.05	<0.05	0.262	0.303	0.228	0.273	<0.05	1[a]	10[a]
Benzo(g,h,i)perylene	0.071	0.058	<0.05	<0.05	<0.05	0.09	0.107	0.098	0.108	<0.05	n.s.	n.s.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1[a]	10[a]
Chrysene	0.673	0.488	<0.05	<0.05	<0.05	0.841	0.971	0.702	0.82	<0.05	n.s.	n.s.
Dibenz(a,h)anthracene	0.052	<0.05	<0.05	<0.05	<0.05	0.062	0.081	0.057	0.068	<0.05	1[a]	10[a]
Fluoranthene	<0.05	<0.3	<0.05	<0.05	<0.05	<0.05	<0.055	<0.35	<0.45	<0.05	n.s.	n.s.
Fluorene	<0.6	0.703	<0.05	<0.05	<0.05	<0.8	<1	<0.7	1.37	<0.05	n.s.	n.s.
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1[a]	10[a]
Naphthalene	**5.61**	1.78	<0.05	<0.05	<0.05	**8.1**	**9.37**	1.58	1.99	<0.05	5[a]	50[a]
Phenanthrene	**5.63**	3.98	<0.05	<0.05	<0.05	**8.11**	**8.77**	**6.28**	**6.51**	<0.05	5[a]	50[a]
Pyrene	0.347	0.307	<0.05	<0.05	<0.05	0.423	0.478	0.411	0.469	<0.05	10[a]	100[a]

Table continued on next page...

Notes:

m - metres
mg/kg - milligrams per dry kilogram
< - less than the analytical detection limit indicated
Dup - blind field duplicate sample
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 3 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - PAHs (mg/kg)												
Sample ID	**BH2 SA6**	**BH3 SA1**	**BH3 SA2**	**BH3 SA4**	**BH3 SA5**	**BH3 SA7**	**BH4 SA1**	**BH4 SA2 (SA1 Dup)**	**BH4 SA3**	**BH4 SA4**	**BC CSR Standard**	
Date	**21-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**15.8-16.8**	**2.4-3.4**	**6.1-6.9**	**7.3-8.2**	**12.2-13.1**	**16.2-17.4**	**3.7-4.6**	**3.7-4.6**	**7.3-8.2**	**10.2-11.0**		
Acenaphthene	<0.04	<0.55	<0.7	<0.65	<0.5	<0.04	<0.35	<0.3	<0.65	<0.04	n.s.	n.s.
Acenaphthylene	<0.05	<0.25	<0.5	<0.55	<0.15	<0.05	<0.08	<0.08	<0.15	<0.05	n.s.	n.s.
Anthracene	<0.05	0.157	0.192	0.35	0.35	<0.05	0.154	0.13	0.297	<0.05	n.s.	n.s.
Benzo(a)anthracene	<0.05	0.37	0.529	0.58	0.391	<0.05	0.25	0.231	0.475	<0.05	1[a]	10[a]
Benzo(a)pyrene	<0.05	0.17	0.248	0.261	0.177	<0.05	0.109	0.099	0.207	<0.05	1[b]	10[b]
Benzo(b)fluoranthene	<0.05	0.248	0.372	0.395	0.227	<0.05	0.13	0.118	0.233	<0.05	1[a]	10[a]
Benzo(g,h,i)perylene	<0.05	0.097	0.136	0.148	0.096	<0.05	0.059	0.058	0.119	<0.05	n.s.	n.s.
Benzo(k)fluoranthene	<0.05	<0.05	<0.055	<0.065	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1[a]	10[a]
Chrysene	<0.05	0.797	1.21	1.22	0.709	<0.05	0.432	0.385	0.797	<0.05	n.s.	n.s.
Dibenz(a,h)anthracene	<0.05	0.061	0.097	0.1	0.057	<0.05	<0.05	<0.05	0.068	<0.05	1[a]	10[a]
Fluoranthene	<0.05	<0.35	0.512	<0.075	<0.4	<0.05	0.262	0.244	0.51	<0.05	n.s.	n.s.
Fluorene	<0.05	1.55	<2	<1.5	1.38	<0.05	0.727	0.628	1.69	<0.05	n.s.	n.s.
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1[a]	10[a]
Naphthalene	<0.05	**7.27**	**9.49**	**13.8**	0.895	<0.05	0.871	0.832	1.01	<0.05	5[a]	50[a]
Phenanthrene	<0.05	**7.27**	**11.1**	**11.3**	**6.12**	0.05	3.22	2.8	**5.95**	0.055	5[a]	50[a]
Pyrene	<0.05	0.37	0.604	0.64	0.438	<0.05	0.288	0.276	0.54	<0.05	10[a]	100[a]

Table continued on next page...

Notes:

m - metres
mg/kg - milligrams per dry kilogram
< - less than the analytical detection limit indicated
Dup - blind field duplicate sample
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 3 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	BH4 SA5	BH5 SA1	BH5 SA2	BH5 SA3	BH5 SA4	BH5 SA6	BH5 SA7	BH5 SA8	BH6D 0-3	BH6D 24-27.5	BH7S 0-3	BHC (BH7S 0-3 Dup)	BC CSR Standard	
Date	22-Jan-04	23-Jan-04	23-Jan-04	23-Jan-04	23-Jan-04	23-Jan-04	23-Jan-04	23-Jan-04	01-Sep-04	01-Sep-04	02-Sep-04	02-Sep-04	CSR RL/PL	CSR CL/IL
Depth (m)	13.4-14.3	1.2-2.1	4.3-5.2	7.3-8.2	10.4-11.3	13.4-14.3	19.5-20.4	22.6-23.5	0-0.9	7.3-8.4	0-0.9	0.0-0.9		
Acenaphthene	<0.04	<0.6	<0.75	<0.5	<0.3	<0.5	<0.04	<0.04	<0.3	0.369	<0.08	<0.15	n.s.	n.s.
Acenaphthylene	<0.05	<0.45	<0.5	<0.4	<0.15	<0.15	<0.05	<0.05	<0.2	<0.15	<0.15	<0.15	n.s.	n.s.
Anthracene	<0.05	0.227	0.284	0.142	0.154	0.221	<0.05	<0.05	0.177	0.168	0.187	0.161	n.s.	n.s.
Benzo(a)anthracene	<0.05	0.457	0.498	0.39	0.267	0.366	<0.05	<0.05	0.476	0.359	0.431	0.383	1[a]	10[a]
Benzo(a)pyrene	<0.05	0.194	0.225	0.148	0.121	0.167	<0.05	<0.05	0.167	0.152	0.092	0.077	1[b]	10[b]
Benzo(b)fluoranthene	<0.05	0.276	0.289	0.214	0.141	0.208	<0.05	<0.05	0.323	0.212	0.397	0.362	1[a]	10[a]
Benzo(g,h,i)perylene	<0.05	0.115	0.125	0.1	0.075	0.109	<0.05	<0.05	0.145	0.093	0.098	0.083	n.s.	n.s.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1[a]	10[a]
Chrysene	<0.05	1.05	0.974	0.855	0.491	0.664	<0.05	<0.05	1.05	0.622	<1.5	1.1	n.s.	n.s.
Dibenz(a,h)anthracene	<0.05	0.084	0.086	0.065	<0.05	0.057	<0.05	<0.05	0.081	0.054	0.076	0.068	1[a]	10[a]
Fluoranthene	<0.05	0.461	0.544	<0.5	0.241	0.39	<0.05	<0.05	<0.4	0.379	0.692	0.624	n.s.	n.s.
Fluorene	<0.05	1.72	1.85	<0.9	0.673	1.07	<0.05	<0.05	<0.3	0.856	<0.08	<0.06	n.s.	n.s.
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1[a]	10[a]
Naphthalene	<0.05	**8.19**	**11.9**	**5.33**	1.08	1.05	<0.05	<0.05	**11.9**	1.09	**5.65**	**5.22**	5[a]	50[a]
Phenanthrene	<0.05	**8.5**	**9.14**	**6.3**	3.53	4.6	0.066	<0.05	**6.98**	4.84	**8.95**	**8.17**	5[a]	50[a]
Pyrene	<0.05	0.555	0.584	0.448	0.315	0.452	<0.05	<0.05	0.463	0.401	0.595	0.555	10[a]	100[a]

Table continued on next page...

Notes:

m - metres
mg/kg - milligrams per dry kilogram
< - less than the analytical detection limit indicated
Dup - blind field duplicate sample
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
n.s. - no standard listed

shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 3 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - PAHs (mg/kg)										
Sample ID	**BH7S 10-12**	**BH8D 0-3**	**BH8D 16-19**	**BHK-2 SA2**	**BHK-12 SA4**	**BHK-13 SA2**	**BHK-3 SA3**	**BHK-3 SA6**	**BC CSR Standard**	
Date	**02-Sep-04**	**02-Sep-04**	**02-Sep-04**	**08-Dec-04**	**09-Dec-04**	**09-Dec-04**	**08-Dec-04**	**08-Dec-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**3.1-3.7**	**0-0.9**	**4.9-5.8**	**1.1-1.4m**	**2.3-2.9**	**0.8-1.4**	**1.5-2.1**	**3.8-4.4**		
Acenaphthene	<0.3	<0.25	<0.3	<0.04	<0.04	<0.4	<0.6	<0.04	n.s.	n.s.
Acenaphthylene	<0.2	<0.15	<0.06	<0.05	<0.05	<0.2	<0.2	<0.05	n.s.	n.s.
Anthracene	0.145	0.146	0.117	<0.05	<0.05	0.234	0.251	<0.05	n.s.	n.s.
Benzo(a)anthracene	0.464	0.372	0.187	<0.05	<0.05	0.611	0.636	<0.05	1[a]	10[a]
Benzo(a)pyrene	0.152	0.15	0.083	<0.05	<0.05	0.225	0.236	<0.05	1[b,c]	10[b,c]
Benzo(b)fluoranthene	0.358	0.212	0.113	<0.05	<0.05	0.469	0.482	<0.05	1[a]	10[a]
Benzo(g,h,i)perylene	0.156	0.104	0.055	<0.05	<0.05	0.219	0.174	<0.05	n.s.	n.s.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.053	<0.072	<0.05	1[a]	10[a]
Chrysene	1.1	0.706	<0.4	<0.05	<0.05	1.21	<1.5	<0.05	n.s.	n.s.
Dibenz(a,h)anthracene	0.095	0.056	<0.05	<0.05	<0.05	0.111	0.12	<0.05	1[a]	10[a]
Fluoranthene	0.429	0.282	0.185	<0.05	<0.05	0.718	0.723	<0.05	n.s.	n.s.
Fluorene	<0.3	<0.2	0.488	<0.05	<0.05	0.396	0.483	<0.05	n.s.	n.s.
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	0.069	0.055	<0.05	1[a]	10[a]
2-Methylnaphthalene	---	---	---	<0.05	0.076	2.18	6.9	0.129	n.s.	n.s.
Naphthalene	1.37	**7.88**	0.705	<0.05	0.055	1.35	4.99	0.101	5[a]	50[a]
Phenanthrene	**8.8**	4.76	2.71	0.052	0.165	**8.81**	10.7	0.178	5[a]	50[a]
Pyrene	0.525	0.352	0.205	<0.05	<0.05	0.786	0.805	<0.05	10[a]	100[a]

Notes:
m - metres
mg/kg - milligrams per dry kilogram
< - less than the analytical detection limit indicated
Dup - blind field duplicate sample
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 4: WASTE COAL PILE SOIL CHEMISTRY RESULTS - METALS (mg/kg)											
Sample ID	**BH1 SA1**	**BH1 SA2**	**BH1 SA3 (SA2 Dup)**	**BH1 SA4**	**BH1 SA5 (SA4 Dup)**	**BH1 SA6**	**BH2 SA1**	**BH2 SA2 (SA1 Dup)**	**BH2 SA3**	**BC CSR Standard**	
Date	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**20-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**2.1-3.1**	**6.7-7.6**	**6.7-7.6**	**11.3-12.2**	**11.3-12.2**	**12.2-12.8**	**2.1-3.1**	**2.1-3.1**	**6.7-7.6**		
pH	3.03	4.3	4.28	4.4	4.39	4.46	3.57	4.56	4.64	Avg* = 5.1	Avg* = 5.1
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	20[a]	40[a]
Arsenic	***127***	8.1	7.8	11.8	11.2	11.6	***87.4***	***34.6***	***34.1***	20[b]	20[b]
Barium	142	34.2	32	19.6	26.3	16	118	47.3	80.1	500[a]	2000[a]
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4[a]	8[a]
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2[b,c]	2[b,c]
Chromium (total)	5.6	5.8	5.8	28	28.7	26	16.4	5.3	7.3	60[b,c]	60[b,c]
Cobalt	<2	10.4	10.8	14.6	14.5	14.1	13.2	20	12.7	50[a]	300[a]
Copper	22.3	67.3	64.5	57.8	57.4	59.3	***190***	51.8	53.2	100[b,c]	100[b,c]
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	150[b,c]	150[b,c]
Mercury	0.537	0.459	0.437	<0.05	<0.05	<0.05	0.674	0.303	0.37	15[e]	40[e]/150[d]
Molybdenum	4.1	<4	<4	<4	<4	<4	<4	<4	4.5	10[a]	40[a]
Nickel	6.1	23.6	24.3	30.4	29.2	28.5	18	24.5	18.4	100[a]	500[a]
Selenium	<3	<2	<2	<2	<3	<2	<2	<2	<3	3[a]	10[a]
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	20[a]	40[a]
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	50[a]	300[a]
Vanadium	28.8	22.8	23.7	116	124	120	55	34.2	38	200[a]	n.s.
Zinc	21.3	56.2	59.1	54.4	53.2	50.4	38.7	133	53.2	150[b,c]	150[b,c]

Table continued on next page...

Notes:
m - metres
mg/kg - milligrams per dry kilogram
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< - less than analytical detection limit indicated
Dup - blind field duplicate sample
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Freshwater)
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d - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
e - CSR, Schedule 5 Matrix Numerical Soil Standards - intake of contaminated soil
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 4 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - METALS (mg/kg)											
Sample ID	**BH2 SA4**	**BH2 SA5**	**BH2 SA6**	**BH2 SA7 (SA6 Dup)**	**BH3 SA1**	**BH3 SA2**	**BH3 SA3 (SA2 Dup)**	**BH3 SA4**	**BH3 SA5**	**BC CSR Standard**	
Date	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**22-Jan-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**11.6-12.5**	**14.3-15.2**	**15.9-16.8**	**15.9-16.8**	**2.4-3.4**	**6.1-7.0**	**6.1-7.0**	**7.3-8.2**	**12.2-13.1**		
pH	5.61	4.35	4.32	4.35	4.69	4.64	5.06	3.22	7.38	Avg* = 5.1	Avg* = 5.1
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	20[a]	40[a]
Arsenic	7	8.3	9.9	9.9	***37.5***	***32.8***	***37.6***	***30.9***	7.9	20[b]	20[b]
Barium	33.5	8.3	10.3	10.6	52.4	100	87	78.3	36	500[a]	2000[a]
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4[a]	8[a]
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2[b,c]	2[b,c]
Chromium (total)	4.7	24.8	25	24	5.3	7.1	6.9	4.5	5.2	60[b,c]	60[b,c]
Cobalt	8.7	12.8	12	11.8	22.3	10.9	10.6	3.9	13.3	50[a]	300[a]
Copper	51	41	55.8	52.1	58.7	52.6	51.2	30.6	52.5	100[b,c]	100[b,c]
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	150[b,c]	150[b,c]
Mercury	0.521	<0.05	<0.05	<0.05	0.298	0.367	0.368	0.378	0.523	15[e]	40[e]/150[d]
Molybdenum	<4	<4	<4	<4	<4	<4	<4	<4	<4	10[a]	40[a]
Nickel	12.8	24.9	23.1	22.9	27.2	15.8	15.5	7.1	17.2	100[a]	500[a]
Selenium	<2	<3	<2	<2	<2	<2	<2	<2	<2	3[a]	10[a]
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	20[a]	40[a]
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	50[a]	300[a]
Vanadium	38.7	97.4	109	108	33.4	38.7	39.8	23.6	32.2	200[a]	n.s.
Zinc	35	47.2	47.8	46.2	61.8	45.9	48.2	21.9	64.5	150[b,c]	150[b,c]

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Notes:
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mg/kg - milligrams per dry kilogram
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< - less than analytical detection limit indicated
Dup - blind field duplicate sample
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Freshwater)
c - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Marine)
d - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
e - CSR, Schedule 5 Matrix Numerical Soil Standards - intake of contaminated soil
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

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TABLE 4 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - METALS (mg/kg)

Sample ID	BH3 SA6	BH3 SA7	BH4 SA1	BH4 SA2 (SA1 Dup)	BH4 SA3	BH4 SA4	BH4 SA5	BH5 SA1	BH5 SA2	BC CSR Standard	
Date	22-Jan-04	22-Jan-04	22-Jan-04	22-Jan-04	22-Jan-04	22-Jan-04	22-Jan-04	23-Jan-04	23-Jan-04	CSR RL/PL	CSR CL/IL
Depth (m)	13.1-14.0	16.2-17.4	3.7-4.6	3.7-4.6	7.3-8.2	10.2-11.0	13.4-14.3	1.2-2.1	4.3-5.2		
pH	7.5	3.81	4.29	4.21	6	5.19	5.12	3.26	4.78	Avg* = 5.1	Avg* = 5.1
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	20[a]	40[a]
Arsenic	9.6	7.5	18.6	15.3	8.4	8.5	9.8	***26.1***	***26.1***	20[b]	20[b]
Barium	30.7	8.2	43.6	38.5	45.8	25.6	17.7	77.3	58.2	500[a]	2000[a]
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4[a]	8[a]
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2[b,c]	2[b,c]
Chromium (total)	7.6	28.5	14.1	12.7	3.4	32.9	32.1	5.2	5.9	60[b,c]	60[b,c]
Cobalt	13.1	11.7	12.2	12	19.5	23.3	15.8	5	10.9	50[a]	300[a]
Copper	72.8	53.5	***274***	***202***	45.3	40.3	77.3	***106***	51	100[b,c]	100[b,c]
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	150[b,c]	150[b,c]
Mercury	0.366	<0.05	0.807	0.514	0.513	<0.05	<0.05	0.234	0.333	15[e]	40[e]/150[d]
Molybdenum	<4	<4	<4	<4	<4	<4	<4	<4	<4	10[a]	40[a]
Nickel	20.4	20.1	26.2	23.9	15.8	30.9	29.6	8.4	15.3	100[a]	500[a]
Selenium	<2	<2	<3	<2	<2	<2	<2	<2	<2	3[a]	10[a]
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	20[a]	40[a]
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	50[a]	300[a]
Vanadium	28.2	110	32.7	28.6	27.8	117	128	21.4	33.3	200[a]	n.s.
Zinc	55.7	40.3	139	76.2	139	51	51.1	11.3	46.1	150[b,c]	150[b,c]

Table continued on next page...

Notes:
m - metres
mg/kg - milligrams per dry kilogram
* - average pH of 47 soil samples collected from the Waste Coal Pile is 5.1
< - less than analytical detection limit indicated
Dup - blind field duplicate sample
CSR - Contaminated Sites Regulation, 1997
CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Freshwater)
c - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Marine)
d - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
e - CSR, Schedule 5 Matrix Numerical Soil Standards - intake of contaminated soil
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 4 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - METALS (mg/kg)											
Sample ID	**BH5 SA3**	**BH5 SA4**	**BH5 SA6**	**BH5 SA7**	**BH5 SA8**	**BH6D 0-3**	**BH6D 24-27.5**	**BH7S 0-3**	**BHC (BH7S 0-3 Dup)**	**BC CSR Standard**	
Date	**23-Jan-04**	**23-Jan-04**	**23-Jan-04**	**23-Jan-04**	**23-Jan-04**	**01-Sep-04**	**01-Sep-04**	**02-Sep-04**	**02-Sep-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**7.3-8.2**	**10.4-11.2**	**13.4-14.3**	**19.5-20.4**	**22.6-23.5**	**0.0-0.9**	**7.3-8.4**	**0.0-0.9**	**0.0-0.9**		
pH	5.18	7.5	7.72	5.94	4.44	3.38	4.07	3.54	3.74	Avg* = 5.1	Avg* = 5.1
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	20[a]	40[a]
Arsenic	***23.1***	17.2	8.4	8.9	10.2	***173***	12.9	***30.3***	***31.4***	20[b]	20[b]
Barium	109	31.6	44.7	14.1	15	71.5	37.4	149	155	500[a]	2000[a]
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4[a]	8[a]
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.56	<0.5	<0.5	2[b,c]	2[b,c]
Chromium (total)	5	5	6.3	30	30	8.2	7.8	10.4	11.1	60[b,c]	60[b,c]
Cobalt	2.6	11.6	12.2	14	13.2	8.6	13	<2	<2	50[a]	300[a]
Copper	58.3	***119***	68.3	56.4	68.4	49.8	68.9	27.9	30.3	100[b,c]	100[b,c]
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	150[b,c]	150[b,c]
Mercury	0.447	0.559	0.471	<0.05	<0.05	2.37	0.55	0.672	0.755	15[e]	40[e]/150[d]
Molybdenum	<4	<4	<4	<4	<4	4.9	<4	<4	<4	10[a]	40[a]
Nickel	6	18	19.2	27.5	25.2	15.1	20.9	<5	<5	100[a]	500[a]
Selenium	<3	<2	<2	<2	<2	<2	<2	<2	<2	3[a]	10[a]
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	20[a]	40[a]
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	50[a]	300[a]
Vanadium	22.7	26.5	26.6	112	113	42.6	32.5	33.8	34.1	200[a]	n.s.
Zinc	25.5	48.4	44.9	45.1	42.6	50	61.7	8.5	8.1	150[b,c]	150[b,c]

Table continued on next page...

Notes:
m - metres
mg/kg - milligrams per dry kilogram
* - average pH of 47 soil samples collected from the Waste Coal Pile is 5.1
< - less than analytical detection limit indicated
Dup - blind field duplicate sample
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CSR PL - BC Contaminated Sites Regulation, urban park land use standards
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CSR IL - BC Contaminated Sites Regulation, industrial land use standards
a - CSR, Schedule 4 Generic Numerical Soil Standards
b - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Freshwater)
c - CSR, Schedule 5 Matrix Numerical Soil Standards - groundwater flow to surface water used by aquatic life (Marine)
d - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
e - CSR, Schedule 5 Matrix Numerical Soil Standards - intake of contaminated soil
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

TABLE 4 (continued): WASTE COAL PILE SOIL CHEMISTRY RESULTS - METALS (mg/kg)										
Sample ID	**BH7S 10-12**	**BH8D 0-3**	**BH8D 16-19**	**BHK-2 SA2**	**BHK-12 SA4**	**BHK-13 SA2**	**BHK-3 SA3**	**BHK-3 SA6**	**BC CSR Standard**	
Date	**02-Sep-04**	**02-Sep-04**	**02-Sep-04**	**08-Dec-04**	**09-Dec-04**	**09-Dec-04**	**08-Dec-04**	**08-Dec-04**	**CSR RL/PL**	**CSR CL/IL**
Depth (m)	**3.0-3.7**	**0.0-0.9**	**4.9-5.8**	**1.1-1.4**	**2.3-2.9**	**0.8-1.4**	**1.5-2.1**	**3.8-4.4**		
pH	3.68	7.5	7.74	7.62	4.02	7.35	6.61	7.18	Avg* = 5.1	Avg* = 5.1
Antimony	<10	<10	<10	--	--	--	--	--	20[a]	40[a]
Arsenic	***31.3***	***67.5***	11.3	8.9	9	6.4	10.2	***173***	20[b]	20[b]
Barium	158	52	63.4	--	--	--	--	--	500[a]	2000[a]
Beryllium	<0.5	<0.5	<0.5	--	--	--	--	--	4[a]	8[a]
Cadmium	<0.5	<0.5	<0.5	--	--	--	--	--	2[b,c]	2[b,c]
Chromium (total)	11.3	7.4	10.7	--	--	--	--	--	60[b,c]	60[b,c]
Cobalt	<2	14.2	10.8	--	--	--	--	--	50[a]	300[a]
Copper	29	***142***	70.8	56.4	90.8	44.3	68.4	49.8	100[b,c]	100[b,c]
Lead	<50	<50	<50	--	--	--	--	--	150[b,c]	150[b,c]
Mercury	0.716	1.09	0.276	--	--	--	--	--	15[e]	40[e]/150[d]
Molybdenum	<4	<4	<4	--	--	--	--	--	10[a]	40[a]
Nickel	<5	25.9	20.1	--	--	--	--	--	100[a]	500[a]
Selenium	<2	<3	<2	--	--	--	--	--	3[a]	10[a]
Silver	<2	<2	<2	--	--	--	--	--	20[a]	40[a]
Tin	<5	<5	<5	--	--	--	--	--	50[a]	300[a]
Vanadium	32.7	47.2	38.8	--	--	--	--	--	200[a]	n.s.
Zinc	8.7	57.7	48.2	--	--	--	--	--	150[b,c]	150[b,c]

Notes:
m - metres
mg/kg - milligrams per dry kilogram
* - average pH of 47 soil samples collected from the Waste Coal Pile is 5.1
< - less than analytical detection limit indicated
"--" - sample not analyzed for parameter indicated
Dup - blind field duplicate sample
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CSR RL - BC Contaminated Sites Regulation, residential land use standards
CSR PL - BC Contaminated Sites Regulation, urban park land use standards
CSR CL - BC Contaminated Sites Regulation, commercial land use standards
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d - CSR, Schedule 5 Matrix Numerical Soil Standards - toxicity to soil invertebrates and plants
e - CSR, Schedule 5 Matrix Numerical Soil Standards - intake of contaminated soil
n.s. - no standard listed
shade - exceeds CSR RL/PL standards
shade and italics - exceeds CSR RL/PL and CL/IL standards

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TABLE 5: WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - DISSOLVED METALS AND INORGANICS (µg/L)

Sample ID	BH1		BH2			BH3			BH4	BH5			CSR AWM[2]	CSR AWF[2]
Date (dd-mmm-yy)	28-Jan-04	03-Sep-04	28-Jan-04	03-Sep-04	13-Oct-05	28-Jan-04	3-Sep-04	13-Oct-05	28-Jan-04	28-Jan-04	BH6 (28-Jan-04 Dup)	03-Sep-04		
pH	---	3.61	---	5.51	---	---	4.80	---	---	---	---	5.00	ns	ns
Salinity (o/oo)	---	---	---	---	---	---	---	---	---	---	---	---	10 g/L[e]	15 g/L
Chloride (mg/L)	17.9	11.7	26	22.7	---	4.54	57.4	---	8.94	33.3	30.3	27.9	ns	ns
Fluoride (mg/L)	5	2	0.042	0.085	---	0.092	10.9	---	0.42	0.259	0.211	1.66	3,000[d]	3,000[d]
Bromide (mg/L)	---	---	---	---	---	---	---	---	---	---	---	---	ns	ns
Nitrate-N (mg/L)	<0.25*	<0.1	<0.25*	<0.1	---	<0.25*	<0.1	---	<0.25*	<0.25*	<0.0050	<0.1	0.2-2	400
Nitrite-N (mg/L)	<0.050	<0.1	<0.050	<0.1	---	<0.050	<0.1	---	<0.050	<0.050	0.0023	<0.1	ns	200-2,000
Sulphate-SO4 (mg/L)	**4,310**	**2,340**	**4,000**	**3,700**	---	**2,690**	**4,290**	---	**1,620**	**2,210**	**2,230**	**2,310**	1,000	1,000
Sulphite-SO3 (mg/L)	<0.50	---	<0.50	---	---	<0.50	-	---	<0.50	<0.50	<0.50	---	ns	ns
Hardness (mg/L)H	1,120	694	1,710	1,660	---	1,590	1,410	---	732	1,260	1,350	1,150	ns	ns
Total Alkalinity (mg/L)	---	---	---	24.2	46.5	---	14.3	10.2	---	---	---	13.7	ns	ns
Aluminum	122,000	54,100	<200	<200	---	<100	6,200	---	8,220	310	250	9,700	ns	ns
Antimony	<10	<5	<10	<10	---	<5	<10	---	<5	<5	<5	<5	200	200
Arsenic	*<20*	<10	<20	<20	---	<10	<20	---	<10	<10	<10	<10	120	50
Barium	<40	<20	<40	<40	---	24	32	---	31	27	27	26	5,000	10,000
Beryllium	22	11	<10	<10	---	<5	<5	---	<5	<5	<5	<5	1,000	53
Boron	240	150	1430	1390	---	810	380	---	250	620	630	400	50,000	ns
Cadmium	**1.6**	0.76	<1*	<1*	---	<0.5	**1.2**	---	**9.19**	<0.5	<0.5	0.86	1	3.89[a]
Calcium	374,000	230,800	523,000	395,400	---	497,000	404,050	---	253,000	312,000	329,000	302,600	ns	ns
Total Chromium	<10	<5	<10	<10	---	<5	<10	---	<5	<5	<5	<5	150[b]/560[c]	10[b]/90[c]
Cobalt	**467**	**280**	**45**	**82**	---	<5	**463**	---	**206**	**73**	**70.3**	**115**	40	40
Copper	**24**	**22**	<20	<20	---	<10	<20	---	**62**	<10	<10	<10	20	90
Iron	1,250,000	661,000	1,180,000	1,420,000	---	493,000	975,000	---	405,000	378,000	374,000	590,000	ns	ns
Lead	<20	<10	<20	<20	---	<10	<20	---	<10	<10	<10	<10	20	160
Lithium	<100	<50	200	200	---	184	79	---	78	80	77	103	ns	ns
Magnesium	45,700	28,600	97,400	88,100	---	85,000	97,400	---	24,300	118,000	128,000	95,800	ns	ns
Manganese	7,040	4,480	7,250	8,380	---	4,110	17,500	---	4,580	3,030	3,020	4,080	ns	ns
Mercury	<0.2	<0.2	<0.2	<0.2	---	<0.2	<0.2	---	<0.2	<0.2	<0.2	<0.2	1	1
Molybdenum	<20	<10	<20	<20	---	<10	<20	---	<10	<10	<10	<10	10,000	10,000
Nickel	**530**	**251**	**110**	**120**	---	<50	**610**	---	**293**	**97**	**93**	**154**	83	1,500
Selenium	<20*	<10	<20*	<20*	---	<10	<20*	---	<10	<10	<10	<10	540	10
Silver	2.7	<0.5	<1	<1	---	<0.5	<1	---	<0.5	<0.5	<0.5	<0.5	15	15
Sodium	19,500	12,000	21,800	24,300	---	7,600	30,500	---	8,400	21,000	20,500	27,300	ns	ns
Thallium	<4*	<2	<4*	<4*	---	<2	<4*	---	<2	<2	<2	<2	3	3
Titanium	<100	<50	<100	<100	---	<50	<50	---	<50	<50	<50	<50	1,000	1,000
Uranium	<4	<2	<4	<4	---	<2	<4	---	<2	<2	<2	<2	1,000	3,000
Vanadium	<60	<30	<60	<60	---	<30	<30	---	<30	<30	<30	<30	ns	ns
Zinc	**2,990**	**1,510**	83	**130**	---	13	**1,680**	---	**706**	**201**	**196**	**483**	100	12,563[a]

Table continued on next page...

Notes:
µg/L - micrograms per litre
mg/L - milligrams per litre
H Tide - high tide
L Tide - low tide
E Tide - ebb tide
F Tide - flood tide
H - hardness in milligrams per litre CaCO3
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
Dup - blind field duplicate sample
< - less than analytical detection limit indicated
"---" - sample not analyzed for parameter indicated
* - Detection limit exceeds CSR AWM and/or CSR AWF
CSR - Contaminated Sites Regulation, 1997
CSR AWM - BC Contaminated Sites Regulation, Marine Aquatic Life Standards
CSR AWF - BC Contaminated Sites Regulation, Freshwater Aquatic Life Standards
2 - CSR AWM and AWF standards for groundwater samples analysed for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations
a - Site-specific freshwater water quality standards for cadmium and zinc, calculated as per BC MOE Protocol 10 for Contaminated Sites, dated 2/12/2001; based on the average hardness for the groundwater samples of 1755 mg/L (n=19)
b - standard for Chromium (+6)
c - standard for Chromium (+3)
d - CSR Schedule 6 Generic Numerical Water Standards Aquatic Life (AW) Hardness >= 50mg/L
e - standard applicable where natural salinity is 0-<3.5 g/L
ns - no standard listed
bold - exceeds CSR AWM
shade - exceeds CSR AWM and CSR AWF
italics - exceeds CSR AWF

TABLE 5 (continued): WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - DISSOLVED METALS AND INORGANICS (µg/L)

Sample ID	BH6S				BH6D				BH7D	BH8S		
Date (dd-mmm-yy)	03-Sep-04	04-Feb-05	11-Sep-05	13-Oct-05	03-Sep-04	BHA (03-Sep-04 Dup)	11-Sep-05	13-Oct-05	22-Feb-05	04-Apr-06	CSR AWM[2]	CSR AWF[2]
Tidal Height[1]	-	-	-	-	-	-	-	-	-	(L Tide)		
Time	-	-	-	-	-	-	-	-	-	14:30		
pH	3.91	---	4.17	---	4.05	4.1	3.89	---	---	6.04	ns	ns
Salinity (o/oo)	---	---	---	---	---	---	---	---	---	1.8	10 g/L[e]	15 g/L
Chloride (mg/L)	11,700	1,590	---	---	12,500	12,500	---	---	---	466	ns	ns
Fluoride (mg/L)	3.07	---	---	---	2.14	2.13	---	---	---	---	3000[d]	3000[d]
Bromide (mg/L)	---	---	---	---	---	---	---	---	---	---	ns	ns
Nitrate-N (mg/L)	<0.1	---	---	---	<0.1	<0.1	---	---	---	---	0.2-2	400
Nitrite-N (mg/L)	<0.1	---	---	---	<0.1	<0.1	---	---	---	---	ns	200-2000
Sulphate-SO4 (mg/L)	**2,840**	**4,370**	**3,010**	---	**2,650**	**2,650**	**3,410**	---	77.8	---	1,000	1,000
Sulphite-SO3 (mg/L)	---	---	---	---	---	---	---	---	---	---	ns	ns
Hardness (mg/L)H	4,100	1,590	3,560	---	4,430	3,960	3,160	---	105	---	ns	ns
Total Alkalinity (mg/L)	< 1.0	---	---	< 2.0	< 1.0	< 1.0	---	< 2.0	---	---	ns	ns
Aluminum	162,000	56,500	118,000	---	119,000	134,000	159,000	---	1,180	1570	ns	ns
Antimony	<50	<10	<25	---	<50	<50	<25	---	<10	---	200	200
Arsenic	<100*	<20*	<50	---	<100*	<100*	<50	---	<4	< 0.20	120	50
Barium	<200	<100	<200	---	<200	<200	<200	---	50	---	5,000	10,000
Beryllium	<50	<25	<50	---	<50	<50	<50	---	<5	---	1,000	53
Boron	<1000	980	1500	---	1900	1600	1200	---	<0.10	---	50,000	ns
Cadmium	**9.2**	**6.6**	**6.5**	---	**6.7**	**7.2**	**8.4**	---	0.44	**2.38**	1	3.89[a]
Calcium	543,600	443,000	457,000	---	471,300	419,900	520,000	---	30,400	---	ns	ns
Total Chromium	<50*	<10	<25*	---	<50*	<50*	<25*	---	<2	---	150[b]/560[c]	10[b]/90[c]
Cobalt	**258**	**347**	**350**	---	**214**	**224**	**504**	---	19	9.66	40	40
Copper	<100*	**196**	<50*	---	<100*	<100*	<50*	---	**61.7**	13.3	20	90
Iron	983,000	1,470,000	1,000,000	---	603,000	539,000	1,440,000	---	4,650	< 10	ns	ns
Lead	<100*	<20	<50*	---	<100*	<100*	<50*	---	<2	0.081	20	160
Lithium	<500	360	<500	---	<500	<500	500	---	<50	---	ns	ns
Magnesium	666,000	118,000	588,000	---	790,000	707,000	451,000	---	7,110	---	ns	ns
Manganese	7,060	10,600	6,990	---	4,820	4,310	9,780	---	541	258	ns	ns
Mercury	<0.2	<0.2	<0.2	---	<0.2	<0.2	<0.2	---	<0.2	---	1	1
Molybdenum	<100	<20	<50	---	<100	<100	<50	---	<2	---	10,000	10,000
Nickel	<500*	**460**	**550**	---	<500*	<500*	**790**	---	31	**101**	83	1,500
Selenium	<100*	<20	<50*	---	<100*	<100*	<50*	---	<2	---	540	10
Silver	<5	<1	<2.5	---	<5	<5	<2.5	---	<0.1	---	15	15
Sodium	5,840,000	182,000	4,390,000	---	6,610,000	5,960,000	3,600,000	---	14,300	---	ns	ns
Thallium	<20*	<4	<10*	---	<20*	<20*	<10*	---	<0.4	---	3	3
Titanium	<500	<250	<500	---	<500	<500	<500	---	<50	---	1,000	1,000
Uranium	<20	<4	<10	---	<20	<20	<10	---	<0.4	< 0.050	1,000	3,000
Vanadium	<300	760	<300	---	<300	<300	<300	---	<30	---	ns	ns
Zinc	**1,600**	**2,120**	**2,120**	---	**1,310**	**1,170**	**2,920**	---	66.1	**298**	100	12,563[a]

Table continued on next page...

Notes:
µg/L - micrograms per litre
mg/L - milligrams per litre
H Tide - high tide
L Tide - low tide
E Tide - ebb tide
F Tide - flood tide
H - hardness in milligrams per litre CaCO3
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
Dup - blind field duplicate sample
< - less than analytical detection limit indicated
"---" - sample not analyzed for parameter indicated
* - Detection limit exceeds CSR AWM and/or CSR AWF
CSR - Contaminated Sites Regulation, 1997
CSR AWM - BC Contaminated Sites Regulation, Marine Aquatic Life Standards
CSR AWF - BC Contaminated Sites Regulation, Freshwater Aquatic Life Standards
2 - CSR AWM and AWF standards for groundwater samples analysed for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations
a - Site-specific freshwater water quality standards for cadmium and zinc, calculated as per BC MOE Protocol 10 for Contaminated Sites, dated 2/12/2001; based on the average hardness for the groundwater samples of 1755 mg/L (n=19)
b - standard for Chromium (+6)
c - standard for Chromium (+3)
d - CSR Schedule 6 Generic Numerical Water Standards Aquatic Life (AW) Hardness >= 50mg/L
e - standard applicable where natural salinity is 0-<3.5 g/L
ns - no standard listed
bold - exceeds CSR AWM
shade - exceeds CSR AWM and CSR AWF
italics - exceeds CSR AWF

SEACOR ENVIRONMENTAL INC.

TABLE 5 (continued): WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - DISSOLVED METALS AND INORGANICS (µg/L)

Sample ID	BH8D				BH15								
Date (dd-mmm-yy)	03-Sep-04	11-Sep-05	14-Dec-05	4-Apr-06 (L Tide)	22-Feb-05	11-Sep-05	14-Dec-05	10-Feb-06 (E Tide)	10-Feb-06 (L Tide)	11-Feb-06 (F Tide)	4-Apr-06 (L Tide)	CSR AWM[2]	CSR AWF[2]
Tidal Height[1]	-	-	-		-	-	-						
Time	-	-	-	14:20	-	-	-	19:07	22:32	1:39	15:20		
pH	6.22	6.31	5.95	6.34	---	6.54	6.14	5.90	5.89	5.91	6.32	ns	ns
Salinity (o/oo)	---	---	1.9	2.1	---	---	2.0	1.9	1.8	1.9	1.4	10 g/L[e]	15 g/L
Chloride (mg/L)	938	---	335	97.8	---	---	38.6	8.09	5.18	5.34	6.05	ns	ns
Fluoride (mg/L)	0.221	---	0.34	---	---	---	0.94	---	---	---	---	3,000[d]	3,000[d]
Bromide (mg/L)	---	---	< 0.50	---	---	---	<0.50	---	---	---	---	ns	ns
Nitrate-N (mg/L)	< 0.1	---	< 0.050	---	---	---	---	---	---	---	---	0.2-2	400
Nitrite-N (mg/L)	< 0.1	---	0.062	---	---	---	---	---	---	---	---	ns	200-2000
Sulphate-SO4 (mg/L)	**1,900**	**1,910**	**1,740**	---	**2,080**	**3,100**	**2,620**	---	---	---	---	1,000	1,000
Sulphite-SO3 (mg/L)	---	---	---	---	---	---	---	---	---	---	---	ns	ns
Hardness (mg/L)H	1,680	1,170	---	---	1,570	1,540	---	---	---	---	---	ns	ns
Total Alkalinity (mg/L)	78.9	---	---	---	---	---	---	---	---	---	---	ns	ns
Aluminum	<100	<50	< 50	< 100	<100	<100	< 50	---	---	---	170	ns	ns
Antimony	<5	<2.5	< 2000*	---	<5	<5	< 2000*	---	---	---	---	200	200
Arsenic	<10	<5	1.30	0.51	<10	<10	3.05	---	---	---	0.55	120	50
Barium	43	<20	< 100	---	<100	<200	< 100	---	---	---	---	5,000	10,000
Beryllium	<5	<5	< 50	---	<25	<50	< 50	---	---	---	---	1,000	53
Boron	560	490	< 1000	---	620	<1000	< 1000	---	---	---	---	50,000	ns
Cadmium	<0.5	<0.25	< 0.25	< 0.50	0.74	<0.5	< 0.50	---	---	---	**2.04**	1	3.89[a]
Calcium	588,500	398,000	494,000	---	543,000	538,000	684,000	---	---	---	---	ns	ns
Total Chromium	<5	<2.5	< 50*	---	<5	<5	< 50*	---	---	---	---	150[b]/560[c]	10[b]/90[c]
Cobalt	**77.3**	**77.1**	**77.7**	**63.1**	**308**	**232**	**299**	---	---	---	**253**	40	40
Copper	<10	<5	< 0.50	1.5	<10	<10	1.3	---	---	---	13.9	20	90
Iron	250,000	377,000	330,000	208,000	659,000	631,000	631,000	654,000	613,000	671,000	351,000	ns	ns
Lead	<10	<5	< 0.25	< 0.50	<10	<10	< 0.50	---	---	---	< 0.50	20	160
Lithium	149	140	140	---	<250	<500	130	---	---	---	---	ns	ns
Magnesium	51,100	42,400	51,300	---	50,700	47,400	56,900	---	---	---	---	ns	ns
Manganese	5,990	5,980	5,920	5,100	7,920	6,080	7,610	---	---	---	7,450	ns	ns
Mercury	<0.2	<0.2	< 0.010	---	<0.2	<0.2	< 0.010	---	---	---	---	1	1
Molybdenum	<10	<5	< 5.0	---	<10	<10	< 5.0	---	---	---	---	10,000	10,000
Nickel	**85**	48	57.5	68.1	**450**	**330**	**397**	---	---	---	**417**	83	1,500
Selenium	<10	<5	< 0.50	---	<10	<10	< 0.50	---	---	---	---	540	10
Silver	<0.5	<0.25	< 100*	---	<0.5	<0.5	< 100*	---	---	---	---	15	15
Sodium	304,000	113,000	---	---	16,000	<20,000	---	---	---	---	---	ns	ns
Thallium	<2	<1	< 2000*	---	<2	<2	< 2000*	---	---	---	---	3	3
Titanium	<50	<50	< 100	---	<250	<500	< 100	---	---	---	---	1,000	1,000
Uranium	<2	<1	0.094	0.13	<2	<2	0.20	---	---	---	0.34	1,000	3,000
Vanadium	<30	<30	< 300	---	<30	<300	< 300	---	---	---	---	ns	ns
Zinc	**101**	79.2	57.6	**138**	**134**	**189**	**220**	---	---	---	**592**	100	12,563[a]

Table continued on next page...

Notes:
µg/L - micrograms per litre
mg/L - milligrams per litre
H Tide - high tide
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E Tide - ebb tide
F Tide - flood tide
H - hardness in milligrams per litre CaCO3
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
Dup - blind field duplicate sample
< - less than analytical detection limit indicated
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* - Detection limit exceeds CSR AWM and/or CSR AWF
CSR - Contaminated Sites Regulation, 1997
CSR AWM - BC Contaminated Sites Regulation, Marine Aquatic Life Standards
CSR AWF - BC Contaminated Sites Regulation, Freshwater Aquatic Life Standards
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a - Site-specific freshwater water quality standards for cadmium and zinc, calculated as per BC MOE Protocol 10 for Contaminated Sites, dated 2/12/2001; based on the average hardness for the groundwater samples of 1755 mg/L (n=19)
b - standard for Chromium (+6)
c - standard for Chromium (+3)
d - CSR Schedule 6 Generic Numerical Water Standards Aquatic Life (AW) Hardness >= 50mg/L
e - standard applicable where natural salinity is 0-<3.5 g/L
ns - no standard listed
bold - exceeds CSR AWM
shade - exceeds CSR AWM and CSR AWF
italics - exceeds CSR AWF

TABLE 5 (continued): WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - DISSOLVED METALS AND INORGANICS (µg/L)

Sample ID							BH16							
Date (dd-mmm-yy)	22-Feb-05	11-Sep-05	18-Sep-05	13-Oct-05	14-Dec-05	13-Dec-05	26-Jan-06	10-Feb-06	10-Feb-06	11-Feb-06	DUPF (11-Feb-06 Dup)	04-Apr-06	CSR AWM[2]	CSR AWF[2]
Tidal Height[1]	-	-	-	-	(H Tide)	(L Tide)	-	(E Tide)	(L Tide)	(F Tide)	(F Tide)	(L Tide)		
Time	-	-	-	-	-	-	-	19:18	22:58	1:25	1:25	17:00		
pH	---	3.39	3.24	3.12	3.29	2.85	---	3.43	3.13	3.08	3.08	3.05	ns	ns
Salinity (o/oo)	---	---	14.8	---	11.9	11.2	2.8	2.7	2.6	2.4	2.5	3.3	10 g/L[e]	15 g/L
Chloride (mg/L)	---	---	---	---	6,020	5,500	---	501	417	368	377	656.00	ns	ns
Fluoride (mg/L)	---	---	---	---	2.7	4.3	---	---	---	---	---	---	3,000[d]	3,000[d]
Bromide (mg/L)	---	---	---	---	6.7	6.2	---	---	---	---	---	---	ns	ns
Nitrate-N (mg/L)	---	---	---	---	< 0.50	< 0.50	---	---	---	---	---	---	0.2-2	400
Nitrite-N (mg/L)	---	---	---	---	1.18	0.22	---	---	---	---	---	---	ns	200-2000
Sulphate-SO4 (mg/L)	**2,750**	**2,950**	**2,880**	---	**2,300**	**2,620**	---	---	---	---	---	---	1,000	1,000
Sulphite-SO3 (mg/L)	---	---	---	---	---	---	---	---	---	---	---	---	ns	ns
Hardness (mg/L)H	1350	3290	---	---	---	---	1510	---	---	---	---	---	ns	ns
Total Alkalinity (mg/L)	---	---	---	< 2.0	---	---	---	---	---	---	---	---	ns	ns
Aluminum	2,340	48,200	42,200	39,200	26,300	34,500	16,600	---	---	---	---	20,700	ns	ns
Antimony	<5	<25	---	---	< 2000*	< 2000*	<50	---	---	---	---	---	200	200
Arsenic	<10	<50	2.97	1.95	0.76	0.74	<50	---	---	---	---	1.16	120	50
Barium	<100	<200	---	---	< 100	< 100	<200	---	---	---	---	---	5,000	10,000
Beryllium	<25	<50	---	---	< 50	< 50	<100	---	---	---	---	---	1,000	53
Boron	720	1200	---	---	1300	1100	<1000	---	---	---	---	---	50,000	ns
Cadmium	**6.19**	**7.4**	**2.69**	**11.3**	**3.91**	**5.57**	<1.7*	---	---	---	---	**1.77**	1	3.89[a]
Calcium	328,000	619,000	---	---	386,000	577,000	433,000	---	---	---	---	---	ns	ns
Total Chromium	<5	<25*	---	---	< 50*	< 50*	<100*	---	---	---	---	---	150[b]/560[c]	10[b]/90[c]
Cobalt	**175**	**440**	**129**	**424**	**162**	**230**	**188**	---	---	---	---	**168**	40	40
Copper	<10	**147**	**69.4**	**448**	**51.7**	**248**	**250**	---	---	---	---	**263**	20	90
Iron	301,000	960,000	252,000	712,000	289,000	239,000	183,000	394,000	319,000	249,000	243,000	298,000	ns	ns
Lead	<10	<50*	3.5	**22.6**	2.71	5.36	<50*	---	---	---	---	2.2	20	160
Lithium	<250	<500	---	---	110	140	<500	---	---	---	---	---	ns	ns
Magnesium	128,000	424,000	---	---	340,000	318,000	104,000	---	---	---	---	---	ns	ns
Manganese	4,740	9,410	2,690	7,800	4,000	5,490	4,400	---	---	---	---	4,030	ns	ns
Mercury	<0.2	<0.2	---	---	0.01	0.011	0.024	---	---	---	---	---	1	1
Molybdenum	<10	<50	---	---	< 5.0	< 5.0	<100	---	---	---	---	---	10,000	10,000
Nickel	**229**	**570**	**170**	**515**	**232**	**287**	**220**	---	---	---	---	**209**	83	1,500
Selenium	<10	<50*	---	---	0.98	< 0.50	<100	---	---	---	---	---	540	10
Silver	<0.5	<2.5	---	---	< 100*	< 100*	<2.0	---	---	---	---	---	15	15
Sodium	547,000	3,540,000	---	---	---	---	430,000	---	---	---	---	---	ns	ns
Thallium	<2	<10*	---	---	< 2000*	< 2000*	<2.0	---	---	---	---	---	3	3
Titanium	<250	<500	---	---	< 100	< 100	<100	---	---	---	---	---	1,000	1,000
Uranium	<2	<10	0.77	3.43	1.05	2.56	<20	---	---	---	---	1.72	1,000	3,000
Vanadium	<150	<300	---	---	< 300	< 300	<300	---	---	---	---	---	ns	ns
Zinc	**518**	**2,200**	**653**	**1,890**	**983**	**1,100**	**760**	---	---	---	---	**877**	100	12,563[a]

Table continued on next page...

Notes:
µg/L - micrograms per litre
mg/L - milligrams per litre
H Tide - high tide
L Tide - low tide
E Tide - ebb tide
F Tide - flood tide
H - hardness in milligrams per litre CaCO3
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
Dup - blind field duplicate sample
< - less than analytical detection limit indicated
"---" - sample not analyzed for parameter indicated
* - Detection limit exceeds CSR AWM and/or CSR AWF
CSR - Contaminated Sites Regulation, 1997
CSR AWM - BC Contaminated Sites Regulation, Marine Aquatic Life Standards
CSR AWF - BC Contaminated Sites Regulation, Freshwater Aquatic Life Standards
2 - CSR AWM and AWF standards for groundwater samples analysed for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations
a - Site-specific freshwater water quality standards for cadmium and zinc, calculated as per BC MOE Protocol 10 for Contaminated Sites, dated 2/12/2001; based on the average hardness for the groundwater samples of 1755 mg/L (n=19)
b - standard for Chromium (+6)
c - standard for Chromium (+3)
d - CSR Schedule 6 Generic Numerical Water Standards Aquatic Life (AW) Hardness >= 50mg/L
e - standard applicable where natural salinity is 0-<3.5 g/L
ns - no standard listed
bold - exceeds CSR AWM
shade - exceeds CSR AWM and CSR AWF
italics - exceeds CSR AWF

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TABLE 5 (continued): WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - DISSOLVED METALS AND INORGANICS (µg/L)

Sample ID	BH17				BHK-3	BH20							
Date (dd-mmm-yy)	22-Feb-05	11-Sep-05	14-Dec-05	04-Apr-06	04-Feb-05	11-Sep-05	18-Sep-05	13-Oct-05	14-Dec-05	13-Dec-05	26-Jan-06	CSR AWM[2]	CSR AWF[2]
Tidal Height[1]	-	-	-	(L Tide)	-	-	-	-	(H Tide)	(L Tide)	-		
Time	-	-	-	15:50	-	-	-	-	-	-	-		
pH	---	3.43	3.16	3.33	---	4.88	4.29	4.55	3.32	3.83	--	ns	ns
Salinity (o/oo)	---	---	17.7	7.5	---	---	5.6	---	5.9	6.1	2.6	10 g/L[e]	15 g/L
Chloride (mg/L)	---	---	9,380	3,440	633	---	---	---	600	2,550	---	ns	ns
Fluoride (mg/L)	---	---	<2.0	---	---	---	---	---	0.92	4.07	---	3,000[d]	3,000[d]
Bromide (mg/L)	---	---	14.9	---	---	---	---	---	0.28	1.20	---	ns	ns
Nitrate-N (mg/L)	---	---	< 0.50	---	---	---	---	---	< 0.025	< 0.10	---	0.2-2	400
Nitrite-N (mg/L)	---	---	1.76	---	---	---	---	---	< 0.0050	0.408	---	ns	200-2000
Sulphate-SO4 (mg/L)	**3,850**	**2,300**	**1,790**	---	513	**2,480**	**2,550**	---	607	**2,560**	---	1,000	1,000
Sulphite-SO3 (mg/L)	---	---	---	---	---	---	---	---	---	---	---	ns	ns
Hardness (mg/L)H	1,900	5,210	--	---	633	1,940	1,690	---	---	---	1,460	ns	ns
Total Alkalinity (mg/L)	---	---	---	---	---	---	---	< 2.0	---	---	---	ns	ns
Aluminum	70,900	30,900	13,900	58,000	<20	6,700	30,500	25,000	56,300	38,900	71,400	ns	ns
Antimony	<5	<50	< 2000*	---	<1	<10	---	---	< 2,000*	< 2,000*	<50	200	200
Arsenic	<10	<100	0.39	1.50	<2	<20	3.67	2.65	1.01	2.12	<50	120	50
Barium	<100	<200	< 100	---	32	<40	---	---	< 100	< 100	<200	5,000	10,000
Beryllium	<25	<50	< 50	---	<5	<10	---	---	< 50	< 50	<100*	1,000	53
Boron	0.92	3,300	1,900	---	290	750	---	---	< 1,000	< 1,000	<1,000	50,000	ns
Cadmium	**11**	<5*	0.805	**3.9**	<0.1	**13.1**	**17.1**	**5.51**	**11.3**	**6.58**	**8.2**	1	3.89[a]
Calcium	384,000	354,000	251,000	---	184,000	413,000	---	---	386,000	375,000	451,000	ns	ns
Total Chromium	***38.3***	<50*	< 50*	---	<1	<10	< 10	---	< 50*	< 50*	<100*	150[b]/560[c]	10[b]/90[c]
Cobalt	**492**	<50*	**45.0**	**339**	<1	**280**	**282**	**234**	**350**	**281**	**432**	40	40
Copper	**634**	<100*	**78.6**	**138**	<2	**22**	< 20	6.0	**125**	**21.5**	<100*	20	90
Iron	670,000	34,200	32,100	896,000	<30	515,000	475,000	396,000	245,000	337,000	480,000	ns	ns
Lead	<10	<100*	0.586	< 2.0	<2	<20	< 20	7.18	8.84	5.43	<50	20	160
Lithium	<250	<500	120	---	<50	150	---	---	330	230	<500	ns	ns
Magnesium	227,000	1,050,000	626,000	---	42,000	221,000	---	---	183,000	176,000	81,700	ns	ns
Manganese	9,690	280	528	5,780	207	5,200	5,060	3,410	3,990	4,020	4,390	ns	ns
Mercury	<0.2	<0.2	< 0.010	---	<0.2	<0.2	< 0.20	---	< 0.010	0.010	<0.020	1	1
Molybdenum	<10	<100	< 5.0	---	<2	<20	< 20	---	< 5.0	< 5.0	<100	10,000	10,000
Nickel	**758**	<500*	75.7	**529**	<10	**380**	**370**	**276**	**475**	**385**	**560**	83	1,500
Selenium	<10	<100*	< 0.50	---	<2	<20*	< 20	---	< 0.50	< 0.50	<100*	540	10
Silver	<0.5	<5	< 100*	---	<0.1	<1	---	---	< 100*	< 100*	<2.0	15	15
Sodium	1,040,000	8,710,000	---	---	384,000	1,710,000	---	---	---	---	247,000	ns	ns
Thallium	<2	<20*	< 2000*	---	<0.4	<4*	---	---	< 2000*	< 2000*	<20*	3	3
Titanium	<250	<500	< 100	---	<50	<100	---	---	< 100	< 100	<100	1,000	1,000
Uranium	11.4	<20	0.801	3.93	<0.4	<4	< 4.0	0.22	0.658	0.204	<20	1,000	3,000
Vanadium	<150	<300	< 300	---	<30	88	---	---	< 300	< 300	<300	ns	ns
Zinc	**1,770**	**118**	**224**	**1,600**	19.4	**1,320**	**1,520**	**1,070**	**1,580**	**1,490**	**2,280**	100	12,563[a]

Table continued on next page...

Notes:
µg/L - micrograms per litre
mg/L - milligrams per litre
H Tide - high tide
L Tide - low tide
E Tide - ebb tide
F Tide - flood tide
H - hardness in milligrams per litre CaCO3
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
Dup - blind field duplicate sample
< - less than analytical detection limit indicated
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* - Detection limit exceeds CSR AWM and/or CSR AWF
CSR - Contaminated Sites Regulation, 1997
CSR AWM - BC Contaminated Sites Regulation, Marine Aquatic Life Standards
CSR AWF - BC Contaminated Sites Regulation, Freshwater Aquatic Life Standards
2- CSR AWM and AWF standards for groundwater samples analysed for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations
a - Site-specific freshwater water quality standards for cadmium and zinc, calculated as per BC MOE Protocol 10 for Contaminated Sites, dated 2/12/2001; based on the average hardness for the groundwater samples of 1755 mg/L (n=19)
b - standard for Chromium (+6)
c - standard for Chromium (+3)
d - CSR Schedule 6 Generic Numerical Water Standards Aquatic Life (AW) Hardness >= 50mg/L
e - standard applicable where natural salinity is 0-<3.5 g/L
ns - no standard listed
bold - exceeds CSR AWM
shade - exceeds CSR AWM and CSR AWF
italics - exceeds CSR AWF

TABLE 5 (continued): WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - DISSOLVED METALS AND INORGANICS (µg/L)

Sample ID	BH20					BH21			BH22			
Date (dd-mmm-yy)	10-Feb-06	10-Feb-06	DUPE (10-Feb-06 Dup)	11-Feb-06	04-Apr-06	11-Sep-05	14-Dec-05	04-Apr-06	11-Sep-05	14-Dec-05	CSR AWM[2]	CSR AWF[2]
Tidal Height[1]	(E Tide)	(L Tide)	(L Tide)	(F Tide)	(L Tide)	-	-	(L Tide)	-	-		
Time	18:43	22:00	22:00	1:54	17:35	-	-	14:55	-	-		
pH	3.79	4.19	4.38	4.22	3.66	6.99	6.60	6.47	6.56	5.64	ns	ns
Salinity (o/oo)	2.9	2.7	2.7	2.5	5.4	---	1.4	1.2	---	4.1	10 g/L[e]	15 g/L
Chloride (mg/L)	415	331	327	194	2,070	---	---	147	---	1,330	ns	ns
Fluoride (mg/L)	---	---	---	---	---	---	---	---	---	2.15	3,000[d]	3,000[d]
Bromide (mg/L)	---	---	---	---	---	---	---	---	---	<1.0	ns	ns
Nitrate-N (mg/L)	---	---	---	---	---	---	< 0.050	---	---	< 0.10	0.2-2	400
Nitrite-N (mg/L)	---	---	---	---	---	---	0.024	---	---	0.226	ns	200-2000
Sulphate-SO4 (mg/L)	---	---	---	---	---	**1,760**	---	---	**2,500**	**2,480**	1,000	1,000
Sulphite-SO3 (mg/L)	---	---	---	---	---	---	---	---	-	---	ns	ns
Hardness (mg/L)H	---	---	---	---	---	1,640	---	---	3,700	---	ns	ns
Total Alkalinity (mg/L)	---	---	---	---	---	---	---	---	---	---	ns	ns
Aluminum	---	---	---	---	118,000	<100	307	3,590	280	4,280	ns	ns
Antimony	---	---	---	---	---	<5	< 2,000*	---	<10	< 2,000*	200	200
Arsenic	---	---	---	---	1.41	<10	0.92	< 0.20	<20	2.78	120	50
Barium	---	---	---	---	---	26	< 100	---	<200	< 100	5,000	10,000
Beryllium	---	---	---	---	---	<5	< 50	---	<50	< 50	1,000	53
Boron	---	---	---	---	---	390	< 1000	---	1100	< 1000	50,000	ns
Cadmium	---	---	---	---	**11.6**	<0.5	0.514	0.935	**4.2**	**2.74**	1	3.89[a]
Calcium	---	---	---	---	---	601,000	612,000	---	1,060,000	616,000	ns	ns
Total Chromium	---	---	---	---	---	<5	< 50*	---	<10	< 50*	150[b]/560[c]	10[b]/90[c]
Cobalt	---	---	---	---	**415**	**93.2**	**83.4**	**67.4**	**323**	**326**	40	40
Copper	---	---	---	---	**61.6**	<10	**20.8**	**91.2**	<20	**59**	20	90
Iron	707,000	757,000	766,000	791,000	435,000	63,500	24,600	20,600	380,000	314,000	ns	ns
Lead	---	---	---	---	5.5	<10	< 0.050	< 0.050	<20	2.09	20	160
Lithium	---	---	---	---	---	109	< 100	---	<500	150	ns	ns
Magnesium	---	---	---	---	---	34,200	42,400	---	255,000	126,000	ns	ns
Manganese	---	---	---	---	4,070	5,920	4,720	3,560	12,900	10,400	ns	ns
Mercury	---	---	---	---	---	<0.2	< 0.010	---	<0.2	< 0.010	1	1
Molybdenum	---	---	---	---	---	<10	< 5.0	---	<20	< 5.0	10,000	10,000
Nickel	---	---	---	---	**554**	**171**	**126**	81.4	**440**	**458**	83	1,500
Selenium	---	---	---	---	---	<10	< 0.50	---	<20*	< 0.50	540	10
Silver	---	---	---	---	---	<0.5	< 100*	---	<1	< 100*	15	15
Sodium	---	---	---	---	---	43,800	---	---	1,780,000	---	ns	ns
Thallium	---	---	---	---	---	<2	< 2000*	---	<4*	< 2000*	3	3
Titanium	---	---	---	---	---	<50	< 100	---	<500	< 100	1,000	1,000
Uranium	---	---	---	---	0.41	<2	0.652	0.837	<4	1.47	1,000	3,000
Vanadium	---	---	---	---	---	<30	< 300	---	<300	< 300	ns	ns
Zinc	---	---	---	---	**2,060**	58.6	**138**	**130**	**533**	**730**	100	12,563[a]

Notes:
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c - standard for Chromium (+3)
d - CSR Schedule 6 Generic Numerical Water Standards Aquatic Life (AW) Hardness >= 50mg/L
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ns - no standard listed
bold - exceeds CSR AWM
shade - exceeds CSR AWM and CSR AWF
italics - exceeds CSR AWF

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TABLE 6: WASTE COAL PILE GROUNDWATER CHEMISTRY RESULTS - TOTAL METALS AND INORGANICS (µg/L)

Sample ID	BH6S	BH6D	BH8D	BH15	BH16	BH17	BH20		BH21	BH22	CSR AWM[1]	CSR AWF[1]
Date (dd-mmm-yy)	11-Sep-05	11-Sep-05	11-Sep-05	11-Sep-05	11-Sep-05	11-Sep-05	11-Sep-05	17-Sep-05	11-Sep-05	11-Sep-05		
pH	4.17	3.89	6.31	6.54	3.39	3.43	4.88	4.29	6.99	6.56	ns	ns
Hardness (mg/L)H	3,560	3,160	1,170	1,540	3,290	5,210	1,940	1,730	1,640	3,700	ns	ns
Aluminum	119,000	175,000	133	3,170	56,300	35,300	66,500	31,700	3,010	1,070	ns	ns
Antimony	<25	<25	<2.5	<5.0	<25	<50	<10	---	<5.0	<10	200	200
Arsenic	<50	***102***	<5	<10	<50	<100	<60*	3.99	12	<20	120	50
Barium	<200	320	<20	<200	<200	<200	266	---	54	<200	5,000	10,000
Beryllium	<50	<50	<5	<50	<50	<50	<10	---	<5	<50	1,000	53
Boron	1600	1200	520	<1000	1300	2900	770	---	370	1000	50,000	ns
Cadmium	**7.3**	**7.4**	<0.25	**1.23**	**8**	**<5**	**14.4**	**19.7**	0.55	**4.4**	1	0.6
Calcium	468,000	499,000	424,000	467,000	600,000	320,000	421,000	---	614,000	1,050,000	ns	ns
Chromium	<25	49	<2.5	<5	<25*	<50	88	< 10	<5.0	<10	150[a]/560[b]	10[a]/90[b]
Cobalt	**357**	**528**	**86.2**	**253**	**453**	**<50**	**358**	**291**	**95.2**	**343**	40	40
Copper	**<50**	**469**	<5	**65**	**154**	**<100**	**270**	< 20	**56**	<20	20	90
Iron	1,040,000	1,540,000	356,000	509,000	941,000	38,600	653,000	492000	61,900	372,000	ns	ns
Lead	<50*	<50*	<5	<10	<50*	<100*	**50**	< 20	<10	<20	20	160
Lithium	<500	530	144	<500	<500	<500	290	---	108	<500	ns	ns
Magnesium	625,000	427,000	42,300	42,500	405,000	933,000	246,000	---	36,700	251,000	ns	ns
Manganese	7,250	9,950	6,030	7,970	9,050	300	6,030	5,260	6,050	12,500	ns	ns
Mercury	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	< 0.20	<0.2	<0.2	1	1
Molybdenum	<50	<50	<5	<10	<50	<100	<20	< 20	<10	<20	10,000	10,000
Nickel	**570**	**840**	53	**429**	**590**	<500*	**520**	**390**	**180**	**460**	83	1,500
Selenium	<50*	<50*	<5	<10	<50*	<100*	<20*	< 20*	<10	<20*	540	10
Silver	<2.5	<2.5	<0.25	<0.5	<2.5	<5	<1	---	<0.5	<1	15	15
Sodium	4,510,000	3,310,000	120,000	<20000	3,380,000	7,720,000	1,860,000	---	49,200	1,740,000	ns	ns
Thallium	<10*	<10*	<1	<2	<10*	<20*	<4*	---	<2	<4*	3	3
Titanium	<500	710	<50	<500	<500	<500	**3,290**	---	59	<500	1,000	1,000
Uranium	<10	<10	<1	<2	<10	<20	4.2	< 4.0	2.5	<4	1,000	3,000
Vanadium	<300	380	33	<300	<300	<300	282	---	<30	<300	ns	ns
Zinc	**2,310**	**3,160**	46.5	**521**	**2,190**	**109**	**1,580**	**1,540**	77.8	**513**	100	1,650

