

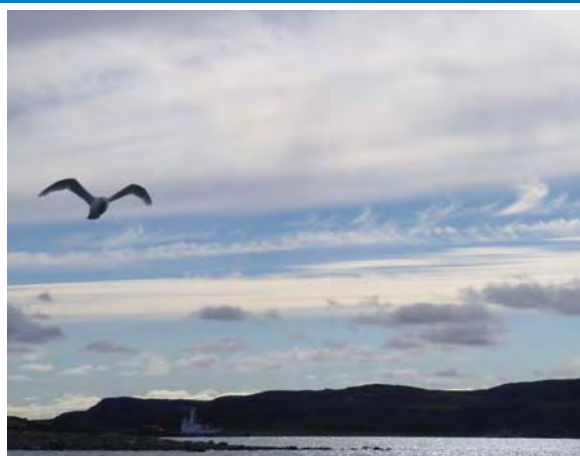
Appendix V5-7B

Hope Bay Belt Project:
2010 Marine Baseline Report



Hope Bay Mining Limited

HOPE BAY BELT PROJECT 2010 Marine Baseline Report



Rescan™ Environmental Services Ltd.
Rescan Building, Sixth Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

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HOPE BAY BELT PROJECT

2010 MARINE BASELINE REPORT

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Hope Bay Mining Limited

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Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

Executive Summary

Environmental baseline studies were conducted by Rescan Environmental Services Ltd. (Rescan) in 2010, on behalf of Hope Bay Mining Ltd. (HBML), for the Hope Bay Belt Project. The Hope Bay Belt Property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the south shore of Melville Sound. The nearest communities are Omingmaktok (Bay Chimo; 75 km to the southwest of the property), Cambridge Bay, and Kingaok (Bathurst Inlet; 160 km to the southwest of the property).

This report presents the findings of the 2010 Marine Baseline Program. The primary objective of the 2010 marine program was to collect additional marine baseline data relevant to the planned Phase 2 Project to support permitting and project design. The Marine Baseline Program included the following components: the vertical structure and dissolved oxygen content of the water column, water and sediment quality, phytoplankton, and benthic invertebrates. Two distinct marine basins near the Project area were surveyed between April and October 2010: Roberts Bay and Reference Bay. Roberts Bay was included in the baseline sampling program as this area could potentially be influenced by future Project activities, and Reference Bay (east of Roberts Bay) was selected as a marine reference site. The following text provides a brief summary of the various components sampled as part of the 2010 program.

Water Column Structure and Dissolved Oxygen

In April, the water columns of Roberts Bay and Reference Bay underneath the snow and ice were vertically stratified. Surface salinity ranged from 24 to 26, and bottom water salinity approached 27.3. Winter water temperatures were approximately -1.4°C to -1.3°C at the surface and -0.7°C to -0.5°C in bottom waters. Dissolved oxygen concentrations ranged from 9.4 to 10.2 mg/L at the surface, and decreased to a minimum of 5.6 mg/L in deeper waters.

During summer, the surface layer in both bays was warmer and more brackish than in winter because of the increased solar radiation, ice melt, and enhanced riverine input during summer. Salinities typically ranged between 20 and 24 at the surface, and reached 27.4 at depth. Surface temperatures ranged between 7.9°C and 14.3°C in Roberts Bay and between 5.9°C and 10.3°C in Reference Bay, and approached -0.7°C at depth. Pycnocline depths in July and August were similar to those in the winter. Summer dissolved oxygen concentrations in the mixed layer ranged between 8.7 and 10.9 mg/L and were similar to April levels. Below the mixed layer, oxygen concentrations were substantially higher than in April.

During fall, sampling occurred during a period of very strong winds; therefore, Roberts and Reference bays were laterally well mixed and the thermohaline structure between inlets was very similar. Surface salinities ranged from 24.4 to 24.9, and surface temperatures ranged from 3.4°C to 3.9°C . Deep water temperature and salinity were very similar to those in the winter and summer, approaching -0.7°C and 27.5. Near the surface, oxygen was 12.4 to 12.7 mg/L at all sites. In bottom waters, dissolved oxygen concentrations ranged from 11.7 to 12.8 mg/L.

Light penetration was high in both Roberts Bay and Reference Bay during summer and fall. The euphotic depth was generally deeper than 16 m and below the pycnocline, which suggests that net photosynthesis was possible throughout the upper water column in both bays.

Water Quality

Overall, water quality parameters were similar between Roberts Bay and Reference Bay. pH averaged 7.7 across all sites and depths in winter and 7.9 in summer. Winter concentrations of total suspended solids (TSS) ranged from below detection (<3 mg/L) to 10.3 mg/L. Summer and fall concentrations of TSS were generally higher and more variable, ranging from below detection to 24.4 mg/L. Turbidity levels were low at all sites during winter (averaging 0.2 NTU), but were higher and more variable in summer and fall (0.2 to 16 NTU). Near-shore sites in Roberts Bay had particularly high TSS and turbidity levels in late summer; this is likely attributable to sediment re-suspension due to wave activity at these shallow sites.

Some nutrients showed vertical concentration gradients, which were most dramatic during July and August. Nitrate, total phosphorus, orthophosphate, and silicate concentrations were generally lower at the surface than in deep waters. Vertical gradients of total organic carbon exhibited the opposite trend as the summer surface concentrations were usually slightly higher than at depth. Vertical gradients characterized by lower nutrients and higher total organic carbon at the surface than at depth are indicative of phytoplankton growth and biological nutrient uptake.

Roberts Bay and Reference Bay can be considered low-metal environments, as average concentrations of total and dissolved arsenic, cadmium, chromium, copper, iron, mercury, and zinc were generally below the detection limits for all sites in all sampling months. Exceptions to this tended to be from summer surface samples collected at shallow near-shore sites. Although manganese and molybdenum concentrations were usually above detection, few spatial or seasonal trends were apparent. Water quality parameters were generally below the Canadian Council of Ministers of the Environment (CCME) water quality guidelines for the protection of marine aquatic life. The only exception was total chromium in the September deep sample at site REF-4, which was slightly higher than the CCME guideline for hexavalent chromium.

Sediment Quality

Marine sediments were composed mainly of sand, with some silt and clay. Concentrations of several parameters co-varied with the fine particle composition of the sediment. Sites with higher proportions of silts and clays tended to contain the highest concentrations of total organic carbon, total nitrogen, available ammonium, and molybdenum. Conversely, the sand-dominated eastern basin of Roberts Bay contained the lowest concentrations of these parameters, and also had the lowest levels of available phosphate, aluminum, arsenic, chromium, copper, iron, manganese, molybdenum, nickel, and zinc. Concentrations of polycyclic aromatic hydrocarbons were below analytical detection limits for all sites. Concentrations of EPH19-32 (extractable petroleum hydrocarbons with a carbon range between 19 and 32) and HEPH (heavy extractable petroleum hydrocarbons) were above the detection limits at some Roberts Bay sites. All sediment parameters were below CCME interim marine sediment quality guidelines (ISQGs) and probable effects levels (PELs) for the protection of marine aquatic life.

Phytoplankton

Phytoplankton biomass (as chlorophyll *a*) was generally low at all sites (0.07 to 1.3 µg chl *a*/L), but reached approximately 7.0 µg chl *a*/L in the eastern basin of Roberts Bay in August. Phytoplankton abundance, biomass (as carbon), taxonomy, richness, and diversity levels were similar between Roberts Bay and Reference Bay, and showed similar seasonal trends. Average phytoplankton abundance and biomass as carbon were lowest in August and highest in September. In both Roberts and Reference bays, cryptophytes were numerically dominant in August, while diatoms were dominant in September. Despite being numerically dominant in August and abundant in September, cryptophytes represented a

relatively small proportion of phytoplankton biomass as carbon due to their small size. In comparison, diatoms and dinoflagellates made up a relatively large proportion of the total phytoplankton biomass.

Phytoplankton genus richness and diversity were similar between Roberts and Reference bays. Genus richness averaged 12 in August and 13 in September in both areas. In August, average Simpson's diversity was 0.21 in Roberts Bay and 0.28 in Reference Bay, while in September, Simpson's diversity increased to 0.44 in Roberts Bay and 0.41 in Reference Bay. In general, taxonomic diversity was low to moderate.

Benthos

Average benthos density was highly variable, ranging from 959 organisms/m² at in the eastern basin of Roberts Bay to 29,900 organisms/m² in the western basin of Roberts Bay. Benthos density in Reference Bay was within range of the densities observed in Roberts Bay. Sites with highest benthos density tended to be dominated by polychaetes. The polychaete genus *Nephtys* was particularly abundant at these sites. Conversely, sites with lowest benthos density tended to be dominated by bivalves, particularly by the small Baltic clam (*Macoma balthica*).

Average benthos genus richness ranged from 3 in the eastern basin of Roberts Bay to 15 in the western basin of Roberts Bay. The pattern in genus richness closely followed benthos density, with sites with greater densities having correspondingly higher richness. Average Simpson's diversity levels ranged from 0.30 to 0.69. In general, taxonomic diversity was low to moderate.

Acknowledgements

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HOPE BAY BELT PROJECT

2010 MARINE BASELINE REPORT

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1. Introduction

1. Introduction

The Hope Bay Belt Property is located approximately 125 km southwest of Cambridge Bay, Nunavut, on the south shore of Melville Sound (Figure 1-1). The nearest communities are Omingmaktok (75 km to the southwest of the property), Cambridge Bay, and Kingaok (Bathurst Inlet; 160 km to the southwest of the property).

The property consists of a greenstone belt running in a north/south direction, approximately 80 km long, with three main gold deposit areas. The Doris and Madrid deposits are located in the northern portion of the belt, and the Boston deposit is located in the southern end. The northern portion of the property consists of several watershed systems that drain into Roberts Bay, and a large river (Koignuk River) that drains into Hope Bay. Watersheds in the southern portion of the belt ultimately drain into the upper Koignuk, which drains into Hope Bay.

Hope Bay Mining Limited (HBML) is proceeding with the development of the Doris North Project. Required licences and permits are in place for the development of the Doris North Gold Mine, and construction of the project commenced in 2010.

HBML plans to develop additional deposits in the belt, and planning for this Phase 2 Project development has commenced. Baseline studies to support the permitting of the Phase 2 Project were carried out in 2009, and were continued in 2010. The environmental baseline program conducted in 2010 was intended to fill in information gaps in order to support the permitting process for the Phase 2 Project. The site layout options considered for the 2010 Phase 2 environmental baseline program (entire belt) are shown in Figure 1-2, and the site layout options considered for Roberts Bay are shown in Figure 1-3.

Results from the 2010 Phase 2 Project environmental baseline program are being reported in a series of reports, as follows:

- 2010 Hydrology Baseline Report;
- 2010 Freshwater Baseline Report;
- 2010 Freshwater Fish and Fish Habitat Baseline Report;
- 2010 Marine Baseline Report;
- 2010 Marine Fish and Fish Habitat Baseline Report;
- 2010 Terrain and Soils Baseline Report;
- 2010 Country Foods Baseline Report;
- 2010 Ecosystems and Vegetation Baseline Report; and
- 2010 Marine Wildlife Baseline Report.



Figure 1-1

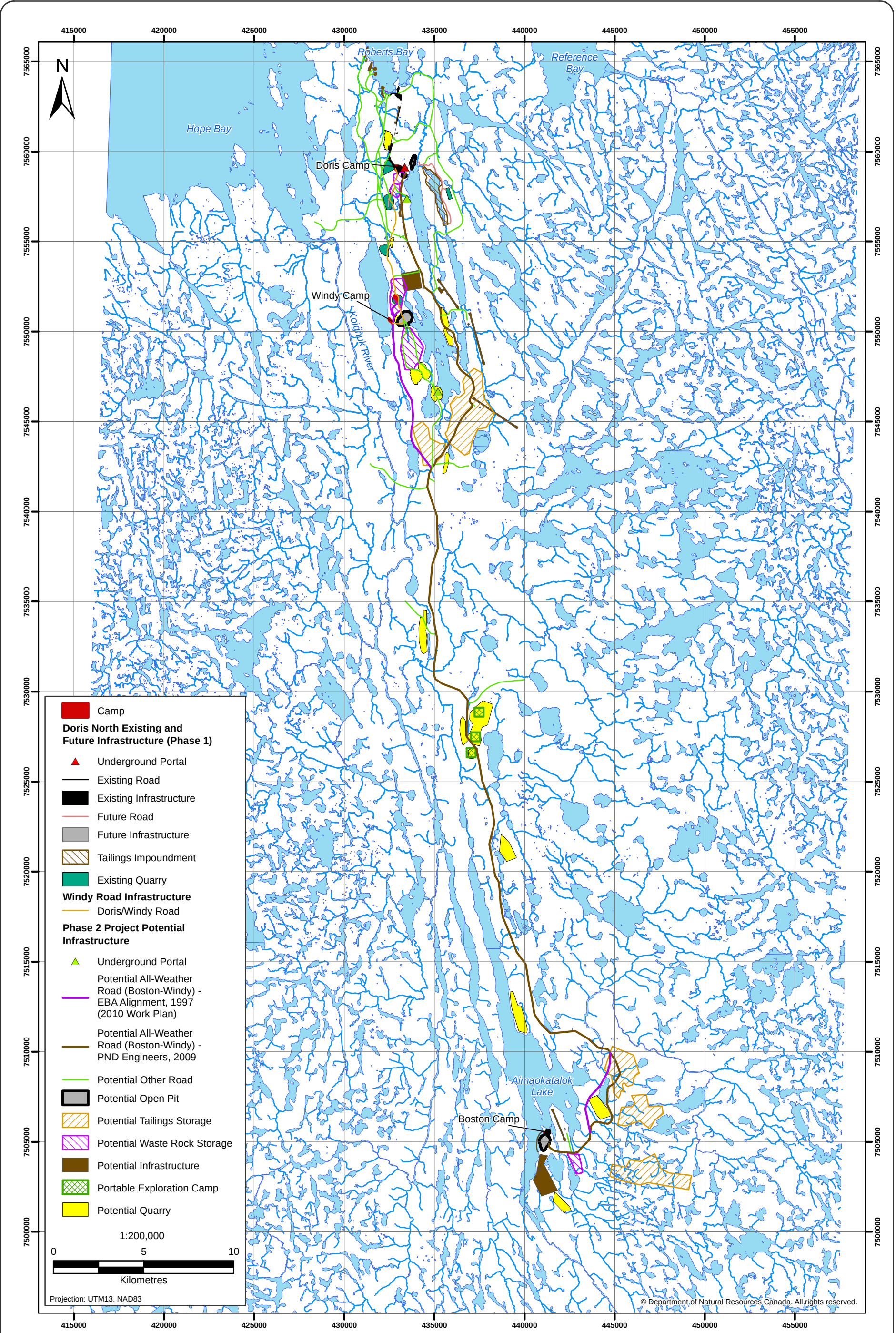
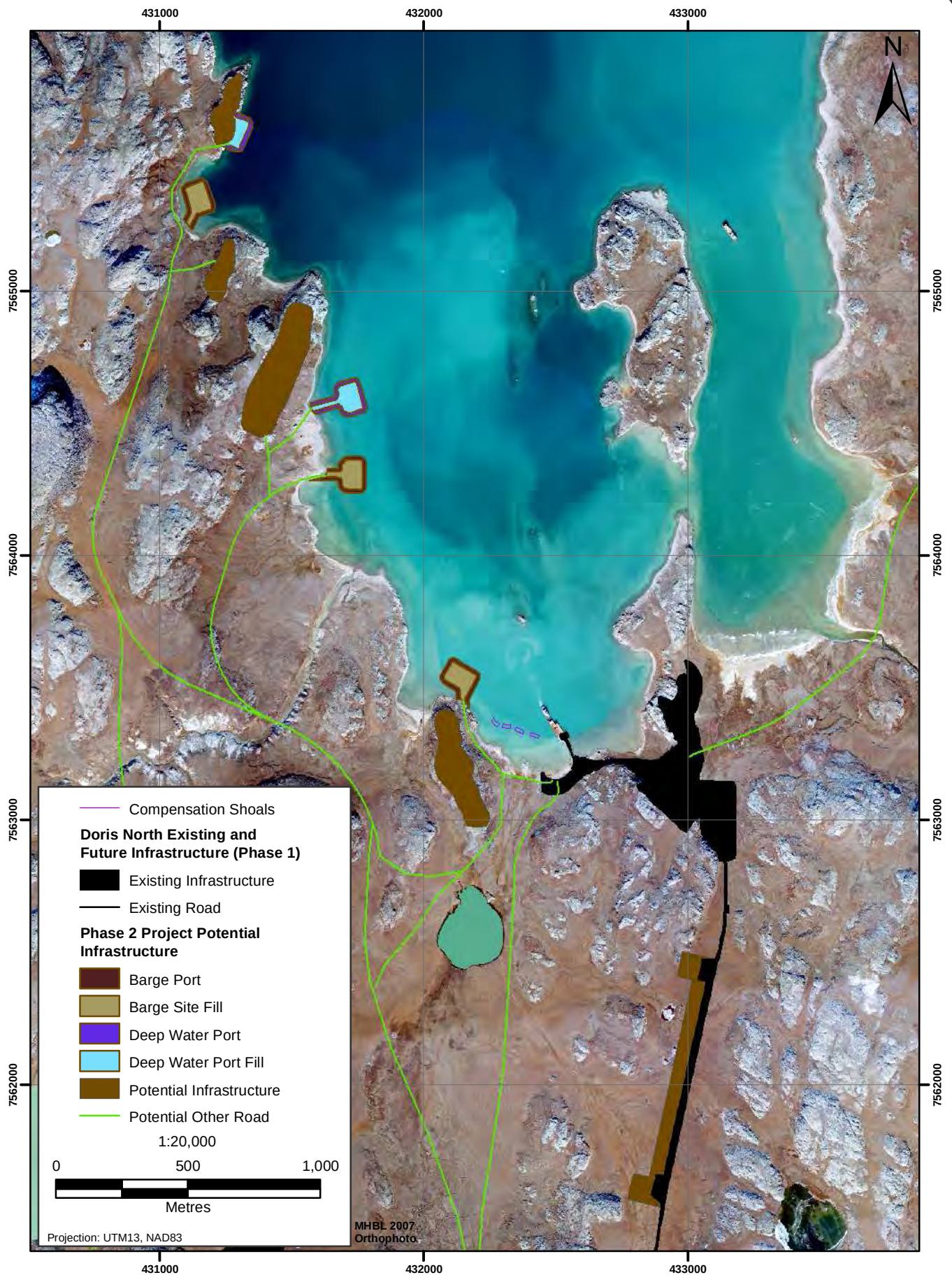


Figure 1-2

Figure 1-2

Site Layout Options Considered for
Phase 2 Baseline Program, 2010





Roberts Bay Site Layout Options Considered for
Phase 2 Baseline Program, 2010

Figure 1-3

In addition, numerous reports are being produced as part of the Doris North Project compliance requirements, and many of these reports cover the geographical areas of the proposed Phase 2 Project. Examples of Doris North Project compliance reports generated in 2010 that are relevant to the proposed Phase 2 Project include:

- 2010 Meteorology Compliance Report, Doris North Project;
- 2010 Hydrology Compliance Report, Doris North Project;
- 2010 Aquatic Effects Monitoring Program Report, Doris North Project;
- 2010 Wildlife Mitigation and Monitoring Report, Doris North Project;
- 2010 Wildlife DNA Study, Doris North Project; and
- 2010 Air Quality Compliance Reports, Doris North Project.

Archaeology work was also conducted in 2010 and is being reported separately.

This report presents the results from the marine portion of the 2010 Phase 2 environmental baseline program. The 2010 marine baseline program involved the characterization of the physico-chemical and biological components of the marine environment around the Hope Bay Belt Project area. The marine baseline program included the following components: the vertical structure and dissolved oxygen content of the water column (winter, summer, and fall), water quality (winter, summer, and fall), sediment quality (summer), phytoplankton (winter, summer, and fall), and benthos (summer). Two distinct marine basins near the Project area were surveyed: Roberts Bay and Reference Bay. Roberts Bay was included in the baseline sampling program as this area could potentially be influenced by future Project activities, and Reference Bay was selected as a marine reference site.

Analytical results from all samples collected as part of the 2010 marine baseline program are provided in the appendices to this report. Section 2 of this report presents the sampling locations and methods used for the 2010 marine baseline work, and Section 3 presents the results of the marine baseline program. Historical methods and results from past studies in the Project area are included in Sections 2 and 3.

2. Methods

2. Methods

The 2010 marine baseline surveys were conducted in Roberts Bay and Reference Bay four times between April and October (April, July, August, and September/October). A three-person team (including an Inuit assistant) conducted marine sampling in both bays during the ice-covered season from April 23 to April 24, 2010, the summer season July 13 to July 22 and August 15 to August 19, as well as in fall from September 28 to October 1, 2010. During the April, July, and September/October surveys, the following environmental components were included in the sampling program: water column physical structure, dissolved oxygen profiles, marine water quality, and phytoplankton biomass. The August sampling program included these components, but was expanded to include sediment quality and marine phytoplankton and benthos community characteristics.

For the sake of completeness, all marine data collected as part of the 2010 Aquatic Effects Monitoring Program (AEMP) was also included in this report. This data was collected over the same sampling periods as described above and included two sites in Roberts Bay (RBE, RBW) and one site in Reference Bay (REF-Marine).

2.1 SAMPLING LOCATIONS AND DESIGN

The 2010 marine baseline survey was designed to capture the spatial and seasonal variability of the physico-chemical environment and the spatial patterns of the biota in both Roberts Bay, near the Project area, and Reference Bay. Historical marine baseline data exists for localized geographical areas in Roberts Bay (1996-2010) and Reference Bay (2009-2010). 2010 was the second time that sampling was conducted in Reference Bay. Table 2.1-1 lists the parameters measured for each marine environmental component during 2010.

Table 2.1-1. Winter, Summer, and Fall Marine Surveys, Hope Bay Belt Project, April-October, 2010

Sampled Parameters	April	July	August	Sept/Oct
Water Column Structure				
Salinity	X	X	X	X
Temperature	X	X	X	X
Dissolved Oxygen	X	X	X	X
Euphotic Zone Depth		X	X	X
Water Quality				
Physical, Anions, and Nutrients	X	X	X	X
Metals (Total and Dissolved)	X	X	X	X
Sediment Quality				
Particle Composition, % Moisture			X	
Organic Content, Nutrients, EPH/PAH			X	
Total Metals			X	
Biology				
Phytoplankton Biomass	X	X	X	X
Phytoplankton Abundance, Taxonomy, and Diversity			X	X
Benthos Abundance, Taxonomy, and Diversity			X	

The winter sampling was designed to collect ‘worse-case scenario’, under-ice water in Roberts and Reference bays when dissolved oxygen concentrations would be lowest (reduced photosynthesis) and concentrations of nutrients and metals would be highest (limited biological uptake). In Roberts Bay, winter thermohaline profiles (temperature, salinity) were collected at ten sites covering the mid-channel and near-shore environment (Figure 2.1-1). Dissolved oxygen profiles and water quality samples were collected at one pelagic site (ST4) and three near-shore sites (DWP, RBE, and RBW). Site DWP was sampled to collect baseline information at a potential deep-water port location, while RBE (shallow eastern basin of Roberts Bay) and RBW (shallow western basin of Roberts Bay) were sampled to collect information specific to future Project activities (e.g. jetty activity). In Reference Bay, winter thermohaline profiles were collected at seven sites along a north-south, mid-channel transect (Figure 2.1-2). A single winter dissolved oxygen profile was collected at REF-4. Water quality samples were collected at two sites: REF-4 in the pelagic region, and REF-Marine in the near-shore region. All winter sampling was conducted from April 23-24, 2010.

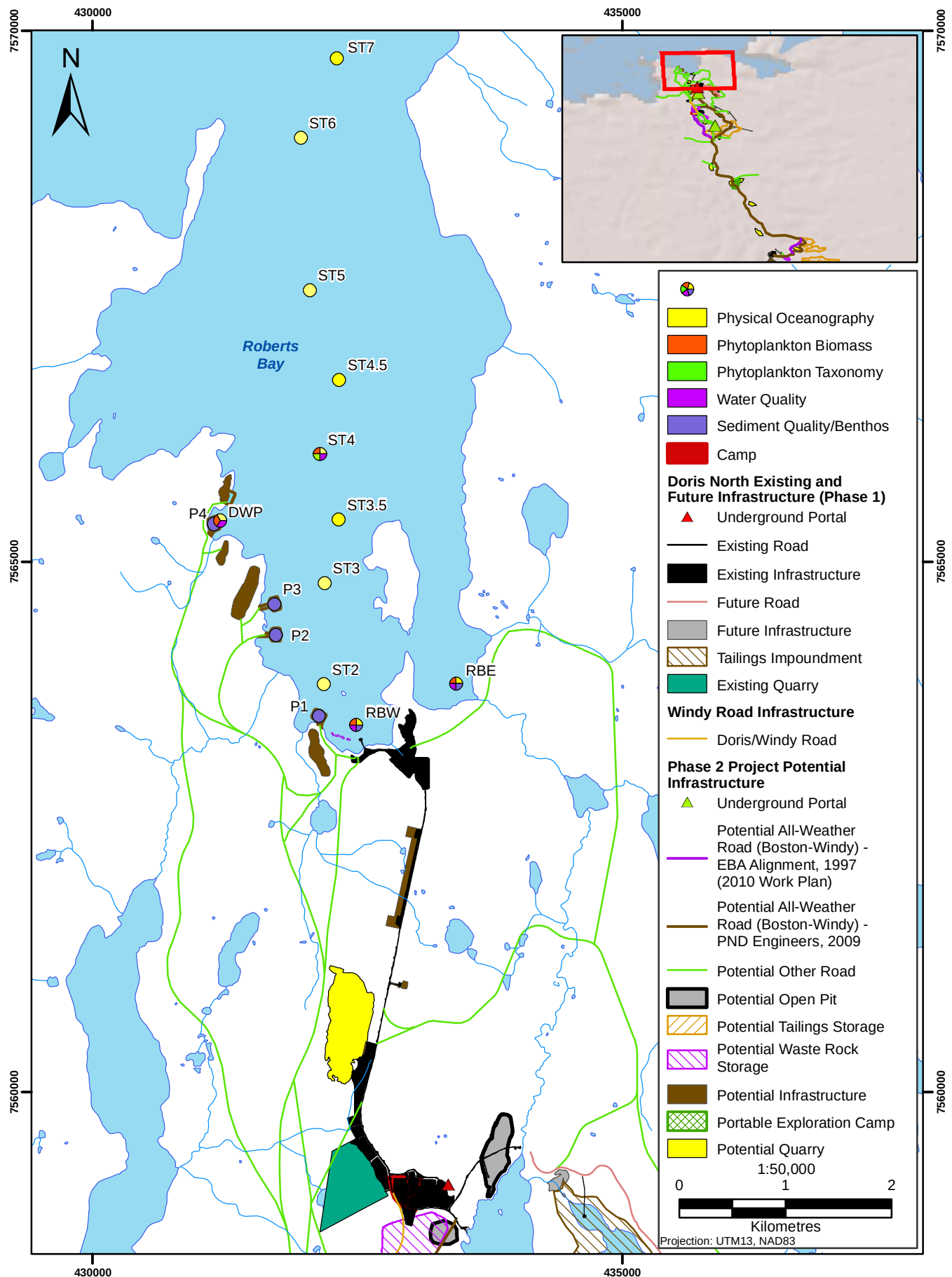
Summer and fall sampling were also carried out in Roberts Bay and Reference Bay. Sampling in Roberts Bay was designed with two objectives in mind: 1) to gather temporal baseline oceanographic data for the entire inlet, and 2) to collect baseline data relevant to the future shipping infrastructure (e.g., deep water port, fuel dock, fuel tank farm) that could be built in Roberts Bay. In support of the first objective, the physical structure of the water column was surveyed and water quality and aquatic biology samples were collected throughout Roberts Bay. In support of the second objective, the sampling program focussed on characterizing sediment chemistry and benthic invertebrate communities in areas relevant to future potential infrastructure. For the first objective, thermohaline profiling was conducted at sites similar to winter (Figure 2.1-1) during the following dates: July 21, August 19, and September 29 to October 1. Water quality, dissolved oxygen profiles, Secchi depths, and phytoplankton biomass (chlorophyll *a*) samples were collected at the pelagic site, ST4, and the three near-shore sites (DWP, RBE, and RBW) during each survey. Phytoplankton taxonomy samples were collected at ST4 in August and September. For the second objective, an additional four sites (P sites) were sampled along the western periphery of Roberts Bay for sediment quality (particle size, nutrients, metals, and hydrocarbons) and benthic invertebrate community characteristics (Figure 2.1-1). Sediment quality and benthic invertebrate samples were also collected at RBE and RBW. All sediment and benthos sampling was conducted on August 15, except RBW which was sampled on August 17, 2010.

Reference Bay was selected as a reference site for Roberts Bay. During the July, August, and September surveys, thermohaline profiles (temperature, salinity) were taken at eight sites along the entire mid-channel and the REF-Marine site near the southwest shore of Reference Bay (Figure 2.1-2). Water quality and phytoplankton biomass (chlorophyll *a*) samples were collected at the pelagic site (REF-4) and the near-shore site (REF-Marine) during the summer (July 22, August 15) and fall (September 29) surveys. Phytoplankton taxonomy samples were collected at REF-4 on August 15 and September 29, while sediment quality and benthos (abundance and taxonomy) samples were collected at REF-Marine on August 19, 2010.

Because of the open-water nature of the marine program, sampling was occasionally hindered by high winds and swells. When these circumstances became unsafe, samples were not collected.

2.2 SAMPLING METHODS

Table 2.2-1 provides a summary of sampled parameters, replication, sampling dates, and sampling equipment used. Full descriptions are provided in the following text.



**Marine Sampling Locations in Roberts Bay,
Hope Bay Belt Project, 2010**

Figure 2.1-1

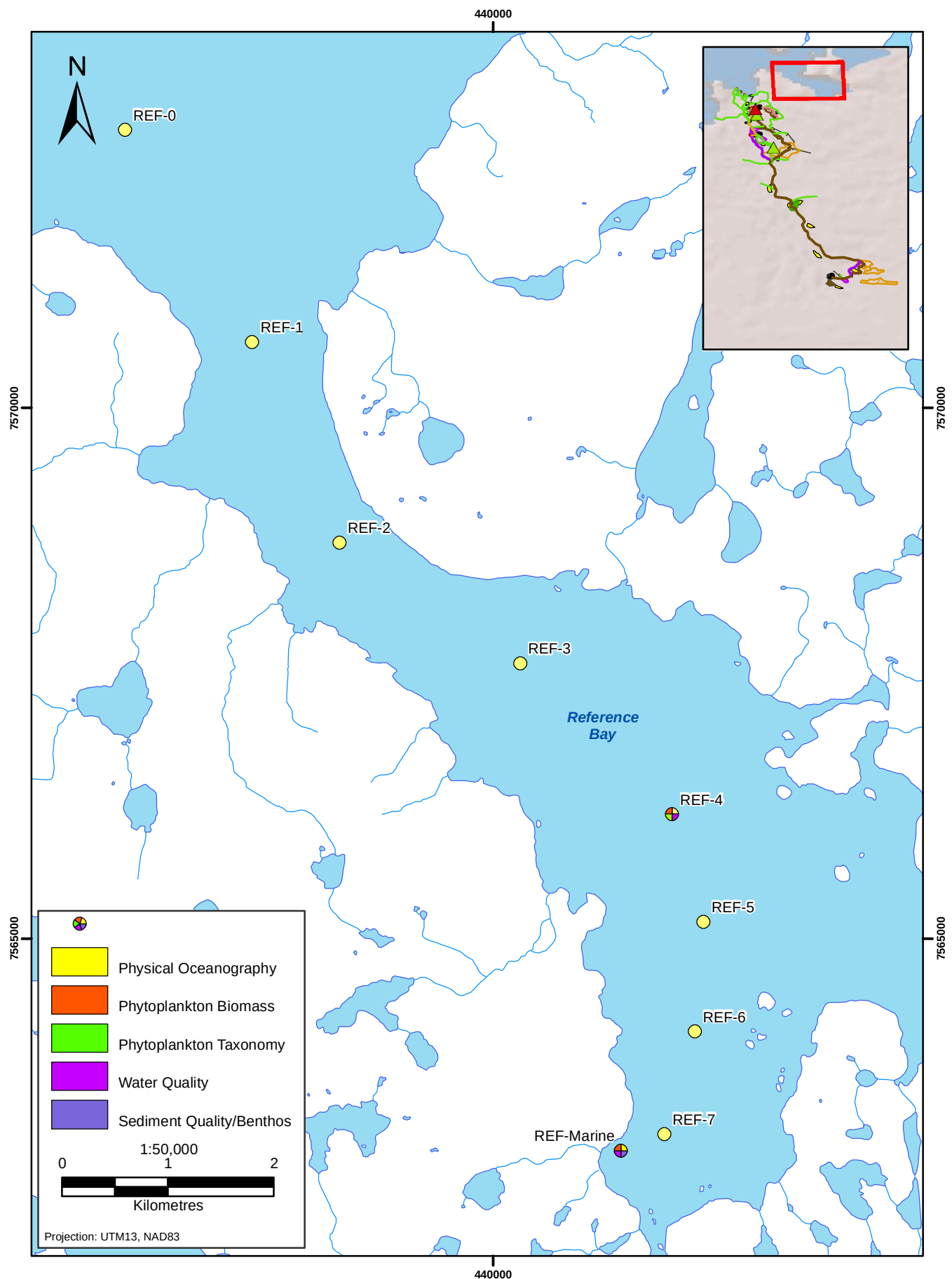


Table 2.2-1. Marine Sampling Details, Hope Bay Belt Project, 2010

Monitoring Parameter	Location	Sample Replication and Depths	Sampling Dates	Sampling Device
Winter Marine Physical Oceanography				
Salinity/Temperature, Dissolved Oxygen (DO) profiles	Roberts Bay (CTD - 10 sites; DO - 2 sites) Reference Bay (CTD - 7 sites; DO - 1 sites)	n=1/site	April	Conductivity-Temperature-Depth (CTD) probe; DO meter
Winter Marine Water Quality				
Physical, anions, nutrients, total and dissolved metals, total organic carbon (TOC)	Roberts Bay (4 sites) Reference Bay (2 sites)	<u>Deep Sites:</u> n=1/site @ 1 m below the surface, 4 m above pycnocline, 4 m below pycnocline, mid-deep layer + 20% replication; <u>Shallow:</u> n=2/site @ 1 m below the surface	April	Niskin sampling bottle
Summer and Fall Marine Physical Oceanography				
Salinity/Temperature, DO profiles, Secchi depth	Roberts Bay (CTD - 8 sites; DO - 4 sites) Reference Bay (CTD - 9 sites; DO - 2 sites)	n=1/site	July, August, September	CTD; DO meter; Secchi disk
Summer and Fall Marine Water Quality				
Physical, anions, nutrients, total and dissolved metals, TOC	Roberts Bay (4 sites) Reference Bay (2 sites)	<u>Deep Sites:</u> n=1/site @ 1 m below the surface, 4 m above pycnocline, 4 m below pycnocline, mid-deep layer + 20% replication; <u>Shallow:</u> n=1/site @ 1 m below the surface, 2 m above sediments + 20% replication	July, August, September	Go-Flo sampling bottle
Summer Sediment Quality				
Particle size, nutrients, TOC, total metals, polycyclic aromatic hydrocarbons (PAH), extractable hydrocarbons (EPH)	Roberts Bay (6 sites) Reference Bay (1 site)	n=3/site	August	Ponar grab
Summer Benthos				
Density and taxonomy	Roberts Bay (6 sites) Reference Bay (1 site)	n=5/site; AEMP sites (RBE, RBW, REF-Marine) n=5/site with 3 pooled subsamples/replicate	August	Ponar grab; 500 µm sieve; 10% formalin preservation
Winter, Summer, and Fall Phytoplankton				
Biomass (chl <i>a</i>) Abundance and taxonomy	Roberts Bay (biomass - 4 sites; taxonomy - 1 site) Reference Bay (biomass - 2 sites; taxonomy - 1 site)	n=3/site @ 1 m below the surface	April, July, August, September (biomass); Aug, Sept (taxonomy)	Go-Flo sampling bottle; Lugol's solution preservation

2.2.1 Water Column Structure and Dissolved Oxygen

2.2.1.1 Winter

The underlying water at the winter sampling sites was accessed by drilling a 25 cm diameter hole through the ice. Ice thickness was recorded and the bottom depth measured using a weighted, metred line. A vertical profile of temperature, salinity, and conductivity was collected using an *in situ* conductivity, temperature, and depth (CTD) probe. The probe was lowered through the water column (at an approximate speed 0.5 m/s) on a cable to within a few metres of the sea floor. The data logged during this process was immediately transferred to a computer in the field. Data from the downcast was used for interpretation. Salinity profiles were plotted from the acquired data to determine the pycnocline depth, from which water quality sampling depths were determined. Density was calculated from the acquired CTD data using the algorithm of Fofonoff and Millard Jr. (1983). Following the CTD casts, vertical profiles of dissolved oxygen (DO) concentration and percent saturation were collected at 1 m intervals to within 2 m of the sediments (or to a maximum depth of 30 m) using a YSI dissolved oxygen meter.

2.2.1.2 Summer

CTD and DO profiles were collected from the side of an aluminum boat. The logged and recorded data was processed in the same fashion as that collected in winter. Secchi depths were measured to determine the light penetration at each site. A 30 cm white disk was placed over the shaded side of the boat and lowered until it disappeared from sight. It was raised into view and lowered until it disappeared a second time. This was recorded as the Secchi depth (D_s). The 1% ($Z_{1\%}$) euphotic zone depth was computed by first calculating the light extinction coefficient (k) from D_s , and then calculating the euphotic zone depth based on the appropriate light extinction coefficient. The 1% euphotic depth is the depth of the water column where 1% of the surface irradiance reaches. It represents the depth at which the integrated gross water column photosynthetic production is equivalent to the integrated gross water column respiration; thus, there is net photosynthesis above this depth. The 1% euphotic depth is often known as the compensation depth, and is calculated as follows (Parsons et al. 1984):

Light extinction coefficient:

$$k \text{ (m}^{-1}\text{)} = 1.7/D_s$$

Euphotic Depth (1%):

$$Z_{1\%} \text{ (m}^{-1}\text{)} = 4.6/k$$

2.2.2 Water Quality

Water quality samples were collected in April, July, August, and September. Depths of water quality sampling were determined based on the water column structure (as determined by the CTD profiles initially collected at a specific site). At deep sites (>5 m), four depths were sampled: 1 m below the surface, 4 m above the pycnocline, 4 m below the pycnocline, and at mid-depth of the deep layer. At shallower sites (<5 m), duplicate samples were collected at 1 m depth. For Quality Assurance/Quality Control (QA/QC) purposes, replicate samples were collected at 20% of the sample depths.

An adapted 'skinny' Niskin bottle was used to collect water during winter sampling. This bottle is designed to 'trip' and collect discrete samples during freezing temperatures. To avoid metal contamination, the tripping mechanism used acid-cleaned silicone tubing within the interior of the bottle. A dual rope system was used to achieve bottle closure and to ensure the collection of discrete samples. During summer and fall sampling, all water samples were collected using a 5 L Go-Flo sampler.

Both sampling bottles (Niskin/Go-Flo) were acid-cleaned at ALS Laboratory Group facilities (Burnaby, BC) prior to use in the field. All analytical sample bottles were rinsed three times before filling.

A set of travel blanks, field blanks, and equipment blanks (4% of total samples) were processed and submitted with the water samples as part of the QA/QC program. This identified potential sources of contamination to the field samples.

Table 2.2-2 presents the water quality parameters analyzed, and ALS's detection limits. Realized detection limits were occasionally higher than the theoretical detection limits due to interference from other parameters.

Table 2.2-2. Baseline Marine Water Quality Parameters and Detection Limits, Hope Bay Belt Project, April-October 2010

ParameterUnits		Detection Limit		ParameterUnits		Detection Limit	
		Marine	Marine-AEMP			Marine	Marine-AEMP
Physical Tests				Total and Dissolved Metals (continued)			
pH	pH	0.1	0.1	Beryllium (Be)	mg/L	0.0005	0.0005
Alkalinity, Total (as CaCO ₃)	mg/L	-	-	Bismuth (Bi)	mg/L	0.0005	0.0005
Hardness (as CaCO ₃)	mg/L	3.1	0.86	Boron (B)	mg/L	0.1	0.1
Salinity	g/L	1	1	Cadmium (Cd)	mg/L	0.00012	0.00002 or 0.00012
Total Suspended Solids	mg/L	3	3	Calcium (Ca)	mg/L	0.5	0.1
Turbidity	NTU	0.1	0.1	Cesium (Cs)	mg/L	0.0005	0.0005
Anions				Chromium (Cr)	mg/L	0.001	0.001
Bromide (Br)	mg/L	5	2.5	Cobalt (Co)	mg/L	0.0005	0.00005 or 0.0005
Chloride (Cl)	mg/L	50	25	Copper (Cu)	mg/L	0.001	0.00005 or 0.001
Fluoride (F)	mg/L	0.03	0.03	Gallium (Ga)	mg/L	0.0005	0.0005
Sulphate (SO ₄)	mg/L	50	25	Iron (Fe)	mg/L	0.05	0.01 or 0.05
Nutrients				Lead (Pb)	mg/L	0.001	0.00005 or 0.001
Ammonia (as N)	mg/L	0.001	0.005	Lithium (Li)	mg/L	0.02	0.02
Nitrate + Nitrite (as N)	mg/L	0.006	0.006	Magnesium (Mg)	mg/L	1	0.2
Nitrate (as N)	mg/L	0.006	0.006	Manganese (Mn)	mg/L	0.0005	0.00005 or 0.0005
Nitrite (as N)	mg/L	0.002	0.002	Mercury (Hg)	mg/L	0.00001	0.00001
Ortho Phosphate (as P)	mg/L	0.001	-	Molybdenum (Mo)	mg/L	0.002	0.002
Total Phosphorus	mg/L	0.002	0.002	Nickel (Ni)	mg/L	0.0005	0.00005 or 0.0005
Silicate (as SiO ₂)	mg/L	0.025	-	Phosphorus (P)	mg/L	1	1
Organic Carbon				Potassium (K)	mg/L	20	4
Cyanide, Total	mg/L	0.001	0.001	Rhenium (Re)	mg/L	0.0005	0.0005
Total Organic Carbon	mg/L	0.5	0.5	Rubidium (Rb)	mg/L	0.0005	0.005
Total and Dissolved Metals				Selenium (Se)	mg/L	0.002	0.0004 or 0.002
Aluminum (Al)	mg/L	0.005	0.005	Silicon (Si)	mg/L	0.5	0.1
Antimony (Sb)	mg/L	0.0005	0.0005	Silver (Ag)	mg/L	0.0002	0.0002
Arsenic (As)	mg/L	0.002	0.0004 or 0.002	Sodium (Na)	mg/L	20	4
Barium (Ba)	mg/L	0.001	0.001	Strontium (Sr)	mg/L	0.00005	0.00005

(continued)

Table 2.2-2. Baseline Marine Water Quality Parameters and Detection Limits, Hope Bay Belt Project, April-October 2010 (completed)

ParameterUnits		Detection Limit		ParameterUnits		Detection Limit	
		Marine	Marine-AEMP			Marine	Marine-AEMP
Total and Dissolved Metals (continued)				Total and Dissolved Metals (continued)			
Tellurium (Te)	mg/L	0.0005	0.0005	Uranium (U)	mg/L	0.0005	0.00005 or 0.0005
Thallium (Tl)	mg/L	0.0005	0.0005	Vanadium (V)	mg/L	0.0005	0.0005
Thorium (Th)	mg/L	0.0005	0.0005	Yttrium (Y)	mg/L	0.0005	0.0005
Tin (Sn)	mg/L	0.001	0.001	Zinc (Zn)	mg/L	0.0005	0.0008 or 0.005
Tungsten (W)	mg/L	0.001	0.001	Zirconium (Zr)	mg/L	0.0005	0.0005
Titanium (Ti)	mg/L	0.005	0.005				

2.2.3 Sediment Quality

Sediment quality samples were collected during August in Roberts Bay (6 sites; August 15-17, 2010) and Reference Bay (one site; August 19, 2010). Triplicate samples were collected at each site (Figures 2.1-1 and 2.1-2) using a ponar grab sampler, with replicates gathered 5 to 20 m apart. Sampling depths are provided in Table 2.2-3. Each sediment sample was carefully transferred onto a tray, and the top 2 cm of sediment was scraped into Whirl-Pak bags and sent to ALS (Yellowknife, NT) for analysis. Samples were refrigerated (in darkness) until they were shipped on the first available flight out of camp. Table 2.2-4 presents the sediment quality parameters that were analyzed and their detection limits. Realized detection limits were occasionally higher than the theoretical detection limits.

Table 2.2-3. Baseline Marine Sediment Quality Sampling Depths, Hope Bay Belt Project, August 2010

Site	Sampling Depth (m)
Roberts Bay	
P1	5.5
P2	3.0
P3	3.5
P4	5.0
RBE	4.7
RBW	3.9
Reference Bay	
REF-MARINE	7.0

2.2.4 Phytoplankton

Phytoplankton samples were collected during the summer and fall seasons at the same sites and during the same time as water quality collection (Figures 2.1-1 and 2.1-2).

Table 2.2-4. Baseline Marine Sediment Quality Parameters and Detection Limits, Hope Bay Belt Project, August 2010

Parameter	Units	Detection Limit	Parameter	Units	Detection Limit
Physical Tests			Total Metals (cont'd)		
% Moisture	%	0.1	Selenium (Se)	mg/kg	0.5
pH	pH	0.1	Silver (Ag)	mg/kg	0.1
Particle Size			Sodium (Na)	mg/kg	200
% Gravel (>2 mm)	%	0.1	Strontium (Sr)	mg/kg	0.5
% Sand (2.0 mm - 0.063 mm)	%	0.1	Sulphur (S)	mg/kg	100
% Silt (0.063 mm - 4 µm)	%	0.1	Thallium (Tl)	mg/kg	0.5
% Clay (<4 µm)	%	0.1	Tin (Sn)	mg/kg	5
Leachable Nutrients			Titanium (Ti)	mg/kg	1
Total Nitrogen	mg/kg	0.02	Uranium (U)	mg/kg	0.05
Plant Available Nutrients			Vanadium (V)	mg/kg	2
Available Ammonium (as N)	mg/kg	0.8	Zinc (Zn)	mg/kg	1
Available Nitrate (as N)	mg/kg	2.0	Polycyclic Aromatic Hydrocarbons		
Available Nitrite (as N)	mg/kg	0.4	Acenaphthene	mg/kg	0.005
Available Phosphate (as P)	mg/kg	2.0	Acenaphthylene	mg/kg	0.005
Organic Carbon			Anthracene	mg/kg	0.004
Total Organic Carbon	mg/kg	0.1	Benz(a)anthracene	mg/kg	0.01
Total Metals			Benzo(a)pyrene	mg/kg	0.01
Aluminum (Al)	mg/kg	50	Benzo(b)fluoranthene	mg/kg	0.01
Antimony (Sb)	mg/kg	10	Benzo(g,h,i)perylene	mg/kg	0.01
Arsenic (As)	mg/kg	0.05	Benzo(k)fluoranthene	mg/kg	0.01
Barium (Ba)	mg/kg	1	Chrysene	mg/kg	0.01
Beryllium (Be)	mg/kg	0.5	Dibenz(a,h)anthracene	mg/kg	0.005
Bismuth (Bi)	mg/kg	20	Fluoranthene	mg/kg	0.01
Cadmium (Cd)	mg/kg	0.1	Fluorene	mg/kg	0.01
Calcium (Ca)	mg/kg	50	Indeno(1,2,3-c,d)pyrene	mg/kg	0.01
Chromium (Cr)	mg/kg	2	2-Methylnaphthalene	mg/kg	0.01
Cobalt (Co)	mg/kg	2	Naphthalene	mg/kg	0.01
Copper (Cu)	mg/kg	1	Phenanthrene	mg/kg	0.01
Iron (Fe)	mg/kg	50	Pyrene	mg/kg	0.01
Lead (Pb)	mg/kg	2	d10-Acenaphthene (SS)	%	-
Lithium (Li)	mg/kg	2	d12-Chrysene (SS)	%	-
Magnesium (Mg)	mg/kg	50	d8-Naphthalene (SS)	%	-
Manganese (Mn)	mg/kg	1	d10-Phenanthrene (SS)	%	-
Mercury (Hg)	mg/kg	0.005	Extractable Hydrocarbons		
Molybdenum (Mo)	mg/kg	0.2	EPH10-19	mg/kg	40 or 200
Nickel (Ni)	mg/kg	5	EPH19-32	mg/kg	40 or 200
Phosphorus (P)	mg/kg	50	LEPH	mg/kg	40 or 200
Potassium (K)	mg/kg	200	HEPH	mg/kg	40 or 200

2.2.4.1 *Biomass (as chlorophyll a)*

Phytoplankton biomass samples were collected at four sites in Roberts Bay (ST4, DWP, RBE, RBW) and two sites in Reference Bay (REF-4, REF-Marine) during April, July, August, and late September. Triplicate samples were collected at 1 m depth using a 5 L Go-Flo water sampler. All samples were transferred into 1 L plastic bottles and stored in a cool, dark cooler until being returned to camp later in the day. Once at camp, the samples were filtered onto 0.45 µm filters, which were wrapped into aluminum foil, and stored frozen. Chlorophyll samples were hand carried to Vancouver, BC, to ensure they remained frozen, and sent to ALS (Burnaby, BC) for analysis.

2.2.4.2 *Taxonomy, Abundance, and Diversity*

Phytoplankton taxonomy samples were collected twice at ST4 in Roberts Bay (August 17, September 30) and REF-4 in Reference Bay (August 19, September 29) in 2010. Triplicate samples were gathered at each site from 1 m depth using a Go-Flo water sampler. Each sample was transferred into a 1 L plastic bottle and preserved in the field with Lugol's Iodine solution. The samples were kept cool and dark until they were shipped to David Cassis at the University of British Columbia for enumeration, carbon-based biomass estimates, and identification. Genus richness and Simpson's diversity index were calculated from taxonomic results. Genus richness was calculated as the total number of genera present in each sample, and Simpson's index was calculated using the following formula:

$$\text{Simpson Index } (D) = 1 - \sum_{i=1}^G p_i^2$$

where G is the number of genera present, N is the total number of all individuals, n_i is the number of individuals in genus i , and p_i is the relative abundance of each genera calculated as n_i/N . Cryptophytes (also called cryptomonads) were not identifiable beyond the level of phylum, so all observed cryptophytes were assumed to belong to a single genus for the purpose of calculating richness and diversity.

2.2.5 **Benthic Invertebrate Community (Benthos)**

Benthos samples were collected during the summer season in Roberts Bay (6 sites; August 15-17, 2010) and Reference Bay (one site; August 19, 2010). These were collected concurrently with the sediment quality samples (see Section 2.2.3). Five replicate samples were collected at each site (Figures 2.1-2) using a ponar grab sampler, with replicates being gathered 5-20 m apart. For the AEMP sites (RBE, RBW, and REF-Marine), sediment sampling followed Environment Canada's Environmental Effects Monitoring (EEM) guideline recommendations, with three separate subsamples being collected and pooled for each of the five replicate samples (15 total casts per site). All sampling depths are provided in Table 2.2-3. Once at the surface, 1 L of each sediment sample was transferred into a 500 µm sieve bucket and rinsed until free of sediments. The material retained within the sieve was then placed into a labelled plastic jar and filled with 10% buffered formalin. Samples with high sand content that did not pass through the sieve bucket were divided into two subsamples and placed into separate plastic jars without sieving. These were filled with 10% buffered formalin and gently agitated to fully distribute the preservative throughout the sample. All benthos samples were sent to Columbia Science (Courtney, BC) for enumeration and identification. Genus richness and Simpson's diversity index were calculated from taxonomic results as described for phytoplankton taxonomy.

2.3 **HISTORICAL MARINE SAMPLING**

Summaries of the historical sampling sites are presented as maps in Figures 2.3-1 through 2.3-4. Summaries of historical sampling methodologies in the Hope Bay Belt area are presented in Tables 2.3-1 through 2.3-5.

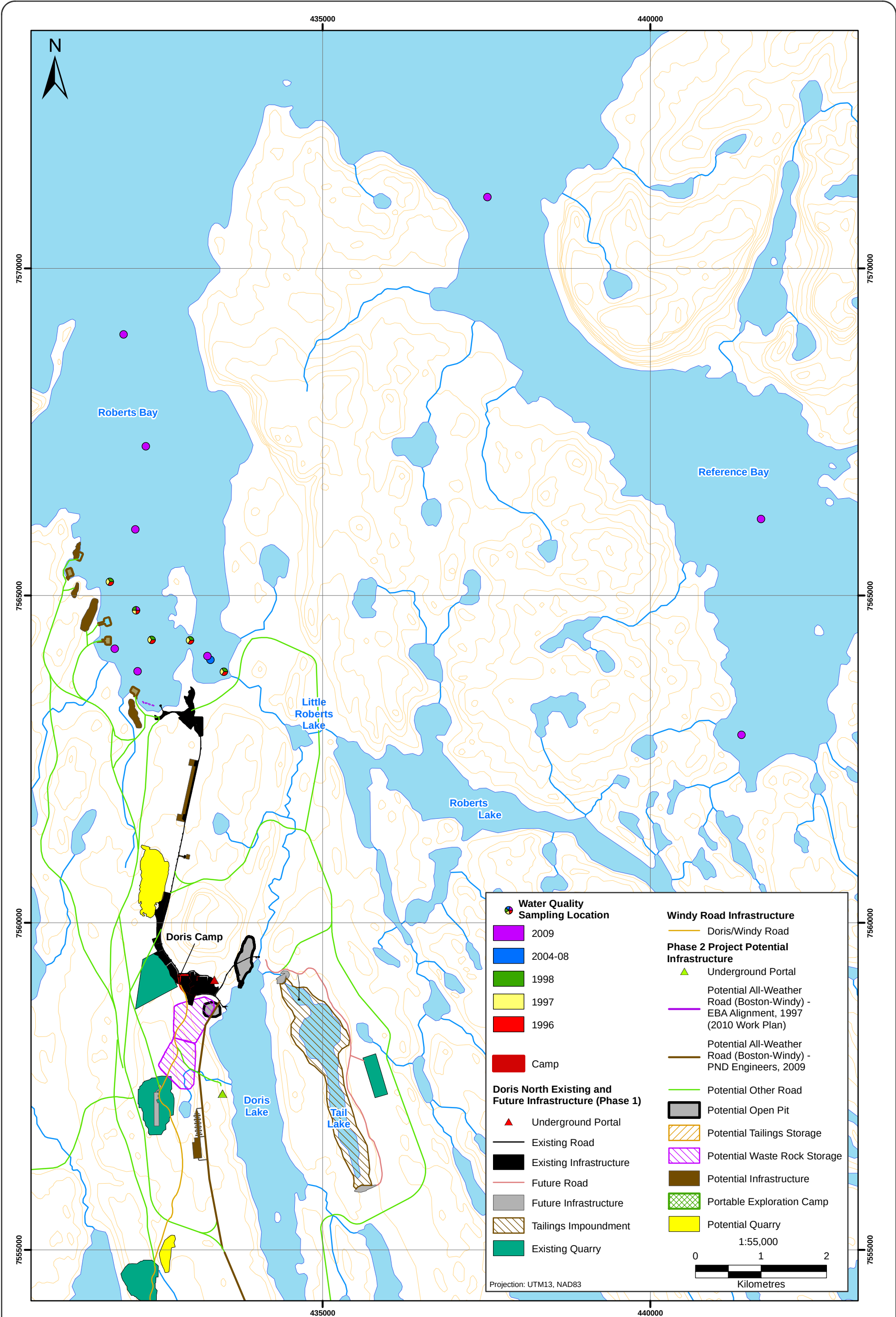


Figure 2.3-1



Historical Marine Water Quality Sampling Locations in Roberts and Reference Bays, Hope Bay Belt Project

Figure 2.3-1



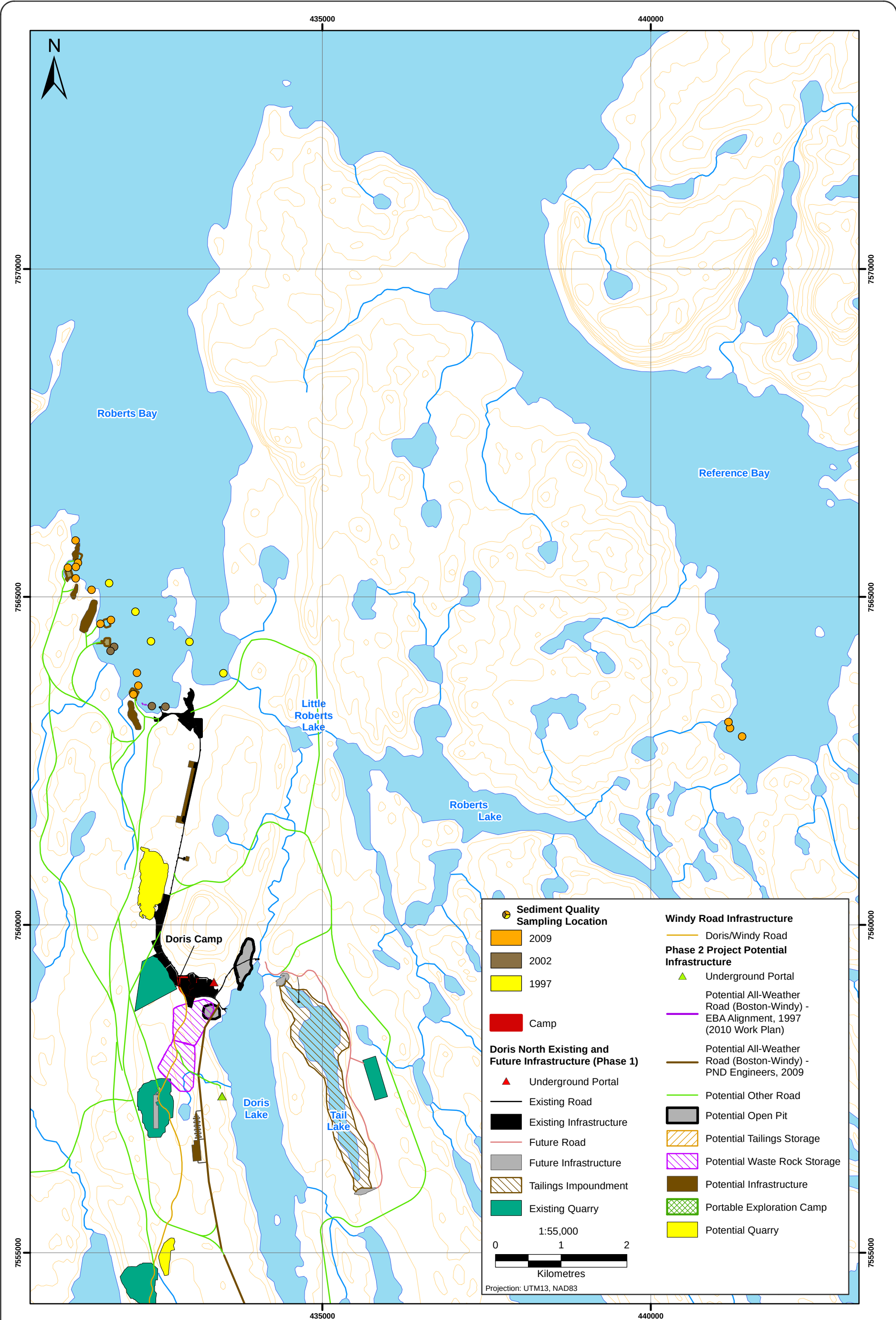


Figure 2.3-2

Figure 2.3-2

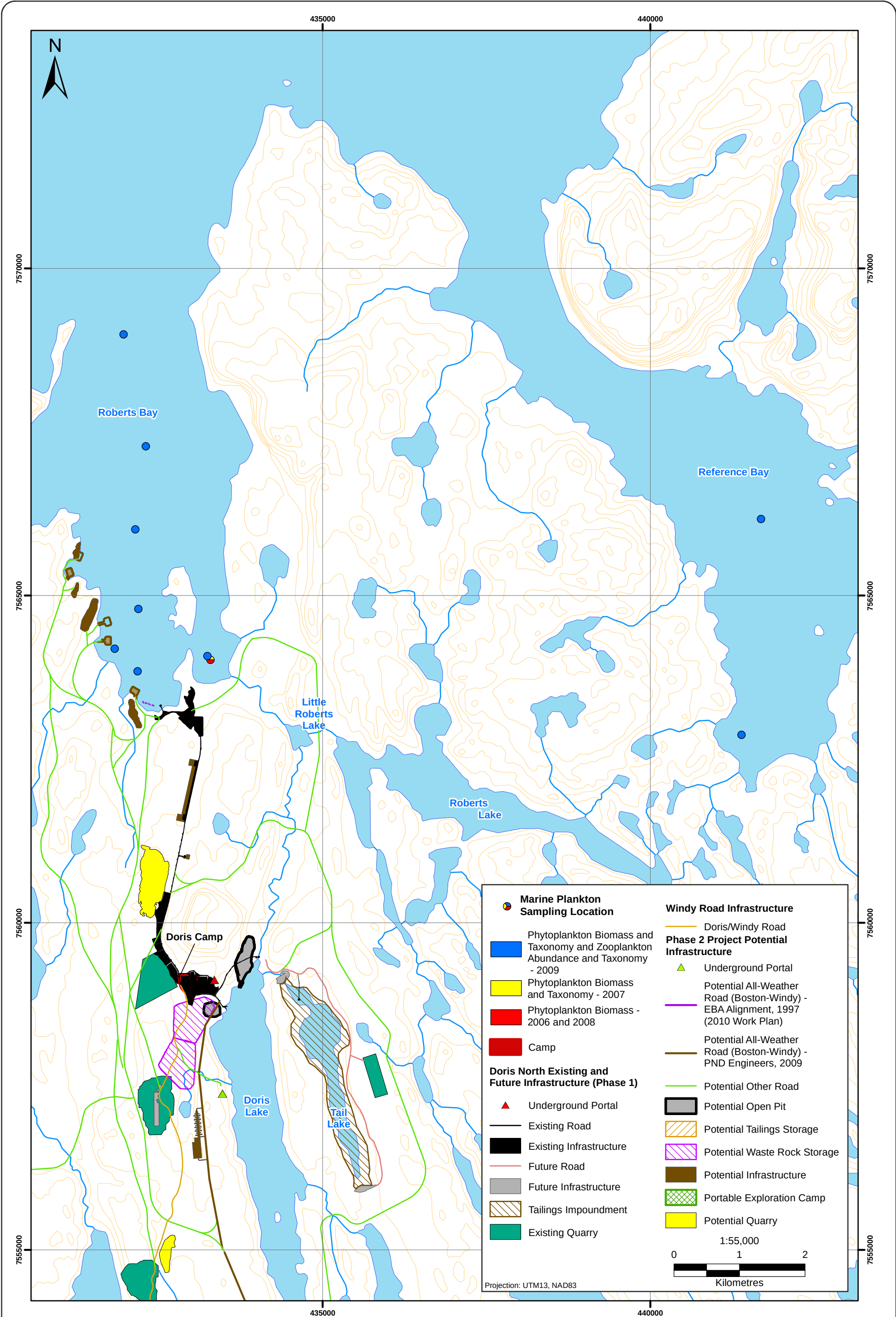


Figure 2.3-3

Figure 2.3-3

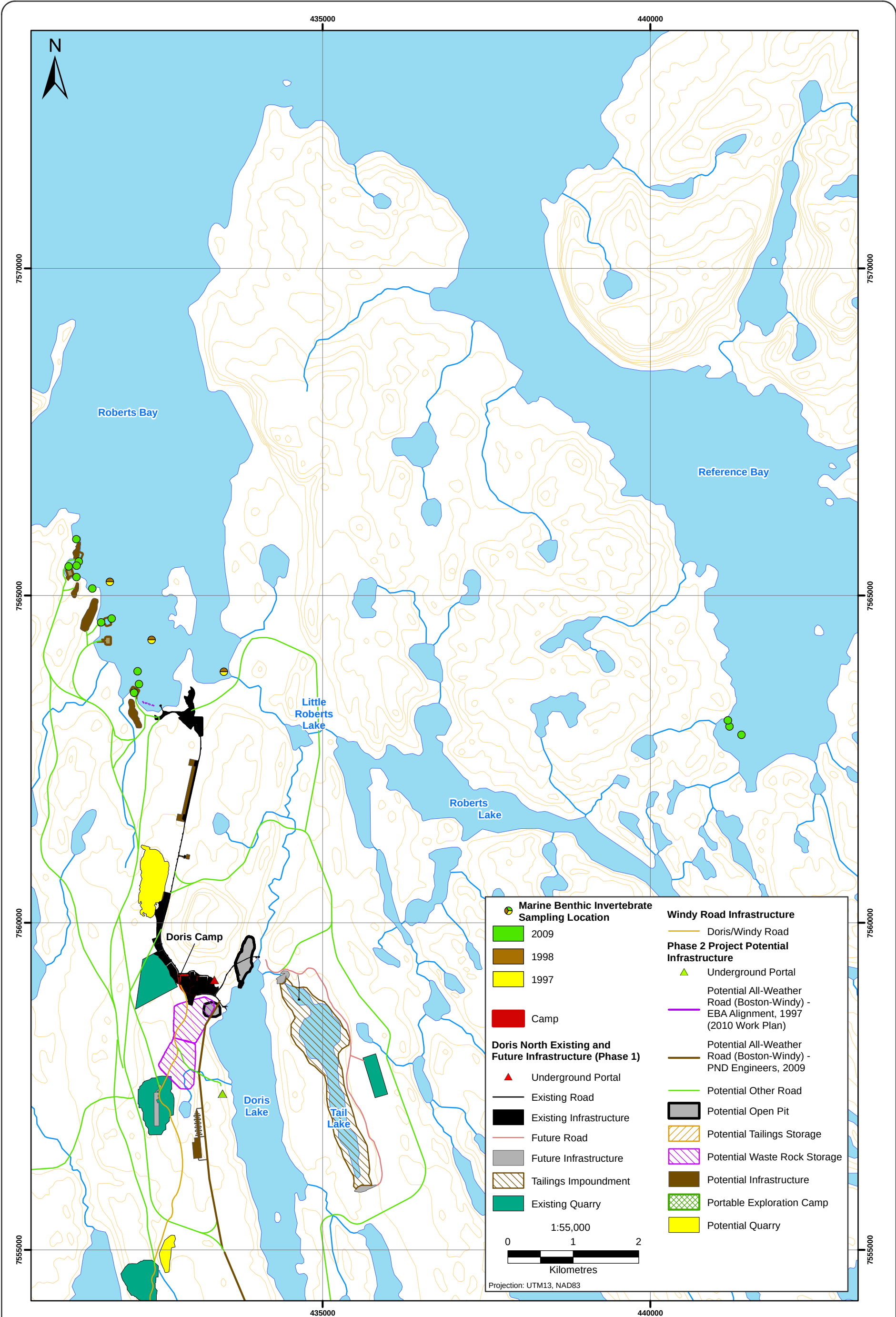


Figure 2.3-4



Historical Benthic Invertebrate Sampling Locations in Roberts and Reference Bays, Hope Bay Belt Project

Figure 2.3-4



Table 2.3-1. Summary of Historical Marine Water Quality Sampling, Hope Bay Belt Project

Year	1996	1997	1998	2004	2005	2006	2007	2008	2009	2010
Sampling month(s)	August	August	July	July, Aug., Sept.	July, Aug., Sept.	May*, July, Aug., Sept.	May*, July, Aug., Sept.	July, Aug., Sept.	April*, August	April*, July, Aug., Sept./Oct.
Sampling Depths	not provided	surface and deep	surface and deep	mid-column	mid-column	mid-column (May); surface and deep (July, Aug, Sept)	surface and deep	surface and deep	Surface at shallow sites; 4 depths at deep sites	Surface at shallow sites; 4 depths at deep sites
Physical	none	Secchi Depth, DO, and Temperature profiles; no salinity	Secchi Depth, DO, and Temperature profiles; no salinity	Secchi Depth, DO, and Temperature profiles; no salinity	Secchi Depth, DO, and Temperature profiles	Secchi Depth, DO, and Temperature profiles	Secchi Depth, DO, and Temperature profiles	Secchi Depth, DO, and Temperature profiles	Secchi Depth (August only), DO, and Salinity/Temperature profiles	Secchi Depth, DO, and Salinity/Temperature profiles
Analytical Parameters	Physical (no salinity), nutrients, anions, total and dissolved metals	Physical (no salinity), nutrients, anions, dissolved metals	Physical (no salinity), nutrients, anions, dissolved metals	Physical parameters (no salinity), nutrients, anions, total and dissolved metals; limited Aug 16 data	Physical parameters, nutrients, anions, total and dissolved metals	Physical parameters, nutrients, anions, dissolved metals	Physical parameters, nutrients, anions, dissolved metals; limited data for May samples	Physical parameters, nutrients, anions, total and dissolved metals	Physical parameters, nutrients, anions, total and dissolved metals	Physical parameters, nutrients, anions, total and dissolved metals
QA/QC	Split samples, Travel/Field Blanks	Split samples, Replicates, Travel Blanks	Split samples, Replicates, Travel Blanks	Replicates, Travel/Field/Equipment Blanks	Field/Equipment Blanks	Replicates, Field Blanks	Replicates, Field Blanks	Replicates, Field/Equipment Blanks	Replicates, Field/Travel/Equipment Blanks	Replicates, Field/Travel/Equipment Blanks
Field Methodology	2 L G-FLO Bottle	5 L GO-FLO Bottle	5 L GO-FLO Bottle	Kemmerer Bottle Sampler	Kemmerer Bottle Sampler	Kemmerer Bottle Sampler	Kemmerer Bottle Sampler	Kemmerer Bottle Sampler	2 L Niskin (April); 5 L GO-FLO (August)	2 L Niskin (April); 5 L GO-FLO (July, August, Sept./Oct.)
Sampled sites	Roberts Bay (5 sites)	Roberts Bay (5 sites) Hope Bay (3 sites)	Roberts Bay (5 sites) Hope Bay (3 sites)	Roberts Bay (1 site)	Roberts Bay (1 site)	Roberts Bay (1 site)	Roberts Bay (1 site) Hope Bay (1 site)	Roberts Bay (1 site) Hope Bay (1 site)	Roberts Bay (April/August) (5 sites/7 sites) Hope Bay (May) (6 Sites) Reference Bay (August) (2 sites)	Roberts Bay (4 sites) Reference Bay (2 sites)

* - represents under-ice season

Table 2.3-2. Summary of Historical Marine Sediment Quality Sampling, Hope Bay Belt Project

	Year				
	1997	1998	2002	2009	2010
Sampling Month(s)	August	July	September	August	August
Sampling Methods	Ekman Grab	Ekman Grab	Ekman Grab	Ponar Grab	Ponar Grab
Data Collected	Moisture, TOC (Total Organic Carbon), Total Metals	Visual Descriptions	TOC, pH, Total Metals, Particle Size, Hydrocarbons	TOC, pH, Nutrients, Total Metals, Particle Size, Hydrocarbons	TOC, pH, Nutrients, Total Metals, Particle Size, Hydrocarbons
Replicates	n=1	n=1	n=5	n=3	n=3
Sampled Sites	Roberts Bay (5 sites) Hope Bay (3 sites)	Roberts Bay (5 sites) Hope Bay (3 sites)	Roberts Bay (4 sites)	Roberts Bay (11 sites) Reference Bay (3 sites)	Roberts Bay (6 sites) Reference Bay (1 site)

Table 2.3-3. Summary of Historical Marine Phytoplankton Sampling, Hope Bay Belt Project

	Year				
	2006	2007	2008	2009	2010
Sampling Month(s)	September	July, August, September	July, August, September	August	August, September
Sampling Device	Kemmerer Bottle Sampler	Depth-integrated Water Sampler	Depth-integrated Water Sampler	GO-FLO sampler	GO-FLO sampler
Data Collected	Chlorophyll <i>a</i> , phaeophytin <i>a</i>	Abundance, biovolume, taxonomy, chlorophyll <i>a</i>	Chlorophyll <i>a</i>	Abundance, carbon content, taxonomy, chlorophyll <i>a</i>	Abundance, carbon content, taxonomy, chlorophyll <i>a</i>
Depths	3 m	entire euphotic zone	entire euphotic zone	1 m	1 m
Replicates	n=3	n=1	n=1	n=3	n=3
Sampled Sites	Roberts Bay (1 site)	Roberts Bay (1 site) Hope Bay (1 site)	Roberts Bay (1 site) Hope Bay (1 site)	Roberts Bay (7 sites) Reference Bay (2 sites)	Roberts Bay (1 site) Reference Bay (1 site)

Table 2.3-4. Summary of Historical Marine Zooplankton Sampling, Hope Bay Belt Project

	Year	
	2007	2009
Sampling Month(s)	July, August, September	August
Sampling Device	Wisconsin net; 152 µm mesh size	Birge-style net; 202 µm mesh size
Data Collected	Abundance, biomass, and taxonomy	Abundance and taxonomy
Replicates	n=1	n=3
Sampled Sites	Hope Bay (1 site)	Roberts Bay (7 sites) Reference Bay (2 sites)

Table 2.3-5. Summary of Historical Marine Benthos Sampling, Hope Bay Belt Project

	Year			
	1997	1998	2009	2010
Sampling Month	August	July	August	August
Sampling Equipment	Ekman; 493 µm sieve	Ponar; 500 µm sieve	Ponar; 500 µm sieve	Ponar; 500 µm sieve
Replicates	n=1	n=1	n=3	n=5/site; AEMP sites (RBE, RBW, REF-Marine) n=5/site with 3 pooled subsamples/replicate
Sampled Sites	Roberts Bay (3 sites)	Roberts Bay (3 sites) Hope Bay (3 sites)	Roberts Bay (11 sites) Reference Bay (3 sites)	Roberts Bay (6 sites) Reference Bay (1 site)

3. Results and Discussion

3. Results and Discussion

Physical, chemical, and biological oceanographic sampling was conducted in Roberts Bay and Reference Bay between April and October, 2010. Roberts Bay is a small, broad fjord with a shallow sill (~30 m) located just north of the constriction that separates inner Roberts Bay from the outer portion that connects to Melville Sound. Roberts Bay receives inflow from a few small streams (primarily Glenn Outflow and Little Roberts Outflow), and maximum depths can exceed 75 m in the inner section. Reference Bay to the east of Roberts Bay is a typical long (~10 km) and deep (>60 m) fjord, with a constriction and sill (~20 m) located near its mouth. Steep cliffs border this fjord to the east and the principal freshwater source is from the Angimajug River.