Notes:
µg/L - micrograms per litre
mg/L - milligrams per litre
o/oo - parts per thousand (grams per litre)
H - hardness in milligrams per litre CaCO3
< - less than analytical detection limit indicated
CSR - Contaminated Sites Regulation, 1997
CSR AWM - BC Contaminated Sites Regulation, Marine Aquatic Life Standards
CSR AWF - BC Contaminated Sites Regulation, Freshwater Aquatic Life Standards
1 - CSR AWM and AWF standards for groundwater samples analysed for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations
a - standard for Chromium (+6)
b - standard for Chromium (+3)
ns - no standard listed
* - Detection limit exceeds CSR AWM and/or CSR AWF
"---" - sample not analyzed for parameter indicated

bold	exceeds CSR AWM
shade	exceeds CSR AWM and AWF
italics	exceeds CSR AWF

TABLE 7: MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)												
Sample ID	S1	S2	S3	S4	S7 (S4 Dup)	S5	S6	S7 (0-15)	Dup1 (S7 (0-15) Dup)	S7 (15-40)	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	21-Jan-04	21-Jan-04	21-Jan-04	21-Jan-04	21-Jan-04	21-Jan-04	22-Jan-04	08-Apr-04	08-Apr-04	08-Apr-04		
Depth (m)	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0-0.15	0.15-0.4		
Acenaphthene	<0.04	<0.2*	<0.15*	<0.3*	<0.4*	<0.04	<0.04	<0.3*	<0.31*	<0.2*	0.055	0.11
Acenaphthylene	<0.05	<0.15*	<0.065	<0.15*	<0.15*	<0.05	<0.05	<0.2*	<0.19*	<0.15*	0.079	0.15
Anthracene	<0.05	0.136	0.069	**0.219**	**0.302**	<0.05	<0.05	**0.227**	<0.2*	0.132	0.15	0.29
Benzo(a)anthracene	<0.05	0.26	0.137	0.252	0.371	<0.05	<0.05	0.429	0.368	0.226	0.43	0.83
Benzo(a)pyrene	<0.05	0.096	<0.05	0.106	0.163	<0.05	<0.05	0.183	0.136	0.079	0.47	0.92
Benzo(b)fluoranthene	0.053	0.193	0.105	0.152	0.224	<0.05	<0.05	0.322	0.266	0.158	n.c.	n.c.
Benzo(g,h,i)perylene	<0.05	0.069	<0.05	0.067	0.123	<0.05	<0.05	0.144	0.101	0.06	n.c.	n.c.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.065	<0.05	<0.05	n.c.	n.c.
Chrysene	0.073	**0.572**	0.307	0.422	**0.597**	<0.05	<0.05	**0.897**	**0.782**	0.492	0.52	1.0
Dibenz(a,h)anthracene	<0.05	<0.05	<0.05	<0.05	0.052	<0.05	<0.05	0.065	0.052	<0.05	0.084	0.16
Fluoranthene	<0.05	0.265	<0.2	0.248	<0.35	<0.05	<0.05	0.512	0.392	0.253	0.93	1.8
Fluorene	<0.05	<0.2*	<0.15*	<0.55*	<0.75*	<0.05	<0.05	<0.3*	<0.3*	<0.2*	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.064	<0.05	<0.05	n.c.	n.c.
2-Methylnaphthalene	---	---	---	---	---	---	---	---	---	---	0.12	0.24
Naphthalene	**0.29**	**3.57**	**1.68**	**1.32**	**1.77**	0.109	<0.05	**4.43**	**4.65**	**2.49**	0.24	0.47
Phenanthrene	**0.404**	**4.9**	**2.48**	**3.66**	**5.03**	0.221	<0.05	**6.24**	**5.92**	**3.82**	0.34	0.65
Pyrene	<0.05	0.312	0.167	0.276	0.411	<0.05	<0.05	0.554	0.474	0.29	0.87	1.7

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Notes:
m - metres
mg/kg - milligrams per dry kilogram
Dup - blind field duplicate sample
< - less than the analytical detection limit indicated
"---" - sample not analyzed for parameter indicated
* - indicates detection limit in excess of the BC Marine $SedQC_{SCS}$ or $SedQC_{TSC}$
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
BC Marine $SedQC_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9
BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	S8 (0-15)	S9 (0-15)	S10 (0-15)	S10 (15-40)	S11 (0-15)	Dup2 (S11 (0-15) Dup)	S11 (15-40)	S12 (0-15)	S13	S14	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04		
Depth (m)	0-0.15	0-0.15	0-0.15	0.15-0.4	0-0.15	0-0.15	0.15-0.4	0-0.15	0-0.15	0-0.15		
Acenaphthene	<0.25*	<0.2*	<0.25*	<0.15*	<0.2*	<0.2*	<0.2*	<0.23*	<0.11*	<0.04	0.055	0.11
Acenaphthylene	<0.15*	<0.07	<0.15*	<0.075	<0.2*	<0.13*	<0.07	<0.11*	<0.05	<0.05	0.079	0.15
Anthracene	0.134	0.084	0.104	0.077	0.093	0.083	0.069	**0.619**	0.078	<0.05	0.15	0.29
Benzo(a)anthracene	0.247	0.138	0.266	0.14	0.217	0.254	0.152	0.258	0.123	<0.05	0.43	0.83
Benzo(a)pyrene	0.093	<0.05	0.095	0.05	0.092	0.096	0.056	0.111	0.054	<0.05	0.47	0.92
Benzo(b)fluoranthene	0.176	0.09	0.194	0.101	0.163	0.186	0.106	0.162	0.075	<0.05	n.c.	n.c.
Benzo(g,h,i)perylene	0.064	<0.05	0.075	<0.05	0.074	0.077	<0.05	0.082	<0.05	<0.05	n.c.	n.c.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
Chrysene	**0.582**	0.307	**0.619**	0.317	0.453	**0.53**	0.311	0.463	0.198	0.062	0.52	1.0
Dibenz(a,h)anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.084	0.16
Fluoranthene	0.264	0.153	0.289	0.152	0.268	0.268	0.163	0.237	0.115	<0.05	0.93	1.8
Fluorene	<0.2*	<0.15*	<0.2*	<0.15*	<0.2*	<0.18*	<0.2*	<0.35*	<0.18*	<0.05	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
2-Methylnaphthalene	---	---	---	---	---	---	---	---	---	---	0.12	0.24
Naphthalene	**3.48**	**1.46**	**3.63**	**1.89**	**2.15**	**2.57**	**1.61**	**1.38**	**0.374**	0.133	0.24	0.47
Phenanthrene	**4.22**	**2.45**	**4.52**	**2.38**	**3.44**	**3.76**	**2.44**	**3.51**	<1.4*	**0.409**	0.34	0.65
Pyrene	0.298	0.179	0.339	0.178	0.316	0.325	0.197	0.296	0.138	0.052	0.87	1.7

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Notes:
m - metres
mg/kg - milligrams per dry kilogram
Dup - blind field duplicate sample
< - less than the analytical detection limit indicated
"---" - sample not analyzed for parameter indicated
* - indicates detection limit in excess of the BC Marine $SedQC_{SCS}$ or $SedQC_{TSC}$
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
BC Marine $SedQC_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9
BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	S15	S16	S17	S18	S19 0-15	S20 0-15	S21 0-15	S23	S24	S26	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	08-Apr-04	08-Apr-04	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05		
Depth (m)	0-0.15	0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15		
Acenaphthene	<0.13*	<0.06*	<0.2*	<0.3*	0.158	0.316	0.216	<0.2*	<0.2*	<0.04	0.055	0.11
Acenaphthylene	<0.06	<0.05	<0.2*	<0.2*	0.087	0.207	0.148	<0.2*	<0.07	<0.05	0.079	0.15
Anthracene	0.089	<0.05	<0.2*	<0.2*	0.064	0.127	0.101	<0.2*	<0.2*	<0.05	0.15	0.29
Benzo(a)anthracene	0.14	0.069	0.238	0.383	0.163	0.399	0.268	0.21	0.166	<0.05	0.43	0.83
Benzo(a)pyrene	0.062	<0.05	0.096	0.154	0.058	0.15	0.103	0.102	0.069	<0.05	0.47	0.92
Benzo(b)fluoranthene	0.094	<0.05	0.189	0.319	0.15	0.297	0.194	0.18	0.119	<0.05	n.c.	n.c.
Benzo(g,h,i)perylene	<0.05	<0.05	0.067	0.122	0.05	0.114	0.07	0.07	0.063	<0.05	n.c.	n.c.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.054	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
Chrysene	0.254	0.123	0.569	0.837	<0.35	<0.85*	<0.58*	0.481	0.292	<0.05	0.52	1.0
Dibenz(a,h)anthracene	<0.05	<0.05	<0.05	0.065	<0.05	0.072	<0.05	<0.05	<0.05	<0.05	0.084	0.16
Fluoranthene	0.138	0.077	0.248	0.424	0.199	0.341	0.294	0.24	0.167	<0.05	0.93	1.8
Fluorene	<0.15*	<0.07	<0.2*	<0.3*	0.117	0.265	0.22	<0.2*	<0.2*	<0.05	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
2-Methylnaphthalene	---	---	7.7	7.57	3.5	5.91	6.28	5.23	1.58	<0.05	0.12	0.24
Naphthalene	0.701	0.264	4.01	4.54	1.9	3.27	3.47	2.85	0.692	<0.05	0.24	0.47
Phenanthrene	1.87	0.953	4.41	6.61	2.83	6.34	3.89	3.7	2.43	0.073	0.34	0.65
Pyrene	0.187	0.095	0.29	0.442	0.197	0.457	0.355	0.286	0.19	<0.05	0.87	1.7

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Notes:
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Dup - blind field duplicate sample
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* - indicates detection limit in excess of the BC Marine $SedQC_{SCS}$ or $SedQC_{TSC}$
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
BC Marine $SedQC_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9
BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	C1 0-10	C1 10-30	C1 30-52	C2 0-10	C2 10-30	C2 30-51	C3 0-10	C3 50-64	C4 0-10	C4 10-30	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05		
Depth (m)	0.0-0.1	0.1-0.3	0.3-0.52	0.0-0.1	0.1-0.3	0.3-0.51	0.0-0.1	0.5-0.64	0.0-0.1	0.1-0.3		
Acenaphthene	**0.264**	**0.067**	<0.04	**0.082**	<0.04	<0.04	**0.489**	**0.43**	**0.234**	**0.397**	0.055	0.11
Acenaphthylene	<0.15*	<0.050	<0.05	<0.05	<0.05	<0.05	<0.25*	<0.2*	<0.15*	<0.2*	0.079	0.15
Anthracene	**0.206**	0.057	<0.05	0.07	<0.05	<0.05	**0.216**	**0.273**	**0.182**	**0.276**	0.15	0.29
Benzo(a)anthracene	0.266	0.068	<0.05	0.089	<0.05	<0.05	**0.446**	0.357	0.24	0.387	0.43	0.83
Benzo(a)pyrene	0.121	<0.050	<0.05	<0.05	<0.05	<0.05	0.179	0.141	0.113	0.191	0.47	0.92
Benzo(b)fluoranthene	0.217	0.056	<0.05	0.072	<0.05	<0.05	0.293	0.201	0.251	0.33	n.c.	n.c.
Benzo(g,h,i)perylene	0.089	<0.050	<0.05	<0.05	<0.05	<0.05	0.102	0.083	0.092	0.13	n.c.	n.c.
Benzo(k)fluoranthene	<0.050	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.058	0.056	n.c.	n.c.
Chrysene	0.436	0.111	<0.05	0.155	0.062	<0.05	**0.812**	**0.632**	0.44	**0.701**	0.52	1.0
Dibenz(a,h)anthracene	<0.050	<0.050	<0.05	<0.05	<0.05	<0.05	0.057	<0.05	<0.05	0.051	0.084	0.16
Fluoranthene	0.454	0.115	<0.05	0.138	0.052	<0.05	0.452	0.395	0.523	0.591	0.93	1.8
Fluorene	**0.686**	**0.186**	<0.05	**0.208**	**0.094**	<0.05	**1.15**	**1.02**	**0.552**	**0.995**	0.089	0.17
Indeno(1,2,3-c,d)pyrene	0.06	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.067	0.085	n.c.	n.c.
2-Methylnaphthalene	**2.59**	**0.43**	<0.05	**1.03**	**0.33**	<0.05	**5.32**	**2.58**	**3.04**	**4.04**	0.12	0.24
Naphthalene	**1.22**	0.197	<0.05	**0.508**	0.157	<0.05	**2.61**	**1.22**	**1.55**	**1.94**	0.24	0.47
Phenanthrene	**3.31**	**0.835**	<0.05	**1.2**	**0.502**	<0.05	**6.45**	**4.92**	**3.12**	**5.02**	0.34	0.65
Pyrene	0.442	0.107	<0.05	0.129	<0.05	<0.05	0.527	0.392	0.465	0.552	0.87	1.7

Table continued on next page...

Notes:
m - metres
mg/kg - milligrams per dry kilogram
Dup - blind field duplicate sample
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PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
BC Marine $SedQC_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9
BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	C4 30-36	C5 0-10	C5 10-30	C5 30-50	C6 0-10	C6 10-30	C7 0-10	C9 0-10	C9 10-30	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	02-Feb-05	02-Feb-05		
Depth (m)	0.3-0.36	0.0-0.1	0.1-0.3	0.3-0.5	0.0-0.1	0.1-0.3	0.0-0.1	0.0-0.1	0.1-0.3		
Acenaphthene	**0.214**	0.049	<0.04	<0.04	**0.187**	**0.11**	**0.35**	**0.122**	**0.056**	0.055	0.11
Acenaphthylene	<0.100*	<0.05	<0.05	<0.05	<0.1*	<0.05	**0.237**	<0.1*	<0.05	0.079	0.15
Anthracene	**0.172**	<0.05	<0.05	<0.05	0.148	0.095	**0.167**	0.098	<0.05	0.15	0.29
Benzo(a)anthracene	0.202	0.059	<0.05	<0.05	0.196	0.137	0.273	0.132	0.063	0.43	0.83
Benzo(a)pyrene	0.088	<0.05	<0.05	<0.05	0.1	0.065	0.125	0.057	<0.05	0.47	0.92
Benzo(b)fluoranthene	0.149	<0.05	<0.05	<0.05	0.203	0.124	0.205	0.109	0.057	n.c.	n.c.
Benzo(g,h,i)perylene	0.068	<0.05	<0.05	<0.05	0.085	0.053	0.078	<0.05	<0.05	n.c.	n.c.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
Chrysene	0.337	0.104	0.069	<0.05	0.347	0.231	<0.6*	0.224	0.113	0.52	1.0
Dibenz(a,h)anthracene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.084	0.16
Fluoranthene	0.237	0.093	0.057	<0.05	0.37	0.217	0.351	0.224	0.103	0.93	1.8
Fluorene	**0.581**	**0.121**	**0.092**	<0.05	**0.465**	**0.296**	**0.671**	**0.314**	**0.16**	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.05	0.056	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
2-Methylnaphthalene	**1.06**	**0.755**	**0.464**	0.097	**2.34**	**1.15**	**6.9**	**1.76**	**0.761**	0.12	0.24
Naphthalene	**0.532**	**0.382**	0.231	<0.05	**1.17**	**0.558**	**3.1**	**0.878**	**0.375**	0.24	0.47
Phenanthrene	**2.77**	**0.811**	**0.523**	0.123	**2.53**	**1.54**	**5.05**	**1.72**	**0.798**	0.34	0.65
Pyrene	0.231	0.08	0.055	<0.05	0.305	0.195	0.408	0.195	0.091	0.87	1.7

Table continued on next page...

Notes:
m - metres
mg/kg - milligrams per dry kilogram
Dup - blind field duplicate sample
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* - indicates detection limit in excess of the BC Marine $SedQC_{SCS}$ or $SedQC_{TSC}$
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BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	C9 30-44	C10 0-10	C10 30-45	C11 0-10	C11 40-50	C12 0-10	C12 10-30	C12 84-92	C13 0-10	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	02-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	02-Feb-05		
Depth (m)	0.3-0.44	0.0-0.1	0.3-0.45	0.0-0.1	0.4-0.5	0.0-0.1	0.1-0.3	0.84-0.92	0.0-0.1		
Acenaphthene	<0.04	**0.272**	**0.381**	**0.163**	**0.225**	**0.293**	**0.412**	<0.040	**0.49**	0.055	0.11
Acenaphthylene	<0.05	<0.20*	**0.114**	<0.15*	**0.135**	**0.08**	**0.112**	<0.050	**0.133**	0.079	0.15
Anthracene	<0.05	**0.129**	**0.157**	0.085	0.08	**0.166**	**0.217**	<0.050	**0.22**	0.15	0.29
Benzo(a)anthracene	<0.05	0.328	0.252	0.229	0.2	0.254	0.314	<0.050	0.376	0.43	0.83
Benzo(a)pyrene	<0.05	0.12	0.104	0.088	0.074	0.121	0.14	<0.050	0.155	0.47	0.92
Benzo(b)fluoranthene	<0.05	0.231	0.162	0.173	0.144	0.168	0.197	<0.050	0.229	n.c.	n.c.
Benzo(g,h,i)perylene	<0.05	0.077	0.072	0.061	0.051	0.061	0.075	<0.050	0.076	n.c.	n.c.
Benzo(k)fluoranthene	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.059	n.c.	n.c.
Chrysene	<0.05	**0.654**	<0.050	0.486	<0.38	<0.36	<0.45	<0.050	<0.56*	0.52	1.0
Dibenz(a,h)anthracene	<0.05	<0.050	<0.050	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.084	0.16
Fluoranthene	<0.05	0.351	0.311	0.243	0.228	0.287	0.342	<0.050	0.471	0.93	1.8
Fluorene	<0.05	**0.531**	**0.77**	**0.245**	**0.233**	**0.607**	**0.868**	0.072	**0.957**	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	n.c.	n.c.
2-Methylnaphthalene	0.061	**5.2**	**1.55**	**3.58**	**4.33**	**1.7**	**2.41**	**0.126**	**2.93**	0.12	0.24
Naphthalene	<0.05	**2.7**	**0.739**	**1.67**	**2.15**	**0.807**	**1.15**	0.064	**1.59**	0.24	0.47
Phenanthrene	0.068	**5.31**	**3.48**	**3.86**	**3.54**	**3.1**	**4.12**	**0.345**	**5.08**	0.34	0.65
Pyrene	<0.05	0.385	0.352	0.272	0.233	0.318	0.371	<0.050	0.443	0.87	1.7

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Notes:
m - metres
mg/kg - milligrams per dry kilogram
Dup - blind field duplicate sample
< - less than the analytical detection limit indicated
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* - indicates detection limit in excess of the BC Marine $SedQC_{SCS}$ or $SedQC_{TSC}$
PAH - polycyclic aromatic hydrocarbons
CSR - Contaminated Sites Regulation, 1997
BC Marine $SedQC_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9
BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	C13 70-80	C14 0-10	C14 50-59	C15 0-10	C15 10-30	C15 70-75	IC1 S4	IC1 S6	IC2 S4	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	02-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05		
Depth (m)	0.7-0.8	0.0-0.1	0.5-0.59	0.0-0.1	0.1-0.3	0.7-0.75	2.0-2.8	3.0-3.5	3.0-3.8		
Acenaphthene	0.665	0.345	0.583	0.248	0.519	0.617	0.334	<0.04	0.129	0.055	0.11
Acenaphthylene	0.145	0.128	0.232	0.129	0.246	0.337	0.107	<0.05	0.084	0.079	0.15
Anthracene	0.334	0.164	0.273	0.114	0.234	0.267	0.16	<0.05	0.062	0.15	0.29
Benzo(a)anthracene	0.522	0.271	0.392	0.201	0.405	0.511	0.244	<0.05	0.144	0.43	0.83
Benzo(a)pyrene	0.224	0.107	0.169	0.087	0.181	0.205	0.091	<0.05	0.053	0.47	0.92
Benzo(b)fluoranthene	0.307	0.177	0.245	0.139	0.288	0.317	0.17	<0.05	0.114	n.c.	n.c.
Benzo(g,h,i)perylene	0.114	0.071	0.109	<0.05	0.099	0.111	0.051	<0.05	<0.05	n.c.	n.c.
Benzo(k)fluoranthene	0.059	<0.05	<0.05	<0.05	0.056	0.055	<0.05	<0.05	<0.05	n.c.	n.c.
Chrysene	<0.90*	<0.52	<0.05	<0.39	<0.75*	<0.95*	<0.46	<0.05	<0.32	0.52	1.0
Dibenz(a,h)anthracene	0.066	<0.05	0.051	<0.05	0.053	0.07	<0.05	<0.05	<0.05	0.084	0.16
Fluoranthene	0.575	0.261	0.482	0.289	0.563	0.473	0.237	<0.05	0.156	0.93	1.8
Fluorene	1.64	0.546	0.972	0.48	1	1.56	0.618	<0.05	0.141	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	n.c.	n.c.
2-Methylnaphthalene	2.61	3.07	5.02	4.63	9.39	9.34	2.02	<0.05	3.5	0.12	0.24
Naphthalene	1.27	1.62	2.43	2.52	6.27	4.54	0.997	<0.05	1.83	0.24	0.47
Phenanthrene	6.98	3.85	5.71	2.82	5.7	7.9	3.52	<0.05	2.68	0.34	0.65
Pyrene	0.7	0.346	0.553	0.313	0.655	0.524	0.3	<0.05	0.198	0.87	1.7

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n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	IC3 S2	IC3 S4	IC4 S2	IC4 S4	S-K-1	S-K-2	S-K-3	S-K-4	S-K-5	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	18-May-05	18-May-05	18-May-05	18-May-05	18-May-05		
Depth (m)	1.0-2.0	3.0-4.0	0.5-1.0	1.25-1.6	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2		
Acenaphthene	0.14	<0.04	0.249	0.188	<0.040	<0.040	<0.040	<0.14*	0.116	0.055	0.11
Acenaphthylene	0.098	<0.05	0.125	0.112	<0.050	<0.050	<0.050	<0.070	0.053	0.079	0.15
Anthracene	0.06	<0.05	0.126	0.12	<0.050	<0.050	<0.050	0.125	0.084	0.15	0.29
Benzo(a)anthracene	0.13	<0.05	0.171	0.174	<0.050	<0.050	<0.050	0.254	0.182	0.43	0.83
Benzo(a)pyrene	<0.05	<0.05	0.076	0.072	0.05	<0.050	<0.050	0.113	0.067	0.47	0.92
Benzo(b)fluoranthene	0.096	<0.05	0.113	0.118	0.056	<0.050	<0.050	0.198	0.138	n.c.	n.c.
Benzo(g,h,i)perylene	<0.05	<0.05	0.055	0.055	<0.050	<0.050	<0.050	0.076	<0.050	n.c.	n.c.
Benzo(k)fluoranthene	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	n.c.	n.c.
Chrysene	<0.29	<0.05	<0.32	<0.31	0.053	<0.050	<0.050	0.509	0.41	0.52	1.0
Dibenz(a,h)anthracene	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.084	0.16
Fluoranthene	0.14	<0.05	0.166	0.157	0.075	<0.050	<0.050	0.392	0.239	0.93	1.8
Fluorene	0.124	<0.05	0.414	0.203	<0.050	<0.050	<0.050	0.146	0.107	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	n.c.	n.c.
2-Methylnaphthalene	4.24	<0.05	1.71	1.68	0.065	0.078	0.178	2.36	3.32	0.12	0.24
Naphthalene	2.18	<0.05	0.719	0.886	<0.050	<0.050	0.106	1.43	1.86	0.24	0.47
Phenanthrene	2.45	<0.05	2.74	2.55	0.083	0.093	0.251	2.68	2.88	0.34	0.65
Pyrene	0.179	<0.05	0.235	0.221	0.084	<0.050	<0.050	0.391	0.248	0.87	1.7

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Notes:
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n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$

TABLE 7 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - PAHs (mg/kg)

Sample ID	C-K-3 0-30	C-K-3 30-40	C-K-3b 40-45	S27	S28	S29	S30	S31	S33	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	18-May-05	18-May-05	18-May-05	16-Sep-05	16-Sep-05	16-Sep-05	16-Sep-05	16-Sep-05	16-Sep-05		
Depth (m)	0-0.3	0.3-0.45	0.4-0.45	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.15	0 - 0.10	0 - 0.15		
Acenaphthene	**0.088**	**0.149**	<0.040	< 0.20*	< 0.20*	< 0.10*	< 0.30*	< 0.30*	< 0.040	0.055	0.11
Acenaphthylene	<0.050	0.052	<0.050	< 0.050	< 0.050	< 0.050	< 0.20*	< 0.20*	< 0.050	0.079	0.15
Anthracene	0.056	0.06	<0.050	0.113	0.129	0.076	0.091	**0.186**	< 0.050	0.15	0.29
Benzo(a)anthracene	0.115	0.201	<0.050	0.133	0.143	0.121	0.363	0.425	< 0.050	0.43	0.83
Benzo(a)pyrene	0.057	0.097	<0.050	0.055	0.062	< 0.050	0.349	0.159	< 0.050	0.47	0.92
Benzo(b)fluoranthene	0.081	0.161	<0.050	0.080	0.094	0.085	0.464	0.316	< 0.050	n.c.	n.c.
Benzo(g,h,i)perylene	<0.050	0.071	<0.050	< 0.050	< 0.050	< 0.050	0.254	0.131	< 0.050	n.c.	n.c.
Benzo(k)fluoranthene	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050	0.105	0.056	< 0.050	n.c.	n.c.
Chrysene	0.22	0.406	<0.050	0.231	0.241	0.239	**0.742**	**0.930**	< 0.050	0.52	1.0
Dibenz(a,h)anthracene	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050	0.068	0.071	< 0.050	0.084	0.16
Fluoranthene	0.184	0.301	<0.050	0.132	0.143	0.127	0.423	0.442	< 0.050	0.93	1.8
Fluorene	**0.094**	**0.161**	<0.050	**0.302**	**0.284**	**0.110**	< 0.20*	**0.299**	< 0.050	0.089	0.17
Indeno(1,2,3-c,d)pyrene	<0.050	<0.050	<0.050	< 0.050	< 0.050	< 0.050	0.202	< 0.050	< 0.050	n.c.	n.c.
2-Methylnaphthalene	**0.815**	**2.21**	**0.149**	**1.34**	**1.36**	**1.31**	**4.79**	**9.53**	< 0.050	0.12	0.24
Naphthalene	**0.426**	**1.4**	0.088	**0.582**	**0.534**	**0.593**	**2.68**	**4.96**	< 0.050	0.24	0.47
Phenanthrene	**1.42**	**2.45**	0.243	**1.92**	**2.02**	**1.95**	**4.25**	**6.88**	< 0.050	0.34	0.65
Pyrene	0.203	0.319	<0.050	0.146	0.160	0.145	0.513	0.504	0.051	0.87	1.7

Notes:
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n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$

TABLE 8: MARINE SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)												
Sample ID	**S1**	**S2**	**S3**	**S4**	**S7 (S4 Dup)**	**S5**	**S6**	**S7 (0-15)**	**S7 (15-40)**	**S8 (0-15)**	**BC Marine $SedQC_{SCS}$**	**BC Marine $SedQC_{TCS}$**
Date	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**21-Jan-04**	**22-Jan-04**	**08-Apr-04**	**08-Apr-04**	**08-Apr-04**		
Depth (m)	**0.0-0.15**	**0.0-0.15**	**0.0-0.15**	**0.0-0.15**	**0.0-0.15**	**0.0-0.15**	**0.0-0.15**	**0.0-0.15**	**0.15-0.4**	**0.0-0.15**		
pH	6.56	7.8	8.05	8.29	8.36	8.5	8.46	7.54	7.85	8.06	n.c.	n.c.
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	n.c.	n.c.
Arsenic	14.2	20.3	25.7	10.5	9.8	6	5.4	22.4	14.8	**33.5**	26	50
Barium	23.1	39	43.1	41.5	47.8	10.2	14.6	52	31	32.9	n.c.	n.c.
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	n.c.	n.c.
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.6	5.0
Chromium (total)	22.6	9.7	15	11.7	15.2	20	12.8	9.9	10	9.1	99	190
Cobalt	12.8	6.8	9.2	5.6	6.3	8.9	5.1	6.9	6.2	8.3	n.c.	n.c.
Copper	49.1	44.8	45.7	37.3	36.2	21.8	12.2	47.5	48.9	53.4	67	130
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	69	130
Mercury	0.105	0.343	0.291	0.164	0.156	<0.05	<0.05	**0.462**	0.328	**0.497**	0.43	0.84
Molybdenum	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	n.c.	n.c.
Nickel	24	11.6	14.8	12.1	13.7	17.4	9.7	11	11.6	12	n.c.	n.c.
Selenium	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	n.c.	n.c.
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	n.c.	n.c.
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	n.c.	n.c.
Vanadium	102	41.8	64.7	51.4	53	84.2	51.1	48.8	35.6	38.4	n.c.	n.c.
Zinc	45.8	36.9	49.3	30.9	32.7	36.2	24.6	40.5	37.7	54.2	170	330

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n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 8 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)

Sample ID	S9 (0-15)	S10 (0-15)	S10 (15-40)	S11 (0-15)	S14	S15	S16	C1 0-10	C2 0-10	C3 0-10	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	08-Apr-04	01-Feb-05	01-Feb-05	01-Feb-05		
Depth (m)	0.0-0.15	0.0-0.15	0.15-0.4	0.0-0.15	0.0-0.15	0.0-0.15	0-0.15	0.0-0.10	0.0-0.10	0.0-0.10		
pH	8.53	7.57	7.64	7.99	8.34	5.91	8.65	7.62	8.16	8.06	n.c.	n.c.
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	n.c.	n.c.
Arsenic	18.4	25.3	**30.3**	23	6.4	18.5	11.3	11.3	7.7	10.2	26	50
Barium	24.3	52.5	42.9	42.8	11.7	23.8	22.4	38.6	22.2	49.5	n.c.	n.c.
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	n.c.	n.c.
Cadmium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.11	0.53	<0.5	2.6	5.0
Chromium (total)	12.4	12.2	14	12.3	17.3	13.6	16.9	23.9	23	11.5	99	190
Cobalt	8.2	7.7	10.2	8.2	9	7.7	11.3	9.1	8.9	5.9	n.c.	n.c.
Copper	44	47	53.6	48.3	28.5	44.6	62.8	43.9	29.4	38.5	67	130
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	69	130
Mercury	0.236	0.394	0.376	0.327	0.083	0.187	0.128	0.232	0.091	0.3	0.43	0.84
Molybdenum	<4	4.9	5	<4	<4	9.1	<4	5.1	<4	<4	n.c.	n.c.
Nickel	13.7	12.3	15	13.6	18.4	15.4	20.4	19.7	17	10.2	n.c.	n.c.
Selenium	<2	<3	<2	<2	<2	<2	<2	<2	<3	<2	n.c.	n.c.
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	n.c.	n.c.
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	n.c.	n.c.
Vanadium	45.4	56.5	60.3	51.9	75.1	59.1	71.1	62.7	67.5	48.6	n.c.	n.c.
Zinc	47.8	47.8	57.6	51.6	39.3	49.2	48.8	60.1	49.2	38.4	170	330

Table continued on next page...

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n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 8 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)

Sample ID	C4 0-10	C5 0-10	C6 0-10	C7 0-10	C9 0-10	C10 0-10	C11 0-10	C12 0-10	C12 10-30	C13 0-10	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	01-Feb-05	01-Feb-05	01-Feb-05	01-Feb-05	02-Feb-05	02-Feb-05	02-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05		
Depth (m)	0.0-0.10	0.0-0.10	0.0-0.10	0.0-0.10	0.0-0.10	0.0-0.10	0.0-0.10	0.0-0.10	0.10-0.30	0.0-0.10		
pH	7.62	8.17	7.49	8.23	7.46	8.05	8.29	8.32	8.34	8.25	ns	ns
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	ns	ns
Arsenic	14	7.1	11.9	**27.7**	8.7	18.1	15.6	8	6.7	8.4	26	50
Barium	57.2	20.3	56.9	35.8	40.9	43.8	20.8	26	30.8	44.5	ns	ns
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ns	ns
Cadmium	1.36	<0.5	1.78	<0.5	2.23	<0.5	<0.5	<0.5	<0.5	<0.5	2.6	5
Chromium (total)	34.9	24.1	36.9	9.5	29.1	12.7	10.2	17.7	15.2	8.2	99	190
Cobalt	9.7	9.9	9.9	6.5	9.1	7.4	7.7	6.9	6.6	4.5	ns	ns
Copper	**69.7**	31.6	**68.4**	53.8	45.3	49.7	46.9	32.8	35.1	35.4	67	130
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	69	130
Mercury	0.244	0.069	0.192	0.316	0.128	0.343	0.227	0.164	0.197	0.301	0.43	0.84
Molybdenum	5.9	4.1	4.8	<4	<4	<4	<4	<4	<4	<4	ns	ns
Nickel	26.3	18.8	27.2	12.2	21.6	11.5	10.9	12.6	12.1	7.5	ns	ns
Selenium	<2	<2	<3	<2	<2	<2	<2	<2	<2	<2	ns	ns
Silver	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	ns	ns
Tin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ns	ns
Vanadium	71.6	72.6	69.9	36.4	59.5	47.9	35.9	50.7	48.5	40.5	ns	ns
Zinc	88.5	52.6	92.3	54.4	71.9	48.1	42.9	36.8	35.9	30.9	170	330

Table continued on next page...

Notes:
m - metres
mg/kg - milligrams per dry kilogram
Dup - blind field duplicate sample
< - less than the analytical detection limit indicated
" --- " - sample not analyzed for parameter indicated
CSR - Contaminated Sites Regulation, 1997
BC Marine $SedQC_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9
BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9
n.c. - no criterion listed
bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$
shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 8 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)

Sample ID Date Depth (m)	C14 0-10 03-Feb-05 0.0-0.10	C15 0-10 03-Feb-05 0.0-0.10	IC1 S4 03-Feb-05 2.0-2.8	IC1 S6 03-Feb-05 3.0-3.5	IC2 S5 03-Feb-05 3.8-4.0	IC3 S4 03-Feb-05 3.0-4.0	IC4 S2 03-Feb-05 0.5-1.0	IC4 S4 03-Feb-05 1.25-1.6	S17 03-Feb-05 0.0-0.15	S18 03-Feb-05 0.0-0.15	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
pH	8.2	7.89	8.37	8.85	8.73	5.68	8.21	8.03	8.11	7.67	n.c.	n.c.
Antimony	<10	<10	---	---	---	---	<10	---	<10	<10	n.c.	n.c.
Arsenic	10.1	20.2	14.7	<5	9.2	6.9	12.9	16.6	**40.7**	25.5	26	50
Barium	67.2	53.4	---	---	---	---	45.9	---	50.7	60.4	n.c.	n.c.
Beryllium	<0.5	<0.5	---	---	---	---	<0.5	---	<0.5	<0.5	n.c.	n.c.
Cadmium	<1	<1	---	---	---	---	<1	---	<0.5	<0.5	2.6	5
Chromium (total)	7	15.8	---	---	---	---	12.7	---	11.6	11.4	99	190
Cobalt	4.4	6.9	---	---	---	---	10	---	11.5	7.5	n.c.	n.c.
Copper	31	51.2	64.5	20.5	32.8	17	**68.3**	40.5	62.3	49.1	67	130
Lead	<50	<50	---	---	---	---	<50	---	<50	<50	69	130
Mercury	0.276	0.323	0.301	<0.05	<0.05	<0.05	0.221	0.094	**0.513**	0.413	0.43	0.84
Molybdenum	<4	5.4	---	---	---	---	<4	---	4.2	<4	n.c.	n.c.
Nickel	6.9	13.8	---	---	---	---	17.8	---	14.3	11.6	n.c.	n.c.
Selenium	<3	<2	---	---	---	---	<3	---	<3	2.9	n.c.	n.c.
Silver	<2	<2	---	---	---	---	<2	---	<2	<2	n.c.	n.c.
Tin	<5	<5	---	---	---	---	<5	---	<5	<5	n.c.	n.c.
Vanadium	46.5	55.9	---	---	---	---	51.5	---	46.7	54.8	n.c.	n.c.
Zinc	26.5	53.9	---	---	---	---	54.2	---	56.1	42.6	170	330

Table continued on next page...

Notes:

m - metres

mg/kg - milligrams per dry kilogram

Dup - blind field duplicate sample

< - less than the analytical detection limit indicated

" --- " - sample not analyzed for parameter indicated

CSR - Contaminated Sites Regulation, 1997

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BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9

n.c. - no criterion listed

bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$

shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 8 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)

Sample ID	S19 0-15	S20 0-15	S21 0-15	S23	S24	S26	S-K-1	S-K-2	S-K-3	S-K-4	BC Marine $SedQC_{SCS}$	BC Marine $SedQC_{TCS}$
Date	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	03-Feb-05	18-May-05	18-May-05	18-May-05	18-May-05		
Depth (m)	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0.0-0.15	0 - 0.2	0 - 0.2	0 - 0.2	0 - 0.2		
pH	7.45	8.08	7.69	6.65	7.22	8.42	8.12	8.2	8.22	7.79	n.c.	n.c.
Antimony	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	n.c.	n.c.
Arsenic	21.3	17.8	**49.2**	**35.4**	21.5	5.7	7.2	5.2	<5.0	20.6	26	50
Barium	66.9	43.8	69.5	47.8	40	22.7	19.5	26	23.2	42.6	n.c.	n.c.
Beryllium	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	n.c.	n.c.
Cadmium	<1	<1	<1	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	2.6	5
Chromium (total)	19.7	8.5	15.7	11.7	12.1	15.9	32.5	20.3	18.4	16.9	99	190
Cobalt	10.3	6.8	16.3	7	8.3	7.8	14.6	9.9	8.4	8.4	n.c.	n.c.
Copper	44	53.7	**94.3**	49.5	40.2	17.3	44.5	24	21.5	46.6	67	130
Lead	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	69	130
Mercury	0.231	0.316	**0.558**	0.412	0.143	<0.05	<0.050	<0.050	0.075	0.352	0.43	0.84
Molybdenum	<4	<4	8.6	8.6	9	<4	<4.0	<4.0	<4.0	<4.0	n.c.	n.c.
Nickel	16.4	10.9	17.2	12	14	12.6	27.8	18.8	16.3	15.8	n.c.	n.c.
Selenium	<2	<2	<2	<5	<5	<2	<2.0	<2.0	<2.0	<2.0	n.c.	n.c.
Silver	<2	<2	<2	<2	<2	<2	2.6	<2.0	<2.0	<2.0	n.c.	n.c.
Tin	12.8	<5	<5	<5	<5	<5	<5.0	<5.0	7.5	<5.0	n.c.	n.c.
Vanadium	73.1	30.4	65.5	53.8	52.9	63.6	97.7	70.9	63.1	62.4	n.c.	n.c.
Zinc	45.3	36.9	73.3	56.8	53	40.1	86.4	48	56	81.6	170	330

Table continued on next page...

Notes:

m - metres

mg/kg - milligrams per dry kilogram

Dup - blind field duplicate sample

< - less than the analytical detection limit indicated

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CSR - Contaminated Sites Regulation, 1997

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BC Marine $SedQC_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9

n.c. - no criterion listed

bold - indicates concentrations in excess of the BC Marine $SedQC_{SCS}$

shade - indicates concentrations in excess of the BC Marine $SedQC_{TCS}$

TABLE 8 (continued): MARINE SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)												
Sample ID	**S-K-5**	**C-K-3 0-30**	**C-K-3 30-40**	**C-K-3b 40-45**	**S27**	**S28**	**S29**	**S30**	**S31**	**S33**	**BC Marine SedQC$_{SCS}$**	**BC Marine SedQC$_{TCS}$**
Date	**18-May-05**	**18-May-05**	**18-May-05**	**18-May-05**	**16-Sep-05**	**16-Sep-05**	**16-Sep-05**	**16-Sep-05**	**16-Sep-05**	**17-Sep-05**		
Depth (m)	**0 - 0.2**	**0 - 0.3**	**0.3 - 0.4**	**0.4 - 0.45**	**0 - 0.15**	**0 - 0.15**	**0 - 0.15**	**0 - 0.15**	**0 - 0.10**	**0 - 0.15**		
pH	8.43	8.31	8.08	8.46	7.21	7.05	7.37	6.83	4.51	8.47	n.c.	n.c.
Antimony	<10	<10	<10	<10	< 10	< 10	< 10	< 10	< 10	< 10	n.c.	n.c.
Arsenic	25.6	13.9	9.6	5.1	14.3	25.0	17.1	**27.1**	**34.7**	< 5.0	26	50
Barium	49.5	42.5	39.3	24	33.0	31.4	28.4	46.8	78.1	8.1	n.c.	n.c.
Beryllium	<0.50	<0.50	<0.50	<0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.53	< 0.50	n.c.	n.c.
Cadmium	<0.50	<0.50	<0.50	<0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.6	5
Chromium (total)	16.3	15.3	19.8	22	15.9	16.2	14.2	12.9	11.9	20.7	99	190
Cobalt	9.8	10.1	8.8	9.8	26.1	9.3	9.9	4.9	3.7	6.6	n.c.	n.c.
Copper	52.1	37	37.9	29.1	32.8	29.6	41.1	47.0	45.1	16.9	67	130
Lead	<50	<50	<50	<50	< 50	< 50	< 50	< 50	< 50	< 50	69	130
Mercury	**0.462**	0.204	0.145	<0.050	0.111	0.083	0.136	0.316	0.378	< 0.050	0.43	0.84
Molybdenum	<4.0	<4.0	<4.0	<4.0	< 4.0	6.5	< 4.0	8.6	11.8	< 4.0	n.c.	n.c.
Nickel	17.4	18.7	18	20.4	15.8	13.9	17.0	10.8	8.3	13.6	n.c.	n.c.
Selenium	<2.0	<2.0	<2.0	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	n.c.	n.c.
Silver	<2.0	<2.0	<2.0	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	n.c.	n.c.
Tin	<5.0	<5.0	<5.0	<5.0	---	---	---	---	---	---	n.c.	n.c.
Vanadium	44.7	51.5	58.6	65.7	67.2	66.5	58.1	52.0	53.2	61.4	n.c.	n.c.
Zinc	56	53.1	52.6	39.9	38.7	38.6	50.3	47.3	49.3	29.5	170	330

Notes:

m - metres

mg/kg - milligrams per dry kilogram

Dup - blind field duplicate sample

< - less than the analytical detection limit indicated

" --- " - sample not analyzed for parameter indicated

CSR - Contaminated Sites Regulation, 1997

BC Marine SedQC$_{SCS}$ - BC Marine Sediment Quality Criteria for sensitive contaminated sites, as outlined in CSR Schedule 9

BC Marine SedQC$_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9

n.c. - no criterion listed

bold - indicates concentrations in excess of the BC Marine SedQC$_{SCS}$

shade - indicates concentrations in excess of the BC Marine SedQC$_{TCS}$

TABLE 9: INTERTIDAL PRECIPITATE/SEDIMENT CHEMISTRY RESULTS - METALS (mg/kg)							
Sample ID **Date** **Depth (m)**	**PSED 1** **4-Apr-2006** **0 - 0.01**	**PSED 2** **4-Apr-2006** **0 - 0.01**	**PSED 3** **4-Apr-2006** **0 - 0.01**	**PSED 4** **4-Apr-2006** **0 - 0.01**	**PSED 5** **4-Apr-2006** **0 - 0.01**	**BC Marine SedQC$_{SCS}$**	**BC Marine SedQC$_{TCS}$**
pH	4.6	6.32	6.35	5.65	6.76	n.c.	n.c.
Antimony	< 20	< 10	< 10	< 10	< 10	n.c.	n.c.
Arsenic	23	**30.4**	18.9	14.3	21.6	26	50
Barium	31	34.7	33	21.5	28.4	n.c.	n.c.
Beryllium	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	n.c.	n.c.
Cadmium	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	2.6	5
Chromium (total)	7.2	12.1	12.3	13.7	14.3	99	190
Cobalt	< 4.0	5.7	7.3	5.3	7.7	n.c.	n.c.
Copper	30.4	48.3	35.8	39.3	33.8	67	130
Lead	< 100	< 50	< 50	< 50	< 50	69	130
Mercury	0.146	0.304	0.17	0.175	0.126	0.43	0.84
Molybdenum	37.8	7.4	9.7	4.9	13.2	n.c.	n.c.
Nickel	< 10	11.1	11.8	11.3	14	n.c.	n.c.
Selenium	< 8.0	< 2.0	< 2.0	< 3.0	< 4.0	n.c.	n.c.
Silver	< 4.0	< 2.0	< 2.0	< 2.0	< 2.0	n.c.	n.c.
Tin	---	---	---	---	---	n.c.	n.c.
Titanium	209	482	275	397	734	n.c.	n.c.
Vanadium	36.3	51.1	52.2	46.3	74.3	n.c.	n.c.
Zinc	75	50.9	40.9	31.7	51.2	170	330

Notes:

m - metres

mg/kg - milligrams per dry kilogram

< - less than the analytical detection limit indicated

" --- " - sample not analyzed for parameter indicated

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BC Marine SedQC$_{TCS}$ - BC Marine Sediment Quality Criteria for typical contaminated sites, as outlined in CSR Schedule 9

n.c. - no criterion listed

bold - indicates concentrations in excess of the BC Marine SedQC$_{SCS}$

shade - indicates concentrations in excess of the BC Marine SedQC$_{TCS}$

TABLE 10: INTERTIDAL SHEEN CHEMISTRY RESULTS - METALS (µg/filter paper)		
Sample ID	**SHEEN E**	**SHEEN N**
Date	**4-Apr-2006**	**4-Apr-2006**
Aluminum	<20	30
Antimony	<20	<20
Arsenic	<20	<20
Barium	<1.0	<1.0
Beryllium	<0.50	<0.50
Bismuth	<20	<20
Cadmium	<1.0	<1.0
Calcium	266	293
Chromium (Total)	<1.0	<1.0
Cobalt	<1.0	<1.0
Copper	<1.0	<1.0
Iron	1370	1070
Lead	<5.0	<5.0
Lithium	<1.0	<1.0
Magnesium	176	376
Manganese	1.94	2.62
Molybdenum	<3.0	<3.0
Nickel	<5.0	<5.0
Phosphorus	<30	<30
Potassium	<200	<200
Selenium	<20	<20
Silver	<1.0	<1.0
Sodium	1310	2870
Strontium	2.27	4.18
Thallium	<20	<20
Tin	<3.0	<3.0
Titanium	<1.0	1.7
Vanadium	<3.0	<3.0
Zinc	<0.50	0.65

Notes:

µg/filter paper - micrograms per filter paper. Globule of sheen collected as solid on filter paper.

< - less than the analytical detection limit indicated

" --- " - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 11: EAST FACE SEEP WATER RESULTS - TOTAL METALS AND INORGANICS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW1	SW1	SW6	SW7	SW9						SW9 E	SW9 L	SW9 F1	
Date (dd-mmm-yy)	07-Apr-04	02-Feb-05	19-Aug-05	19-Aug-05	19-Aug-05	17-Sep-05	13-Oct-05	13-Dec-05	26-Jan-06	10-Feb-06	09-Feb-06	09-Feb-06	09-Feb-06	
Time	13:20	17:40	12:30	13:45	14:00	12:25-12:55	9:50	22:20	20:27	23:00	19:00	21:30	22:30	BCWQ Marine[2]
Tidal Height[1] (m)	Low Tide (1.0 m)	Low Tide (1.5 m)	Low Tide (0.8 m)	Low Tide (1.3 m)	Low Tide (1.4 m)	Low Tide (1.4-1.6 m)	Low Tide (1.7 m)	Low Tide (0.5 m)	Low Tide (1.1 m)	Low Tide (1.2 m)	Ebb Tide (2.1 m)	Low Tide (1.2 m)	Rising Flood Tide (1.3 m)	
Field pH	**---**	---	7.04	7.09	5.86	6.42-6.50	6.85	---	---	**---**	**---**	---	**---**	n.g.
pH	7.4	---	---	---	---	6.00	---	6.40	6.41	6.2	6.49	6.26	6.23	n.g.
Field Salinity	---	---	21.3	23.8	17.3	21.3-21.4	21.5	---	---	---	---	---	---	n.g.
Salinity (o/oo)	23.2	---	22	26.2	18.1	22	---	20.6	20.6	16.4	18.2	17.5	17.1	n.g.
Hardness (mg/L)[H]	---	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	---	---	---	---	---	2,220	---	2,060	2,130	---	---	---	---	n.g.
Bromide (mg/L)	---	---	---	---	---	---	---	16.1	31.9	---	---	---	---	n.g.
Chloride (mg/L)	---	---	---	---	---	---	---	11,500	11,000	8,760	9,980	9,200	8,960	n.g.
Fluoride (mg/L)	---	---	---	---	---	---	---	< 2.0	< 2.0	---	---	---	---	n.g.
Aluminum	61	---	15	< 10	< 10	< 10	< 10	< 10	< 20	< 150	---	---	---	n.g.
Arsenic	< 0.5	---	0.21	< 0.20	< 0.20	0.28	< 0.20	0.34	< 0.2	< 0.20	---	---	---	12[a]
Cadmium	< 0.25*	0.06	0.051	0.058	0.092	< 0.15*	< 0.25*	0.066	<0.25*	< 0.25*	---	---	---	0.1[a,d]
Total Chromium	< 2.5*	---	---	---	---	---	---	< 50*	<50*	< 50*	---	---	---	1.5[e], 56[f]
Cobalt	< 0.5	14.6	0.991	9.67	49.5	38.4	69.1	36.8	23	30.2	---	---	---	n.g.
Copper	**2.6**	0.745	0.383	0.579	0.97	1.41	0.76	0.45	1.95	1.98	**---**	**---**	**---**	3[a], <2[b]
Iron	**17,300**	**9,560**	**21,100**	**21,100**	**109,000**	**118,000**	**185,000**	**89,700**	**37,600**	**49,900**	**36,600**	**53,000**	**52,500**	50[g], 300[h]
Lead	< 0.25	< 0.05	0.062	< 0.050	< 0.15	< 0.15	< 0.25	< 0.050	< 0.25	< 0.25	---	---	---	140[a], <2[b]
Manganese	**478**	**910**	**828**	**402**	**2,910**	**2,320**	**3,110**	**2,230**	**1,980**	**1,930**	---	---	---	100[i]
Mercury	< 0.01	---	---	---	---	---	---	0.01	< 0.010	< 0.010	---	---	---	2.0[a], 0.02[b]
Molybdenum	< 6	---	---	---	---	---	---	< 5.0	<5.0	<5.0	---	---	---	n.g.
Nickel	0.74	**12.6**	0.673	**10.3**	**31.5**	**24.8**	**42**	**20.5**	**13.5**	**18.9**	---	---	---	8.3[j]
Selenium	< 5*	---	---	---	---	---	---	< 0.50	< 0.50	< 0.50	---	---	---	2.0[c]
Uranium	0.351	0.378	1.23	0.459	0.36	0.768	0.715	0.301	0.624	0.214	---	---	---	100[h], 500[i]
Zinc	9.7	3.01	2.09	**13.3**	**13.1**	9.5	**18.1**	9.2	8.2	**11.2**	---	---	---	10

Table continued on next page...

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

TABLE 11 (continued): EAST FACE SEEP WATER RESULTS - TOTAL METALS AND INORGANICS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW9 F2	SW9 F3	SW9	SW38	SW38B	SW39	SW40		SW41	SW42	SW43	SW44	
Date	09-Feb-06	09-Feb-06	04-Apr-06	26-Jan-06	10-Feb-06	26-Jan-06	26-Jan-06	10-Feb-06	26-Jan-06	09-Feb-06	09-Feb-06	09-Feb-06	
Time Tidal Height[1] (m)	23:00 Rising Flood Tide (1.4 m)	23:30 Rising Flood Tide (1.7 m)	18:00 Low Tide (1.7 m)	20:57 Low Tide (0.7 m)	22:30 Low Tide (1.2 m)	21:17 Low Tide (0.7 m)	20:55 Low Tide (0.7 m)	23:30 Low Tide (1.6 m)	20:32 Low Tide (0.7 m)	21:00 Low Tide (1.2 m)	21:00 Low Tide (1.2 m)	20:56 Low Tide (1.2 m)	BCWQ Marine[2]
Field pH	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
pH	6.24	6.25	6.21	6.52	6.5	6.98	7.22	6.49	6.74	6.23	6.15	6.4	n.g.
Field Salinity	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
Salinity (o/oo)	17.6	17.9	18.4	18.8	16.3	21.3	20.9	18.9	22.7	11.8	12.1	14.8	n.g.
Hardness (mg/L)H	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	---	---	---	1,930	---	1,960	2,120	---	2,140	---	---	---	n.g.
Bromide (mg/L)	---	---	---	27.4	---	33.4	32.1	---	34.8	---	---	---	n.g.
Chloride (mg/L)	9,580	9,550	---	9,580	8,550	11,600	11,300	9,790	12,000	5,760	6,200	7,720	n.g.
Fluoride (mg/L)	---	---	---	< 2.0	---	< 2.0	2.2	---	3.1	---	---	---	n.g.
Aluminum	---	---	< 1,000	< 30	< 150	< 10	< 10	220	< 10	---	---	---	n.g.
Arsenic	---	---	< 0.20	< 0.20	< 0.20	< 0.20	0.22	0.93	< 0.20	---	---	---	12[a]
Cadmium	---	---	< 0.10	< 0.50*	< 0.25*	< 0.25*	0.07	< 0.25*	< 0.25*	---	---	---	0.1[a,d]
Total Chromium	---	---	---	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	---	---	---	1.5[e], 56[f]
Cobalt	---	---	20.9	31.4	20.3	9.64	5.38	15	4.39	---	---	---	n.g.
Copper	---	---	0.74	**2.2**	1.69	0.89	0.32	**3.84**	0.69	---	---	---	3[a], <2[b]
Iron	**54,700**	**56,900**	**49,000**	**33,800**	**16,400**	**12,600**	**5,830**	**28,000**	**11,000**	**33,500**	**70,200**	**22,300**	50[g], 300[h]
Lead	---	---	< 0.10	< 0.50	<0.25	< 0.25	< 0.050	0.99	< 0.25	---	---	---	140[a], <2[b]
Manganese	---	---	**1,520**	**2,460**	**2,130**	**735**	**344**	**705**	**610**	---	---	---	100[i]
Mercury	---	---	---	< 0.010	<0.010	< 0.010	< 0.010	0.015	< 0.10	---	---	---	2.0[a], 0.02[b]
Molybdenum	---	---	---	< 5.0	<5.0	< 5.0	< 5.0	< 5.0	< 5.0	---	---	---	n.g.
Nickel	---	---	**13.1**	**28.8**	**18.9**	**11.9**	**4.15**	**14.8**	4.4	---	---	---	8.3[j]
Selenium	---	---	---	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	---	---	---	2.0[c]
Uranium	---	---	0.458	0.28	0.61	1.91	1.23	0.693	1.13	---	---	---	100[h], 500[i]
Zinc	---	---	5.8	**30**	7.7	< 5.0	3.5	**13.8**	3.5	---	---	---	10

Notes:
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 12: EAST FACE SEEP WATER RESULTS - DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID				SW9				SW9E	SW9L	SW9F1	SW9F2	SW9F3	
Date	19-Aug-05	17-Sep-05	13-Oct-05	13-Dec-05	26-Jan-06	10-Feb-06	04-Apr-06	09-Feb-06	09-Feb-06	09-Feb-06	09-Feb-06	09-Feb-06	
Time	14:00	12:25-12:55	9:50	22:20	20:25	23:00	18:00	19:00	21:30	22:30	23:00	23:30	BCWQ Marine[2]
Tidal Height[1] (m)	Low Tide (1.4 m)	Low Tide (1.4-1.6 m)	Low Tide (1.7 m)	Low Tide (0.5 m)	Low Tide (1.1 m)	Low Tide (1.2 m)	Low Tide (1.7 m)	Ebb Tide (2.1 m)	Low Tide (1.2 m)	Rising Flood Tide (1.3 m)	Rising Flood Tide (1.4 m)	Rising Flood Tide (1.7 m)	
pH	---	5.85	---	6.4	6.41	6.2	6.21	6.49	6.26	6.23	6.24	6.25	n.g.
Salinity (o/oo)	---	21.7	---	20.6	20.6	16.4	---	18.2	17.5	17.1	17.6	17.9	n.g.
Sulphate (mg/L)	---	2,240	---	2,060	2,130	---	---	---	---	---	---	---	n.g.
Aluminum	< 10	< 10	< 10	< 10	< 20	< 150	< 100	---	---	---	---	---	n.g.
Arsenic	1.51	< 0.20	< 0.20	0.28	< 0.20	< 0.20	< 0.20	---	---	---	---	---	12[a]
Cadmium	0.081	< 0.15*	< 0.25*	0.078	< 0.25*	< 0.25*	0.067	---	---	---	---	---	0.1[a,d]
Total Chromium	---	---	---	< 50*	< 50*	< 50*	---	---	---	---	---	---	1.5[e], 56[f]
Cobalt	49.5	35.1	76.3	36.1	21.1	28.3	21.4	---	---	---	---	---	n.g.
Copper	1.21	1.29	0.91	0.44	1.29	1.87	0.796	---	---	---	---	---	3[a], <2[b]
Iron	**109,000**	**109,000**	**206,000**	**85,400**	**30,000**	**43,800**	**42,600**	**42,500**	**49,000**	**51,700**	**41,800**	**44,200**	50[g], 300[h]
Lead	< 0.15	< 0.15	< 0.25	< 0.050	< 0.25	< 0.25	< 0.050	---	---	---	---	---	140[a], <2[b]
Manganese	**3,040**	**2,080**	**3,520**	**2,460**	**1,850**	**1,940**	**1,580**	---	---	---	---	---	100[i]
Mercury	---	---	---	< 0.010	< 0.010	< 0.010	---	---	---	---	---	---	2.0[a], 0.02[b]
Molybdenum	---	---	---	< 5.0	< 5.0	< 5.0	---	---	---	---	---	---	n.g.
Nickel	**31.2**	**23.1**	**47.2**	**20.6**	**13.5**	**17.4**	**13.6**	---	---	---	---	---	8.3[j]
Selenium	---	---	---	< 0.50	0.57	< 0.50	---	---	---	---	---	---	2.0[c]
Uranium	0.35	0.783	0.735	0.163	0.595	0.212	0.459	---	---	---	---	---	100[h], 500[i]
Zinc	**19.9**	**11.5**	**25**	**10.9**	7	**11.5**	5.23	---	---	---	---	---	10

Table continued on next page...

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

TABLE 12 (continued): EAST FACE SEEP WATER RESULTS - DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW38	SW38B	SW39	SW40		SW41	SW42	SW43	SW44	
Date	26-Jan-06	10-Feb-06	26-Jan-06	26-Jan-06	10-Feb-06	26-Jan-06	09-Feb-06	09-Feb-06	09-Feb-06	
Time Tidal Height[1] (m)	20:55 Low Tide (0.7 m)	22:30 Low Tide (1.2 m)	21:15 Low Tide (0.7 m)	20:53 Low Tide (0.7 m)	23:30 Low Tide (1.6 m)	20:30 Low Tide (0.7 m)	21:00 Low Tide (1.2 m)	21:00 Low Tide (1.2 m)	20:56 Low Tide (1.2 m)	BCWQ Marine[2]
pH	6.52	6.5	6.98	7.22	6.49	6.74	6.23	6.15	6.4	n.g.
Salinity (o/oo)	18.8	16.3	21.3	20.9	18.9	22.7	11.8	12.1	14.8	n.g.
Sulphate (mg/L)	1,930	---	1,960	2,120	---	2,140	---	---	---	n.g.
Aluminum	< 20	< 150	< 10	< 10	< 150	< 10	---	---	---	n.g.
Arsenic	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	---	---	---	12[a]
Cadmium	< 0.25*	< 0.25*	**0.27**	< 0.10	< 0.25*	**0.13**	---	---	---	0.1[a,d]
Total Chromium	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	---	---	---	1.5[e], 56[f]
Cobalt	29.8	18.4	10.5	9.15	16.2	4.48	---	---	---	n.g.
Copper	**2.1**	1.41	1.75	1.29	1.78	1.38	---	---	---	3[a], <2[b]
Iron	**33,300**	**14,500**	**9,710**	**15,500**	**26,300**	**11,500**	**37,100**	**64,800**	**14,200**	50[g], 300[h]
Lead	< 0.25	<0.25	0.18	< 0.10	<0.025	<0.10	---	---	---	140[a], <2[b]
Manganese	**2,530**	**2,000**	**741**	**511**	**750**	**598**	---	---	---	100[j]
Mercury	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.10*	---	---	---	2.0[a], 0.02[b]
Molybdenum	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	---	---	---	n.g.
Nickel	24.5	17.2	16.5	7.4	16.1	4.2	---	---	---	8.3[j]
Selenium	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.75	---	---	---	2.0[c]
Uranium	0.282	0.583	1.98	0.881	0.519	1.18	---	---	---	100[h], 500[i]
Zinc	24.8	9	543	10.9	16.6	7.7	---	---	---	10

Notes:

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H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
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j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 13: EAST FACE MARINE SURFACE WATER (OCEAN) RESULTS - TOTAL METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID Date	SW8 19-Aug-05	SW13 13-Oct-05	SW14 13-Oct-05	SW16 13-Oct-05	SW17 13-Oct-05	SW20 13-Oct-05	SW21 13-Oct-05	SW22 13-Oct-05	SW25 13-Oct-05	SW28 (at SW9) 13-Oct-05	SW30 13-Dec-05	BCWQ Marine[2]
Time Tidal Height[1] (m)	14:10 Low Tide (1.4 m)	8:43 Low Tide (1.5 m)	8:45 Low Tide (1.5 m)	8:52 Low Tide (1.5 m)	8:54 Mid Tide (1.5 m)	9:01 Mid Tide (1.5 m)	9:07 Mid Tide (1.5 m)	9:09 Mid Tide (1.5 m)	9:19 Mid Tide (1.6 m)	12:05 High Tide (2.9 m)	22:45 Low Tide (0.6 m)	
Field pH	7.95	7.49	7.73	7.76	7.83	8.01	7.83	7.86	7.84	7.42	---	n.g.
pH	---	---	---	---	---	---	---	---	---	---	7.24	n.g.
Field Salinity	26.5	19.3	18.8	19.0	20.0	8.9	18.0	16.9	17.0	21.7	---	n.g.
Salinity (o/oo)	28.0	---	---	---	---	---	---	---	---	---	26.0	n.g.
Hardness(mg/L)H	---	---	---	---	---	---	---	---	---	---		n.g.
Sulphate (mg/L)	---	---	---	---	---	---	---	---	---	---	1,950	n.g.
Bromide (mg/L)	---	---	---	---	---	---	---	---	---	---	21.3	n.g.
Chloride (mg/L)	---	---	---	---	---	---	---	---	---	---	14,500	n.g.
Fluoride (mg/L)	---	---	---	---	---	---	---	---	---	---	2.90	n.g.
Aluminum	288	141	---	---	39	---	---	73	---	70	< 10.0	n.g.
Arsenic	4.78	1.15	---	---	1.04	---	---	0.73	---	0.77	0.850	12[a]
Cadmium	**0.233**	0.078	0.059	0.064	0.096	0.066	0.053	0.054	0.057	0.055	0.0680	0.1[a,d]
Total Chromium	---	---	---	---	---	---	---	---	---	---	< 50*	1.5[e], 56[f]
Cobalt	1.15	0.879	0.233	0.73	0.843	1.26	0.506	0.529	0.997	0.163	0.124	n.g.
Copper	**6.16**	1.47	1.05	0.885	0.656	0.904	0.87	0.827	0.96	0.847	0.440	3[a], <2[b]
Iron	**6,480**	**872**	**399**	**778**	**1,020**	**1,440**	**640**	**919**	**803**	224	**2,450**	50[g], 300[h]
Lead	1.55	0.346	0.148	0.106	0.087	0.074	0.101	0.078	0.156	0.123	< 0.0500	140[a], <2[b]
Manganese	**180**	**145**	19	**105**	94.5	97.7	99.6	**126**	**155**	14.8	**176**	100[i]
Mercury	---	---	---	---	---	---	---	---	---	---	< 0.0100	2.0[a], 0.02[b]
Molybdenum	---	---	---	---	---	---	---	---	---	---	7.90	n.g.
Nickel	2.63	1.17	0.699	0.841	0.96	1.3	0.736	0.713	1.05	0.497	0.363	8.3[j]
Selenium	---	---	---	---	---	---	---	---	---	---	< 0.500	2.0[c]
Uranium	2.15	2.01	1.69	1.66	2.08	1.48	1.52	1.5	1.41	1.68	1.94	100[h], 500[i]
Zinc	**16.2**	2.59	1.86	2.15	1.95	1.49	1.42	1.37	1.29	4.69	1.38	10

Table continued on next page...