3.1 SNOW AND ICE COVER

Measurement of snow and ice thickness was conducted in Roberts Bay and Reference Bay during April 2010 at the sites where oxygen profiles were collected. Ice thickness ranged between 155 cm and 190 cm in Roberts Bay and was 156 cm at the single site (REF-4) sampled in Reference Bay (Table 3.1-1). Snow cover ranged from 2 to 12 cm in Roberts Bay and was 14 cm at site REF-4 in Reference Bay.

Table 3.1-1. Snow and Ice Cover in Roberts Bay and Reference Bay, Hope Bay Belt Project, April 2010

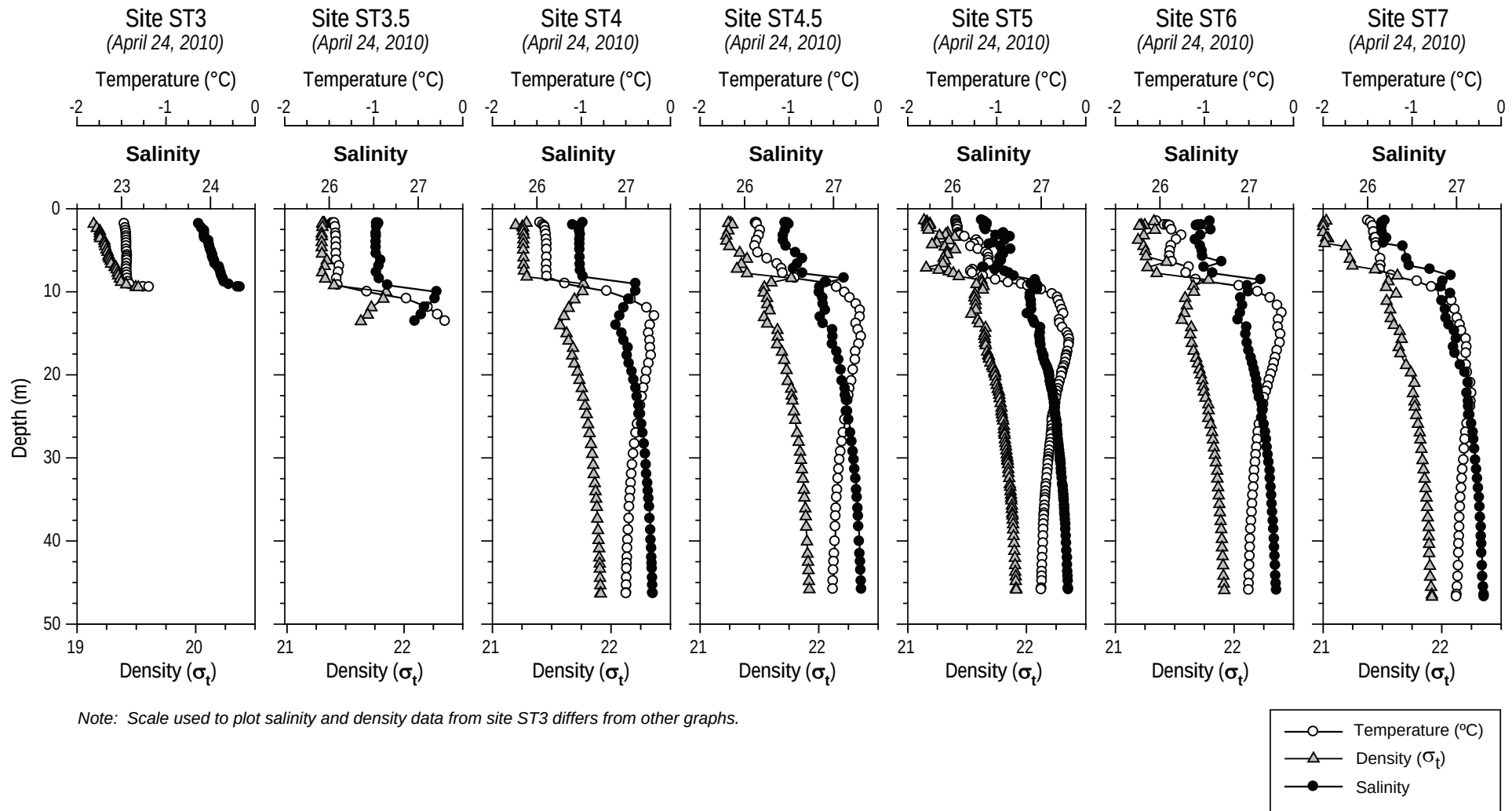
Bay	Ice Depth (cm)	Snow Depth (cm)
Roberts Bay		
(n=4)		
Mean	169	8.5
SE	8.3	2.4
Min	155	2.0
Max	190	12
Reference Bay		
REF-4	156	14

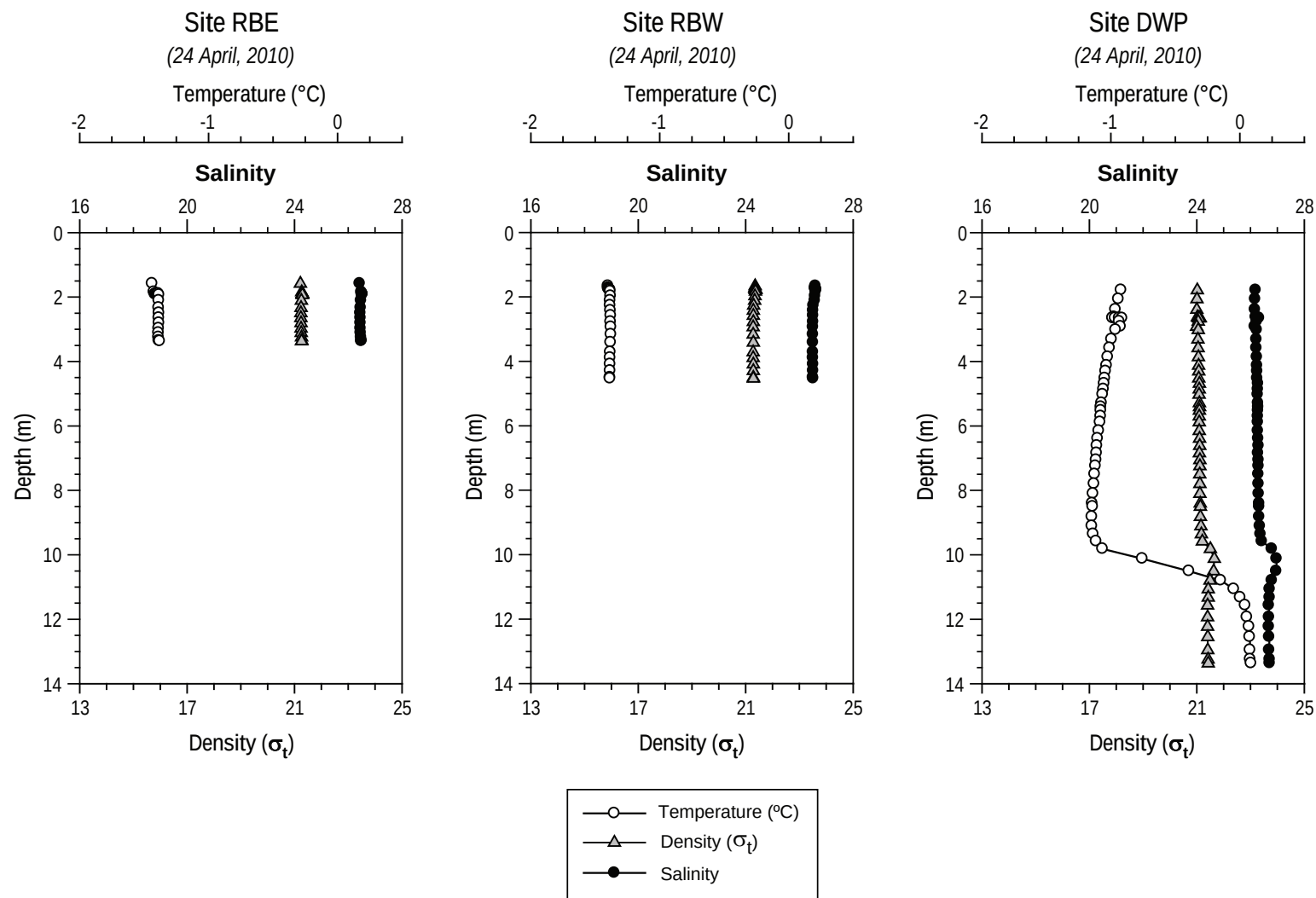
*Notes: Snow and ice depths for Reference Bay measured at site REF-4 only.
SE = Standard error of the mean*

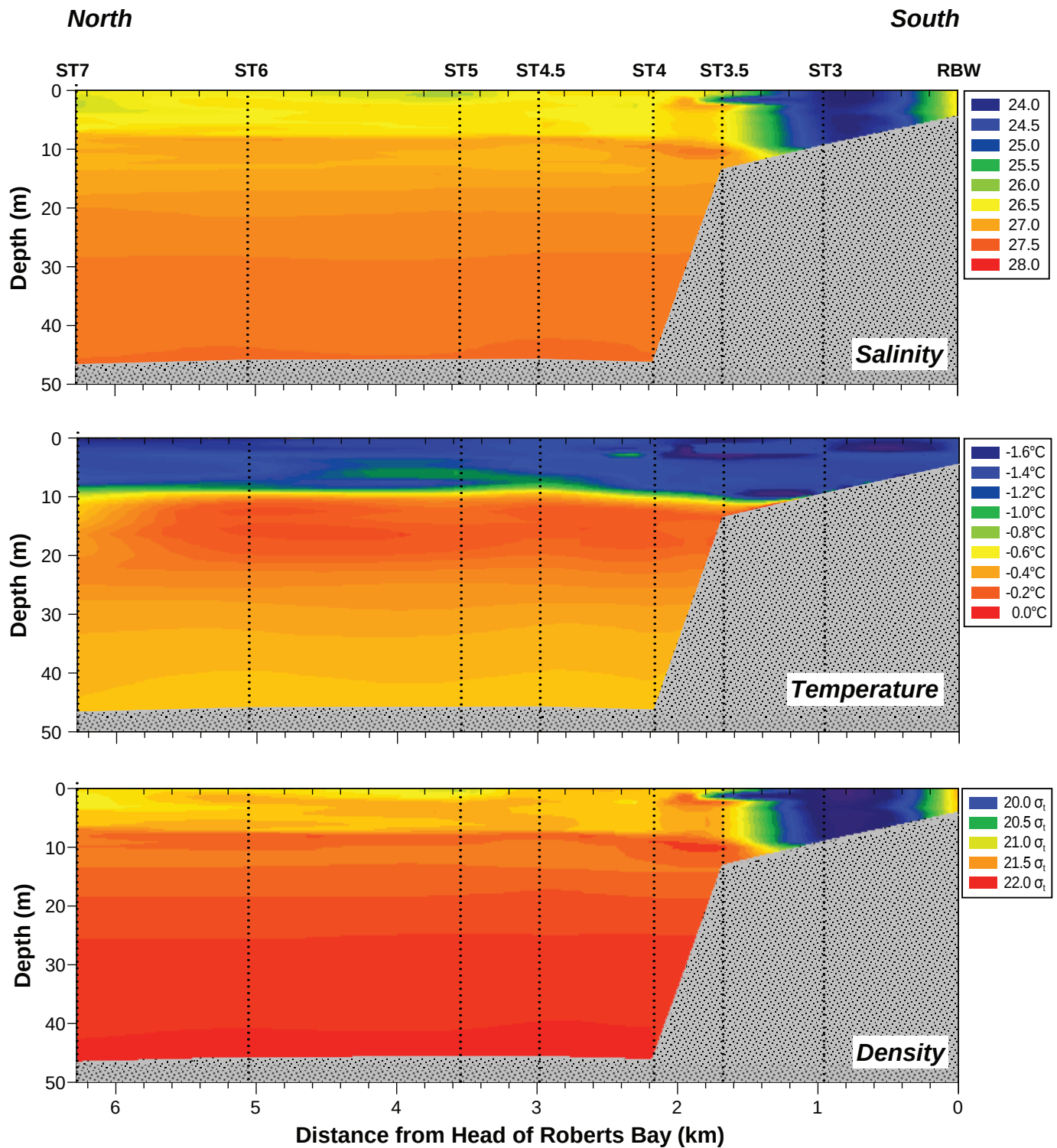
3.2 WATER COLUMN STRUCTURE

3.2.1 Winter

Conductivity, temperature, and depth (CTD) casts were conducted at ten sites in Roberts Bay and seven sites in Reference Bay during April 2010. Profiles and contour plots of the thermohaline structure (temperature, salinity, and density) are shown in Figures 3.2-1 to 3.2-5. The full dataset is provided in Appendix 3.2-1.

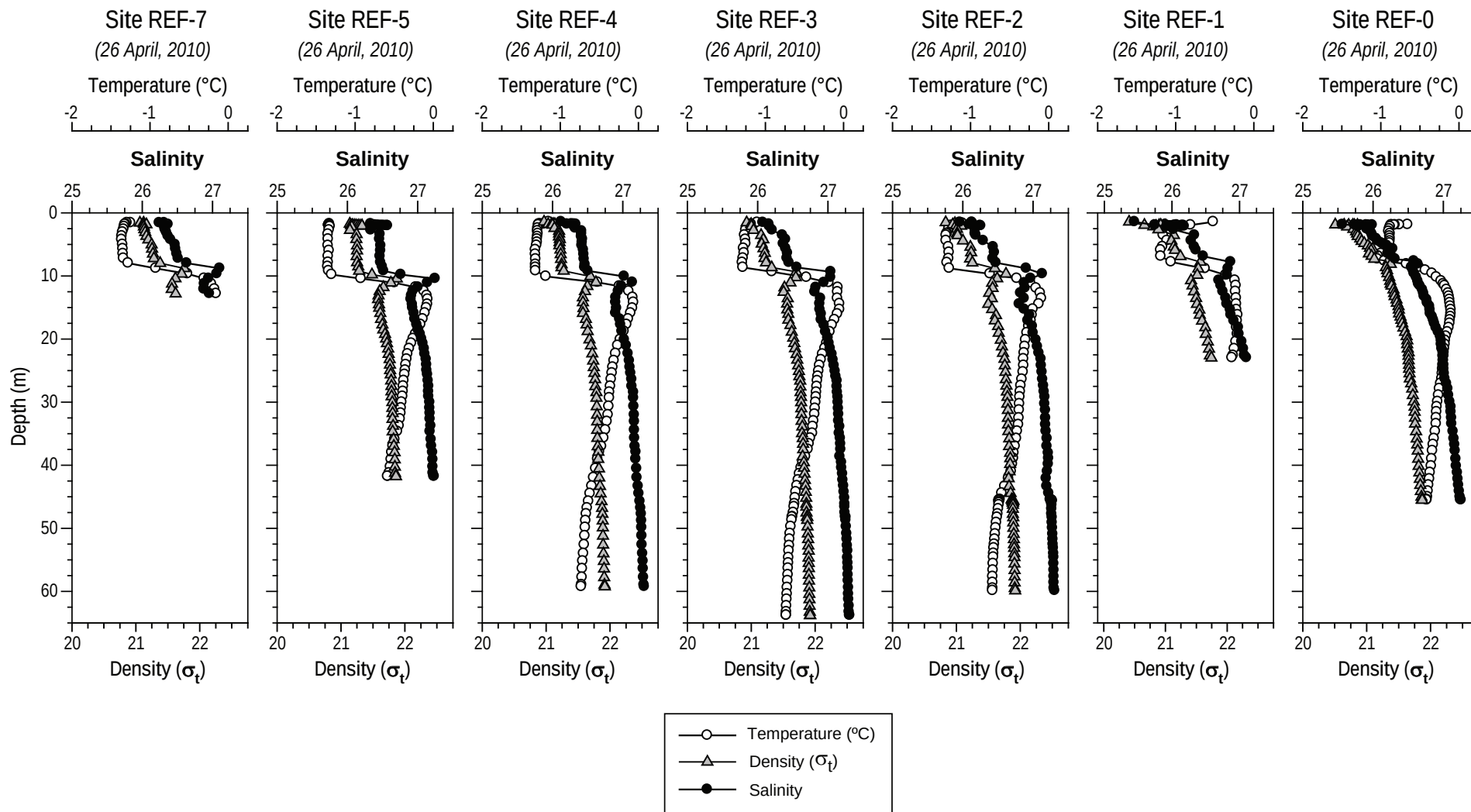


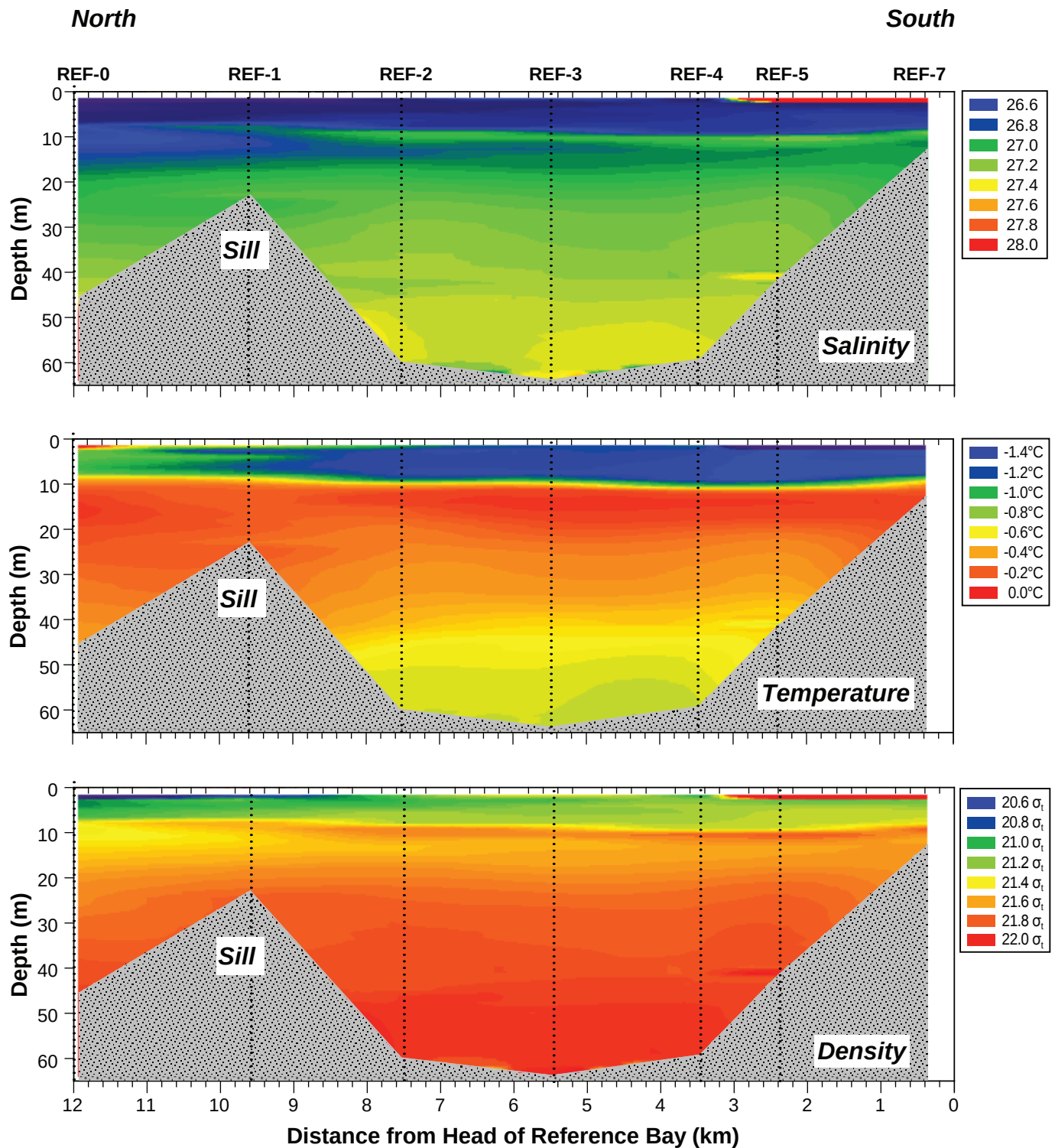




Note: Vertical exaggeration is 42:1

Bottom boundary set by depths of maximum sampling; does not represent actual topography.





Note: Vertical exaggeration is 62:1

Bottom boundary set by depths of maximum sampling; does not represent actual topography.

For the temperature and salinity ranges observed during this study, changes in salinity have a greater effect on density and stratification than do changes in temperature. This is typical of coastal oceans where river input and ground water can dilute seawater. The pycnocline (depth at which density increases most dramatically) in Roberts Bay and Reference Bay was at about 8 m during the April thermohaline survey, with colder and less saline waters above this depth, and warmer, saltier water below (Figures 3.2-1 and 3.2-4). Surface salinity was above 26 at all sites in Roberts Bay (Figures 3.2-1, 3.2-2, and 3.2-3), except site ST3 where the surface salinity was approximately 24 (Figure 3.2-1). In Reference Bay, surface salinity was above 26 at the landward sites REF-5 and REF-7, but ranged from 25 to 26 at seaward sites REF-0 through REF-4 (Figures 3.2-4 and 3.2-5). The lower surface salinities observed at certain sites are indicative of freshwater input from rivers or melting sea ice. Bottom water salinity approached 27.3 in both bays.

Winter water temperatures in Roberts Bay increased from approximately -1.4°C at the surface to -0.5°C in bottom waters, while temperatures in Reference Bay increased from approximately -1.3°C to -0.7°C at depths greater than 40 m. In both embayments, the highest water column temperature occurred at the bottom of the pycnocline, where temperatures approached 0°C .

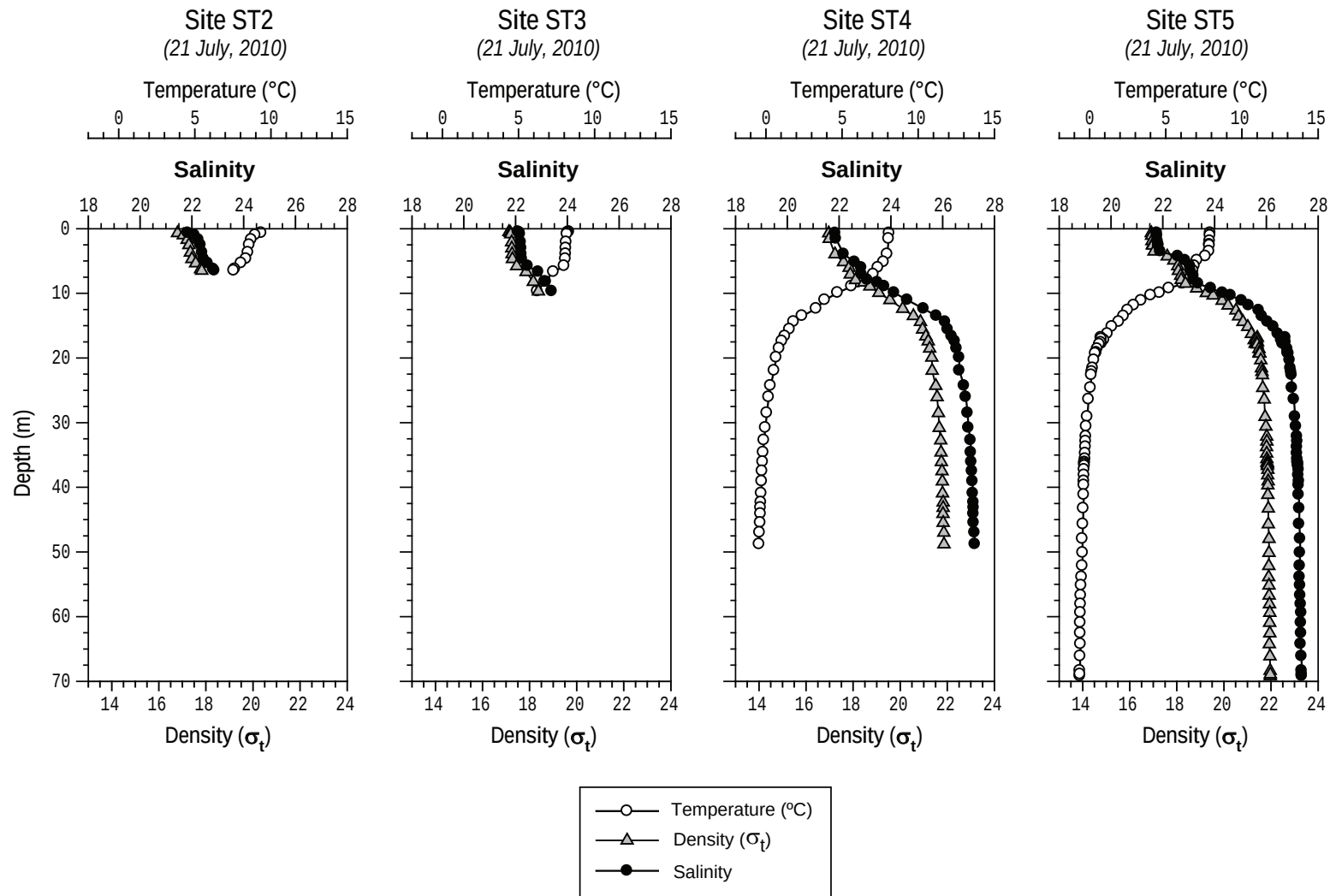
3.2.2 Summer

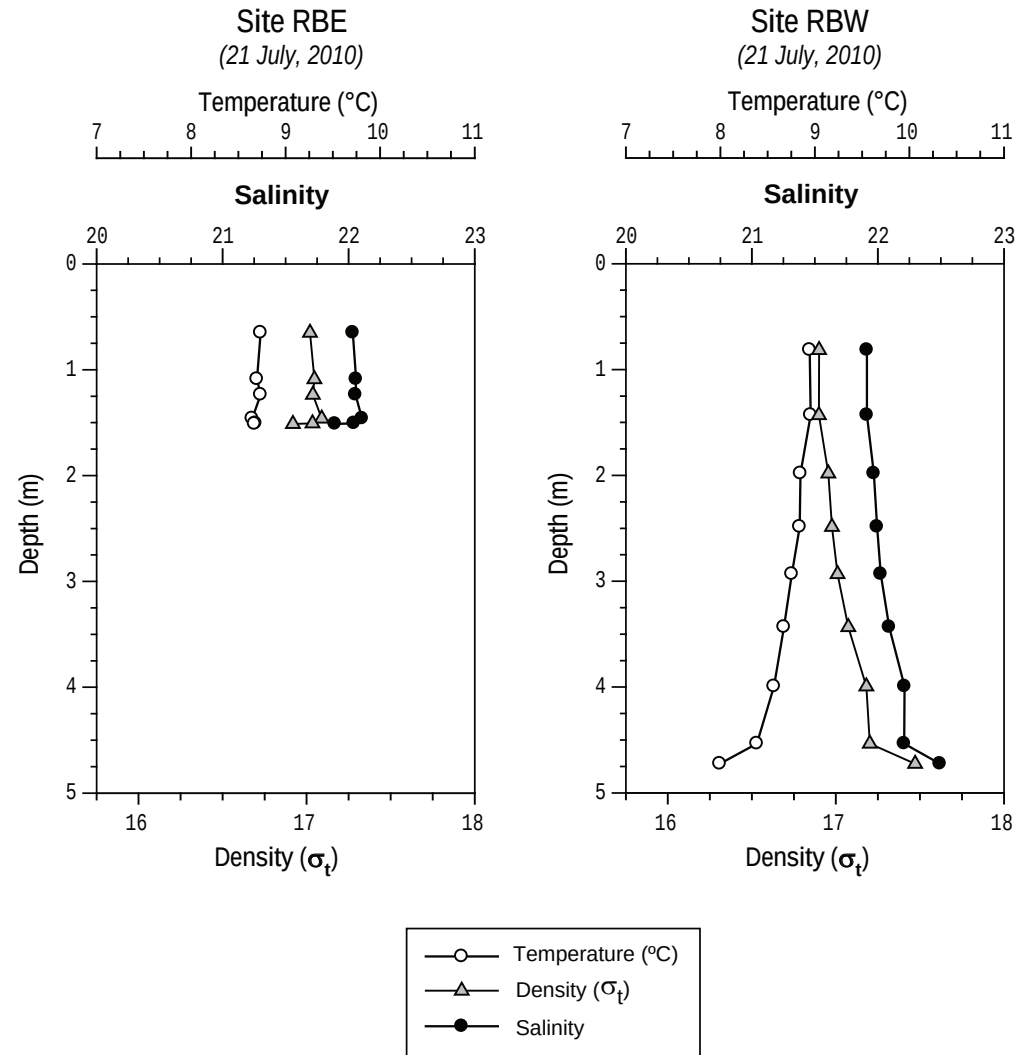
Summer CTD casts were conducted in both July and August throughout Roberts Bay and Reference Bay. The results of each sampling period are summarized below and the full datasets are provided in Appendix 3.2-2.

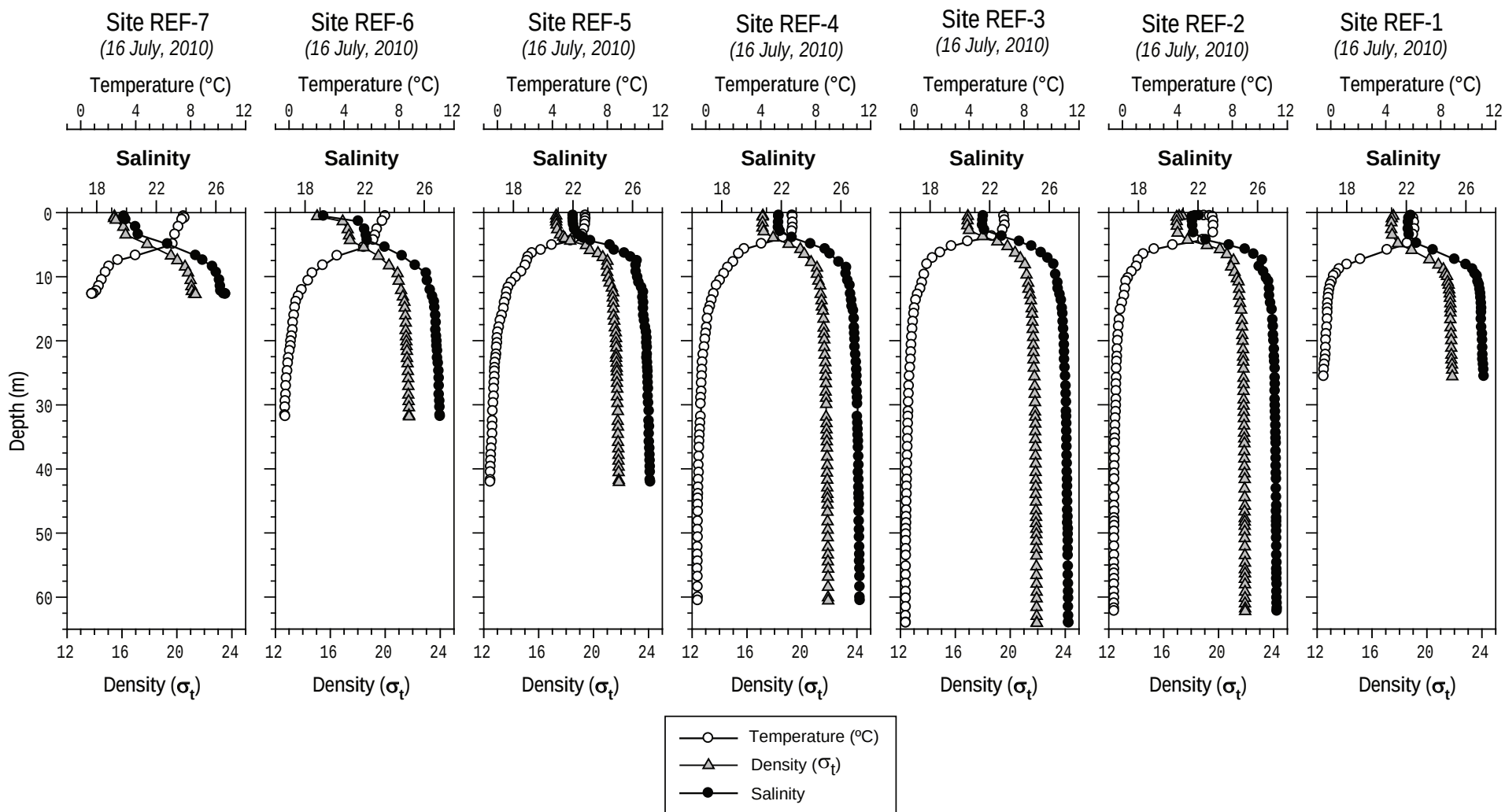
During July 2010, CTD casts were conducted at six sites throughout Roberts Bay (Figures 3.2-6 and 3.2-7) and eight sites in Reference Bay (Figures 3.2-8 and 3.2-9), and during August 2010, casts were made at eight sites in Roberts Bay (Figures 3.2-10, 3.2-11, and 3.2-12) and nine sites in Reference Bay (Figures 3.2-13, 3.2-14, and 3.2-15). The surface layer in both bays was warmer and more brackish than in winter because of the increased solar radiation and enhanced riverine input during summer. Surface salinities were between 20 and 24 in July and August, except at the head of Reference Bay (sites REF-6, REF-7, and REF-Marine) and at site RBE in Roberts Bay (in July) where salinity was less than 20. The low surface salinities at these landward sites were due to river input.