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 13 (continued): EAST FACE MARINE SURFACE WATER (OCEAN) RESULTS - TOTAL METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID Date	SW31 13-Dec-05	SW32 13-Dec-05	OW1 10-Feb-06	OW2 10-Feb-06	OW3 10-Feb-06	OW4 10-Feb-06	OW5 10-Feb-06	OW6 10-Feb-06	DUPD (OW6 Dup) 09-Feb-06	OW7 10-Feb-06	OW8 10-Feb-06	BCWQ Marine[2]
Time Tidal Height[1] (m)	23:00 Low Tide (0.6 m)	23:15 Low Tide (0.7 m)	21:14 Low Tide (1.5 m)	21:19 Low Tide (1.5 m)	21:30 Low Tide (1.2 m)	21:30 Low Tide (1.2 m)	21:30 Low Tide (1.2 m)	21:27 Low Tide (1.5 m)	21:27 Low Tide (1.5 m)	21:32 Low Tide (1.2 m)	21:36 Low Tide (1.2 m)	
Field pH	---	---	---	---	---	---	---	---	---	---	---	n.g.
pH	7.61	7.61	6.52	7.27	7.5	7.6	7.64	7.46	7.07	7.59	6.78	n.g.
Field Salinity	---	---	---	---	---	---	---	---	---	---	---	n.g.
Salinity (o/oo)	25.9	26.0	21.9	21.4	24.3	22.7	22.2	24.1	22.1	25.1	21.8	n.g.
Hardness(mg/L)H	---	---	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	1,910	1,980	---	---	---	---	---	---	---	---	---	n.g.
Bromide (mg/L)	21	26	---	---	---	---	---	---	---	---	---	n.g.
Chloride (mg/L)	14,300	14,200	11,900	11,300	12,800	12,400	12,300	13,300	12,800	13,900	11,700	n.g.
Fluoride (mg/L)	<2.0	<2.0	---	---	---	---	---	---	---	---	---	n.g.
Aluminum	< 10	< 10	16	24	12	19	23	23	35	23	22	n.g.
Arsenic	1.50	0.440	<0.20	0.9	0.51	0.99	0.99	0.58	0.55	0.8	0.92	12[a]
Cadmium	0.0610	0.0600	0.057	0.051	0.061	0.049	0.058	0.067	0.073	0.059	0.049	0.1[a,d]
Total Chromium	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	< 50*	1.5[e], 56[f]
Cobalt	0.0850	0.490	0.102	<0.050	0.404	<0.050	<0.050	1.03	2.12	0.212	<0.050	n.g.
Copper	0.410	0.354	0.449	0.445	0.368	0.386	0.414	0.466	0.92	0.459	0.426	3[a], <2[b]
Iron	148	218	63	43	292	32	28	**3,220**	**5,140**	279	32	50[g], 300[h]
Lead	< 0.0500	< 0.0500	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.085	< 0.050	< 0.050	140[a], <2[b]
Manganese	7.65	83.5	6.16	3.63	48.5	3.84	3.31	**383**	**586**	96.9	3.25	100[i]
Mercury	< 0.0100	< 0.0100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	2.0[a], 0.02[b]
Molybdenum	7.00	7.80	6.8	6.4	6.3	6.2	6.3	6.2	5.5	7.4	7.1	n.g.
Nickel	0.352	0.957	0.364	0.443	0.617	0.291	0.314	1.09	1.68	0.525	0.302	8.3[j]
Selenium	0.820	< 0.500	<0.50	<0.50	1.00	<0.50	<0.50	< 0.50	0.73	< 0.50	< 0.50	2.0[c]
Uranium	1.89	1.88	1.75	1.64	1.66	1.67	1.24	1.8	1.84	1.73	1.63	100[h], 500[i]
Zinc	1.21	0.800	1.09	1.03	0.81	1.01	0.81	1.25	2.4	1.63	1.07	10

Notes:
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

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TABLE 14: EAST FACE MARINE SURFACE WATER (OCEAN) RESULTS - DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID Date	SW30 13-Dec-05	SW31 13-Dec-05	SW32 13-Dec-05	OW1 10-Feb-06	OW2 10-Feb-06	OW3 10-Feb-06	OW4 10-Feb-06	OW5 10-Feb-06	OW6 10-Feb-06	DUPD (OW6 Dup) 09-Feb-06	OW7 10-Feb-06	OW8 10-Feb-06	
Time Tidal Height[1] (m)	22:45 Low Tide (0.6 m)	23:00 Low Tide (0.6 m)	23:15 Low Tide (0.7 m)	21:14 Low Tide (1.5 m)	21:19 Low Tide (1.5 m)	21:30 Low Tide (1.2 m)	21:30 Low Tide (1.2 m)	21:30 Low Tide (1.2 m)	21:27 Low Tide (1.5 m)	21:27 Low Tide (1.5 m)	21:32 Low Tide (1.2 m)	21:36 Low Tide (1.2 m)	BCWQ Marine[2]
Field pH	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
pH	7.24	7.61	7.61	6.52	7.27	7.5	7.6	7.64	7.46	7.07	7.59	6.78	n.g.
Field Salinity	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
Salinity (o/oo)	26.0	25.9	26.0	21.9	21.4	24.3	22.7	22.2	24.1	22.1	25.1	21.8	n.g.
Hardness(mg/L)H	---	---	---	---	---	---	---	---	---	---	---	---	n.g.
Aluminum	< 10	< 10	< 10	---	---	---	---	---	---	---	---	---	n.g.
Arsenic	0.390	1.44	0.330	---	---	---	---	---	---	---	---	---	12[a]
Cadmium	0.0690	0.0610	0.0710	---	---	---	---	---	---	---	---	---	0.1[a,d]
Total Chromium	< 50*	< 50*	< 50*	---	---	---	---	---	---	---	---	---	1.5[e], 56[f]
Cobalt	0.113	0.0580	0.945	---	---	---	---	---	---	---	---	---	n.g.
Copper	0.525	0.375	0.393	---	---	---	---	---	---	---	---	---	3[a], <2[b]
Iron	**1,350**	44.0	**752**	< 300*	< 300*	< 300*	< 300*	< 300*	**4,570**	**4,270**	< 300*	< 300*	50[g], 300[h]
Lead	< 0.0500	< 0.0500	< 0.0500	---	---	---	---	---	---	---	---	---	140[a], <2[b]
Manganese	**112**	6.16	**176**	---	---	---	---	---	---	---	---	---	100[i]
Mercury	< 0.0100	< 0.0100	< 0.0100	---	---	---	---	---	---	---	---	---	2.0[a], 0.02[b]
Molybdenum	7.30	7.20	8.00	---	---	---	---	---	---	---	---	---	n.g.
Nickel	0.385	0.358	0.944	---	---	---	---	---	---	---	---	---	8.3[j]
Selenium	0.610	< 0.500	< 0.500	---	---	---	---	---	---	---	---	---	2.0[c]
Uranium	1.90	1.81	1.81	---	---	---	---	---	---	---	---	---	100[h], 500[i]
Zinc	2.91	2.11	2.95	---	---	---	---	---	---	---	---	---	10

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

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TABLE 15: NORTH FACE SEEP WATER RESULTS - TOTAL METALS AND INORGANICS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW2	SW4	SW5	SW10	SW11						
Date	02-Feb-05	09-Apr-04	09-Apr-04	19-Aug-05	19-Aug-05	17-Sep-05	13-Oct-05	13-Dec-05	26-Jan-06	10-Feb-06	
Time Tidal Height[1] (m)	19:00 Low Tide (1.7 m)	14:30 Low Tide (1.0 m)	14:35 Low Tide (1.0 m)	14:45 Mid Tide (2.1 m)	14:30 Mid Tide (2.0 m)	13:27-14:00 Low Tide (1.8-2.1 m)	10:43 Mid Tide (2.1 m)	23:30 Low Tide (0.8 m)	23:17 Low Tide (1.2 m)	22:30 Low Tide (1.2 m)	BCWQ Marine[2]
Field pH	---	---	---	7.11	4.6	4.37-4.49	4.87	---	---	---	n.g.
pH	---	7.24	4.51	---	---	4.39	---	5.24	4.84	6.01	n.g.
Field Salinity	---	---	---	26.2	25.3	26.7-27.3	25.8	---	---	---	n.g.
Salinity (o/oo)	---	16.7	18.1	27.0	26.4	26.7	---	20.8	10.3	8.8	n.g.
Hardness (mg/L)H	---	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	---	---	---	---	---	2,200	---	1,910	2,510	---	n.g.
Bromide (mg/L)	---	---	---	---	---	---	---	19.7	13.2	---	n.g.
Chloride (mg/L)	---	---	---	---	---	---	---	11,300	4,870	4,150	n.g.
Fluoride (mg/L)	---	---	---	---	---	---	---	<2.0	<2.0	---	n.g.
Aluminum	---	454	17,400	113	14,700	18,100	7,130	5,450	7,990	740	n.g.
Arsenic	---	< 0.5	< 0.5	0.34	1.16	0.37	0.71	0.21	0.43	0.3	12[a]
Cadmium	**0.28**	< 0.25*	< 0.25*	0.097	**1.04**	**1.43**	**2.36**	**0.586**	< 1.0*	< 1.0*	0.1[a,d]
Total Chromium	---	< 2.5*	< 2.5*	---	---	---	---	< 50*	< 50*	< 50*	1.5[e], 56[f]
Cobalt	39.9	< 0.5	< 0.5	2.08	35.4	37.4	54.7	17	104	72.8	n.g.
Copper	**4.1**	**5.79**	**5.46**	1.56	**8.11**	**2.13**	**7.58**	**2.44**	**8**	**3.9**	3[a], <2[b]
Iron	**67,200**	**11,900**	**9,860**	**2,670**	**54,200**	**60,800**	**58,600**	**17,800**	**193,000**	**164,000**	50[g], 300[h]
Lead	0.36	0.39	<0.25	< 0.050	1.56	**2.98**	**2.17**	0.3	<1.0	<1.0	140[a], <2[b]
Manganese	**841**	**240**	**2,450**	48.8	**454**	**493**	**805**	**269**	**2,130**	**1,720**	100[i]
Mercury	---	< 0.01	< 0.1*	---	---	---	---	< 0.010	**0.025**	< 0.010	2.0[a], 0.02[b]
Molybdenum	---	< 6	< 6	---	---	---	---	< 5.0	< 5.0	< 5.0	n.g.
Nickel	**53.6**	0.57	1.03	3.79	**50.3**	**51**	**66.3**	**28**	**161**	**109**	8.3[j]
Selenium	---	< 5*	< 5*	---	---	---	---	< 0.50	<0.5	<0.50	2.0[c]
Uranium	0.66	0.694	<0.05	1.47	1.62	0.62	0.998	0.68	0.93	<0.20	100[h], 500[i]
Zinc	**127**	**27.3**	**637**	8.26	**195**	**185**	**218**	**81.1**	**458**	**281**	10

Table continued on next page...

Notes:
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

TABLE 15 (continued): NORTH FACE SEEP WATER RESULTS - TOTAL METALS AND INORGANICS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW11	SW11E	SW11L	SW11F	SW33		SW34	SW35	SW36	
Date	04-Apr-06	09-Feb-06	09-Feb-06	10-Feb-06	26-Jan-06	10-Feb-06	26-Jan-06	26-Jan-06	26-Jan-06	
Time	17:00	17:00	22:25	0:00	22:32	22:00	22:42	22:52	23:27	BCWQ Marine[2]
Tidal Height[1] (m)	Low Tide (1.4 m)	Ebb Tide (3.3 m)	Low Tide (1.2 m)	Rising Flood Tide (2.0 m)	Low Tide (1.2 m)	Low Tide (1.2 m)	Low Tide (1.2 m)	Low Tide (1.2 m)	Low Tide (1.2 m)	
Field pH	---	---	---	---	---	---	---	---	---	n.g.
pH	4.44	5.51	5.89	5.68	6.64	6.18	6.67	7.37	6.24	n.g.
Field Salinity	---	---	---	---	---	---	---	---	---	n.g.
Salinity (o/oo)	15.8	11.2	9.9	7.8	19.7	15	20.3	24.7	20.3	n.g.
Hardness (mg/L)H	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	---	---	---	---	2,000	---	1,970	2,220	2,210	n.g.
Bromide (mg/L)	---	---	---	---	29.3	---	30.4	38.3	30.6	n.g.
Chloride (mg/L)	8,450	5,600	4,850	3,630	10,400	7,910	10,700	13,400	10,700	n.g.
Fluoride (mg/L)	---	---	---	---	<2.0	---	<2.0	<2.0	2.4	n.g.
Aluminum	11,300	---	---	---	267	770	298	< 10	1,110	n.g.
Arsenic	0.43	---	---	---	0.81	0.48	1.22	< 0.20	< 0.20	12[a]
Cadmium	**0.89**	---	---	---	< 0.25*	<0.50*	< 0.25*	0.079	< 1.0*	0.1[a,d]
Total Chromium	---	---	---	---	< 50*	<50*	< 50*	< 50*	< 50*	1.5[e], 56[f]
Cobalt	91	---	---	---	23.2	41.3	19.5	3.06	40.8	n.g.
Copper	**6.2**	---	---	---	**3.88**	**6.9**	**5.79**	0.54	**20.6**	3[a], <2[b]
Iron	**242,000**	**215,000**	**147,000**	**224,000**	**35,200**	**67,600**	**25,800**	**4,350**	**73,600**	50[g], 300[h]
Lead	0.73	---	---	---	0.46	0.52	0.93	< 0.050	< 1.0	140[a], <2[b]
Manganese	**1,850**	---	---	---	**1,090**	**1,450**	**1,040**	**688.00**	**785.00**	100[i]
Mercury	---	---	---	---	< 0.010	0.018	0.014	< 0.010	0.014	2.0[a], 0.02[b]
Molybdenum	---	---	---	---	< 5.0	<5.0	< 5.0	< 5.0	< 5.0	n.g.
Nickel	**129**	---	---	---	**27.4**	**53.9**	**22.5**	2.19	**64**	8.3[j]
Selenium	---	---	---	---	< 0.50	<0.50	0.59	< 0.50	< 0.50	2.0[c]
Uranium	1.13	---	---	---	1.33	0.88	1.3	2.74	1.35	100[h], 500[i]
Zinc	**474**	---	---	---	**47**	**116**	**35.9**	2.9	**141**	10

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 16: NORTH FACE SEEP WATER RESULTS - DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW11						SW11E	SW11L	SW11F	SW33	SW34	SW35	SW36	
Date	19-Aug-05	17-Sep-05	13-Oct-05	13-Dec-05	10-Feb-06	04-Apr-06	09-Feb-06	09-Feb-06	10-Feb-06	26-Jan-06	26-Jan-06	26-Jan-06	26-Jan-06	
Time Tidal Height[1] (m)	14:30 Mid Tide (2.0 m)	13:27-14:00 Low Tide (1.8-2.1 m)	10:43 Mid Tide (2.1 m)	23:30 Low Tide (0.8 m)	22:30 Low Tide (1.2 m)	17:15 Low Tide (1.5 m)	17:00 Ebb Tide (3.3 m)	22:25 Low Tide (1.2 m)	0:00 Rising Flood Tide (2.0 m)	22:30 Low Tide (1.2 m)	22:40 Low Tide (1.2 m)	22:50 Low Tide (1.2 m)	23:25 Low Tide (1.2 m)	BCWQ Marine[2]
pH	---	4.38	---	5.24	6.01	4.44	5.51	5.89	5.68	6.64	6.67	7.37	6.24	n.g.
Salinity (o/oo)	---	26.5	---	20.8	8.8	---	11.2	9.9	7.8	19.7	20.3	24.7	20.3	n.g.
Sulphate (mg/L)	---	2,210	---	---	---	---	---	---	---	2,000	1,970	2,220	2,210	n.g.
Aluminum	11,700	18,200	6,720	4,920	670	11,400	---	---	---	< 20	< 20	< 10	275	n.g.
Arsenic	< 0.20	0.71	< 0.20	< 0.20	0.23	< 0.20	---	---	---	< 0.20	< 0.20	< 0.20	< 0.20	12[a]
Cadmium	1.1	1.43	1.95	0.591	< 1.0*	0.99	---	---	---	< 0.25*	< 0.25*	0.114	0.41	0.1[a,d]
Total Chromium	---	---	---	< 50*	< 50*	---	---	---	---	< 50*	< 50*	< 50*	< 50*	1.5[e], 56[f]
Cobalt	39.9	36.1	40.7	16.8	75.4	90.7	---	---	---	26.7	18.2	3.6	47.4	n.g.
Copper	7.07	2.05	4.56	2.36	3.4	5.9	---	---	---	1.75	2.01	1.35	25.1	3[a], <2[b]
Iron	56,900	58,700	46,200	19,400	166,000	292,000	223,000	158,000	226,000	37,200	23,400	7,570	89,300	50[g], 300[h]
Lead	0.8	2.86	1.05	0.295	<1.0	< 0.50	---	---	---	< 0.25	< 0.25	< 0.050	< 0.25	140[a], <2[b]
Manganese	489	483	610	256	1,770	1,970	---	---	---	1,120	1,100	755	892	100[j]
Mercury	---	---	---	< 0.010	<0.010	---	---	---	---	< 0.010	< 0.010	< 0.010	0.013	2.0[a], 0.02[b]
Molybdenum	---	---	---	< 5.0	<5.0	---	---	---	---	< 5.0	< 5.0	< 5.0	< 5.0	n.g.
Nickel	56.2	49.3	49.2	27.3	110	127	---	---	---	31.4	20.4	2.8	73.1	8.3[j]
Selenium	---	---	---	< 0.50	<0.50	---	---	---	---	< 0.50	0.52	< 0.50	< 0.50	2.0[c]
Uranium	1.56	0.594	0.648	0.601	<0.20	1.12	---	---	---	1.01	1.68	2.88	1.03	100[h], 500[i]
Zinc	219	180	164	81.1	307	480	---	---	---	52.7	38.1	12	161	10

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

TABLE 17: NORTH FACE MARINE SURFACE WATER (OCEAN) RESULTS - TOTAL METALS (SEAWATER ANALYSIS) (µg/L)				
Sample ID	**SW3**	**SW26**	**SW29 (SW11)**	
Date	**07-Apr-04**	**13-Oct-05**	**13-Oct-05**	
Time	**14:20**	**10:24**	**12:30**	**BCWQ Marine[2]**
Tidal Height[1] (m)	**Low Tide (1.0 m)**	**Mid Tide (2.0 m)**	**High Tide (3.3 m)**	
Field pH	---	7.15	7.80	n.g.
pH	7.76	---	---	n.g.
Field Salinity	---	25.3	19.8	n.g.
Salinity (o/oo)	11.6	---	---	n.g.
Hardness(mg/L)H	---	---	---	n.g.
Sulphate (mg/L)	---	---	---	n.g.
Bromide (mg/L)	---	---	---	n.g.
Chloride (mg/L)	---	---	---	n.g.
Fluoride (mg/L)	---	---	---	n.g.
Aluminum	230	140	130	n.g.
Arsenic	< 0.5	0.61	0.91	12[a]
Cadmium	< 0.25*	**0.108**	0.051	0.1[a,d]
Total Chromium	**2.6**	---	---	1.5[e], 56[f]
Cobalt	< 0.5	5.12	0.382	n.g.
Copper	**3.39**	1.1	1.56	3[a], <2[b]
Iron	**360**	**9,720**	**597**	50[g], 300[h]
Lead	< 0.25	0.121	0.314	140[a], <2[b]
Manganese	11.3	**298**	19.8	100[i]
Mercury	< 0.01	---	---	2.0[a], 0.02[b]
Molybdenum	<6	---	---	n.g.
Nickel	0.63	4.99	0.768	8.3[j]
Selenium	< 5*	---	---	2.0[c]
Uranium	< 0.05	1.44	1.4	100[h], 500[i]
Zinc	< 6	6.8	3.35	10

Notes:

µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
m - metres
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 18: REFERENCE STATION MARINE SURFACE WATER (OCEAN) RESULTS - TOTAL AND DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID	SW12		SW37				
Date	17-Sep-05		26-Jan-06		10-Feb-06		BCWQ Marine[2]
Time	11:25		-		17:00		
	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	
Field pH	---	---	---	---	---	---	n.g.
pH	7.84	7.91	7.52	---	---	---	n.g.
Field Salinity	---	---	---	---	---	---	n.g.
Salinity (o/oo)	30.0	29.9	---	---	---	---	n.g.
Hardness(mg/L)H	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	2,340	2,270	1,990	---	---	---	n.g.
Bromide (mg/L)	---	---	---	---	---	---	n.g.
Chloride (mg/L)	---	---	---	---	12,600	---	n.g.
Fluoride (mg/L)	---	---	---	---	---	---	n.g.
Nitrate (mg/L)	---	---	< 0.5	---	---	---	n.g.
Nitrite (mg/L)	---	---	< 0.1	---	---	---	n.g.
Aluminum	99	< 10	202	< 20	50	< 10	n.g.
Arsenic	1.23	1.4	1.17	1.28	0.87	0.82	12[a]
Cadmium	0.087	0.059	0.079	0.071	0.053	0.06	0.1[a,d]
Total Chromium	---	---	< 50*	< 50*	< 50*	< 50*	1.5[e], 56[f]
Cobalt	0.131	< 0.050	0.086	< 0.050	< 0.05	< 0.05	n.g.
Copper	1.04	0.626	0.645	1.08	0.565	0.894	3[a], <2[b]
Iron	222	13	161	< 10	60	< 10	50[g], 300[h]
Lead	0.115	< 0.050	0.127	< 0.050	0.057	<0.050	140[a], <2[b]
Manganese	8.04	4.01	5.22	0.993	3.33	2.24	100[i]
Mercury	---	---	< 0.010	< 0.010	< 0.01	< 0.01	2.0[a], 0.02[b]
Molybdenum	---	---	6.9	8.3	7	6.5	n.g.
Nickel	0.7	0.545	0.497	0.36	0.333	0.281	8.3[j]
Selenium	---	---	< 0.50	< 0.50	< 0.5	< 0.5	2.0[c]
Uranium	2.47	2.29	2.31	2.24	1.69	0.519	100[h], 500[i]
Zinc	3.33	2.54	1.44	3.38	1.42	3.45	10

Notes:
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guidelines
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline
* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 19: POREWATER CHEMISTRY - TOTAL METALS AND INORGANICS (SEAWATER ANALYSIS) (µg/L)

Sample ID Depth (m) Date	PW1 - 26-Jan-06	PW2 - 26-Jan-06	PW3-25 0.25 09-Feb-06	PW3-50 0.5 09-Feb-06	PW3-75 0.75 09-Feb-06	PW3-100 1.0 09-Feb-06	PW4-25 0.25 09-Feb-06	PW4-25 0.25 09-Feb-06	PW4-50 0.5 09-Feb-06	PW4-75 0.75 09-Feb-06	BCWQ Marine[2]
Time Tidal Height[1] (m)	21:37 Low Tide (0.8 m)	22:02 Low Tide (0.8 m)	20:20 Low Tide (1.6 m)	19:55 Low Tide (1.6 m)	19:45 Low Tide (1.6 m)	20:20 Low Tide (1.6 m)	21:56 Low Tide (1.2 m)	21:56 Low Tide (1.2 m)	21:50 Low Tide (1.2 m)	21:43 Low Tide (1.2 m)	
pH	6.58	7.57	6.57	6.72	6.48	7.05	7.31	7.31	7.46	7.56	n.g.
Salinity (o/oo)	25.5	27.2	21.0	22.8	21.9	22.9	19.7	19.7	19.5	18.8	n.g.
Hardness (mg/L)H	---	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	2,270	2,190	---	---	---	---	---	---	---	---	n.g.
Bromide (mg/L)	42.4	43.2	---	---	---	---	---	---	---	---	n.g.
Chloride (mg/L)	14,700	15,000	11,400	12,500	11,800	12,200	10,900	10,900	10,700	10,500	n.g.
Fluoride (mg/L)	<2.0	2.5	---	---	---	---	---	---	---	---	n.g.
Nitrate (mg/L)	<0.50	<0.50	---	---	---	---	---	---	---	---	n.g.
Nitrite (mg/L)	<0.10	<0.10	---	---	---	---	---	---	---	---	n.g.
Aluminum	150	677	---	---	---	---	---	---	---	---	n.g.
Arsenic	0.33	0.95	---	---	---	---	---	---	---	---	12[a]
Cadmium	< 0.50*	0.050	---	---	---	---	---	---	---	---	0.1[a,d]
Total Chromium	< 50	< 50	---	---	---	---	---	---	---	---	1.5[e], 56[f]
Cobalt	< 1.0	0.532	---	---	---	---	---	---	---	---	n.g.
Copper	**2.2**	**2.92**	---	---	---	---	---	---	---	---	3[a], <2[b]
Iron	**51,000**	**1,040**	44.9	---	---	11.7	10.6	10.6	---	---	50[g], 300[h]
Lead	< 0.50	0.296	---	---	---	---	---	---	---	---	140[a], <2[b]
Manganese	**1,980**	**190**	---	---	---	---	---	---	---	---	100[i]
Mercury	< 0.010	< 0.010	---	---	---	---	---	---	---	---	2.0[a], 0.02[b]
Molybdenum	< 5.0	< 5.0	---	---	---	---	---	---	---	---	n.g.
Nickel	< 2.0	1.71	---	---	---	---	---	---	---	---	8.3[j]
Selenium	0.65	0.57	---	---	---	---	---	---	---	---	2.0[c]
Uranium	< 0.10	1.33	---	---	---	---	---	---	---	---	100[h], 500[i]
Zinc	< 10	3.70	---	---	---	---	---	---	---	---	10

Table continued on next page...

Notes:
m - metres
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 19 (continued): POREWATER CHEMISTRY - TOTAL METALS AND INORGANICS (SEAWATER ANALYSIS) (µg/L)

Sample ID Depth (m) Date	PW4-100 1.0 09-Feb-06	PW4-150 1.5 09-Feb-06	PW4-175 1.75 09-Feb-06	PW5-25 0.25 09-Feb-06	PW5-50 0.5 09-Feb-06	PW5-75 0.75 09-Feb-06	PW5-100 1.0 09-Feb-06	PW5-150 1.5 09-Feb-06	DUPB (PW5-150 Dup) 1.5 09-Feb-06	PW5-175 1.75 09-Feb-06	BCWQ Marine[2]
Time Tidal Height[1] (m)	21:35 Low Tide (1.2 m)	21:27 Low Tide (1.2 m)	21:24 Low Tide (1.2 m)	23:40 Low Tide (1.4 m)	23:30 Low Tide (1.4 m)	23:20 Low Tide (1.4 m)	22:45 Low Tide (1.4 m)	23:55 Low Tide (2.0 m)	23:55 Low Tide (2.0 m)	23:47 Low Tide (2.0 m)	
pH	7.57	7.46	7.28	6.28	6.43	6.56	6.7	6.76	6.79	6.75	n.g.
Salinity (o/oo)	19.1	18.5	19.8	10.3	13.1	14.9	15.4	17.7	17.4	17.2	n.g.
Hardness (mg/L)H	---	---	---	---	---	---	---	---	---	---	n.g.
Sulphate (mg/L)	---	---	---	---	---	---	---	---	---	---	n.g.
Bromide (mg/L)	---	---	---	---	---	---	---	---	---	---	n.g.
Chloride (mg/L)	10,300	10,100	10,700	5,210	7,030	8,400	8,260	9,930	9,840	9,750	n.g.
Fluoride (mg/L)	---	---	---	---	---	---	---	---	---	---	n.g.
Nitrate (mg/L)	---	---	---	---	---	---	---	---	---	---	n.g.
Nitrite (mg/L)	---	---	---	---	---	---	---	---	---	---	n.g.
Aluminum	---	---	---	---	---	---	---	---	---	---	n.g.
Arsenic	---	---	---	---	---	---	---	---	---	---	12[a]
Cadmium	---	---	---	---	---	---	---	---	---	---	0.1[a,d]
Total Chromium	---	---	---	---	---	---	---	---	---	---	1.5[e], 56[f]
Cobalt	---	---	---	---	---	---	---	---	---	---	n.g.
Copper	---	---	---	---	---	---	---	---	---	---	3[a], <2[b]
Iron	---	---	26.4	154	---	---	---	---	81	71.4	50[g], 300[h]
Lead	---	---	---	---	---	---	---	---	---	---	140[a], <2[b]
Manganese	---	---	---	---	---	---	---	---	---	---	100[i]
Mercury	---	---	---	---	---	---	---	---	---	---	2.0[a], 0.02[b]
Molybdenum	---	---	---	---	---	---	---	---	---	---	n.g.
Nickel	---	---	---	---	---	---	---	---	---	---	8.3[j]
Selenium	---	---	---	---	---	---	---	---	---	---	2.0[c]
Uranium	---	---	---	---	---	---	---	---	---	---	100[h], 500[i]
Zinc	---	---	---	---	---	---	---	---	---	---	10

Notes:
m - metres
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

SEACOR ENVIRONMENTAL INC.

TABLE 20: POREWATER CHEMISTRY - DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)

Sample ID Depth (m) Date	PW1 - 26-Jan-06	PW2 - 26-Jan-06	PW3-25 0.25 09-Feb-06	PW3-50 0.5 09-Feb-06	PW3-75 0.75 09-Feb-06	PW3-100 1.0 09-Feb-06	PW4-25 0.25 09-Feb-06	PW4-50 0.5 09-Feb-06	PW4-75 0.75 09-Feb-06	DUPA (PW4-75 Dup) 0.75 09-Feb-06	BCWQ Marine[2]
Time Tidal Height[1] (m)	21:35 Low Tide (0.8 m)	22:00 Low Tide (0.8 m)	20:20 Low Tide (1.6 m)	19:55 Low Tide (1.6 m)	19:45 Low Tide (1.6 m)	20:20 Low Tide (1.6 m)	21:56 Low Tide (1.2 m)	21:50 Low Tide (1.2 m)	21:43 Low Tide (1.2 m)	21:43 Low Tide (1.2 m)	
Aluminum	< 10	< 10	---	---	---	---	---	---	---	---	n.g.
Arsenic	< 0.20	0.73	---	---	---	---	---	---	---	---	12[a]
Cadmium	< 0.25*	0.032	---	---	---	---	---	---	---	---	0.1[a,d]
Total Chromium	< 50*	< 50*	---	---	---	---	---	---	---	---	1.5[e], 56[f]
Cobalt	< 0.50	< 0.050	---	---	---	---	---	---	---	---	n.g.
Copper	1.57	0.760	---	---	---	---	---	---	---	---	3[a], <2[b]
Iron	**49,500**	< 10	15.7	24.7	102	1.94	12.7	12.1	11.4	13.5	50[g], 300[h]
Lead	< 0.25	< 0.050	---	---	---	---	---	---	---	---	140[a], <2[b]
Manganese	**1,840**	37.4	---	---	---	---	---	---	---	---	100[i]
Mercury	< 0.010	< 0.010	---	---	---	---	---	---	---	---	2.0[a], 0.02[b]
Molybdenum	< 5.0	< 5.0	---	---	---	---	---	---	---	---	n.g.
Nickel	< 2.5	0.427	---	---	---	---	---	---	---	---	8.3[j]
Selenium	0.57	0.66	---	---	---	---	---	---	---	---	2.0[c]
Uranium	< 0.050	1.38	---	---	---	---	---	---	---	---	100[h], 500[i]
Zinc	< 5.0	1.57	---	---	---	---	---	---	---	---	10

Table continued on next page...

Notes:
m - metres
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
c - mean concentration
d - under BC Ministry of Environment review
e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

TABLE 20 (continued): POREWATER CHEMISTRY - DISSOLVED METALS (SEAWATER ANALYSIS) (µg/L)										
Sample ID **Depth (m)** **Date**	**PW4-100** **1.0** **09-Feb-06**	**PW4-150** **1.5** **09-Feb-06**	**PW4-175** **1.75** **09-Feb-06**	**PW5-25** **0.25** **09-Feb-06**	**PW5-50** **0.5** **09-Feb-06**	**PW5-75** **0.75** **09-Feb-06**	**PW5-100** **1.0** **09-Feb-06**	**PW5-150** **1.5** **09-Feb-06**	**PW5-175** **1.75** **09-Feb-06**	**BCWQ Marine[2]**
Time **Tidal Height[1] (m)**	**21:35** **Low Tide** **(1.2 m)**	**21:27** **Low Tide** **(1.2 m)**	**21:24** **Low Tide** **(1.2 m)**	**23:40** **Low Tide** **(1.4 m)**	**23:30** **Low Tide** **(1.4 m)**	**23:20** **Low Tide** **(1.4 m)**	**22:45** **Low Tide** **(1.4 m)**	**23:55** **Low Tide** **(2.0 m)**	**23:47** **Low Tide** **(2.0 m)**	
Aluminum	---	---	---	---	---	---	---	---	---	n.g.
Arsenic	---	---	---	---	---	---	---	---	---	12[a]
Cadmium	---	---	---	---	---	---	---	---	---	0.1[a,d]
Total Chromium	---	---	---	---	---	---	---	---	---	1.5[e], 56[f]
Cobalt	---	---	---	---	---	---	---	---	---	n.g.
Copper	---	---	---	---	---	---	---	---	---	3[a], <2[b]
Iron	13.7	17.2	28.1	168	55.2	6.77	24.5	61.1	61.6	50[g], 300[h]
Lead	---	---	---	---	---	---	---	---	---	140[a], <2[b]
Manganese	---	---	---	---	---	---	---	---	---	100[i]
Mercury	---	---	---	---	---	---	---	---	---	2.0[a], 0.02[b]
Molybdenum	---	---	---	---	---	---	---	---	---	n.g.
Nickel	---	---	---	---	---	---	---	---	---	8.3[j]
Selenium	---	---	---	---	---	---	---	---	---	2.0[c]
Uranium	---	---	---	---	---	---	---	---	---	100[h], 500[i]
Zinc	---	---	---	---	---	---	---	---	---	10

Notes:
m - metres
µg/L - (micrograms per litre)
o/oo - parts per thousand (grams per litre)
mg/L - milligrams per litre
H - Hardness (parts per million)
Dup - blind field duplicate sample
< - less than analytical detection limit
BCWQ Marine - British Columbia Water Quality Guidelines (Marine)
a - maximum concentration
b - 30 day average concentration
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e - guideline for Cr+6
f - guideline for Cr+3
g - minimal risk guideline
h - hazardous level guideline
i - guideline to protect consumers of shellfish
j - 4-day average concentration

Exceeds BCWQ 30 day average concentration guideline
Exceeds BCWQ maximum concentration guideline
Exceeds BCWQ minimal risk guideline
Exceeds BCWQ minimal risk and hazardous level guidelines
Exceeds BCWQ guideline to protect consumers of shellfish
Exceeds BCWQ Marine Aquatic Life guideline

* - Detection limit exceeds BCWQ Marine guideline
n.g. - no guideline
1 - Tidal Height shown indicates inferred height at time of sampling based on Environment Canada database results for Station 7965 (Comox)
2 - BCWQ Marine standards are for total substance concentrations
"---" - sample not analyzed for parameter indicated

TABLE 21: CLAM TISSUE CHEMISTRY RESULTS - PAHs (mg/kg ww)																	
Sample ID	**Date (dd-mmm-yy)**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(g,h,i)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenz(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-c,d)pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**
CL1	**02-Feb-05**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
CL2	**02-Feb-05**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	0.025	<0.01
CL3	**02-Feb-05**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	0.011	<0.01
CL4	**02-Feb-05**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	0.013	<0.01
CL5	**02-Feb-05**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	0.017	<0.01
BCWQ Tissue Guidelines		n.g.	n.g.	n.g.	n.g.	0.001[a]	n.g.	n.g.	n.g.	n.g.	n.g.	n.g.	n.g.	n.g.	n.g.	n.g.	n.g.

Notes:
mg/kg ww - milligrams per kilogram wet weight
< - less than analytical detection limit indicated
BCWQ Tissue Guidelines - Tissue guidelines from the BC Approved Water Quality Guidelines (Criteria), 1998 Edition
a - guideline is for edible tissue for human consumption - heavy consumption (200 g/week); guidelines for low and moderate consumption were 0.004 mg/kg and 0.002 mg/kg
n.g. - no guideline

TABLE 22: CLAM TISSUE CHEMISTRY RESULTS - METALS (mg/kg ww)						
Sample ID	**CL1**	**CL2**	**CL3**	**CL4**	**CL5**	**BCWQ**
Date (dd-mmm-yy)	**02-Feb-05**	**02-Feb-05**	**02-Feb-05**	**02-Feb-05**	**02-Feb-05**	**Tissue Guidelines**
Aluminum	18.5	74.8	59.4	51.1	171	n.g.
Antimony	<0.01	<0.01	<0.01	<0.01	<0.01	n.g.
Arsenic	2.86	1.53	1.2	1.56	1.4	n.g.
Barium	0.421	1.51	0.802	0.816	0.957	n.g.
Beryllium	<0.1	<0.1	<0.1	<0.1	<0.1	n.g.
Bismuth	<0.1	<0.1	<0.1	<0.1	<0.1	n.g.
Cadmium	0.523	0.0364	0.041	0.0265	0.0409	n.g.
Calcium	878	321	325	407	490	n.g.
Chromium	0.12	0.16	<0.1	0.12	0.43	n.g.
Cobalt	0.198	0.15	0.096	0.115	0.132	n.g.
Copper	1.17	3.34	4.14	3.55	4.67	n.g.
Iron	72	143	115	166	208	n.g.
Lead	<0.02	0.044	0.032	0.03	0.083	n.g.
Lithium	0.12	0.13	0.1	0.12	0.18	n.g.
Magnesium	805	545	517	649	503	n.g.
Manganese	1.6	2.96	1.97	3.82	3.38	n.g.
Mercury	---	0.0098	0.0074	---	---	0.1 - 0.5[a]
Molybdenum	0.152	0.384	0.285	0.395	0.476	n.g.
Nickel	0.41	0.16	0.11	0.14	0.3	n.g.
Selenium	0.37	0.43	0.47	0.48	0.54	n.g.
Strontium	10.6	5.17	4.53	6.62	5.41	n.g.
Uranium	0.0519	0.0347	0.0272	0.0304	0.0357	n.g.
Vanadium	<0.1	0.31	0.21	0.21	0.62	n.g.
Zinc	11.9	21.3	23.3	25.9	26.1	n.g.

Notes:
mg/kg ww - milligrams per kilogram wet weight
< - less than analytical detection limit indicated
'---' - sample not analyzed for parameter indicated
BCWQ Tissue Guidelines - Tissue guidelines from the BC Approved Water Quality Guidelines (Criteria), 1998 Edition
a - range based on quantity for weekly consumption on a regular basis
n.g. - no guideline

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TABLE 23: OYSTER TISSUE CHEMISTRY RESULTS - METALS (mg/kg ww)													
Sample ID	**OYS1A**	**OYS1B**	**OYS1C**	**OYS2A**	**OYS2B**	**OYS2C**	**OYS3A**	**OYS3B**	**OYS3C**	**OYS4A**	**OYS4B**	**OYS4C**	**BCWQ**
Date (dd-mmm-yy)	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**18-Aug-05**	**Tissue Guidelines**
Aluminum	5.2	8.9	8.6	5	3.8	10	<2.0	3.2	5.4	23.6	36.9	11.6	n.g.
Antimony	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	n.g.
Arsenic	1.11	1.24	2.24	2.1	1.74	1.12	0.943	1.96	0.75	0.738	0.721	0.658	n.g.
Barium	0.068	0.096	0.099	0.174	0.164	0.345	0.054	0.082	0.159	0.227	0.263	0.156	n.g.
Beryllium	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	n.g.
Bismuth	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	n.g.
Cadmium	1.67	1.56	2.85	2.61	0.808	1.29	1.29	0.947	1.01	1.39	1.21	1.41	n.g.
Calcium	362	276	344	224	238	292	409	453	277	311	313	314	n.g.
Chromium	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	n.g.
Cobalt	0.024	0.029	0.044	0.058	0.035	0.042	<0.020	0.03	<0.020	0.037	0.033	0.025	n.g.
Copper	22.8	20.1	36.2	43.1	13.2	12.4	22.9	20	20.5	36.5	30.7	18.1	n.g.
Iron	22.2	29.3	33.4	559	316	645	48.4	61	47.2	117	152	103	n.g.
Lead	0.023	0.024	0.031	0.021	<0.020	0.029	<0.020	<0.020	<0.020	0.038	0.037	<0.020	n.g.
Lithium	<0.10	<0.10	<0.10	<0.10	<0.10	0.1	<0.10	<0.10	<0.10	0.1	0.12	<0.10	n.g.
Magnesium	714	719	621	634	574	671	576	615	542	619	628	739	n.g.
Manganese	6.29	8.88	9.37	12.7	13.7	1.86	1.85	13.5	1.97	1.7	1.2	3.3	n.g.
Mercury	0.0072	0.0069	0.0104	0.0088	0.0062	0.0056	<0.0050	<0.0050	<0.0050	0.0069	0.0062	<0.0050	0.1 - 0.5[a]
Molybdenum	0.026	0.038	0.057	0.055	0.063	0.053	0.02	0.031	0.021	0.029	0.034	0.033	n.g.
Nickel	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	n.g.
Selenium	0.28	0.38	0.59	0.66	0.55	0.24	0.21	0.48	<0.20	0.2	0.2	<0.20	n.g.
Strontium	4.18	4	2.92	3.26	2.99	4.96	4.1	3.04	3.35	3.96	4.07	4.48	n.g.
Thallium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	n.g.
Tin	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	n.g.
Uranium	0.0132	0.0191	0.0306	0.0542	0.0265	0.0628	0.0097	0.0104	0.01	0.0242	0.0248	0.031	n.g.
Vanadium	<0.10	<0.10	<0.10	0.25	0.12	0.39	<0.10	<0.10	<0.10	0.12	0.18	<0.10	n.g.
Zinc	213	257	411	387	188	182	244	144	163	179	186	107	n.g.

Notes:
mg/kg ww - milligrams per kilogram wet weight
< - less than analytical detection limit indicated
'---' - sample not analyzed for parameter indicated
BCWQ Tissue Guidelines - Tissue guidelines from the BC Approved Water Quality Guidelines (Criteria), 1998 Edition
a - range based on quantity for weekly consumption on a regular basis
n.g. - no guideline



REFERENCED FROM:
DEP'T OF ENERGY MINES & RESOURCES MAPPING BRANCH
92F/10

KILOMETRES

0 0.5 1 2 3 km

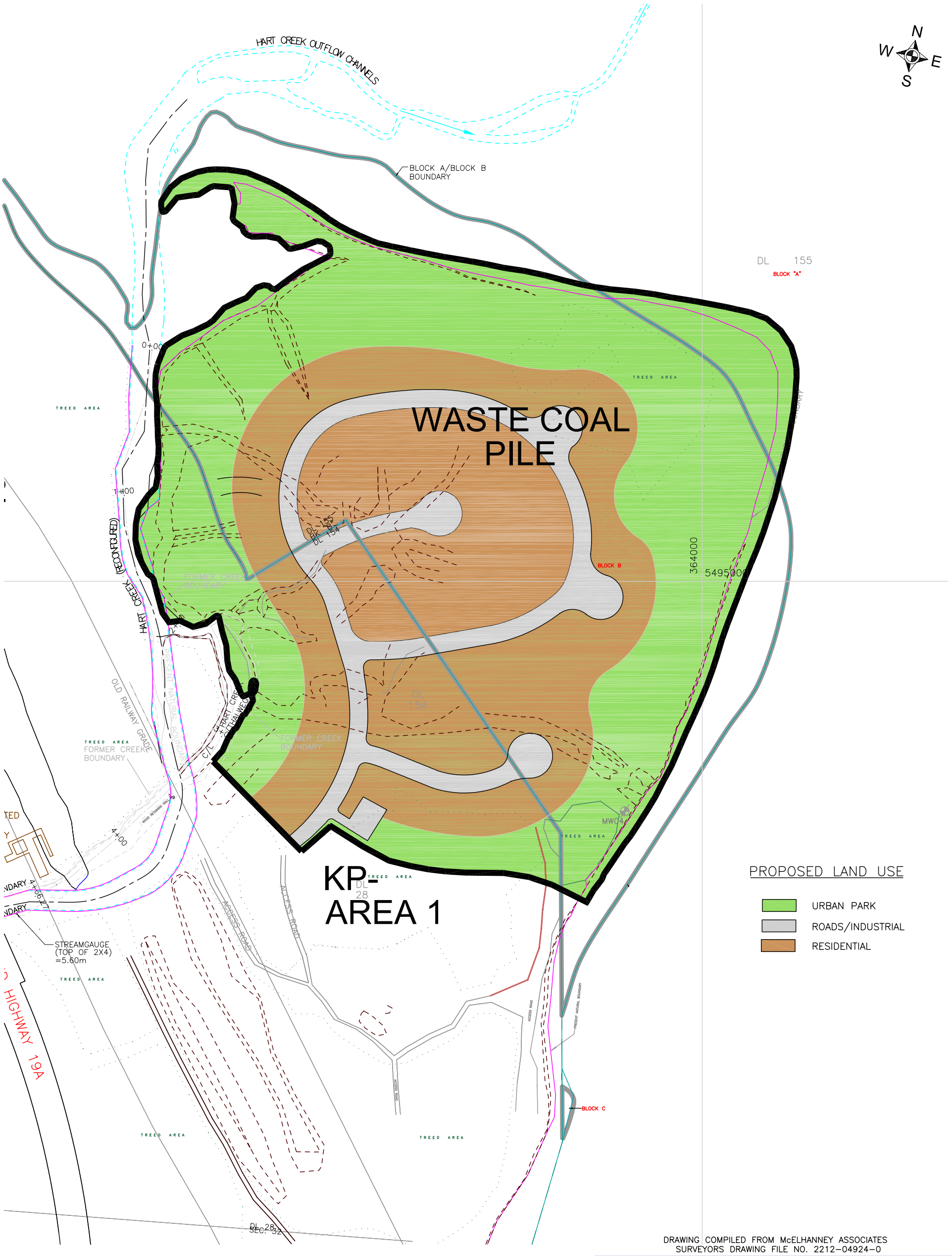
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UNION BAY, BC

SUPPLEMENTAL DSI

SITE LOCATION MAP

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B12	201.01022.01	EC	TMS	1



DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

LEGEND

- LEASE LOT BOUNDARIES
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK

METRES (APPROX.)
0 25 50 100 150 m

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

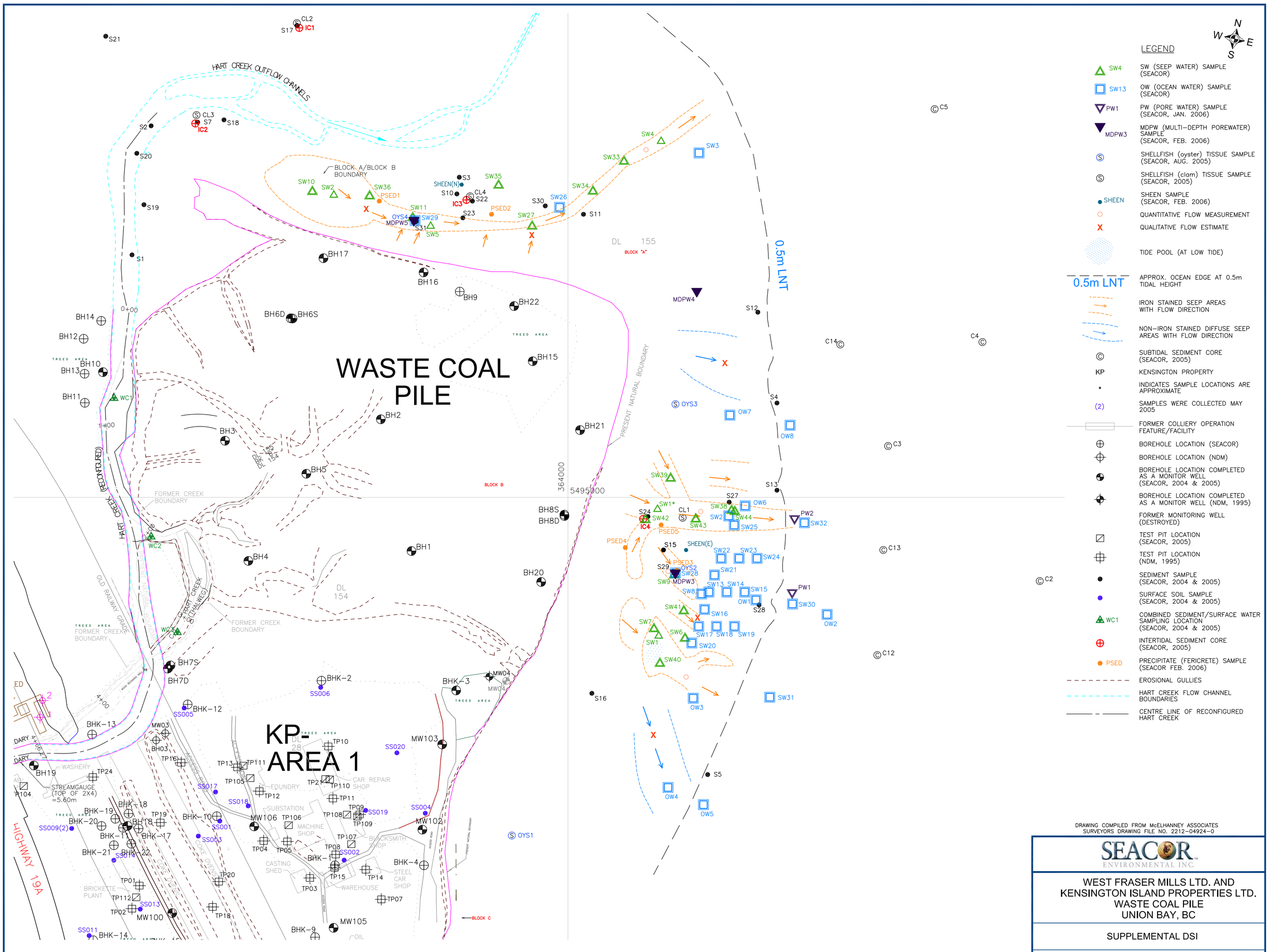
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LEASE LOT BOUNDARIES AND REVISED LAND USE PLAN

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B2	201.01022.01	EC	TMS	2



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- PW1 — PW (PORE WATER) SAMPLE (SEACOR, JAN. 2006)
- MDPW3 — MDPW (MULTI-DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006)
- (S) — SHELLFISH (oyster) TISSUE SAMPLE (SEACOR, AUG. 2005)
- (S) — SHELLFISH (clam) TISSUE SAMPLE (SEACOR, 2005)
- SHEEN — SHEEN SAMPLE (SEACOR, FEB. 2006)
- ○ — QUANTITATIVE FLOW MEASUREMENT
- X — QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- IRON STAINED SEEP AREAS WITH FLOW DIRECTION
- NON-IRON STAINED DIFFUSE SEEP AREAS WITH FLOW DIRECTION
- © — SUBTIDAL SEDIMENT CORE (SEACOR, 2005)
- KP — KENSINGTON PROPERTY
- * — INDICATES SAMPLE LOCATIONS ARE APPROXIMATE
- (2) — SAMPLES WERE COLLECTED MAY 2005
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- FORMER MONITORING WELL (DESTROYED)
- TEST PIT LOCATION (SEACOR, 2005)
- TEST PIT LOCATION (NDM, 1995)
- SEDIMENT SAMPLE (SEACOR, 2004 & 2005)
- SURFACE SOIL SAMPLE (SEACOR, 2004 & 2005)
- WC1 — COMBINED SEDIMENT/SURFACE WATER SAMPLING LOCATION (SEACOR, 2004 & 2005)
- INTERTIDAL SEDIMENT CORE (SEACOR, 2005)
- PSED — PRECIPITATE (FERICRETE) SAMPLE (SEACOR FEB. 2006)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

METRES (APPROX.)
0 25 50 100 150 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

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SITE PLAN - SAMPLE LOCATIONS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG.
AS SHOWN	06/07/06	201-01022-01-B1	201.01022.01	EC	TMS	3



REFERENCED FROM:
DEP'T OF ENERGY MINES & RESOURCES MAPPING BRANCH
92F/10

KILOMETRES

0 0.5 1 2 3 km

△ TIDE POOL WATER SAMPLE (SEACOR AUG./SEPT. 2005)

□ OCEAN WATER SAMPLE (SEACOR)

● SEDIMENT SAMPLE (SEACOR, SEPT. 2005)

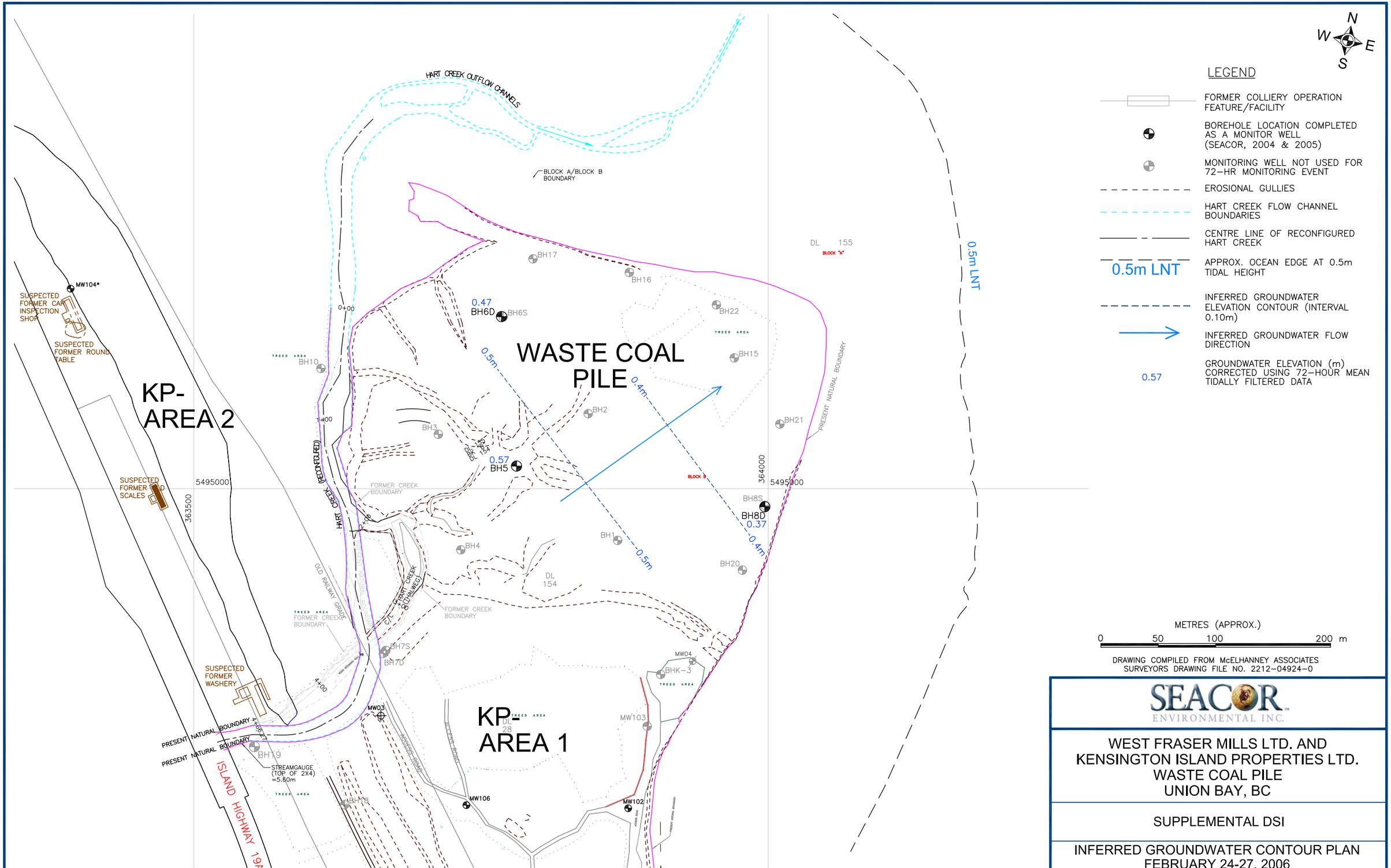
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UNION BAY, BC

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WASTE COAL PILE AND REFERENCE AREA SAMPLE LOCATIONS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/14/06	201-01022-01-B18	201.01022.01	EC	TMS	3b



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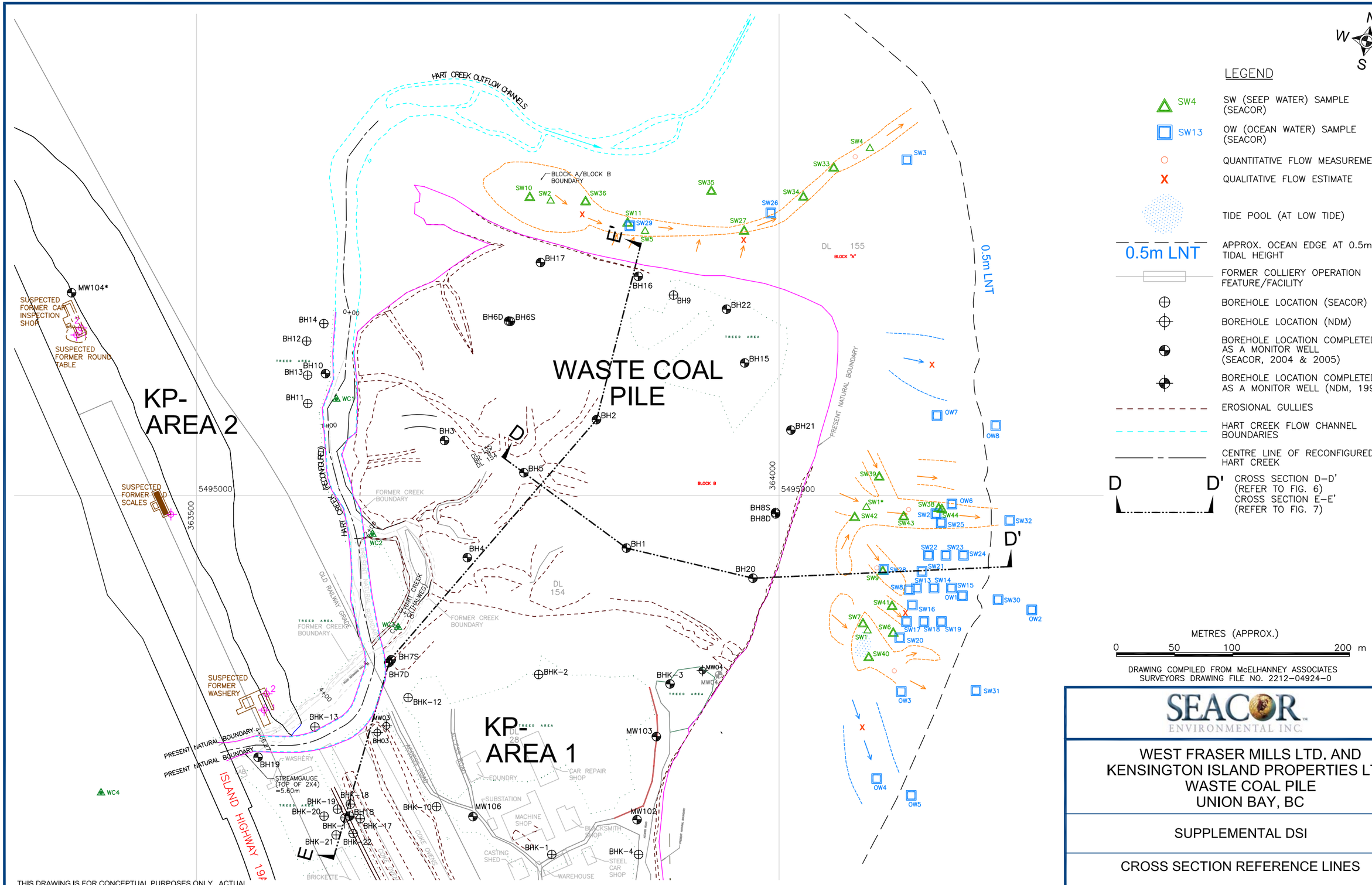
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INFERRED GROUNDWATER CONTOUR PLAN
FEBRUARY 24-27, 2006

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B5	201.01022.01	EC	TMS	4



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- X — QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- D — D' CROSS SECTION D–D' (REFER TO FIG. 6)
- CROSS SECTION E–E' (REFER TO FIG. 7)

METRES (APPROX.)

0 — 50 — 100 — 200 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212–04924–0

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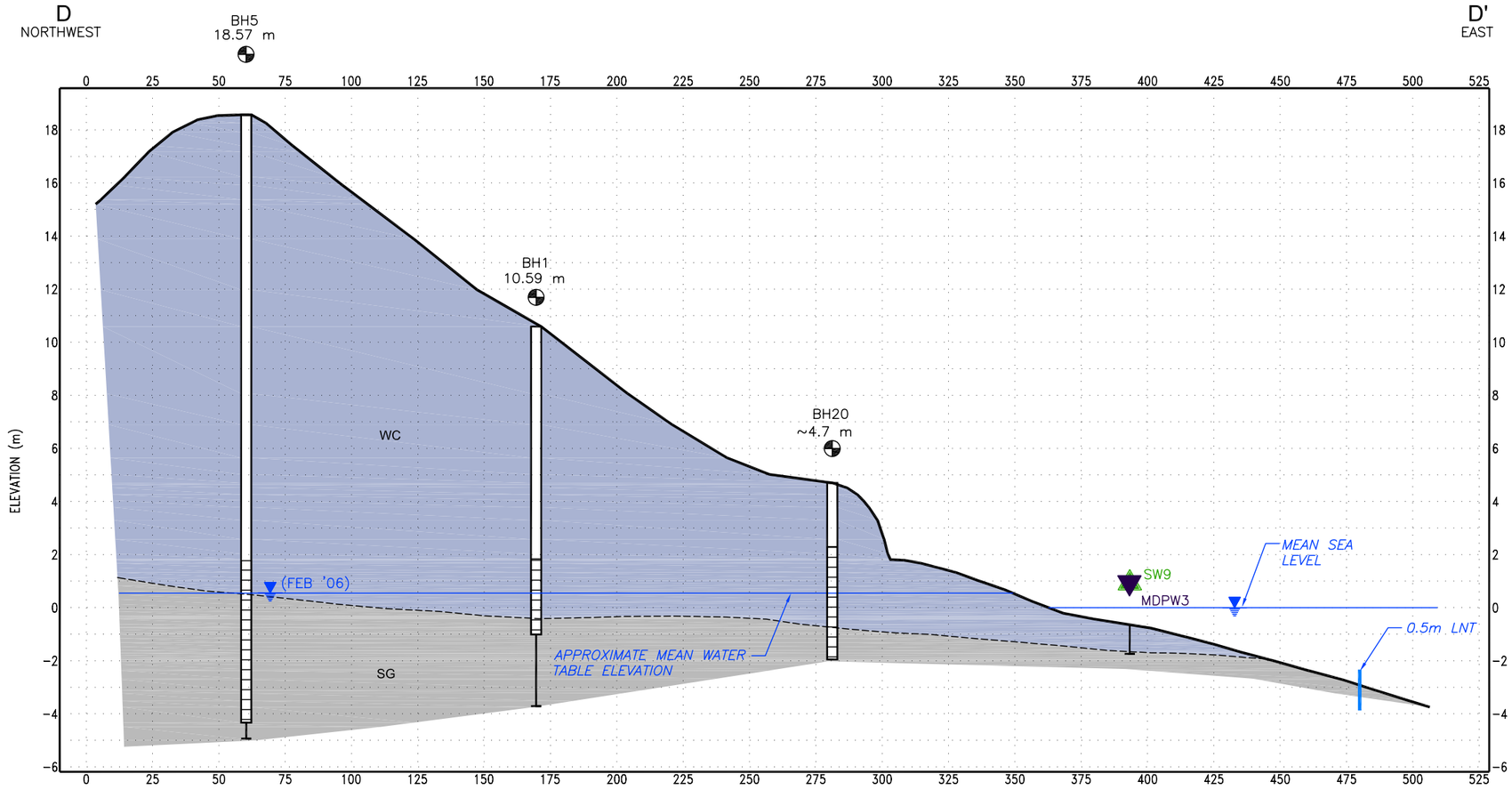
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SUPPLEMENTAL DSI

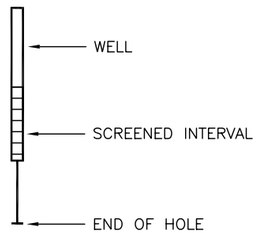
CROSS SECTION REFERENCE LINES

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B4	201.01022.01	EC	TMS	5



LEGEND:

- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL
- SEEP WATER SAMPLE
- MDPW (MULTI–DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006)
- GROUNDWATER ELEVATION
- *0.5m LNT* — 0.5m LOWEST NORMAL TIDE
- WC — WASTE COAL
- SG — SAND AND GRAVEL



METRES
0 25 50 100 150 m

VERTICAL SCALE
0 2.5 5 10 15 m

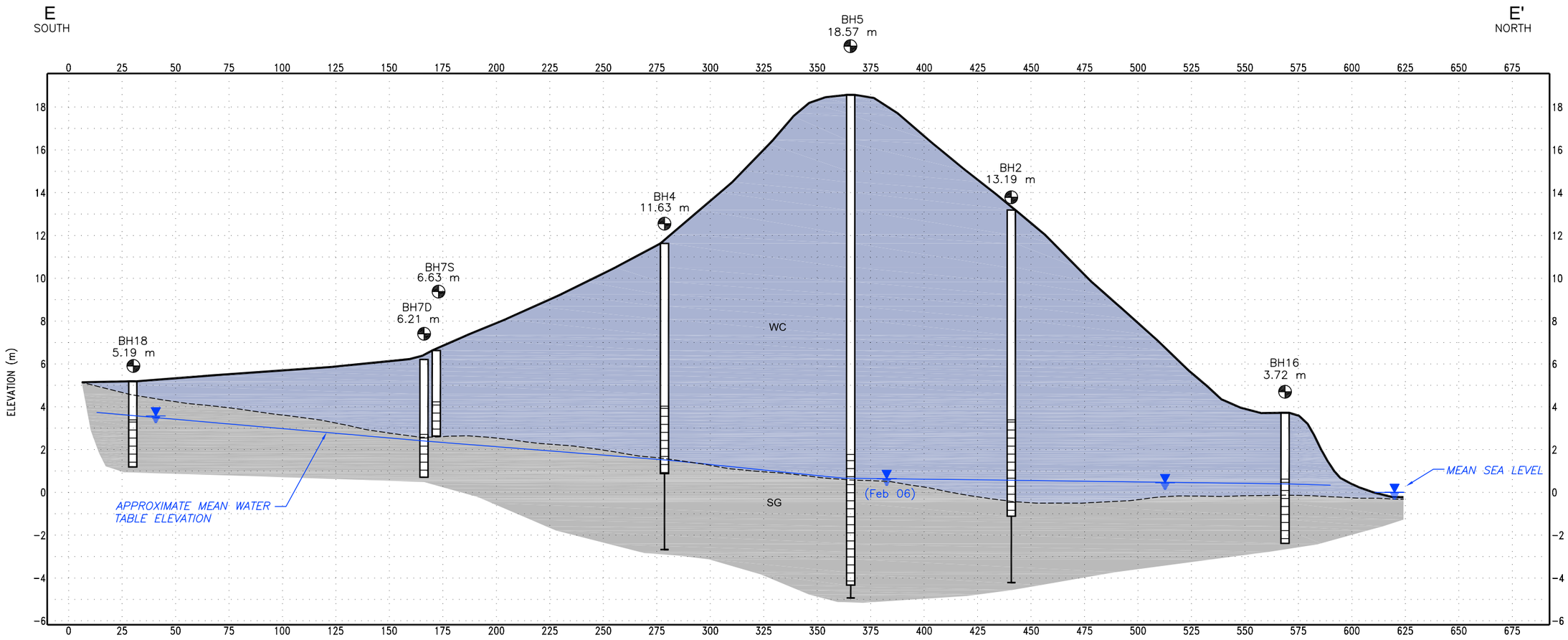
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SUPPLEMENTAL DSI

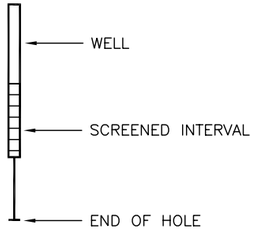
CROSS SECTION D-D'

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
V=1:200 H=1:2000	06/07/06	201-01022-01-B3-2	201.01022.01	EC	IHO	6



LEGEND:

- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL
- GROUNDWATER ELEVATION
- WC — WASTE COAL
- SG — SAND AND GRAVEL



METRES
0 25 50 100 150 m

VERTICAL SCALE
0 2.5 5 10 15 m

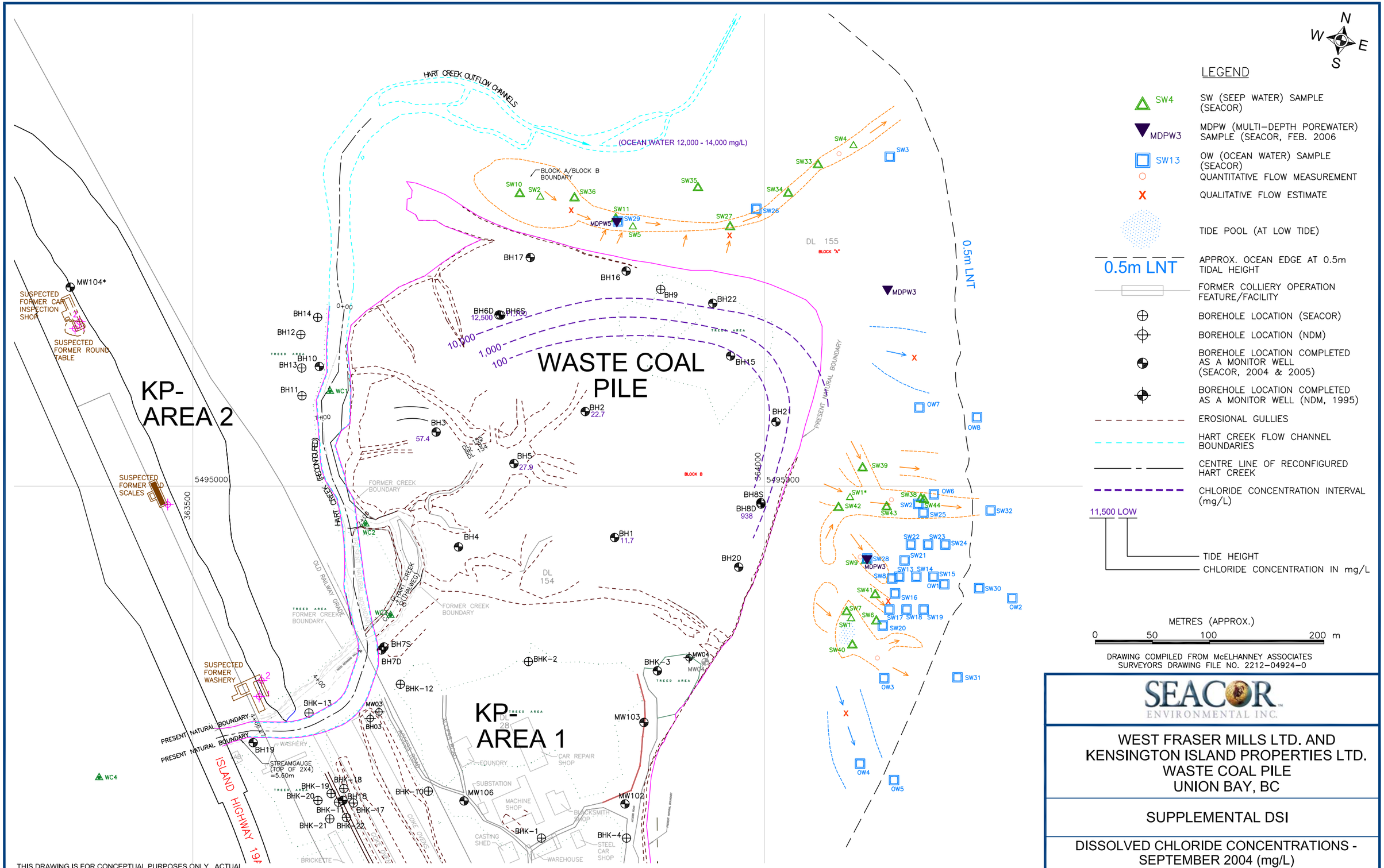
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WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

CROSS SECTION E-E'

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
V=1:200 H=1:2000	06/07/06	201-01022-01-B3-1	201.01022.01	EC	IHO	7



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- MDPW3 — MDPW (MULTI–DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- X — QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- CHLORIDE CONCENTRATION INTERVAL (mg/L)

11,500 LOW

- TIDE HEIGHT
- CHLORIDE CONCENTRATION IN mg/L

METRES (APPROX.)

0 50 100 200 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212–04924–0

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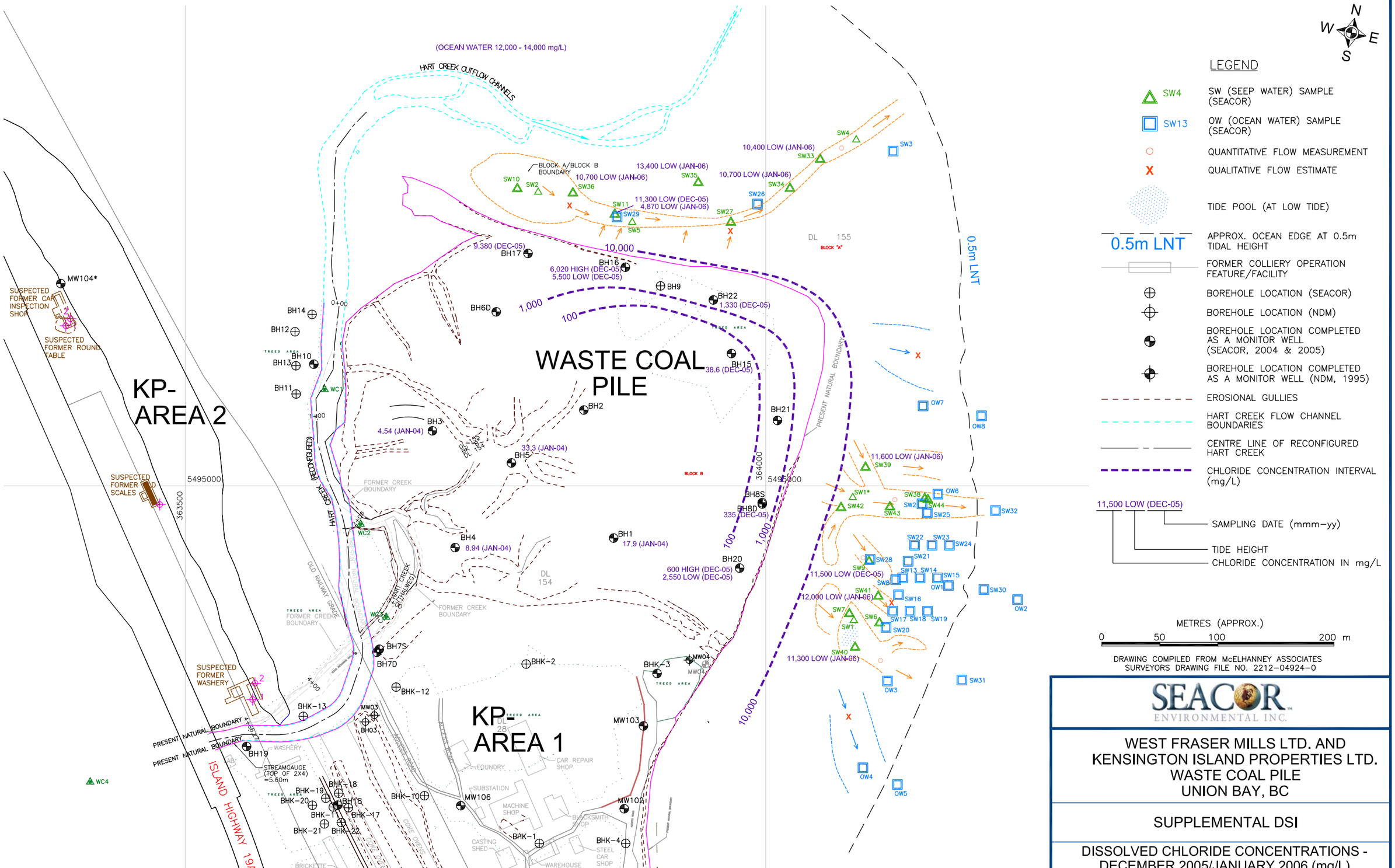
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UNION BAY, BC

SUPPLEMENTAL DSI

DISSOLVED CHLORIDE CONCENTRATIONS - SEPTEMBER 2004 (mg/L)

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/14/06	201-01022-01-B20	201.01022.01	EC	TMS	8a



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- CHLORIDE CONCENTRATION INTERVAL (mg/L)

11,500 LOW (DEC-05)
- SAMPLING DATE (mmm-yy)
- TIDE HEIGHT
- CHLORIDE CONCENTRATION IN mg/L

METRES (APPROX.)
0 50 100 200 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

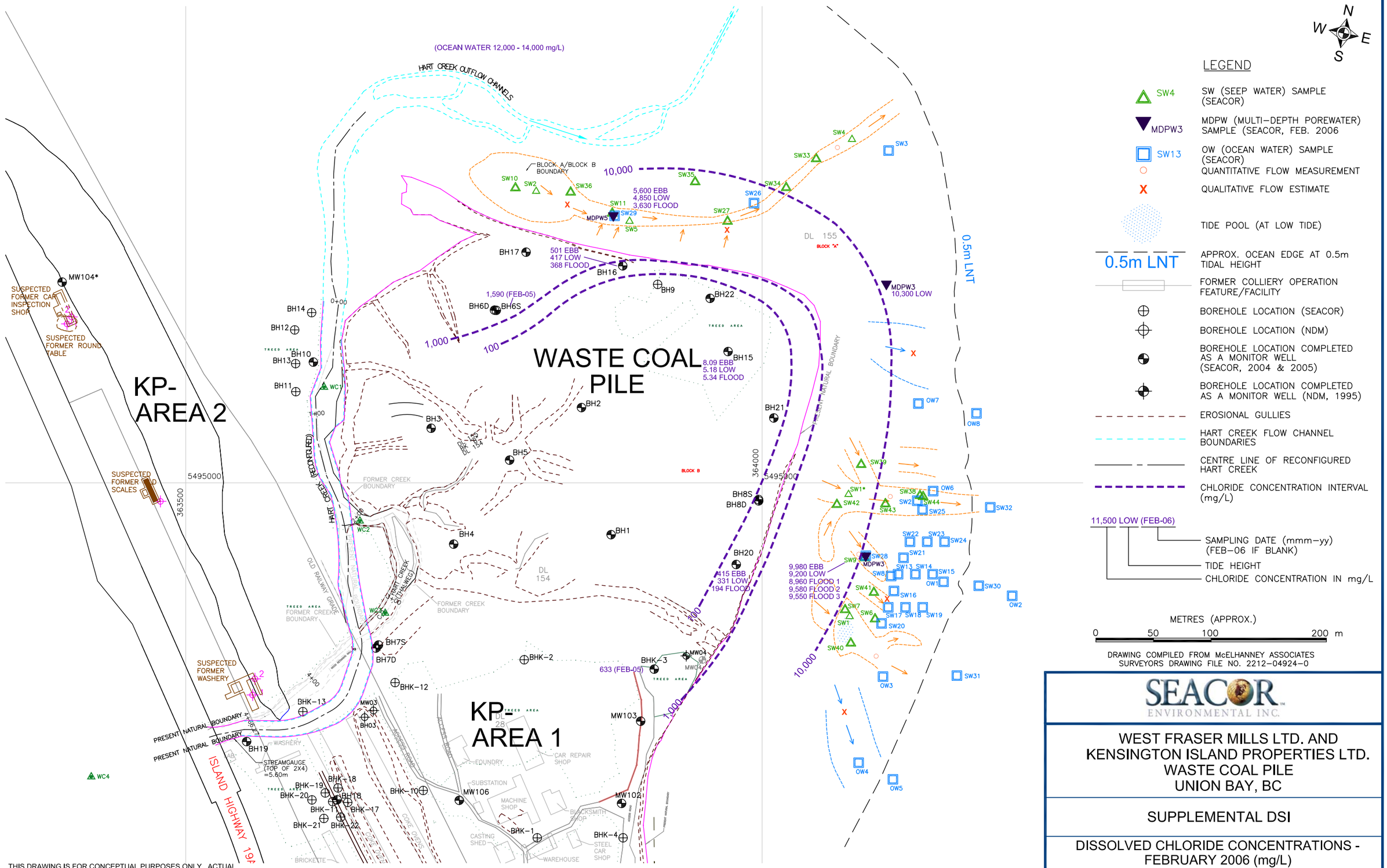
SEACOR ENVIRONMENTAL INC.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES LTD.
WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

DISSOLVED CHLORIDE CONCENTRATIONS - DECEMBER 2005/JANUARY 2006 (mg/L)

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B6	201.01022.01	EC	TMS	8b



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- MDPW3 — MDPW (MULTI–DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- X — QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- CHLORIDE CONCENTRATION INTERVAL (mg/L)

11,500 LOW (FEB-06)

- SAMPLING DATE (mmm–yy) (FEB–06 IF BLANK)
- TIDE HEIGHT
- CHLORIDE CONCENTRATION IN mg/L

METRES (APPROX.)

0 50 100 200 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212–04924–0

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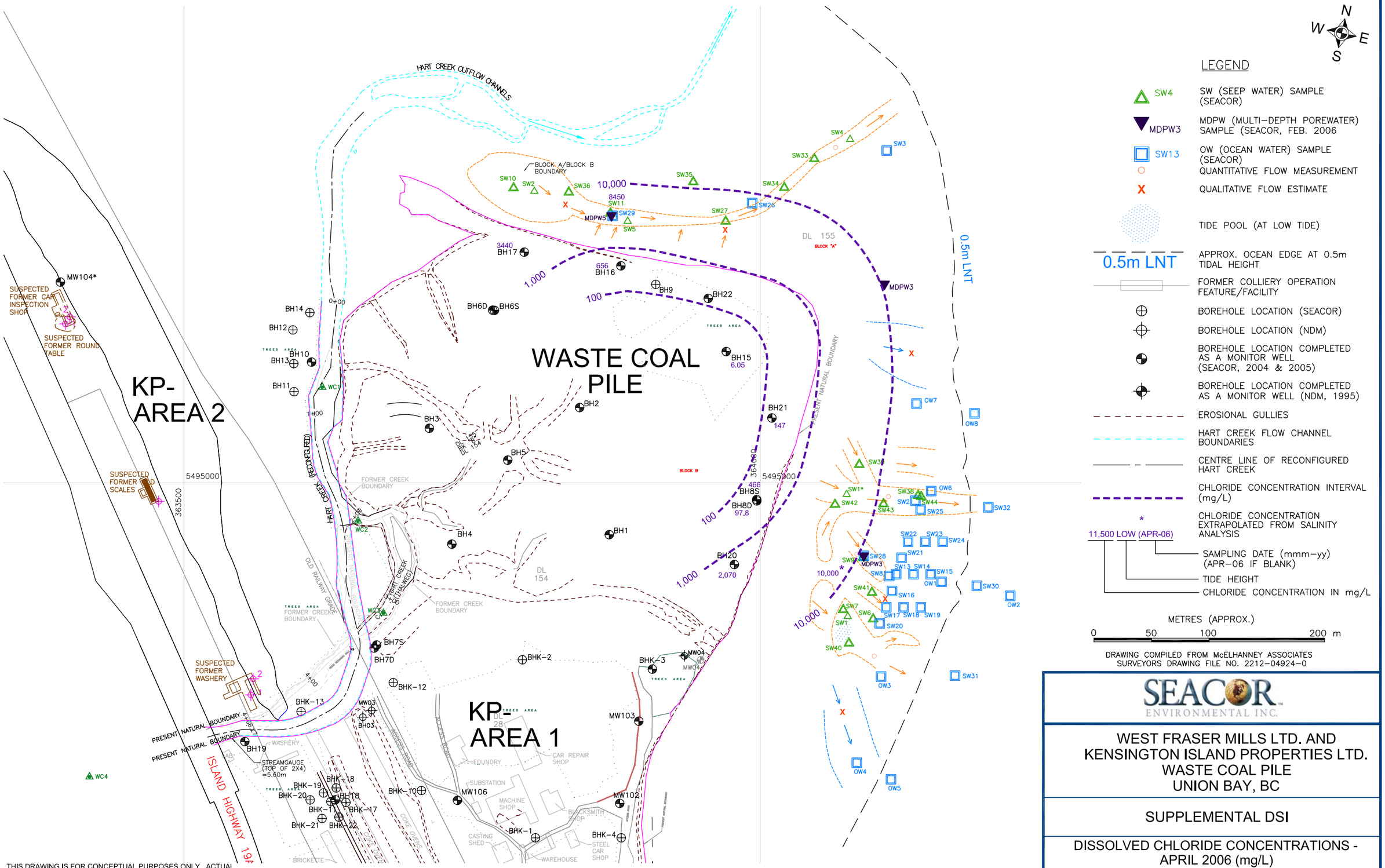
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WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

DISSOLVED CHLORIDE CONCENTRATIONS - FEBRUARY 2006 (mg/L)

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B7	201.01022.01	EC	TMS	8c



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- MDPW3 — MDPW (MULTI–DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- X — QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- CHLORIDE CONCENTRATION INTERVAL (mg/L)
- * CHLORIDE CONCENTRATION EXTRAPOLATED FROM SALINITY ANALYSIS
- 11,500 LOW (APR-06)
  - SAMPLING DATE (mmm–yy) (APR–06 IF BLANK)
  - TIDE HEIGHT
  - CHLORIDE CONCENTRATION IN mg/L

METRES (APPROX.)
0 50 100 200 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212–04924–0

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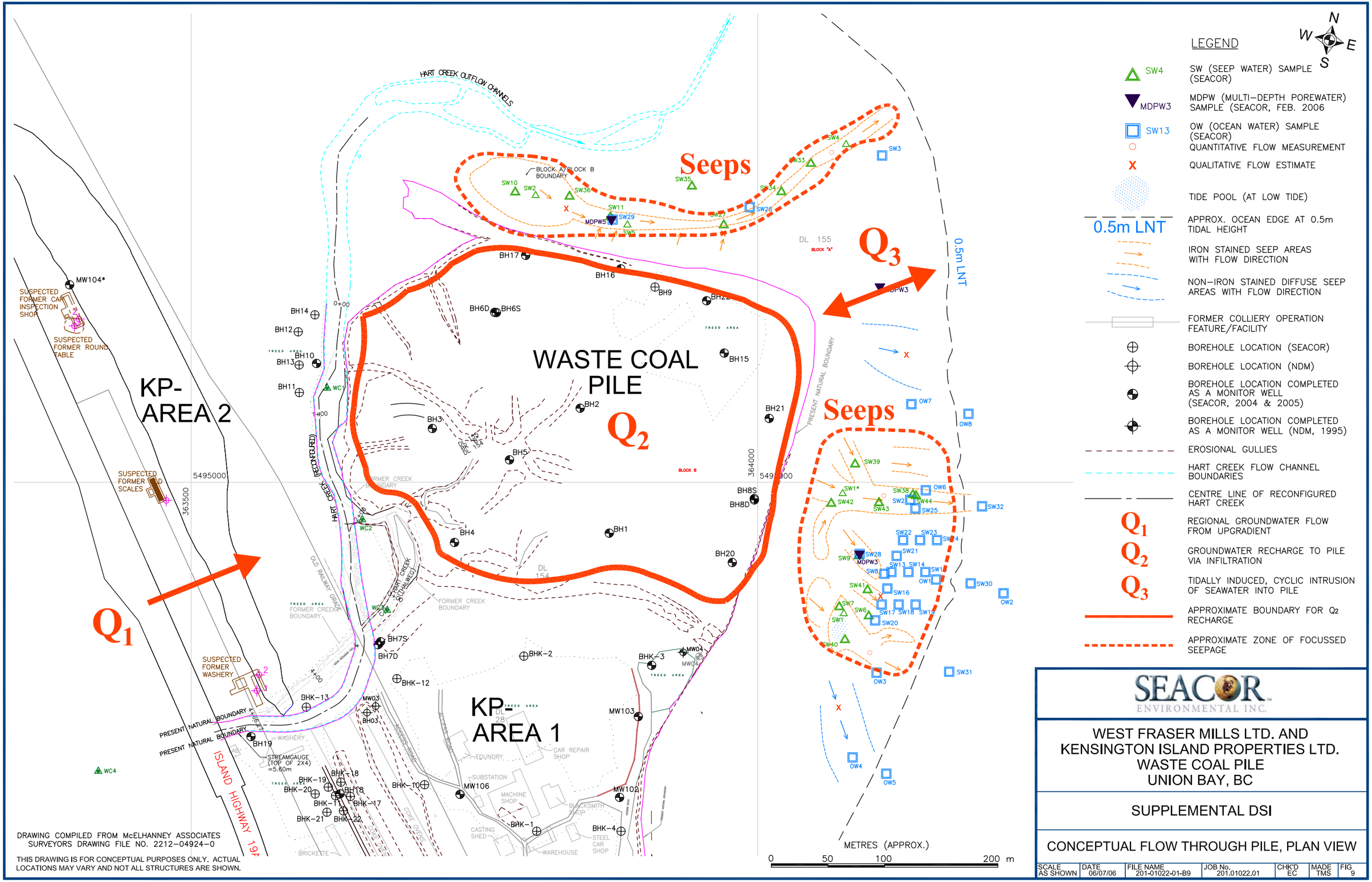
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WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

DISSOLVED CHLORIDE CONCENTRATIONS - APRIL 2006 (mg/L)

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B8	201.01022.01	EC	TMS	8d



DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- MDPW3 — MDPW (MULTI-DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006)
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- IRON STAINED SEEP AREAS WITH FLOW DIRECTION
- NON-IRON STAINED DIFFUSE SEEP AREAS WITH FLOW DIRECTION
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- Q_1 — REGIONAL GROUNDWATER FLOW FROM UPGRADIENT
- Q_2 — GROUNDWATER RECHARGE TO PILE VIA INFILTRATION
- Q_3 — TIDALLY INDUCED, CYCLIC INTRUSION OF SEAWATER INTO PILE
- APPROXIMATE BOUNDARY FOR Q_2 RECHARGE
- APPROXIMATE ZONE OF FOCUSSED SEEPAGE

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WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES LTD.
WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

CONCEPTUAL FLOW THROUGH PILE, PLAN VIEW

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG.
AS SHOWN	06/07/06	201-01022-01-B9	201.01022.01	EC	TMS	9

E
SOUTH

E'
NORTH

BH18
5.19 m

BH7D
6.21 m

BH7S
6.63 m

BH4
11.63 m

BH5
18.57 m

BH2
13.19 m

BH16
3.72 m

WC

SG

Q_2

Q_1

APPROXIMATE MEAN WATER TABLE ELEVATION

(Feb 06)

MEAN SEA LEVEL

Q_3

Dilutive Mixing

Dispersive Mixing

Salt Water Wedge

?

LEGEND:

Q_1	REGIONAL GROUNDWATER FLOW FROM UPGRADIENT
Q_2	GROUNDWATER RECHARGE TO PILE VIA INFILTRATION
Q_3	TIDALLY INDUCED, CYCLIC INTRUSION OF SEAWATER INTO PILE
– – –	INFERRED REGIONAL SALT WATER WEDGE
⊕	BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
▽	GROUNDWATER ELEVATION
WC	WASTE COAL
SG	SAND AND GRAVEL

WELL

SCREENED INTERVAL

END OF HOLE

METRES
0 25 50 100 150 m

VERTICAL SCALE
0 2.5 5 10 15 m

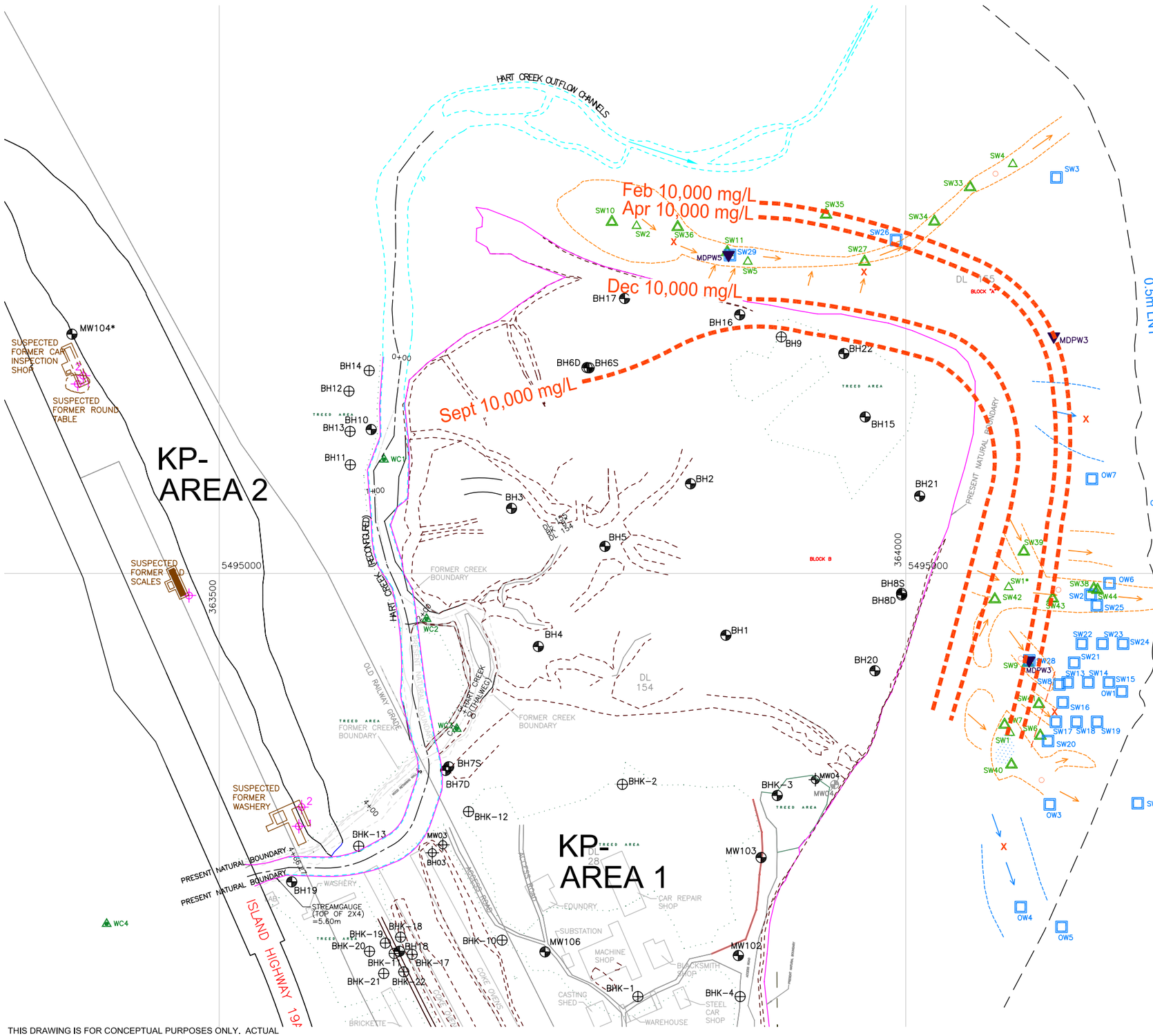
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WEST FRASER MILLS LTD. AND
KENSINGTON ISLAND PROPERTIES LTD.
WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

CONCEPTUAL FLOW THROUGH PILE
CROSS SECTION E-E'

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
V=1:200 H=1:2000	06/07/06	201-01022-01-B11	201.01022.01	EC	IHO	10



LEGEND

- SW4 — SW (SEEP WATER) SAMPLE (SEACOR)
- MDPW3 — MDPW (MULTI-DEPTH POREWATER) SAMPLE (SEACOR, FEB. 2006
- SW13 — OW (OCEAN WATER) SAMPLE (SEACOR)
- QUANTITATIVE FLOW MEASUREMENT
- QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- 0.5m LNT — APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- 10,000 mg/L CHLORIDE ISOPLETHS USED TO INFER APPROXIMATE MIXING BOUNDARY BETWEEN SEAWATER AND SEAWATER MIXED WITH GROUNDWATER

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

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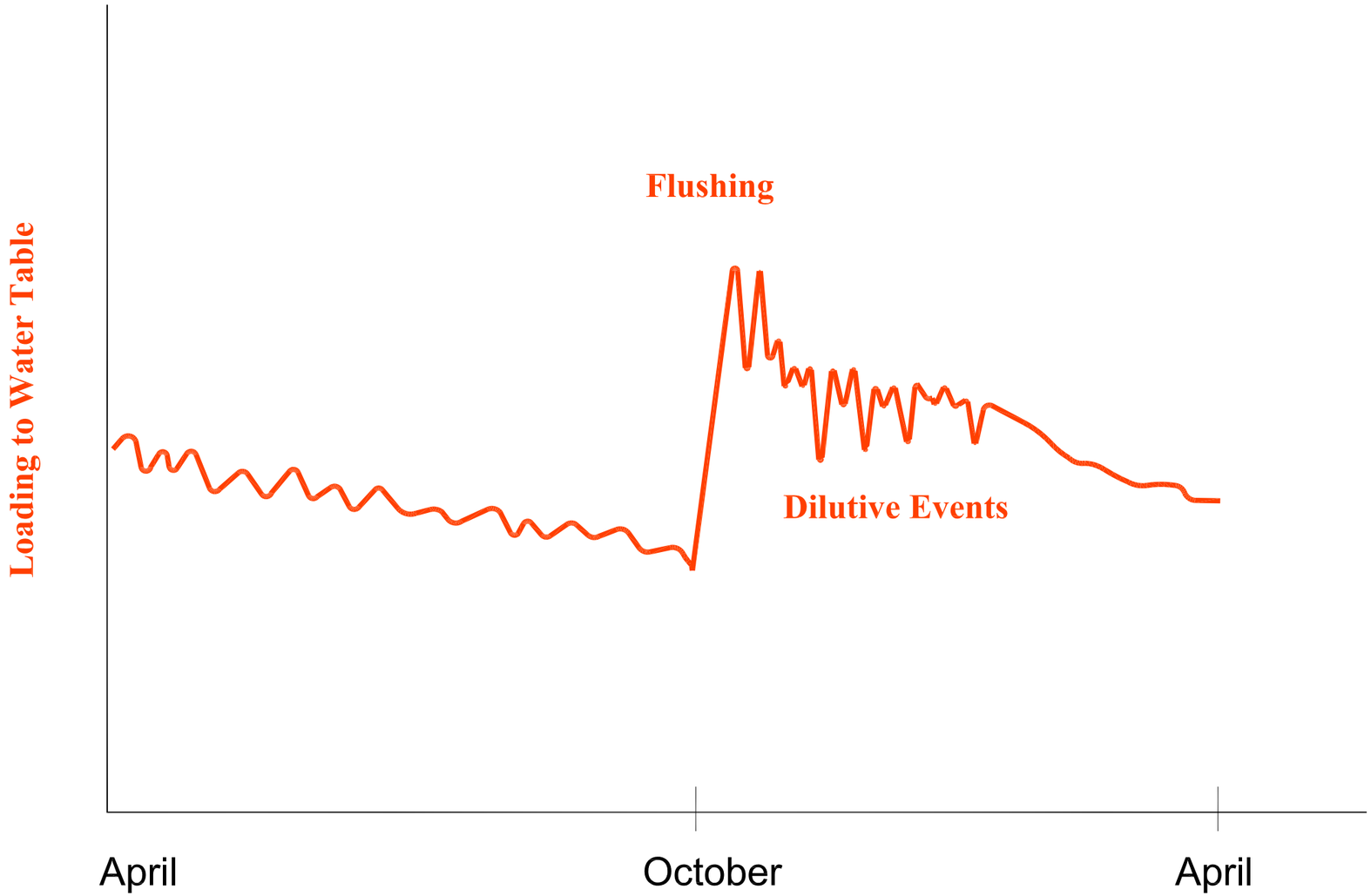
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WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES LTD. WASTE COAL PILE UNION BAY, BC

SUPPLEMENTAL DSI

SEASONAL VARIATIONS IN SEAWATER -GROUNDWATER MIXING BOUNDARY

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B10	201.01022.01	EC	TMS	11



LEGEND

CONCEPTUAL CYCLE OF CONTAMINANT LOADINGS FROM WASTE PILE TO GROUNDWATER. CONCENTRATION LEVELS ARE RELATIVE AND ARE INFERRED FOR CONCEPTUAL PURPOSES ONLY.

SEACOR ENVIRONMENTAL INC.

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WASTE COAL PILE
UNION BAY, BC

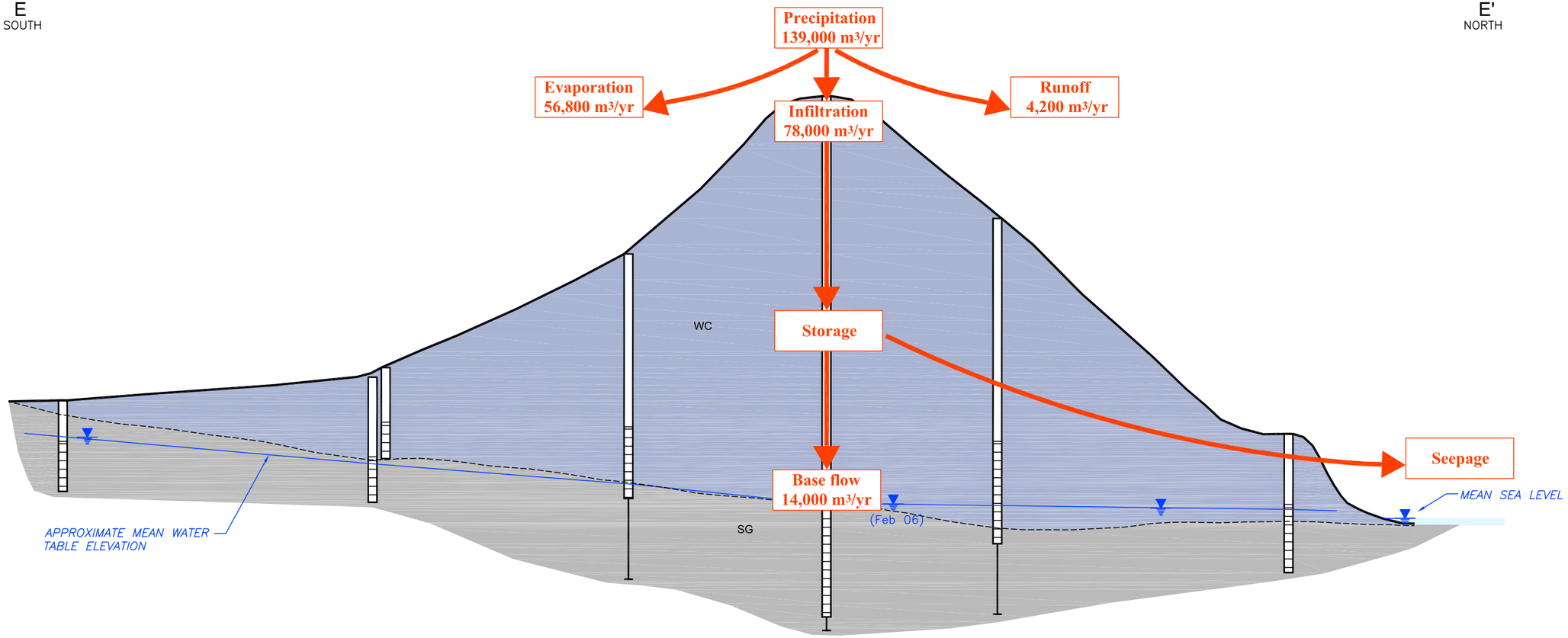
SUPPLEMENTAL DSI

CONCEPTUAL SEASONAL CONTAMINANT LOADINGS FROM WASTE PILE

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
NTS	06/07/06	201-01022-01-B14	201.01022.01	EC	TMS	12

E
SOUTH

E'
NORTH



LEGEND:

BOREHOLE LOCATION COMPLETED AS A MONITOR WELL

GROUNDWATER ELEVATION

WC — WASTE COAL

SG — SAND AND GRAVEL

WELL

SCREENED INTERVAL

END OF HOLE

NOTE: WATER BALANCE VOLUMES DERIVED USING HYDROGEOLOGICAL EVALUATION OF LANDFILL PERFORMANCE (HELP) NUMERICAL MODEL AND LOCAL CLIMATE DATA.

METRES

0 25 50 100 150 m

VERTICAL SCALE

0 2.5 5 10 15 m

SEACOR ENVIRONMENTAL INC.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES LTD. WASTE COAL PILE UNION BAY, BC

SUPPLEMENTAL DSI

PILE WATER BALANCE

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
V=1:200 H=1:2000	06/07/06	201-01022-01-B13	201.01022.01	EC	TMS	13

WASTE COAL PILE

KP-AREA 1

BH17	Metals	Sulphate
22-Feb-05	Cd, Cr, Co, Cu, Ni, Zn	X
11-Sep-05	Cd, Cr, Co, Cu, Ni,Zn	X
14-Dec-05	Cr, Co, Cu, Zn	X
4-Apr-06 (L Tide)	Cd, Co, Cu, Ni, Zn	n/a

BH6D	Metals	Sulphate
3-Sep-04	Cd, Co, Cu, Ni, Zn	X
11-Sep-05	Cd, Co, Cu, Ni, Zn	X

BH6S	Metals	Sulphate
3-Sep-04	Cd, Co, Cu, Ni, Zn	X
04-Feb-05	Cd, Co, Cu, Ni, Zn	X
11-Sep-05	Cd, Co, Cu, Ni, Zn	X

BH16	Metals	Sulphate
22-Feb-05	Cd, Co, Ni, Zn	X
11-Sep-05	Cd, Co, Cu, Ni, Zn	X
18-Sep-05	Cd, Co, Cu, Ni, Zn	X
13-Oct-05	Cd, Co, Cu, Ni, Zn	n/a
14-Dec-05 (H Tide)	Cd, Co, Cu, Ni, Zn	X
13-Dec-05 (L Tide)	Cd, Co, Cu, Ni, Zn	X
26-Jan-06	Cd, Co, Cu, Ni, Zn	n/a
4-Apr-06 (L Tide)	Cd, Co, Cu, Ni, Zn	n/a

BH22	Metals	Sulphate
11-Sep-05	Cd, Co, Ni, Zn	X
14-Dec-05	Cd, Co, Cu, Ni, Zn	X

BH15	Metals	Sulphate
22-Feb-05	Co, Ni, Zn	X
11-Sep-05	Co, Ni, Zn	X
14-Dec-05	Co, Ni, Zn	X
04-Apr-06 (L Tide)	Cd, Co, Ni, Zn	n/a

BH21	Metals	Sulphate
11-Sep-05	Co, Ni, Zn	X
14-Dec-05	Co, Cu, Ni, Zn	n/a
4-Apr-06 (L Tide)	Co, Cu, Zn	n/a

BH3	Metals	Sulphate
28-Jan-04	--	X
3-Sep-04	Cd, Co, Ni, Zn	X

BH2	Metals	Sulphate
28-Jan-04	Co, Ni	X
3-Sep-04	Co, Ni, Zn	X

BH5	Metals	Sulphate
28-Jan-04	Co, Ni, Zn	X
3-Sep-04	Co, Ni, Zn	X

BH8S	Metals	Sulphate
04-Apr-06 (L Tide)	Cd, Ni, Zn	–

BH8D	Metals	Sulphate
3-Sep-04	Co, Ni, Zn	X
11-Sep-05	Co	X
14-Dec-05	Co	X
04-Apr-06 (L Tide)	Co, Zn	n/a

BH1	Metals	Sulphate
28-Jan-04	Cd, Co, Cu, Ni, Zn	X
3-Sep-04	Co, Cu, Ni, Zn	X

BH4	Metals	Sulphate
28-Jan-04	Cd, Co, Ni, Zn	X

BH20	Metals	Sulphate
11-Sep-05	Cd, Co, Cu, Ni, Zn	X
18-Sep-05	Cd, Co, Ni, Zn	X
13-Oct-05	Cd, Co, Ni, Zn	n/a
14-Dec- 05 (H Tide)	Cd, Co, Cu, Ni, Zn	–
13-Dec-05 (L Tide)	Cd, Co, Cu, Ni, Zn	X
26-Jan-06	Cd, Co, Cu, Ni, Zn	n/a
4-Apr-06 (L Tide)	Cd, Co, Cu, Ni, Zn	n/a

BH7D	Metals	Sulphate
22-Feb-05	Cu	--

BHK-3	Metals	Sulphate
4-Feb-05	–	--

HART CREEK OUTFLOW CHANNELS

DL 155 BLOCK "A"

DL 154

DL 28

BLOCK B

BLOCK C

PRESENT NATURAL BOUNDARY

364000

5495000

BH17 BH16 BH9 BH6D BH6S BH22 BH15 BH21 BH2 BH3 BH5 BH8S BH8D BH1 BH4 BH20 BH7S BH7D BHK-2 BHK-3 MW04 BHK-12 BHK-13 MW03 BH03 MW103 BH19 BHK-19 BHK-18 BHK-20 BH18 BHK-1 BHK-17 BHK-21 BHK-22 BHK-10 MW106 MW102 BHK-1 BHK-4 MW100 MW105 BH14 BH12 BH10 BH13 BH11 WC1 WC2 WC3 WC4 BH10 BH11 BH12 BH13 BH14

0+00 1+00 2+00 3+00 4+00

HART CREEK (RECONTOURED)

FORMER CREEK BOUNDARY

OLD RAILWAY GRADE

HART CREEK (THALWEG)

TREED AREA

ACCESS ROAD

WASHERY

STREAMGAUGE (TOP OF 2X4) =5.60m

EQUIPMENT SHOP

CAR REPAIR SHOP

FOUNDRY

SUBSTATION

MACHINE SHOP

BLACKSMITH SHOP

CASTING SHED

STEEL CAR SHOP

WAREHOUSE

COKE OVENS

BRICKETTE PLANT

HIGHWAY 19A

LEGEND

- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- FORMER MONITORING WELL (DESTROYED)
- -- INDICATES CONCENTRATIONS ARE BELOW THE CSR AWM AND AWF STANDARDS
- CSR AWM — CONTAMINATED SITES REGULATION, MARINE AQUATIC LIFE STANDARDS
- CSR AWF — CONTAMINATED SITES REGULATION, FRESHWATER AQUATIC LIFE STANDARDS
- GREEN INDICATES CONCENTRATIONS ARE BELOW CSR AWM AND CSR AWF STANDARDS
- Cu, Ni — BLUE INDICATES CONCENTRATIONS IN EXCESS OF CSR AWM STANDARDS
- Cu, Ni — RED INDICATES CONCENTRATIONS IN EXCESS OF CSR AWM AND CSR AWF STANDARDS
- Cu, Ni — MAGENTA INDICATES THAT THE DETECTION LIMITS EXCEED THE CSR AWM AND/OR AWF STANDARDS
- X — SAMPLE EXCEEDED CSR SULPHATE STANDARD; STANDARD EXCEEDED INDICATED BY SYMBOL COLOUR
- n/a — PARAMETER NOT ANALYSED ON DATE INDICATED
- *Cr* — *"italicized"* INDICATES CONCENTRATIONS IN EXCESS OF CSR AWF STANDARDS

NOTE (1): ALL GROUNDWATER SAMPLES SUBMITTED FOR ANALYSIS OF LEPH/HEPH (OR EPH), PAHs AND/OR VOCs WERE BELOW THE BC CSR AWM AND AWF STANDARDS

NOTE (2): ALL METAL ANALYTICAL RESULTS REPORTED IN µg/L

NOTE (3): ALL SULPHATE ANALYTICAL RESULTS REPORTED IN mg/L

IN CHEMISTRY TABLES:

As – Arsenic
Cd – Cadmium
Co – Cobalt
Cr – Chromium
Cu – Copper
Pb – Lead
Ni – Nickel
Se – Selinium
Th – Thallium
Zn – Zinc

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METRES (APPROX.)
0 25 50 100 150 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

SEACOR ENVIRONMENTAL INC.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES LTD.
WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

GROUNDWATER CHEMISTRY RESULTS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B15	201.01022.01	EC	TMS	14

WASTE COAL PILE

KP AREA 1

HART CREEK OUTFLOW CHANNELS

PRESENT NATURAL BOUNDARY

SENT NATURAL BOUNDARY

ISLAND HIGHWAY 19A

HART CREEK (RECONFIGURED)

FORMER CREEK BOUNDARY

OLD RAILWAY GRADE

SUSPECTED FORMER WASHERY

STREAMGAUGE (TOP OF 2X4) =5.60m

WASHERY

EQUIPMENT

CAR REPAIR SHOP

SUBSTATION

MACHINE SHOP

BLACKSMITH SHOP

CASTING SHED

STEEL CAR SHOP

WAREHOUSE

BRICKETTE PLANT

COAL OVERPASS

COAL CONVEYOR

ACCESS ROAD

DL 154

DL 28

TREED AREA

BLOCK "A"

BLOCK B

BLOCK C

5.5m LNT

0.5m LNT

364000

363500

5495000

0+00

1+00

2+00

3+00

4+00

ID	Depth (m)	PAH	Metals
S17	0-0,15	Ace (<0,2), Acen (<0,2), Anth <0,2), Flu (<0,2), 2 M/Naph (7,7), Naph (4,01), Phen (4,41), Chry (0,569)	As (40,7), Hg (0,513)

ID	Depth (m)	PAH	Metals
IC1 S4	2,0 - 2,8	Ace (0,334), Acen (0,107), Anth (0,16), Flu (0,618), 2 M/Naph (2,02), Naph (0,997), Phen (3,52)	---
IC1 S6	3,0 - 3,5	---	---

ID	Depth (m)	PAH	Metals
S21	0 - 0,15	Ace (0,216), Acen (0,148), Flu (0,22), 2 M/Naph (6,28), Naph (3,47), Phen (3,89), Chry (<0,58)	As (49,2), Cu (94,3), Hg (0,558)

ID	Depth (m)	PAH	Metals
S7	0 - 0,15	Ace (<0,3), Acen (<0,2), Anth (0,227), Flu (<0,3), Naph (4,43), Phen (6,24), Chry (<0,837)	Hg (0,462)
S7	0,15-0,4	Ace (<0,2), Acen (<0,5), Flu (<0,2), Naph (2,49), Phen (3,82)	---

ID	Depth (m)	PAH	Metals
S2	0 - 0,15	Ace (<0,2), Acen (<0,15), Flu (<0,2), Naph (3,57), Phen (4,9), Chry (0,572)	---

ID	Depth (m)	PAH	Metals
S18	0-0,15	Ace (<0,3), Acen (<0,2), Flu (<0,3), 2 M/Naph (7,57), Naph (4,54), Phen (6,61), Chry (0,837)	---

ID	Depth (m)	PAH	Metals
IC2 S4	3,0 - 3,8	Ace (0,129), Acen (0,084), Flu (0,141), 2 M/Naph (3,5), Naph (1,83), Phen (2,68)	n.a.
IC2 S5	3,8 - 4,0	---	---

ID	Depth (m)	PAH	Metals
S20	0 - 0,15	Ace (0,316), Acen (0,207), Flu (0,265), 2 M/Naph (5,91), Naph (3,27), Phen (6,34), Chry (<0,85)	---

ID	Depth (m)	PAH	Metals
S19	0 - 0,15	Ace (0,158), Acen (0,087), Flu (0,117), 2 M/Naph (3,5), Naph (1,9), Phen (2,83)	---

ID	Depth (m)	PAH	Metals
S1	0 - 0,15	Naph (0,29), Phen (0,404)	---

ID	Depth (m)	PAH	Metals
S10	0-0,15	Ace (<0,25), Acen (<0,15), Flu (<0,2), Naph (3,63), Phen (4,52), Chry (0,619)	---
S10	0,15-0,4	Ace (<0,15), Flu (<0,15), Naph (1,89), Phen (2,38)	As (30,3)

ID	Depth (m)	PAH	Metals
S3	0 - 0,15	Ace (<0,15), Flu (<0,15), Naph (1,68), Phen (2,48)	---

ID	Depth (m)	PAH	Metals
IC3 S2	1,0 - 2,0	Acen (0,098), Ace (0,14), Flu (0,124), 2 M/Naph (4,24), Naph (2,18), Phen (2,45)	n.a.
IC3 S4	3,0 - 4,0	---	---

ID	Date	Depth (m)	PAH	Metals
PSED 1	16-Sep-05	0 - 0,01	n/a	---

ID	Date	Depth (m)	PAH	Metals
PSED 2	16-Sep-05	0 - 0,01	n/a	As (30,4)

ID	Depth (m)	PAH	Metals
S11	0 - 0,15	Ace (<0,2), Acen (<0,2), Flu (<0,2), Naph (2,15), Phen (3,44)	---
S11	0,15-0,4	Ace (<0,2), Flu (<0,2), Naph (1,61), Phen (2,44)	n.a.

ID	Date	Depth (m)	PAH	Metals
S30	16-Sep-05	0 - 0,15	Ace(<0,30), Acen(<0,20), Chry(0,742), Flu(<0,20), 2 M/Naph(4,79), Naph(2,68), Phen(4,25)	As (27,1)

ID	Depth (m)	PAH	Metals
S23	0 - 0,15	Ace (<0,2), Acen (<0,2), Anth (<0,2), Flu (<0,2), 2 M/Naph (5,23), Naph (2,85), Phen (3,7)	As (35,4)

ID	Depth (m)	PAH	Metals
S12	0 - 0,15	Ace (<0,23), Acen (<0,11), Flu (<0,35), Anth (0,619), Naph (1,38), Phen (3,51)	n.a.

ID	Depth (m)	PAH	Metals
C14	0,0-0,1	Ace (0,345), Acen (0,128), Anth (0,164), Flu (0,546), 2 M/Naph (3,07), Naph (1,62), Phen (3,85)	---
C14	0,5-0,59	Ace (0,583), Acen (0,232), Anth (0,273), Flu (0,972), 2 M/Naph (5,02), Naph (2,43), Phen (5,71)	n.a.

ID	Depth (m)	PAH	Metals
C4	0,0-0,1	Ace (0,234), Acen (<0,15), Anth (0,182), Flu (0,552), 2 M/Naph (3,04), Naph (1,55), Phen (3,12)	Cu (69,7)
C4	0,5-0,3	Ace (0,397), Acen (<0,2), Anth (0,276), Flu (0,995), 2 M/Naph (4,04), Naph (1,94), Phen (5,02), Chry (0,701)	n.a.
C4	0,3-0,36	Ace (0,214), Acen (<0,10), Anth (0,172), Flu (0,581), 2 M/Naph (1,06), Naph (0,532), Phen (2,77)	n.a.

ID	Depth (m)	PAH	Metals
S4	0 - 0,15	Ace (<0,3), Acen (<0,15), Anth (0,219), Flu (<0,55), Naph (1,32), Phen (3,66)	---

ID	Depth (m)	PAH	Metals
S24	0 - 0,15	Ace (<0,2), Anth (<0,2), Flu (<0,2), 2 M/Naph (1,58), Naph (0,692), Phen (2,43)	---

ID	Depth (m)	PAH	Metals
C3	0,0-0,1	Ace (0,489), Acen (<0,25), Anth (0,216), Flu (1,15), 2 M/Naph (5,32), Naph (2,61), Phen (6,45), B(a)A (0,446), Chry (0,812)	---
C3	0,5-0,64	Ace (0,43), Acen (<0,2), Anth (0,273), Flu (1,02), 2 M/Naph (2,58), Naph (1,22), Phen (4,92), Chry (0,632)	n.a.

ID	Date	Depth (m)	PAH	Metals
S27	16-Sep-05	0 - 0,15	Ace(<0,20), Flu(0,302), 2 M/Naph(1,34), Naph(0,582), Phen(1,92)	---

ID	Depth (m)	PAH	Metals
S13	0 - 0,15	Ace (<0,11), Flu (<0,18), Naph (0,374), Phen (<1,4)	n.a.

ID	Depth (m)	PAH	Metals
IC4 S2	0,5 - 1,0	Ace (0,249), Acen (0,125), Flu (0,414), 2 M/Naph (1,71), Naph (0,719), Phen (2,74)	Cu (68,3)
IC4 S4	1,25 - 1,6	Ace (0,188), Acen (0,112), Flu (0,203), 2 M/Naph (1,68), Naph (0,886), Phen (2,55)	---

ID	Date	Depth (m)	PAH	Metals
PSED 5	16-Sep-05	0 - 0,01	n/a	---

ID	Depth (m)	PAH	Metals
C13	0,0-0,1	Ace (0,49), Acen (0,133), Anth (0,22), Flu (0,957), 2 M/Naph (2,93), Naph (1,59), Phen (5,08), Chry (<0,56)	---
C13	0,1-0,5	Ace (0,665), Acen (0,145), Anth (0,334), Flu (1,64), 2 M/Naph (2,61), Naph (1,27), Phen (6,98), B(a)A (0,522), Chry (<0,90)	n.a.

ID	Depth (m)	PAH	Metals
C2	0,0-0,1	Ace (0,082), Flu (0,208), 2 M/Naph (1,03), Naph (0,508), Phen (1,2)	---
C2	0,1-0,3	Flu (0,994), 2 M/Naph (0,33), Phen (0,502)	n.a.
C2	0,3-0,51	---	n.a.

ID	Depth (m)	PAH	Metals
S15	0 - 0,15	Ace (<0,15), Flu (<0,15), Naph (0,701), Phen (1,87)	---

ID	Depth (m)	PAH	Metals
C12	0,0-0,1	Ace (0,293), Acen (0,08), Anth (0,166), Flu (0,607), 2 M/Naph (1,7), Naph (0,807), Phen (3,1)	---
C12	0,1-0,3	Ace (0,412), Acen (0,112), Anth (0,217), Flu (0,868), 2 M/Naph (2,41), Naph (1,15), Phen (4,12)	---
C12	0,84-0,92	2 M/Naph (0,126), Phen (0,345)	n.a.

ID	Date	Depth (m)	PAH	Metals
S28	16-Sep-05	0 - 0,15	Ace(<0,20), Flu(0,284), 2 M/Naph(1,36), Naph(0,534), Phen(2,02)	---

ID	Date	Depth (m)	PAH	Metals
S29	16-Sep-05	0 - 0,15	Ace(<0,10), Flu(0,110), 2 M/Naph(1,31), Naph(0,593), Phen(1,95)	---

ID	Depth (m)	PAH	Metals
S16	0 - 0,15	Ace (<0,06), Phen (0,953), Naph (0,264)	---

ID	Depth (m)	PAH	Metals
S5	0 - 0,15	---	---

ID	Date	Depth (m)	PAH	Metals
PSED 4	16-Sep-05	0 - 0,01	n/a	---

ID	Date	Depth (m)	PAH	Metals
PSED 3	16-Sep-05	0 - 0,01	n/a	---

BH1 BH2 BH3 BH4 BH5 BH6D BH6S BH7D BH7S BH8D BH8S BH9 BH10 BH11 BH12 BH13 BH14 BH15 BH16 BH17 BH18 BH19 BH20 BH21 BH22

BHK-1 BHK-2 BHK-3 BHK-4 BHK-9 BHK-10 BHK-11 BHK-12 BHK-13 BHK-14 BHK-17 BHK-18 BHK-19 BHK-20 BHK-21 BHK-22

MW03 MW04 MW100 MW102 MW103 MW105 MW106

PSED1 PSED2 PSED3 PSED4 PSED5

OYS1 OYS2 OYS3

CL1 CL2 CL3 CL4

IC1 IC2 IC3 IC4

S1 S2 S3 S4 S5 S7 S10 S11 S12 S13 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S27 S28 S29 S30 S31

C2 C3 C4 C5 C12 C13 C14

LEGEND

- SHELLFISH (oyster) TISSUE SAMPLE (SEACOR, AUG. 2005)
- SHELLFISH (clam) TISSUE SAMPLE (SEACOR, 2005)
- QUANTITATIVE FLOW MEASUREMENT
- QUALITATIVE FLOW ESTIMATE
- TIDE POOL (AT LOW TIDE)
- APPROX. OCEAN EDGE AT 0.5m TIDAL HEIGHT
- IRON STAINED SEEP AREAS WITH FLOW DIRECTION
- NON-IRON STAINED DIFFUSE SEEP AREAS WITH FLOW DIRECTION
- KP KENSINGTON PROPERTY
- INDICATES SAMPLE LOCATIONS ARE APPROXIMATE
- FORMER COLLIERY OPERATION FEATURE/FACILITY
- BOREHOLE LOCATION (SEACOR)
- BOREHOLE LOCATION (NDM)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (SEACOR, 2004 & 2005)
- BOREHOLE LOCATION COMPLETED AS A MONITOR WELL (NDM, 1995)
- SEDIMENT SAMPLE (SEACOR, 2004 & 2005)
- IC INTERTIDAL SEDIMENT CORE (SEACOR, 2005)
- PSED PRECIPITATE (FERICRETE) SAMPLE (SEACOR FEB. 2006)
- EROSIONAL GULLIES
- HART CREEK FLOW CHANNEL BOUNDARIES
- CENTRE LINE OF RECONFIGURED HART CREEK
- GREEN INDICATES CONCENTRATIONS ARE BELOW BC MARINE SEDQC $_{SCS}$
- Cu, Hg BLUE INDICATES CONCENTRATIONS IN EXCESS OF THE BC MARINE SEDQC $_{SCS}$
- Cu, Hg RED INDICATES CONCENTRATIONS IN EXCESS OF BOTH THE BC MARINE SEDQC $_{TCS}$ AND BC MARINE SEDQC $_{SCS}$
- <0.30 MAGENTA INDICATES THAT THE LABORATORY DETECTION LIMITS EXCEED THE BC MARINE SEDQC $_{TCS}$ AND/OR BC MARINE SEDQC $_{SCS}$
- BC MARINE SEDQC $_{SCS}$ BC MARINE SEDIMENT QUALITY CRITERIA FOR SENSITIVE CONTAMINATED SITES, AS OUTLINED IN CSR SCHEDULE 9
- BC MARINE SEDQC $_{TCS}$ BC MARINE SEDIMENT QUALITY CRITERIA FOR TYPICAL CONTAMINATED SITES, AS OUTLINED IN CSR SCHEDULE 9
- NOTE (1): ALL ANALYTICAL RESULTS REPORTED IN mg/kg

ID	Depth (m)	PAH	Metals

DATA COLLECTED PRIOR TO MAY 31, 2005

ID	Date	Depth (m)	PAH	Metals

CURRENT DATA

IN CHEMISTRY TABLES:

ID	SAMPLE IDENTIFICATION
"– –"	INDICATES THAT CONCENTRATIONS WERE BELOW SEDQC $_{SCS}$
n.a.	PARAMETER NOT ANALYSED ON DATE INDICATED
"<"	LESS THAN LABORATORY DETECTION LIMIT INDICATED
(0.186)	PARAMETER CONCENTRATION (mg/kg)
As	ARSENIC
Cu	COPPER
Hg	MERCURY
Ace –	Acenaphthene
Acen –	Acenaphthylene
Anth –	Anthracene
Flu –	Fluorene
2 M/Naph –	2 Methyl/Naphthalene
Naph –	Naphthalene
Phen –	Phenanthrene
Chry –	Chrysene
B(a)A –	Benzo(a)anthracene

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

METRES (APPROX.) 0 25 50 100 150 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

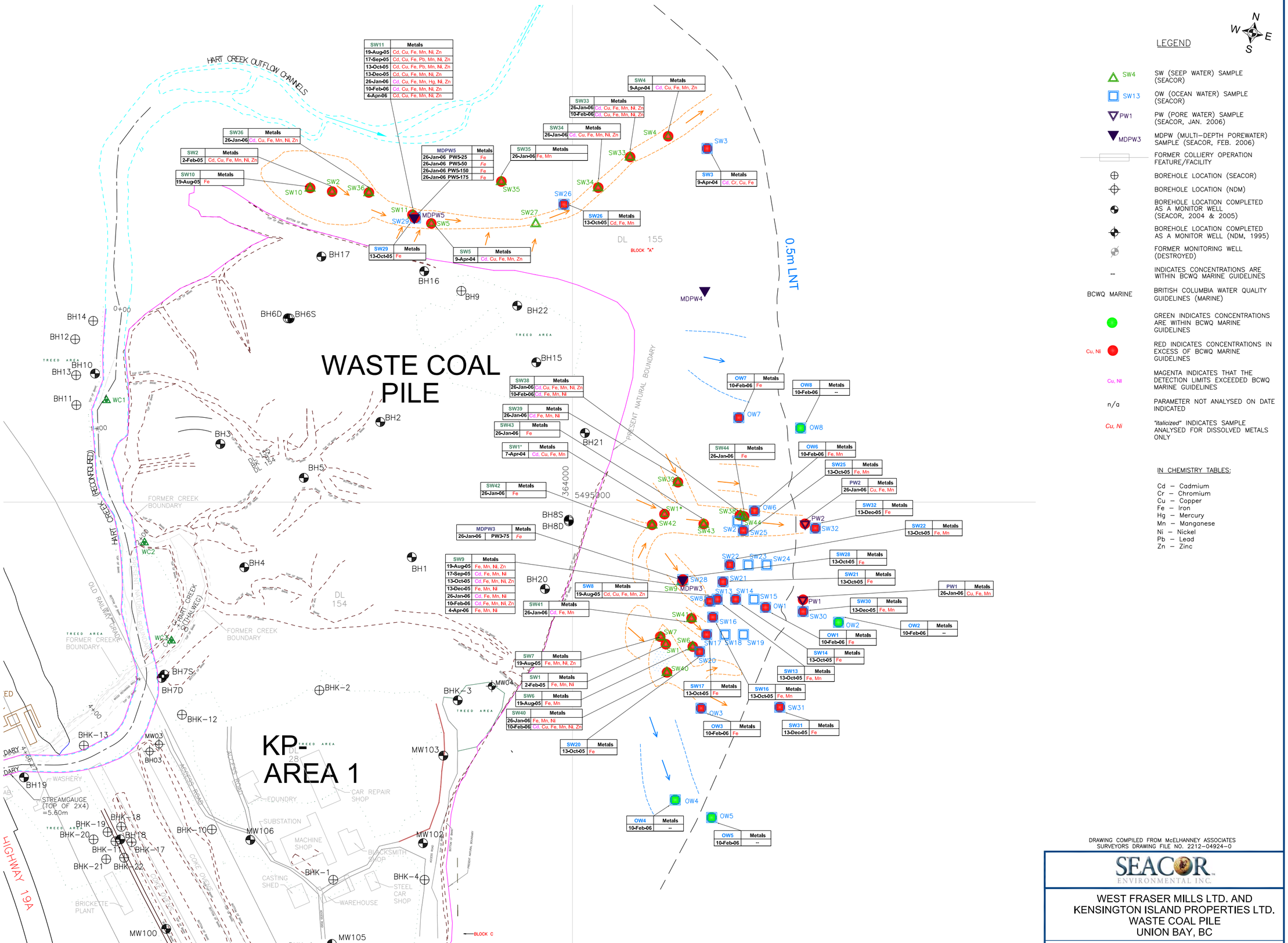
SEACOR ENVIRONMENTAL INC.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES LTD.
WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

MARINE SEDIMENT CHEMISTRY RESULTS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B17	201.01022.01	EC	TMS	15



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

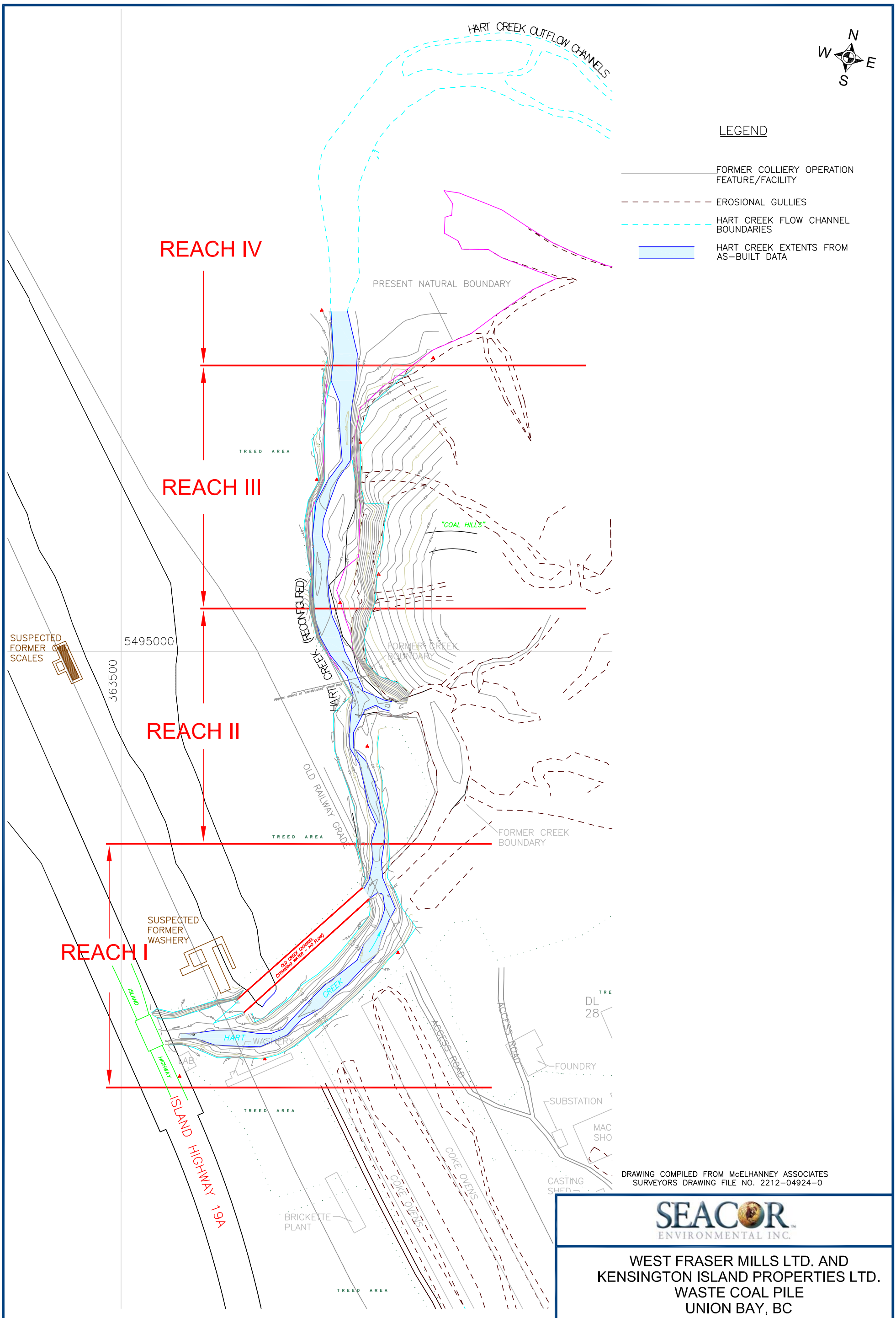
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WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

MARINE SURFACE WATER, SEDIMENT POREWATER AND SEEP WATER CHEMISTRY RESULTS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/07/06	201-01022-01-B16	201.01022.01	EC	TNS	16



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

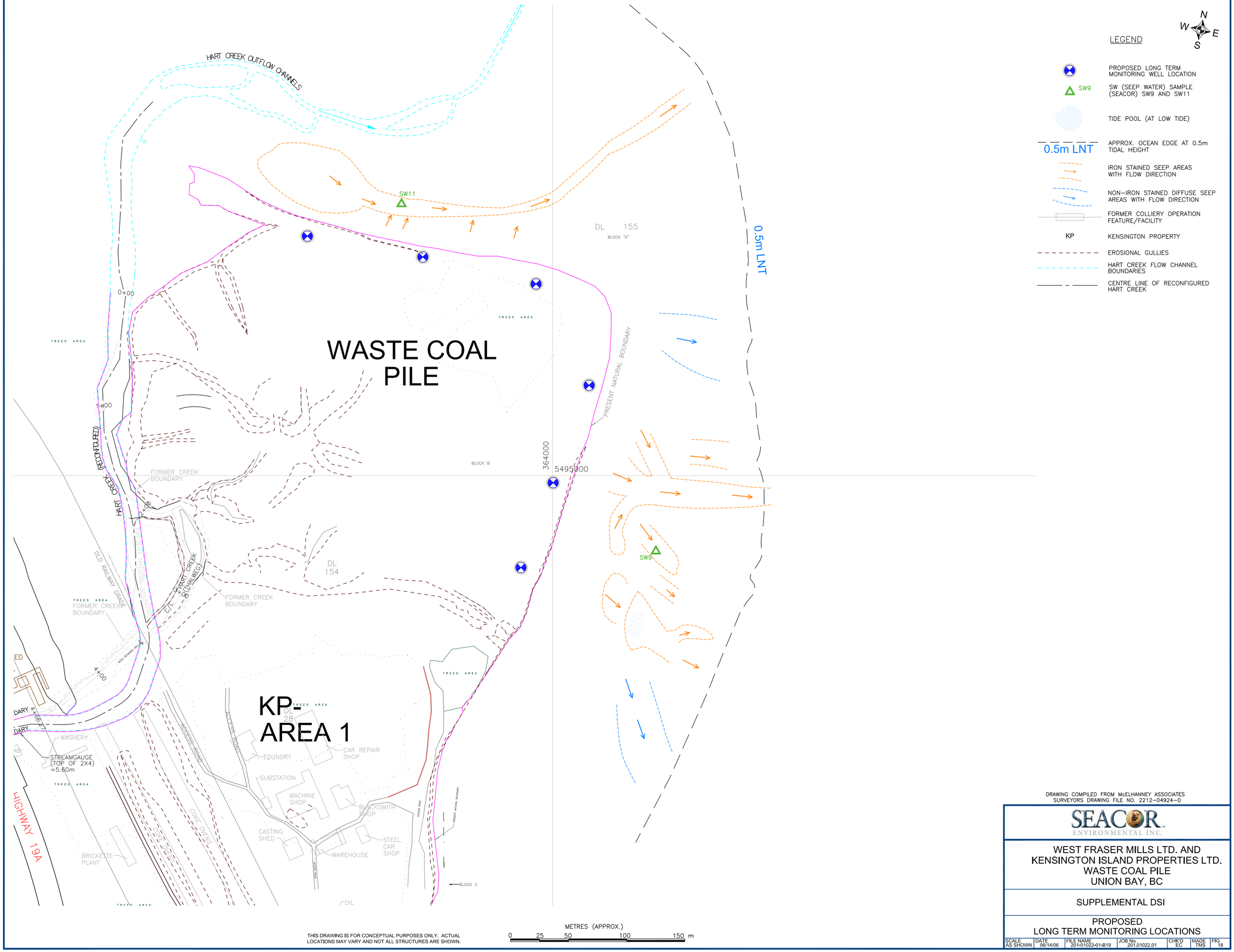
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UNION BAY, BC

SUPPLEMENTAL DSI

HART CREEK REACHES & AS-BUILT EXTENTS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/14/06	201-01022-01-B21	201.01022.01	EC	TMS/MT	17



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

METRES (APPROX.)
0 25 50 100 150 m

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0

SEACOR ENVIRONMENTAL INC.