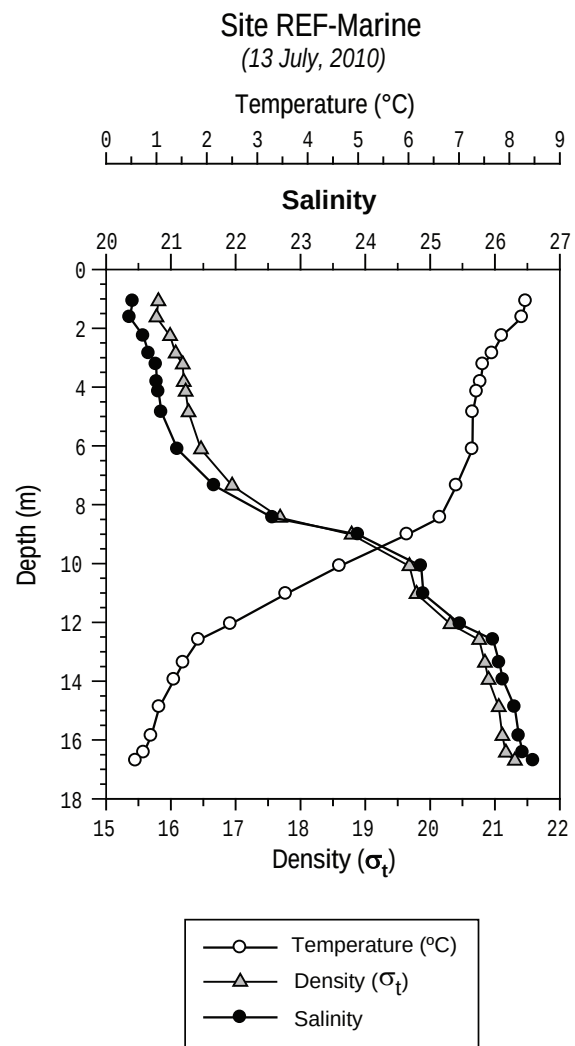
Surface temperatures were higher in August than in July. In July, surface temperatures ranged between 7.9°C and 9.4°C in Roberts Bay and between 5.9°C and 8.3°C in Reference Bay. In August, surface temperatures were 10.1°C to 14.3°C in Roberts Bay and 8.7°C to 10.3°C in Reference Bay. In general, warmer temperatures occurred at landward sites where stratification was strongest.

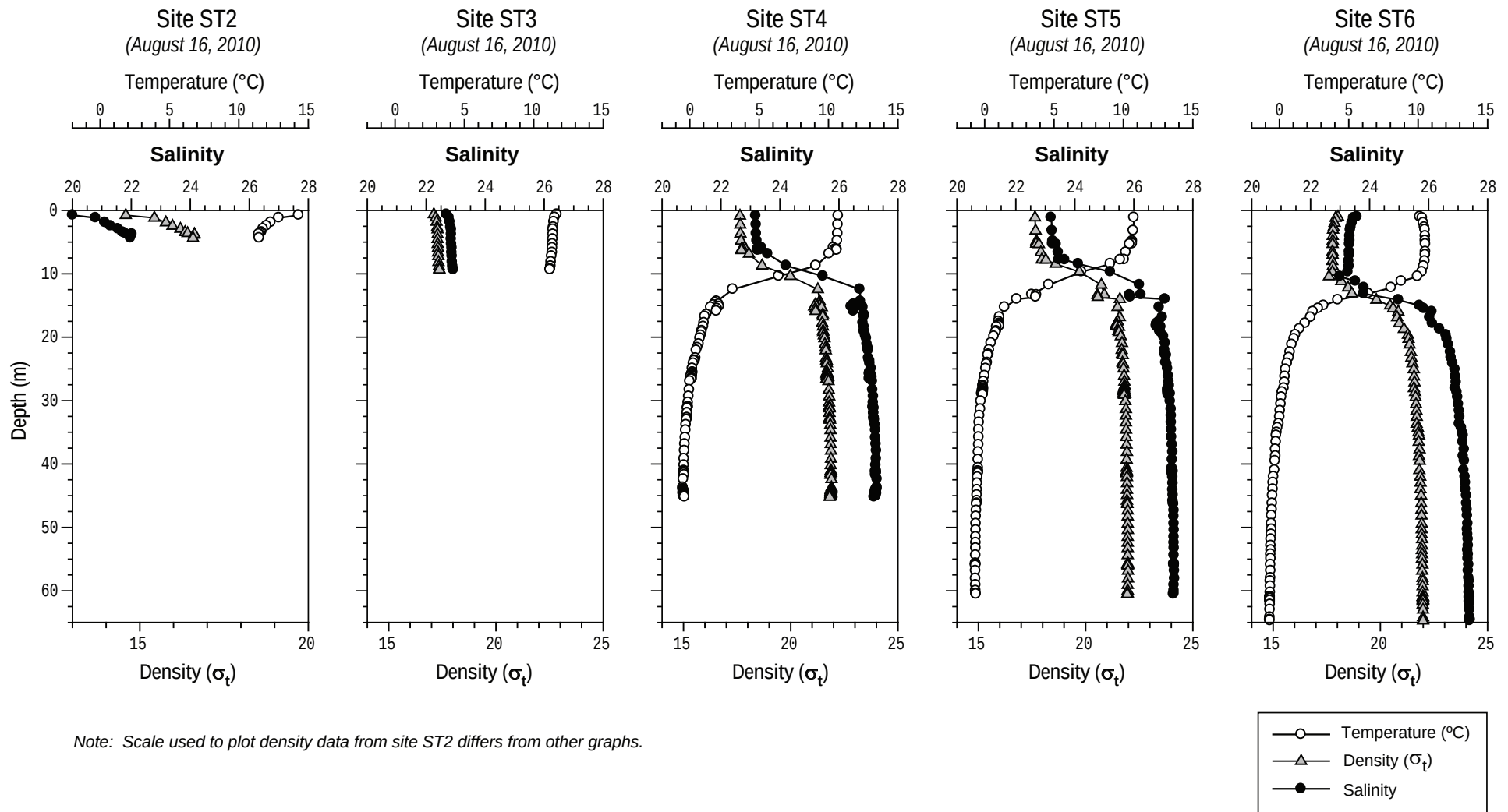
Pycnocline depths in July and August were similar to those in the winter, varying between 5 m and 15 m, and deep water temperatures and salinities approached -0.7°C and 27.4, respectively. However, unlike the case in August, 2009, when thermohaline structure was similar between Roberts Bay and Reference Bay, the pycnoclines of Roberts Bay and Reference Bay differed from each other in July and August, 2010. In July, the pycnocline in Reference Bay (Figure 3.2-8) was well defined at 5 m while that in Roberts Bay (Figure 3.2-6) occurred over a broader depth. In August, this pattern was reversed; in Roberts Bay, the pycnocline occurred abruptly at 8 to 15 m (Figure 3.2-10), while in Reference Bay it was less well defined (Figure 3.2-13).

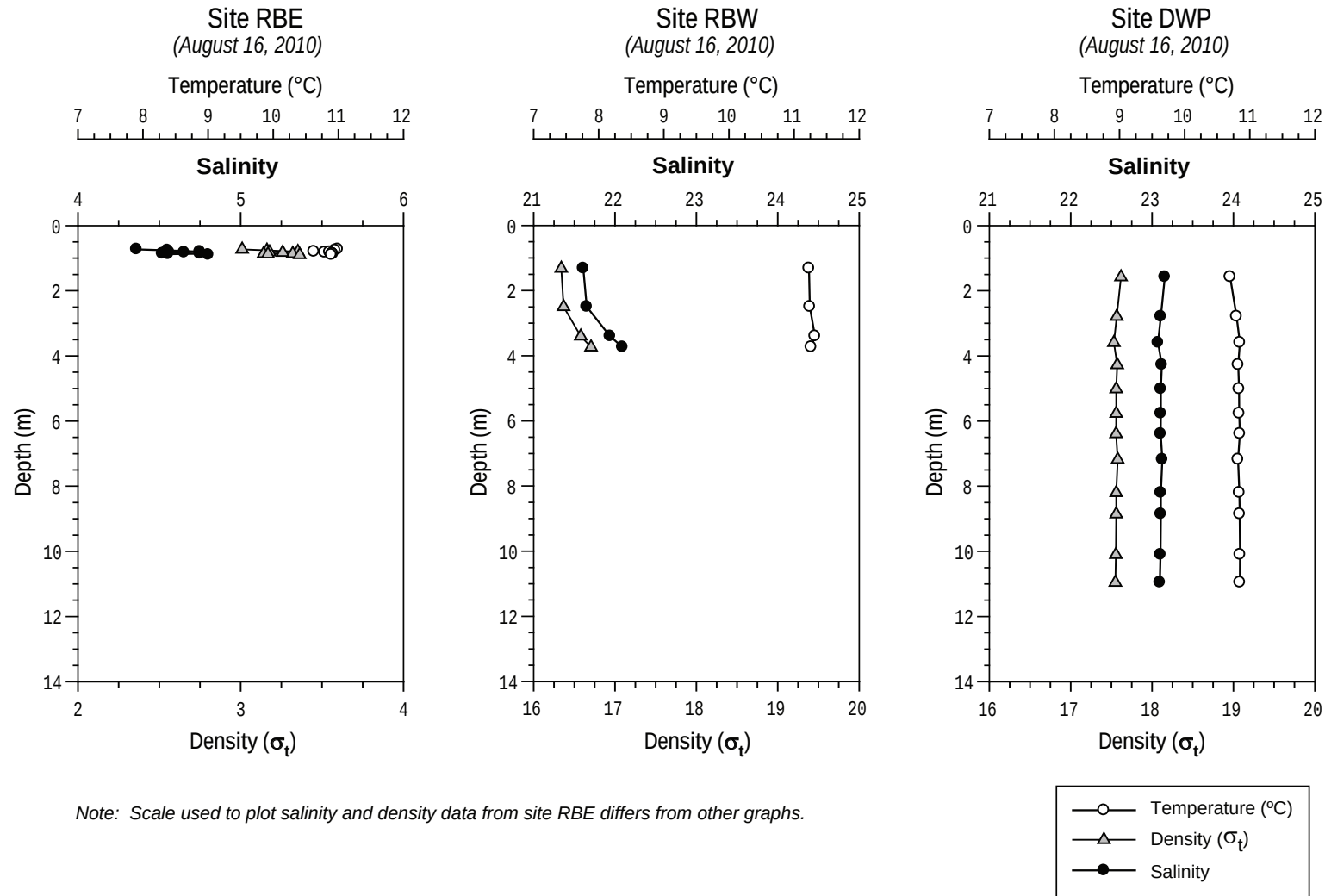


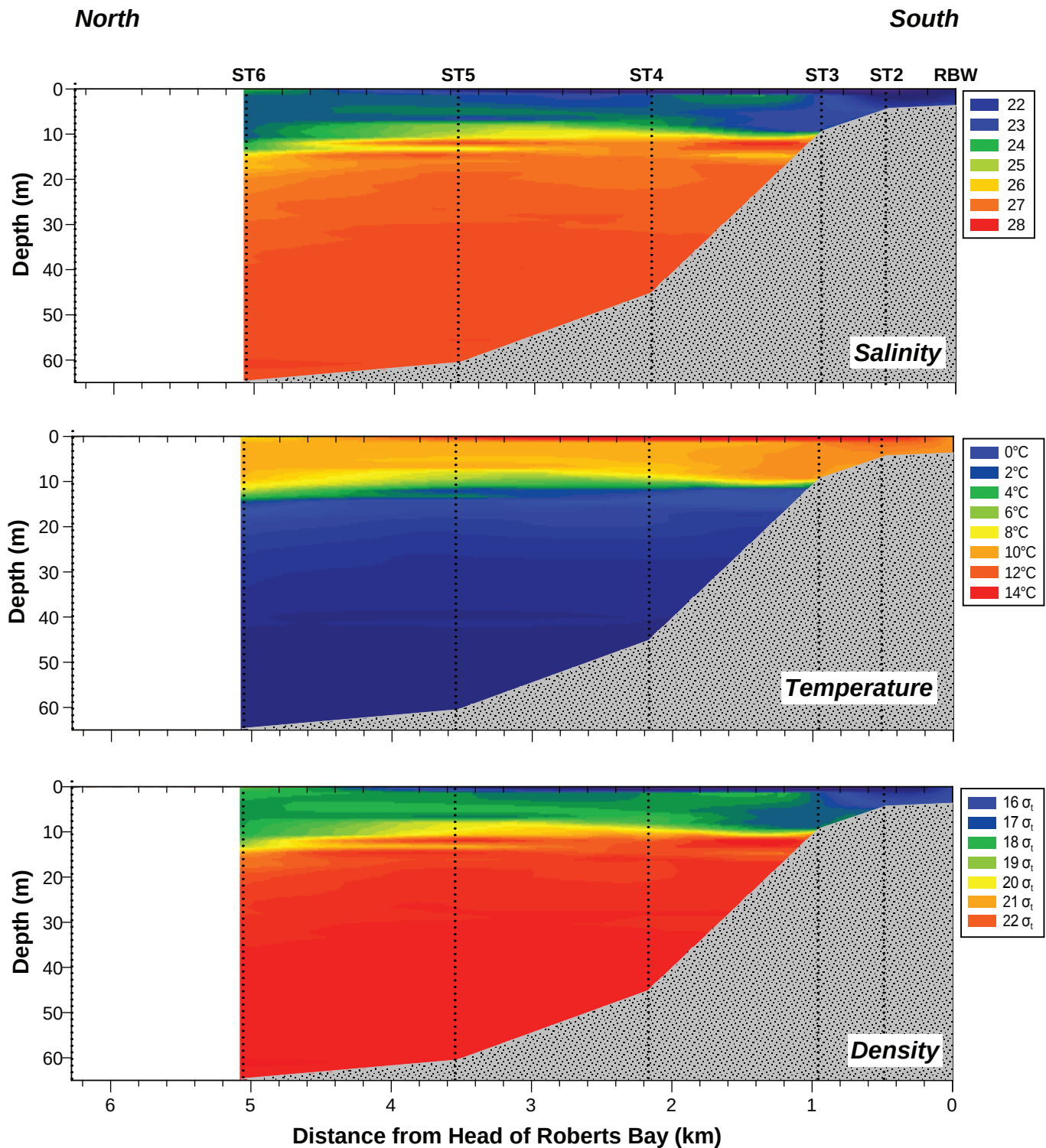






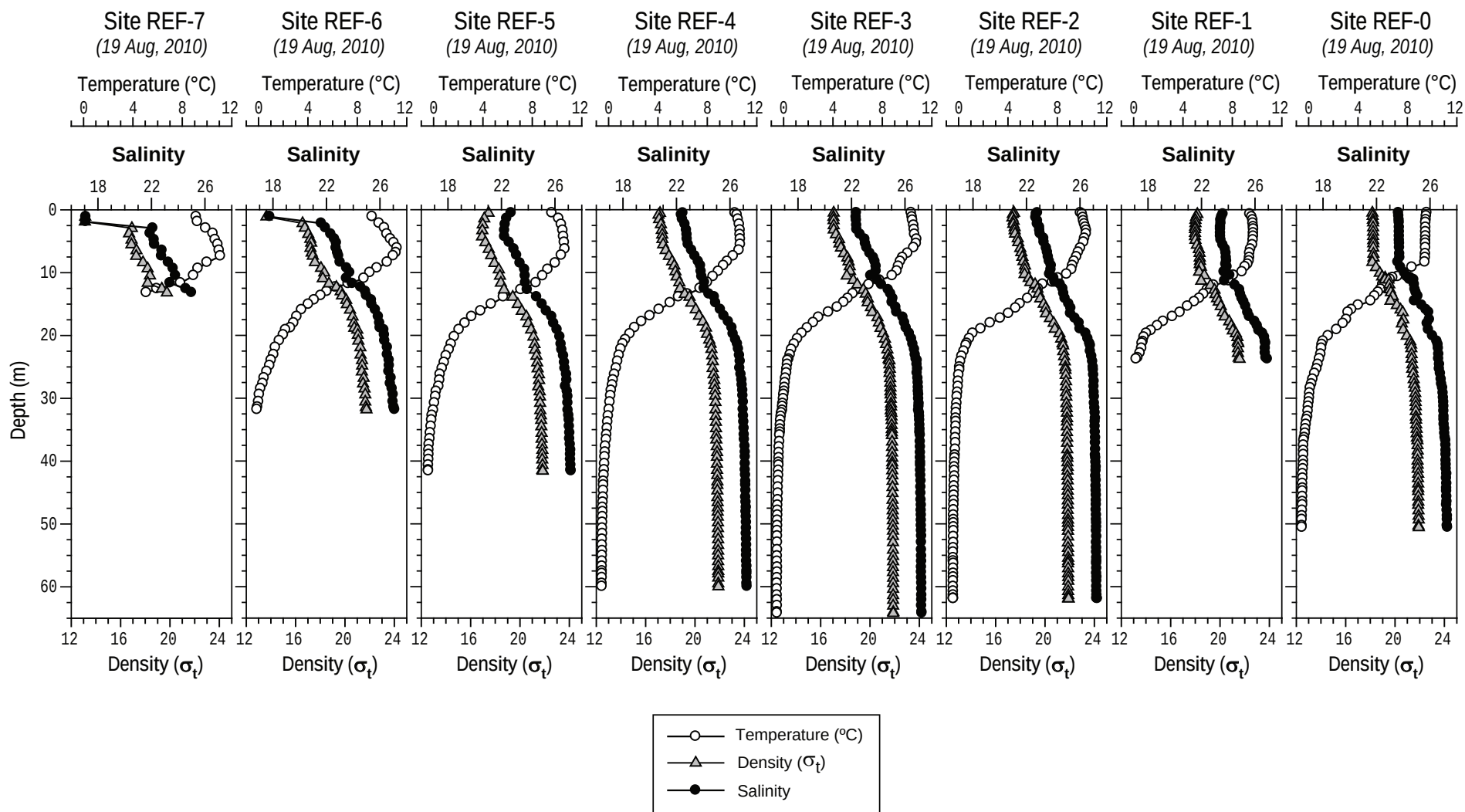


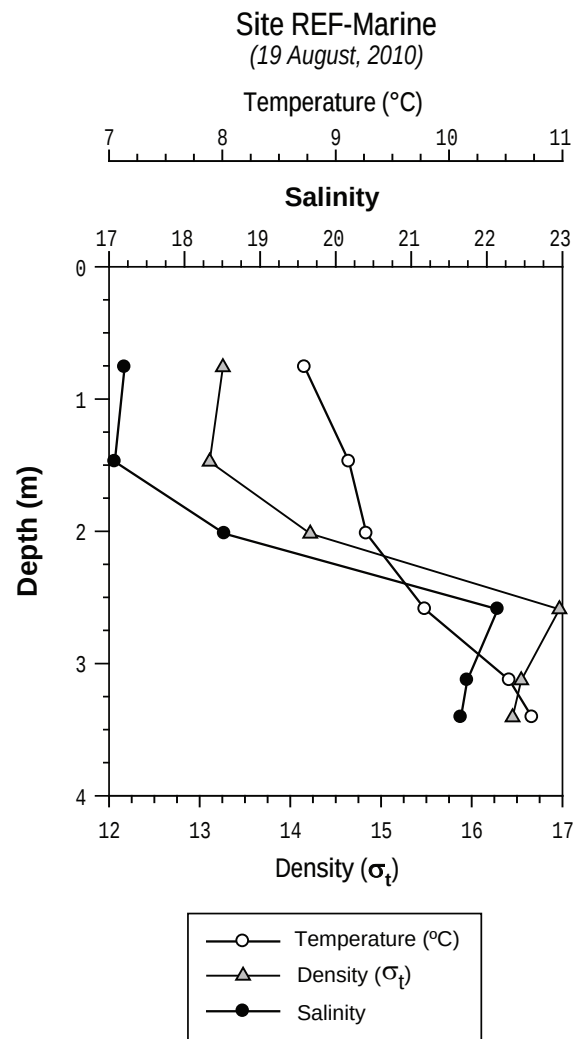


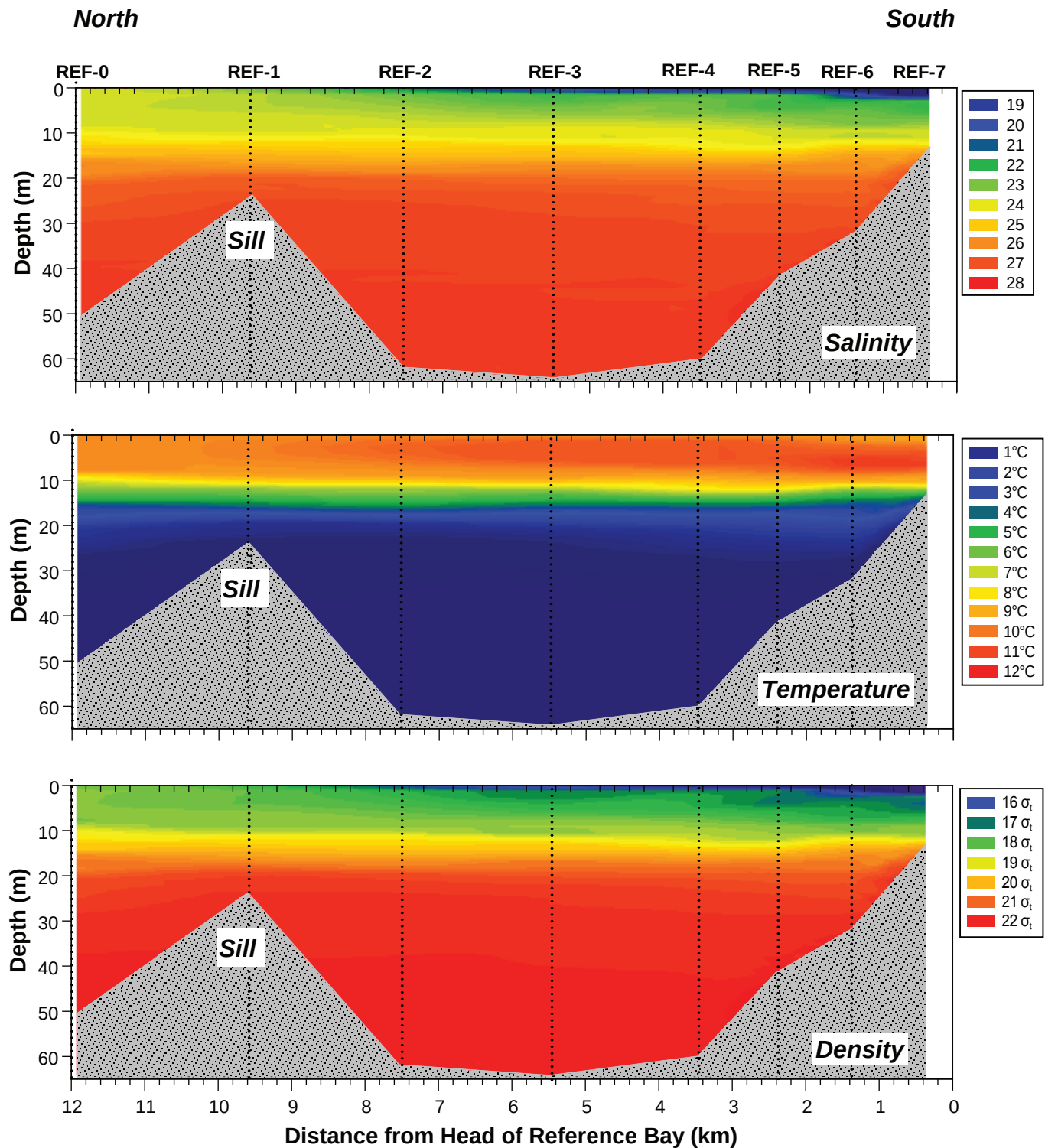


Note: Vertical exaggeration is 42:1

Bottom boundary set by depths of maximum sampling; does not represent actual topography.







Note: Vertical exaggeration is 62:1

Bottom boundary set by depths of maximum sampling; does not represent actual topography.

**Temperature, Salinity, and Density Contours in
Reference Bay, Hope Bay Belt Project, August 2010**

Figure 3.2-15

3.2.3 Fall

CTD casts were conducted throughout Roberts Bay and Reference Bay in late September or early October, 2010. The results are summarized below and the full dataset is provided in Appendix 3.2-2.

During September and October, 2010, CTD casts were conducted at five sites in Roberts Bay (Figures 3.2-16 and 3.2-17) and nine sites in Reference Bay (Figures 3.2-18 and 3.2-19). Sampling occurred during a period of very strong winds; therefore, Roberts and Reference Bays were laterally well mixed and the thermohaline structure between inlets was very similar. Surface salinity varied only from 24.4 to 24.9, and surface temperature ranged from 3.4 to 3.9°C. The cooler fall surface temperatures reflect not only mixing of intermediate waters to the surface, but also seasonal cooling. Deep water temperature and salinity were very similar to those in the winter and summer, approaching -0.7°C and 27.5, respectively. As a consequence of the winds and cooler temperatures, the mixed layer was deeper in fall than in winter or summer. In Roberts Bay and at outer site REF-0 of Reference Bay, the pycnocline occurred at 15 to 20 m. The pycnocline of inner sites REF-7 to REF-1 was less abrupt and the top of the pycnocline occurred at 10 m.

3.3 DISSOLVED OXYGEN

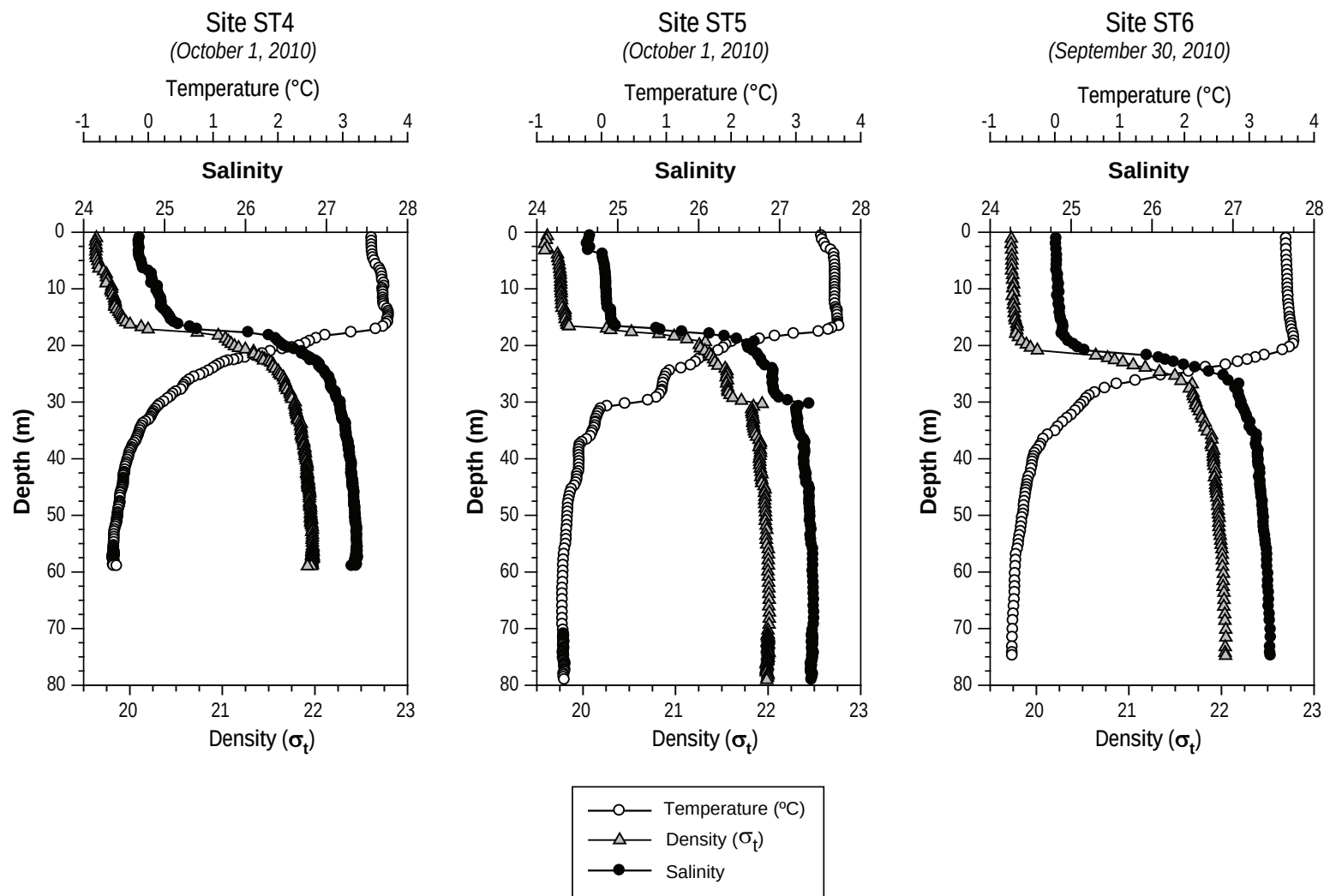
3.3.1 Winter

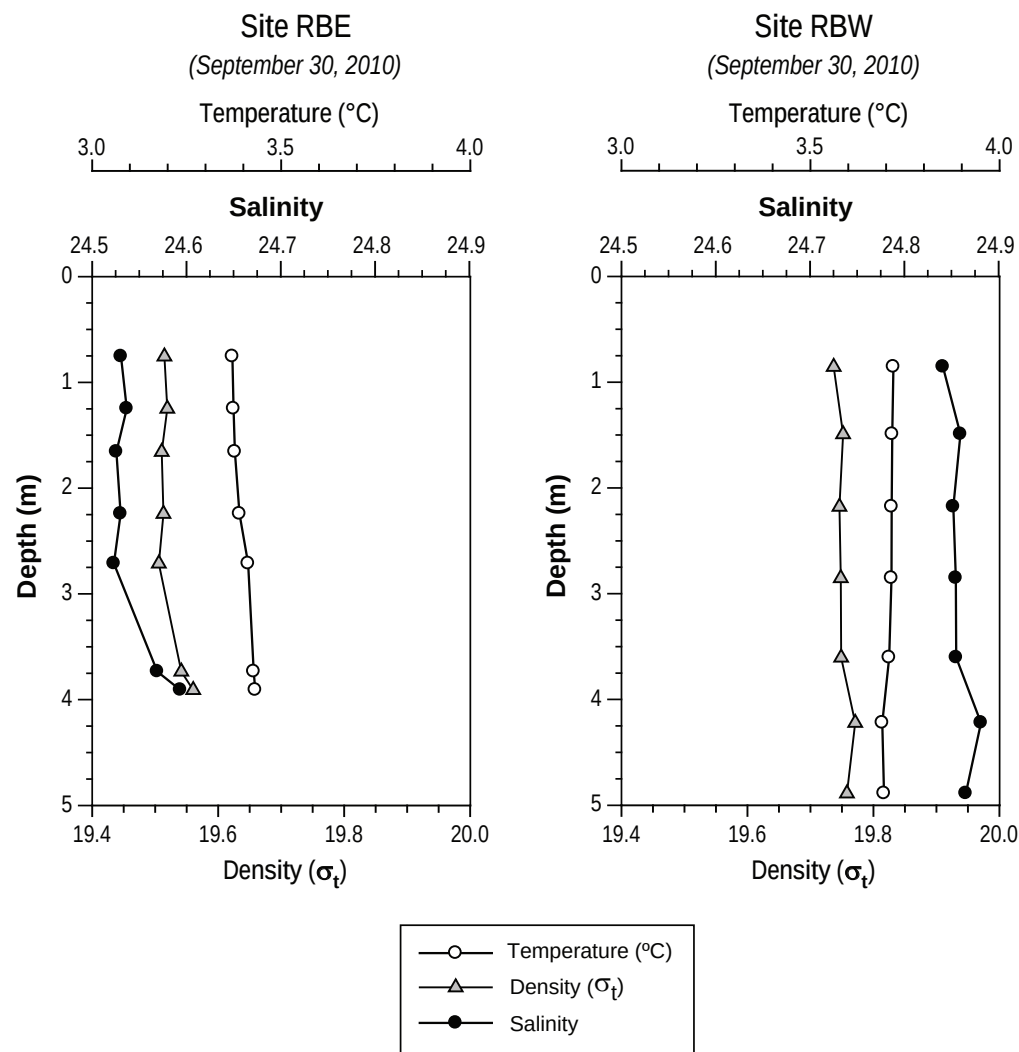
Profiles of dissolved oxygen concentration and saturation were collected at four sites in Roberts Bay (ST4, DWP, RBW and RBE) and at two sites in Reference Bay (REF-4 and REF-Marine) during the four sampling periods April, July, August, and September/October; however, profiling did not occur at all sites during each sampling period. Profiles are presented in Figure 3.3-1 and the oxygen data are provided in Appendix 3.3-1 (winter) and Appendix 3.3-2 (summer and fall).

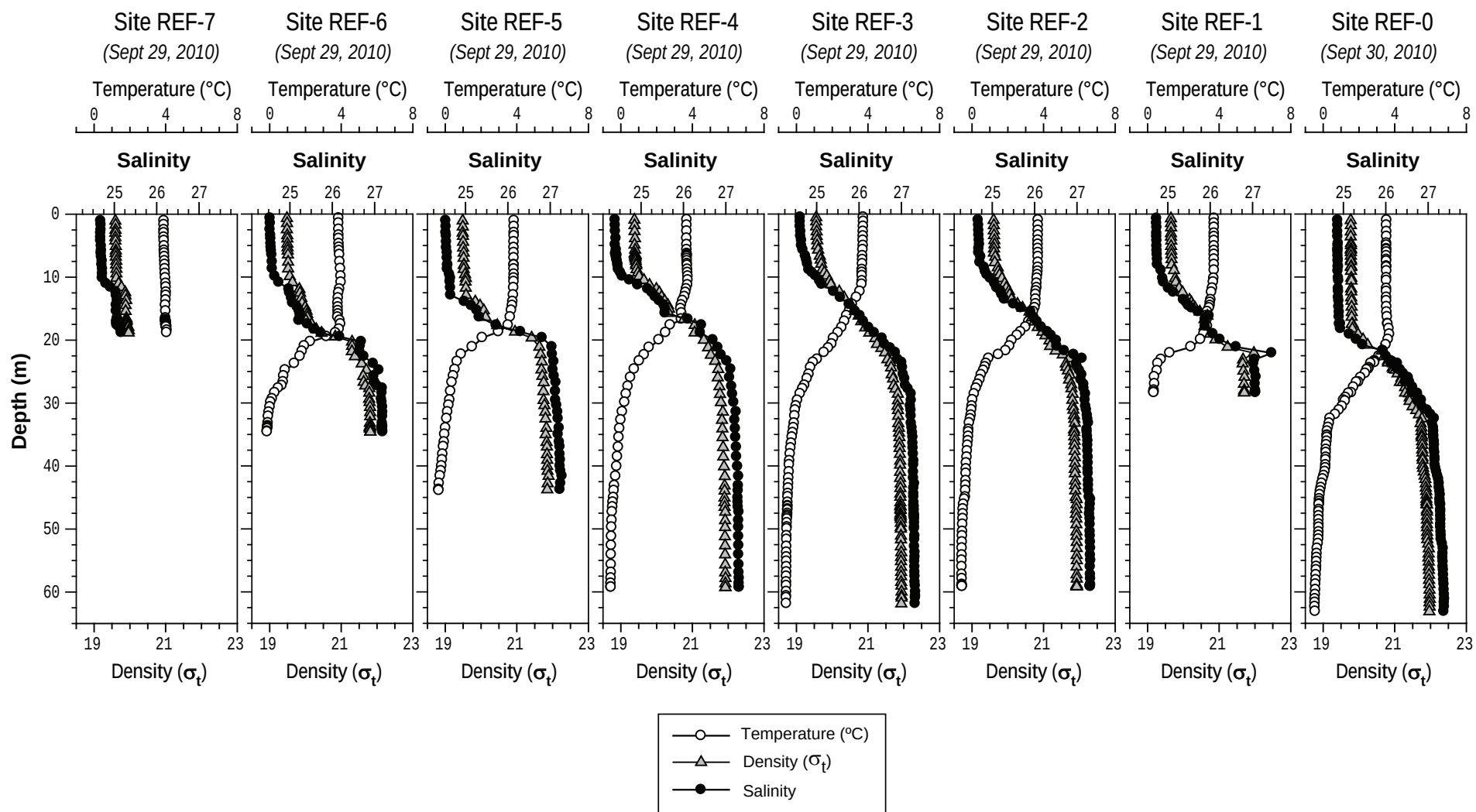
Vertical trends in dissolved oxygen tracked thermohaline structure (Figure 3.3-1). In April at the deepest sites profiled (ST4 and REF-4), oxygen levels were highest above the pycnocline and lowest below. Surface dissolved oxygen concentrations in April ranged from 9.4 to 10.2 mg/L, which is equivalent to a dissolved oxygen saturation of 79 to 86%. Saturation of less than 100% indicates net heterotrophy (i.e., community respiration exceeds photosynthesis), which is expected in the low light conditions of winter. Dissolved oxygen concentrations in deep waters dropped to levels as low as 5.6 mg/L in April, with saturation as low as 48% at site REF-4. Lower oxygen concentrations are expected for deep waters, especially since the deep waters are restricted from horizontal mixing by the shallow sills on the seaward ends of Roberts and Reference bays. Although the bottom layers of Roberts and Reference Bays showed little evidence of hypoxia, dissolved oxygen concentrations at depths greater than 10 to 12 m were below the Canadian Council of Ministers of the Environment (CCME) interim guideline of 8.0 mg/L (CCME 2007). These low oxygen concentrations occur as a result of natural processes. Concentrations less than 8.0 mg/L occurred only in April.