WEST FRASER MILLS LTD. AND
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WASTE COAL PILE
UNION BAY, BC

SUPPLEMENTAL DSI

PROPOSED
LONG TERM MONITORING LOCATIONS

SCALE	DATE	FILE NAME	JOB No.	CHK'D	MADE	FIG
AS SHOWN	06/14/06	201-01022-01-B19	201.01022.01	EC	TMS	18



PHOTO 1: Typical weir setup for seepage flow rate measurement in the intertidal zone; February 9, 2006.



PHOTO 2: Using a Swoffer to measure seepage discharge channelized through a flume box; February 9, 2006.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES, SUPPLEMENTAL DSI, UNION BAY WASTE COAL PILE				
SITE PHOTOGRAPHS				
DATE June 2006	MADE CJ/EC	CHKD MS	JOB NO. 201.01022.01	PAGE 1 OF 5

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PHOTO 3: Porewater sample collection at SW9 during low tide; February 9, 2006.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES, SUPPLEMENTAL DSI, UNION BAY WASTE COAL PILE				
SITE PHOTOGRAPHS				
DATE June 2006	MADE CJ/EC	CHKD MS	JOB NO. 201.01022.01	PAGE 2 OF 5

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PHOTO 4: Photo taken of Mouth of Hart Creek where it enters Baynes Sound, from atop the coal pile; June 7, 2006.



PHOTO 5: Upstream view of the new Reach I channel, Highway 19A bridge in background; June 7, 2006.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES, SUPPLEMENTAL DSI, UNION BAY WASTE COAL PILE				
SITE PHOTOGRAPHS				
DATE June 2006	MADE CJ/EC	CHKD MS	JOB NO. 201.01022.01	PAGE 3 OF 5

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PHOTO 6: Photo taken of the downstream end of the former main channel of Reach II (now a side channel), showing erosion of the coal pile that had been occurring; June 7, 2006.



PHOTO 7: Upstream view of the new main Reach II channel, showing rootwads, log vanes and rock groynes; June 7, 2006.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES, SUPPLEMENTAL DSI, UNION BAY WASTE COAL PILE				
SITE PHOTOGRAPHS				
DATE June 2006	MADE CJ/EC	CHKD MS	JOB NO. 201.01022.01	PAGE 4 OF 5

SEACOR ENVIRONMENTAL INC.



PHOTO 8: Photo taken of the riparian planting taking place along the new Reach I channel; April 27, 2006.



PHOTO 9: Photo taken of the newly planted riparian vegetation along Reach I; June 7, 2006.

WEST FRASER MILLS LTD. AND KENSINGTON ISLAND PROPERTIES, SUPPLEMENTAL DSI, UNION BAY WASTE COAL PILE

SITE PHOTOGRAPHS

DATE	MADE	CHKD	JOB NO.	PAGE
June 2006	CJ	EC	201.01022.01	5 OF 5

SEACOR ENVIRONMENTAL INC.

APPENDIX A
Hydrogeology Assessment Supporting Information

Supplemental Detailed Site Investigation
Union Bay Waste Coal Pile
Union Bay, BC

SEACOR Project: 201.01022.01

Project : Union Bay

Waste Coal Pile on foreshore at Union Bay

Model : HELP

An US EPA model for predicting landfill hydrologic processes and testing of effectiveness of landfill designs

Author : Ian Mitchell

Client : Weldwood Canada Ltd.

Location : Union Bay, BC

27/07/2005

1. Profile. Union Bay Profile1

Model Settings

[HELP] Case Settings

Parameter	Value	Units
Runoff Method	Model calculated	(-)
Initial Moisture Settings	Model calculated	(-)

[HELP] Surface Water Settings

Parameter	Value	Units
Runoff Area	100	(%%)
Vegetation Class	Bare soil	(-)

Profile Structure

Layer	Top (m)	Bottom (m)	Thickness (m)
Coal Waste Surface Layer	18.6000	18.5000	0.1000
Coal Waste, Subsurface	18.5000	1.0000	17.5000

1.1. Layer. Coal Waste, Surface (Compacted)

Top Slope Length: 1.0
Bottom Slope Length: 0.0
Top Slope: 8.2%
Bottom Slope : 0.0

[HELP] Vertical Perc. Layer Parameters

Parameter	Value	Units
total porosity	.37	(vol/vol)
field capacity	.13	(vol/vol)
wilting point	.05	(vol/vol)
sat.hydr.conductivity	.0026	(cm/sec)
subsurface inflow	0.0000	(cm/day)

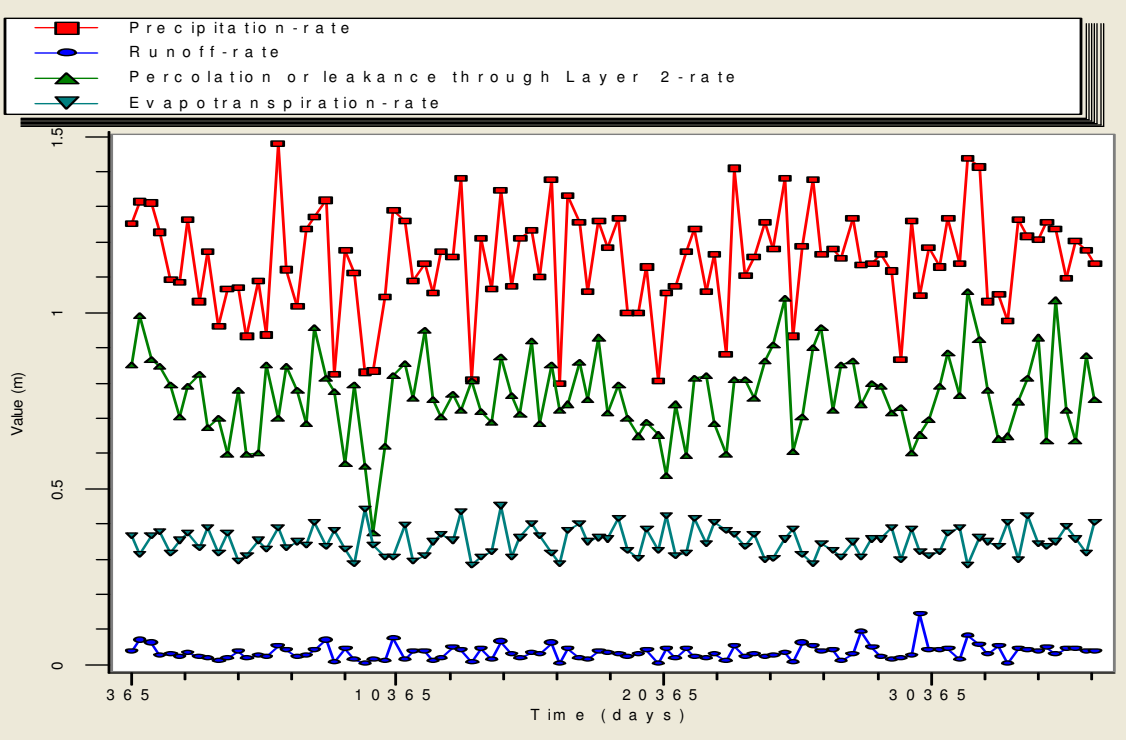
1.2. Layer. Coal Waste, Subsurface

Top Slope Length: 0.0
Bottom Slope Length: 0.0
Top Slope: 0.0
Bottom Slope : 0.0

[HELP] Vertical Perc. Layer Parameters

Parameter	Value	Units
total porosity	.37	(vol/vol)
field capacity	.13	(vol/vol)
wilting point	.05	(vol/vol)
sat.hydr.conductivity	.013	(cm/sec)
subsurface inflow	0.0000	(cm/day)

Example output for recharge rate and associated parameters, using average values tabulated above. Data points are annual rates projected for 100 years.



Notes:

1) It was considered that the recharge estimate be adjusted downwards by approximately 10 to 15% to account for:

- Minor stands of vegetation
- Minor areas of very high compaction
- Increased localized runoff via drainage channelling on surface of coal waste during intense precipitation events
- Increased evaporation rate due to black nature of materials

2) A sensitivity analysis has been conducted on these results.

Taking factors (1) and (2) into account:

The estimated recharge rate for the waste pile is approximately 650 mm/yr +/- 100mm

SEACOR ENVIRONMENTAL INC.

TABLE A-1: GROUNDWATER FIELD OBSERVATIONS

Monitoring Well ID	Date	Screened Interval (mbg)	Elevation (m)[1]		Depth to Water (m)		Groundwater Elevation (m)
			T.O.P.	Grade	T.O.P.	Grade	
BH6S	10-Sep-05	7.0 - 8.5	8.22	8.42	7.83	8.03	0.39
BH6D	10-Sep-05	9.5 - 10.4	8.20	8.45	7.86	8.11	0.34
BH8S	10-Sep-05	2.7 - 4.3	4.47	4.72	Dry	Dry	n/a
	14-Dec-05	2.7 - 4.3	4.47	4.72	3.87	4.12	0.60
	04-Apr-06	2.7 - 4.3	4.47	4.72	3.61	3.86	0.86
BH8D	10-Sep-05	4.9 - 6.4	4.58	4.75	4.48	4.65	0.10
	14-Dec-05	4.9 - 6.4	4.58	4.75	4.01	4.18	0.57
	04-Apr-06	4.9 - 6.4	4.58	4.75	3.78	3.95	0.80
BH15	10-Sep-05	3.1 - 6.1	2.82	3.11	2.65	2.94	0.17
	13-Dec-05	3.1 - 6.1	2.82	3.11	2.38	2.67	0.44
	10-Feb-06	3.1 - 6.1	2.82	3.11	2.27	2.56	0.55
	04-Apr-06	3.1 - 6.1	2.82	3.11	2.05	2.34	0.77
BH16	10-Sep-05	3.1 - 6.1	3.34	3.72	3.16	3.54	0.18
	17-Sep-05	3.1 - 6.1	3.34	3.72	3.23	3.61	0.12
	13-Dec-05	3.1 - 6.1	3.34	3.72	3.08	3.46	0.26
	14-Dec-05	3.1 - 6.1	3.34	3.72	2.82	3.20	0.52
	10-Feb-06	3.1 - 6.1	3.34	3.72	2.85	3.23	0.49
	04-Apr-06	3.1 - 6.1	3.34	3.72	2.65	3.03	0.69
BH17	10-Sep-05	3.4 - 6.4	4.11	4.37	3.85	4.11	0.26
	14-Dec-05	3.4 - 6.4	4.11	4.37	3.57	3.83	0.54
	04-Apr-06	3.4 - 6.4	4.11	4.37	3.41	3.67	0.71
BH20	10-Sep-05	2.4 - 6.7	n/a	n/a	4.48	n/a	n/a
	17-Sep-05	2.4 - 6.7	n/a	n/a	4.43	n/a	n/a
	13-Dec-05	2.4 - 6.7	n/a	n/a	4.32	n/a	n/a
	14-Dec-05	2.4 - 6.7	n/a	n/a	4.00	n/a	n/a
	10-Feb-06	2.4 - 6.7	n/a	n/a	3.99	n/a	n/a
	04-Apr-06	2.4 - 6.7	n/a	n/a	3.72	n/a	n/a
BH21	10-Sep-05	1.7 - 6.2	n/a	n/a	3.18	n/a	n/a
	14-Dec-05	1.7 - 6.2	n/a	n/a	2.85	n/a	n/a
	04-Apr-06	1.7 - 6.2	n/a	n/a	2.54	n/a	n/a
BH22	10-Sep-05	1.8 - 6.4	n/a	n/a	2.95	n/a	n/a
	14-Dec-05	1.8 - 6.4	n/a	n/a	2.57	n/a	n/a

Notes:

m - metre

mm - millimetre

mbg - metres below grade

ppmv - parts per million by volume

T.O.P. - top of pipe

LTDL - less than the detection limit of the field instrument

n.m. - not measured

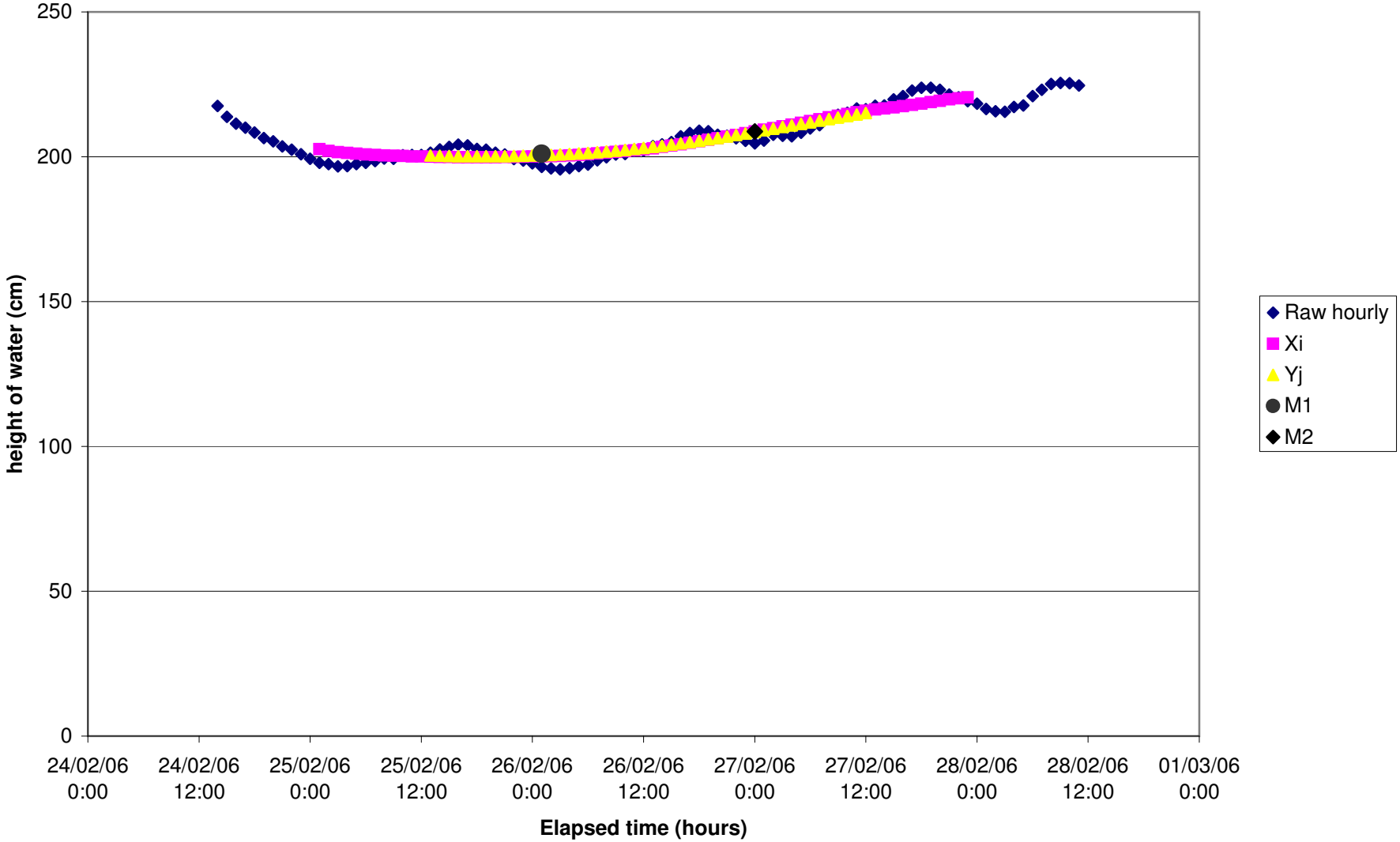
[1] - elevations referenced to geodetic

n/a - data not available

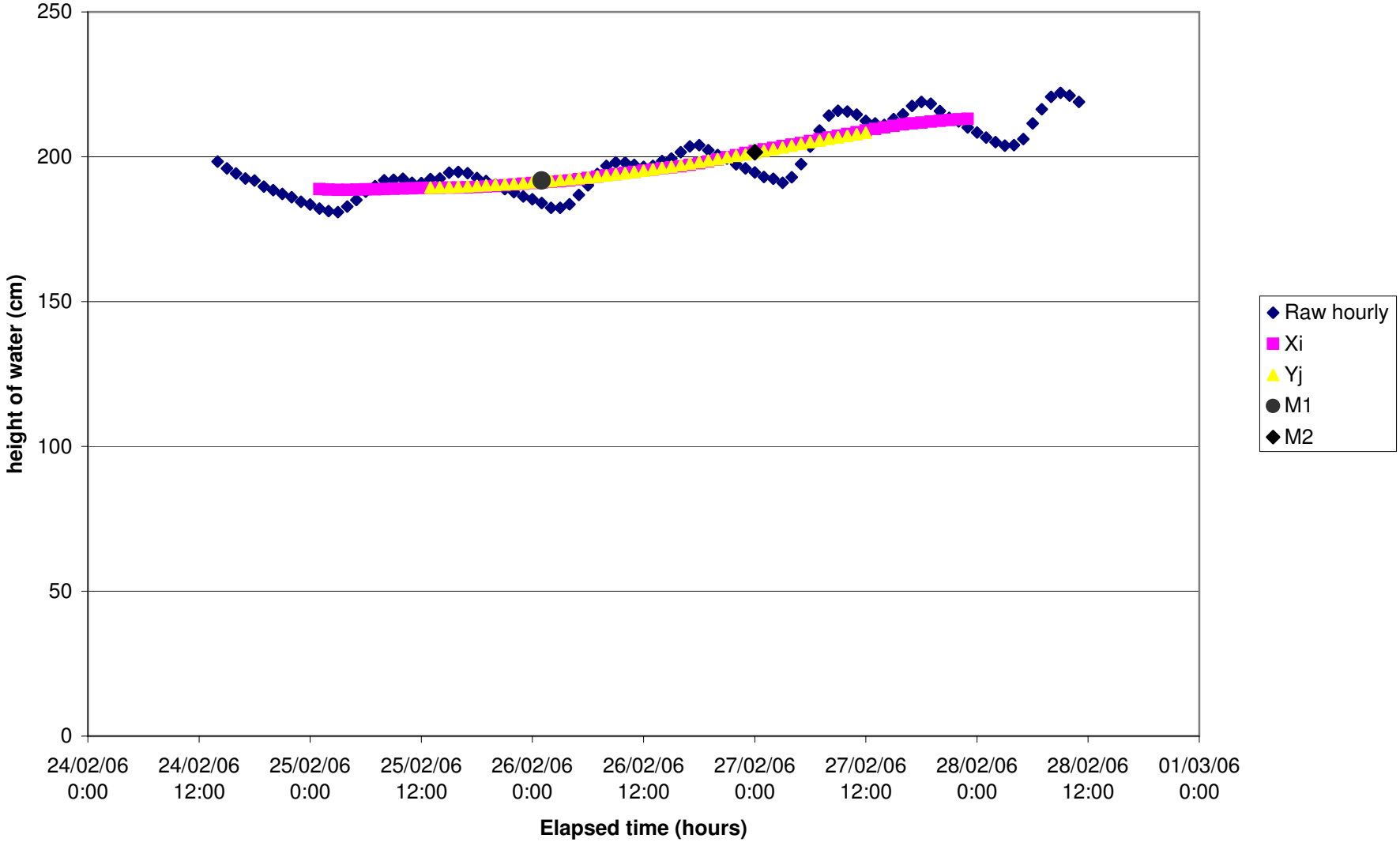
TABLE A-2: TIDAL RESPONSE DATA									
Monitoring Well ID	Screened Interval (mbg)	Elevation (m)[1]		Height of Water Above Transducer (cm)	Measured Depth to Water (m)	Mean Height of Water Above Transducer over 72 hour period	Mean Depth to Water (m)		Groundwater Elevation (m)
		T.O.P.	Grade				T.O.P.	Grade	
72-hour mean from 14:00 February 24, 2006 to 13:00 February 27, 2006									
BH5	16.8 - 22.9	18.17	18.57	224.0	17.41	201.01	17.63	18.03	0.54
BH6D	9.5 - 10.4	8.20	8.45	198.5	7.66	191.78	7.73	7.98	0.47
BH8D	4.9 - 6.4	4.58	4.75	154.2	3.98	131.66	4.21	4.38	0.37
72-hour mean from 12:00 February 25, 2006 to 11:00 February 28, 2006									
BH5	16.8 - 22.9	18.17	18.57	224.0	17.41	208.76	17.56	17.96	0.61
BH6D	9.5 - 10.4	8.20	8.45	198.5	7.66	201.61	7.63	7.88	0.57
BH8D	4.9 - 6.4	4.58	4.75	154.2	3.98	145.91	4.06	4.23	0.52

Notes:
m - metre
mm - millimetre
mbg - metres below grade
ppmv - parts per million by volume
T.O.P. - top of pipe
LTDL - less than the detection limit of the field instrument
n.m. - not measured
[1] - elevations referenced to geodetic

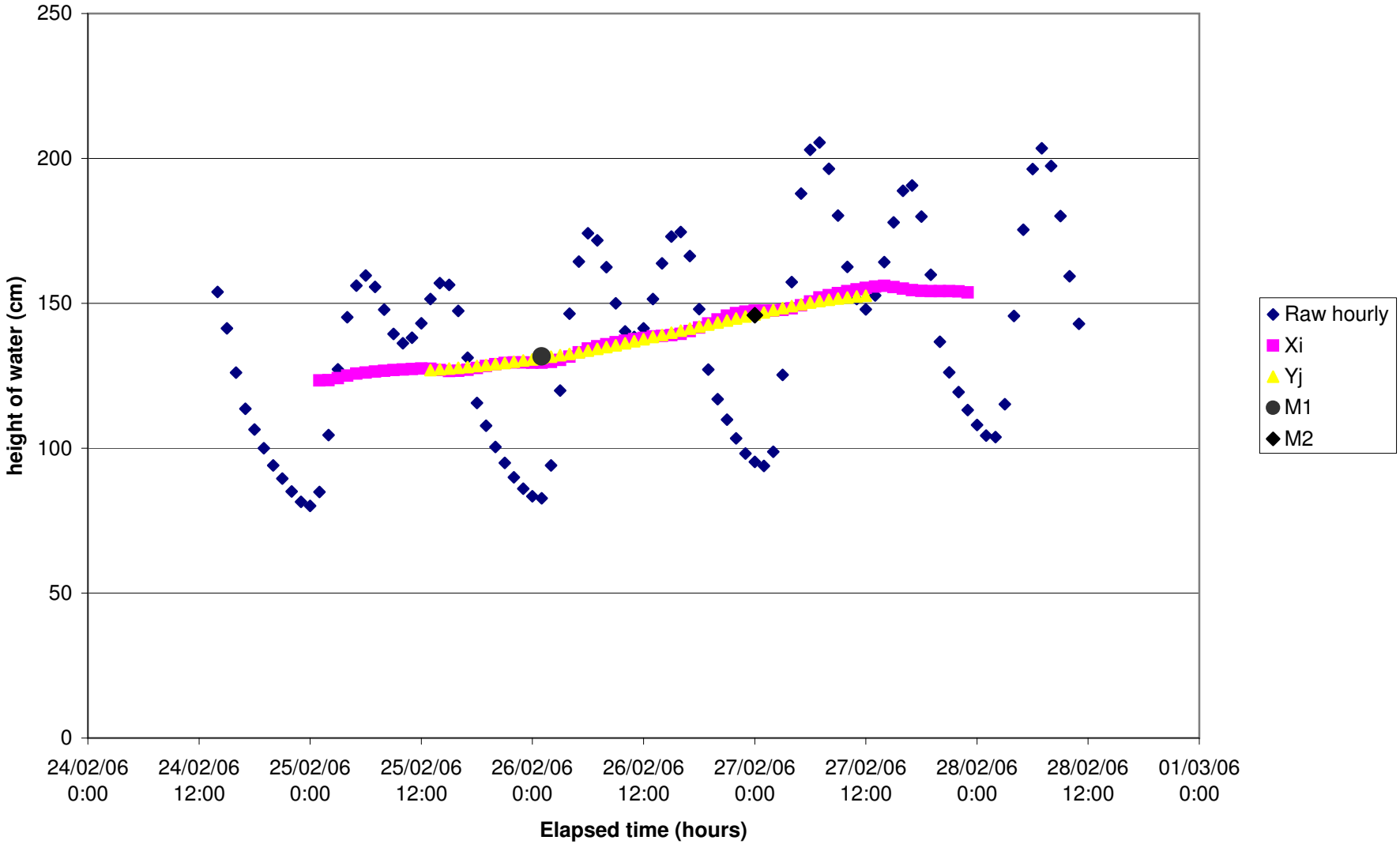
PLOT A-1: BH5 Tidal Analysis Feb 2006



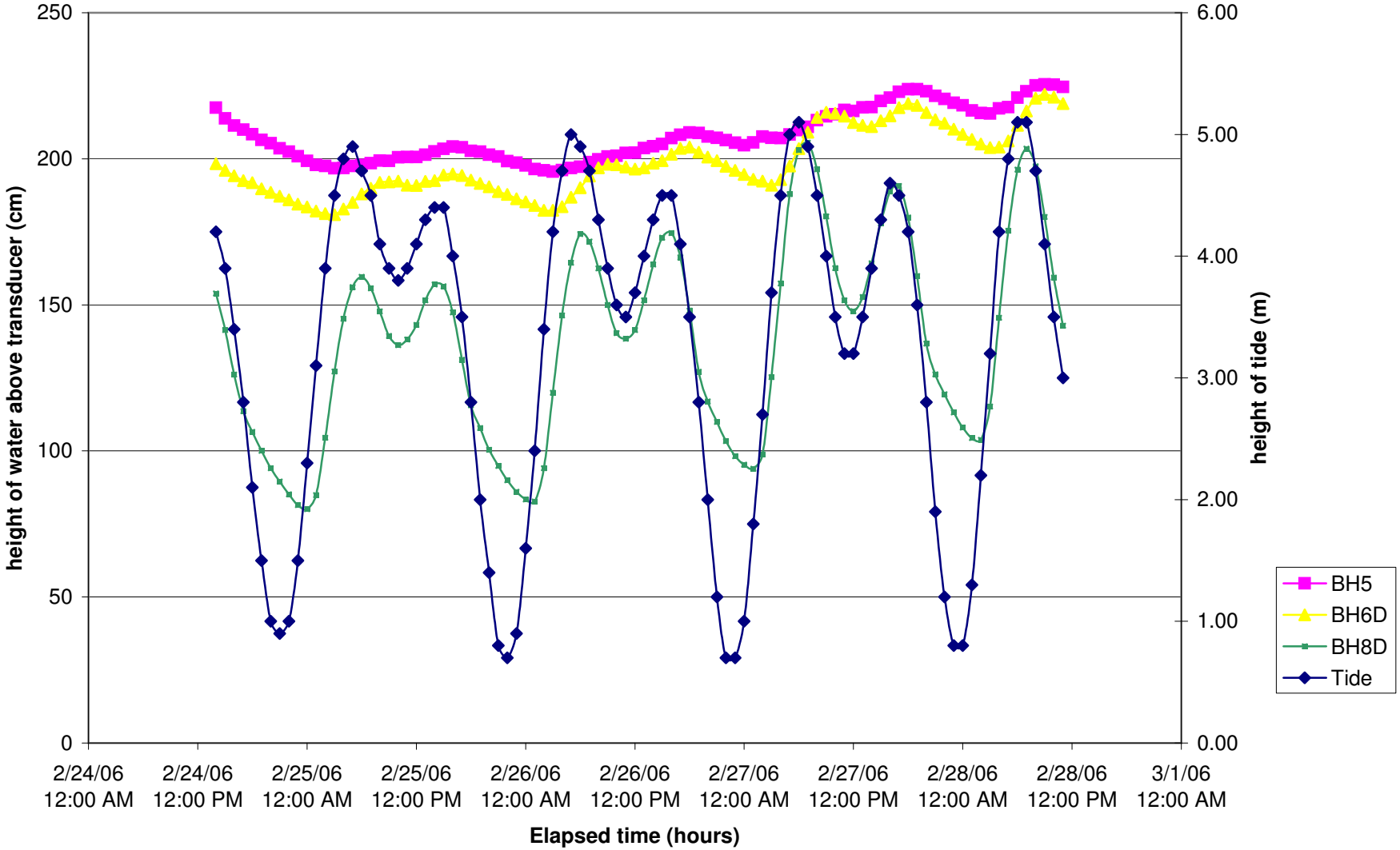
PLOT A-2: BH6D Tidal Analysis Feb 2006



PLOT A-3: BH8D Tidal Analysis Feb 2006



PLOT A-4: Union Bay Tidal Monitoring February 24-27, 2006



SEACOR ENVIRONMENTAL INC.

Estimated Total Annual Seepage Discharge from Pile
Union Bay, B.C.

Total Measured Seep Flow Rate[1] (L/sec)	Unadjusted[2] Seep Flow Rate (m^3/day)	Unadjusted[2] Annualized Seep Discharge (m^3/yr)	Adjusted[3] Annualized Seep Flow Rate (m^3/yr)
31.2	2,696	983,923	472,283

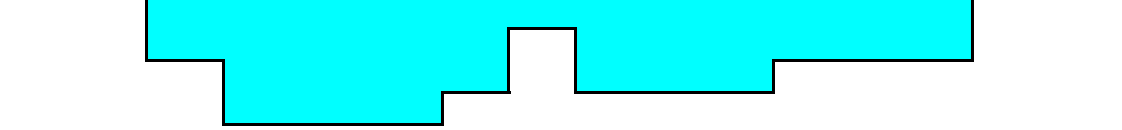
Flow Calculations:		**Dilution Calculations:**	
Total hrs per year:	8,760	Total Volume (seawater+fresh)	500,000[4]
Lunar cycles (25hrs) per year:	350	Freshwater Proportion	78,000[5]
Discharge days per year:	175	Dilution %	84.4

Notes:
[1] As measured during seepage flow assessment during low tide on February 9, 2006
[2] Not adjusted for discharge period per day
[3] Adjusted based on 12.5 hrs discharge per 25 hour tidal cycle
[4] Adjusted, annualized seep flow rate has been rounded
[5] From HELP Model

North Face Seeps

Combined seepage in iron stained channel measured using Swoffer flow meter, in channel between SW4 and SW33 seep water stations.

Left Bank			at 1.3												Right Bank		
0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	m	Dist
0	1	3	5	5	5	4	2	4	4	4	3	3	3	1	0	cm	Depth
	0.08	0.15	0.25	0.24	0.25	0.14	*0.1*	0.14	0.21	0.2	0.19	0.17	*0.09*	*0.04*		m/s	Velocity



Velocities shown in italic were not measured, but assumed as half the closest measurable velocity.
Given minimal water depth, velocities needed to be measured at mid water depth.

0.002	0.006	0.010	0.010	0.010	0.008	0.004	0.008	0.008	0.008	0.006	0.006	0.006	0.002		m2	Cell Area
0.15	0.90	2.50	2.40	2.50	1.12	0.28	1.12	1.68	1.60	1.14	1.02	0.51	0.08		L/s	Flow

Estimated Total N. Face Flow **17.0** L/s

	%	
Estimated SW27/SW34 Area Contribution	30	5.1 L/s
Estimated SW11 Area Contribution	10.5	1.8 L/s
Estimated SW10/SW36 Area Contribution	59.5	10.1 L/s

East Face Seeps

SW9 Iron Stained Seep Area

Measured using Channelization and Timed Pail Fill

Trial	Time (s)	Volume (L)	Flow (L/s)
1	16	3.5	0.22
2	15	3.5	0.23
3	13	3.5	0.27
4	17	3.5	0.21
5	22	3.5	0.16
6	17	3.5	0.21
7	18	3.5	0.19
8	17	3.5	0.21
9	16	3.5	0.22
10	16	3.5	0.22

Mean Flow 0.2 L/s

SW41 Iron Stained Seep Area

Diffuse, similar to 2X SW9 Area Seep

Estimated Flow 0.4 L/s

SW40 Iron Stained Seep Area (Draining Tide Pool)

Measured using Swoffer in Flow Channelized Through Flume-Box

Left Side Box				Right Side Box		
0.0	0.03	0.055	0.09	0.11	m	Dist
3	3	3	3	3	cm	Depth
	0.39	0.39	0.41		m/s	Velocity

0.0033 m2 Cell Area
0.40 m/s Mean Velocity
1.3 L/s Flow
Flow 1.3 L/s

SW38/39/42/43/44 Iron Stained Seep Area

Measured using Swoffer in Flow Channelized Through Flume-Box

Left Side Box				Right Side Box		
0.0	0.03	0.083	0.136	0.166	m	Dist
	7.5	8	9		cm	Depth
	0.62	0.48	0.5		m/s	Velocity (Rep 1)
	0.61	0.48	0.52			Velocity (Rep 2)
	0.62	0.5	0.51			Velocity (Rep 3)

8.17 cm Mean Depth
0.0136 m2 Cell Area
0.54 m/s Mean Velocity
7.3 L/s Flow
Flow 7.3 L/s

(Checks against bucket method with > 5 L/s)

	%	
Estimated SW39 Area Contribution	20	1.5 L/s
Estimated SW38/SW42/SW43/SW44 Contribution	80	5.8 L/s

Non-Iron Stained Diffuse Seepage North of East Face Iron Stained Seeps

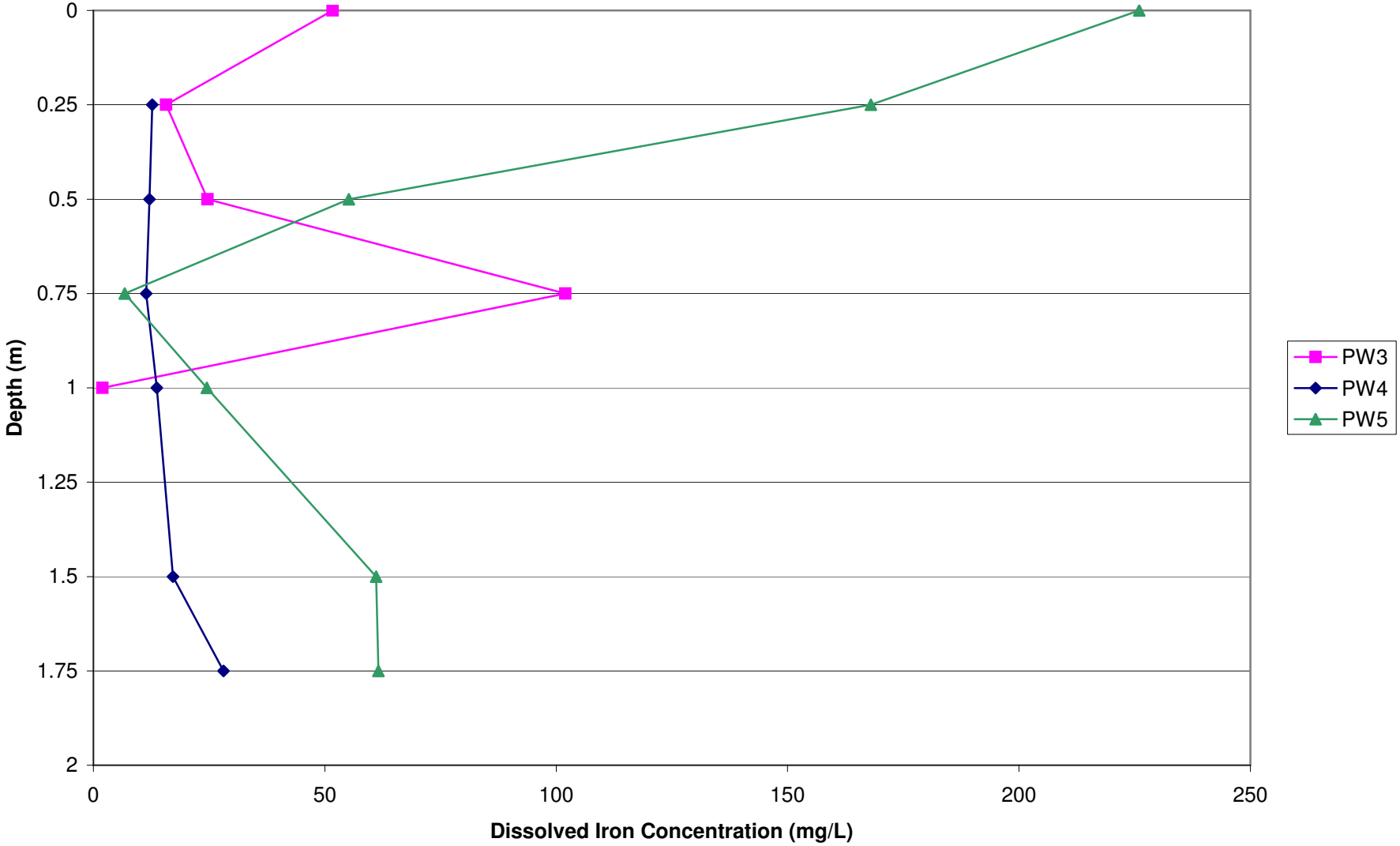
Estimated Flow 3 L/s

Non-Iron Stained Diffuse Seepage South of East-Face Iron Stained Seeps

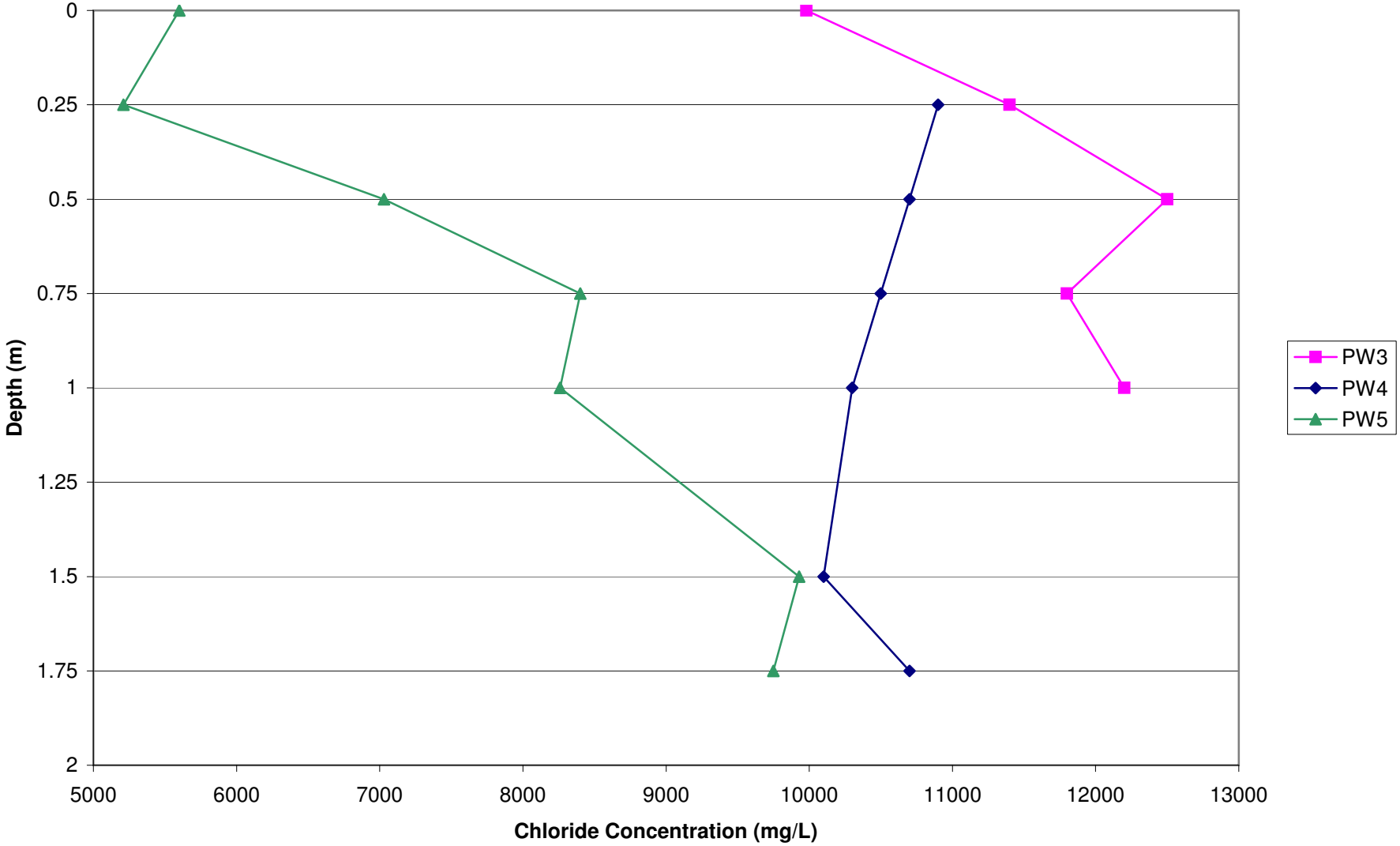
Estimated Flow 2 L/s

Estimated Total E. Face Flow **14.2** L/s

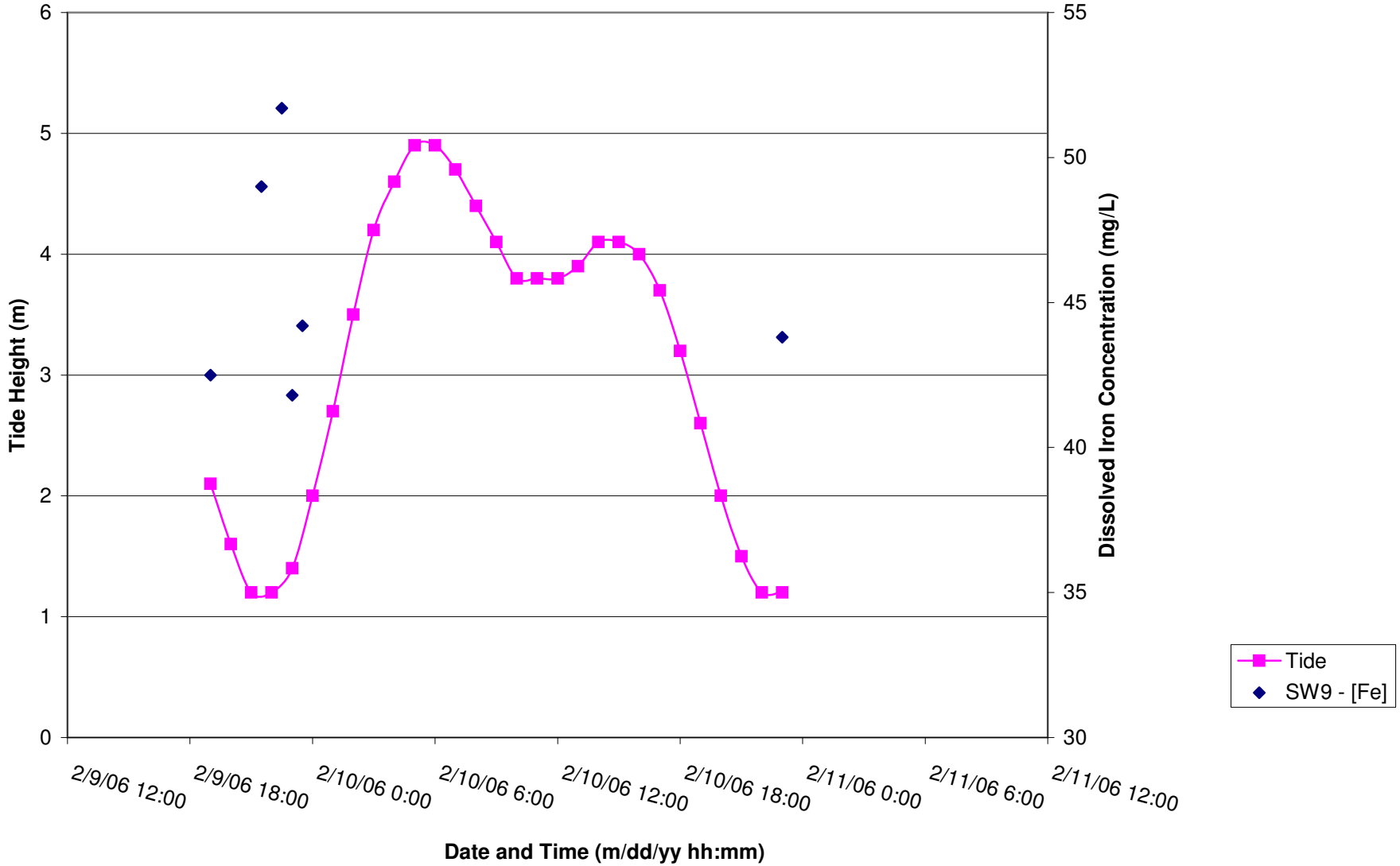
PLOT A-5: Porewater Dissolved Iron Depth Profiles



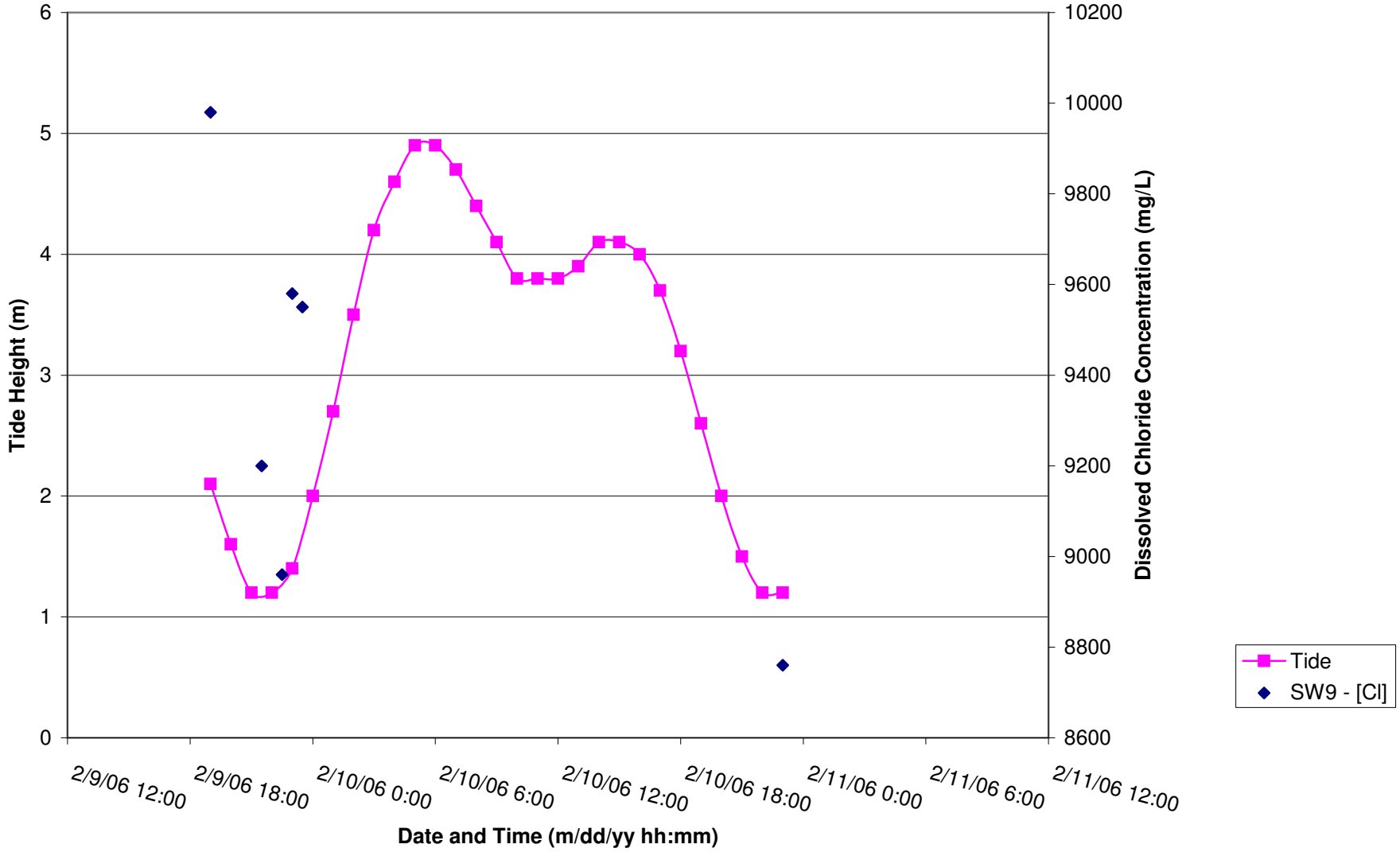
PLOT A-6: Porewater Dissolved Chloride Depth Profiles



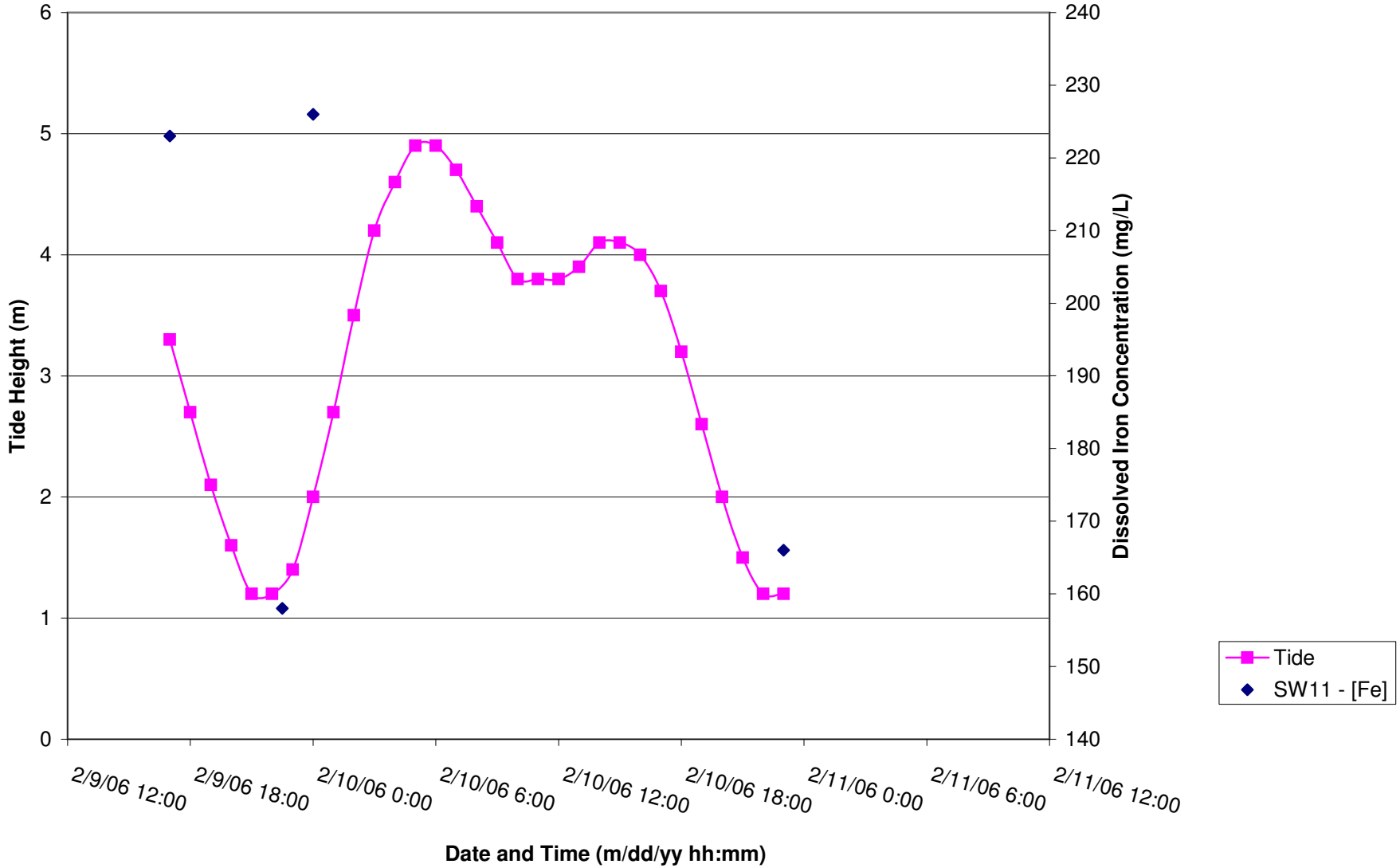
PLOT A-7: SW9 Dissolved Iron vs Tidal Cycle



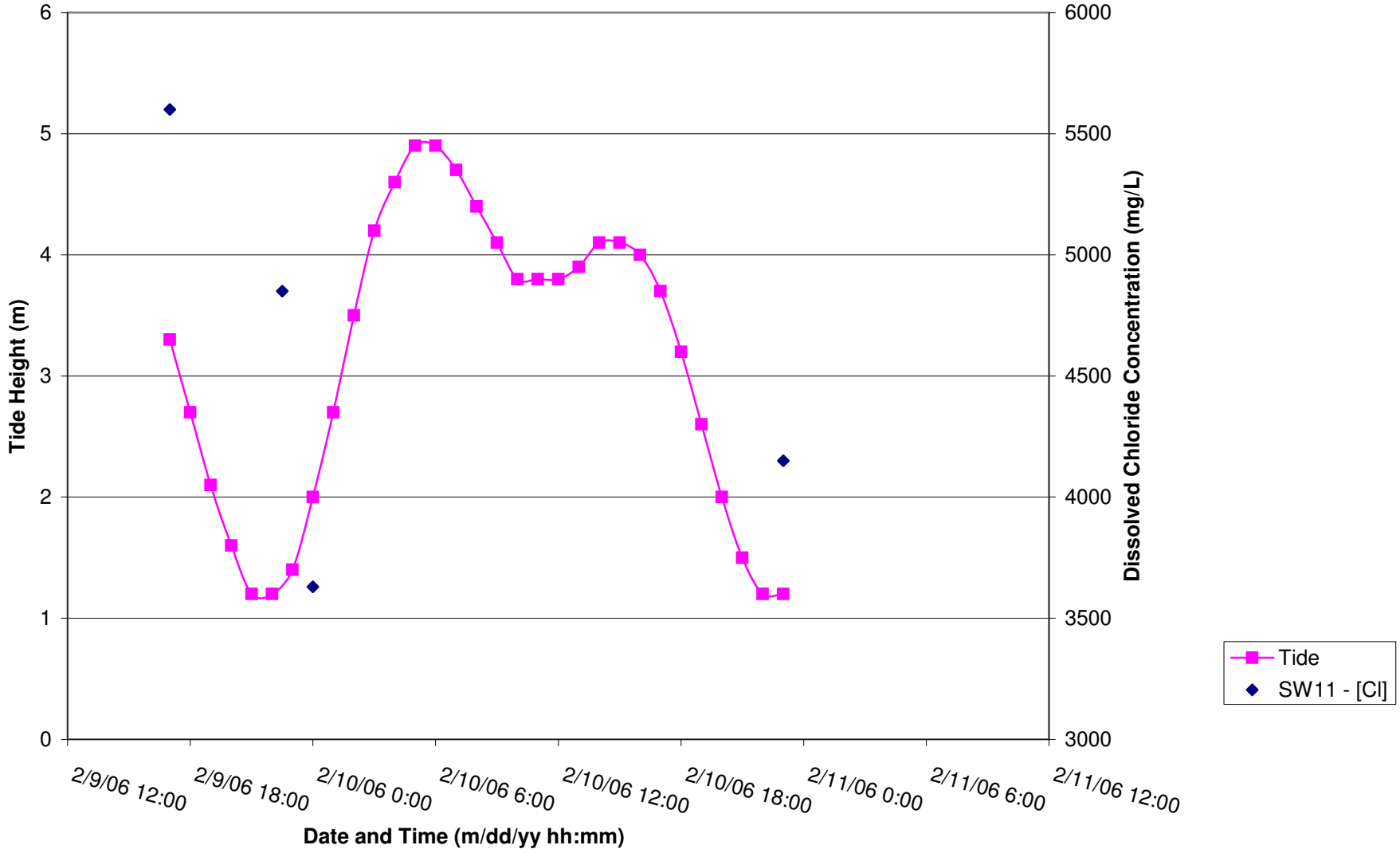
PLOT A-8: SW9 Dissolved Chloride vs Tidal Cycle



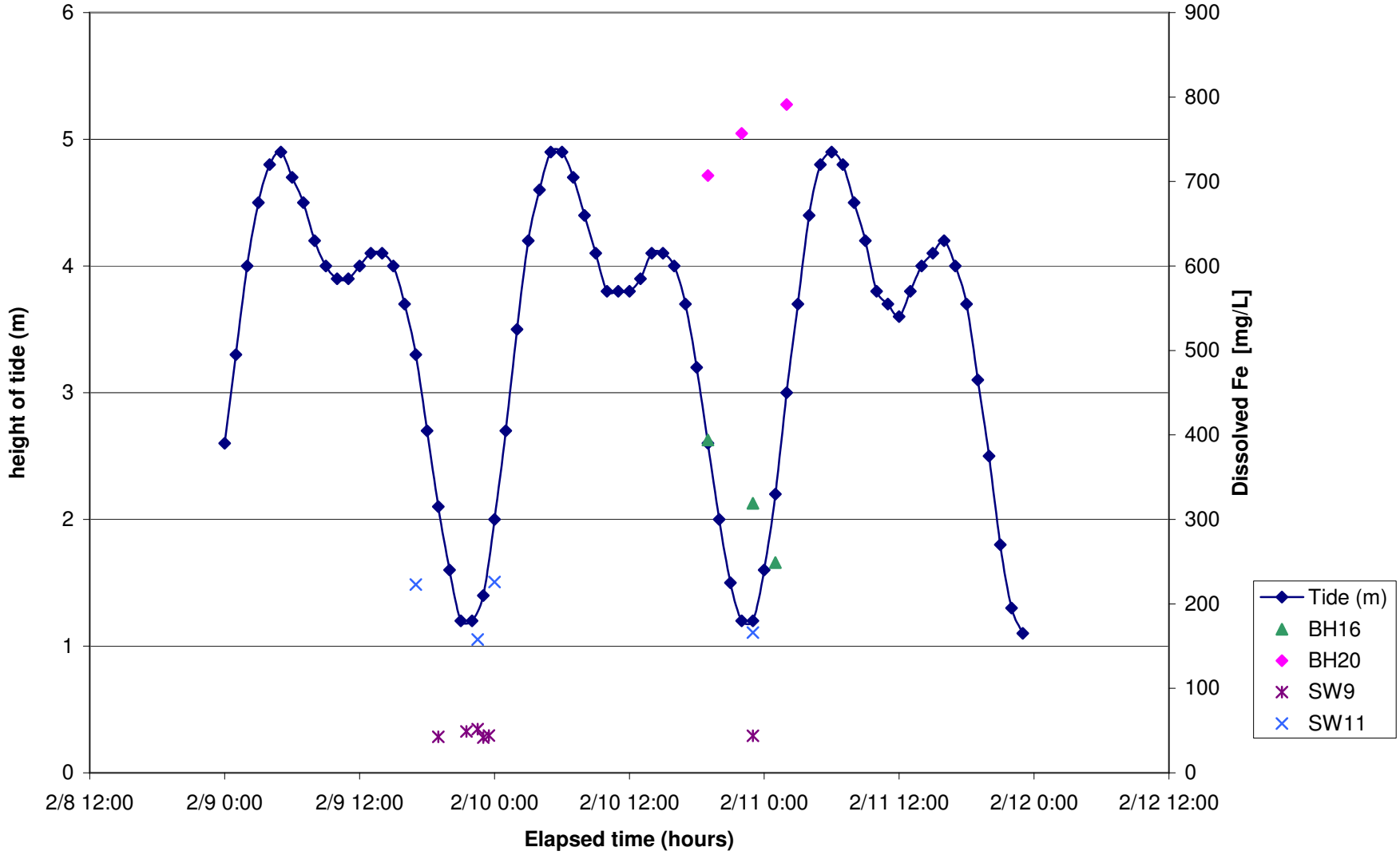
PLOT A-9: SW11 Dissolved Iron vs Tidal Cycle



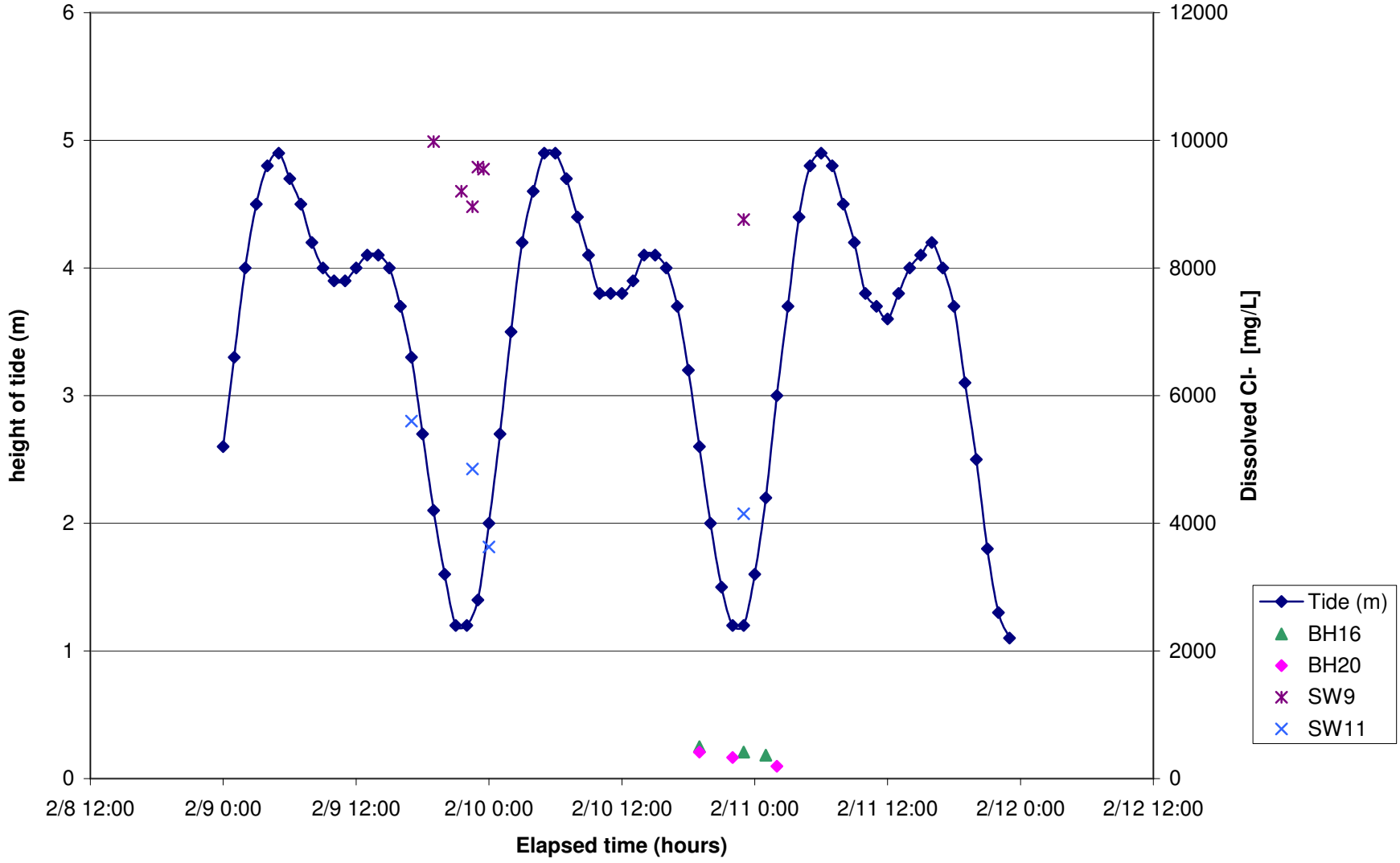
PLOT A-10: SW11 Dissolved Chloride vs Tidal Cycle



PLOT A-11: Dissolved Iron Concentration over Tidal Cycle



PLOT A-12: Dissolved Chloride Concentration over Tidal Cycle



APPENDIX B
Borehole Logs

Supplemental Detailed Site Investigation
Union Bay Waste Coal Pile
Union Bay, BC

SEACOR Project: 201.01022.01

SEACOR ENVIRONMENTAL INC.

SEACOR JOB NO: 201.01022

CLIENT: **Weldwood of Canada Ltd**
PROJECT: **Union Bay**
Coal Piles
Union Bay, BC

Borehole LOG

Borehole NO: BH20

SURFACE ELEVATION: N/A

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 10 100 1000 10000	WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
0					**WASTE COAL** trace silt, loose, dark brown to black, dry to damp				roadbox, jplug, cement	
1	B								50 mm solid PVC pipe bentonite seal	1.0
					-increasing silt content below 1.5 m					
2	B									2.0
3					-some rounded sand and gravel, trace silt, loose, black, moist near 3.1 m					3.0
4	B									4.0
					-wet below 4.6 m				silica sand 50 mm 010 slot PVC pipe	
5	B				-increasing sand and gravel content below 5.2 m					5.0
					SAND and GRAVEL fine to coarse sand, some silt, brown, wet					
6										6.0
					End of borehole at 6.7 m Well Completion Details: Screened interval from 2.4 m to 6.7 m below surface Elevation at top of pipe (TOP) = m				end cap	

DRILLING METHOD: Downhole Hammer

DRILL DATE: September 9, 2005 LOGGED BY: BH

Notes: B BAG SAMPLE

SEACOR CANADA V5 201.01022BH20TO22.GPJ SEACOR CANADA V5.GDT 9/5/06

SEACOR ENVIRONMENTAL INC.

SEACOR JOB NO: 201.01022

CLIENT: **Weldwood of Canada Ltd**
PROJECT: **Union Bay**
Coal Piles
Union Bay, BC

Borehole LOG

Borehole NO: BH21

SURFACE ELEVATION: N/A

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 10 100 1000 10000	WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
0					**WASTE COAL** trace silt, loose, dark brown to black, dry to damp				roadbox, jplug, cement	
1	B								bentonite seal 50 mm solid PVC pipe	1.0
					-slight increase in silt content from1.5 m to 3.0 m, moist to wet					
2	B									2.0
3					-wet below 3.1 m					3.0
4	B				- some rounded sand and gravel, trace silt, loose, black, wet below 4.0 m				silica sand 50 mm 010 slot PVC pipe	4.0
5										5.0
6					**SAND and GRAVEL** fine to coarse sand, some silt, brown, wet					6.0
					End of borehole at 6.4 m Well Completion Details: Screened interval from 1.7 m to 6.6 m below surface Elevation at top of pipe (TOP) = m				end cap	

DRILLING METHOD: Downhole Hammer

DRILL DATE: September 9, 2005 LOGGED BY: BH

Notes: B BAG SAMPLE

SEACOR CANADA V5 201.01022BH20TO22.GPJ SEACOR CANADA V5.GDT 8/30/06

SEACOR ENVIRONMENTAL INC.

SEACOR JOB NO: 201.01022

CLIENT: **Weldwood of Canada Ltd**
PROJECT: **Union Bay**
Coal Piles
Union Bay, BC

Borehole LOG

Borehole NO: BH22

SURFACE ELEVATION: N/A

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	SPT COUNT	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA: ORGANIC VAPOUR LEVEL (ppmv) 1 10 100 1000 10000	WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	DEPTH (m)
	B				**TOPSOIL**				roadbox, jplug, cement	
1	B				**WASTE COAL** trace silt, trace fibrous organics, loose, dark brown to black, damp				bentonite seal	1.0
	B								silica sand	
2					-increasing silt content to some silt from 2.1 m to 3.7 m					2.0
	B				-wet below 2.7 m					
3										3.0
					some sand and gravel, loose, dark brown to black, wet from 3.7 m to 5.2 m					
4	B								50 mm 010 slot PVC pipe	4.0
5					**SAND and GRAVEL** fine to coarse gravel, some silt, brown, wet					5.0
6										6.0
					End of borehole at 6.4 m Well Completion Details: Screened interval from 1.5 m to 6.4 m below surface Elevation at top of pipe (TOP) = m				end cap	

DRILLING METHOD: Downhole Hammer

DRILL DATE: September 9, 2005 LOGGED BY: BH

Notes: B BAG SAMPLE

SEACOR CANADA V5 201.01022BH20TO22.GPJ SEACOR CANADA V5.GDT 9/5/06

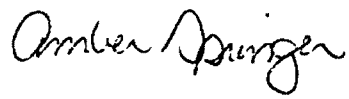
APPENDIX C
Detailed Laboratory Chemistry Reports

Supplemental Detailed Site Investigation
Union Bay Waste Coal Pile
Union Bay, BC
SEACOR Project: 201.01022.01

CHEMICAL ANALYSIS REPORT

Date:	September 15, 2005
ALS File No.	W3331
Report On:	201.01022.01 Tissue/Water/Soil Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	August 23, 2005

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Scott P. Hoekstra, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. W3331

RESULTS OF ANALYSIS - Tissue[1]

Sample ID		OYS1A	OYS1B	OYS1C	OYS2A	OYS2B
Sample Date		05-08-19	05-08-19	05-08-19	05-08-19	05-08-19
Sample Time		09:50	09:50	09:50	10:50	10:50
ALS ID		*1*	*2*	*3*	*4*	*5*
Physical Tests						
Moisture	%	87.1	84.6	74.9	76.4	78.2
Total Metals						
Aluminum	T-Al	5.2	8.9	8.6	5.0	3.8
Antimony	T-Sb	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	T-As	1.11	1.24	2.24	2.10	1.74
Barium	T-Ba	0.068	0.096	0.099	0.174	0.164
Beryllium	T-Be	<0.10	<0.10	<0.10	<0.10	<0.10
Bismuth	T-Bi	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium	T-Cd	1.67	1.56	2.85	2.61	0.808
Calcium	T-Ca	362	276	344	224	238
Chromium	T-Cr	<0.10	<0.10	<0.10	<0.10	<0.10
Cobalt	T-Co	0.024	0.029	0.044	0.058	0.035
Copper	T-Cu	22.8	20.1	36.2	43.1	13.2
Iron	T-Fe	22.2	29.3	33.4	559	316
Lead	T-Pb	0.023	0.024	0.031	0.021	<0.020
Lithium	T-Li	<0.10	<0.10	<0.10	<0.10	<0.10
Magnesium	T-Mg	714	719	621	634	574
Manganese	T-Mn	6.29	8.88	9.37	12.7	13.7
Mercury	T-Hg	0.0072	0.0069	0.0104	0.0088	0.0062
Molybdenum	T-Mo	0.026	0.038	0.057	0.055	0.063
Nickel	T-Ni	<0.10	<0.10	<0.10	<0.10	<0.10
Selenium	T-Se	0.28	0.38	0.59	0.66	0.55
Strontium	T-Sr	4.18	4.00	2.92	3.26	2.99
Thallium	T-Tl	<0.010	<0.010	<0.010	<0.010	<0.010
Tin	T-Sn	<0.050	<0.050	<0.050	<0.050	<0.050
Uranium	T-U	0.0132	0.0191	0.0306	0.0542	0.0265
Vanadium	T-V	<0.10	<0.10	<0.10	0.25	0.12
Zinc	T-Zn	213	257	411	387	188

< = Less than the detection limit indicated.
[1]Metals results expressed as milligrams per wet kilogram except where noted.

A Campbell Brothers Limited Company

File No. W3331

RESULTS OF ANALYSIS - Tissue[1]

Sample ID		OYS2C	OYS3A	OYS3B	OYS3C	OYS4A
Sample Date		05-08-19	05-08-19	05-08-19	05-08-19	05-08-19
Sample Time		10:50	11:10	11:10	11:10	12:15
ALS ID		*6*	*7*	*8*	*9*	*10*
Physical Tests						
Moisture	%	87.3	80.0	80.2	67.6	87.9
Total Metals						
Aluminum	T-Al	10.0	<2.0	3.2	5.4	23.6
Antimony	T-Sb	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic	T-As	1.12	0.943	1.96	0.750	0.738
Barium	T-Ba	0.345	0.054	0.082	0.159	0.227
Beryllium	T-Be	<0.10	<0.10	<0.10	<0.10	<0.10
Bismuth	T-Bi	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium	T-Cd	1.29	1.29	0.947	1.01	1.39
Calcium	T-Ca	292	409	453	277	311
Chromium	T-Cr	0.12	<0.10	<0.10	<0.10	<0.10
Cobalt	T-Co	0.042	<0.020	0.030	<0.020	0.037
Copper	T-Cu	12.4	22.9	20.0	20.5	36.5
Iron	T-Fe	645	48.4	61.0	47.2	117
Lead	T-Pb	0.029	<0.020	<0.020	<0.020	0.038
Lithium	T-Li	0.10	<0.10	<0.10	<0.10	0.10
Magnesium	T-Mg	671	576	615	542	619
Manganese	T-Mn	1.86	1.85	13.5	1.97	1.70
Mercury	T-Hg	0.0056	<0.0050	<0.0050	<0.0050	0.0069
Molybdenum	T-Mo	0.053	0.020	0.031	0.021	0.029
Nickel	T-Ni	<0.10	<0.10	<0.10	<0.10	<0.10
Selenium	T-Se	0.24	0.21	0.48	<0.20	0.20
Strontium	T-Sr	4.96	4.10	3.04	3.35	3.96
Thallium	T-Tl	<0.010	<0.010	<0.010	<0.010	<0.010
Tin	T-Sn	<0.050	<0.050	<0.050	<0.050	<0.050
Uranium	T-U	0.0628	0.0097	0.0104	0.0100	0.0242
Vanadium	T-V	0.39	<0.10	<0.10	<0.10	0.12
Zinc	T-Zn	182	244	144	163	179

< = Less than the detection limit indicated.
[1]Metals results expressed as milligrams per wet kilogram except where noted.

A Campbell Brothers Limited Company

File No. W3331

RESULTS OF ANALYSIS - Tissue[1]

Sample ID		OYS4B	OYS4C
Sample Date		05-08-19	05-08-19
Sample Time		12:15	12:15
ALS ID		*11*	*12*
Physical Tests			
Moisture	%	89.4	90.4
Total Metals			
Aluminum	T-Al	36.9	11.6
Antimony	T-Sb	<0.010	<0.010
Arsenic	T-As	0.721	0.658
Barium	T-Ba	0.263	0.156
Beryllium	T-Be	<0.10	<0.10
Bismuth	T-Bi	<0.10	<0.10
Cadmium	T-Cd	1.21	1.41
Calcium	T-Ca	313	314
Chromium	T-Cr	<0.10	<0.10
Cobalt	T-Co	0.033	0.025
Copper	T-Cu	30.7	18.1
Iron	T-Fe	152	103
Lead	T-Pb	0.037	<0.020
Lithium	T-Li	0.12	<0.10
Magnesium	T-Mg	628	739
Manganese	T-Mn	1.20	3.30
Mercury	T-Hg	0.0062	<0.0050
Molybdenum	T-Mo	0.034	0.033
Nickel	T-Ni	<0.10	<0.10
Selenium	T-Se	0.20	<0.20
Strontium	T-Sr	4.07	4.48
Thallium	T-Tl	<0.010	<0.010
Tin	T-Sn	<0.050	<0.050
Uranium	T-U	0.0248	0.0310
Vanadium	T-V	0.18	<0.10
Zinc	T-Zn	186	107

< = Less than the detection limit indicated.
[1]Metals results expressed as milligrams per wet kilogram except where noted.

A Campbell Brothers Limited Company

File No. W3331

RESULTS OF ANALYSIS - Seawater

Sample ID		SW6	SW7	SW9	SW9D	SW8
Sample Date		05-08-19	05-08-19	05-08-19	05-08-19	05-08-19
Sample Time		12:30	13:45	14:00	14:05	14:10
ALS ID		*13*	*14*	*15*	*16*	*17*
Physical Tests						
Salinity	o/oo	22.0	26.2	18.1	18.0	28.0
Total Metals						
Aluminum	T-Al	0.015	<0.010	<0.010	<0.010	0.288
Arsenic	T-As	0.00021	<0.00020	<0.00020	0.00151	0.00478
Cadmium	T-Cd	0.000051	0.000058	0.000092	0.000081	0.000233
Cobalt	T-Co	0.000991	0.00967	0.0495	0.0495	0.00115
Copper	T-Cu	0.000383	0.000579	0.00097	0.00121	0.00616
Iron	T-Fe	21.1	21.1	109	109	6.48
Lead	T-Pb	0.000062	<0.000050	<0.00015	<0.00015	0.00155
Manganese	T-Mn	0.828	0.402	2.91	3.04	0.180
Nickel	T-Ni	0.000673	0.0103	0.0315	0.0312	0.00263
Uranium	T-U	0.00123	0.000459	0.00036	0.00035	0.00215
Zinc	T-Zn	0.00209	0.0133	0.0131	0.0199	0.0162

< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W3331

RESULTS OF ANALYSIS - Seawater

Sample ID		SW11	SW11D	SW10
Sample Date		05-08-19	05-08-19	05-08-19
Sample Time		14:30	14:35	14:45
ALS ID		*18*	*19*	*20*
Physical Tests				
Salinity	o/oo	26.4	26.4	27.0
Total Metals				
Aluminum	T-Al	14.7	11.7	0.113
Arsenic	T-As	0.00116	<0.00020	0.00034
Cadmium	T-Cd	0.00104	0.00110	0.000097
Cobalt	T-Co	0.0354	0.0399	0.00208
Copper	T-Cu	0.00811	0.00707	0.00156
Iron	T-Fe	54.2	56.9	2.67
Lead	T-Pb	0.00156	0.00080	<0.000050
Manganese	T-Mn	0.454	0.489	0.0488
Nickel	T-Ni	0.0503	0.0562	0.00379
Uranium	T-U	0.00162	0.00156	0.00147
Zinc	T-Zn	0.195	0.219	0.00826

< = Less than the detection limit indicated.

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File No. W3331

RESULTS OF ANALYSIS - Water[1]

Sample ID		FB
Sample Date		05-08-19
Sample Time		15:30
ALS ID		*21*
Physical Tests		
Salinity	o/oo	<1.0
Total Metals		
Aluminum	T-Al	<0.010
Arsenic	T-As	<0.00020
Cadmium	T-Cd	<0.000020
Cobalt	T-Co	<0.000050
Copper	T-Cu	0.000412
Iron	T-Fe	<0.010
Lead	T-Pb	<0.000050
Manganese	T-Mn	0.000097
Nickel	T-Ni	0.000106
Uranium	T-U	<0.000050
Zinc	T-Zn	0.00053

< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. W3331

RESULTS OF ANALYSIS - Sediment/Soil[1]

Sample ID		SEDSW11
Sample Date		05-08-19
Sample Time		15:00
ALS ID		*22*
Physical Tests		
pH		6.58
Total Metals		
Antimony	T-Sb	<10
Arsenic	T-As	30.0
Barium	T-Ba	77.7
Beryllium	T-Be	<0.50
Cadmium	T-Cd	<0.50
Chromium	T-Cr	8.7
Cobalt	T-Co	3.2
Copper	T-Cu	44.1
Lead	T-Pb	<50
Mercury	T-Hg	0.543
Molybdenum	T-Mo	10.4
Nickel	T-Ni	6.4
Selenium	T-Se	<2.0
Silver	T-Ag	<2.0
Tin	T-Sn	<5.0
Vanadium	T-V	54.4
Zinc	T-Zn	46.8

< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per dry kilogram except where noted.

A Campbell Brothers Limited Company

File No. W3331

Appendix 1 - QUALITY CONTROL - Replicates

Tissue [1]		OYS1A	OYS1A
		05-08-19 09:50	QC # 461316
Total Metals			
Aluminum	T-Al	5.2	4.5
Antimony	T-Sb	<0.010	<0.010
Arsenic	T-As	1.11	0.967
Barium	T-Ba	0.068	0.052
Beryllium	T-Be	<0.10	<0.10
Bismuth	T-Bi	<0.10	<0.10
Cadmium	T-Cd	1.67	1.45
Calcium	T-Ca	362	564
Chromium	T-Cr	<0.10	<0.10
Cobalt	T-Co	0.024	0.020
Copper	T-Cu	22.8	20.3
Lead	T-Pb	0.023	0.020
Lithium	T-Li	<0.10	<0.10
Magnesium	T-Mg	714	618
Manganese	T-Mn	6.29	5.42
Molybdenum	T-Mo	0.026	0.022
Nickel	T-Ni	<0.10	<0.10
Selenium	T-Se	0.28	0.23
Strontium	T-Sr	4.18	4.25
Thallium	T-Tl	<0.010	<0.010
Tin	T-Sn	<0.050	<0.050
Uranium	T-U	0.0132	0.0106
Vanadium	T-V	<0.10	<0.10
Zinc	T-Zn	213	189

< = Less than the detection limit indicated.
Metals results expressed as milligrams per wet kilogram except where noted.

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Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Moisture in Tissue

This analysis is carried out gravimetrically by drying the sample at 103 Cfor a minimum of six hours.

Recommended Holding Time:
Sample: 14 days
Reference: Puget
For more detail see ALS Environmental "Collection & Sampling Guide"

Metals in Vegetation and Animal Tissue

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. Tissue samples are homogenized either mechanically or manually prior to digestion. The hotplate digestion involves the use of nitric acid followed by repeatedadditions of hydrogen peroxide. Instrumental analysis is by atomicabsorption spectrophotometry (EPA Method 7000 series), inductively coupled plasma - mass spectrometry (EPA Method 6020), and/or inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Recommended Holding Time:
Sample/Extract: 2 years (Mercury = 28 days)
Reference: Puget
For more detail see ALS Environmental "Collection & Sampling Guide"

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in"Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) ona divinylbenzene polymer, is used to chelate and preconcentrate metals inseawater. Instrumental analysis is by inductively coupled plasma massspectrometry (ICPMS) and/or routine atomic absorption spectrophotometrytechniques (EPA 7000 series).

A Campbell Brothers Limited Company

Sample Extract Recommended Holding Time: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Sample Recommended Holding Time: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using eitherhotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ALS "Collection & Sampling Guide"

pH in Soil

This analysis is carried out in accordance with procedures described in"Soil Sampling and Methods of Analysis" (CSSS). The procedure involves mixing the air-dried sample with deionized/distilled water. The pH of the solution is then measured using a standard pH probe. A one to two ratio of sediment to water is used for mineral soils and a one to tenratio is used for highly organic soils.

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Metals in Sediment/Soil

This analysis is carried out using procedures from CSR Analytical Method 8"Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment,Lands and Parks, 26 June 2001, and procedures adapted from "Test Methodsfor Evaluating Solid Waste", SW-846 Method 3050B or Method 3051, United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed.The sample is then digested at 90 degrees Celsius for 2 hours by eitherhotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic absorption/fluorescence spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Method Limitation: This method is not a total digestion technique. It isa very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Recommended Holding Time:

Sample:	6 months (Hg = 28 days)
Extract:	6 months (Hg = 28 days, Sb & Sn = 7 days)
Reference:	BCMELP

For more detail see ALS Environmental "Collection & Sampling Guide"

Results contained within this report relate only to the samples as submitted.

This Chemical Analysis Report shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	September 22, 2005
ALS File No.	W4304
Report On:	202.01022.01 Water Analysis
Report To:	**SEACOR Environmental Inc.** 200 - 1620 West 8th Avenue Vancouver, BC V6J 1V4
Attention:	**Ms. Tara Siemens**
Received:	September 13, 2005

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

REMARKS

The detection limits for some total and dissolved metals were increased for the samples reported due to interferences encountered during analysis.

For some of the submitted water samples, the measured concentration of specific dissolved parameters is greater than the corresponding total parameters concentration. The explanation for these findings is one or a combination of the following:

- laboratory method variability;
- field sampling method variability;
- bias introduced during general handling, storage, transportation and/or analysis of the sample;
- field sample grab bias - where separate grab samples are processed to produce total and dissolved samples;
- field sample split bias - where total and dissolved parameters samples are produced from the same grab sample.

For further clarification on any of the above information, please contact your ALS representative.

A Campbell Brothers Limited Company

File No. W4304

RESULTS OF ANALYSIS - Water

Sample ID			BH20	BH8D	BH21	BH15	BH22
Sample Date			05-09-11	05-09-11	05-09-11	05-09-11	05-09-11
Sample Time			16:30	16:30	16:00	16:00	15:30
ALS ID			*1*	*2*	*3*	*4*	*5*
Physical Tests							
Hardness		CaCO3	1940	1170	1640	1540	3700
pH			4.88	6.31	6.99	6.54	6.56
Dissolved Anions							
Sulphate		SO4	2480	1910	1760	3100	2500
Total Metals							
Aluminum	T-Al		66.5	0.133	3.01	3.17	1.07
Antimony	T-Sb		<0.010	<0.0025	<0.0050	<0.0050	<0.010
Arsenic	T-As		<0.060	<0.0050	0.012	<0.010	<0.020
Barium	T-Ba		0.266	<0.020	0.054	<0.20	<0.20
Beryllium	T-Be		<0.010	<0.0050	<0.0050	<0.050	<0.050
Boron	T-B		0.77	0.52	0.37	<1.0	1.0
Cadmium	T-Cd		0.0144	<0.00025	0.00055	0.00123	0.0044
Calcium	T-Ca		421	424	614	467	1050
Chromium	T-Cr		0.088	<0.0025	<0.0050	<0.0050	<0.010
Cobalt	T-Co		0.358	0.0862	0.0952	0.253	0.343
Copper	T-Cu		0.270	<0.0050	0.056	0.065	<0.020
Iron	T-Fe		653	356	61.9	509	372
Lead	T-Pb		0.050	<0.0050	<0.010	<0.010	<0.020
Lithium	T-Li		0.29	0.144	0.108	<0.50	<0.50
Magnesium	T-Mg		246	42.3	36.7	42.5	251
Manganese	T-Mn		6.03	6.03	6.05	7.97	12.5
Mercury	T-Hg		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	T-Mo		<0.020	<0.0050	<0.010	<0.010	<0.020
Nickel	T-Ni		0.52	0.053	0.180	0.429	0.46
Selenium	T-Se		<0.020	<0.0050	<0.010	<0.010	<0.020
Silver	T-Ag		<0.0010	<0.00025	<0.00050	<0.00050	<0.0010
Sodium	T-Na		1860	120	49.2	<20	1740
Thallium	T-Tl		<0.0040	<0.0010	<0.0020	<0.0020	<0.0040
Titanium	T-Ti		3.29	<0.050	0.059	<0.50	<0.50
Uranium	T-U		0.0042	<0.0010	0.0025	<0.0020	<0.0040
Vanadium	T-V		0.282	0.033	<0.030	<0.30	<0.30
Zinc	T-Zn		1.58	0.0465	0.0778	0.521	0.513

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4304

RESULTS OF ANALYSIS - Water

Sample ID		BH20	BH8D	BH21	BH15	BH22
Sample Date		05-09-11	05-09-11	05-09-11	05-09-11	05-09-11
Sample Time		16:30	16:30	16:00	16:00	15:30
ALS ID		*1*	*2*	*3*	*4*	*5*
Dissolved Metals						
Aluminum	D-Al	6.70	<0.050	<0.10	<0.10	0.28
Antimony	D-Sb	<0.010	<0.0025	<0.0050	<0.0050	<0.010
Arsenic	D-As	<0.020	<0.0050	<0.010	<0.010	<0.020
Barium	D-Ba	<0.040	<0.020	0.026	<0.20	<0.20
Beryllium	D-Be	<0.010	<0.0050	<0.0050	<0.050	<0.050
Boron	D-B	0.75	0.49	0.39	<1.0	1.1
Cadmium	D-Cd	0.0131	<0.00025	<0.00050	<0.00050	0.0042
Calcium	D-Ca	413	398	601	538	1060
Chromium	D-Cr	<0.010	<0.0025	<0.0050	<0.0050	<0.010
Cobalt	D-Co	0.280	0.0771	0.0932	0.232	0.323
Copper	D-Cu	0.022	<0.0050	<0.010	<0.010	<0.020
Iron	D-Fe	515	377	63.5	631	380
Lead	D-Pb	<0.020	<0.0050	<0.010	<0.010	<0.020
Lithium	D-Li	0.15	0.140	0.109	<0.50	<0.50
Magnesium	D-Mg	221	42.4	34.2	47.4	255
Manganese	D-Mn	5.20	5.98	5.92	6.08	12.9
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	<0.020	<0.0050	<0.010	<0.010	<0.020
Nickel	D-Ni	0.38	0.048	0.171	0.330	0.44
Selenium	D-Se	<0.020	<0.0050	<0.010	<0.010	<0.020
Silver	D-Ag	<0.0010	<0.00025	<0.00050	<0.00050	<0.0010
Sodium	D-Na	1710	113	43.8	<20	1780
Thallium	D-Tl	<0.0040	<0.0010	<0.0020	<0.0020	<0.0040
Titanium	D-Ti	<0.10	<0.050	<0.050	<0.50	<0.50
Uranium	D-U	<0.0040	<0.0010	<0.0020	<0.0020	<0.0040
Vanadium	D-V	0.088	<0.030	<0.030	<0.30	<0.30
Zinc	D-Zn	1.32	0.0792	0.0586	0.189	0.533

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4304

RESULTS OF ANALYSIS - Water

Sample ID			BH16	BH17	BH6D	BH6S
Sample Date			05-09-11	05-09-11	05-09-11	05-09-11
Sample Time			15:30	15:00	15:00	15:00
ALS ID			*6*	*7*	*8*	*9*
Physical Tests						
Hardness		CaCO3	3290	5210	3160	3560
pH			3.39	3.43	3.89	4.17
Dissolved Anions						
Sulphate		SO4	2950	2300	3410	3010
Total Metals						
Aluminum	T-Al		56.3	35.3	175	119
Antimony	T-Sb		<0.025	<0.050	<0.025	<0.025
Arsenic	T-As		<0.050	<0.10	0.102	<0.050
Barium	T-Ba		<0.20	<0.20	0.32	<0.20
Beryllium	T-Be		<0.050	<0.050	<0.050	<0.050
Boron	T-B		1.3	2.9	1.2	1.6
Cadmium	T-Cd		0.0080	<0.0050	0.0074	0.0073
Calcium	T-Ca		600	320	499	468
Chromium	T-Cr		<0.025	<0.050	0.049	<0.025
Cobalt	T-Co		0.453	<0.050	0.528	0.357
Copper	T-Cu		0.154	<0.10	0.469	<0.050
Iron	T-Fe		941	38.6	1540	1040
Lead	T-Pb		<0.050	<0.10	<0.050	<0.050
Lithium	T-Li		<0.50	<0.50	0.53	<0.50
Magnesium	T-Mg		405	933	427	625
Manganese	T-Mn		9.05	0.30	9.95	7.25
Mercury	T-Hg		<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	T-Mo		<0.050	<0.10	<0.050	<0.050
Nickel	T-Ni		0.59	<0.50	0.84	0.57
Selenium	T-Se		<0.050	<0.10	<0.050	<0.050
Silver	T-Ag		<0.0025	<0.0050	<0.0025	<0.0025
Sodium	T-Na		3380	7720	3310	4510
Thallium	T-Tl		<0.010	<0.020	<0.010	<0.010
Titanium	T-Ti		<0.50	<0.50	0.71	<0.50
Uranium	T-U		<0.010	<0.020	<0.010	<0.010
Vanadium	T-V		<0.30	<0.30	0.38	<0.30
Zinc	T-Zn		2.19	0.109	3.16	2.31

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4304

RESULTS OF ANALYSIS - Water

Sample ID		BH16	BH17	BH6D	BH6S
Sample Date		05-09-11	05-09-11	05-09-11	05-09-11
Sample Time		15:30	15:00	15:00	15:00
ALS ID		*6*	*7*	*8*	*9*
Dissolved Metals					
Aluminum	D-Al	48.2	30.9	159	118
Antimony	D-Sb	<0.025	<0.050	<0.025	<0.025
Arsenic	D-As	<0.050	<0.10	<0.050	<0.050
Barium	D-Ba	<0.20	<0.20	<0.20	<0.20
Beryllium	D-Be	<0.050	<0.050	<0.050	<0.050
Boron	D-B	1.2	3.3	1.2	1.5
Cadmium	D-Cd	0.0074	<0.0050	0.0084	0.0065
Calcium	D-Ca	619	354	520	457
Chromium	D-Cr	<0.025	<0.050	<0.025	<0.025
Cobalt	D-Co	0.440	<0.050	0.504	0.350
Copper	D-Cu	0.147	<0.10	<0.050	<0.050
Iron	D-Fe	960	34.2	1440	1000
Lead	D-Pb	<0.050	<0.10	<0.050	<0.050
Lithium	D-Li	<0.50	<0.50	0.50	<0.50
Magnesium	D-Mg	424	1050	451	588
Manganese	D-Mn	9.41	0.28	9.78	6.99
Mercury	D-Hg	<0.00020	<0.00020	<0.00020	<0.00020
Molybdenum	D-Mo	<0.050	<0.10	<0.050	<0.050
Nickel	D-Ni	0.57	<0.50	0.79	0.55
Selenium	D-Se	<0.050	<0.10	<0.050	<0.050
Silver	D-Ag	<0.0025	<0.0050	<0.0025	<0.0025
Sodium	D-Na	3540	8710	3600	4390
Thallium	D-Tl	<0.010	<0.020	<0.010	<0.010
Titanium	D-Ti	<0.50	<0.50	<0.50	<0.50
Uranium	D-U	<0.010	<0.020	<0.010	<0.010
Vanadium	D-V	<0.30	<0.30	<0.30	<0.30
Zinc	D-Zn	2.20	0.118	2.92	2.12

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4304

Appendix 1 - QUALITY CONTROL - Replicates

Water			BH16	BH16
			05-09-11 15:30	QC # 463184
Physical Tests				
Hardness		CaCO3	3290	3260
Total Metals				
Aluminum	T-Al		56.3	57.7
Antimony	T-Sb		<0.025	<0.025
Arsenic	T-As		<0.050	<0.050
Barium	T-Ba		<0.20	<0.20
Beryllium	T-Be		<0.050	<0.050
Boron	T-B		1.3	1.3
Cadmium	T-Cd		0.0080	0.0074
Calcium	T-Ca		600	607
Chromium	T-Cr		<0.025	<0.025
Cobalt	T-Co		0.453	0.459
Copper	T-Cu		0.154	0.155
Iron	T-Fe		941	961
Lead	T-Pb		<0.050	<0.050
Lithium	T-Li		<0.50	<0.50
Magnesium	T-Mg		405	413
Manganese	T-Mn		9.05	9.17
Mercury	T-Hg		<0.00020	<0.00020
Molybdenum	T-Mo		<0.050	<0.050
Nickel	T-Ni		0.59	0.60
Selenium	T-Se		<0.050	<0.050
Silver	T-Ag		<0.0025	<0.0025
Sodium	T-Na		3380	3440
Thallium	T-Tl		<0.010	<0.010
Titanium	T-Ti		<0.50	<0.50
Uranium	T-U		<0.010	<0.010
Vanadium	T-V		<0.30	<0.30
Zinc	T-Zn		2.19	2.22

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4304

Appendix 1 - QUALITY CONTROL - Replicates

Water		BH16	BH16
		05-09-11 15:30	QC # 463184
Dissolved Metals			
Aluminum	D-Al	48.2	51.5
Antimony	D-Sb	<0.025	<0.025
Arsenic	D-As	<0.050	<0.050
Barium	D-Ba	<0.20	<0.20
Beryllium	D-Be	<0.050	<0.050
Boron	D-B	1.2	1.2
Cadmium	D-Cd	0.0074	0.0084
Calcium	D-Ca	619	620
Chromium	D-Cr	<0.025	<0.025
Cobalt	D-Co	0.440	0.470
Copper	D-Cu	0.147	0.153
Iron	D-Fe	960	951
Lead	D-Pb	<0.050	<0.050
Lithium	D-Li	<0.50	<0.50
Magnesium	D-Mg	424	416
Manganese	D-Mn	9.41	9.32
Mercury	D-Hg	<0.00020	<0.00020
Molybdenum	D-Mo	<0.050	<0.050
Nickel	D-Ni	0.57	0.61
Selenium	D-Se	<0.050	<0.050
Silver	D-Ag	<0.0025	<0.0025
Sodium	D-Na	3540	3490
Thallium	D-Tl	<0.010	<0.010
Titanium	D-Ti	<0.50	<0.50
Uranium	D-U	<0.010	<0.010
Vanadium	D-V	<0.30	<0.30
Zinc	D-Zn	2.20	2.20

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

pH in Water

This analysis is carried out using procedures adapted from APHA Method4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA
For more detail see ALS Environmental "Collection & Sampling Guide"

Sulphate in Water

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulphate". Sulphate is determined using the turbidimetric method.

Recommended Holding Time:
Sample: 28 days
Reference: APHA
For more detail see ALS Environmental "Collection & Sampling Guide"

Metals in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using eitherhotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

Sample:	6 months
Reference:	EPA
For more detail see:	ALS "Collection & Sampling Guide"

Mercury in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY - Continued

involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

Recommended Holding Time:

Sample:	28 days
Reference:	EPA

For more detail see ALS Environmental "Collection & Sampling Guide"

Results contained within this certificate relate only to the samples as submitted.

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End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	October 12, 2005
ALS File No.	W4726
Report On:	201.01022.01 Task 0019 Seawater Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	September 20, 2005

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. W4726

RESULTS OF ANALYSIS - Seawater

Sample ID			SW12	SW12D	SW9	SW9D	SW11
Sample Date			05-09-18	05-09-18	05-09-18	05-09-18	05-09-18
Sample Time			11:25	11:30	12:25	12:25	13:27
ALS ID			*1*	*2*	*3*	*4*	*5*
Physical Tests							
Hardness		CaCO3	-	-	-	-	-
pH			7.84	7.91	6.00	5.85	4.39
Salinity	o/oo		30.0	29.9	22.0	21.7	26.7
Dissolved Anions							
Sulphate		SO4	2340	2270	2220	2240	2200

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4726

RESULTS OF ANALYSIS - Seawater

Sample ID		SW12	SW12D	SW9	SW9D	SW11
Sample Date		05-09-18	05-09-18	05-09-18	05-09-18	05-09-18
Sample Time		11:25	11:30	12:25	12:25	13:27
ALS ID		*1*	*2*	*3*	*4*	*5*
Total Metals						
Aluminum	T-Al	0.099	<0.010	<0.010	<0.010	18.1
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	0.00123	0.00140	0.00028	<0.00020	0.00037
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	0.000087	0.000059	<0.00015	<0.00015	0.00143
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	0.000131	<0.000050	0.0384	0.0351	0.0374
Copper	T-Cu	0.00104	0.000626	0.00141	0.00129	0.00213
Iron	T-Fe	0.222	0.013	118	109	60.8
Lead	T-Pb	0.000115	<0.000050	<0.00015	<0.00015	0.00298
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	0.00804	0.00401	2.32	2.08	0.493
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	0.000700	0.000545	0.0248	0.0231	0.0510
Selenium	T-Se	-	-	-	-	-
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.00247	0.00229	0.000768	0.000783	0.000620
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.00333	0.00254	0.0095	0.0115	0.185

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4726

RESULTS OF ANALYSIS - Seawater

Sample ID			SW11D	BH20	BH20D	BH16	BH16D
Sample Date			05-09-18	05-09-18	05-09-18	05-09-18	05-09-18
Sample Time			13:27	12:35	12:35	14:02	14:02
ALS ID			*6*	*7*	*8*	*9*	*10*
Physical Tests							
Hardness		CaCO3	-	1730	1690	-	-
pH			4.38	4.29	4.29	3.18	3.24
Salinity	o/oo		26.5	5.6	5.6	14.8	14.8
Dissolved Anions							
Sulphate		SO4	2210	2550	2590	2880	2870

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4726

RESULTS OF ANALYSIS - Seawater

Sample ID		SW11D	BH20	BH20D	BH16	BH16D
Sample Date		05-09-18	05-09-18	05-09-18	05-09-18	05-09-18
Sample Time		13:27	12:35	12:35	14:02	14:02
ALS ID		*6*	*7*	*8*	*9*	*10*
Total Metals						
Aluminum	T-Al	18.2	31.7	30.5	41.0	42.2
Antimony	T-Sb	-	<0.010	<0.010	-	-
Arsenic	T-As	0.00071	0.00399	0.00367	0.00384	0.00297
Barium	T-Ba	-	<0.10	<0.10	-	-
Beryllium	T-Be	-	<0.025	<0.025	-	-
Boron	T-B	-	0.60	0.62	-	-
Cadmium	T-Cd	0.00143	0.0197	0.0171	0.00301	0.00269
Calcium	T-Ca	-	410	405	-	-
Chromium	T-Cr	-	<0.010	<0.010	-	-
Cobalt	T-Co	0.0361	0.291	0.282	0.134	0.129
Copper	T-Cu	0.00205	<0.020	<0.020	0.0729	0.0694
Iron	T-Fe	58.7	492	475	264	252
Lead	T-Pb	0.00286	<0.020	<0.020	0.0039	0.0035
Lithium	T-Li	-	<0.25	<0.25	-	-
Magnesium	T-Mg	-	171	166	-	-
Manganese	T-Mn	0.483	5.26	5.06	2.78	2.69
Mercury	T-Hg	-	<0.00020	<0.00020	-	-
Molybdenum	T-Mo	-	<0.020	<0.020	-	-
Nickel	T-Ni	0.0493	0.39	0.37	0.178	0.170
Selenium	T-Se	-	<0.020	<0.020	-	-
Silver	T-Ag	-	<0.0010	<0.0010	-	-
Sodium	T-Na	-	1330	1290	-	-
Thallium	T-Tl	-	<0.0040	<0.0040	-	-
Titanium	T-Ti	-	<0.25	<0.25	-	-
Uranium	T-U	0.000594	<0.0040	<0.0040	0.00093	0.00077
Vanadium	T-V	-	<0.15	<0.15	-	-
Zinc	T-Zn	0.180	1.54	1.52	0.679	0.653

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4726

RESULTS OF ANALYSIS - Seawater

Sample ID			Travel Blank
Sample Date			05-09-18
Sample Time			14:02
ALS ID			*11*
Physical Tests			
Hardness		CaCO3	<0.66
pH			-
Salinity	o/oo		-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W4726

RESULTS OF ANALYSIS - Seawater

Sample ID		Travel Blank
Sample Date		05-09-18
Sample Time		14:02
ALS ID		*11*
Total Metals		
Aluminum	T-Al	<0.010
Antimony	T-Sb	<0.00050
Arsenic	T-As	<0.0010
Barium	T-Ba	<0.020
Beryllium	T-Be	<0.0050
Boron	T-B	<0.10
Cadmium	T-Cd	<0.000050
Calcium	T-Ca	<0.10
Chromium	T-Cr	<0.00050
Cobalt	T-Co	<0.00050
Copper	T-Cu	<0.0010
Iron	T-Fe	<0.030
Lead	T-Pb	<0.0010
Lithium	T-Li	<0.050
Magnesium	T-Mg	<0.10
Manganese	T-Mn	<0.010
Mercury	T-Hg	<0.00020
Molybdenum	T-Mo	<0.0010
Nickel	T-Ni	<0.0050
Selenium	T-Se	<0.0010
Silver	T-Ag	<0.000050
Sodium	T-Na	<2.0
Thallium	T-Tl	<0.00020
Titanium	T-Ti	<0.050
Uranium	T-U	<0.00020
Vanadium	T-V	<0.030
Zinc	T-Zn	<0.0050

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		BH16D	BH16D
		05-09-18 14:02	QC # 464910
Dissolved Anions			
Sulphate	SO4	2870	2900

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

pH in Water

This analysis is carried out using procedures adapted from APHA Method4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in"Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual forthe Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Laboratory Location: ALS Environmental, Vancouver

Sulphate in Water

This analysis is carried out using procedures adapted from APHA Method 4500-SO4 "Sulphate". Sulphate is determined using the turbidimetric method.

Recommended Holding Time:
Sample: 28 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) ona divinylbenzene polymer, is used to chelate and preconcentrate metals inseawater. Instrumental analysis is by inductively coupled plasma massspectrometry (ICPMS) and/or routine atomic absorption spectrophotometrytechniques (EPA 7000 series).

Recommended Holding Time:

A Campbell Brothers Limited Company

Sample/Extract: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:
Sample: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using eitherhotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:
Sample: 6 months
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Mercury in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY - Continued

Instrumental analysis is by cold vapour atomic fluorescencespectrophotometry (EPA Method 245.7).

Recommended Holding Time:
Sample: 28 days
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

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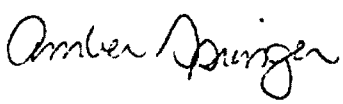
End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	November 2, 2005
ALS File No.	W6036
Report On:	201.01022.01 Task 0019 Seawater Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	October 15, 2005

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		BH16D	BH20D	SW9	SW9D	SW11
Sample Date		05-10-13	05-10-13	05-10-13	05-10-13	05-10-13
Sample Time		12:25	12:00	08:30	08:30	10:43
ALS ID		*1*	*2*	*3*	*4*	*5*
Total Metals						
Aluminum	T-Al	39.2	25.0	<0.010	<0.010	7.13
Arsenic	T-As	0.00195	0.00265	<0.00020	<0.00020	0.00071
Cadmium	T-Cd	0.0113	0.00551	<0.00025	<0.00025	0.00236
Cobalt	T-Co	0.424	0.234	0.0691	0.0763	0.0547
Copper	T-Cu	0.448	0.0060	0.00076	0.00091	0.00758
Iron	T-Fe	712	396	185	206	58.6
Lead	T-Pb	0.0226	0.00718	<0.00025	<0.00025	0.00217
Manganese	T-Mn	7.80	3.41	3.11	3.52	0.805
Nickel	T-Ni	0.515	0.276	0.0420	0.0472	0.0663
Uranium	T-U	0.00343	0.00022	0.000715	0.000735	0.000998
Zinc	T-Zn	1.89	1.07	0.0181	0.0250	0.218

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		SW11D	SW13	SW14
Sample Date		05-10-13	05-10-13	05-10-13
Sample Time		10:43	08:43	08:45
ALS ID		*6*	*7*	*9*
Total Metals				
Aluminum	T-Al	6.72	0.141	-
Arsenic	T-As	<0.00020	0.00115	-
Cadmium	T-Cd	0.00195	0.000078	0.000059
Cobalt	T-Co	0.0407	0.000879	0.000233
Copper	T-Cu	0.00456	0.00147	0.00105
Iron	T-Fe	46.2	0.872	0.399
Lead	T-Pb	0.00105	0.000346	0.000148
Manganese	T-Mn	0.610	0.145	0.0190
Nickel	T-Ni	0.0492	0.00117	0.000699
Uranium	T-U	0.000648	0.00201	0.00169
Zinc	T-Zn	0.164	0.00259	0.00186

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		SW16	SW17
Sample Date		05-10-13	05-10-13
Sample Time		08:52	08:54
ALS ID		*13*	*14*
Total Metals			
Aluminum	T-Al	-	0.039
Arsenic	T-As	-	0.00104
Cadmium	T-Cd	0.000064	0.000096
Cobalt	T-Co	0.000730	0.000843
Copper	T-Cu	0.000885	0.000656
Iron	T-Fe	0.778	1.02
Lead	T-Pb	0.000106	0.000087
Manganese	T-Mn	0.105	0.0945
Nickel	T-Ni	0.000841	0.000960
Uranium	T-U	0.00166	0.00208
Zinc	T-Zn	0.00215	0.00195

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		SW20
Sample Date		05-10-13
Sample Time		09:01
ALS ID		*20*
Total Metals		
Aluminum	T-Al	-
Arsenic	T-As	-
Cadmium	T-Cd	0.000066
Cobalt	T-Co	0.00126
Copper	T-Cu	0.000904
Iron	T-Fe	1.44
Lead	T-Pb	0.000074
Manganese	T-Mn	0.0977
Nickel	T-Ni	0.00130
Uranium	T-U	0.00148
Zinc	T-Zn	0.00149

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		SW21	SW22
Sample Date		05-10-13	05-10-13
Sample Time		09:07	09:09
ALS ID		*21*	*22*
Total Metals			
Aluminum	T-Al	-	0.073
Arsenic	T-As	-	0.00073
Cadmium	T-Cd	0.000053	0.000054
Cobalt	T-Co	0.000506	0.000529
Copper	T-Cu	0.000870	0.000827
Iron	T-Fe	0.640	0.919
Lead	T-Pb	0.000101	0.000078
Manganese	T-Mn	0.0996	0.126
Nickel	T-Ni	0.000736	0.000713
Uranium	T-U	0.00152	0.00150
Zinc	T-Zn	0.00142	0.00137

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		SW25	SW26	SW27	SW28
Sample Date		05-10-13	05-10-13	05-10-13	05-10-13
Sample Time		09:19	10:24	10:28	12:05
ALS ID		*26*	*27*	*28*	*29*
Total Metals					
Aluminum	T-Al	-	0.140	0.292	0.070
Arsenic	T-As	-	0.00061	0.00039	0.00077
Cadmium	T-Cd	0.000057	0.000108	0.000192	0.000055
Cobalt	T-Co	0.000997	0.00512	0.0150	0.000163
Copper	T-Cu	0.000960	0.00110	0.0144	0.000847
Iron	T-Fe	0.803	9.72	27.8	0.224
Lead	T-Pb	0.000156	0.000121	0.000105	0.000123
Manganese	T-Mn	0.155	0.298	0.583	0.0148
Nickel	T-Ni	0.00105	0.00499	0.0144	0.000497
Uranium	T-U	0.00141	0.00144	0.000902	0.00168
Zinc	T-Zn	0.00129	0.0068	0.0206	0.00469

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

RESULTS OF ANALYSIS - Seawater

Sample ID		SW29
Sample Date		05-10-13
Sample Time		12:30
ALS ID		*31*
Total Metals		
Aluminum	T-Al	0.130
Arsenic	T-As	0.00091
Cadmium	T-Cd	0.000051
Cobalt	T-Co	0.000382
Copper	T-Cu	0.00156
Iron	T-Fe	0.597
Lead	T-Pb	0.000314
Manganese	T-Mn	0.0198
Nickel	T-Ni	0.000768
Uranium	T-U	0.00140
Zinc	T-Zn	0.00335

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6036

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		SW9	SW9	SW16	SW16
		05-10-13 08:30	QC # 470248	05-10-13 08:52	QC # 470249
Total Metals					
Aluminum	T-Al	<0.010	<0.010	-	-
Arsenic	T-As	<0.00020	<0.00020	-	-
Cadmium	T-Cd	<0.00025	<0.00025	0.000064	0.000068
Cobalt	T-Co	0.0691	0.0750	0.000730	0.000750
Copper	T-Cu	0.00076	0.00099	0.000885	0.000927
Iron	T-Fe	185	201	0.778	0.789
Lead	T-Pb	<0.00025	<0.00025	0.000106	0.000107
Manganese	T-Mn	3.11	3.42	0.105	0.108
Nickel	T-Ni	0.0420	0.0464	0.000841	0.000881
Uranium	T-U	0.000715	0.000754	0.00166	0.00170
Zinc	T-Zn	0.0181	0.0236	0.00215	0.00183

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) ona divinylbenzene polymer, is used to chelate and preconcentrate metals inseawater. Instrumental analysis is by inductively coupled plasma massspectrometry (ICPMS) and/or routine atomic absorption spectrophotometrytechniques (EPA 7000 series).

Recommended Holding Time:
Sample/Extract: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:
Sample: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	October 21, 2005
ALS File No.	W6037
Report On:	201.01022.01 Task 0019 Seawater Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	October 15, 2005

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. W6037

RESULTS OF ANALYSIS - Seawater

Sample ID		BH16	BH20
Sample Date		05-10-13	05-10-13
Sample Time		12:25	12:00
ALS ID		*1*	*2*
Dissolved Anions			
Alkalinity-Total	CaCO3	<2.0	<2.0

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6037

RESULTS OF ANALYSIS - Water

Sample ID		BH3	BH2
Sample Date		05-10-13	05-10-13
Sample Time		15:30	16:20
ALS ID		*3*	*4*
Dissolved Anions			
Alkalinity-Total	CaCO3	10.2	46.5

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W6037

RESULTS OF ANALYSIS - Seawater

Sample ID		BH6S	BH6D
Sample Date		05-10-13	05-10-13
Sample Time		16:00	16:00
ALS ID		*5*	*6*
Dissolved Anions			
Alkalinity-Total	$CaCO_3$	<2.0	<2.0

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		BH16	BH16
		05-10-13 12:25	QC # 469875
Dissolved Anions			
Alkalinity-Total	CaCO3	<2.0	<2.0

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Alkalinity in Water by Colourimetry

This analysis is carried out using procedures adapted from EPA Method 310.2"Alkalinity". Total Alkalinity is determined using the methyl orangecolourimetric method.

Recommended Holding Time:
Sample: 14 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	November 3, 2005
ALS File No.	W6248
Report On:	201.01022.01 Task 0019 Soil Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	October 20, 2005

ALS ENVIRONMENTAL
per:

Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

REMARKS

The detection limits for some Polycyclic Aromatic Hydrocarbons were increased for the samples reported due to interferences encountered during analysis.

A Campbell Brothers Limited Company

File No. W6248

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID		S27	S28	S29	S30	S31
Sample Date		05-09-16	05-09-16	05-09-16	05-09-16	05-09-16
Sample Time		10:35	11:00	11:15	12:30	12:50
ALS ID		*1*	*2*	*3*	*4*	*5*
Physical Tests						
Moisture	%	26.2	48.3	16.5	29.5	32.3
pH		7.21	7.05	7.37	6.83	4.51
Total Metals						
Antimony	T-Sb	<10	<10	<10	<10	<10
Arsenic	T-As	14.3	25.0	17.1	27.1	34.7
Barium	T-Ba	33.0	31.4	28.4	46.8	78.1
Beryllium	T-Be	<0.50	<0.50	<0.50	<0.50	0.53
Cadmium	T-Cd	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	T-Cr	15.9	16.2	14.2	12.9	11.9
Cobalt	T-Co	26.1	9.3	9.9	4.9	3.7
Copper	T-Cu	32.8	29.6	41.1	47.0	45.1
Lead	T-Pb	<50	<50	<50	<50	<50
Mercury	T-Hg	0.111	0.083	0.136	0.316	0.378
Molybdenum	T-Mo	<4.0	6.5	<4.0	8.6	11.8
Nickel	T-Ni	15.8	13.9	17.0	10.8	8.3
Selenium	T-Se	<2.0	<2.0	<2.0	<2.0	<2.0
Silver	T-Ag	<2.0	<2.0	<2.0	<2.0	<2.0
Tin	T-Sn	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium	T-V	67.2	66.5	58.1	52.0	53.2
Zinc	T-Zn	38.7	38.6	50.3	47.3	49.3

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID			S27	S28	S29	S30	S31
Sample Date			05-09-16	05-09-16	05-09-16	05-09-16	05-09-16
Sample Time			10:35	11:00	11:15	12:30	12:50
ALS ID			*1*	*2*	*3*	*4*	*5*
Polycyclic Aromatic Hydrocarbons							
Acenaphthene			<0.20	<0.20	<0.10	<0.30	<0.30
Acenaphthylene			<0.050	<0.050	<0.050	<0.20	<0.20
Anthracene			0.113	0.129	0.076	0.091	0.186
Benz(a)anthracene			0.133	0.143	0.121	0.363	0.425
Benzo(a)pyrene			0.055	0.062	<0.050	0.349	0.159
Benzo(b)fluoranthene			0.080	0.094	0.085	0.464	0.316
Benzo(g,h,i)perylene			<0.050	<0.050	<0.050	0.254	0.131
Benzo(k)fluoranthene			<0.050	<0.050	<0.050	0.105	0.056
Chrysene			0.231	0.241	0.239	0.742	0.930
Dibenz(a,h)anthracene			<0.050	<0.050	<0.050	0.068	0.071
Fluoranthene			0.132	0.143	0.127	0.423	0.442
Fluorene			0.302	0.284	0.110	<0.20	0.299
Indeno(1,2,3-c,d)pyrene			<0.050	<0.050	<0.050	0.202	<0.050
2-Methylnaphthalene			1.34	1.36	1.31	4.79	9.53
Naphthalene			0.582	0.534	0.593	2.68	4.96
Phenanthrene			1.92	2.02	1.95	4.25	6.88
Pyrene			0.146	0.160	0.145	0.513	0.504
Organic Parameters							
Total Organic Carbon	C		23.0	27.7	11.0	31.9	42.0
Particle Size							
Gravel (>2.00mm)		%	25.1	39.0	53.7	36.3	7.80
Sand (2.00mm - 1.00mm)		%	68.1	52.4	42.4	59.7	75.1
Silt (0.063mm - 0.0312mm)		%	2.30	6.30	3.60	1.50	15.1
Clay (<0.004mm)		%	4.50	2.30	0.30	2.50	2.00

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID		S33
Sample Date		05-09-16
Sample Time		11:16
ALS ID		*6*
Physical Tests		
Moisture	%	9.40
pH		8.47
Total Metals		
Antimony	T-Sb	<10
Arsenic	T-As	<5.0
Barium	T-Ba	8.1
Beryllium	T-Be	<0.50
Cadmium	T-Cd	<0.50
Chromium	T-Cr	20.7
Cobalt	T-Co	6.6
Copper	T-Cu	16.9
Lead	T-Pb	<50
Mercury	T-Hg	<0.050
Molybdenum	T-Mo	<4.0
Nickel	T-Ni	13.6
Selenium	T-Se	<2.0
Silver	T-Ag	<2.0
Tin	T-Sn	<5.0
Vanadium	T-V	61.4
Zinc	T-Zn	29.5

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID			S33
Sample Date			05-09-16
Sample Time			11:16
ALS ID			*6*
Polycyclic Aromatic Hydrocarbons			
Acenaphthene			<0.040
Acenaphthylene			<0.050
Anthracene			<0.050
Benz(a)anthracene			<0.050
Benzo(a)pyrene			<0.050
Benzo(b)fluoranthene			<0.050
Benzo(g,h,i)perylene			<0.050
Benzo(k)fluoranthene			<0.050
Chrysene			<0.050
Dibenz(a,h)anthracene			<0.050
Fluoranthene			<0.050
Fluorene			<0.050
Indeno(1,2,3-c,d)pyrene			<0.050
2-Methylnaphthalene			<0.050
Naphthalene			<0.050
Phenanthrene			<0.050
Pyrene			0.051
Organic Parameters			
Total Organic Carbon	C		0.860
Particle Size			
Gravel (>2.00mm)		%	51.2
Sand (2.00mm - 1.00mm)		%	45.3
Silt (0.063mm - 0.0312mm)		%	3.10
Clay (<0.004mm)		%	0.40

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248

Appendix 1 - QUALITY CONTROL - Replicates

Sediment/Soil		S28	S28
		05-09-16 11:00	QC # 470626
Physical Tests			
Moisture	%	48.3	43.5
pH		7.05	7.08
Total Metals			
Antimony	T-Sb	<10	<10
Arsenic	T-As	25.0	21.6
Barium	T-Ba	31.4	33.8
Beryllium	T-Be	<0.50	<0.50
Cadmium	T-Cd	<0.50	<0.50
Chromium	T-Cr	16.2	16.3
Cobalt	T-Co	9.3	8.6
Copper	T-Cu	29.6	30.8
Lead	T-Pb	<50	<50
Mercury	T-Hg	0.083	0.097
Molybdenum	T-Mo	6.5	5.9
Nickel	T-Ni	13.9	14.0
Selenium	T-Se	<2.0	<2.0
Silver	T-Ag	<2.0	<2.0
Tin	T-Sn	<5.0	<5.0
Vanadium	T-V	66.5	64.5
Zinc	T-Zn	38.6	35.1

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Moisture in Sediment/Soil

This analysis is carried out gravimetrically by drying the sample at 103 Cfor a minimum of six hours.

Recommended Holding Time:
Sample: 14 days
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

pH in Soil

This analysis is carried out in accordance with procedures described in"Soil Sampling and Methods of Analysis" (CSSS). The procedure involvesmixing the air-dried sample with deionized/distilled water. The pH ofthe solution is then measured using a standard pH probe. A one to two ratio of sediment to water is used for mineral soils and a one to tenratio is used for highly organic soils.

Laboratory Location: ALS Environmental, Vancouver

Metals in Sediment/Soil

This analysis is carried out using procedures from CSR Analytical Method 8"Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment,Lands and Parks, 26 June 2001, and procedures adapted from "Test Methodsfor Evaluating Solid Waste", SW-846 Method 3050B or Method 3051, UnitedStates Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed.The sample is then digested at 90 degrees Celsius for 2 hours by eitherhotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic absorption/fluorescence spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPAMethod 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Method Limitation: This method is not a total digestion technique. It isa very strong acid digestion that is intended to dissolve those metalsthat may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Recommended Holding Time:
Sample: 6 months (Hg = 28 days)
Extract: 6 months (Hg = 28 days, Sb & Sn = 7 days)
Reference: BCMELP

A Campbell Brothers Limited Company

Laboratory Location: ALS Environmental, Vancouver

Polycyclic Aromatic Hydrocarbons in Sediment/Soil

This analysis is carried out using procedures adapted from "Test Methodsfor Evaluating Solid Waste" SW-846, Methods 3545 & 8270, published by theUnited States Environmental Protection Agency (EPA). The procedure usesan automated system (Accelerated Solvent Extractor - ASE) to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract isanalysed by capillary column gas chromatography with mass spectrometricdetection (GC/MS).

Recommended Holding Time:
Sample: 14 days Extract: 40 days
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Total Carbon, Total Organic Carbon and Inorganic Carbon in Sediment/Soil
This analysis is carried out in accordance with U.S. EPA Method 9060A(Publ. # SW-846 3rd ed., Washington, DC 20460). Using a Leco analyzerTotal Carbon is determined by high temperature oxidation of carbon to carbon dioxide which is then measured by means of a nondispersive infrared analyzer. Inorganic Carbon is determined by means of a CO2 coulometer. A prepared sample is acidified in a heated reaction vessel to evolveinorganic carbon as carbon dioxide. The resulting carbon dioxide is thenmeasured by chemical reaction in the CO2 coulometer. Total Organic Carbonis determined as the difference between Total and Inorganic Carbons.

Recommended Holding Time:
Sample: 14 days
Reference: Puget

Laboratory Location: ALS Chemex, North Vancouver

Particle Size Distribution in Sediment/Soil

This analysis is carried out using a method adapted for Fisheries andEnvironment Canada, Ottawa, described in Walton, 1978. The procedureinvolves oven-drying and sample pre-treatment to remove organics, prior tousing standard sieves for the sand and silt fractions and the pipette method for the clay fraction.

Laboratory Location: Pacific Soil Analysis Inc., Richmond (Subcontract)

A Campbell Brothers Limited Company

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	November 14, 2005
ALS File No.	W6248(1)
Report On:	201.01022.01 Task 0019 Soil Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	October 20, 2005

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

File No. W6248(1)

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID		S27	S28	S29	S30	S31
Sample Date		05-09-16	05-09-16	05-09-16	05-09-16	05-09-16
Sample Time		10:35	11:00	11:15	12:30	12:50
ALS ID		*1*	*2*	*3*	*4*	*5*
Total Metals						
Iron	T-Fe	55200	93500	52100	55700	61000

Results are expressed as milligrams per dry kilogram except where noted.

A Campbell Brothers Limited Company

File No. W6248(1)

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID		S33
Sample Date		05-09-16
Sample Time		11:16
ALS ID		*6*
Total Metals		
Iron	T-Fe	17700

Results are expressed as milligrams per dry kilogram except where noted.

A Campbell Brothers Limited Company

Appendix 1 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Metals in Sediment/Soil

This analysis is carried out using procedures from CSR Analytical Method 8"Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment,Lands and Parks, 26 June 2001, and procedures adapted from "Test Methodsfor Evaluating Solid Waste", SW-846 Method 3050B or Method 3051, United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed.The sample is then digested at 90 degrees Celsius for 2 hours by eitherhotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic absorption/fluorescence spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Method Limitation: This method is not a total digestion technique. It isa very strong acid digestion that is intended to dissolve those metalsthat may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Recommended Holding Time:
- Sample: 6 months (Hg = 28 days)
- Extract: 6 months (Hg = 28 days, Sb & Sn = 7 days)
- Reference: BCMELP

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	April 27, 2006
ALS File No.	W6248a
Report On:	201.01022.01 Task 0019 Soil Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	October 20, 2005

ALS ENVIRONMENTAL
per:

Amber Springer, B.Sc. - Project Chemist
Jerry Holzbecher, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. W6248a

REMARKS

The detection limits for some Polycyclic Aromatic Hydrocarbons were increased for the samples reported due to interferences encountered during analysis.

A Campbell Brothers Limited Company

File No. W6248a

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID		S27	S28	S29	S30	S31
Sample Date		05-09-16	05-09-16	05-09-16	05-09-16	05-09-16
Sample Time		10:35	11:00	11:15	12:30	12:50
ALS ID		*1*	*2*	*3*	*4*	*5*
Physical Tests						
Moisture	%	26.2	48.3	16.5	29.5	32.3
pH		7.21	7.05	7.37	6.83	4.51
Total Metals						
Aluminum	T-Al	10500	10300	10200	8910	9850
Antimony	T-Sb	<10	<10	<10	<10	<10
Arsenic	T-As	14.3	25.0	17.1	27.1	34.7
Barium	T-Ba	33.0	31.4	28.4	46.8	78.1
Beryllium	T-Be	<0.50	<0.50	<0.50	<0.50	0.53
Cadmium	T-Cd	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium	T-Cr	15.9	16.2	14.2	12.9	11.9
Cobalt	T-Co	26.1	9.3	9.9	4.9	3.7
Copper	T-Cu	32.8	29.6	41.1	47.0	45.1
Iron	T-Fe	55200	93500	52100	55700	61000
Lead	T-Pb	<50	<50	<50	<50	<50
Manganese	T-Mn	237	213	227	160	70.3
Mercury	T-Hg	0.111	0.083	0.136	0.316	0.378
Molybdenum	T-Mo	<4.0	6.5	<4.0	8.6	11.8
Nickel	T-Ni	15.8	13.9	17.0	10.8	8.3
Selenium	T-Se	<2.0	<2.0	<2.0	<2.0	<2.0
Silver	T-Ag	<2.0	<2.0	<2.0	<2.0	<2.0
Tin	T-Sn	<5.0	<5.0	<5.0	<5.0	<5.0
Vanadium	T-V	67.2	66.5	58.1	52.0	53.2
Zinc	T-Zn	38.7	38.6	50.3	47.3	49.3

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248a

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID			S27	S28	S29	S30	S31
Sample Date			05-09-16	05-09-16	05-09-16	05-09-16	05-09-16
Sample Time			10:35	11:00	11:15	12:30	12:50
ALS ID			*1*	*2*	*3*	*4*	*5*
Polycyclic Aromatic Hydrocarbons							
Acenaphthene			<0.20	<0.20	<0.10	<0.30	<0.30
Acenaphthylene			<0.050	<0.050	<0.050	<0.20	<0.20
Anthracene			0.113	0.129	0.076	0.091	0.186
Benz(a)anthracene			0.133	0.143	0.121	0.363	0.425
Benzo(a)pyrene			0.055	0.062	<0.050	0.349	0.159
Benzo(b)fluoranthene			0.080	0.094	0.085	0.464	0.316
Benzo(g,h,i)perylene			<0.050	<0.050	<0.050	0.254	0.131
Benzo(k)fluoranthene			<0.050	<0.050	<0.050	0.105	0.056
Chrysene			0.231	0.241	0.239	0.742	0.930
Dibenz(a,h)anthracene			<0.050	<0.050	<0.050	0.068	0.071
Fluoranthene			0.132	0.143	0.127	0.423	0.442
Fluorene			0.302	0.284	0.110	<0.20	0.299
Indeno(1,2,3-c,d)pyrene			<0.050	<0.050	<0.050	0.202	<0.050
2-Methylnaphthalene			1.34	1.36	1.31	4.79	9.53
Naphthalene			0.582	0.534	0.593	2.68	4.96
Phenanthrene			1.92	2.02	1.95	4.25	6.88
Pyrene			0.146	0.160	0.145	0.513	0.504
Organic Parameters							
Total Organic Carbon	C		23.0	27.7	11.0	31.9	42.0
Particle Size							
Gravel (>2.00mm)		%	25.1	39.0	53.7	36.3	7.80
Sand (2.00mm - 1.00mm)		%	68.1	52.4	42.4	59.7	75.1
Silt (0.063mm - 0.0312mm)		%	2.30	6.30	3.60	1.50	15.1
Clay (<0.004mm)		%	4.50	2.30	0.30	2.50	2.00

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248a

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID		S33
Sample Date		05-09-16
Sample Time		11:16
ALS ID		*6*
Physical Tests		
Moisture	%	9.40
pH		8.47
Total Metals		
Aluminum	T-Al	12500
Antimony	T-Sb	<10
Arsenic	T-As	<5.0
Barium	T-Ba	8.1
Beryllium	T-Be	<0.50
Cadmium	T-Cd	<0.50
Chromium	T-Cr	20.7
Cobalt	T-Co	6.6
Copper	T-Cu	16.9
Iron	T-Fe	17700
Lead	T-Pb	<50
Manganese	T-Mn	180
Mercury	T-Hg	<0.050
Molybdenum	T-Mo	<4.0
Nickel	T-Ni	13.6
Selenium	T-Se	<2.0
Silver	T-Ag	<2.0
Tin	T-Sn	<5.0
Vanadium	T-V	61.4
Zinc	T-Zn	29.5

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

File No. W6248a

RESULTS OF ANALYSIS - Sediment/Soil

Sample ID			S33
Sample Date			05-09-16
Sample Time			11:16
ALS ID			*6*
Polycyclic Aromatic Hydrocarbons			
Acenaphthene			<0.040
Acenaphthylene			<0.050
Anthracene			<0.050
Benz(a)anthracene			<0.050
Benzo(a)pyrene			<0.050
Benzo(b)fluoranthene			<0.050
Benzo(g,h,i)perylene			<0.050
Benzo(k)fluoranthene			<0.050
Chrysene			<0.050
Dibenz(a,h)anthracene			<0.050
Fluoranthene			<0.050
Fluorene			<0.050
Indeno(1,2,3-c,d)pyrene			<0.050
2-Methylnaphthalene			<0.050
Naphthalene			<0.050
Phenanthrene			<0.050
Pyrene			0.051
Organic Parameters			
Total Organic Carbon	C		0.860
Particle Size			
Gravel (>2.00mm)		%	51.2
Sand (2.00mm - 1.00mm)		%	45.3
Silt (0.063mm - 0.0312mm)		%	3.10
Clay (<0.004mm)		%	0.40

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Total Organic Carbon results are expressed as percent, dry weight basis.

A Campbell Brothers Limited Company

Appendix 1 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

Moisture in Sediment/Soil

This analysis is carried out gravimetrically by drying the sample at 103 Cfor a minimum of six hours.

Recommended Holding Time:
Sample: 14 days
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

pH in Soil

This analysis is carried out in accordance with procedures described in"Soil Sampling and Methods of Analysis" (CSSS). The procedure involvesmixing the air-dried sample with deionized/distilled water. The pH ofthe solution is then measured using a standard pH probe. A one to two ratio of sediment to water is used for mineral soils and a one to tenratio is used for highly organic soils.

Laboratory Location: ALS Environmental, Vancouver

Metals in Sediment/Soil

This analysis is carried out using procedures from CSR Analytical Method 8"Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment,Lands and Parks, 26 June 2001, and procedures adapted from "Test Methodsfor Evaluating Solid Waste", SW-846 Method 3050B or Method 3051, UnitedStates Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed.The sample is then digested at 90 degrees Celsius for 2 hours by eitherhotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic absorption/fluorescence spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPAMethod 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Method Limitation: This method is not a total digestion technique. It isa very strong acid digestion that is intended to dissolve those metalsthat may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Recommended Holding Time:
Sample: 6 months (Hg = 28 days)
Extract: 6 months (Hg = 28 days, Sb & Sn = 7 days)
Reference: BCMELP

A Campbell Brothers Limited Company

Laboratory Location: ALS Environmental, Vancouver

Polycyclic Aromatic Hydrocarbons in Sediment/Soil

This analysis is carried out using procedures adapted from "Test Methodsfor Evaluating Solid Waste" SW-846, Methods 3545 & 8270, published by theUnited States Environmental Protection Agency (EPA). The procedure usesan automated system (Accelerated Solvent Extractor - ASE) to extract a subsample of the sediment/soil with a 1:1 mixture of hexane and acetone. The extract is then solvent exchanged to toluene. The final extract isanalysed by capillary column gas chromatography with mass spectrometricdetection (GC/MS).

Recommended Holding Time:
Sample: 14 days Extract: 40 days
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Total Carbon, Total Organic Carbon and Inorganic Carbon in Sediment/Soil
This analysis is carried out in accordance with U.S. EPA Method 9060A(Publ. # SW-846 3rd ed., Washington, DC 20460). Using a Leco analyzerTotal Carbon is determined by high temperature oxidation of carbon to carbon dioxide which is then measured by means of a nondispersive infrared analyzer. Inorganic Carbon is determined by means of a CO2 coulometer. A prepared sample is acidified in a heated reaction vessel to evolveinorganic carbon as carbon dioxide. The resulting carbon dioxide is thenmeasured by chemical reaction in the CO2 coulometer. Total Organic Carbonis determined as the difference between Total and Inorganic Carbons.

Recommended Holding Time:
Sample: 14 days
Reference: Puget

Laboratory Location: ALS Chemex, North Vancouver

Particle Size Distribution in Sediment/Soil

This analysis is carried out using a method adapted for Fisheries andEnvironment Canada, Ottawa, described in Walton, 1978. The procedureinvolves oven-drying and sample pre-treatment to remove organics, prior tousing standard sieves for the sand and silt fractions and the pipette method for the clay fraction.