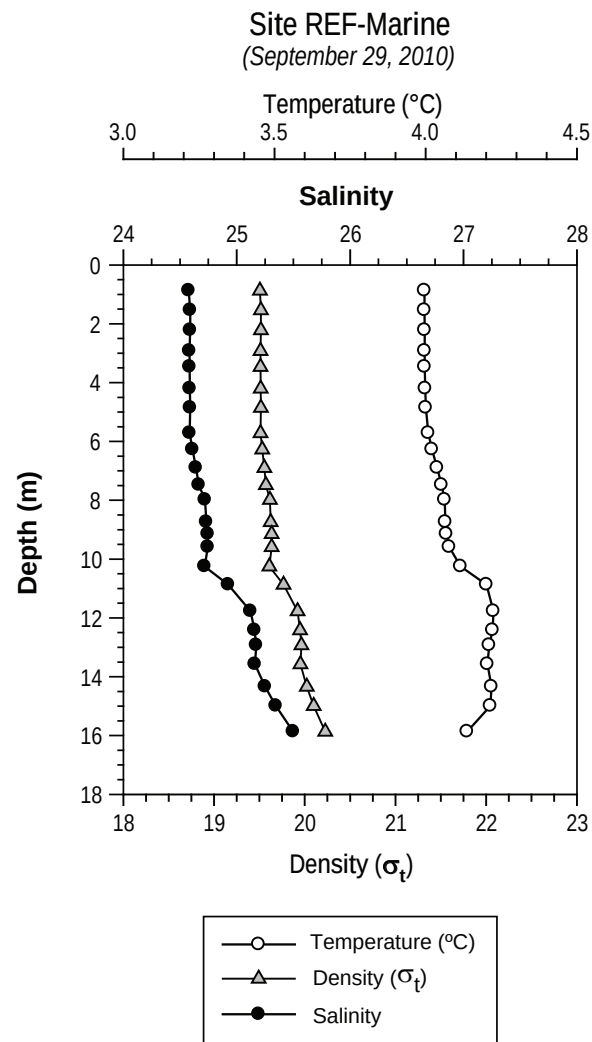
3.3.2 Summer

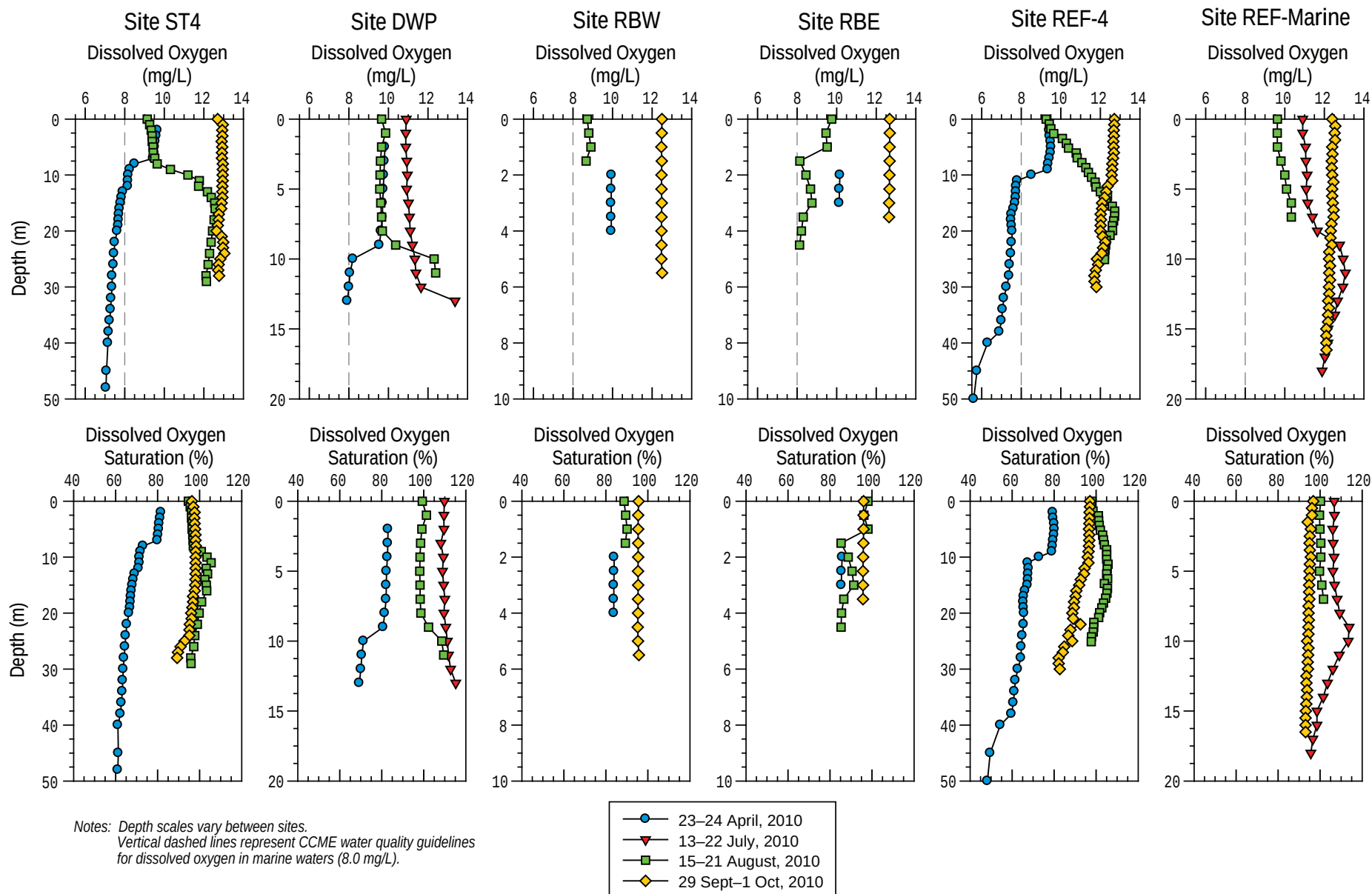
In July and August, dissolved oxygen concentrations in the mixed layer ranged between 8.7 and 10.9 mg/L and were generally similar to April (Figure 3.3-1). Percent saturation increased from winter to summer, reaching a maximum of nearly 115% during July in both bays. Below the mixed layer (and within the mixed layer at site REF-4), however, oxygen concentrations of 11 to 13 mg/L were substantially higher than in April. Without a description of water mass circulation, it is difficult to assess the cause of the oxygen increases below the mixed layer, but the large increases from April suggest that physical exchange with oxygen-rich waters occurred. Mid- and deep-water renewal of waters within silled inlets occurs when water at the sill mouth is denser than water behind the sill, and can happen annually depending on local conditions. A similar increase in oxygen concentrations below the mixed layer occurred between winter and summer, 2009, suggesting that this may be the case in Roberts and Reference bays.











Within the mixed layer, the primary cause of any increase in dissolved oxygen was probably equilibration with the atmosphere in summer ice-free conditions, with oxygen production by phytoplankton photosynthesis adding secondarily to the oxygen budget. Saturation greater than 100% is best explained by photosynthesis. This occurred in the mixed layer at sites DWP and REF-Marine in July, and at or below the mixed layer at sites ST4, DWP, and REF-4 in August.

3.3.3 Fall

The high winds during sampling in the fall (September-October) mixed oxygen downward so that oxygen saturation was close to 100% from the surface to approximately 10 m, and then decreased slightly with increasing depth, due to mixing with deeper, low oxygen waters. Near the surface, oxygen concentrations ranged between 12.4 and 12.7 mg/L at all sites. The deepest fall profiles of 30 m were collected at ST4 and REF-4. Dissolved oxygen concentrations ranged from 11.7 to 12.8 mg/L at ~30-m depth, and saturation dropped to 82 to 89%.

3.4 LIGHT PENETRATION

Light is required for autotrophic photosynthesis and its availability within the water column is controlled by the amount of incident light and the concentration of light-absorbing and attenuating organic and inorganic material in the water. Autotrophic organisms are capable of growth when the respiratory requirements of a cell are balanced by the production of photosynthate. This threshold usually occurs at depths where 1% of the surface irradiance exists, and is often known as the euphotic zone depth, or the compensation depth.

To determine the light characteristics in the Project area, Secchi depth measurements were collected in July, August, and late September/early October from Roberts and Reference bays. All Secchi depths and estimates of light extinction coefficients and euphotic zone depths (compensation depths) are shown in Table 3.4-1.

Table 3.4-1. Euphotic Zone Depths in Roberts and Reference Bays, Hope Bay Belt Project, 2010

Site	Sampling Date	Secchi Depth (D _s) (m)	Extinction Coefficient (k) (m ⁻¹)	Euphotic Zone Depth 1% Light Level (m)
Roberts Bay				
ST4	July 22	15.0	0.11	40.6
	August 17	13.4	0.13	36.3
	October 1	8.0	0.21	21.6
DWP	July 22	9.0	0.19	24.4
	August 17	10.5	0.16	28.4
RBW	August 15	2.1	0.81	5.7
	September 30	Bottom (5.9 m)	-	-
RBE	August 17	Bottom (4.7 m)	-	-
	September 30	Bottom (3.9 m)	-	-
Reference Bay				
REF-4	August 21	8.5	0.20	23.0
REF-Marine	July 13	7.0	0.24	18.9
REF-Marine	August 21	6.0	0.28	16.2
REF-Marine	September 28	10.5	0.16	28.4

Light penetration was high in both Roberts Bay and Reference Bay, as the euphotic depth was generally deeper than 16 m. The only exception was the shallow RBW site in Roberts Bay, which in August had a euphotic depth of 5.7 m. High light penetration suggests that photosynthesis is not limited to the upper few metres of the water column. Site ST4 in July had a euphotic depth of 41 m, suggesting that photosynthesis was possible even at this deep depth. The shallower sites, RBW and RBE, had light penetration all the way to the sediments, suggesting the benthic primary producer community (i.e., periphyton) may make strong contributions to the total primary production in the near-shore area of Roberts Bay. Although there was high variation among sites and months, there were no clear temporal or spatial patterns in euphotic zone depth.

3.5 WATER QUALITY

Winter water quality samples were collected from four sites in Roberts Bay (ST4, DWP, RBW, and RBE) and one site in Reference Bay (REF-4) in April 2010. Water quality samples were not collected at site REF-Marine in Reference Bay during this time because of substantial ice melt along the perimeter and freshwater inputs from surrounding rivers and streams. Summer and fall water quality samples were collected from the same four sites in Roberts Bay and from two sites in Reference Bay (REF-4 and REF-Marine) in July, August and late September/early October 2010. Samples were collected from a range of depths, both above and below the pycnocline. Profiles of water quality parameters are shown in Figures 3.5-1 to 3.5-14 and all water quality data and realized detection limits are presented in Appendix 3.5-1.

3.5.1 pH

Winter pH levels were similar at all sites and at all depth, averaging 7.7 pH units (Figure 3.5-1). Winter pH levels were slightly lower than summer pH levels, which averaged 7.9. Summer pH levels were similar across sampling months and sites, ranging from 7.7 (REF-4 in August) to 8.0 (REF-4 in September). pH declined slightly with depth at most sites. The slightly higher surface pH levels in summer than in winter are probably caused by higher rates of photosynthesis.

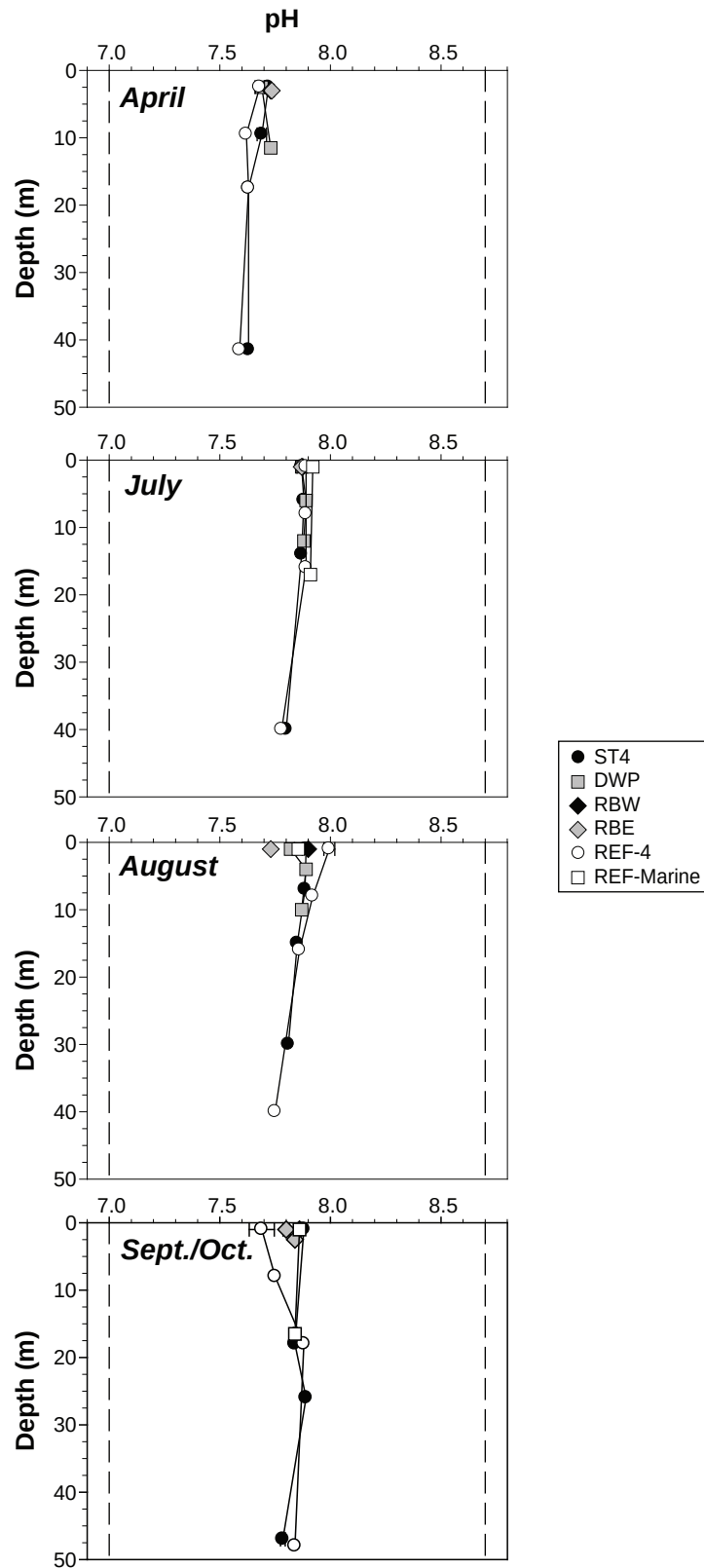
3.5.2 Total Suspended Solids and Turbidity

Winter concentrations of total suspended solids (TSS) were low, ranging from below the detection limit (<3 mg/L) to 10.3 mg/L (Figure 3.5-2). Concentrations of TSS were higher and more variable in summer, ranging from below the detection limit (surface ST4 in August) to 24.4 mg/L (surface RBE in August). Most sites had relatively similar TSS concentrations with the exception of RBE and RBW. Compared to the other sites sampled, RBE and RBW had lower surface TSS concentrations (<7 mg/L) in July, but had much higher surface TSS concentrations (>15 mg/L) in August and September/October. The high TSS in August and September/October is likely a reflection of higher levels of wind-driven sediment re-suspension in these shallow near-shore sites.

Winter turbidity was low at all sites and depths, averaging 0.2 NTU (Figure 3.5-2). Turbidity levels in summer and fall were slightly higher, generally ranging from 0.2 NTU to 1.1 NTU. Turbidity levels at sites RBE and RBW in August were exceptions to this range, as surface levels reached 15.5 and 6.6 NTU, respectively. Similar to TSS, the higher turbidity at these sites is likely a result of sediment re-suspension at these shallow near-shore locations.

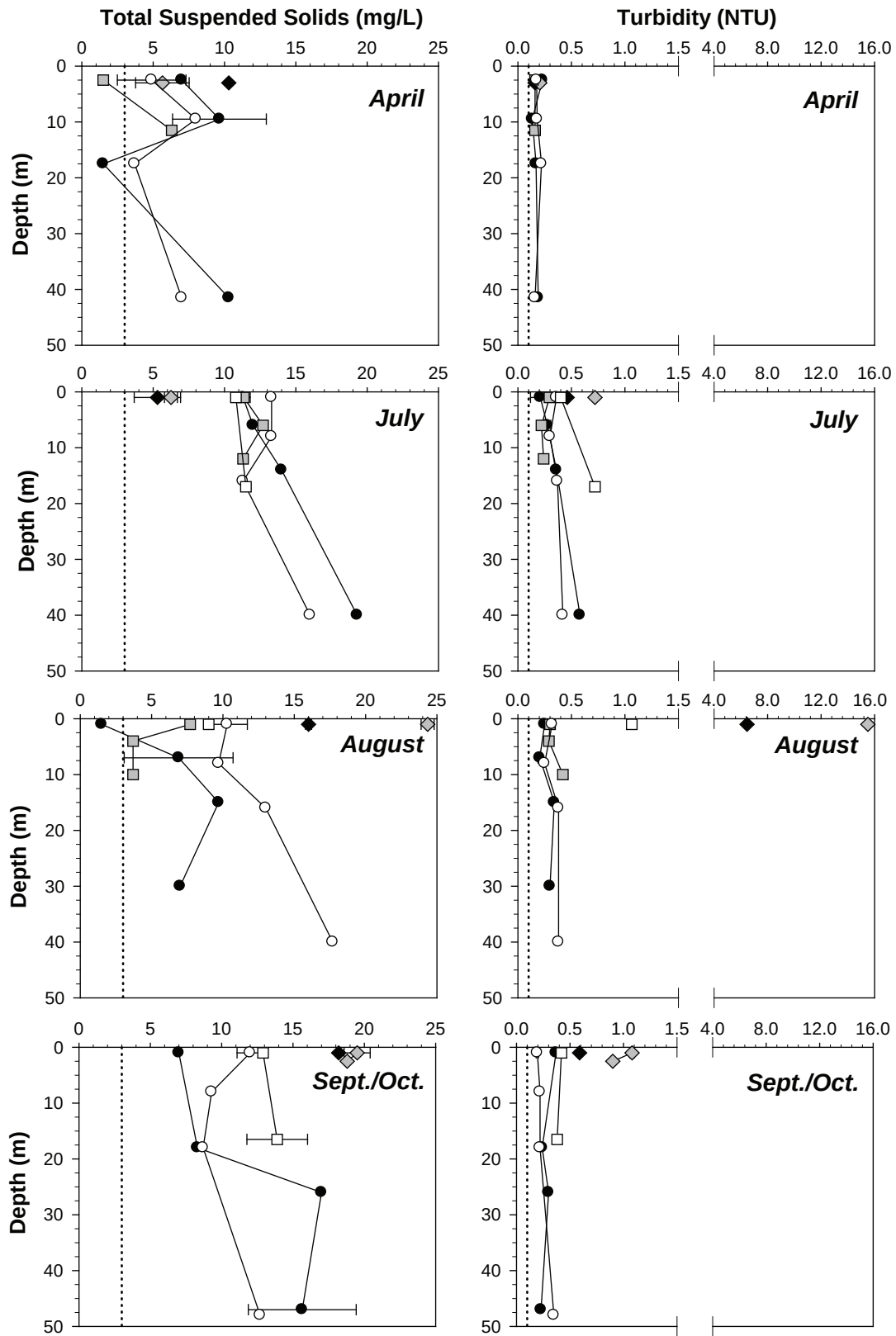
3.5.3 Nutrients and Total Organic Carbon

Overall, nutrient levels were similar between sites (Figures 3.5-3 to 3.5-5). Total ammonia concentrations were generally below detection across all sites and seasons (Figure 3.5-3). The ammonia concentration in the winter sample from site ST4 at 17.5 m was high compared to all other measured concentrations (0.16 mg/L). Ammonia concentrations in samples collected from depths above (9.5 m) and below (41.5 m) this anomalously high sample were below the detection limit (<0.005 mg/L), suggesting that this high concentration may have resulted from contamination or analytical error.



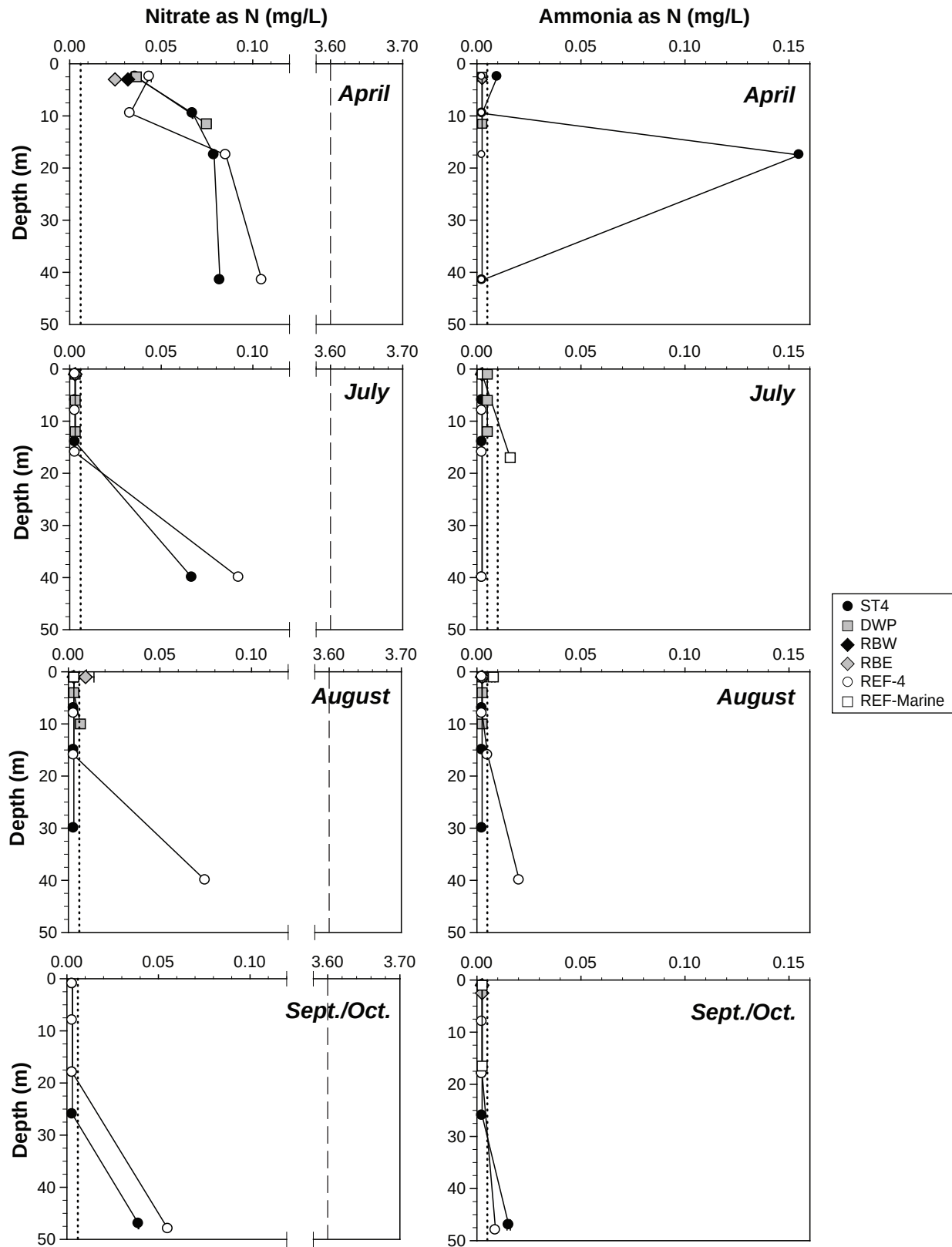
Notes: Error bars represent standard error of the mean of duplicate samples.
Analytical detection limit = 0.1 pH units.
Dashed lines represent CCME water quality guideline (pH 7.0–8.7).

Figure 3.5-1

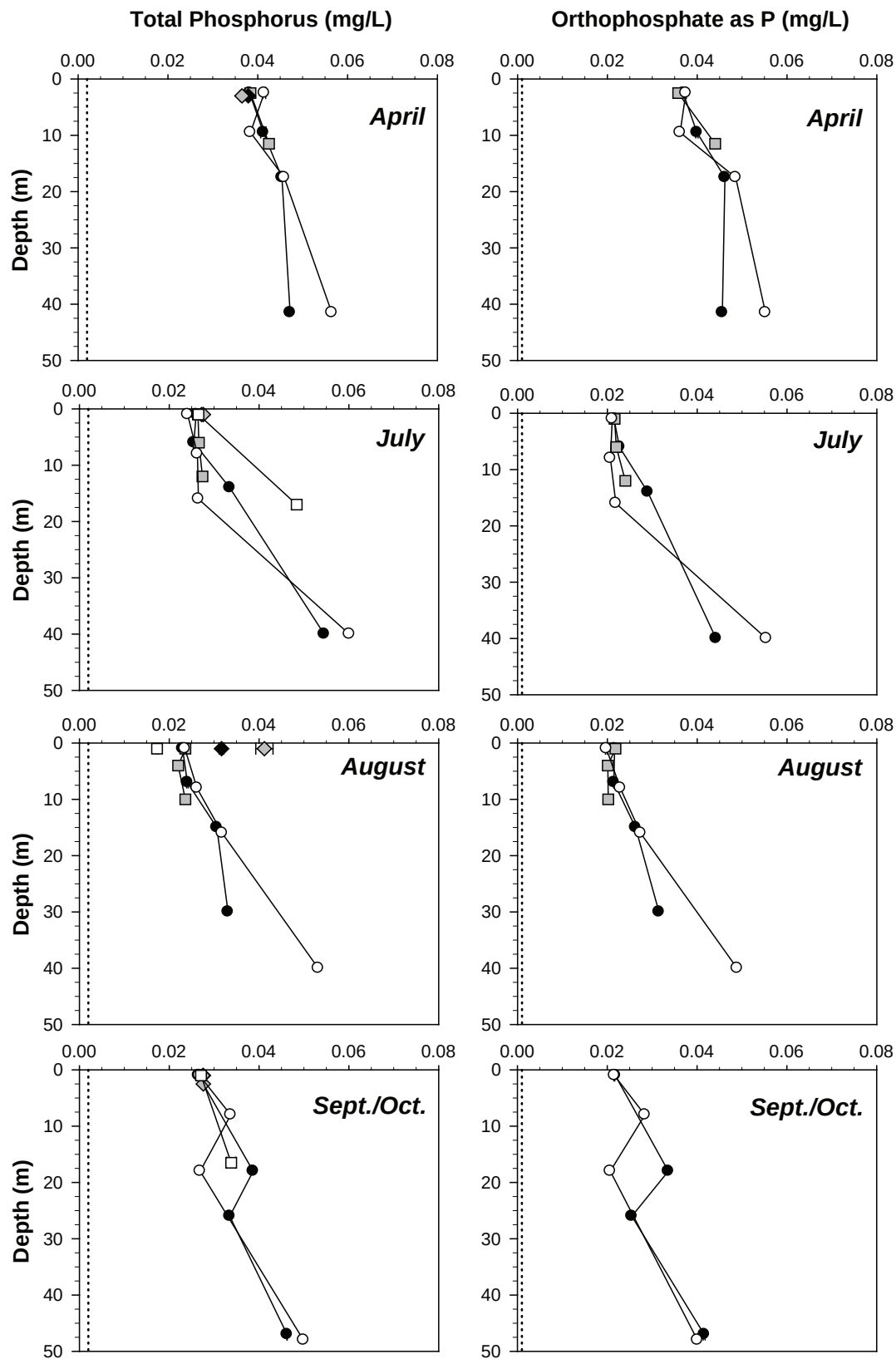


Notes: Error bars represent standard error of the mean of duplicate samples.
Dotted lines represent analytical detection limits (total suspended solids: 3 mg/L; turbidity: 0.1 NTU).
Values below the analytical detection limit are plotted at half the detection limit.
CCME guidelines for total suspended solids and turbidity are dependent upon background levels.

Figure 3.5-2



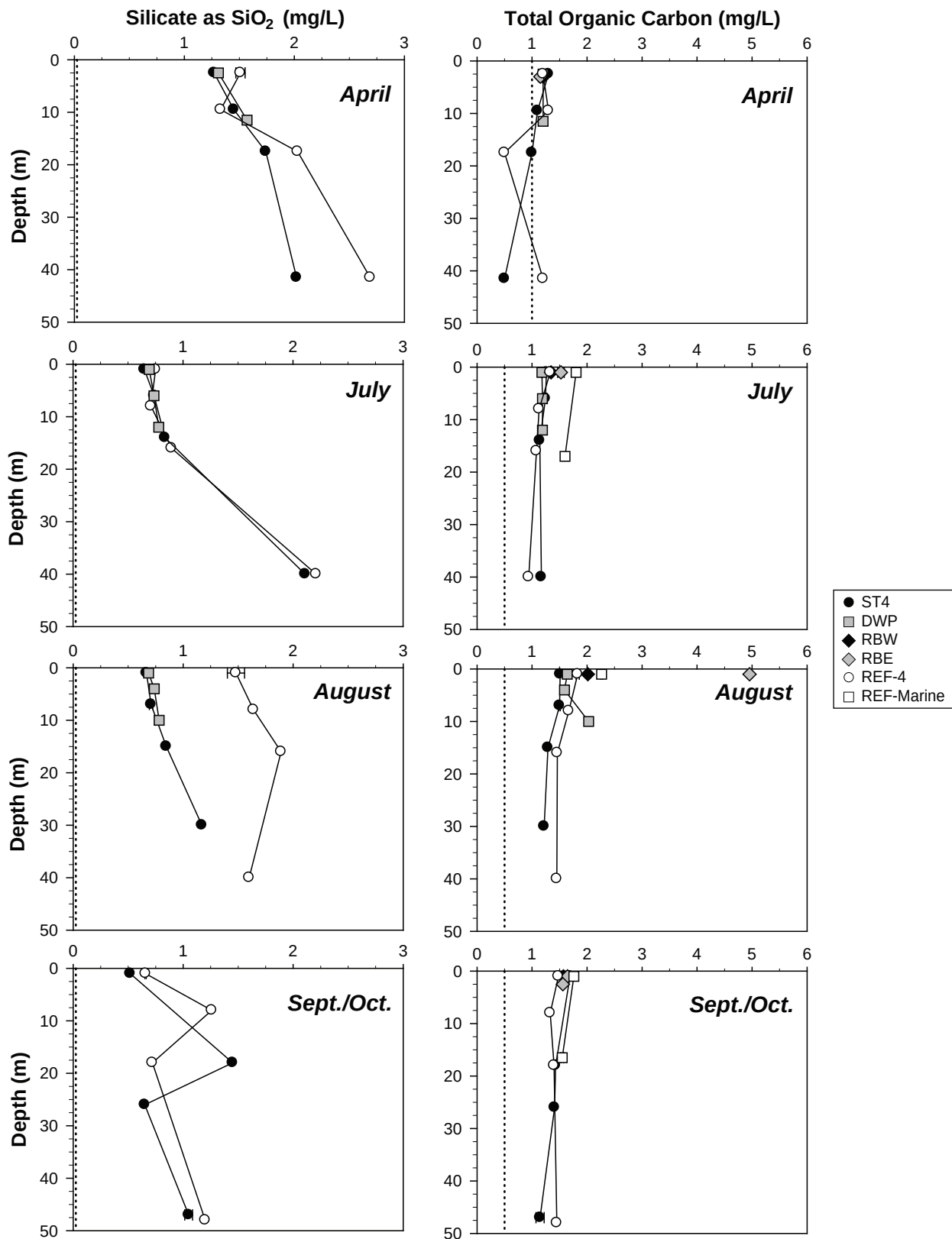
Notes: Error bars represent standard error of the mean of duplicate samples.
Dotted lines represent analytical detection limits (nitrate as N: 0.006 mg/L; ammonia as N: 0.005 or 0.01 mg/L).
Values below the analytical detection limit are plotted at half the detection limit.
Dashed line represents CCME water quality guideline for nitrate as N (3.6 mg/L).



Notes: Error bars represent standard error of the mean of duplicate samples.

Dotted lines represent analytical detection limits (total phosphorus: 0.002 mg/L; orthophosphate: 0.001 mg/L).

Figure 3.5-4



Notes: Error bars represent standard error of the mean of duplicate samples.
Dotted lines represent analytical detection limits (silicate: 0.025 mg/L; total organic carbon: 0.5 or 1 mg/L).
Values below the analytical detection limit are plotted at half the detection limit.

Nitrate, total phosphorus, orthophosphate, silicate, and total organic carbon (TOC) all exhibited depth gradients, with macronutrients being lower and TOC slightly higher in surface waters. The nutrient profiles varied seasonally, as the vertical gradients were more distinct in summer and fall than in winter. These depth gradients are indicative of phytoplankton growth and nutrient uptake. The trend was most evident for surface nitrate, which dropped from between 0.024 mg/L to 0.045 mg/L in winter to below detection (0.006 mg/L) throughout much of the water column in summer and fall (Figure 3.5-3). This depletion of nitrate suggests that phytoplankton growth during the late summer was likely limited by nitrate availability. Phosphorus was always above detection limits during the 2010 surveys, with surface concentrations dropping from an average of 0.038 mg/L in winter to less than 0.028 mg/L in summer. Exceptions to this were sites RBW and RBE, which had relatively high levels of phosphorus in August (0.032 mg/L and 0.041 mg/L, respectively). Bioavailable orthophosphate made up the majority of the total phosphorus pool (Figure 3.5-4), further suggesting that the primary production in this area is controlled by nitrogen availability. Concentrations of surface silicate dropped from an average of 1.4 mg/L in winter to less than 0.75 mg/L in summer, likely due to uptake by silica-frustuled diatoms (Figure 3.5-5). Site REF-4 in August was an exception to this trend, as silicate levels at all depths exceeded 1.2 mg/L.

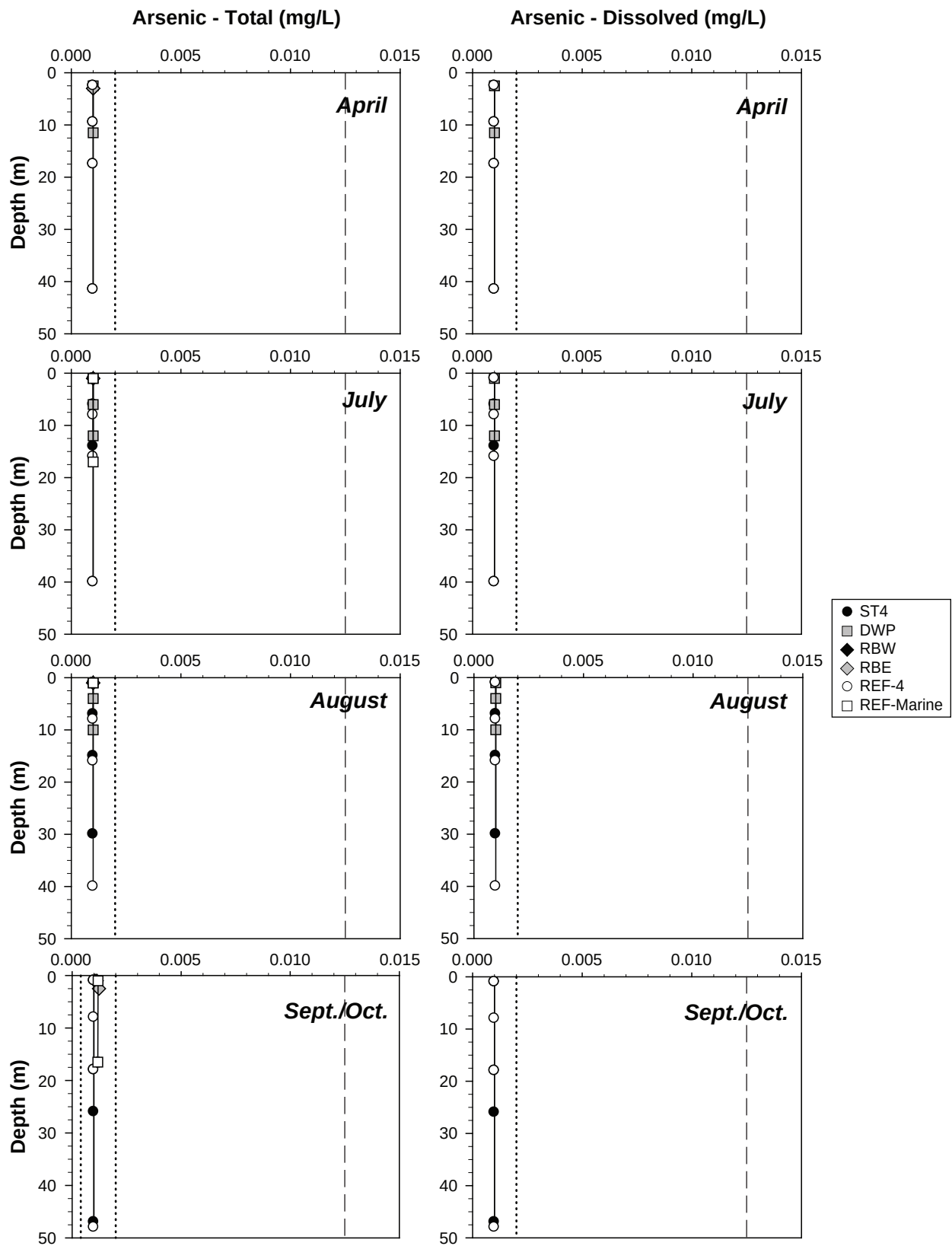
Surface concentrations of total organic carbon (TOC) tended to be slightly higher than bottom layer concentrations, likely due to phytoplankton growth and possibly from riverine inputs (Figure 3.5-5). TOC concentrations in winter ranged from 1.3 mg/L at the surface at sites ST4 and REF-4 to below the detection limit (<1 mg/L) in samples taken from deeper waters at these sites. TOC concentrations were slightly higher in summer and fall, averaging 1.8 mg/L at the surface and 1.2 mg/L in the bottom layer. The TOC concentration in August at site RBE (5.0 mg/L) was substantially higher than other sites. Chlorophyll *a* concentrations measured at the same time were also anomalously high at this site (Section 3.7), suggesting that phytoplankton biomass was relatively high at this site in August.