Laboratory Location: Pacific Soil Analysis Inc., Richmond (Subcontract)

A Campbell Brothers Limited Company

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	January 10, 2006
ALS File No.	W8975
Report On:	201.01022.01 Seawater Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	December 16, 2005

ALS ENVIRONMENTAL
per:

Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. W8975

REMARKS

The detection limits for some total metals were increased for the samples reported due to interferences encountered during analysis.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID			SW9	SW30	SW31
Sample Date			05-12-13	05-12-13	05-12-13
Sample Time			22:20	22:45	23:00
ALS ID			*1*	*3*	*5*
Physical Tests					
pH			6.40	7.24	7.61
Salinity	o/oo		20.6	26.0	25.9
Dissolved Anions					
Bromide	Br		16.1	21.3	20.8
Chloride	Cl		11500	14500	14300
Fluoride	F		<2.0	2.9	<2.0
Sulphate	SO4		2060	1950	1910
Nutrients					
Nitrate Nitrogen		N	<0.50	<0.50	<0.50
Nitrite Nitrogen		N	2.20	2.49	2.45

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID		SW9	SW9D	SW30	SW30D	SW31
Sample Date		05-12-13	05-12-13	05-12-13	05-12-13	05-12-13
Sample Time		22:20	22:20	22:45	22:45	23:00
ALS ID		*1*	*2*	*3*	*4*	*5*
Total Metals						
Aluminum	T-Al	<0.010	<0.010	<0.010	<0.010	<0.010
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	0.00034	0.00028	0.00085	0.00039	0.00150
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Bismuth	T-Bi	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	0.000066	0.000078	0.000068	0.000069	0.000061
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.0368	0.0361	0.000124	0.000113	0.000085
Copper	T-Cu	0.00045	0.00044	0.000440	0.000525	0.000410
Iron	T-Fe	89.7	85.4	2.45	1.35	0.148
Lead	T-Pb	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	2.23	2.46	0.176	0.112	0.00765
Mercury	T-Hg	0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	0.0079	0.0073	0.0070
Nickel	T-Ni	0.0205	0.0206	0.000363	0.000385	0.000352
Phosphorus	T-P	-	-	-	-	-
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	<0.00050	<0.00050	<0.00050	0.00061	0.00082
Silicon	T-Si	-	-	-	-	-
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Strontium	T-Sr	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.000301	0.000163	0.00194	0.00190	0.00189
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.0092	0.0109	0.00138	0.00291	0.00121

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID			SW32	SW11
Sample Date			05-12-13	05-12-13
Sample Time			23:15	23:30
ALS ID			*7*	*9*
Physical Tests				
pH			7.61	5.24
Salinity	o/oo		26.0	20.8
Dissolved Anions				
Bromide	Br		25.8	19.7
Chloride	Cl		14200	11300
Fluoride	F		<2.0	<2.0
Sulphate	SO4		1980	1910
Nutrients				
Nitrate Nitrogen		N	<0.50	<0.50
Nitrite Nitrogen		N	2.22	1.96

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID		SW31D	SW32	SW32D	SW11	SW11D
Sample Date		05-12-13	05-12-13	05-12-13	05-12-13	05-12-13
Sample Time		23:00	23:15	23:15	23:30	23:30
ALS ID		*6*	*7*	*8*	*9*	*10*
Total Metals						
Aluminum	T-Al	<0.010	<0.010	<0.010	5.45	4.92
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	0.00144	0.00044	0.00033	0.00021	<0.00020
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Bismuth	T-Bi	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	0.000061	0.000060	0.000071	0.000586	0.000591
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.000058	0.000490	0.000945	0.0170	0.0168
Copper	T-Cu	0.000375	0.000354	0.000393	0.00244	0.00236
Iron	T-Fe	0.044	0.218	0.752	17.8	19.4
Lead	T-Pb	<0.000050	<0.000050	<0.000050	0.000300	0.000295
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	0.00616	0.0835	0.176	0.269	0.256
Mercury	T-Hg	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	0.0072	0.0078	0.0080	<0.0050	<0.0050
Nickel	T-Ni	0.000358	0.000957	0.000944	0.0280	0.0273
Phosphorus	T-P	-	-	-	-	-
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon	T-Si	-	-	-	-	-
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Strontium	T-Sr	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.00181	0.00188	0.00181	0.000680	0.000601
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.00211	0.00080	0.00295	0.0811	0.0811

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID			BH20L	BH16L	BH20H	BH8D	BH21
Sample Date			05-12-13	05-12-13	05-12-14	05-12-14	05-12-14
Sample Time			22:00	23:45	11:35	11:50	12:00
ALS ID			*11*	*12*	*13*	*14*	*15*
Physical Tests							
pH			3.83	2.85	3.32	5.95	6.60
Salinity	o/oo		6.1	11.2	5.9	1.9	1.4
Dissolved Anions							
Bromide	Br		1.2	6.2	0.28	<0.50	<0.50
Chloride	Cl		2550	5500	600	335	57.4
Fluoride	F		4.07	4.3	0.92	0.34	0.97
Sulphate	SO4		2560	2620	607	1740	1440
Nutrients							
Nitrate Nitrogen		N	<0.10	<0.50	<0.025	<0.050	<0.050
Nitrite Nitrogen		N	0.408	0.22	<0.0050	0.062	0.024

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID		BH20L	BH16L	BH20H	BH8D	BH21
Sample Date		05-12-13	05-12-13	05-12-14	05-12-14	05-12-14
Sample Time		22:00	23:45	11:35	11:50	12:00
ALS ID		*11*	*12*	*13*	*14*	*15*
Total Metals						
Aluminum	T-Al	38.9	34.5	56.3	<0.050	0.307
Antimony	T-Sb	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	T-As	0.00212	0.00074	0.00101	0.00130	0.00092
Barium	T-Ba	<0.10	<0.10	<0.10	<0.10	<0.10
Beryllium	T-Be	<0.050	<0.050	<0.050	<0.050	<0.050
Bismuth	T-Bi	<2.0	<2.0	<2.0	<2.0	<2.0
Boron	T-B	<1.0	1.1	<1.0	<1.0	<1.0
Cadmium	T-Cd	0.00658	0.00557	0.0113	<0.00025	0.000514
Calcium	T-Ca	375	577	386	494	612
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.281	0.230	0.350	0.0777	0.0834
Copper	T-Cu	0.0215	0.248	0.125	<0.00050	0.0208
Iron	T-Fe	337	239	245	330	24.6
Lead	T-Pb	0.00543	0.00536	0.00884	<0.00025	<0.000050
Lithium	T-Li	0.23	0.14	0.33	0.14	<0.10
Magnesium	T-Mg	176	318	183	51.3	42.4
Manganese	T-Mn	4.02	5.49	3.99	5.92	4.72
Mercury	T-Hg	0.000010	0.000011	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.385	0.287	0.475	0.0575	0.126
Phosphorus	T-P	<3.0	<3.0	<3.0	<3.0	<3.0
Potassium	T-K	54	79	59	28	<20
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silicon	T-Si	19.3	25.4	26.6	14.8	19.8
Silver	T-Ag	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium	T-Na	1300	3050	1340	168	48
Strontium	T-Sr	2.15	2.57	2.27	1.99	1.57
Thallium	T-Tl	<2.0	<2.0	<2.0	<2.0	<2.0
Tin	T-Sn	<0.30	<0.30	<0.30	<0.30	<0.30
Titanium	T-Ti	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	T-U	0.000204	0.00256	0.000658	0.000094	0.000652
Vanadium	T-V	<0.30	<0.30	<0.30	<0.30	<0.30
Zinc	T-Zn	1.49	1.10	1.58	0.0576	0.138

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID			BH15	BH22	BH16H	BH17
Sample Date			05-12-14	05-12-14	05-12-14	05-12-14
Sample Time			12:10	12:15	12:25	12:30
ALS ID			*16*	*17*	*18*	*19*
Physical Tests						
pH			6.14	5.64	3.29	3.16
Salinity	o/oo		2.0	4.1	11.9	17.7
Dissolved Anions						
Bromide	Br		<0.50	<1.0	6.7	14.9
Chloride	Cl		38.6	1330	6020	9380
Fluoride	F		0.94	2.15	2.7	<2.0
Sulphate	SO4		2620	2480	2300	1790
Nutrients						
Nitrate Nitrogen		N	<0.050	<0.10	<0.50	<0.50
Nitrite Nitrogen		N	0.011	0.226	1.18	1.76

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

RESULTS OF ANALYSIS - Seawater

Sample ID		BH15	BH22	BH16H	BH17
Sample Date		05-12-14	05-12-14	05-12-14	05-12-14
Sample Time		12:10	12:15	12:25	12:30
ALS ID		*16*	*17*	*18*	*19*
Total Metals					
Aluminum	T-Al	<0.050	4.28	26.3	13.9
Antimony	T-Sb	<2.0	<2.0	<2.0	<2.0
Arsenic	T-As	0.00305	0.00278	0.00076	0.00039
Barium	T-Ba	<0.10	<0.10	<0.10	<0.10
Beryllium	T-Be	<0.050	<0.050	<0.050	<0.050
Bismuth	T-Bi	<2.0	<2.0	<2.0	<2.0
Boron	T-B	<1.0	<1.0	1.3	1.9
Cadmium	T-Cd	<0.00050	0.00274	0.00391	0.000805
Calcium	T-Ca	684	616	386	251
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.299	0.326	0.162	0.0450
Copper	T-Cu	0.0013	0.059	0.0517	0.0786
Iron	T-Fe	631	314	289	32.1
Lead	T-Pb	<0.00050	0.00209	0.00271	0.000586
Lithium	T-Li	0.13	0.15	0.11	0.12
Magnesium	T-Mg	56.9	126	340	626
Manganese	T-Mn	7.61	10.4	4.00	0.528
Mercury	T-Hg	<0.000010	<0.000010	0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.397	0.458	0.232	0.0757
Phosphorus	T-P	<3.0	<3.0	<3.0	<3.0
Potassium	T-K	28	31	95	180
Selenium	T-Se	<0.00050	<0.00050	0.00098	<0.00050
Silicon	T-Si	13.5	17.6	14.8	23.3
Silver	T-Ag	<0.10	<0.10	<0.10	<0.10
Sodium	T-Na	21	767	3460	4910
Strontium	T-Sr	2.75	2.14	2.51	3.44
Thallium	T-Tl	<2.0	<2.0	<2.0	<2.0
Tin	T-Sn	<0.30	<0.30	<0.30	<0.30
Titanium	T-Ti	<0.10	<0.10	<0.10	<0.10
Uranium	T-U	0.00020	0.00147	0.00105	0.000801
Vanadium	T-V	<0.30	<0.30	<0.30	<0.30
Zinc	T-Zn	0.220	0.73	0.983	0.224

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. W8975

Appendix 1 - QUALITY CONTROL - Replicates

Seawater			SW11	SW11	BH8D	BH8D
			05-12-13 23:30	QC # 480427	05-12-14 11:50	QC # 480428
Dissolved Anions						
Bromide	Br		19.7	19.9	<0.50	<0.50
Chloride	Cl		11300	11300	335	336
Fluoride	F		<2.0	<2.0	0.34	0.34
Sulphate	SO4		1910	1910	1740	1740
Nutrients						
Nitrate Nitrogen		N	<0.50	<0.50	<0.050	<0.050
Nitrite Nitrogen		N	1.96	1.95	0.062	0.062

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

pH in Water

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Laboratory Location: ALS Environmental, Vancouver

Dissolved Anions in Water by Ion Chromatography

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Anions are determined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG17 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

Recommended Holding Time:
Sample: 28 days (bromide, chloride, fluoride, sulphate)
Sample: 2 days (nitrate, nitrite)
Reference: APHA and EPA

Laboratory Location: ALS Environmental, Vancouver

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) on a divinylbenzene polymer, is used to chelate and preconcentrate metals in

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seawater. Instrumental analysis is by inductively coupled plasma mass spectrometry (ICPMS) and/or routine atomic absorption spectrophotometry techniques (EPA 7000 series).

Recommended Holding Time:
Sample/Extract: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:
Sample: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Mercury in Seawater

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

Recommended Holding Time:
Sample: 28 days
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with the written approval of ALS Environmental.

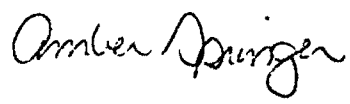
End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	February 15, 2006
ALS File No.	X1399
Report On:	201.01022.01 Task 0019 Seawater Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	January 28, 2006

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Natasha Markovic-Mirovic, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. X1399

REMARKS

The detection limits for some total metals were increased for the samples reported due to interferences encountered during analysis.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID			SW41	SW9	SW11
Sample Date			06-01-26	06-01-26	06-01-26
Sample Time			20:32	20:27	23:17
ALS ID			*1*	*3*	*5*
Physical Tests					
Hardness	CaCO3		-	-	-
pH			6.74	6.41	4.84
Salinity	o/oo		22.7	20.6	10.3
Dissolved Anions					
Bromide	Br		34.8	31.9	13.2
Chloride	Cl		12000	11000	4870
Fluoride	F		3.1	<2.0	<2.0
Sulphate	SO4		2140	2130	2510
Nutrients					
Nitrate Nitrogen		N	<0.50	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10	<0.10

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID		SW41	SW41D	SW9	SW9D	SW11
Sample Date		06-01-26	06-01-26	06-01-26	06-01-26	06-01-26
Sample Time		20:32	20:30	20:27	20:25	23:17
ALS ID		*1*	*2*	*3*	*4*	*5*
Total Metals						
Aluminum	T-Al	<0.010	<0.010	<0.020	<0.020	7.99
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	<0.00020	<0.00020	<0.00020	<0.00020	0.00043
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	<0.00025	0.00013	<0.00025	<0.00025	<0.0010
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.00439	0.00448	0.0230	0.0211	0.104
Copper	T-Cu	0.00069	0.00138	0.00195	0.00129	0.0080
Iron	T-Fe	11.0	11.5	37.6	30.0	193
Lead	T-Pb	<0.00025	<0.00010	<0.00025	<0.00025	<0.0010
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	0.610	0.598	1.98	1.85	2.13
Mercury	T-Hg	<0.000010	<0.000010	<0.000010	<0.000010	0.000025
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.0044	0.0042	0.0135	0.0135	0.161
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	<0.00050	0.00075	<0.00050	0.00057	<0.00050
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.00113	0.00118	0.000624	0.000595	0.00093
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	<0.0050	0.0077	0.0082	0.0070	0.458

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID			DupeA	PW1
Sample Date			06-01-26	06-01-26
Sample Time				21:37
ALS ID			*7*	*9*
Physical Tests				
Hardness		CaCO3	-	-
pH			4.78	6.58
Salinity	o/oo		10.3	25.5
Dissolved Anions				
Bromide		Br	12.8	42.4
Chloride		Cl	4740	14700
Fluoride		F	2.0	<2.0
Sulphate		SO4	2440	2270
Nutrients				
Nitrate Nitrogen		N	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10

Remarks regarding the analyses appear at the beginning of this report.
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A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID		SW11D	DupeA	DupeAD	PW1	PW1D
Sample Date		06-01-26	06-01-26	06-01-26	06-01-26	06-01-26
Sample Time		23:15			21:37	21:35
ALS ID		*6*	*7*	*8*	*9*	*10*
Total Metals						
Aluminum	T-Al	9.63	8.57	9.98	0.15	<0.010
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	<0.00020	0.00046	<0.00020	0.00033	<0.00020
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	0.0011	<0.0010	0.0011	<0.00050	<0.00025
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.107	0.107	0.113	<0.0010	<0.00050
Copper	T-Cu	0.0090	0.0074	0.0069	0.0022	0.00157
Iron	T-Fe	203	197	198	51.0	49.5
Lead	T-Pb	<0.0010	<0.0010	<0.0010	<0.00050	<0.00025
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	2.22	2.16	2.17	1.98	1.84
Mercury	T-Hg	0.000015	0.000014	0.000023	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.161	0.165	0.169	<0.0020	<0.0025
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	0.00066	<0.00050	0.00054	0.00065	<0.00050
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.00092	0.00095	0.00094	<0.00010	<0.000050
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.477	0.459	0.500	<0.010	<0.0050

Remarks regarding the analyses appear at the beginning of this report.
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A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID			PW2	BH16	BH20	SW33
Sample Date			06-01-26	06-01-26	06-01-26	06-01-26
Sample Time			22:02	23:35	23:50	22:32
ALS ID			*11*	*13*	*14*	*15*
Physical Tests						
Hardness	CaCO3		-	1510	1460	-
pH			7.57	-	-	6.64
Salinity	o/oo		27.2	2.8	2.6	19.7
Dissolved Anions						
Bromide	Br		43.2	-	-	29.3
Chloride	Cl		15000	-	-	10400
Fluoride	F		2.5	-	-	<2.0
Sulphate	SO4		2190	-	-	2000
Nutrients						
Nitrate Nitrogen		N	<0.50	-	-	<0.50
Nitrite Nitrogen		N	<0.10	-	-	<0.10

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID		PW2	PW2D	BH16	BH20	SW33
Sample Date		06-01-26	06-01-26	06-01-26	06-01-26	06-01-26
Sample Time		22:02	22:00	23:35	23:50	22:32
ALS ID		*11*	*12*	*13*	*14*	*15*
Total Metals						
Aluminum	T-Al	0.677	<0.010	16.6	71.4	0.267
Antimony	T-Sb	-	-	<0.050	<0.050	-
Arsenic	T-As	0.00095	0.00073	<0.050	<0.050	0.00081
Barium	T-Ba	-	-	<0.20	<0.20	-
Beryllium	T-Be	-	-	<0.10	<0.10	-
Boron	T-B	-	-	<1.0	<1.0	-
Cadmium	T-Cd	0.000050	0.000032	<0.0017	0.0082	<0.00025
Calcium	T-Ca	-	-	433	451	-
Chromium	T-Cr	<0.050	<0.050	<0.10	<0.10	<0.050
Cobalt	T-Co	0.000532	<0.000050	0.188	0.432	0.0232
Copper	T-Cu	0.00292	0.000760	0.25	<0.10	0.00388
Iron	T-Fe	1.04	<0.010	183	480	35.2
Lead	T-Pb	0.000296	<0.000050	<0.050	<0.050	0.00046
Lithium	T-Li	-	-	<0.50	<0.50	-
Magnesium	T-Mg	-	-	104	81.7	-
Manganese	T-Mn	0.190	0.0374	4.40	4.39	1.09
Mercury	T-Hg	<0.000010	<0.000010	0.000024	<0.000020	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.10	<0.10	<0.0050
Nickel	T-Ni	0.00171	0.000427	0.22	0.56	0.0274
Potassium	T-K	-	-	26	26	-
Selenium	T-Se	0.00057	0.00066	<0.10	<0.10	<0.00050
Silver	T-Ag	-	-	<0.0020	<0.0020	-
Sodium	T-Na	-	-	430	247	-
Thallium	T-Tl	-	-	<0.020	<0.020	-
Tin	T-Sn	-	-	<0.050	<0.050	-
Titanium	T-Ti	-	-	<0.10	<0.10	-
Uranium	T-U	0.00133	0.00138	<0.020	<0.020	0.00133
Vanadium	T-V	-	-	<0.30	<0.30	-
Zinc	T-Zn	0.00370	0.00157	0.76	2.28	0.0470

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID			SW34	SW35
Sample Date			06-01-26	06-01-26
Sample Time			22:42	22:52
ALS ID			*17*	*19*
Physical Tests				
Hardness		CaCO3	-	-
pH			6.67	7.37
Salinity	o/oo		20.3	24.7
Dissolved Anions				
Bromide		Br	30.4	38.3
Chloride		Cl	10700	13400
Fluoride		F	<2.0	<2.0
Sulphate		SO4	1970	2220
Nutrients				
Nitrate Nitrogen		N	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID		SW33D	SW34	SW34D	SW35	SW35D
Sample Date		06-01-26	06-01-26	06-01-26	06-01-26	06-01-26
Sample Time		22:30	22:42	22:40	22:52	22:50
ALS ID		*16*	*17*	*18*	*19*	*20*
Total Metals						
Aluminum	T-Al	<0.020	0.298	<0.020	<0.010	<0.010
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	<0.00020	0.00122	<0.00020	<0.00020	<0.00020
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	<0.00025	<0.00025	<0.00025	0.000079	0.000114
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.0267	0.0195	0.0182	0.00306	0.00360
Copper	T-Cu	0.00175	0.00579	0.00201	0.00054	0.00135
Iron	T-Fe	37.2	25.8	23.4	4.35	7.57
Lead	T-Pb	<0.00025	0.00093	<0.00025	<0.000050	<0.000050
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	1.12	1.04	1.10	0.688	0.755
Mercury	T-Hg	<0.000010	0.000014	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.0314	0.0225	0.0204	0.00219	0.00280
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	<0.00050	0.00059	0.00052	<0.00050	<0.00050
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.00101	0.00130	0.00168	0.00274	0.00288
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.0527	0.0359	0.0381	0.0029	0.0120

Remarks regarding the analyses appear at the beginning of this report.
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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID			SW36	SW37	SW38
Sample Date			06-01-26	06-01-26	06-01-26
Sample Time			23:27	15:52	20:57
ALS ID			*21*	*23*	*25*
Physical Tests					
Hardness	CaCO3		-	-	-
pH			6.24	7.52	6.52
Salinity	o/oo		20.3	27.4	18.8
Dissolved Anions					
Bromide	Br		30.6	41.1	27.4
Chloride	Cl		10700	14100	9580
Fluoride	F		2.4	2.2	<2.0
Sulphate	SO4		2210	1990	1930
Nutrients					
Nitrate Nitrogen		N	<0.50	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10	<0.10

Remarks regarding the analyses appear at the beginning of this report:
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID		SW36	SW36D	SW37	SW37D	SW38
Sample Date		06-01-26	06-01-26	06-01-26	06-01-26	06-01-26
Sample Time		23:27	23:25	15:52	15:50	20:57
ALS ID		*21*	*22*	*23*	*24*	*25*
Total Metals						
Aluminum	T-Al	1.11	0.275	0.202	<0.020	<0.030
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	<0.00020	<0.00020	0.00117	0.00128	<0.00020
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	<0.0010	0.00041	0.000079	0.000071	<0.00050
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.0408	0.0474	0.000086	<0.000050	0.0314
Copper	T-Cu	0.0206	0.0251	0.000645	0.00108	0.0022
Iron	T-Fe	73.6	89.3	0.161	<0.010	33.8
Lead	T-Pb	<0.0010	<0.00025	0.000127	<0.000050	<0.00050
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	0.785	0.892	0.00522	0.000993	2.46
Mercury	T-Hg	0.000014	0.000013	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	0.0069	0.0083	<0.0050
Nickel	T-Ni	0.064	0.0731	0.000497	0.000360	0.0288
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.00135	0.00103	0.00231	0.00224	0.00028
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.141	0.161	0.00144	0.00338	0.030

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID			SW39	SW40
Sample Date			06-01-26	06-01-26
Sample Time			21:17	20:55
ALS ID			*27*	*29*
Physical Tests				
Hardness		CaCO3	-	-
pH			6.98	7.22
Salinity	o/oo		21.3	20.9
Dissolved Anions				
Bromide		Br	33.4	32.1
Chloride		Cl	11600	11300
Fluoride		F	<2.0	2.2
Sulphate		SO4	1960	2120
Nutrients				
Nitrate Nitrogen		N	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

RESULTS OF ANALYSIS - Seawater

Sample ID		SW38D	SW39	SW39D	SW40	SW40D
Sample Date		06-01-26	06-01-26	06-01-26	06-01-26	06-01-26
Sample Time		20:55	21:17	21:15	20:55	20:53
ALS ID		*26*	*27*	*28*	*29*	*30*
Total Metals						
Aluminum	T-Al	<0.020	<0.010	<0.010	<0.010	<0.010
Antimony	T-Sb	-	-	-	-	-
Arsenic	T-As	<0.00020	<0.00020	<0.00020	0.00022	<0.00020
Barium	T-Ba	-	-	-	-	-
Beryllium	T-Be	-	-	-	-	-
Boron	T-B	-	-	-	-	-
Cadmium	T-Cd	<0.00025	<0.00025	0.00027	0.000070	<0.00010
Calcium	T-Ca	-	-	-	-	-
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.0298	0.00964	0.0105	0.00538	0.00915
Copper	T-Cu	0.00210	0.00089	0.00175	0.00032	0.00129
Iron	T-Fe	33.3	12.6	9.71	5.83	15.5
Lead	T-Pb	<0.00025	<0.00025	0.00018	<0.000050	<0.00010
Lithium	T-Li	-	-	-	-	-
Magnesium	T-Mg	-	-	-	-	-
Manganese	T-Mn	2.53	0.735	0.741	0.344	0.511
Mercury	T-Hg	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.0245	0.0119	0.0165	0.00415	0.0074
Potassium	T-K	-	-	-	-	-
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silver	T-Ag	-	-	-	-	-
Sodium	T-Na	-	-	-	-	-
Thallium	T-Tl	-	-	-	-	-
Tin	T-Sn	-	-	-	-	-
Titanium	T-Ti	-	-	-	-	-
Uranium	T-U	0.000282	0.00191	0.00198	0.00123	0.000881
Vanadium	T-V	-	-	-	-	-
Zinc	T-Zn	0.0248	<0.0050	0.543	0.0035	0.0109

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

Appendix 1 - QUALITY CONTROL - Replicates

Seawater			SW11	SW11	SW33	SW33
			06-01-26 23:17	QC # 485543	06-01-26 22:32	QC # 485544
Dissolved Anions						
Bromide	Br		13.2	13.1	29.3	29.3
Chloride	Cl		4870	4870	10400	10400
Fluoride	F		<2.0	<2.0	<2.0	<2.0
Sulphate	SO4		2510	2510	2000	2000
Nutrients						
Nitrate Nitrogen		N	<0.50	<0.50	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10	<0.10	<0.10
Total Metals						
Aluminum	T-Al		7.99	7.92	0.267	0.297
Arsenic	T-As		0.00043	0.00050	0.00081	0.00084
Cadmium	T-Cd		<0.0010	<0.0010	<0.00025	0.00032
Chromium	T-Cr		<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co		0.104	0.103	0.0232	0.0242
Copper	T-Cu		0.0080	0.0092	0.00388	0.00421
Iron	T-Fe		193	183	35.2	38.0
Lead	T-Pb		<0.0010	<0.0010	0.00046	0.00062
Manganese	T-Mn		2.13	2.08	1.09	1.11
Mercury	T-Hg		0.000025	0.000020	<0.000010	0.000010
Molybdenum	T-Mo		<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni		0.161	0.158	0.0274	0.0309
Selenium	T-Se		<0.00050	0.00056	<0.00050	<0.00050
Uranium	T-U		0.00093	0.00097	0.00133	0.00133
Zinc	T-Zn		0.458	0.434	0.0470	0.0517

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X1399

Appendix 1 - QUALITY CONTROL - Replicates

Seawater			SW36	SW36
			06-01-26 23:27	QC # 485545
Dissolved Anions				
Bromide	Br		30.6	30.6
Chloride	Cl		10700	10600
Fluoride	F		2.4	2.4
Sulphate	SO4		2210	2210
Nutrients				
Nitrate Nitrogen		N	<0.50	<0.50
Nitrite Nitrogen		N	<0.10	<0.10
Total Metals				
Aluminum	T-Al		1.11	1.20
Arsenic	T-As		<0.00020	<0.00020
Cadmium	T-Cd		<0.0010	<0.0010
Chromium	T-Cr		<0.050	<0.050
Cobalt	T-Co		0.0408	0.0388
Copper	T-Cu		0.0206	0.0227
Iron	T-Fe		73.6	73.7
Lead	T-Pb		<0.0010	<0.0010
Manganese	T-Mn		0.785	0.795
Mercury	T-Hg		0.000014	0.000010
Molybdenum	T-Mo		<0.0050	<0.0050
Nickel	T-Ni		0.064	0.062
Selenium	T-Se		<0.00050	<0.00050
Uranium	T-U		0.00135	0.00135
Zinc	T-Zn		0.141	0.133

Remarks regarding the analyses appear at the beginning of this report.
Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

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Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

pH in Water

This analysis is carried out using procedures adapted from APHA Method4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in"Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Laboratory Location: ALS Environmental, Vancouver

Dissolved Anions in Water by Ion Chromatography

This analysis is carried out using procedures adapted from APHA Method 4110 "Determination of Anions by Ion Chromatography" and EPA Method 300.0"Determination of Inorganic Anions by Ion Chromatography". Anions aredetermined by filtering the sample through a 0.45 micron membrane filter and injecting the filtrate onto a Dionex IonPac AG17 anion exchange column with a hydroxide eluent stream. Anions routinely determined by this method include: bromide, chloride, fluoride, nitrate, nitrite and sulphate.

Recommended Holding Time:
Sample: 28 days (bromide, chloride, fluoride, sulphate)
Sample: 2 days (nitrate, nitrite)
Reference: APHA and EPA

Laboratory Location: ALS Environmental, Vancouver

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) ona divinylbenzene polymer, is used to chelate and preconcentrate metals in

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seawater. Instrumental analysis is by inductively coupled plasma massspectrometry (ICPMS) and/or routine atomic absorption spectrophotometrytechniques (EPA 7000 series).

Recommended Holding Time:
Sample/Extract: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental ProtectionAgency and the Puget Sound Water Quality Authority, 1995. The proceduresmay involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPAMethod 6010B), and/or inductively coupled plasma - mass spectrometry (EPAMethod 6020).

Recommended Holding Time:
Sample: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Mercury in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental ProtectionAgency and the Puget Sound Water Quality Authority, 1995. The procedureinvolves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescencespectrophotometry (EPA Method 245.7).

Recommended Holding Time:
Sample: 28 days
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998published by the American Public Health Association, and with proceduresadapted from "Test Methods for Evaluating Solid Waste" SW-846 published by

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Appendix 2 - METHODOLOGY - Continued

the United States Environmental Protection Agency (EPA). The proceduresmay involve preliminary sample treatment by acid digestion, using eitherhotplate or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma -mass spectrometry (EPA Method 6020).

Recommended Holding Time:
Sample: 6 months
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Mercury in Water

This analysis is carried out using procedures adapted from "StandardMethods for the Examination of Water and Wastewater" 20th Edition 1998 published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

Recommended Holding Time:
Sample: 28 days
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	March 6, 2006
ALS File No.	X2098
Report On:	201.01022.01 Task 0019 Seawater Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	February 14, 2006

ALS ENVIRONMENTAL
per:

Amber Springer, B.Sc. - Project Chemist
Jerry Holzbecher, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		BH15E	BH15ED	BH16E	BH16ED	BH20E
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		19:07	19:07	19:18	19:18	18:43
ALS ID		*1*	*2*	*3*	*4*	*5*
Physical Tests						
pH		5.90	-	3.43	-	3.79
Salinity	o/oo	1.9	-	2.7	-	2.9
Dissolved Anions						
Chloride	Cl	8.09	-	501	-	415
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	-	654	-	394	-
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		BH20ED	BH15L	BH15LD	BH16L	BH16LD
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		18:43	22:32	22:32	22:58	22:58
ALS ID		*6*	*7*	*8*	*9*	*10*
Physical Tests						
pH		-	5.89	-	3.13	-
Salinity	o/oo	-	1.8	-	2.6	-
Dissolved Anions						
Chloride	Cl	-	5.18	-	417	-
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	707	-	613	-	319
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		BH20L	BH20LD	BH15F	BH15FD	BH16F
Sample Date		06-02-10	06-02-10	06-02-11	06-02-11	06-02-11
Sample Time		22:00	22:00	01:39	01:39	01:25
ALS ID		*11*	*12*	*13*	*14*	*15*
Physical Tests						
pH		4.19	-	5.91	-	3.08
Salinity	o/oo	2.7	-	1.9	-	2.4
Dissolved Anions						
Chloride	Cl	331	-	5.34	-	368
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	-	757	-	671	-
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		BH16FD	BH20F	BH20FD	OW1	OW1D
Sample Date		06-02-11	06-02-11	06-02-11	06-02-10	06-02-10
Sample Time		01:25	01:54	01:54	21:14	21:14
ALS ID		*16*	*17*	*18*	*19*	*20*
Physical Tests						
pH		-	4.22	-	6.52	-
Salinity	o/oo	-	2.5	-	21.9	-
Dissolved Anions						
Chloride	Cl	-	194	-	11900	-
Total Metals						
Aluminum	T-Al	-	-	-	0.016	-
Arsenic	T-As	-	-	-	<0.00020	-
Cadmium	T-Cd	-	-	-	0.000057	-
Chromium	T-Cr	-	-	-	<0.050	-
Cobalt	T-Co	-	-	-	0.000102	-
Copper	T-Cu	-	-	-	0.000449	-
Iron	T-Fe	249	-	791	0.063	<0.30
Lead	T-Pb	-	-	-	<0.000050	-
Manganese	T-Mn	-	-	-	0.00616	-
Mercury	T-Hg	-	-	-	<0.000010	-
Molybdenum	T-Mo	-	-	-	0.0068	-
Nickel	T-Ni	-	-	-	0.000364	-
Selenium	T-Se	-	-	-	<0.00050	-
Uranium	T-U	-	-	-	0.00175	-
Zinc	T-Zn	-	-	-	0.00109	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		OW2	OW2D	OW3	OW3D	OW4
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		21:19	21:19	21:30	21:30	21:30
ALS ID		*21*	*22*	*23*	*24*	*25*
Physical Tests						
pH		7.27	-	7.50	-	7.60
Salinity	o/oo	21.4	-	24.3	-	22.7
Dissolved Anions						
Chloride	Cl	11300	-	12800	-	12400
Total Metals						
Aluminum	T-Al	0.024	-	0.012	-	0.019
Arsenic	T-As	0.00090	-	0.00051	-	0.00099
Cadmium	T-Cd	0.000051	-	0.000061	-	0.000049
Chromium	T-Cr	<0.050	-	<0.050	-	<0.050
Cobalt	T-Co	<0.000050	-	0.000404	-	<0.000050
Copper	T-Cu	0.000445	-	0.000368	-	0.000386
Iron	T-Fe	0.043	<0.30	0.292	<0.30	0.032
Lead	T-Pb	<0.000050	-	<0.000050	-	<0.000050
Manganese	T-Mn	0.00363	-	0.0485	-	0.00384
Mercury	T-Hg	<0.000010	-	<0.000010	-	<0.000010
Molybdenum	T-Mo	0.0064	-	0.0063	-	0.0062
Nickel	T-Ni	0.000443	-	0.000617	-	0.000291
Selenium	T-Se	<0.00050	-	0.00100	-	<0.00050
Uranium	T-U	0.00164	-	0.00166	-	0.00167
Zinc	T-Zn	0.00103	-	0.00081	-	0.00101

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		OW4D	OW5	OW5D	OW6	OW6D
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		21:30	21:30	21:30	21:27	21:27
ALS ID		*26*	*27*	*28*	*29*	*30*
Physical Tests						
pH		-	7.64	-	7.46	-
Salinity	o/oo	-	22.2	-	24.1	-
Dissolved Anions						
Chloride	Cl	-	12300	-	13300	-
Total Metals						
Aluminum	T-Al	-	0.023	-	0.023	-
Arsenic	T-As	-	0.00099	-	0.00058	-
Cadmium	T-Cd	-	0.000058	-	0.000067	-
Chromium	T-Cr	-	<0.050	-	<0.050	-
Cobalt	T-Co	-	<0.000050	-	0.00103	-
Copper	T-Cu	-	0.000414	-	0.000466	-
Iron	T-Fe	<0.30	0.028	<0.30	3.22	4.57
Lead	T-Pb	-	<0.000050	-	<0.000050	-
Manganese	T-Mn	-	0.00331	-	0.383	-
Mercury	T-Hg	-	<0.000010	-	<0.000010	-
Molybdenum	T-Mo	-	0.0063	-	0.0062	-
Nickel	T-Ni	-	0.000314	-	0.00109	-
Selenium	T-Se	-	<0.00050	-	<0.00050	-
Uranium	T-U	-	0.00124	-	0.00180	-
Zinc	T-Zn	-	0.00081	-	0.00125	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		OW7	OW7D	OW8	OW8D	SW9
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		21:32	21:32	21:36	21:36	23:00
ALS ID		*31*	*32*	*33*	*34*	*35*
Physical Tests						
pH		7.59	-	6.78	-	6.20
Salinity	o/oo	25.1	-	21.8	-	16.4
Dissolved Anions						
Chloride	Cl	13900	-	11700	-	8760
Total Metals						
Aluminum	T-Al	0.023	-	0.022	-	<0.15
Arsenic	T-As	0.00080	-	0.00092	-	<0.00020
Cadmium	T-Cd	0.000059	-	0.000049	-	<0.00025
Chromium	T-Cr	<0.050	-	<0.050	-	<0.050
Cobalt	T-Co	0.000212	-	<0.000050	-	0.0302
Copper	T-Cu	0.000459	-	0.000426	-	0.00198
Iron	T-Fe	0.279	<0.30	0.032	<0.30	49.9
Lead	T-Pb	<0.000050	-	<0.000050	-	<0.00025
Manganese	T-Mn	0.0969	-	0.00325	-	1.93
Mercury	T-Hg	<0.000010	-	<0.000010	-	<0.000010
Molybdenum	T-Mo	0.0074	-	0.0071	-	<0.0050
Nickel	T-Ni	0.000525	-	0.000302	-	0.0189
Selenium	T-Se	<0.00050	-	<0.00050	-	<0.00050
Uranium	T-U	0.00173	-	0.00163	-	0.000214
Zinc	T-Zn	0.00163	-	0.00107	-	0.0112

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A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW9D	SW11	SW11D	SW33	SW33D
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		23:00	22:30	22:30	22:00	22:00
ALS ID		*36*	*37*	*38*	*39*	*40*
Physical Tests						
pH		-	6.01	-	6.18	-
Salinity	o/oo	-	8.8	-	15.0	-
Dissolved Anions						
Chloride	Cl	-	4150	-	7910	-
Total Metals						
Aluminum	T-Al	<0.15	0.74	0.67	0.77	<0.30
Arsenic	T-As	<0.00020	0.00030	0.00023	0.00048	<0.00020
Cadmium	T-Cd	<0.00025	<0.0010	<0.0010	<0.00050	<0.00050
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.0283	0.0728	0.0754	0.0413	0.0431
Copper	T-Cu	0.00187	0.0039	0.0034	0.0069	0.0028
Iron	T-Fe	43.8	164	166	67.6	65.7
Lead	T-Pb	<0.00025	<0.0010	<0.0010	0.00052	<0.00050
Manganese	T-Mn	1.94	1.72	1.77	1.45	1.48
Mercury	T-Hg	<0.000010	<0.000010	<0.000010	0.000018	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nickel	T-Ni	0.0174	0.109	0.110	0.0539	0.0557
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium	T-U	0.000212	<0.00020	<0.00020	0.00088	0.00061
Zinc	T-Zn	0.0115	0.281	0.307	0.116	0.118

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A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW38B	SW38BD	SW40	SW40D	SW37
Sample Date		06-02-10	06-02-10	06-02-10	06-02-10	06-02-10
Sample Time		22:30	22:30	23:30	23:30	17:00
ALS ID		*41*	*42*	*43*	*44*	*45*
Physical Tests						
pH		6.50	-	6.49	-	-
Salinity	o/oo	16.3	-	18.9	-	-
Dissolved Anions						
Chloride	Cl	8550	-	9790	-	12600
Total Metals						
Aluminum	T-Al	<0.15	<0.15	0.22	<0.15	0.050
Arsenic	T-As	<0.00020	<0.00020	0.00093	<0.00020	0.00087
Cadmium	T-Cd	<0.00025	<0.00025	<0.00025	<0.00025	0.000053
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.0203	0.0184	0.0150	0.0162	<0.000050
Copper	T-Cu	0.00169	0.00141	0.00384	0.00178	0.000565
Iron	T-Fe	16.4	14.5	28.0	26.3	0.060
Lead	T-Pb	<0.00025	<0.00025	0.00099	<0.00025	0.000057
Manganese	T-Mn	2.13	2.00	0.705	0.750	0.00333
Mercury	T-Hg	<0.000010	<0.000010	0.000015	<0.000010	<0.000010
Molybdenum	T-Mo	<0.0050	<0.0050	<0.0050	<0.0050	0.0070
Nickel	T-Ni	0.0189	0.0172	0.0148	0.0161	0.000333
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium	T-U	0.000610	0.000583	0.000693	0.000519	0.00169
Zinc	T-Zn	0.0077	0.0090	0.0138	0.0166	0.00142

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A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW37D	SW9E	SW9ED	SW9L	SW9LD
Sample Date		06-02-10	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		17:00	19:00	19:00	21:30	21:30
ALS ID		*46*	*47*	*48*	*49*	*50*
Physical Tests						
pH		-	6.49	-	6.26	-
Salinity	o/oo	-	18.2	-	17.5	-
Dissolved Anions						
Chloride	Cl	-	9980	-	9200	-
Total Metals						
Aluminum	T-Al	<0.010	-	-	-	-
Arsenic	T-As	0.00082	-	-	-	-
Cadmium	T-Cd	0.000060	-	-	-	-
Chromium	T-Cr	<0.050	-	-	-	-
Cobalt	T-Co	<0.000050	-	-	-	-
Copper	T-Cu	0.000894	-	-	-	-
Iron	T-Fe	<0.010	36.6	42.5	53.0	49.0
Lead	T-Pb	<0.000050	-	-	-	-
Manganese	T-Mn	0.00224	-	-	-	-
Mercury	T-Hg	<0.000010	-	-	-	-
Molybdenum	T-Mo	0.0065	-	-	-	-
Nickel	T-Ni	0.000281	-	-	-	-
Selenium	T-Se	<0.00050	-	-	-	-
Uranium	T-U	0.000519	-	-	-	-
Zinc	T-Zn	0.00345	-	-	-	-

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A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW9F1	SW9F1D	SW9F2	SW9F2D	SW9F3
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		22:30	22:30	23:00	23:00	23:30
ALS ID		*51*	*52*	*53*	*54*	*55*
Physical Tests						
pH		6.23	-	6.24	-	6.25
Salinity	o/oo	17.1	-	17.6	-	17.9
Dissolved Anions						
Chloride	Cl	8960	-	9580	-	9550
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	52.5	51.7	54.7	41.8	56.9
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW9F3D	SW11E	SW11ED	SW11L	SW11LD
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		23:30	17:00	17:00	22:25	22:25
ALS ID		*56*	*57*	*58*	*59*	*60*
Physical Tests						
pH		-	5.51	-	5.89	-
Salinity	o/oo	-	11.2	-	9.9	-
Dissolved Anions						
Chloride	Cl	-	5600	-	4850	-
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	44.2	215	223	147	158
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW11F	SW11FD	SW42	SW42D	SW43
Sample Date		06-02-10	06-02-10	06-02-09	06-02-09	06-02-09
Sample Time		00:00	00:00	21:00	21:00	21:00
ALS ID		*61*	*62*	*63*	*64*	*65*
Physical Tests						
pH		5.68	-	6.23	-	6.15
Salinity	o/oo	7.8	-	11.8	-	12.1
Dissolved Anions						
Chloride	Cl	3630	-	5760	-	6200
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	224	226	33.5	37.1	70.2
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		SW43D	SW44	SW44D	PW3-25	PW3-25D
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		21:00	20:56	20:56	20:20	20:20
ALS ID		*66*	*67*	*68*	*69*	*70*
Physical Tests						
pH		-	6.40	-	6.57	-
Salinity	o/oo	-	14.8	-	21.0	-
Dissolved Anions						
Chloride	Cl	-	7720	-	11400	-
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	64.8	22.3	14.2	44.9	15.7
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		PW3-50	PW3-50D	PW3-75	PW3-75D	PW3-100
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		19:55	19:55	19:45	19:45	20:20
ALS ID		*71*	*72*	*73*	*74*	*75*
Physical Tests						
pH		6.72	-	6.48	-	7.05
Salinity	o/oo	22.8	-	21.9	-	22.9
Dissolved Anions						
Chloride	Cl	12500	-	11800	-	12200
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	-	24.7	-	102	11.7
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

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< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		PW3-100D	PW4-25	PW4-25D	PW4-50	PW4-50D
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		20:20	21:56	21:56	21:50	21:50
ALS ID		*76*	*77*	*78*	*79*	*80*
Physical Tests						
pH		-	7.31	-	7.46	-
Salinity	o/oo	-	19.7	-	19.5	-
Dissolved Anions						
Chloride	Cl	-	10900	-	10700	-
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	1.94	10.6	12.7	-	12.1
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		PW4-75	PW4-75D	PW4-100	PW4-100D	PW4-150
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		21:43	21:43	21:35	21:35	21:27
ALS ID		*81*	*82*	*83*	*84*	*85*
Physical Tests						
pH		7.56	-	7.57	-	7.46
Salinity	o/oo	18.8	-	19.1	-	18.5
Dissolved Anions						
Chloride	Cl	10500	-	10300	-	10100
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	-	11.4	-	13.7	-
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		PW4-150D	PW4-175	PW4-175D	PW5-25	PW5-25D
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		21:27	21:24	21:24	23:40	23:40
ALS ID		*86*	*87*	*88*	*89*	*90*
Physical Tests						
pH		-	7.28	-	6.28	-
Salinity	o/oo	-	19.8	-	10.3	-
Dissolved Anions						
Chloride	Cl	-	10700	-	5210	-
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	17.2	26.4	28.1	154	168
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		PW5-50	PW5-50D	PW5-75	PW5-75D	PW5-100
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		23:30	23:30	23:20	23:20	22:45
ALS ID		*91*	*92*	*93*	*94*	*95*
Physical Tests						
pH		6.43	-	6.56	-	6.70
Salinity	o/oo	13.1	-	14.9	-	15.4
Dissolved Anions						
Chloride	Cl	7030	-	8400	-	8260
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	-	55.2	-	6.77	-
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		PW5-100D	PW5-150	PW5-150D	PW5-175	PW5-175D
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		22:45	23:55	23:55	23:47	23:47
ALS ID		*96*	*97*	*98*	*99*	*100*
Physical Tests						
pH		-	6.76	-	6.75	-
Salinity	o/oo	-	17.7	-	17.2	-
Dissolved Anions						
Chloride	Cl	-	9930	-	9750	-
Total Metals						
Aluminum	T-Al	-	-	-	-	-
Arsenic	T-As	-	-	-	-	-
Cadmium	T-Cd	-	-	-	-	-
Chromium	T-Cr	-	-	-	-	-
Cobalt	T-Co	-	-	-	-	-
Copper	T-Cu	-	-	-	-	-
Iron	T-Fe	24.5	-	61.1	71.4	61.6
Lead	T-Pb	-	-	-	-	-
Manganese	T-Mn	-	-	-	-	-
Mercury	T-Hg	-	-	-	-	-
Molybdenum	T-Mo	-	-	-	-	-
Nickel	T-Ni	-	-	-	-	-
Selenium	T-Se	-	-	-	-	-
Uranium	T-U	-	-	-	-	-
Zinc	T-Zn	-	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		DUPAD	DUPB	DUPD	DUPDD
Sample Date		06-02-09	06-02-09	06-02-09	06-02-09
Sample Time		21:43	23:55	21:27	21:27
ALS ID		*102*	*103*	*104*	*105*
Physical Tests					
pH		-	6.79	7.07	-
Salinity	o/oo	-	17.4	22.1	-
Dissolved Anions					
Chloride	Cl	-	9840	12800	-
Total Metals					
Aluminum	T-Al	-	-	0.035	-
Arsenic	T-As	-	-	0.00055	-
Cadmium	T-Cd	-	-	0.000073	-
Chromium	T-Cr	-	-	<0.050	-
Cobalt	T-Co	-	-	0.00212	-
Copper	T-Cu	-	-	0.00092	-
Iron	T-Fe	13.5	81.0	5.14	4.27
Lead	T-Pb	-	-	0.000085	-
Manganese	T-Mn	-	-	0.586	-
Mercury	T-Hg	-	-	<0.000010	-
Molybdenum	T-Mo	-	-	0.0055	-
Nickel	T-Ni	-	-	0.00168	-
Selenium	T-Se	-	-	0.00073	-
Uranium	T-U	-	-	0.00184	-
Zinc	T-Zn	-	-	0.0024	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

RESULTS OF ANALYSIS - Seawater

Sample ID		DUPE	DUPED	DUPF	DUPFD
Sample Date		06-02-10	06-02-10	06-02-11	06-02-11
Sample Time		22:00	22:00	01:25	01:25
ALS ID		*106*	*107*	*108*	*109*
Physical Tests					
pH		4.38	-	3.08	-
Salinity	o/oo	2.7	-	2.5	-
Dissolved Anions					
Chloride	Cl	327	-	377	-
Total Metals					
Aluminum	T-Al	-	-	-	-
Arsenic	T-As	-	-	-	-
Cadmium	T-Cd	-	-	-	-
Chromium	T-Cr	-	-	-	-
Cobalt	T-Co	-	-	-	-
Copper	T-Cu	-	-	-	-
Iron	T-Fe	-	766	-	243
Lead	T-Pb	-	-	-	-
Manganese	T-Mn	-	-	-	-
Mercury	T-Hg	-	-	-	-
Molybdenum	T-Mo	-	-	-	-
Nickel	T-Ni	-	-	-	-
Selenium	T-Se	-	-	-	-
Uranium	T-U	-	-	-	-
Zinc	T-Zn	-	-	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		BH16ED	BH16ED	BH15L	BH15L
		06-02-10 19:18	QC # 487772	06-02-10 22:32	QC # 487773
Physical Tests					
pH		-	-	5.89	5.95
Salinity	o/oo	-	-	1.8	1.8
Dissolved Anions					
Chloride	Cl	-	-	5.18	5.22
Total Metals					
Iron	T-Fe	394	403	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		OW1	OW1	OW2	OW2
		06-02-10 21:14	QC # 487774	06-02-10 21:19	QC # 487775
Physical Tests					
pH		-	-	7.27	7.43
Salinity	o/oo	-	-	21.4	21.5
Dissolved Anions					
Chloride	Cl	11900	12000	11300	11600
Total Metals					
Aluminum	T-Al	0.016	0.038	0.024	0.023
Arsenic	T-As	<0.00020	0.00090	0.00090	0.00090
Cadmium	T-Cd	0.000057	0.000053	0.000051	0.000057
Chromium	T-Cr	<0.050	<0.050	<0.050	<0.050
Cobalt	T-Co	0.000102	0.000083	<0.000050	<0.000050
Copper	T-Cu	0.000449	0.000404	0.000445	0.000565
Iron	T-Fe	0.063	0.056	0.043	0.044
Lead	T-Pb	<0.000050	<0.000050	<0.000050	<0.000050
Manganese	T-Mn	0.00616	0.00593	0.00363	0.00384
Mercury	T-Hg	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum	T-Mo	0.0068	0.0066	0.0064	0.0067
Nickel	T-Ni	0.000364	0.000357	0.000443	0.000420
Selenium	T-Se	<0.00050	<0.00050	<0.00050	<0.00050
Uranium	T-U	0.00175	0.00170	0.00164	0.00173
Zinc	T-Zn	0.00109	0.00086	0.00103	0.00124

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		SW37	SW37	SW9E	SW9E
		06-02-10 17:00	QC # 487776	06-02-09 19:00	QC # 487777
Physical Tests					
pH		-	-	6.49	6.35
Salinity	o/oo	-	-	18.2	18.3
Dissolved Anions					
Chloride	Cl	-	-	9980	9710
Total Metals					
Aluminum	T-Al	0.050	0.046	-	-
Arsenic	T-As	0.00087	0.00092	-	-
Cadmium	T-Cd	0.000053	0.000054	-	-
Chromium	T-Cr	<0.050	<0.050	-	-
Cobalt	T-Co	<0.000050	0.000053	-	-
Copper	T-Cu	0.000565	0.000531	-	-
Iron	T-Fe	0.060	0.060	36.6	34.7
Lead	T-Pb	0.000057	0.000056	-	-
Manganese	T-Mn	0.00333	0.00330	-	-
Mercury	T-Hg	<0.000010	<0.000010	-	-
Molybdenum	T-Mo	0.0070	0.0058	-	-
Nickel	T-Ni	0.000333	0.000336	-	-
Selenium	T-Se	<0.00050	<0.00050	-	-
Zinc	T-Zn	0.00142	0.00160	-	-

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		SW11L	SW11L	SW44	SW44
		06-02-09 22:25	QC # 487778	06-02-09 20:56	QC # 487779
Physical Tests					
pH		5.89	5.96	6.40	6.45
Salinity	o/oo	9.9	9.9	14.8	14.6
Dissolved Anions					
Chloride	Cl	4850	4850	7720	7650
Total Metals					
Iron	T-Fe	147	142	22.3	23.2

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

File No. X2098

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		PW3-75D	PW3-75D	PW4-100D	PW4-100D
		06-02-09 19:45	QC # 487780	06-02-09 21:35	QC # 487781
Total Metals					
Iron	T-Fe	102	108	13.7	17.1

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 1 - QUALITY CONTROL - Replicates

Seawater		PW4-175D	PW4-175D
		06-02-09 21:24	QC # 487782
Total Metals			
Iron	T-Fe	28.1	29.9

Results are expressed as milligrams per litre except where noted.
< = Less than the detection limit indicated.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

pH in Water

This analysis is carried out using procedures adapted from APHA Method4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in"Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Laboratory Location: ALS Environmental, Vancouver

Chloride in Water

This analysis is carried out using procedures adapted from APHA Method 4500"Chloride". Chloride is determined using the ferricyanide colourimetric method.

Recommended Holding Time:
Sample: 28 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series),inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

A Campbell Brothers Limited Company

Sample: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) ona divinylbenzene polymer, is used to chelate and preconcentrate metals inseawater. Instrumental analysis is by inductively coupled plasma massspectrometry (ICPMS) and/or routine atomic absorption spectrophotometrytechniques (EPA 7000 series).

Recommended Holding Time:
Sample/Extract: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Mercury in Seawater

This analysis is carried out using procedures adapted from "RecommendedGuidelines for Measuring Metals in Puget Sound Marine Water, Sediment, andTissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescencespectrophotometry (EPA Method 245.7).

Recommended Holding Time:
Sample: 28 days
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with thewritten approval of ALS Environmental.

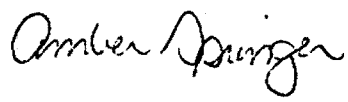
End of Report

A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

Date:	May 3, 2006
ALS File No.	X4111
Report On:	201.01022.01 Task 0019 Seawater/Filter/Soil Analysis
Report To:	**SEACOR Environmental Inc.** #6 - 40 Cadillac Ave Victoria, BC V8Z 1T2
Attention:	**Mr. Michael J. McLeay**
Received:	April 6, 2006

ALS ENVIRONMENTAL
per:



Amber Springer, B.Sc. - Project Chemist
Jerry Holzbecher, B.Sc. - Project Chemist

ALS CANADA LTD.
1988 Triumph Street, Vancouver, BC Canada V5L 1K5
Phone: 604-253-4188 Fax: 604-253-6700 Website: www.alsenviro.com

REMARKS

The detection limits for some total and dissolved metals were increased for the samples reported due to interferences encountered during analysis.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Seawater[1]

Sample ID		BH 8D	BH 8S	BH 21	BH 15	BH 17
Sample Date		06-04-04	06-04-04	06-04-04	06-04-04	06-04-04
Sample Time		14:20	14:30	14:55	15:20	15:50
ALS ID		*1*	*2*	*3*	*4*	*5*
Physical Tests						
pH		6.34	6.04	6.47	6.32	3.33
Salinity	o/oo	1.8	2.1	1.2	1.4	7.5
Dissolved Anions						
Chloride	Cl	97.8	466	147	6.05	3440

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Seawater[1]

Sample ID		BH 8D	BH 8S	BH 21	BH 15	BH 17
Sample Date		06-04-04	06-04-04	06-04-04	06-04-04	06-04-04
Sample Time		14:20	14:30	14:55	15:20	15:50
ALS ID		*1*	*2*	*3*	*4*	*5*
Dissolved Metals						
Aluminum	D-Al	<0.10	1.57	3.59	0.17	58.0
Arsenic	D-As	0.00051	<0.00020	<0.00020	0.00055	0.00150
Cadmium	D-Cd	<0.00050	0.00238	0.000935	0.00204	0.0039
Cobalt	D-Co	0.0631	0.00966	0.0674	0.253	0.339
Copper	D-Cu	0.0015	0.0133	0.0912	0.0139	0.138
Iron	D-Fe	208	<0.010	20.6	351	896
Lead	D-Pb	<0.00050	0.000081	<0.000050	<0.00050	<0.0020
Manganese	D-Mn	5.10	0.258	3.56	7.45	5.78
Nickel	D-Ni	0.0681	0.101	0.0814	0.417	0.529
Uranium	D-U	0.00013	<0.000050	0.000837	0.00034	0.00393
Zinc	D-Zn	0.138	0.298	0.130	0.592	1.60

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Seawater[1]

Sample ID		BH 16	BH 20	SW 11	SW 9
Sample Date		06-04-04	06-04-04	06-04-04	06-04-04
Sample Time		17:00	17:35	17:10	18:00
ALS ID		*6*	*7*	*8*	*10*
Physical Tests					
pH		3.05	3.66	4.44	6.21
Salinity	o/oo	3.3	5.4	15.8	18.4
Dissolved Anions					
Chloride	Cl	656	2070	8450	10400

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Seawater[1]

Sample ID		SW 11	SW 9
Sample Date		06-04-04	06-04-04
Sample Time		17:10	18:00
ALS ID		*8*	*10*
Total Metals			
Aluminum	T-Al	11.3	<1.0
Arsenic	T-As	0.00043	<0.00020
Cadmium	T-Cd	0.00089	<0.00010
Cobalt	T-Co	0.0910	0.0209
Copper	T-Cu	0.0062	0.00074
Iron	T-Fe	242	49.0
Lead	T-Pb	0.00073	<0.00010
Manganese	T-Mn	1.85	1.52
Nickel	T-Ni	0.129	0.0131
Uranium	T-U	0.00113	0.000458
Zinc	T-Zn	0.474	0.0058

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Seawater[1]

Sample ID		BH 16	BH 20	SW 11D
Sample Date		06-04-04	06-04-04	06-04-04
Sample Time		17:00	17:35	17:15
ALS ID		*6*	*7*	*9*
Dissolved Metals				
Aluminum	D-Al	20.7	118	11.4
Arsenic	D-As	0.00116	0.00141	<0.00020
Cadmium	D-Cd	0.00177	0.0116	0.00099
Cobalt	D-Co	0.168	0.415	0.0907
Copper	D-Cu	0.263	0.0616	0.0059
Iron	D-Fe	298	435	292
Lead	D-Pb	0.00220	0.0055	<0.00050
Manganese	D-Mn	4.03	4.07	1.97
Nickel	D-Ni	0.209	0.554	0.127
Uranium	D-U	0.00172	0.00041	0.00112
Zinc	D-Zn	0.877	2.06	0.480

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Seawater[1]

Sample ID		SW 9D
Sample Date		06-04-04
Sample Time		18:05
ALS ID		*11*
Dissolved Metals		
Aluminum	D-Al	<0.10
Arsenic	D-As	<0.00020
Cadmium	D-Cd	0.000067
Cobalt	D-Co	0.0214
Copper	D-Cu	0.000796
Iron	D-Fe	42.6
Lead	D-Pb	<0.000050
Manganese	D-Mn	1.58
Nickel	D-Ni	0.0136
Uranium	D-U	0.000459
Zinc	D-Zn	0.00523

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Filter[1]

Sample ID		SHEEN E	SHEEN N
Sample Date		06-04-04	06-04-04
Sample Time		18:30	18:50
ALS ID		*12*	*13*
Total Metals			
Aluminum	T-Al	<20	30
Antimony	T-Sb	<20	<20
Arsenic	T-As	<20	<20
Barium	T-Ba	<1.0	<1.0
Beryllium	T-Be	<0.50	<0.50
Bismuth	T-Bi	<20	<20
Cadmium	T-Cd	<1.0	<1.0
Calcium	T-Ca	266	293
Chromium	T-Cr	<1.0	<1.0
Cobalt	T-Co	<1.0	<1.0
Copper	T-Cu	<1.0	<1.0
Iron	T-Fe	1370	1070
Lead	T-Pb	<5.0	<5.0
Lithium	T-Li	<1.0	<1.0
Magnesium	T-Mg	176	376
Manganese	T-Mn	1.94	2.62
Molybdenum	T-Mo	<3.0	<3.0
Nickel	T-Ni	<5.0	<5.0
Phosphorus	T-P	<30	<30
Potassium	T-K	<200	<200
Selenium	T-Se	<20	<20
Silver	T-Ag	<1.0	<1.0
Sodium	T-Na	1310	2870
Strontium	T-Sr	2.27	4.18
Thallium	T-Tl	<20	<20
Tin	T-Sn	<3.0	<3.0
Titanium	T-Ti	<1.0	1.7
Vanadium	T-V	<3.0	<3.0
Zinc	T-Zn	<0.50	0.65

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as micrograms except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Sediment/Soil[1]

Sample ID	PSED 1	PSED 2	PSED 3	PSED 4	PSED 5
Sample Date	06-04-04	06-04-04	06-04-04	06-04-04	06-04-04
Sample Time	16:40	16:20	18:10	18:15	18:20
ALS ID	*14*	*15*	*16*	*17*	*18*
Physical Tests					
pH	4.60	6.32	6.35	5.65	6.76

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per dry kilogram except where noted.

A Campbell Brothers Limited Company

File No. X4111

RESULTS OF ANALYSIS - Sediment/Soil[1]

Sample ID		PSED 1	PSED 2	PSED 3	PSED 4	PSED 5
Sample Date		06-04-04	06-04-04	06-04-04	06-04-04	06-04-04
Sample Time		16:40	16:20	18:10	18:15	18:20
ALS ID		*14*	*15*	*16*	*17*	*18*
Total Metals						
Aluminum	T-Al	15400	10700	9440	10700	11100
Antimony	T-Sb	<20	<10	<10	<10	<10
Arsenic	T-As	23	30.4	18.9	14.3	21.6
Barium	T-Ba	31.0	34.7	33.0	21.5	28.4
Beryllium	T-Be	<1.0	<0.50	<0.50	<0.50	<0.50
Bismuth	T-Bi	<40	<20	<20	<20	<20
Cadmium	T-Cd	<1.0	<0.50	<0.50	<0.50	<0.50
Calcium	T-Ca	2230	3930	8220	3630	8220
Chromium	T-Cr	7.2	12.1	12.3	13.7	14.3
Cobalt	T-Co	<4.0	5.7	7.3	5.3	7.7
Copper	T-Cu	30.4	48.3	35.8	39.3	33.8
Iron	T-Fe	307000	60400	114000	101000	116000
Lead	T-Pb	<100	<50	<50	<50	<50
Lithium	T-Li	7.5	13.3	12.3	12.0	12.9
Magnesium	T-Mg	2200	3820	3550	3610	4300
Manganese	T-Mn	79.8	149	269	178	260
Mercury	T-Hg	0.146	0.304	0.170	0.175	0.126
Molybdenum	T-Mo	37.8	7.4	9.7	4.9	13.2
Nickel	T-Ni	<10	11.1	11.8	11.3	14.0
Phosphorus	T-P	630	478	781	525	923
Potassium	T-K	990	1230	1290	1250	1130
Selenium	T-Se	<8.0	<2.0	<2.0	<3.0	<4.0
Silver	T-Ag	<4.0	<2.0	<2.0	<2.0	<2.0
Sodium	T-Na	4310	3500	3490	2100	3720
Strontium	T-Sr	47.1	43.4	81.0	27.0	59.1
Thallium	T-Tl	<100	<50	<50	<50	<50
Tin	T-Sn	<10	<5.0	<5.0	<5.0	<5.0
Titanium	T-Ti	209	482	275	397	734
Vanadium	T-V	36.3	51.1	52.2	46.3	74.3
Zinc	T-Zn	75.0	50.9	40.9	31.7	51.2

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
[1]Results are expressed as milligrams per dry kilogram except where noted.

A Campbell Brothers Limited Company

File No. X4111

Appendix 1 - QUALITY CONTROL - Replicates

Seawater[1]		BH 15	BH 15
		06-04-04 15:20	QC # 495184
Physical Tests			
pH		6.32	6.29
Salinity	o/oo	1.4	1.4
Dissolved Anions			
Chloride	Cl	6.05	5.98
Dissolved Metals			
Aluminum	D-Al	0.17	0.17
Arsenic	D-As	0.00055	0.00050
Cadmium	D-Cd	0.00204	0.00199
Cobalt	D-Co	0.253	0.252
Copper	D-Cu	0.0139	0.0133
Iron	D-Fe	351	354
Lead	D-Pb	<0.00050	<0.00050
Manganese	D-Mn	7.45	7.41
Nickel	D-Ni	0.417	0.415
Uranium	D-U	0.00034	0.00034
Zinc	D-Zn	0.592	0.588

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
Results are expressed as milligrams per litre except where noted.

A Campbell Brothers Limited Company

File No. X4111

Appendix 1 - QUALITY CONTROL - Replicates

Sediment/Soil [1]		PSED 1	PSED 1
		06-04-04 16:40	QC # 495185
Physical Tests			
pH		4.60	4.52
Total Metals			
Antimony	T-Sb	<20	<20
Arsenic	T-As	23	19
Barium	T-Ba	31.0	28.7
Beryllium	T-Be	<1.0	<1.0
Cadmium	T-Cd	<1.0	<1.0
Chromium	T-Cr	7.2	7.0
Cobalt	T-Co	<4.0	<4.0
Copper	T-Cu	30.4	30.9
Lead	T-Pb	<100	<100
Mercury	T-Hg	0.146	0.170
Molybdenum	T-Mo	37.8	35.4
Nickel	T-Ni	<10	<10
Selenium	T-Se	<8.0	<8.0
Silver	T-Ag	<4.0	<4.0
Tin	T-Sn	<10	<10
Vanadium	T-V	36.3	29.0
Zinc	T-Zn	75.0	68.8

Remarks regarding the analyses appear at the beginning of this report.
< = Less than the detection limit indicated.
Results are expressed as milligrams per dry kilogram except where noted.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY

Outlines of the methodologies utilized for the analysis of the samples submitted are as follows

pH in Water

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

Recommended Holding Time:
Sample: 2 hours
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Conventional Parameters in Water

These analyses are carried out in accordance with procedures described in "Methods for Chemical Analysis of Water and Wastes" (USEPA), "Manual for the Chemical Analysis of Water, Wastewaters, Sediments and Biological Tissues" (BCMOE), and/or "Standard Methods for the Examination of Water and Wastewater" (APHA). Further details are available on request.

Laboratory Location: ALS Environmental, Vancouver

Chloride in Water

This analysis is carried out using procedures adapted from APHA Method 4500 "Chloride". Chloride is determined using the ferricyanide colourimetric method.

Recommended Holding Time:
Sample: 28 days
Reference: APHA

Laboratory Location: ALS Environmental, Vancouver

Metals in Seawater

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by acid digestion or filtration (EPA Method 3005A). Instrumental analysis of the seawater is by atomic absorption/emission spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:

A Campbell Brothers Limited Company

Sample: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Trace Metals in Seawater by SPR-IDA Chelation

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995, and with procedures adapted from Cetac Technologies Incorporated. A suspended particulate resin (SPR), consisting of immobilized iminodiacetate (IDA) on a divinylbenzene polymer, is used to chelate and preconcentrate metals in seawater. Instrumental analysis is by inductively coupled plasma mass spectrometry (ICPMS) and/or routine atomic absorption spectrophotometry techniques (EPA 7000 series).

Recommended Holding Time:
Sample/Extract: 6 months
Reference: Puget

Laboratory Location: ALS Environmental, Vancouver

Metals in Filter Media and/or Swabs

This analysis is carried out using procedures adapted from WCB Methods 1050 and 1051, published by the Workers' Compensation Board of British Columbia and/or OSHA Methods ID-121 and ID-125G, published by the Occupational Safety and Health Administration, Salt Lake City, Utah. The procedure involves a hotplate or block digestion of the filter media or swab material, using either nitric acid or a combination of nitric acid and hydrochloric acid. Instrumental analysis of the filter or swab extract is by atomic absorption/emission/fluorescence spectrophotometry (EPA Method 7000A), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Recommended Holding Time:
Sample/Extract: 6 months (Mercury = 28 days)
Reference: EPA

Laboratory Location: ALS Environmental, Vancouver

pH in Soil

This analysis is carried out in accordance with procedures described in "Soil Sampling and Methods of Analysis" (CSSS). The procedure involves mixing the air-dried sample with deionized/distilled water. The pH of the solution is then measured using a standard pH probe. A one to two ratio of sediment to water is used for mineral soils and a one to ten ratio is used for highly organic soils.

A Campbell Brothers Limited Company

Appendix 2 - METHODOLOGY - Continued

Laboratory Location: ALS Environmental, Vancouver

Metals in Sediment/Soil

This analysis is carried out using procedures from CSR Analytical Method 8 "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, Lands and Parks, 26 June 2001, and procedures adapted from "Test Methods for Evaluating Solid Waste", SW-846 Method 3050B or Method 3051, United States Environmental Protection Agency (EPA). The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 90 degrees Celsius for 2 hours by either hotplate or block digester using a 1:1 ratio of concentrated nitric and hydrochloric acids. Instrumental analysis is by atomic absorption/fluorescence spectrophotometry (EPA Method 7000 series), inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B), and/or inductively coupled plasma - mass spectrometry (EPA Method 6020).

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.

Recommended Holding Time:
Sample: 6 months (Hg = 28 days)
Extract: 6 months (Hg = 28 days, Sb & Sn = 7 days)
Reference: BCMELP

Laboratory Location: ALS Environmental, Vancouver

Results contained within this certificate relate only to the samples as submitted.

This Certificate Of Analysis shall only be reproduced in full, except with the written approval of ALS Environmental.

End of Report

A Campbell Brothers Limited Company

APPENDIX D
Supporting Authorizations and Correspondence

Supplemental Detailed Site Investigation
Union Bay Waste Coal Pile
Union Bay, BC
SEACOR Project: 201.01022.01

20120032.01 (Z)

LWBC
LAND AND WATER
BRITISH COLUMBIA INC.

AUG 15 2005

File: A1-1298

West Fraser Mills Ltd. &
Kensington Island Properties
501 858 Beatty St
Vancouver BC V6B 1C1

Dear Rod Beaumont:

Re: Approval under Section 9, Water Act, for Work In and About Hart Creek

Approval under Section 9 of the Water Act for changes in and about Hart Creek for the channel re-alignment/bank erosion protection authorized within District Lot 154, Nanaimo District, those parts of District Lot 28, Nelson District, inculded in Plan 20 RW, and Parcel A (DD 379841I), District Lot 28, Nelson District is hereby granted. The approval document is enclosed. Please make careful note of all its conditions.

Please note that this Approval, under Section 9 of the Water Act, does not include fish habitat concerns and issues under the Federal Fisheries Act. A separate authorization process may be required under the Federal Fisheries Act.

An appeal to this order may be taken only as directed within Section 92 of the Water Act. Notice of any appeal must: (1) be in writing; (2) be delivered within 30 days of the date of this letter; (3) include grounds for the appeal; (4) be accompanied by a fee of $25 (cheque or money order payable to Minister of Finance); and (5) be sent by registered mail to the Chair, Environmental Appeal Board, PO Box 9425, Stn Prov Govt, Victoria BC V8W 9V1; or personally delivered to the office of the Board at 4th Floor, 747 Fort Street, Victoria BC V8W 3E9.

If you have any questions or concerns regarding the document issued, please do not hesitate to contact Bonita Wallace at (250) 741-5670.

Yours truly,

Keith Anderson
Assistant Regional Water Manager

Enclosure

cc: SEACOR Environmental Ltd., 200 1620 W 8th Ave, Vancouver BC V6J 1V4
Kensington Island Properties, 201 1830 Riverside Ln, Courtenay BC V9N 8C7

APPROVAL
CHANGES IN AND ABOUT A STREAM
Section 9 (1), Clauses (a), (b), & (c).

This Approval grants authority under Section 9 of the Water Act only, and does not constitute permission or consent under any other Act or authority.

West Faser Mills Ltd/Kensington Island Properties is hereby authorized to make the following changes in and about a stream:

Channel re-alignment, bank erosion protection in and about Hart Creek within District Lot 154 , Nanaimo District, those parts of District Lot 28, Nelson District included in Plan 20 RW, and Parcel A (DD 379841I), District Lot 28, Nelson District.

APPROVAL CONDITIONS AND SPECIFICATIONS

1. The work authorized under this Approval shall be completed on or before 15th September 2006
2. Instream work shall be undertaken only during the period of 1st July to 15th September.
3. All works are to be constructed in accordance with signed and sealed conceptual design drawings by Dr. E.M. Rykaart P.Eng., enclosed within the SEACOR Environmental report entitled Hart Creek Re-channeling Union Bay, BC, SEACOR project No: 201.01069.01 & 201.01022.01 dated July 8, 2005.
4. This Approval does not relieve the Approval holder of the requirement to comply with any other applicable Federal, Provincial, Regional District or Municipal enactment.
5. This approval is issued subject to the Approval holder conducting any required Archaeology Impact Assessment in accordance with the Provincial Archaeology Branch, and that all authorized instream changes under this approval are made in compliance with terms of the permit issued under the Heritage Conservation Act.
6. The applicant must inform Fisheries and Oceans Canada, in writing, of the location and nature of the works to be constructed.
7. Permission for access through private or public lands must be obtained by the Approval holder, prior to commencement of the work.
8. No right of expropriation exists under an Approval.
9. Every holder of an Approval, or person who makes a change in and about a stream in accordance with the regulations, shall exercise reasonable care to avoid damaging land, works, trees, or other property; and shall make full compensation to the owners for damage or loss resulting from construction, maintenance, use, operation, or failure of the works.
10. A change in and about a stream must be designed, constructed, and maintained in such a manner that the change does not pose a significant danger to life, property, or the environment.
11. The applicant must, while making the change in and about the stream:
    (a) maintain water quality;
    (b) maintain stream channel integrity;
    (c) maintain surface and sub-surface drainage systems;
    (d) conserve wildlife habitat, including riparian vegetation;
    (e) protect fish habitat and fish passage;
    (f) prevent erosion, mass wasting, siltation; and
    (g) prevent degradation to water quality at the intake of existing water supplies authorized under the Water Act.

Keith Anderson
Assistant Regional Water Manager

Issued: August 12, 2005

Approval No. A1-1298

Water District: Nanaimo

Precinct: Courtney

201-01042.01 (2)

Fisheries and Oceans | Pêches et Océans

Pacific Region
Doug Swift
Habitat Management Technologist
Department of Fisheries and Oceans
148 Port Augusta Street
Comox, BC V9M 3N6

August 17, 2005

Mr. Mike Seymour
The FOCUS Corporation Ltd.
57 Cadillac Avenue
Victoria, BC V8Z 1T3

Dear Mr. Seymour:

Subject: Authorization for the Re-Channeling of Hart Creek downstream of Highway 19A, DFO file 05-HPAC-PA3-000-000005

Attached is the signed authorization issued under Section 35(2) of the *Fisheries Act* for the re-channeling of Hart (Washer Creek). Would you ensure that Kensington Island Properties Ltd. and West Fraser Mills Ltd. receive a copy and that all parties are familiar with the provisions. Please note that this authorization does not negate the requirements of other agencies that may have an interest in this project.

Good luck with the project and if you have any additional questions please contact the undersigned at 339-4905.

Sincerely yours,

Doug Swift
Habitat Management Technologist

cc: J.G. Malick, Seacor Environmental Inc.

1.0 AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT

Authorization No. 05-HPAC-PA3-000-000120

Authorization issued to:

Name: West Fraser Mills Ltd.
Address: 501 – 858 Beatty Street
Vancouver BC, V6B 1C1
Rod Beaumont, (604) 662-2705

Name: Kensington Island Properties Ltd.
201-1830 Riverside Lane
Courtenay BC
V9N 8C7
Brian McMahon (250) 342-5440

Location of Project:

The section of Hart (Washer) Creek located to the east of the Highway 19A bridge crossing of the creek in Union Bay, BC.

2.0 VALID AUTHORIZATION PERIOD

The valid authorization period for the harmful alteration of fish habitat associated with the re-channeling of the creek August 15, 2005 to September 15, 2006 unless otherwise agreed to by the Department of Fisheries and Oceans (DFO). Dates for habitat compensation works and monitoring are described under "Conditions of Authorization" below.

Description of HADD

Hart Creek, which supports both coho salmon and trout, will be re-channeled to prevent future erosion of the waste coal pile and to enhance instream and riparian habitat. The proposed conceptual design will leave some of the existing channel alignment in place, and create a new channel alignment in specific problem areas. The dilapidated wood flume located below the Highway 19A bridge will be removed, the main channel will be shifted to the south, one road bridge crossing will be accommodated, and the new re-graded waste coal pile boundary will be shifted to the east with slopes no steeper than 3:1. The average instream channel planform (defined by the mean high water) will be widened approximately 15% to 18% in the central and north area reaches and by over 100% in the creek area south. This design will create more floodplain capacity and lower flood velocities than currently occur. The re-channeling will also have additional high floodplain terraces, and all bank slopes will be reduced (by cutting, re-grading and/or filling) to no steeper than 3:1. Although specific reaches will still require stabilization (i.e., toe armouring with riprap, root wads and large woody debris [LWD] where necessary), the general character of this alternative will have a more natural setting, with a moderate amount of habitat complexity and a vegetated riparian corridor. Flow directions will be

deflected off the banks using a combination of rock groynes (opposing where necessary) and log vanes.

West Fraser Mills Ltd. and Kensington Island Properties Ltd. are committed to undertake appropriate compensation works including replacing riparian habitat and instream habitat.

Description of Works or Undertakings

The details of the above-mentioned alterations are specifically described in the SEACOR Environmental Inc. report titled Hart Creek Re-Channelling, Union Bay, BC, dated June 27, 2005.

3.1 CONDITIONS OF AUTHORIZATION

A) Liability:

West Fraser Mills Ltd. and Kensington Island Properties Ltd. confirm that all plans and specifications relating to this Authorization have been duly prepared and reviewed by appropriate professionals working on behalf of West Fraser Mills Ltd. and Kensington Island Properties Ltd.. West Fraser Mills Ltd. and Kensington Island Properties Ltd. acknowledge that they are solely responsible for all design, safety and workmanship associated with all aspects of the works and this Authorization.

B) Conditions that relate to the re-channelling of Hart Creek:

1. Complete all instream works within the fisheries window of July 1 to September 15 or at times when there is no flow in the creek.

2. A qualified Environmental monitor shall be retained by the Proponent and, in conjunction with the Contractor and proponent, be responsible for the following:
    a) Isolating the worksite areas
    b) Fish salvage where required
    c) Maintain sediment control
    d) Installation of habitat features as shown in Figure 7 and 8 of the SEACOR Environmental Inc. report titled Hart Creek Re-Channelling, Union Bay, BC, dated June 27, 2005.

3. All machinery must be in good working condition and no fuels, lubricants or construction wastes are to enter Hart Creek as a result of the works. A spill kit will be kept on-site at all times during the works.

4. The worksite must be isolated and all fish (if any) salvaged and relocated to a suitable area in the creek.

5. The work shall proceed in a manner that prevents the release of sediment and ensures that a deleterious substance does not enter fish bearing waters. The work shall not proceed during times of adverse weather conditions when sediment cannot be controlled, as required.

6. All excavated materials are to be cast in an upland area where runoff will not re-enter the watercourse.

C) Description of Compensatory Works:

1. The agreed-upon scope of the habitat compensation works is described in the SEACOR report. The general scope of these works includes the following two components:

    a) **Riparian Vegetation.** The streambanks along the re-channelled sections of Hart Creek will be planted with native riparian species (live-stacking where possible) at a density of 1 (jumbo stock (1-1.5m) if possible) shrub per meter square. There will be a fifteen (15) meter riparian setback established along each side of Hart Creek below Highway 19A.

    b) **Instream Habitat.** Fish habitat will be enhanced in the re-channelled sections of Hart Creek through the construction of habitat features, as outlined in the SEACOR report titled Hart Creek Re-Channelling, Union Bay, BC, dated June 27, 2005. In addition the works will incorporate recommendations provided by the DFO Resource Restoration Unit, Nanaimo BC.

2. The instream habitat compensation works must be completed by September 15th, 2006. Best management practices must be employed during the compensation works to ensure that construction activities do not negatively impact on fish habitat upstream and downstream of the construction site.

3. The riparian planting compensation work will be conducted during dormancy of the selected plant species and before April 15, 2006.

D) Timelines for Compensatory Habitat:

1. All instream habitat compensation works (enhanced spawning habitat) must be completed by September 15th, 2006, with Phase I works, as described in the SEACOR report titled Hart Creek Re-Channelling, Union Bay, BC, dated June 27, 2005, to be completed by September 15, 2005.

2. All riparian planting compensation work will be conducted during dormancy of the selected plant species before April 15, 2006.

E) Determination that Compensatory Habitat is Functioning as Intended:

1. West Fraser Mills Ltd. and Kensington Island Properties Ltd. shall carry out a 5 year monitoring program (the "Monitoring Program"), which is to include the following:

    a) A bi-annual assessment of the compensatory habitat completed by a qualified biologist or other professional that has experience in this area. The new Phase I stream channel and associated riparian habitat will be inspected once during the following rainy season (approximately October 2005 to December 2005), and the following spring (March 2006-June 2006) the Phase II channel once during the following rainy season (approximately October 2006 to December 2006) and the

following spring (March 2007 to June 2007), and then bi-annually for four additional years (year 2011) The monitoring period may be amended after two years (Phase 1- yr. 2007) and Phase 2–yr. 2008) to once per year should the compensatory habitat be functioning well and considered stable by DFO.

b) :

I. A photographic assessment of the instream compensation works and riparian plantings conducted during the summer.

II. An assessment of the survival of the planted vegetation conducted during the summer. A minimum plant survival of 75% is expected. Additional planting is to be conducted should plant survival not achieve 75% success.

III. An assessment of the structural stability of the instream habitat features, identifying any failures and describing restoration measures taken to remediate failures.

c) A final report is to be submitted to the Comox DFO office at the end of the 5-year period, confirming that the habitat compensation works are biologically functioning and that a "No Net Loss" of fish habitat has been achieved.

F) Provision for the amendment of conditions under Authorization:

Subject to consultation with and approval of the DFO and following the intent of this Authorization, amendments to the conditions of this Authorization may be established to provide flexibility in the development, maintenance, monitoring and protection of the compensatory habitat consistent with ensuring that the natural productivity of the 'affected habitat' is maintained.

G) Compensatory habitat to remain undisturbed:

West Fraser Mills Ltd. and Kensington Island Properties Ltd. confirms that the vegetation and compensatory instream habitat features will remain undisturbed. After the compensatory habitat is functioning as intended, West Fraser Timber Ltd. and Kensington Island Properties Ltd. shall not carry on any work or undertaking that will adversely disturb or impact the compensatory habitat, and will take all reasonable steps to ensure that the compensatory habitat is not disturbed by others, without prior authorization of the Department of Fisheries and Oceans.

Financial Security:

The proponents, West Fraser Mills Ltd. and Kensington Island Properties Ltd. shall deliver to DFO by August 15, 2005 a letter of credit from a Canadian Bank and valid until September 30, 2011 in the sum of $20,000.00 . The letter of credit shall be in a form acceptable to DFO.

DFO may withdraw funds from the letter(s) of credit to retain an independent contractor to undertake any activity described in the conditions should these not be completed by the proponent.

THE HOLDER OF THIS AUTHORIZATION IS HEREBY AUTHORIZED UNDER THE AUTHORITY OF SECTION 35(2) OF THE FISHERIES ACT, R.S.C., 1985, C. F. 14, TO CARRY OUT THE WORK OR UNDERTAKING DESCRIBED HEREIN.

This authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

Failure to comply with any condition of this authorization may result in charges under the Fisheries Act.

This Authorization form should be held on site and work crews should be made familiar with the conditions attached.

Date of issuance: August 17, 2005

Approved by: C A Russell

Title: Area Chief, South Coast Area
Habitat Management Branch

West Fraser Mills Ltd. and Kensington Island Properties Ltd. acknowledge that DFO has consulted with it regarding the terms of this Authorization, and confirms that it has reviewed and understands the terms of this Authorization, and it will comply with them.

Executed by an authorized signatory of West Fraser Mills Ltd. and Kensington Island Properties Ltd. on the 16th day of August, 2005 in the presence of:	)	West Fraser Timber Ltd. and Kensington Island Properties Ltd.
_____ Witness (signature)	)	Per: _____ Authorized signatory
_____ (print name)	)	Brian A McMahon Name
	)	Vice President Title Kensington Island Properties Ltd.

SEACOR ENVIRONMENTAL INC.

#200 – 1620 West 8th Avenue
Vancouver, BC V6J 1V4
Phone: 604-738-2500
Fax: 604-738-2508
www.seacorcanada.com

FAX

		Date:	September 6, 2005
To:	Ms. Roberta Patterson	**From:**	Tara Siemens on behalf of Jim Malick
Company:	BC Ministry of Environment	**Pages:**	6 (including cover)
Fax:	250-751-3103	**Phone No.:**	250-751-3100
Re:	**Notice of Independent Remediation – Union Bay, BC**		

Hi Roberta,

Please find attached a Notice of Independent Remediation for work currently being conducted in Union Bay, BC.

Please feel free to contact me if you have any questions or concerns.

Best Regards,

Tara Siemens, MET
Environmental Toxicologist

SEACOR Environmental Inc.
Suite 200 - 1620 West 8th Ave.
Vancouver, BC, V6J 1V4
Phone: 604.738.2500
Fax: 604.738.2508
Direct Line: 604.742.3882
e-mail: tsiemens@seacorcanada.com

This message is intended only for the use of the individual or entity to which it is addressed and may contain confidential information. If you have received this information in error, please destroy it and notify us immediately at (604) 738-2500.

BRITISH COLUMBIA

Ministry of Environment
Environmental Protection Program

Notification of Independent Remediation

Date: September 6, 2005

MoE SITE Number (if known): 4291

Part 1: Required information [See Contaminated Sites Regulation, Section 57]

1. Date start of remediation: September 2, 2005

2. Legal Land description:

PID: See Attached Figure with Table

Legal Description: See Attached Figure with Table

Latitude and Longitude: 49°36' and 124°51'

Civic Address: Highway 19A, Union Bay, BC at Hart (Washer) Creek

3. Property owner:

Name: Kensington Island Properties (Brian McMahon)

Address: 201-1831 Riverside Lane
Courtenay, BC, V9N8C7

Phone 250-342-5440 Fax 250-703-9542

4. Agent contact:

Name: Jim Malick, PhD, RPBio, PAg

Firm Name: SEACOR Environmental Inc.

Address: Suite 200 – 1620 West 8th Avenue
Vancouver, BC, V6J 1V4

Phone: 604-738-2500 Fax 604-738-2508

...2

5. Soil investigations:

The following contaminants ☑ were found ☐ are expected:

List contaminants (and maximum concentrations if known) Attach additional information if necessary.

Arsenic - 21.6 mg/kg Naphthalene 9.43 - mg/kg Phenanthrene – 6.29 mg/kg

Contamination is greater than (CSR Schedules 4 & 5):

☐ >AL ☐ >PL ☐ >RL ☑ >CL ☐ >IL ☐ >Special Waste

Volume of contaminated soil: 200 m^3

Soil remediation strategy:
Re-alignment of Hart (Washer) Creek is currently being conducted at the site. Contaminant concentrations in excess of the CSR standards are limited to waste coal present at the site as a result of historical coal processing operations. During creek re-alignment works, any waste coal encountered will be excavated and stockpiled at the location of other stockpiled waste coal (i.e. the waste coal will be placed on the waste coal pile that is present at the site) and will be addressed during future planned remediation of the waste coal pile.

6. Groundwater investigation:

Has a groundwater investigation been undertaken? ☑ Yes ☐ No ☐ To be investigated

Result: ☐ No GW encountered ☐ Contaminated ☑ Not contaminated

List contaminants (and maximum concentrations): Attach additional information if necessary.

No groundwater contamination has been encountered in the areas of the site where the creek re-alignment work is being performed.

Contamination is greater than (CSR Schedule 6):

☐ >AW ☐ >IW ☐ >LW ☐ >DW ☐ >Special Waste

Groundwater remediation strategy

Part 2: Additional information

7. What is the current land use?

☐ Agricultural ☑ Park ☐ Residential ☐ Commercial ☐ Industrial

Description of operation The land is currently vacant .

8. Is a change in zoning or land use expected?

☐ Change in zoning ☐ Change in land use ☐ No change in zoning or land use

From Vacant land/Parkland To Residential/Commercial Development

9. Is a change of ownership expected following remediation? ☐ Yes ☑ No

10. Description of work to be completed: (construction/demolition/upgrade etc.)
Kensington Island Properties currently owns the land located to the south and north of the area where the work is currently being conducted, and West Fraser Mills Ltd. holds the lease to the property located to the east of the area. Kensington intends to purchase the lands currently owned by West Fraser and to develop the entire area for residential/commercial purposes. The area that is currently being remediated (as described in this notice) is located adjacent to Hart (Washer) Creek and as per DFO requirements, will be included as part of the creek setback.

11. Are there offsite impacts? ☐ Yes ☑ No ☐ To be investigated

If to be investigated, the probability off-site impacts are ☐ Low ☐ High

Extent of offsite impacts: _____

_____

_____

_____

Names/addresses of affected property owners: _____

_____

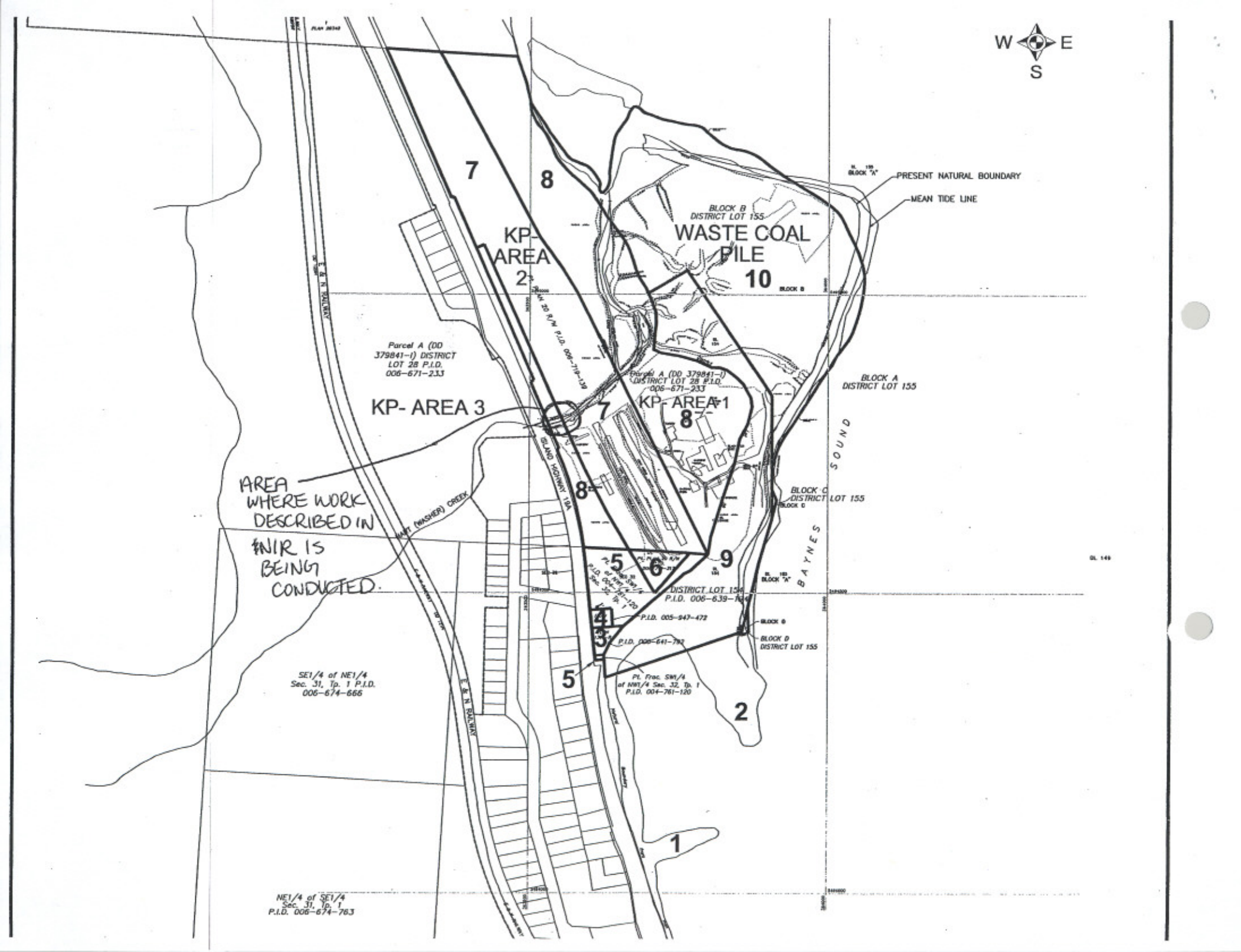
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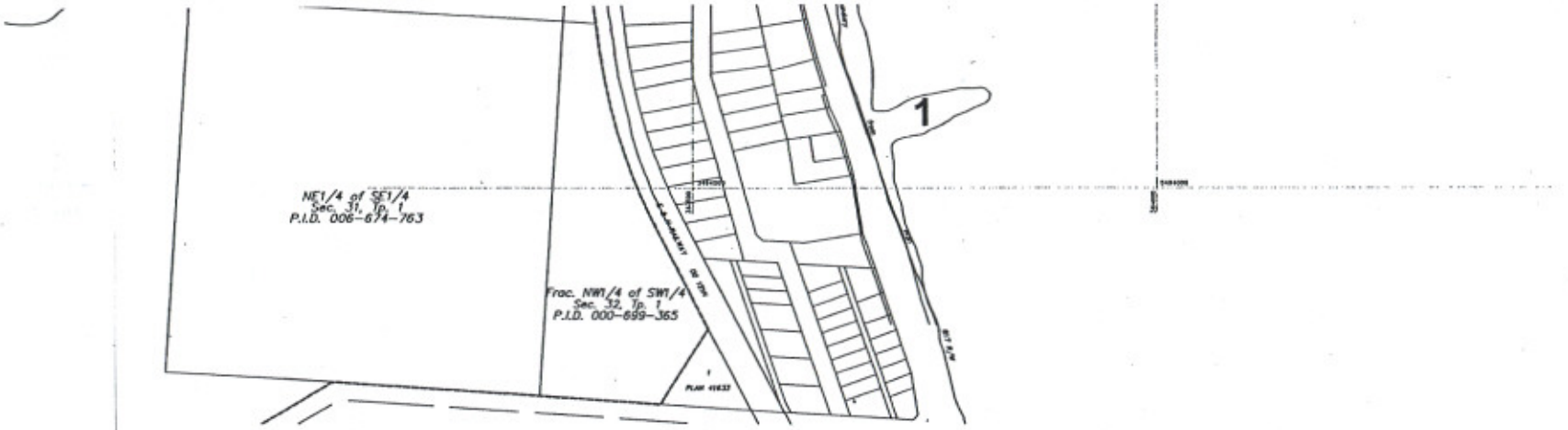
_____

Have affected property owners been notified? ☐ Yes ☐ No

12. Comments:

The creek re-alignment work is being conducted as part of a larger remediation program described in the SEACOR report submitted to the MOE on June 2, 2005 and titled Stage 1 Preliminary Site Investigation, Detailed Site Investigation, Problem Formulation and Remediation Plan, Union Bay Waste Coal Pile and Kensington Property – Areas 1 & 2, Union Bay, BC. The report was submitted in application for an Approval In Principle.


W
E
S
PRESENT NATURAL BOUNDARY
MEAN TIDE LINE
BLOCK B
DISTRICT LOT 155
WASTE COAL
PILE
10
KP-
AREA
2
7
8
KP- AREA 3
KP- AREA 1
Parcel A (DD
379841-I) DISTRICT
LOT 28 P.I.D.
006-671-233
Parcel A (DD 379841-I)
DISTRICT LOT 28 P.I.D.
006-671-233
BLOCK A
DISTRICT LOT 155
BLOCK C
DISTRICT LOT 155
BLOCK D
DISTRICT LOT 155
DISTRICT LOT 154
P.I.D. 006-639-7
P.I.D. 005-947-472
P.I.D. 006-641-792
Pt. Frac. SW1/4
of NW1/4 Sec. 32, Tp. 1
P.I.D. 004-761-120
SE1/4 of NE1/4
Sec. 31, Tp. 1 P.I.D.
006-674-666
NE1/4 of SE1/4
Sec. 31, Tp. 1
P.I.D. 006-674-763
E. & N. RAILWAY
GRAND HIGHWAY 19A
HART (WASHER) CREEK
BAYNES
SOUND
AREA
WHERE WORK
DESCRIBED IN
#NIR IS
BEING
CONDUCTED.



Area No.	Legal Description and P.I.D.
1	Un-surveyed Crown Land. All that part of the filled foreshore of Baynes Sound lying to the east of the Island Highway shown on plan 817 R/W and south of DL 154, Nanaimo District.
2	Un-surveyed Crown Land. All that part of the filled foreshore of Baynes Sound described as follows; commencing at the most southeast corner of DL 154, Nanaimo District, thence following the sinuosity of the limit of fill in a southwesterly direction to the point of intersection with the south boundary of DL 154 at a bearing of 70°10' 30", a distance of 94.00 meters, more or less, to the point of commencement.
3	That part of the southwest ¼ of the northwest ¼ of fractional Section 32, Township 1, Nelson District (PID-006-641-792)
4	Lot 1, Section 32, Township 1, Nelson District, Plan 5161 (PID-005-947- 472)
5	All those parts of the Fractional southwest ¼ of the northwest ¼ of Section 32, Township 1, Nelson District, lying east of the Island Highway as shown on Plan 817 R/W (Part of PID-004-761-120)
6	All that part of Section 32, Township 1, Nelson District, included in Plan 20 R/W (PID-006-719-317)
7	That part of Plan 20 R/W within District Lot 28, Nelson District lying to the east of the Island Highway as shown on Plan 817 R/W (Part of PID 006-719-139)
8	All those parts of Parcel A (DD379841), District Lot 28, Nelson District, lying east of the Island Highway as shown on Plan 817 (Parts of PID 006-671-233)
9	District Lot 154, Nanaimo District (PID 006-639-194)
10	Un-surveyed Crown Land; Block B, District Lot 155, Nanaimo District (Crown Lease #101888)

LEGEND

LEASE AREA (AREA 10 IN LEGAL DESCRIPTION)

SITE LEGAL LOT BOUNDARIES

FORMER COLLIERY OPERATION FEATURE/FACILITY

KP KENSINGTON PROPERTY

DRAWING COMPILED FROM McELHANNEY ASSOCIATES SURVEYORS DRAWING FILE NO. 2212-04924-0 AND DAVE BAZETT LAND SURVEYOR DRAWING FILES: C768 BEACHSIDE CONCEPT, C768 BOUNDARIES, C768 MASTER, C768_FOCUS_POLYGONS

SCALE 1:7500 (APPROX.)

SEACOR ENVIRONMENTAL INC.

WASTE COAL PILE AND KENSINGTON PROPERTY - AREAS 1 & 2 UNION BAY, BC

LEGAL LOT BOUNDARIES

Transport Canada
Marine Branch
401 Burrard Street
Suite 200
Vancouver, BC V6C 3S4

Transports Canada
Sécurité maritime
401, rue Burrard
piece 200
Vancouver, (C-B) V6C 3S4

Tel: (604) 775-8896
Fax: (604) 775-8828

SEACOR - RE...

SEP 08 2005

201.01022.01 (2)

Your File Votre référence

Our file Notre référence
8200-05-8546

September 6, 2005

West Fraser Mills Ltd.
501-858 Beatty Street
Vancouver BC V6B 1C1

Dear Mr. Beaumont

Re: NAVIGABILITY INQUIRY FOR "HART CREEK"

Thank you for your information package of July 8,2005 regarding the navigability of Hart (Washer) Creek.

Following an investigation of the site information, it is the opinion of Transport Canada officials that the waters of "Hart (Washer) Creek" at the site of the proposed large woody debris and channel realignment are considered to be **non-navigable**, therefore an application is not required under the *Navigable Waters Protection Act* for the above noted work.

If you have any questions, please contact the undersigned at (604) 775-8896

Yours truly,

Jim Schellenberg
Navigable Waters Protection Officer
Transport Canada
Pacific Region

cc: Doug Swift – DFO Comox, by email
Kensington Island Properties, 201-1830 Riverside Lane, Courtenay, BC V9N 8C7
Attn: Brian McMahone
Seacor Environmental, 200-1620 West 8th Avenue, Vancouver BC V6J 1V4
Attn: Jim Malick

SEACOR ENVIRONMENTAL INC.

#9-6421 Applecross Road
Nanaimo, BC
V9V 1N1
www.seacorcanada.com

FAX

Date:	August 10, 2006	**Proj. No.:**	201.01022.01.0029
To:	Craig Rosser	**From:**	Michael Sloan
Company:	BC Ministry of Environment	**Pages:**	5
Fax:	250-387-9935	**Phone No.:**	250-356-0334
Re:	**Notice of Independent Remediation – Union Bay, BC**		

Hi Craig,

Please find attached a Notice of Independent Remediation for work currently being conducted in Union Bay, BC.

I have discussed this work with Doug Walton and he has visited the site, but please feel free to contact me if you have any questions or concerns.

Best Regards,

Michael Sloan, M.Sc., P.Eng.
Senior Environmental Engineer

SEACOR Environmental Inc.

Address: 9-6421 Applecross Road, Nanaimo, BC V9V 1N1
Telephone: (250) 390-5050
Mobile: (250) 713-3364
Facsimile: (250) 390-5042
Email: msloan @seacorcanada.com
Website: www.seacorcanada.com

This message is intended only for the use of the individual or entity to which it is addressed and may contain confidential information. If you have received this information in error, please destroy it and notify us immediately at (250) 390-5050.

BRITISH COLUMBIA

Ministry of Environment
Environmental Protection Program

Notification of Independent Remediation

Date: August 10, 2006

MoE SITE Number (if known): 4291

Part 1: Required information [See Contaminated Sites Regulation, Section 57]

1. Date start of remediation August 8, 2006

2. Legal Land descriptions:

PIDs: 006-671-233; and
006-639-194

Legal Descriptions:

All those parts of Parcel A (DD379841), District Lot 28, Nelson District, lying east of the Island Highway as shown on Plan 817; and

District Lot 154, Nanaimo District

Crown Lease:
#101888

Legal Description:

Un-surveyed Crown Land; Block B, District Lot 155, Nanaimo District

Latitude and Longitude 49° 35' 30" and 124° 53' 00"

Civic Address Highway 19A, Union Bay, BC at Hart (Washer) Creek

3. Property owner/Lessee:

Name Kensington Island Properties
(Brian McMahon)

Address 201-1831 Riverside Lane
Courtenay, BC V9N 8C7

Phone 250-342-5440 Fax 250-703-9542

Name West Fraser Mills Ltd.
(Rod Beaumont)

Address 501 – 858 Beatty Street
Vancouver, BC V6B 1C1

Phone 604-895-2700 Fax 604-681-6061

...2

4. Agent contact:

Name	Michael Sloan, MSc, PEng
Firm Name	SEACOR Environmental Inc.
Address	9 – 6421 Applecross Road
	Nanaimo, BC, V9V 1N1
Phone	250-390-5050 Fax 250-390-5042

5. Soil investigations:

The following contaminants ☑ were found ☐ are expected:

List contaminants (and maximum concentrations if known) Attach additional information if necessary.

Arsenic - 21.6 mg/kg Copper – 274 mg/kg

Naphthalene 9.43 - mg/kg Phenanthrene – 6.29 mg/kg

Contamination is greater than (CSR Schedules 4 & 5):

☐ >AL ☐ >PL ☐ >RL ☑ >CL ☐ >IL ☐ >Special Waste

Volume of contaminated soil: 25 000 cubic metres

Soil remediation strategy:

Re-alignment of Hart (Washer) Creek will be conducted at the site. Contaminant concentrations in excess of the CSR standards are limited to waste coal present at the site as a result of historical coal processing operations. During creek re-alignment works, any waste coal encountered will be excavated and stockpiled at the location of other stockpiled waste coal (i.e. the waste coal will be placed on the waste coal pile that is present at the site) and will be addressed during future planned remediation of the waste coal pile.

A portion of the waste coal pile will be reshaped and regraded to provide erosion protection and slope stability along the creek. Waste coal adjacent to the northwest bank at the mouth of the creek will also be excavated and removed to the main pile east of the creek. Waste coal will be used to fill in erosional gullies on the pile.

6. Groundwater investigation:

Has a groundwater investigation been undertaken? ☑ Yes ☐ No ☐ To be investigated

Result: ☐ No GW encountered ☑ Contaminated ☐ Not contaminated

List contaminants (and maximum concentrations): See attached tables.

Cadmium – 9.19 µg/L Cobalt - 206 µg/L Copper – 62 µg/L

Nickel 293 µg/L Zinc – 706 µg/L Sulphate – 1620 mg/L

Contamination is greater than (CSR Schedule 6):

☑ >AW ☐ >IW ☐ >LW ☐ >DW ☐ >Special Waste

Groundwater remediation strategy

Contaminated groundwater is not expected to be encountered during the re-alignment project, as it will be below the planned excavation depth. Therefore, no groundwater remediation is anticipated at this time, but is included in the remediation plan previously submitted.

Part 2: Additional information

7. What is the current land use?

☐ Agricultural ☑ Park ☐ Residential ☐ Commercial ☑ Industrial

Description of operation The land is currently vacant .

8. Is a change in zoning or land use expected?

☐ Change in zoning ☐ Change in land use ☐ No change in zoning or land use

From Vacant land/Parkland To Residential/Urban Park/Commercial

9. Is a change of ownership expected following remediation? ☐ Yes ☑ No

10. Description of work to be completed: (construction/demolition/upgrade etc.)
Kensington Island Properties currently owns the majority of the land adjacent to the creek in which the realignment work is to be carried out. Some of the work will involve a portion of the crown land being leased by West Fraser Mills Ltd. Kensington intends to purchase the lands currently owned by West Fraser and to develop the entire area for residential/urban park/commercial purposes. The area that is currently being remediated (as described in this notice) is located adjacent to Hart (Washer) Creek and as per DFO requirements, will be included as part of the creek setback.

11. Are there offsite impacts? ☐ Yes ☑ No ☐ To be investigated

If to be investigated, the probability off-site impacts are ☐ Low ☐ High

Extent of offsite impacts: _____

_____

_____

_____

Names/addresses of affected property owners: _____

_____

_____

_____

Have affected property owners been notified? ☐ Yes ☐ No

12. Comments:

The creek re-alignment work is being conducted as part of a larger remediation program described in the SEACOR report submitted to the MOE on June 2, 2005 and titled Stage 1 Preliminary Site Investigation, Detailed Site Investigation, Problem Formulation and Remediation Plan, Union Bay Waste Coal Pile and Kensington Property – Areas 1 & 2, Union Bay, BC. The report was submitted in application for an Approval In Principle.

APPENDIX E
Updated Protocol 5

Supplemental Detailed Site Investigation
Union Bay Waste Coal Pile
Union Bay, BC
SEACOR Project: 201.01022.01

Appendix C - Report Summary

Site Information Summary

Common name of site (if applicable)	Union Bay - Waste Coal Pile and Kensington Property - Areas 1 and 2		BCE SITE ID#:			4291
Civic address of site street:	Island Highway					
city/postal code:	Union Bay, B.C.					
Owner of site name:	Kensington Island Properties Ltd.		West Fraser Timber Mills Ltd.			
Owner's address street:	201 - 1830 Riverside Road		501 - 858 Beatty Street			
City, prov/state, postal code, country:	Courtenay, BC V9N 8C7		Vancouver, B.C. V6B 1C1			
Site occupant(s) (if different than owner)	N/A (Site is vacant)					
Latitude (NAD 83 ± 0.5 seconds)	Degrees: 49	Minutes:	35	Seconds:		30
Longitude (NAD 83 ± 0.5 seconds)	Degrees: 124	Minutes:	53	Seconds:		0
PIDs/PINs of site (attach separate page if necessary)	Refer to Figure 2 for Legal Lot Boundaries and Tables 2.1 and 2.2 in DSI (2005)[3]					
Legal description or meets and bounds: (attach separate page if necessary)	Refer to Figure 2 for Legal Lot Boundaries and Appendix A of DSI (2005) report[3] for Metes and Bounds Survey Plan and Descriptions (based on proposed land use)					
Company official & address re sending AiP/Certificates by Registered Mail:	J. Malick, SEACOR Environmental Inc. Suite 200 1620 West 8 Avenue Vancouver, BC V6J1V4					

Report(s) Submitted		Report Date(s)	
		Past Submissions	Present
x	("x" as appropriate)	(yy-mm-dd)	(yy-mm-dd)
x	Preliminary Site Investigation - First Stage	95/05/11[1] 05-05-31[3]	
x	Preliminary Site Investigation - Second Stage	98/05/14[2] 05-05-31[3]	
x	Detailed Site Investigation	05-05-31[3]	08/06/31
x	Remediation Plan with Risk Assessment	05-05-31[3]	
	Remediation Plan without Risk Assessment		
	Confirmatory Sampling		
	Monitoring		

Report Name	Supplemental Detailed Site Investigation, Union Bay Waste Coal Pile, Union Bay, BC
Consultant's Name	SEACOR Environmental Inc.
Consultant's file number	201.01022.01

Summary of Actions Taken (Current Status)

Conducted additional work requested by BC MOE, including:

Advancement of 3 new monitoring wells along eastern perimeter of Waste Coal Pile for groundwater monitoring and sampling; further hydrogeological assessment and refinement of water balance estimate; seep water, sediment porewater, and ocean water sampling

Completed initial phase of Hart Creek realignment

Accompanying Information

Revised Problem Formulation (RPF) and Preliminary Quantitative Risk Assessment
Remedial Option Evaluation, with Case Study Review
Update Land Use and Development Plan
Remediation of Site as per proposed Remediation Plan (Section 6.0 of DSI[3]).
Post remediation monitoring and subsequent post remediation risk assessment.

1 - Reports Phase II Environmental Site Assessments, Areas 1, 2 and 3, Union Bay, British Columbia, Norecol, Dames and Moore Job #29638-004-310, dated December 6, 1995
2 - Final Report Re-Evaluation of Data Site Investigation Areas 1, 2 and 3 Union Bay, British Columbia, Norecol, Dames and Moore Job #38933-001-310, dated May 14, 1998
3 - Stage 1 Preliminary Site Investigation, Detailed Site Investigation, Problem Formulation and Remediation Plan for the Union Bay Waste Coal Pile and Kensington Properties - Areas 1 & 2 Union Bay, BC. SEACOR Environmental. May 31, 2005.

The above information is a summary only and persons who may be relying on the report are encouraged to review the entire document so as to avoid the use of information out of context.

Appendix C Continued

Soil and Groundwater Sampling and Analysis Summary

SITE ID#	4291

Site Data

Total area of site (m^2)	approx 150000 m2
Total area of building(s) (m^2)	no buildings on Site
Total paved surface area (m^2)	no pavement on Site
Current land use	vacant/unused
Proposed land use	commercial/residential/parkland
Suspect land uses	coal processing and shipping
Contaminant source(s)	waste coal pile, coke ovens, briquette plant, coal washer building, machine shop, warehouse, foundry, oil house, railway, laboratory, car repair shop
Presence of free product	LNAPL (N) DNAPL (N)
Number of soil contaminant zones	3
No. of groundwater contaminant plumes	1
Contaminant Migration potential	? : Low: X High:

Area Information

Nearest groundwater water supply (m)	none
Nearest surface water (m)	Baynes Sound and Washer Creek
Nearest sensitive area (m)	Baynes Sound, immediately adjacent
Uses of adjacent water resources	See Section 3.1 of report
Annual rainfall (mm) + snowfall (cm)	1,442 mm
100/200 year flood potential of site	
100/200 yr flood potential of area	
Adjacent land uses	vacant/waterfront to the north and south, vacant and residential to the east (upgradient)

Soil Sample Information

Number of testpits	48
Number of boreholes	70
Number of surface samples collected	32
Number of soil samples collected	n/a
Number of soil samples analyzed (n)	47

Soil Contaminant(s) PCOCs	Soil Quality (AL,PL, RL,CL,IL,W, SW)
Shallow (depth, 0 to 1 m)	
napthalene, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)floranthene, arsenic, copper, antimony, lead	>CSR PL/RL (and > CL/IL at some locations)
Intermediate (depth, > 3 m)	
napthalene, phenanthrene, arsenic, copper, lead	>CSR PL/RL
Deep (depth, 10 m to)	
napthalene, phenanthrene, arsenic, copper	>CSR PL/RL

Groundwater Sample Information

Approx. depth to groundwater (m)	varies due to great variation in topography
No. of affected aquifers & depths (m)	1
No. of monitoring wells developed	23
No. of groundwater samples collected	30
No. groundwater samples analyzed (n)	30

Groundwater Contaminant(s) PCOCs	Water Quality (AW, IW, LW, DW)
Shallow (depth, m)	
Intermediate (depth, m)	
Deep (depth, m)	
cadmium, cobalt, copper, nickel, zinc, sulphate	> CSR AWM and AWF

Notes: Migration potential refers to contaminant plume(s) and "?" = "unknown"
"surface samples" = soil samples obtained using hand trowels, shovels and hand augers at depths less than 0.5 metres
PCOC = Potential contaminants of concern

AL = Agricultural
PL = Urban Park
RL = Residential
CL = Commercial
IL = Industrial
W = Waste
SW = Special Waste

AW = Aquatic Life
LW = Livestock
IW = Irrigation
DW = Drinking Water

The above information is a summary only and persons who may be relying on the report are encouraged to review the entire document so as to avoid the use of information out of context.
Report Date: _____

Statistical Summary of Soil and Groundwater Analyses

Site ID# 4291

SOIL -- Zones of Soil Contamination (referenced to attached Site Plan)

Map Area	Zone Area (m^2)	Depth Range (m)	Volume (m3)	Quality (CL, IL, etc.)	Soil Contaminants (concentrations in µg/g) PCOC	Number of Analyses	Sample Mean	Standard Deviation	Minimum Value	Maximum Value	Median	75th Percentile	90th Percentile
WCP	390000	0 - 3	0.6 million	>CSR PL	Napthalene	14	6.299	3.280	0.05	11.9	6.46	8.1225	9.252
WCP	390000	0 - 3	0.6 million	>CSR PL	Phenanthrene	14	6.682	3.284	0.05	10.7	8.11	8.77	8.922
WCP	390000	> 3	0.6 million	<CSR CL	Napthalene	34	3.011	3.957	0.05	13.8	1.475	1.99	9.731
WCP	390000	> 3	0.6 million	<CSR CL	Phenanthrene	34	4.970	3.264	0.05	11.3	4.84	6.405	9.072
WCP	390000	0 - 3	0.6 million	>CSR PL	Arsenic	25	41.44	49.27	6.4	173	26.1	37.5	56.67
WCP	390000	0 - 3	0.6 million	>CSR PL	Copper	25	64.50	42.14	22.3	190	51.8	69.6	90.8
WCP	390000	> 3	0.6 million	>CSR CL	Arsenic	31	20.29	29.82	7	173	11.2	20.85	32.8
WCP	390000	> 3	0.6 million	>CSR CL	Copper	31	69.40	48.65	29	274	56.4	68.35	77.3
KP A 1	130000	0 - >3	220000	>CSR PL	Phenanthrene	74	3.296	4.023	0.025	18.1	1.27	5.655	8.416
KP A 1	130000	0 - >3	220000	>CSR PL	Napthalene	74	1.461	2.261	0.025	10.7	0.5375	2.025	4.15
KP A 1	130000	0 - >3	40000	>CSR PL	Benzo(a)anthracene	74	0.3747	0.5879	0.025	3.9	0.146	0.505	0.9884
KP A 1	130000	0 - >3	40000	>CSR PL	Benzo(a)pyrene	74	0.2470	0.6438	0.025	5.18	0.081	0.256	0.4
KP A 1	130000	0 - >3	40000	>CSR PL	Benzo(b)fluoranthene	74	0.3899	0.6920	0.025	4.75	0.1745	0.5025	0.7814
KP A 1	130000	0 - >3	40000	>CSR PL	Benzo(k)fluoranthene	74	0.1063	0.2310	0.01	1.66	0.025	0.088	0.1794
KP A 1	130000	0 - >3	10000	>CSR PL	HEPH	9	1,091	2,179	0.1	5960	0.1	180.025	3854
KP A 1	130000	0 - >3	11000	>CSR PL	Arsenic	60	10.66	7.221	2.5	37.9	8	16.275	19.17
KP A 1	130000	0 - >3	11000	>CSR PL	Antimony	43	22.33	107.3	5	709	5	5	5
KP A 1	130000	0 - >3	11000	>CSR PL	Copper	60	111.9	239.6	5.5	1480	51.55	74.7	126
KP A 1	130000	0 - >3	11000	>CSR PL	Lead	43	122.8	441.6	25	2890	25	47.775	102.46
KP A2	1200	0 - >3	1200	>CSR PL	Napthalene	14	2.132	2.861	0.053	9.43	0.984	2.505	7.422
KP A2	1200	0 - >3	1200	>CSR PL	Phenanthrene	14	3.241	2.470	0.084	7.42	2.89	6.185	7.006
KP A2	1200	0 - >3	1200	>CSR PL	Arsenic	8	13.88	5.770	5.9	21.6	12.85	18.6	20.72
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Acenaphthene	79	0.2811	0.1696	0.04	0.665	0.2485	0.393	0.510
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Acenaphthylene	79	0.1500	0.07453	0.05	0.337	0.131	0.192	0.240
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Anthracene	79	0.1563	0.09985	0.05	0.619	0.129	0.216	0.273
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Benzo(a)anthracene	79	0.2450	0.1124	0.05	0.522	0.24	0.314	0.395
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Chrysene	79	0.3924	0.2290	0.05	0.897	0.408	0.559	0.678
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Fluorene	79	0.5157	0.4142	0.05	1.64	0.4395	0.749	1.006
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Naphthalene	79	1.721	1.348	0.05	5.27	1.46	2.520	3.606
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	Phenanthrene	79	3.027	2.034	0.05	7.9	2.88	4.410	5.752
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS/STS}$	2-Methylnaphthalene	57	2.901	2.524	0.05	9.39	2.385	4.405	6.466
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS}$	Arsenic	55	16.64	10.00	5.1	49.2	14.1	21.725	28.480
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS}$	Copper	55	44.08	14.71	12.2	94.3	44.8	49.700	62.400
MSEDIMENTS		0 - 1	NA	>BC Marine SedQC$_{SCS}$	Mercury	55	0.2680	0.1272	0.069	0.558	0.244	0.343	0.452
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	Acenaphthene	6	0.1978	0.09438	0.04	0.334	0.164	0.225	0.290
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	Acenaphthylene	6	0.1003	0.01228	0.05	0.112	0.1025	0.108	0.111
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	Anthracene	6	0.1005	0.04845	0.05	0.16	0.091	0.130	0.148
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	Fluorene	6	0.1977	0.2140	0.05	0.618	0.1325	0.188	0.411
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	Naphthalene	6	1.473	0.6320	0.05	2.18	1.4135	1.918	2.075
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	Phenanthrene	6	2.800	0.4891	0.05	3.52	2.615	2.890	3.268
MSEDIMENTS		1 - 4	NA	>BC Marine SedQC$_{SCS/STS}$	2-Methylnaphthalene	6	2.860	1.213	0.05	4.24	2.76	3.685	4.018
MSEDIMENTS		1 - 4	NA	<BC Marine SedQC$_{SCS}$	Arsenic	5	11.85	4.554	6.9	16.6	11.95	15.175	16.030
MSEDIMENTS		1 - 4	NA	<BC Marine SedQC$_{SCS}$	Copper	5	35.06	18.97	17	64.5	32.8	40.500	54.900
MSEDIMENTS		1 - 4	NA	<BC Marine SedQC$_{SCS}$	Mercury	5	0.1975	0.1464	0.094	0.301	0.1975	0.249	0.280
FSEDIMENTS		0 - 1	NA	>BC Freshwater SedQC$_{SCS}$	Naphthalene	4	0.1693	0.1119	0.084	0.296	0.128	0.212	0.262
FSEDIMENTS		0 - 1	NA	>BC Freshwater SedQC$_{SCS}$	Phenanthrene	4	0.3253	0.1294	0.18	0.428	0.368	0.398	0.416
FSEDIMENTS		0 - 1	NA	>BC Freshwater SedQC$_{SCS}$	2-Methylnaphthalene	4	0.2637	0.2070	0.11	0.499	0.182	0.341	0.436
FSEDIMENTS		0 - 1	NA	>BC Freshwater SedQC$_{SCS}$	Arsenic	5	21.64	5.915	14.3	30.4	21.6	23.000	27.440

Linear velocity of plume = Darcy velocity (V_{Darcy}) divided by the effective porosity (q)

PCOC = potential contaminant of concern

The above information is a summary only and persons who may be relying on the report are encouraged to review the entire document so as to avoid the use of information out of context.

Date: _____

Statistical Summary of Soil and Groundwater Analyses

GROUNDWATER -- Groundwater Contaminant Plumes (referenced to attached Site Plan)

Plume Location	Plume Area (m^2)	Depth Range (m)	Velocity Linear (m/yr)	Quality (AW, DW, etc.)	Groundwater Contaminants (concentrations in µg/L) PCOCs & pH, Hardness	Number of Analyses	Sample Mean	Standard Deviation	Minimum Value	Maximum Value	Median	75th Percentile	90th Percentile
WCP	390000	3-17	100	>CSR AWM/F	Cadmium (dissolved)	51	5.375	3.932	0.44	13.1	5.88	8.25	11.09
WCP	390000	3-17	100	>CSR AWM/F	Cadmium (total)	10	6.183	4.708	0.55	14.4	7.3	7.7	10.56
WCP	390000	3-17	100	>CSR AWM/F	Cobalt (dissolved)	51	238.9	146.0	19	504	224	347	449.2
WCP	390000	3-17	100	>CSR AWM/F	Cobalt (total)	10	309.2	157.2	86.2	528	350	381.75	475.5
WCP	390000	3-17	100	>CSR AWM/F	Copper (dissolved)	51	151.7	167.0	20.8	634	65.7	235	318.5
WCP	390000	3-17	100	>CSR AWM/F	Copper (total)	10	202.8	172.0	56	469	154	270	389.4
WCP	390000	3-17	100	>CSR AWM/F	Lead (dissolved)	51	6.280	7.331	2.09	22.6	3.5	5.43	12.34
WCP	390000	3-17	100	>CSR AWM/F	Lead (total)	10	21.00	17.45	5	50	17.5	25	50
WCP	390000	3-17	100	>CSR AWM/F	Nickel (dissolved)	51	322.4	212.5	31	790	269	501.25	567
WCP	390000	3-17	100	>CSR AWM/F	Nickel (total)	10	455.3	245.5	53	840	490	575	665
WCP	390000	3-17	100	>CSR AWM/F	Zinc (dissolved)	51	987.5	841.4	13	2990	818.5	1595	2120
WCP	390000	3-17	100	>CSR AWM/F	Zinc (total)	10	1,205	1,107	46.5	3160	1030.5	2037.5	2395
WCP	390000	3-17	100	>CSR AWM/F	Sulphate-SO4 (mg/L)	39	2,537	953.0	77.8	4370	2550	2915	3880
WCP	390000	3-17	100	>CSR AWM/F	Titanium (total)	9	1,353	1,709	59	3290	710	2000	2774
KP A1	30000	~2	100	>CSR AWM/F	Sulphate	5	1,395	2,205	3.66	5060	11.7	1890	3792
Pwater		0-1	N/A	<BCWQ	Copper (dissolved)	2	1.165	0.5728	0.76	1.57	1.165	1.3675	1.489
Pwater		0-1	N/A	>BCWQ	Copper (total)	2	2.560	0.5091	2.2	2.92	2.56	2.74	2.848
Pwater		0-1	N/A	>BCWQ	Iron (dissolved)	12	4,538	14,910	6.77	49500	15.7	78.6	168
Pwater		0-1	N/A	>BCWQ	Iron (total)	6	8,710	20,720	10.6	51000	99.45	818.5	26020
Pwater		0-1	N/A	>BCWQ	Manganese (dissolved)	2	938.7	1,275	37.4	1840	938.7	1389.35	1659.74
Pwater		0-1	N/A	>BCWQ	Manganese (total)	2	1,085	1,266	190	1980	1085	1532.5	1801
Pwater		1-1.75	N/A	>BCWQ	Iron (dissolved)	7	29.73	23.15	1.94	61.6	24.5	44.6	61.3
Pwater		1-1.75	N/A	>BCWQ	Iron (total)	4	47.63	33.77	11.7	81	48.9	73.8	78.12
Swater-EAST		N/A	N/A	>BCWQ	Cadmium (dissolved)	13	0.1252	0.08450	0.067	0.27	0.081	0.13	0.214
Swater-EAST		N/A	N/A	<BCWQ	Cadmium (total)	17	0.06617	0.01426	0.051	0.092	0.063	0.069	0.081
Swater-EAST		N/A	N/A	>BCWQ	Copper (dissolved)	13	1.347	0.4602	0.44	2.1	1.29	1.75	1.852
Swater-EAST		N/A	N/A	>BCWQ	Copper (total)	17	1.306	0.9554	0.32	3.84	0.89	1.95	2.36
Swater-EAST		N/A	N/A	>BCWQ	Iron (dissolved)	21	51,520	45,400	9710	206000	42500	51700	109000
Swater-EAST		N/A	N/A	>BCWQ	Iron (total)	25	47,780	41,220	5830	185000	36600	54700	101280
Swater-EAST		N/A	N/A	>BCWQ	Manganese (dissolved)	13	1,815	956.6	511	3520	1940	2460	2938
Swater-EAST		N/A	N/A	>BCWQ	Manganese (total)	17	1,506	932.6	344	3110	1520	2230	2640
Swater-EAST		N/A	N/A	>BCWQ	Nickel (dissolved)	13	19.42	10.90	4.2	47.2	17.2	23.1	29.86
Swater-EAST		N/A	N/A	>BCWQ	Nickel (total)	17	15.97	11.22	0.673	42	13.5	20.5	29.88
Swater-EAST		N/A	N/A	>BCWQ	Zinc (dissolved)	13	54.08	147.0	5.23	543	11.5	19.9	24.96
Swater-EAST		N/A	N/A	>BCWQ	Zinc (total)	17	10.11	6.952	2.09	30	9.35	13.15	15.95
Owater-EAST		N/A	N/A	<BCWQ	Cadmium (dissolved)	3	0.06700	0.005292	0.061	0.071	0.069	0.07	0.0706
Owater-EAST		N/A	N/A	>BCWQ	Cadmium (total)	22	0.07043	0.03869	0.049	0.233	0.06	0.067	0.078
Owater-EAST		N/A	N/A	<BCWQ	Copper (dissolved)	3	0.4310	0.08190	0.375	0.525	0.393	0.459	0.4986
Owater-EAST		N/A	N/A	>BCWQ	Copper (total)	22	0.9936	1.229	0.354	6.16	0.7415	0.916	1.428
Owater-EAST		N/A	N/A	>BCWQ	Iron (dissolved)	12	2,197	2,084	44	4570	1350	4270	4450
Owater-EAST		N/A	N/A	>BCWQ	Iron (total)	22	1,258	1,712	28	6480	709	1335	3143
Owater-EAST		N/A	N/A	>BCWQ	Manganese (dissolved)	3	98.05	85.77	6.16	176	112	144	163.2
Owater-EAST		N/A	N/A	>BCWQ	Manganese (total)	22	142.5	184.9	3.31	701	97.3	152.5	362.7
Owater-EAST		N/A	N/A	<BCWQ	Zinc (dissolved)	3	2.657	0.4738	2.11	2.95	2.91	2.93	2.942
Owater-EAST		N/A	N/A	>BCWQ	Zinc (total)	22	2.306	3.299	0.8	16.2	1.38	1.95	2.59
Swater-NORTH		N/A	N/A	>BCWQ	Cadmium (dissolved)	10	0.9407	0.6289	0.114	1.95	0.99	1.265	1.638
Swater-NORTH		N/A	N/A	>BCWQ	Cadmium (total)	16	0.8453	0.7755	0.079	2.36	0.738	1.1375	1.709
Swater-NORTH		N/A	N/A	>BCWQ	Copper (dissolved)	10	5.555	7.128	1.35	25.1	2.88	5.565	8.873
Swater-NORTH		N/A	N/A	>BCWQ	Copper (total)	16	5.811	4.579	0.54	20.6	5.625	7.07	8.055
Swater-NORTH		N/A	N/A	>BCWQ	Iron (dissolved)	13	108,000	94,070	7570	292000	58700	166000	225400
Swater-NORTH		N/A	N/A	>BCWQ	Iron (total)	19	88,140	81,710	2670	242000	60800	155500	216800
Swater-NORTH		N/A	N/A	>BCWQ	Lead (dissolved)	10	1.251	1.118	0.295	2.86	0.925	1.5025	2.317
Swater-NORTH		N/A	N/A	>BCWQ	Lead (total)	16	1.040	0.9103	0.3	2.98	0.625	1.4025	2.251
Swater-NORTH		N/A	N/A	>BCWQ	Manganese (dissolved)	10	944.5	561.1	256	1970	823.5	1115	1790
Swater-NORTH		N/A	N/A	>BCWQ	Manganese (total)	16	1,022	712.0	48.8	2450	823	1517.5	1990
Swater-NORTH		N/A	N/A	>BCWQ	Nickel (dissolved)	10	54.67	39.23	2.8	127	49.25	68.875	111.7
Swater-NORTH		N/A	N/A	>BCWQ	Nickel (total)	16	51.47	47.27	0.57	161	50.65	64.575	119
Swater-NORTH		N/A	N/A	>BCWQ	Zinc (dissolved)	10	169.5	142.0	12	480	162.5	209.25	324.3
Swater-NORTH		N/A	N/A	>BCWQ	Zinc (total)	16	189.7	186.9	2.9	637	134	233.75	466
Owater-NORTH		N/A	N/A	>BCWQ	Cadmium (total)	3	0.07950	0.04031	0.051	0.108	0.0795	0.09375	0.1023
Owater-NORTH		N/A	N/A	>BCWQ	Copper (total)	3	2.017	1.211	1.1	3.39	1.56	2.475	3.024
Owater-NORTH		N/A	N/A	>BCWQ	Iron (total)	3	3,559	5,337	360	9720	597	5158.5	7895.4
Owater-NORTH		N/A	N/A	>BCWQ	Manganese (total)	3	109.7	163.1	11.3	298	19.8	158.9	242.36
Owater-REFERENCE		N/A	N/A	<BCWQ	Cadmium (dissolved)	3	0.06333	0.006658	0.059	0.071	0.06	0.0655	0.0688
Owater-REFERENCE		N/A	N/A	<BCWQ	Cadmium (total)	3	0.07300	0.01778	0.053	0.087	0.079	0.083	0.0854
Owater-REFERENCE		N/A	N/A	<BCWQ	Copper (dissolved)	3	0.8667	0.2282	0.626	1.08	0.894	0.987	1.0428
Owater-REFERENCE		N/A	N/A	<BCWQ	Copper (total)	3	0.7500	0.2543	0.565	1.04	0.645	0.8425	0.961
Owater-REFERENCE		N/A	N/A	<BCWQ	Iron (dissolved)	3	11.00	1.732	10	13	10	11.5	12.4
Owater-REFERENCE		N/A	N/A	>BCWQ	Iron (total)	3	147.7	81.82	60	222	161	191.5	209.8
Owater-REFERENCE		N/A	N/A	<BCWQ	Manganese (dissolved)	3	2.414	1.516	0.993	4.01	2.24	3.125	3.656
Owater-REFERENCE		N/A	N/A	<BCWQ	Manganese (total)	3	5.530	2.370	3.33	8.04	5.22	6.63	7.476
Owater-REFERENCE		N/A	N/A	<BCWQ	Zinc (dissolved)	3	3.123	0.5064	2.54	3.45	3.38	3.415	3.436
Owater-REFERENCE		N/A	N/A	<BCWQ	Zinc (total)	3	2.063	1.097	1.42	3.33	1.44	2.385	2.952

Linear velocity of plume = Darcy velocity (V_{Darcy}) divided by the effective porosity (n)

PCOC = potential contaminant of concern

The above information is a summary only and persons who may be relying on the report are encouraged to review the entire document so as to avoid the use of information out of context

Date _____

Appendix C Continued

Contaminant Risk Summary 1

HUMAN HEALTH

SITE ID #: 4291

CARCINOGENS

COPC	Exposure Pathway	Maximum Calculated Incremental Lifetime Cancer Risk	Risk-based Standard
Arsenic	Ingestion of waste coal/soil	See Appendix B of Revised Problem Formulation and Preliminary Quantitative Risk Assessment. Risks calculated for recreator only. Values vary depending on assumed exposure scenario.	1.00E-05
	Ingestion of intertidal sediment		
	Ingestion of intertidal seep ferricrete		
	Ingestion of intertidal water		
	Ingestion of clams		
	Ingestion of oysters		
	Dermal contact with waste coal/soil		
	Dermal contact with intertidal sediment		
	Dermal contact with intertidal seep ferricrete		
	Dermal contact with intertidal water		
	Inhalation of waste coal/soil		
	Inhalation of intertidal sediment		
	Combined pathways		

NON-CARCINOGENS

COPC	Exposure Pathway	Maximum Calculated Hazard Index	Risk-based Standard
Aluminium	All above pathways	See Appendix B of Revised Problem Formulation and Preliminary Quantitative Risk Assessment. Risks calculated for recreator only. Values vary depending on assumed exposure scenario.	1.00E+00
Arsenic	All above pathways		
Cadmium	Ingestion of intertidal water, clams, oysters; Dermal contact with intertidal water		
Cobalt	Ingestion of clams, oysters		
Copper	Ingestion of clams, oysters		
Iron	All above pathways		
Lead	Ingestion of clams, oysters		
Manganese	All above pathways		
Molybdenum	Ingestion of ferricrete; Dermal contact with ferricrete		
Nickel	Ingestion of clams, oysters		
Zinc	Ingestion of clams, oysters		
Naphthalene	Ingestion of waste coal/soil, sediment, ferricrete; Dermal contact with waste coal/soil, sediment, ferricrete; Inhalation of waste coal/soil, sediment.		
Phenanthrene	Ingestion of waste coal/soil, sediment, ferricrete; Dermal contact with waste coal/soil, sediment, ferricrete; Inhalation of waste coal/soil, sediment; Ingestion of clams.		

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Date: _____

Contaminant Risk Summary 2

ECOLOGICAL HEALTH

SITE ID #: 4291

Terrestrial

Substance	Critical Receptor	Exposure Pathway	Risk Estimate	Risk Characterization
COPCs not finalized. Wildlife hazard quotients not calculated. Receptors of concern selected and site conceptual model completed. See report Titled:				
Revised Problem Formulation and Preliminary Quantitative Risk Assessment, Union Bay Waste Coal Pile				

Aquatic

Substance	Critical Receptor	Exposure Pathway	Risk Estimate	Risk Characterization
Hazard quotients not calculated. COPCs selected, water and sediment toxicity testing and biological observations completed. See report titled:				
Revised Problem Formulation and Preliminary Quantitative Risk Assessment, Union Bay Waste Coal Pile				

The above information is a summary only and persons who may be relying on the report are encouraged to review the entire document so as to avoid the use of information out of context.

Date: _____