3.5.4 Total and Dissolved Metals

Overall, Roberts Bay and Reference Bay are low-metal systems with similar concentrations of total and dissolved metals in both bays (Figures 3.5-6 to 3.5-14). Average concentrations of total and dissolved arsenic, cadmium, chromium, iron, mercury and zinc were generally near or below the detection limits for all sites in all sampling months. Exceptions to this were August surface samples, which had relatively high levels of total iron at sites RBW and RBE (0.348 mg/L and 0.633 mg/L, respectively), likely due to sediment re-suspension, and total zinc at site DWP (0.011 mg/L) (Figures 3.5-10 and 3.5-14).

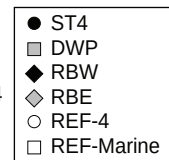
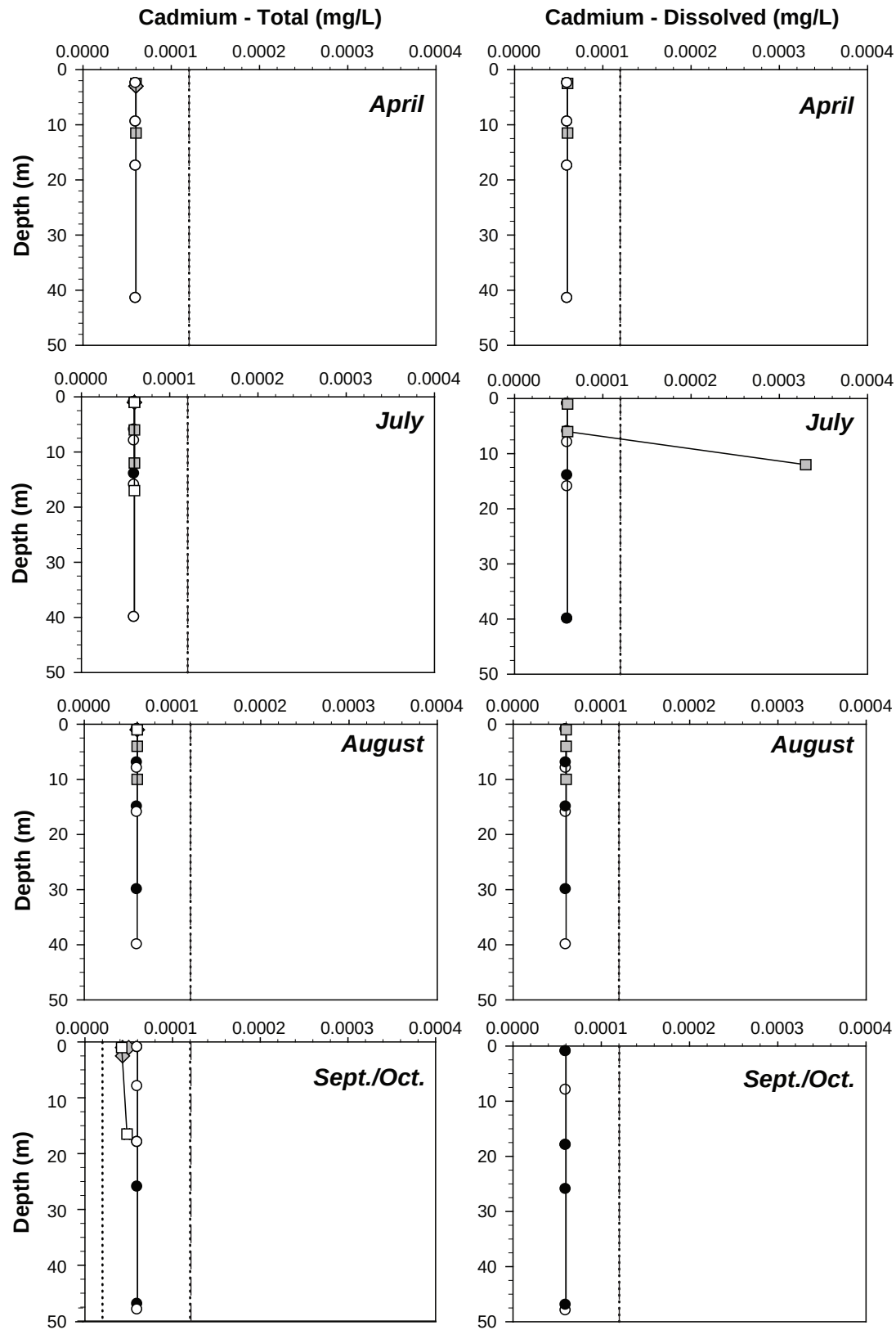
Total copper concentrations varied with depth and site (Figure 3.5-9). Most total copper concentrations were near or below the 0.001 mg/L detection limit, with the following exceptions: REF-4 in April at 3 m (0.0034 mg/L), and DWP and RBE in August at 1 m (0.0038 mg/L and 0.0023 mg/L, respectively). DWP was the only site where detectable total copper levels were found at multiple depths (July). In September, a lower detection limit for total copper of 0.00005 mg/L was achieved for some samples collected from sites RBE, RBW, and REF-Marine. In these samples, copper concentrations ranged from 0.00054 to 0.00095 mg/L. Dissolved copper concentrations were always below the detection limit.

There was no apparent seasonal or spatial trend in total and dissolved manganese concentrations, which were generally above analytic detection limits, ranging from below the detection limit (<0.0005 mg/L) to 0.006 mg/L (Figure 3.5-11). As observed for total iron, total manganese concentrations were particularly high at sites RBW and RBE in August when elevated TSS concentrations were found (0.0079 mg/L and 0.016 mg/L, respectively).



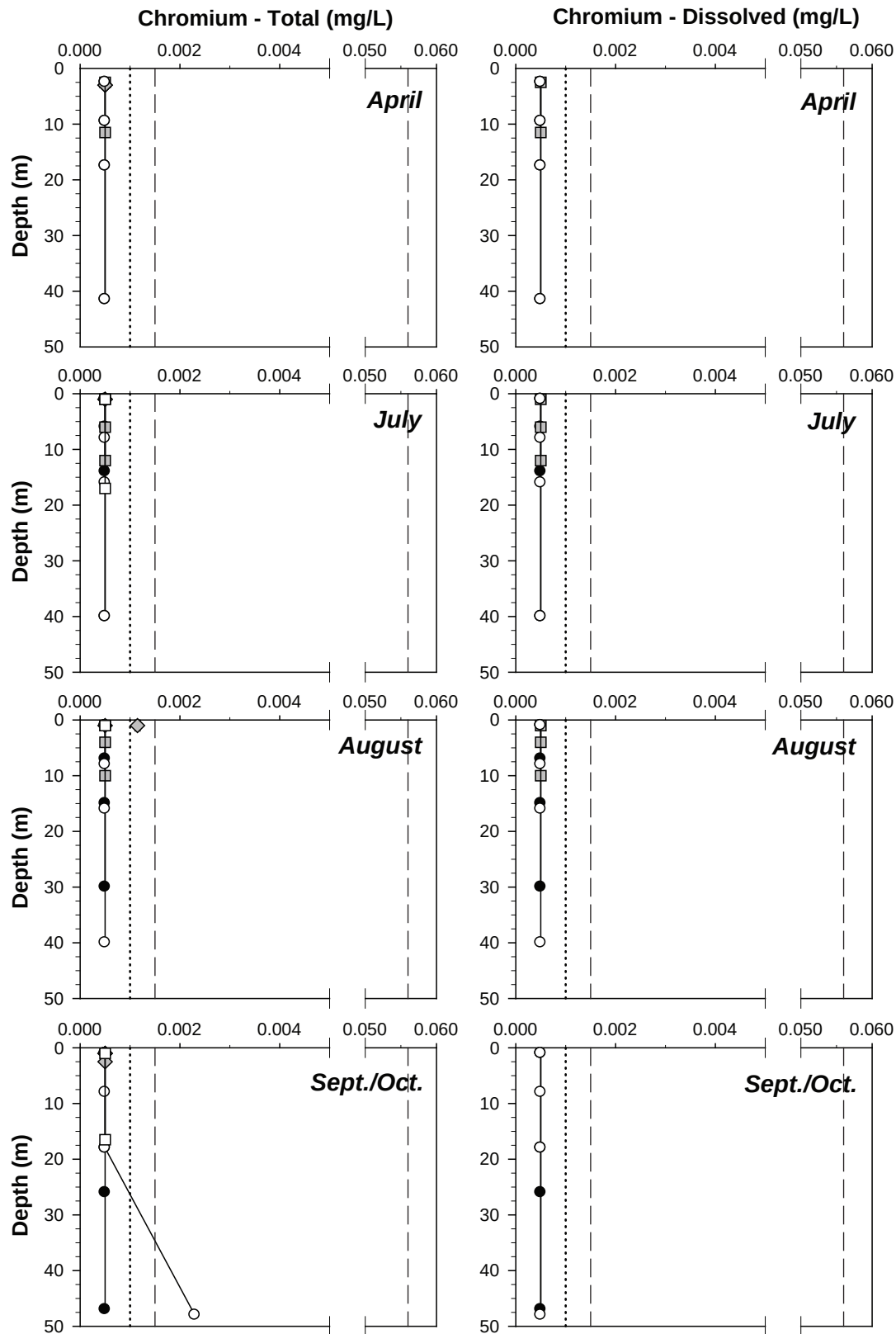
Notes: Dotted lines represent analytical detection limit (0.0004 or 0.002 mg/L).
 Values below the analytical detection limit are plotted at half the detection limit.
 Dashed line represents interim CCME water quality guideline for total arsenic (0.0125 mg/L).

Figure 3.5-6



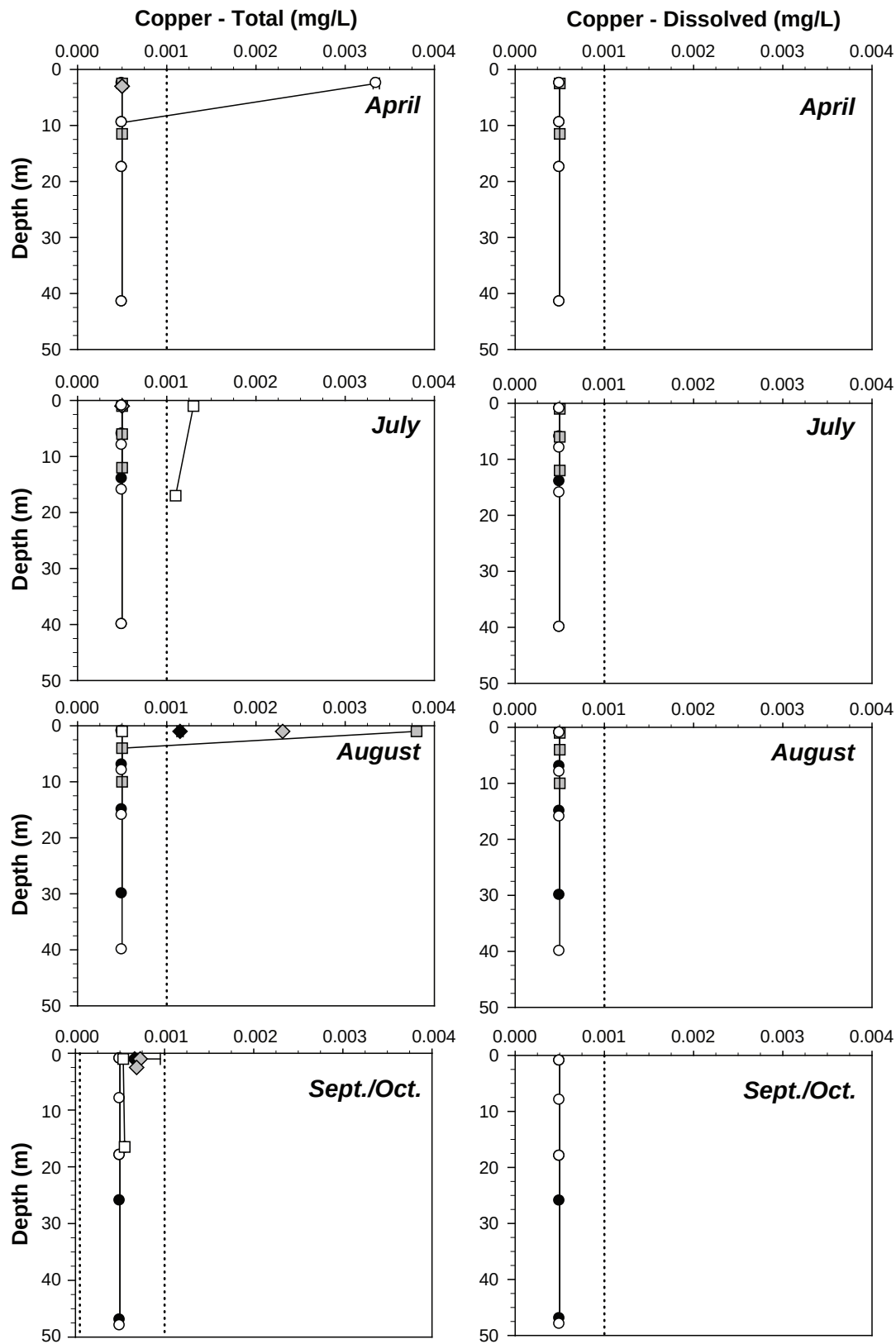
Notes: Dotted lines represent analytical detection limit (0.00002 or 0.00012 mg/L).
 Values below the analytical detection limit are plotted at half the detection limit.
 Dashed line represents CCME water quality guideline (0.00012 mg/L).

Figure 3.5-7



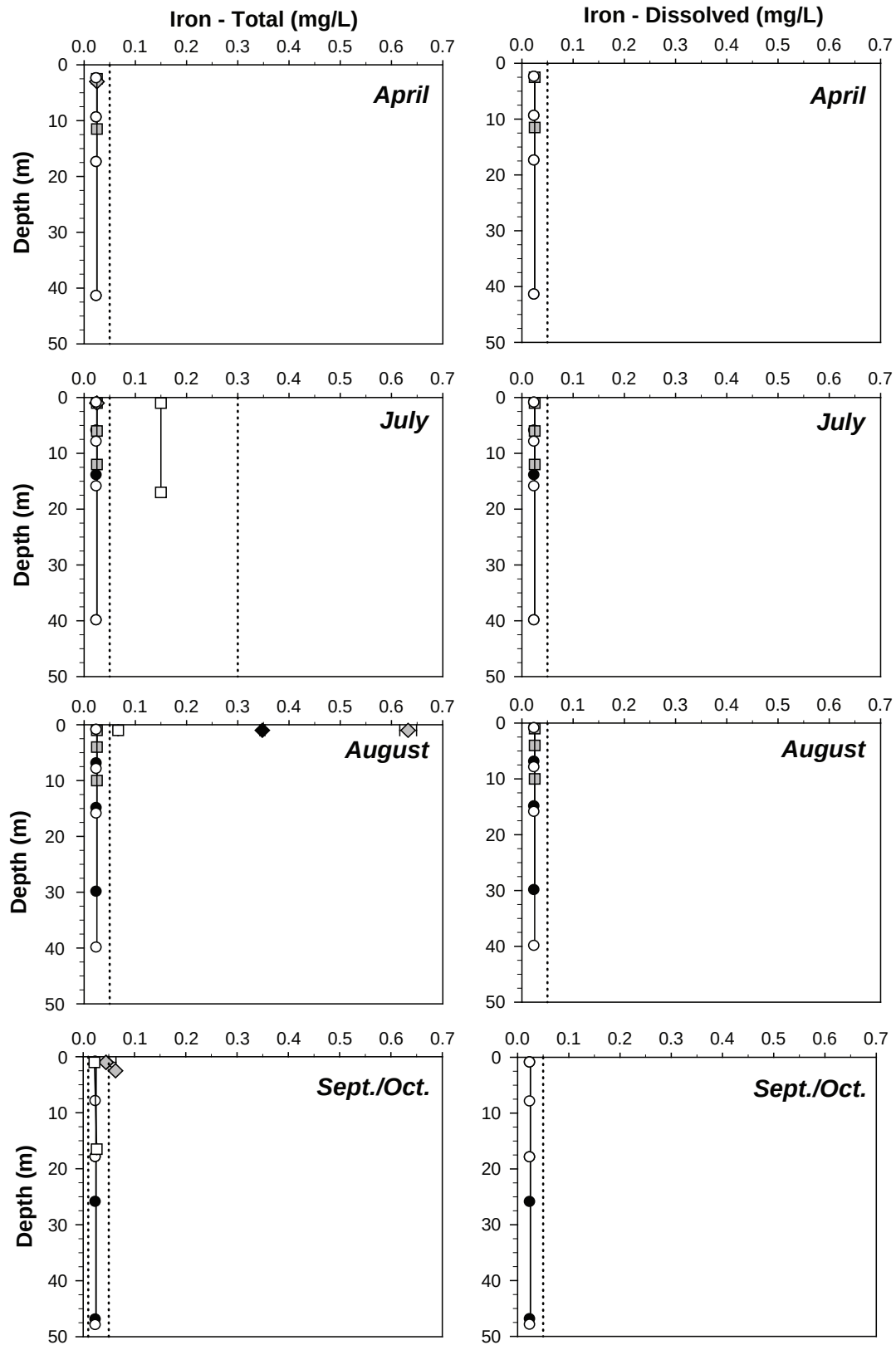
Notes: Dotted line represents analytical detection limit (0.001 mg/L).
 Values below the analytical detection limit are plotted at half the detection limit.
 Dashed lines represent the CCME water quality guideline for hexavalent chromium (0.0015 mg/L)
 and the interim guideline for trivalent chromium (0.056 mg/L).

Figure 3.5-8



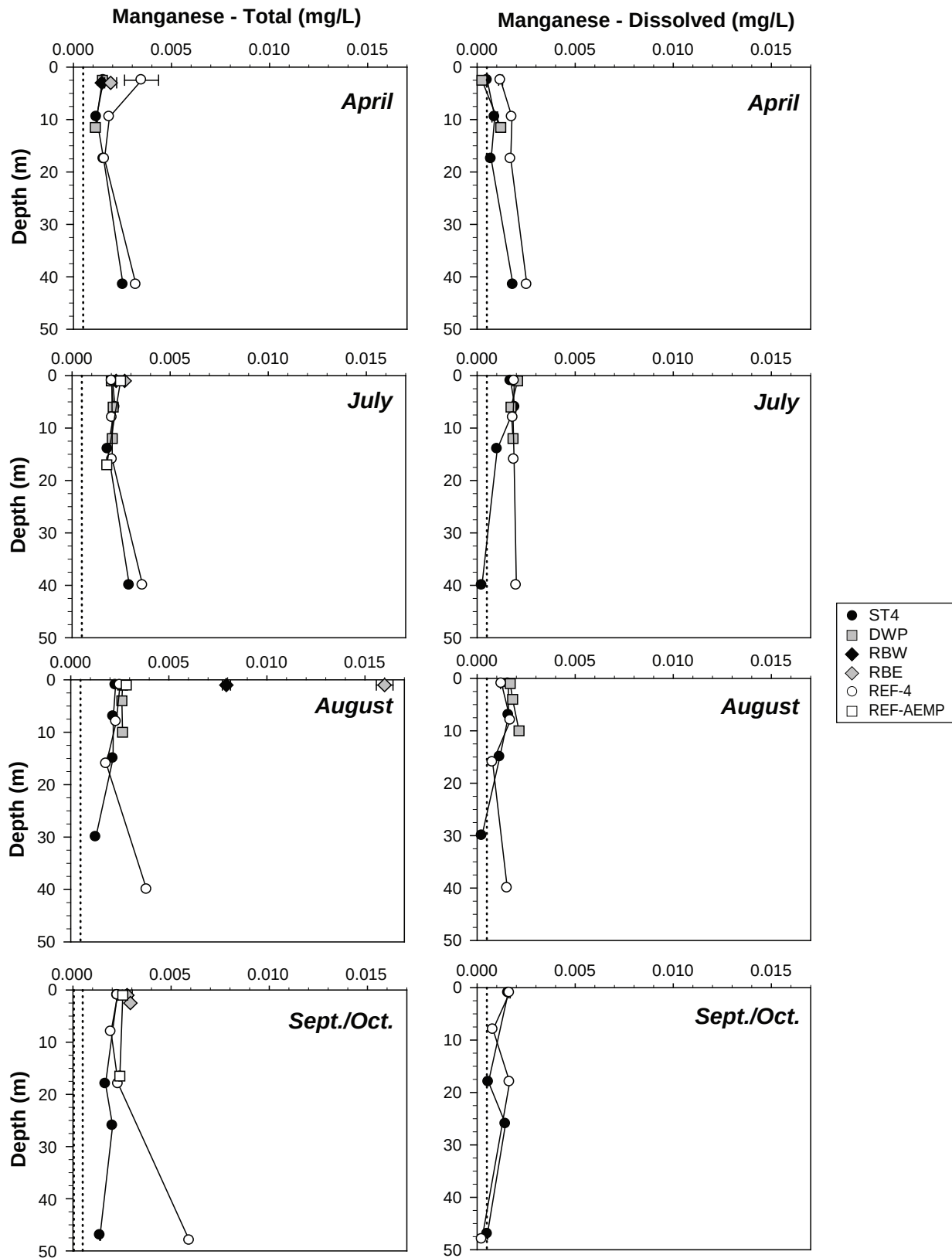
Notes: Error bars represent standard error of the mean of duplicate samples.
 Dotted lines represent analytical detection limit (0.00005 or 0.001 mg/L).
 Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-9



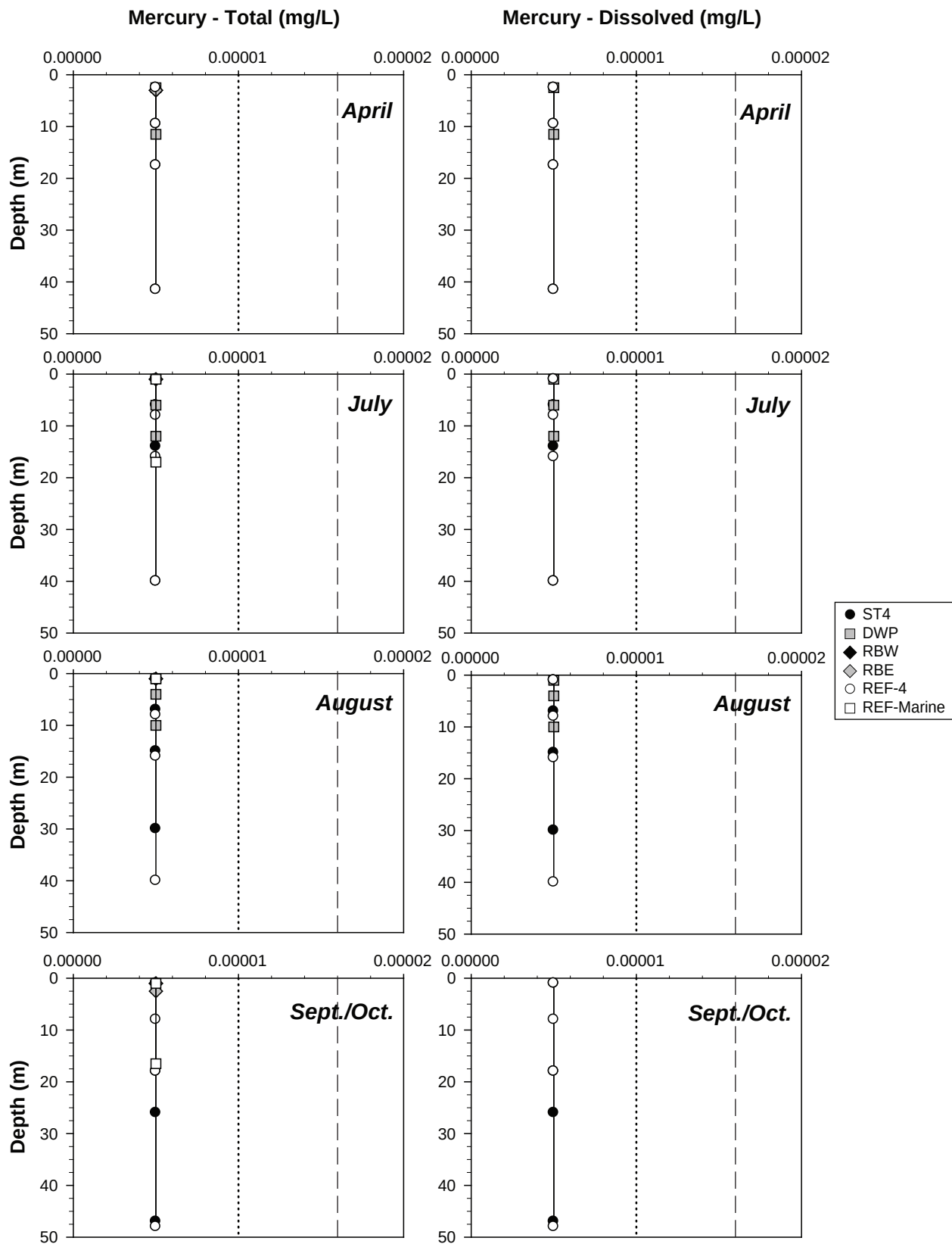
Notes: Error bars represent standard error of the mean of duplicate samples.
Dotted lines represent analytical detection limit (0.01, 0.05, or 0.3 mg/L).
Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-10



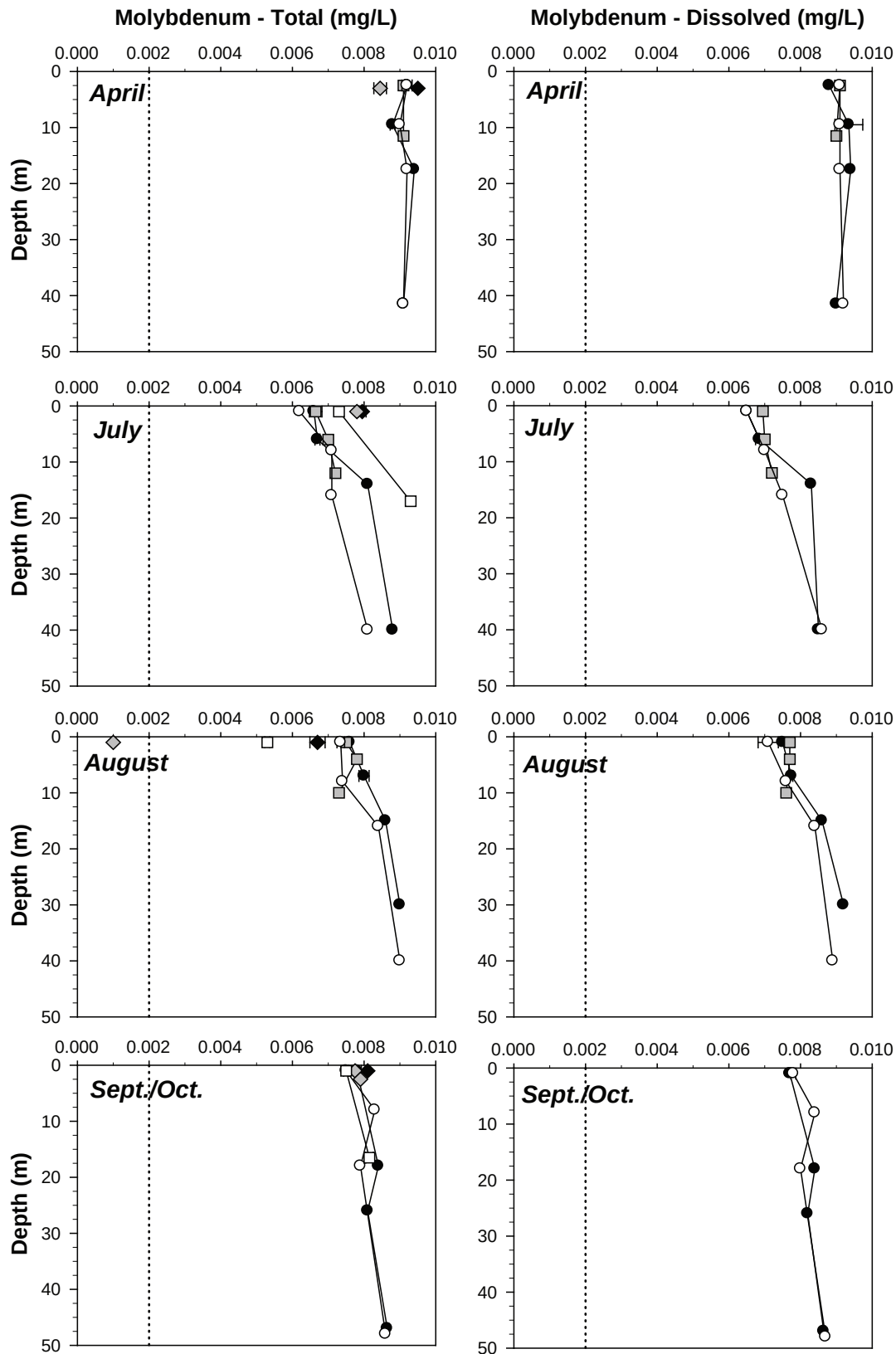
Notes: Error bars represent standard error of the mean of duplicate samples.
Dotted lines represent analytical detection limit (0.00005 or 0.0005 mg/L).
Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-11



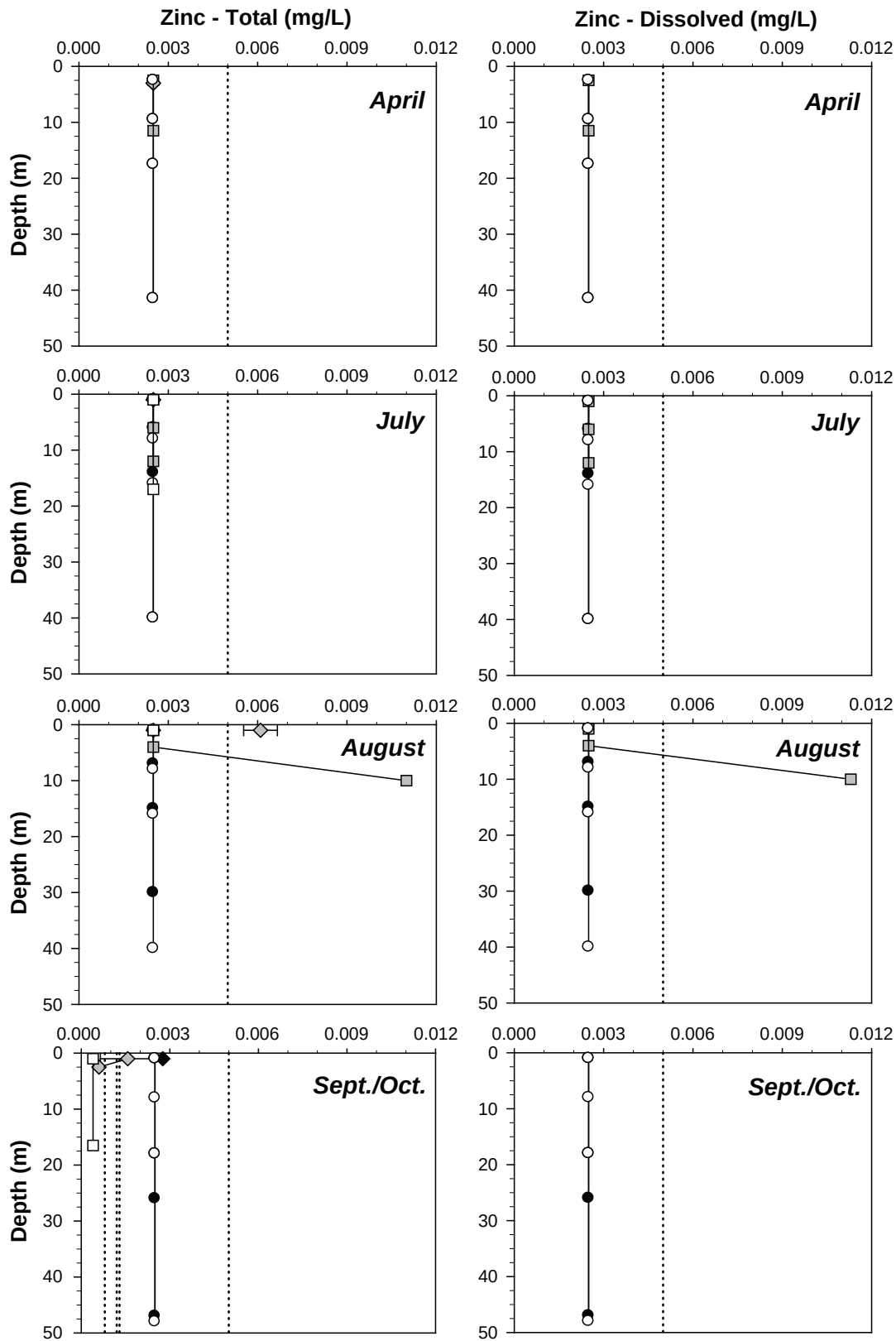
Notes: Dotted line represents analytical detection limit (0.00001 mg/L).
 Values below the analytical detection limit are plotted at half the detection limit.
 Dashed line represents CCME water quality guideline for inorganic mercury (0.000016 mg/L).

Figure 3.5-12



Notes: Error bars represent standard error of the mean of duplicate samples.
Dotted line represents analytical detection limit (0.002 mg/L).
Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-13



Notes: Error bars represent standard error of the mean of duplicate samples.
 Dotted lines represent analytical detection limit (0.0008, 0.0012, 0.0013, or 0.005 mg/L).
 Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-14

Total molybdenum concentrations were generally similar across sites (Figure 3.5-13). There was some seasonal variation in surface total molybdenum concentrations, as the average winter concentration (0.0091 mg/L) was higher than that observed in summer (0.0065 mg/L). Dissolved molybdenum made up the majority of the total molybdenum pool, and there was some surface depletion in summer suggesting phytoplankton uptake or riverine dilution.

3.5.5 Comparison with CCME Water Quality Guidelines

All water quality data collected in Roberts and Reference bays were compared to the CCME's water quality guidelines for the protection of marine aquatic life (CCME 2007). Water quality parameters were generally below recommended guidelines, with the exception of total chromium in the September deep sample at REF-4 (0.0023 mg/L).

The CCME guideline for chromium is dependent on its speciation: the guideline for hexavalent chromium (Cr(VI)) is 0.0015 mg/L and the interim guideline for trivalent chromium (Cr(III)) is 0.056 mg/L (CCME 1999). Routine metal analysis does not distinguish between chromium species, so total chromium results were used to compare with CCME guidelines to be conservative. Chromium most commonly occurs in surface waters as hexavalent chromium (Cr(VI)) (CCME 1999), although the Cr(VI) oxidation state may only be marginally higher than Cr(III) (Ahern, Eckert, and Payne 1985). Concentrations of total chromium in the September deep water sample at REF-4 were slightly higher than CCME chromium Cr(VI) guideline, but lower than the Cr(III) guideline.

3.5.6 Quality Assurance/Quality Control (QA/QC)

Duplicate samples were collected at 20% of the sample depths for QA/QC purposes. Analytical results for travel, field, and equipment blanks collected as part of the 2010 marine water quality sampling program are presented in Appendices 3.5-1 and 3.5-2. Three travel blanks, three field blanks, and one equipment blank were collected in 2010, making up 4% of total samples collected.

Generally, analytical results for blank samples were below detection limits. Exceptions to this were the September travel and field blanks; these blanks both had detectable levels of ammonia (0.0073 mg/L and 0.0161 mg/L respectively; higher than most field samples) and TOC (0.75 mg/L and 0.77 mg/L; lower than most field samples). Travel and field blanks involved taking a double de-ionized water sample out to the sampling site; travel blanks remained unopened, while field blanks were opened and exposed to the sampling environment. The similarity between the unopened travel blank and the field blank, and the large number of field samples below detection limits for ammonia, suggests contamination at the lab source rather than during sampling so no adjustments were made to the raw water quality data.

3.5.7 Historical Trends in Water Quality

Marine water quality data for Roberts Bay were collected in: 1996, 1997, 1998, 2004, 2005, 2006, 2007, 2008, 2009, and 2010. Reference Bay water quality data were collected in 2009 and 2010. Historical water quality trends for Roberts Bay and Reference Bay are shown in Figures 3.5-15 to 3.5-31. For graphing purposes, historical data were grouped according to sampling site location. Site "Roberts Bay West" includes data from historical sites: Stn 1, Stn 2, Stn 3 (1996-1998); ST1, ST2, ST3, WT1, WT2 (2009); and RBW (2010). Site "Roberts Bay East" includes data from: Stn 5 (1996-1998); unnamed sampling site (2004-2008); ST0, WT0 (2009); and RBE (2010). Site "Roberts Bay Pelagic" includes data from: ST4, ST5, ST6, WT4, WT6 (2009); and ST4 (2010). Site "Reference Bay" includes data from: REF-W, REF-4, RP3 (2009); and REF-4, REF-Marine (2010). Historical sampling sites that did not correspond to sites sampled in 2010 were excluded from the historical water quality plots.

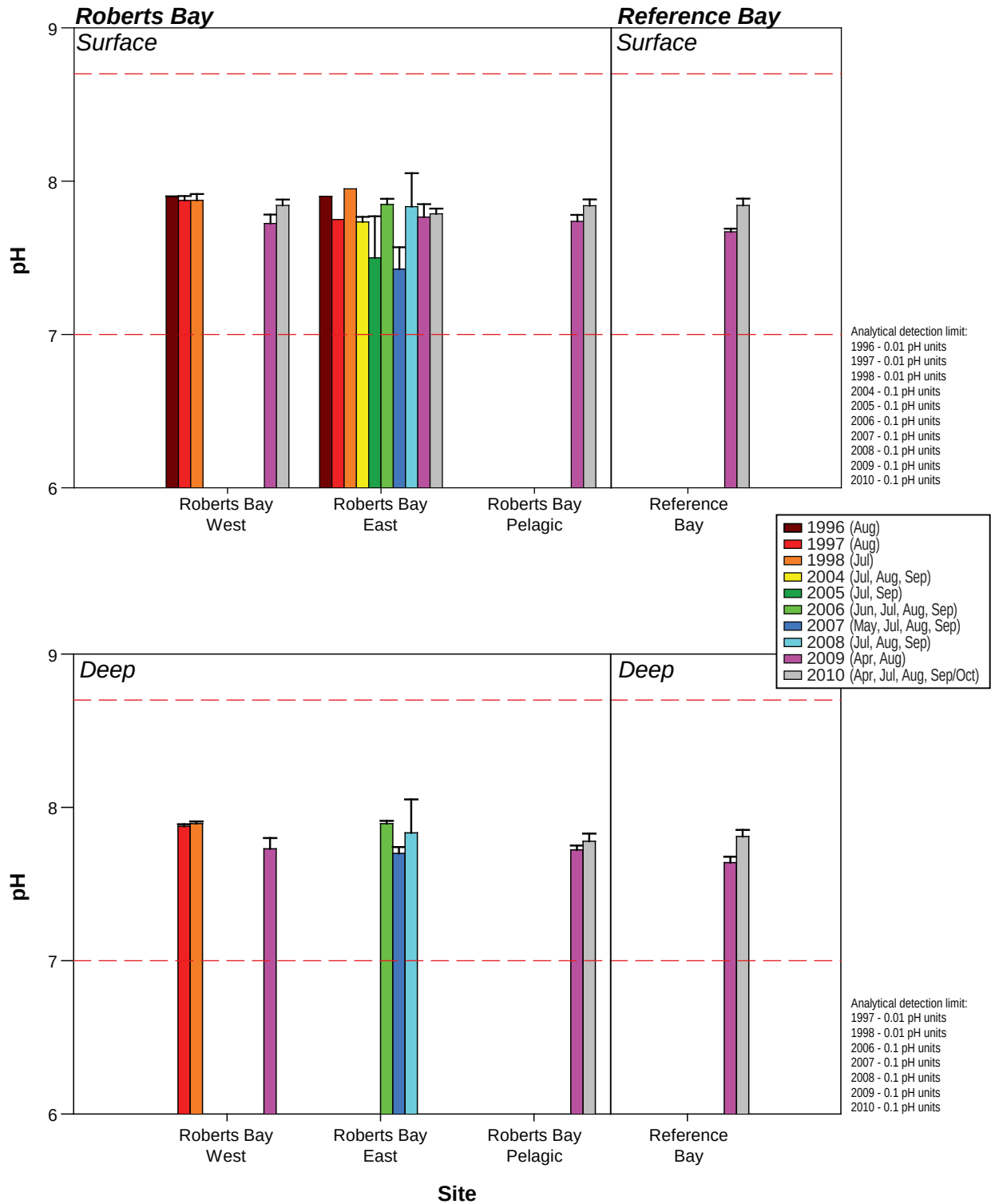
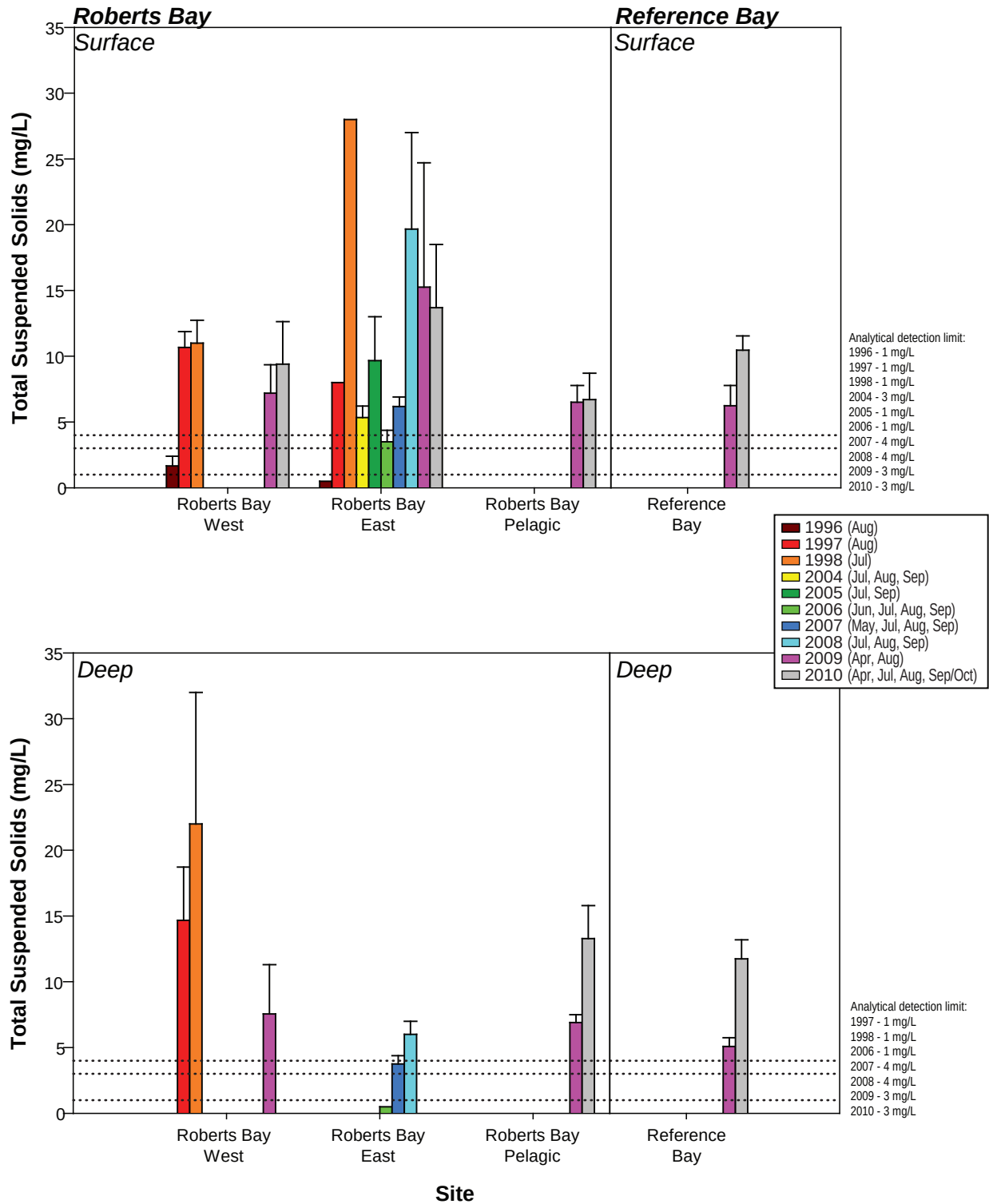
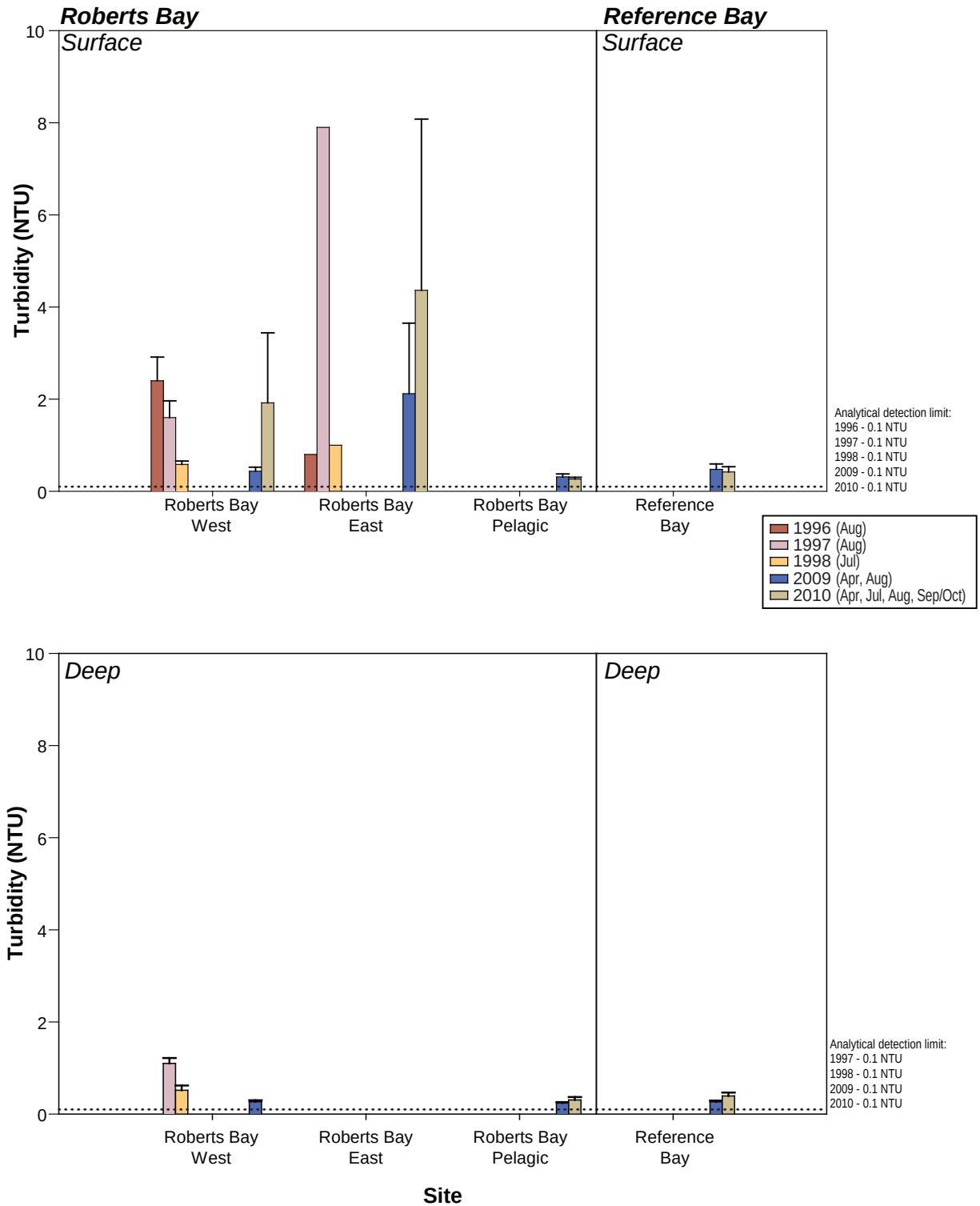


Figure 3.5-15



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
Dotted lines represent analytical detection limits.
Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-16



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
 Dotted lines represent analytical detection limits.

Figure 3.5-17

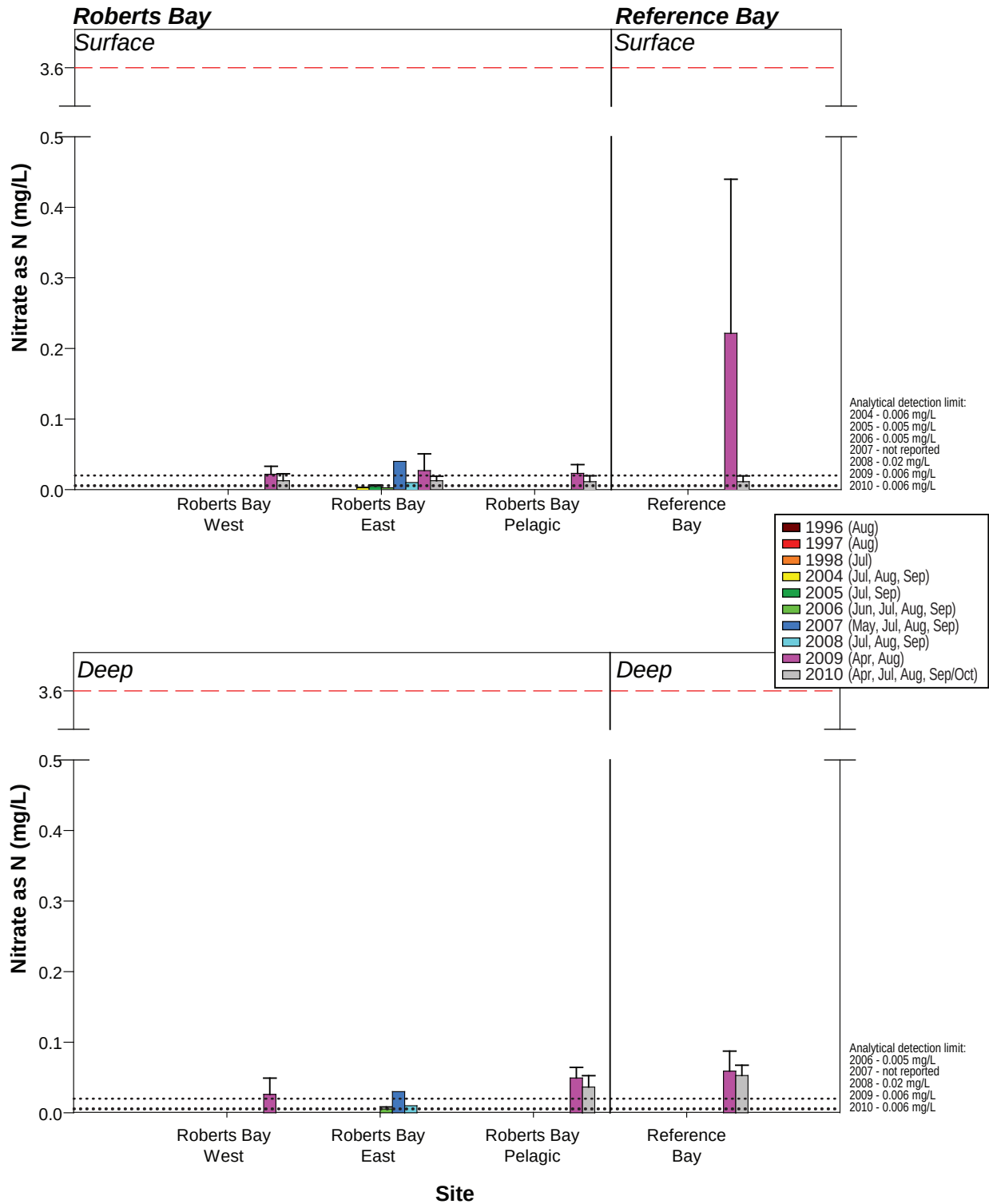
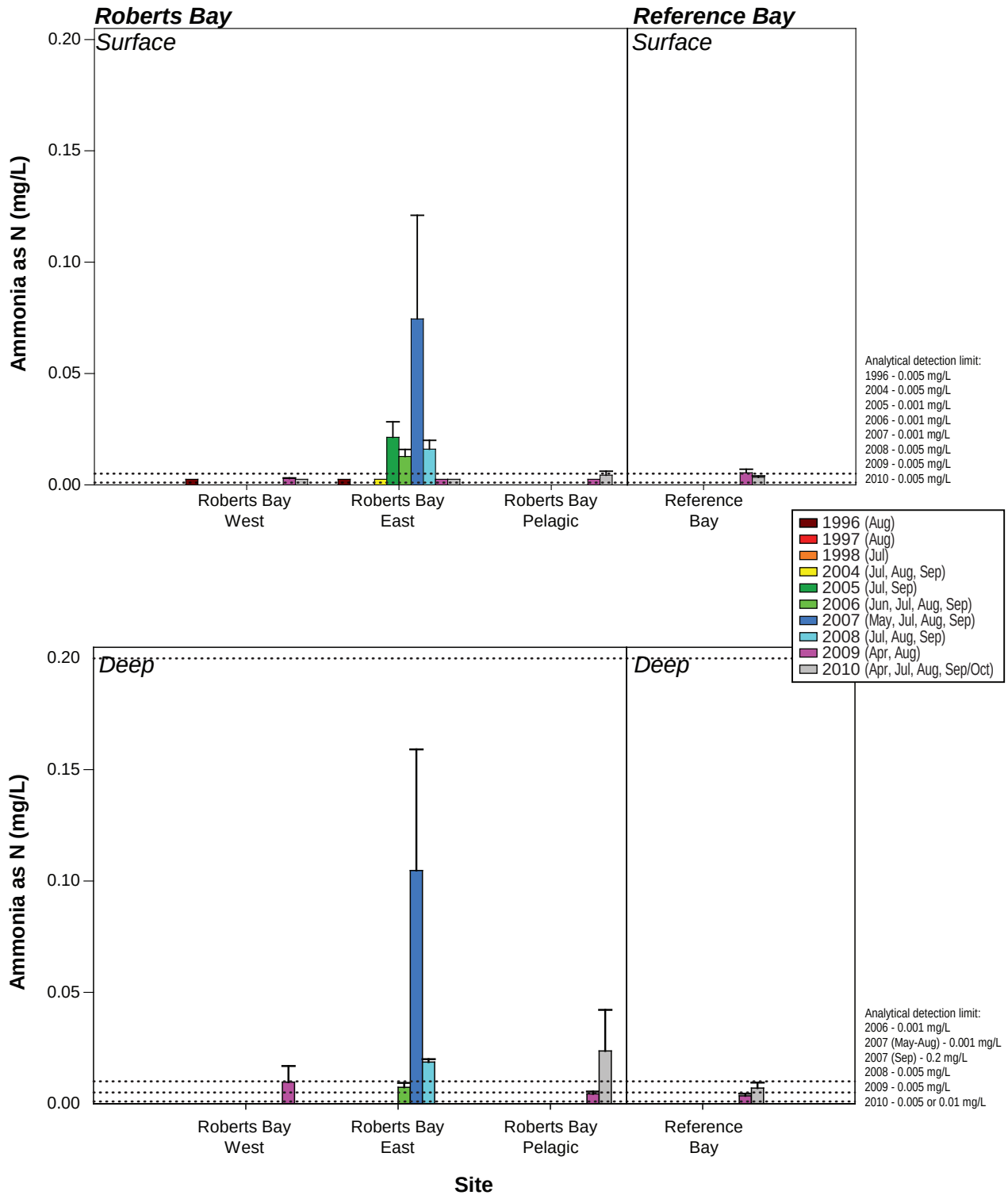
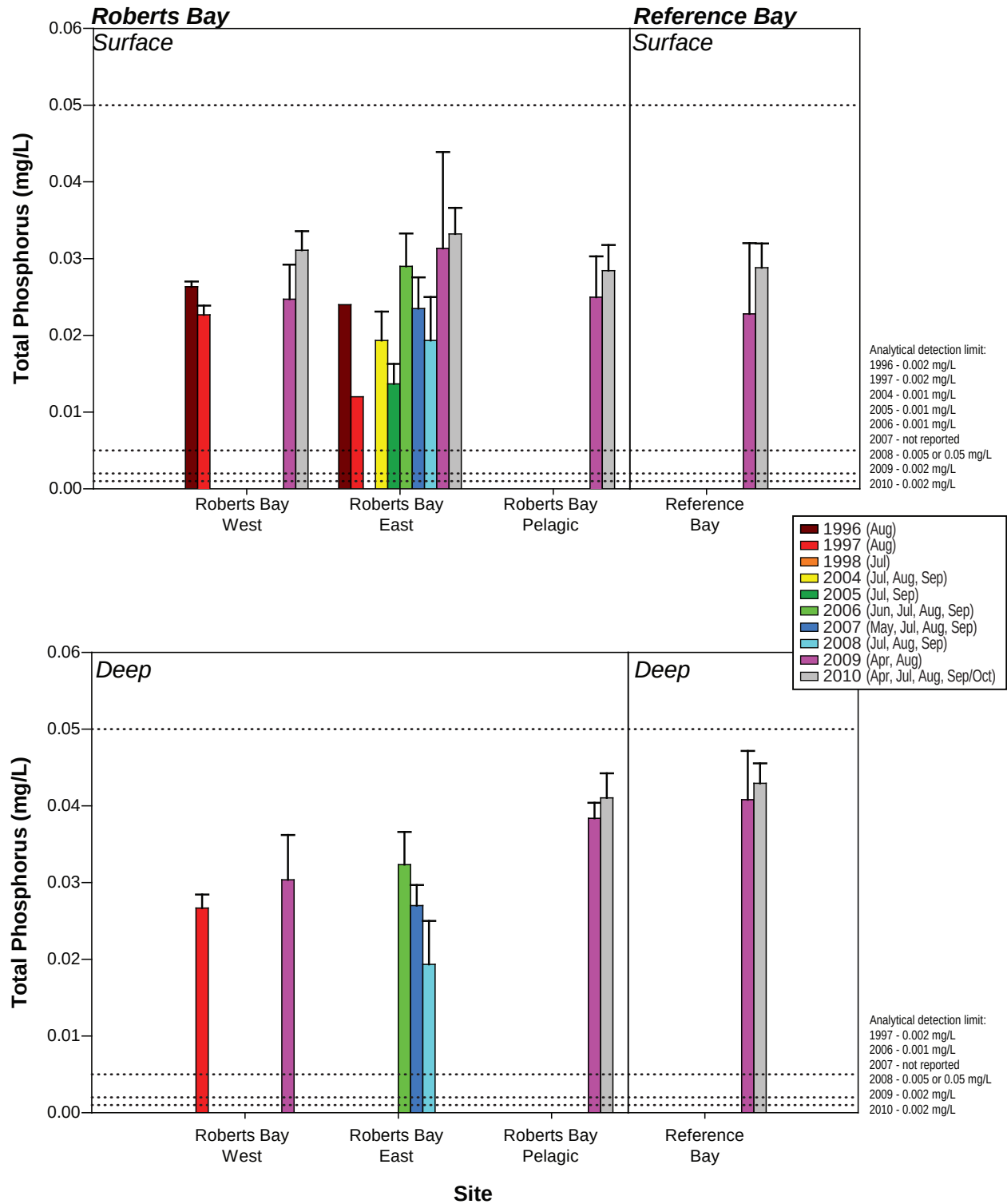


Figure 3.5-18



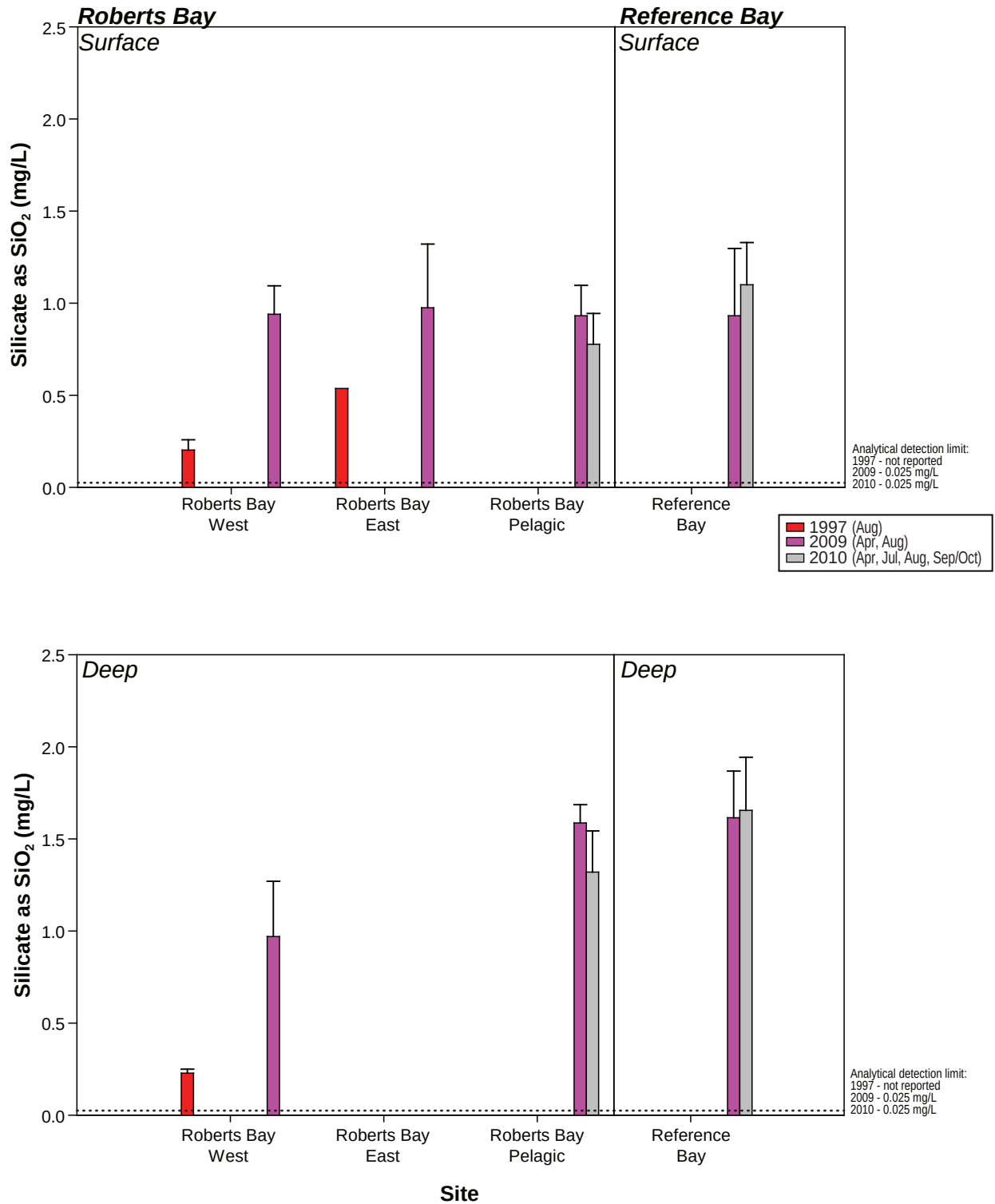
Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-19



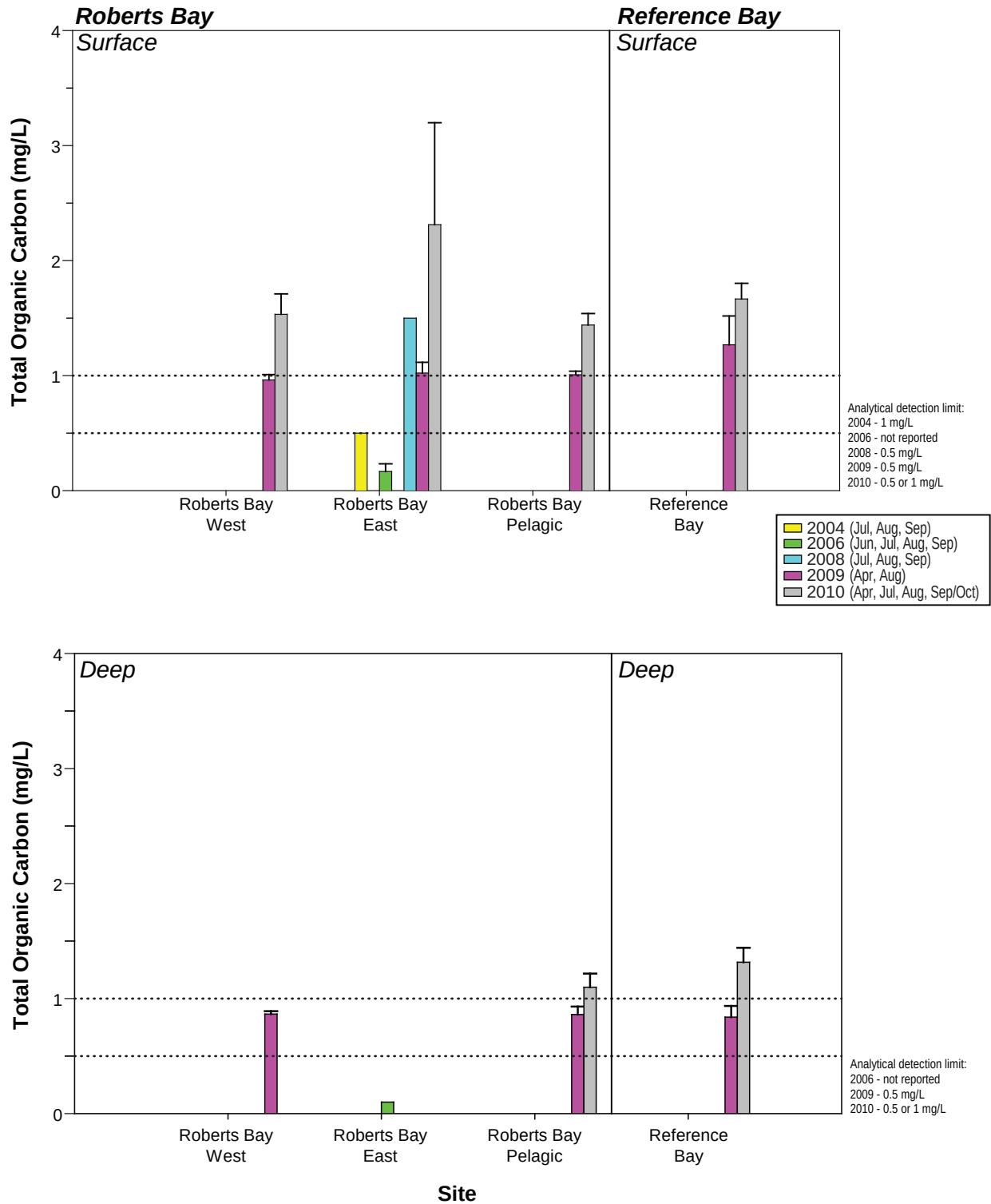
Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
Dotted lines represent analytical detection limits.
Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-20



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
 Dotted lines represent analytical detection limits.

Figure 3.5-21



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.

Figure 3.5-22

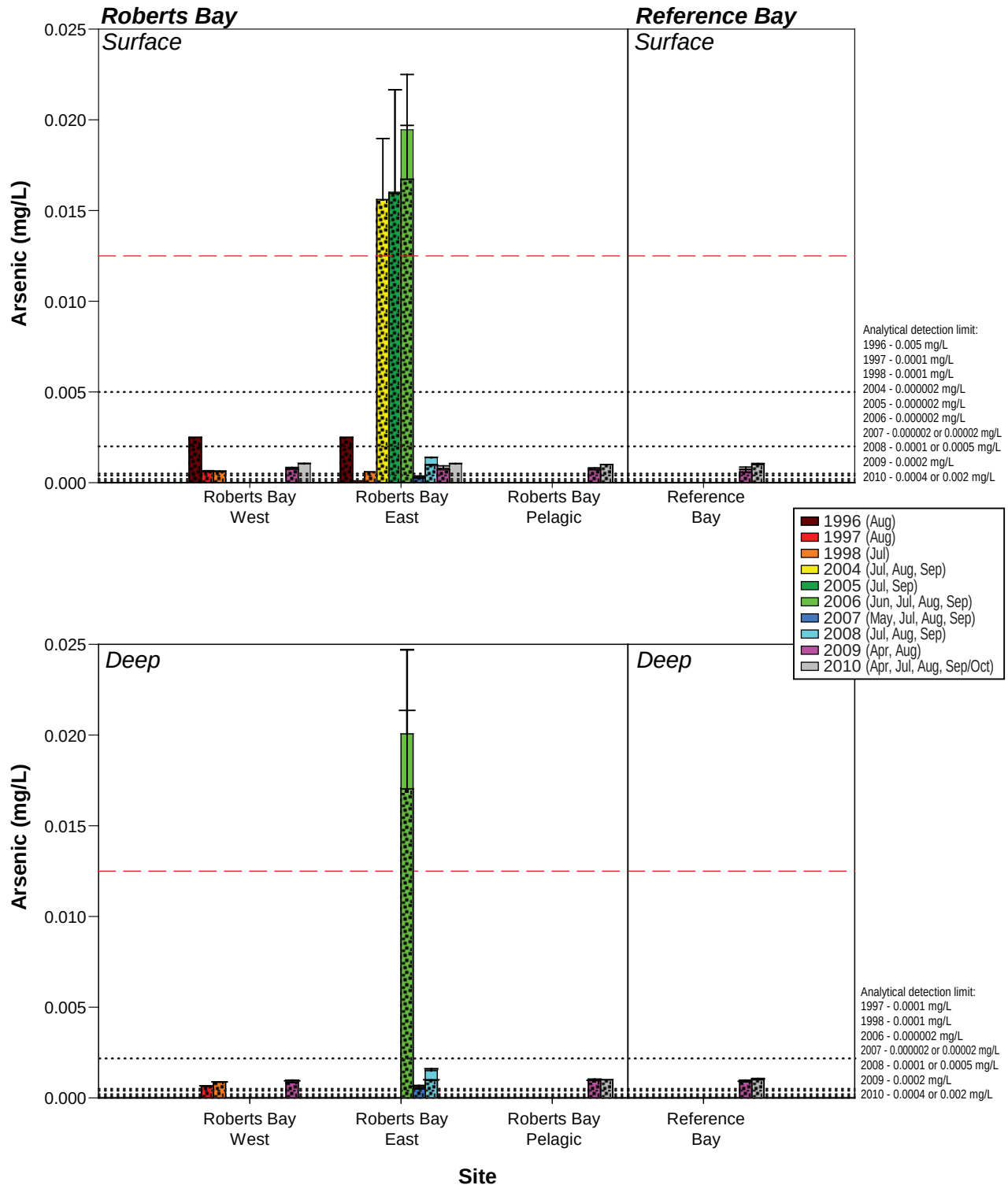


Figure 3.5-23

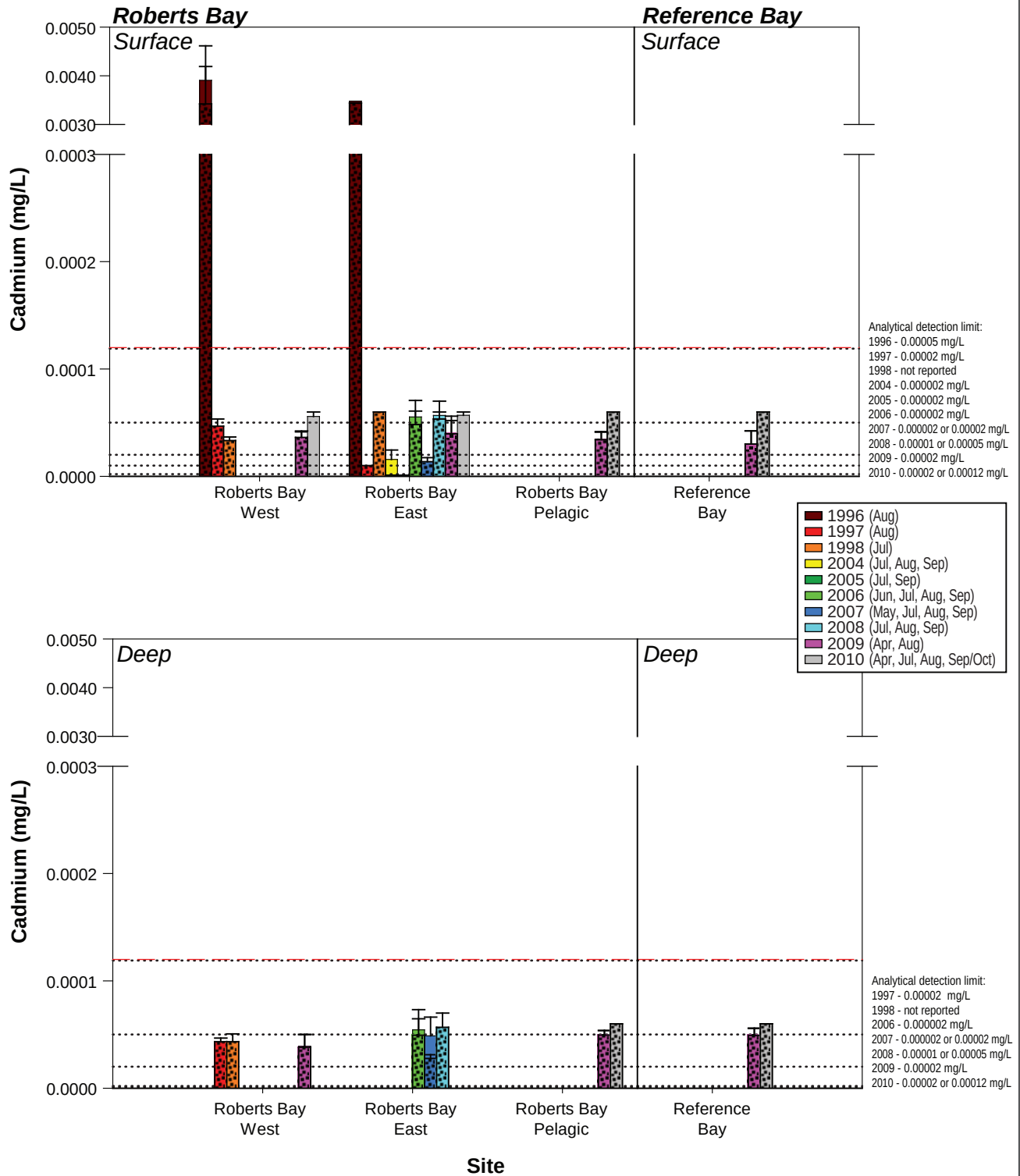
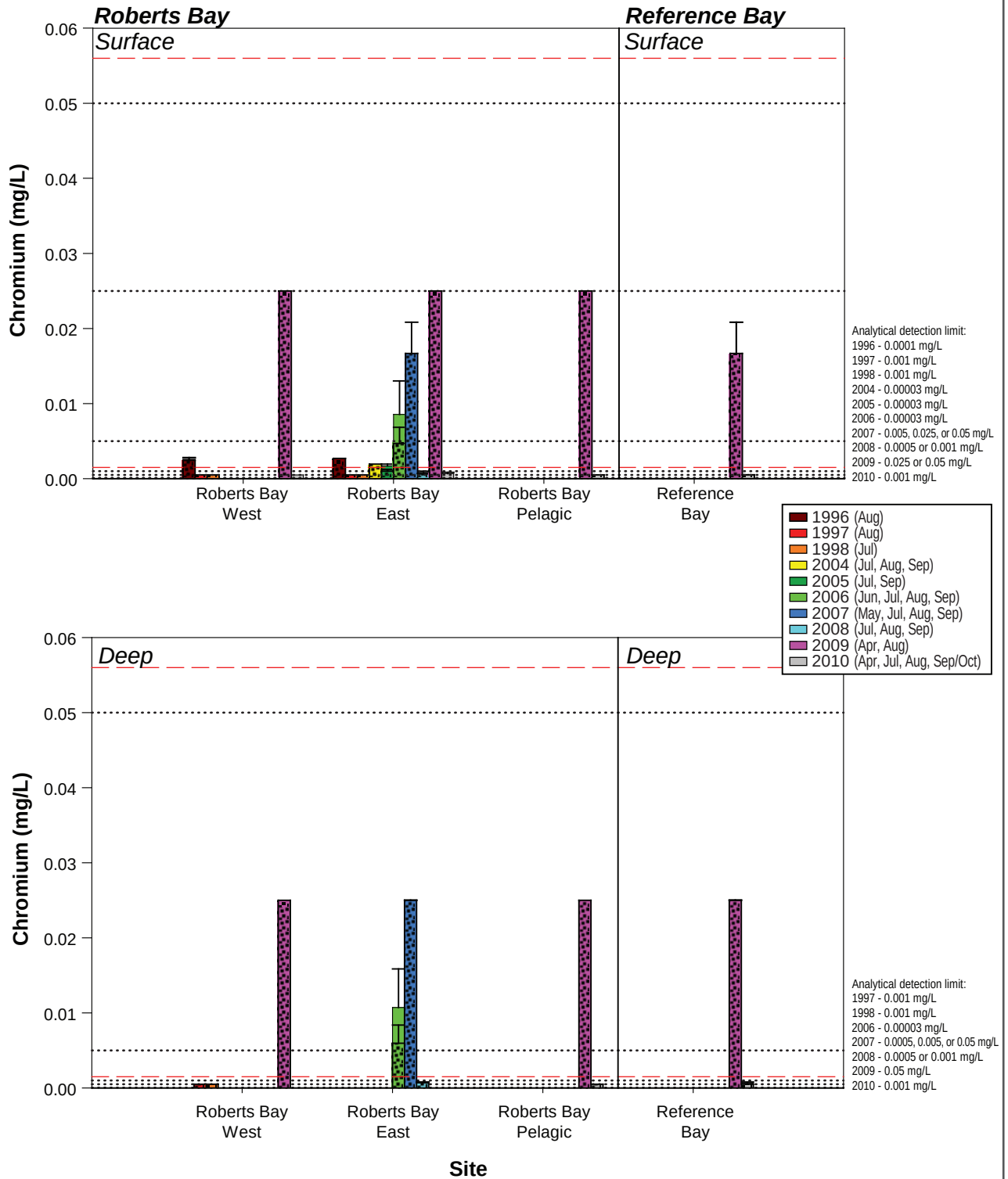


Figure 3.5-24



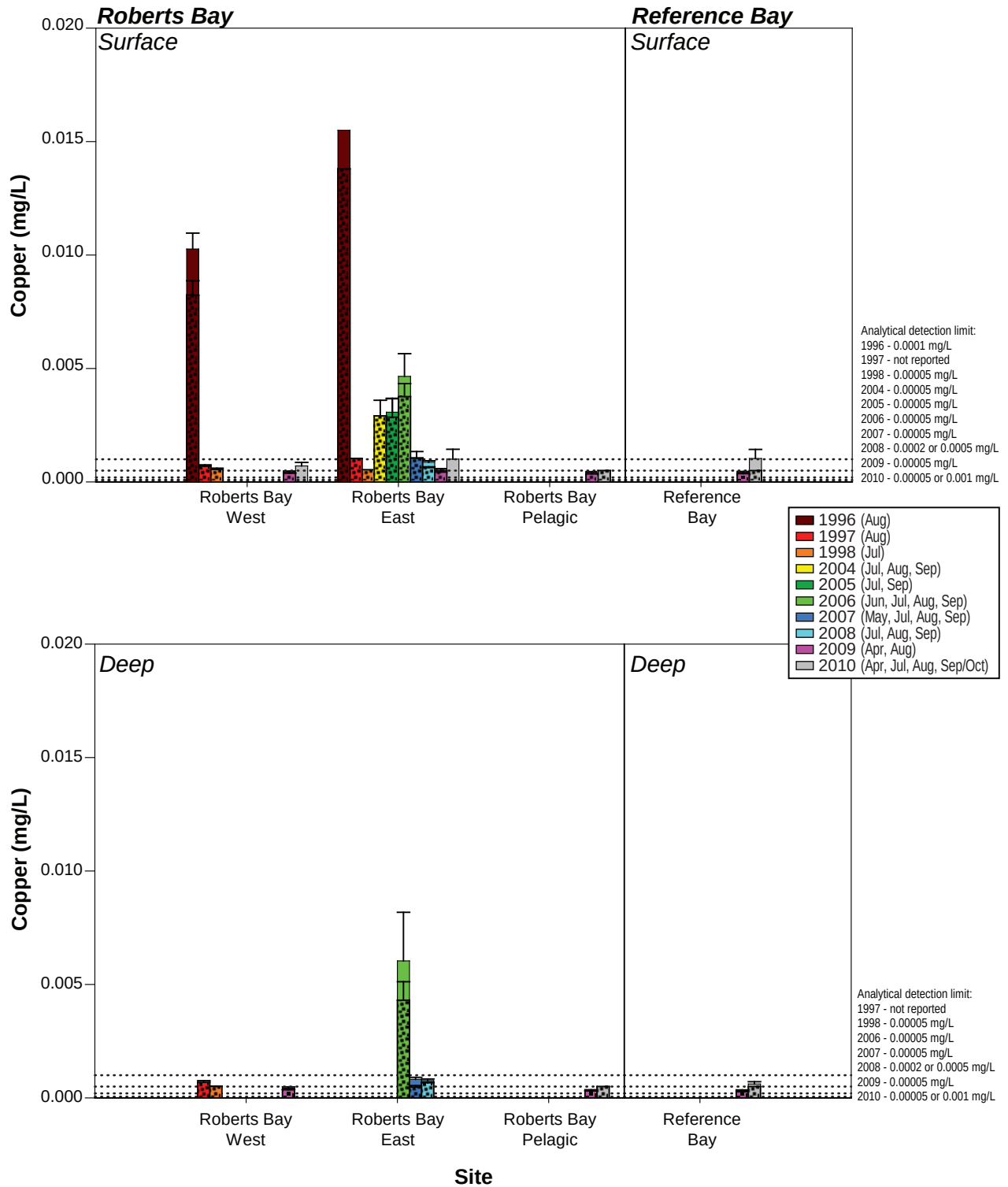
Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.

Dotted lines represent analytical detection limits.

Values below the analytical detection limit are plotted at half the detection limit.

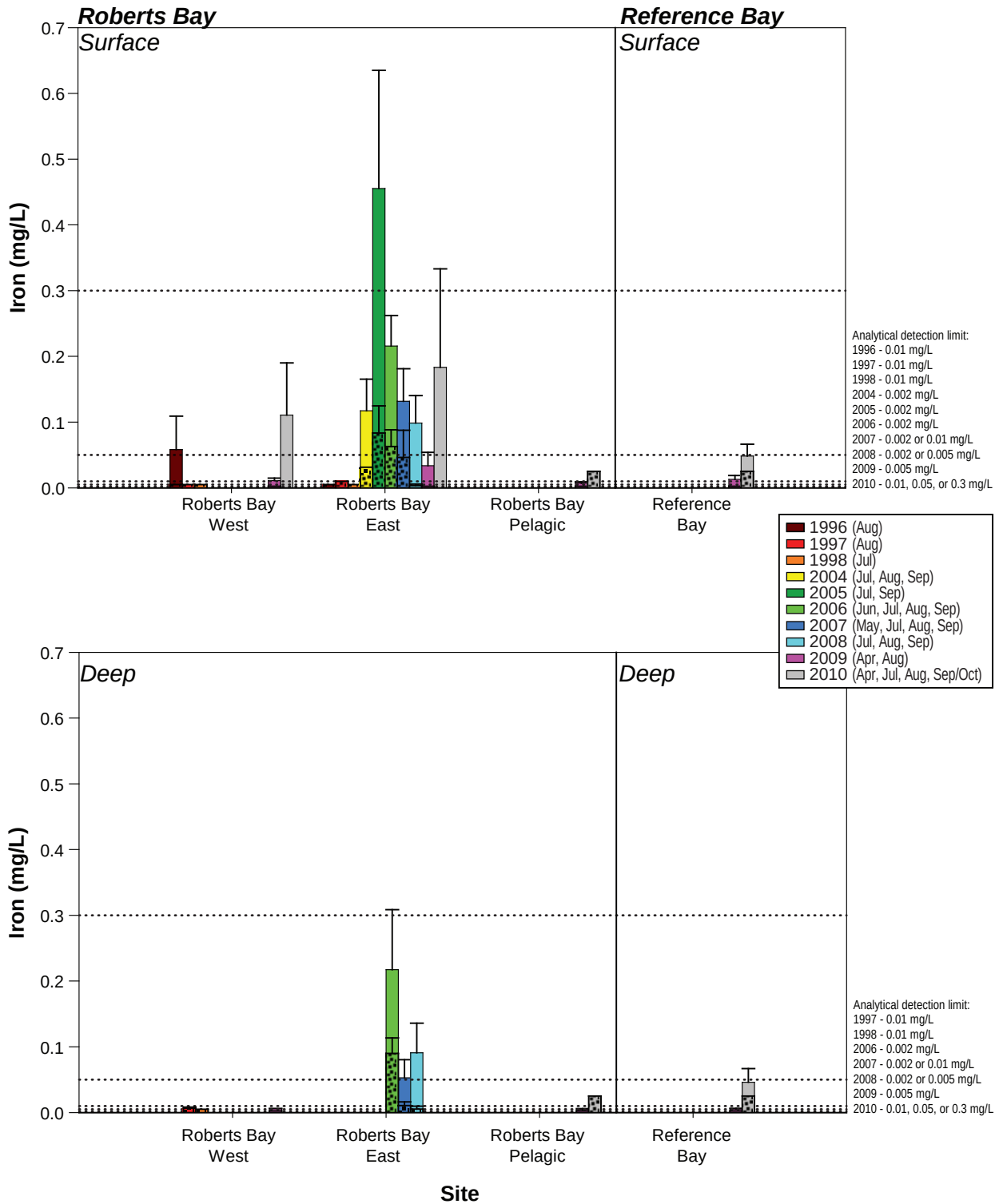
Red dashed lines represent the CCME water quality guideline for hexavalent chromium (0.0015 mg/L) and the interim guideline for trivalent chromium (0.056 mg/L).

Solid bars represent total chromium and superimposed dotted bars represent dissolved chromium.



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
Dotted lines represent analytical detection limits.
Values below the analytical detection limit are plotted at half the detection limit.
Solid bars represent total copper and superimposed dotted bars represent dissolved copper.

Figure 3.5-26



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
Dotted lines represent analytical detection limits.
Values below the analytical detection limit are plotted at half the detection limit.
Solid bars represent total iron and superimposed dotted bars represent dissolved iron.

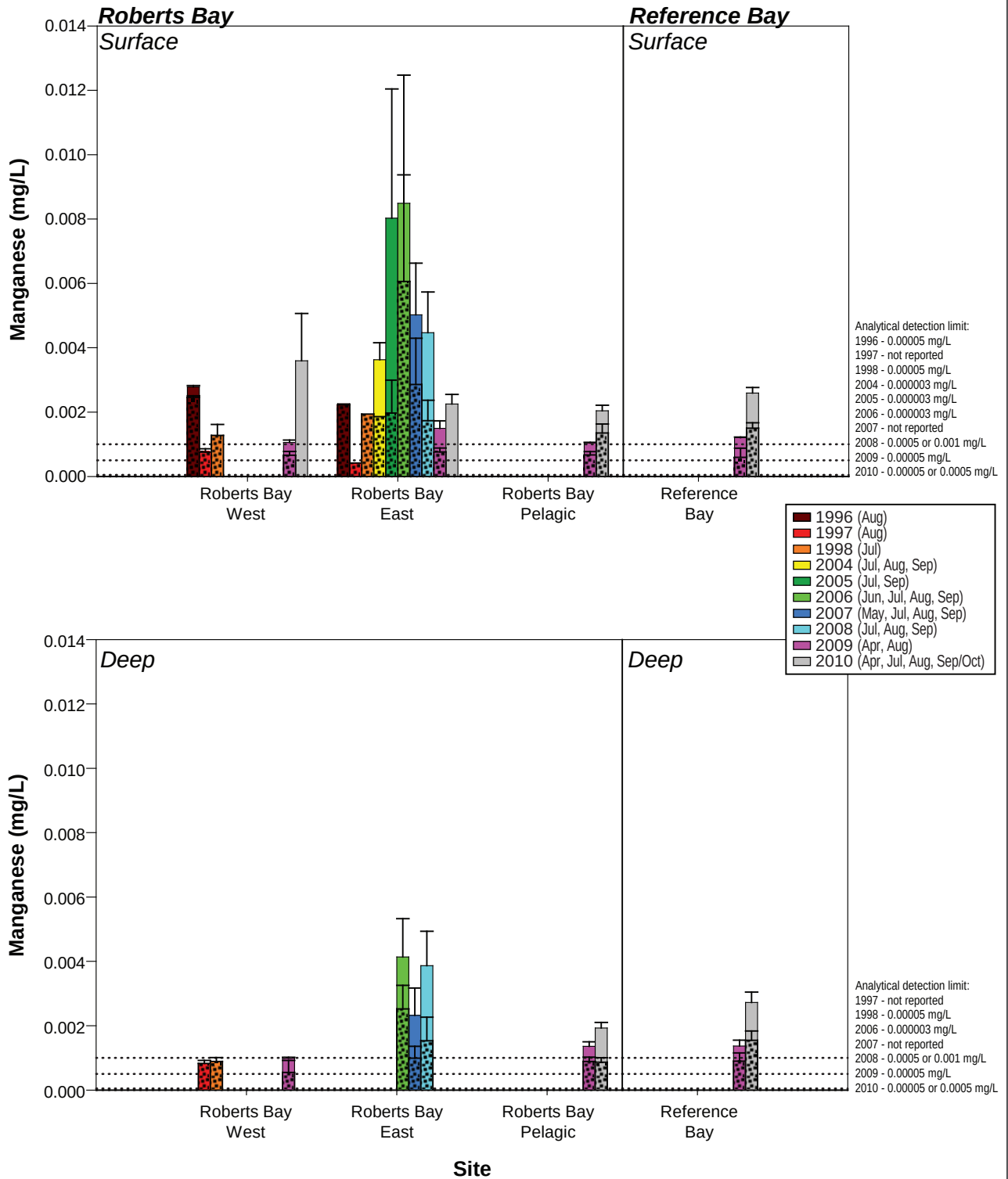


Figure 3.5-28

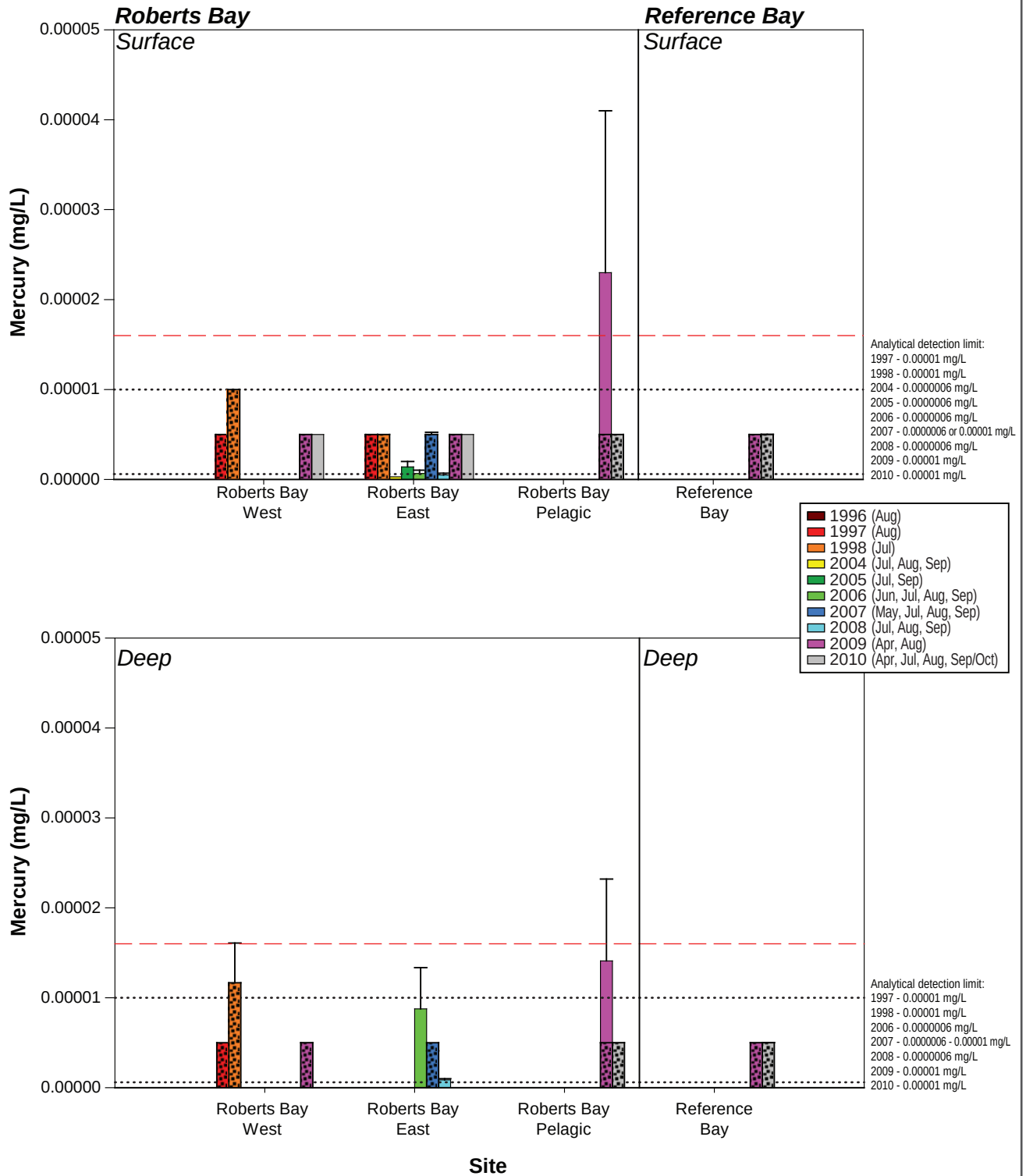
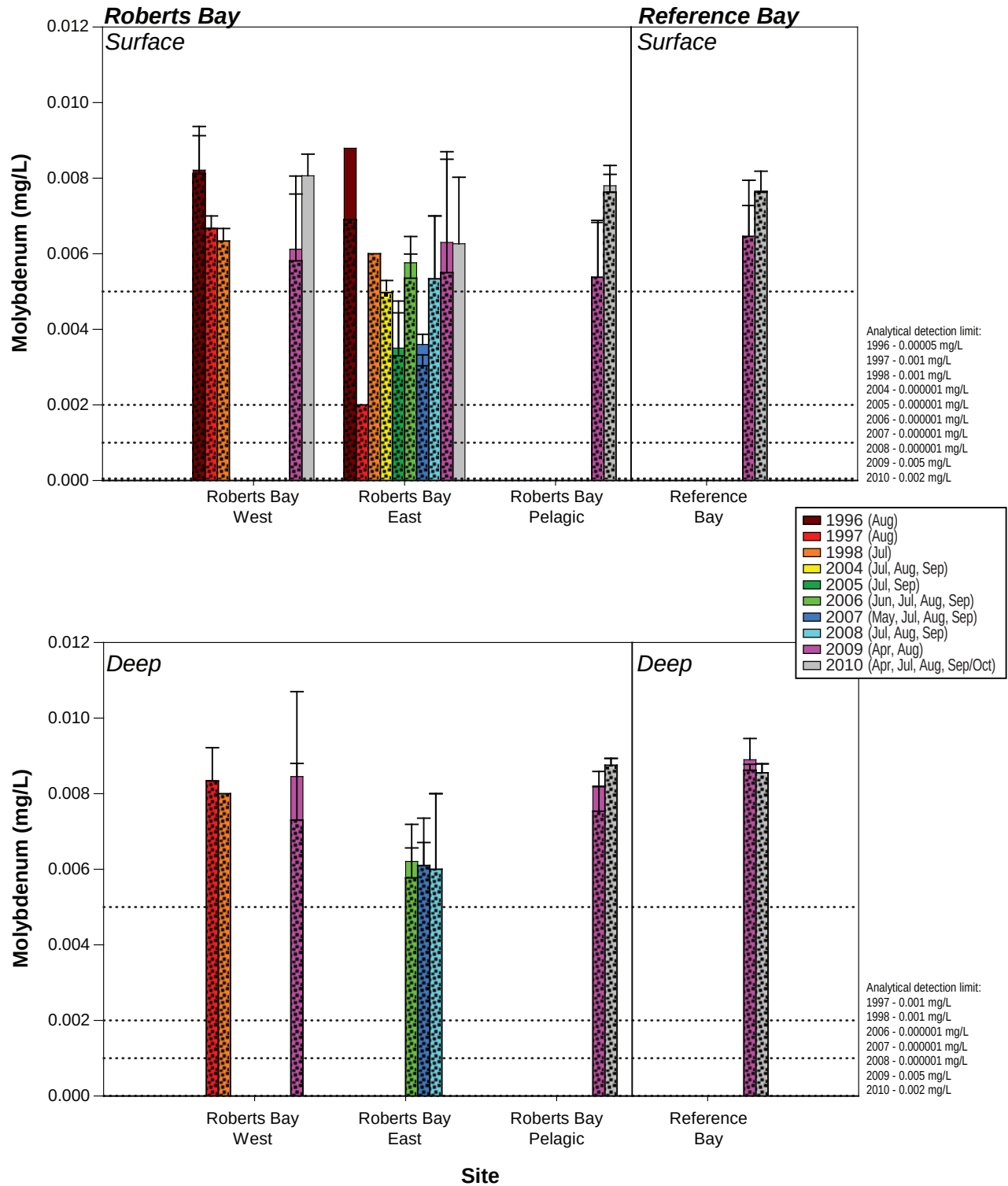


Figure 3.5-29



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
Dotted lines represent analytical detection limits.
Values below the analytical detection limit are plotted at half the detection limit.
Solid bars represent total molybdenum and superimposed dotted bars represent dissolved molybdenum.

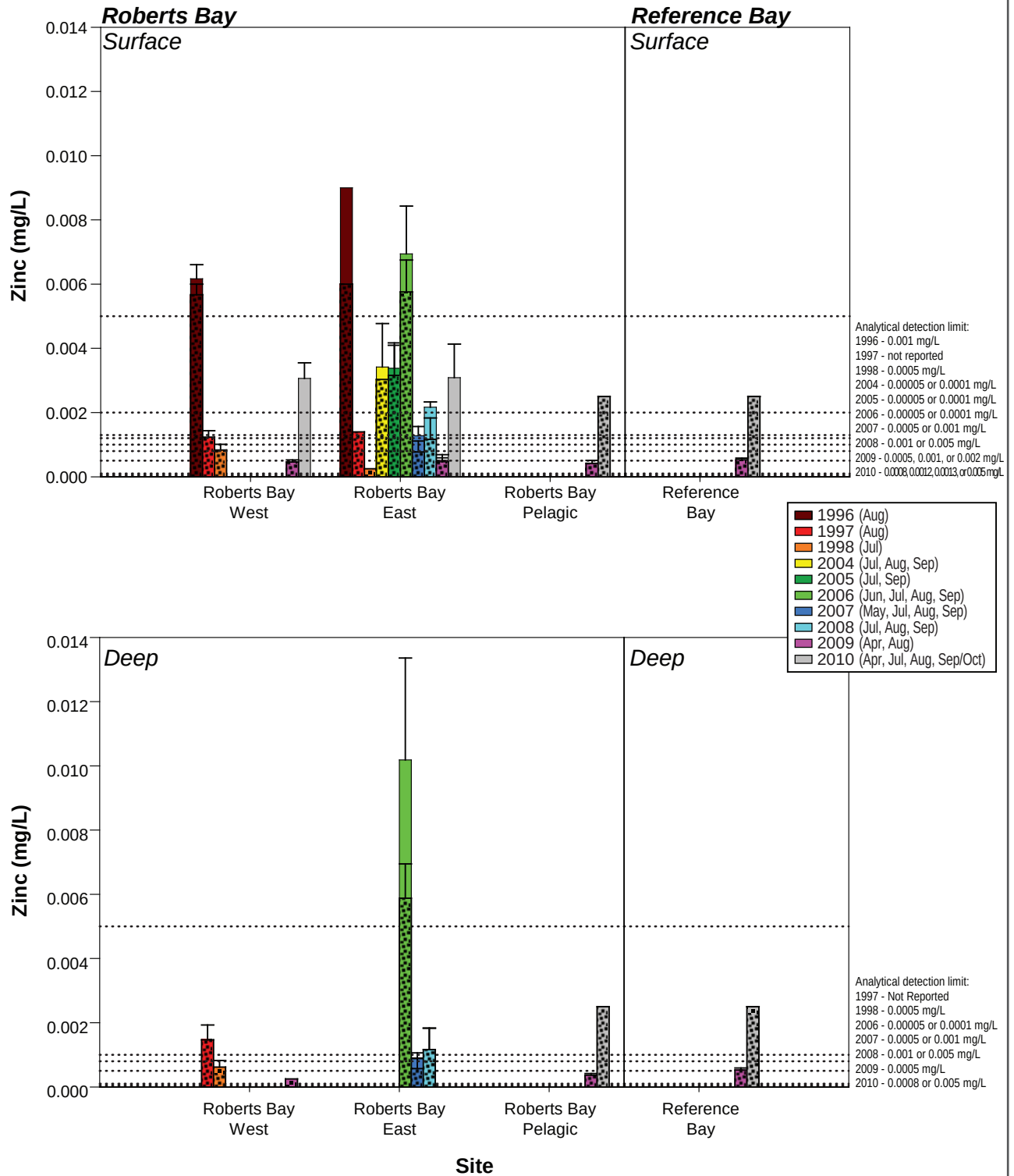


Figure 3.5-31

The differences among annual data sets in terms of when (sampling dates) and where (sampling depth/location) samples were collected can have a significant effect on annual averages of parameters. Comparisons between years are further complicated by differences in sampling methodology and analytical detection limits. Figure 2.3-1 shows the historical water quality sampling locations, and Table 2.3-1 presents the methodological details of historical water quality sampling.

Historically, annual averages of water quality parameters have generally remained below CCME guidelines in Roberts Bay and Reference Bay, with the following exceptions: total arsenic in Roberts Bay from 2004 to 2006, total and dissolved cadmium in Roberts Bay in 1996, and total mercury in Roberts Bay in 2009. Total chromium concentrations in Roberts Bay exceeded the CCME guideline for hexavalent chromium (0.0015 mg/L) in 1996, 2004, 2005, 2006, and 2007; however, total chromium concentrations are not directly comparable to CCME guidelines because the speciation of chromium in Roberts Bay was not determined. The analytical detection limits for total and dissolved chromium in most 2007 and all 2009 samples were higher than the CCME guideline for hexavalent chromium, so values that were below detection limits could not be compared to this guideline. All historical total and dissolved chromium concentrations in Roberts and Reference Bay were below the CCME guideline for trivalent chromium (0.056 mg/L).

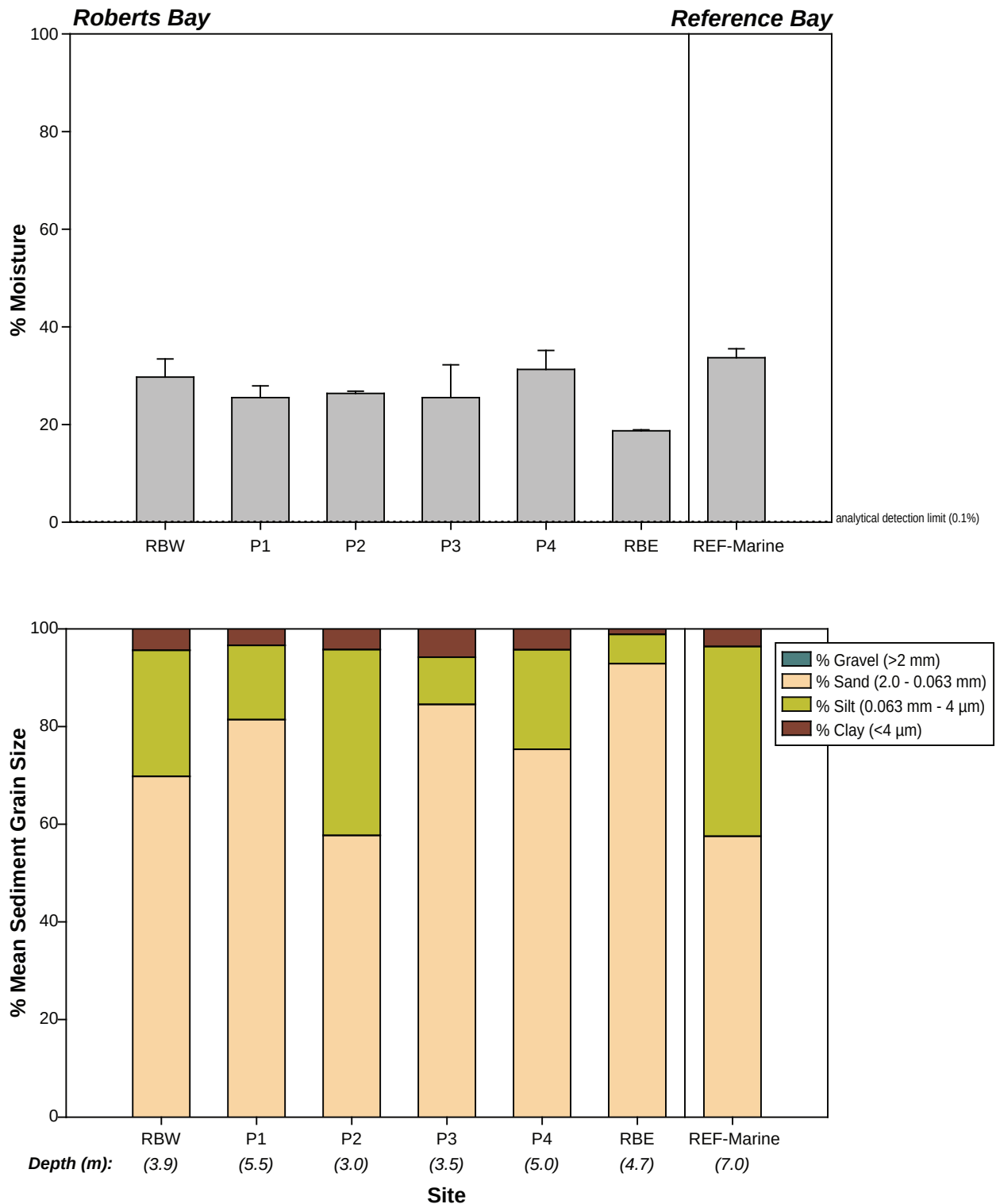
In the surface waters of both Roberts Bay and Reference Bay, historical nitrate, total phosphorus, and silicate concentrations tended to be lower in summer than in winter (Figures 3.5-18, 3.5-20, and 3.5-21). This summer decrease in nitrate, phosphorus, and silicate is attributable to algal uptake of these essential macronutrients.

3.6 SEDIMENT QUALITY

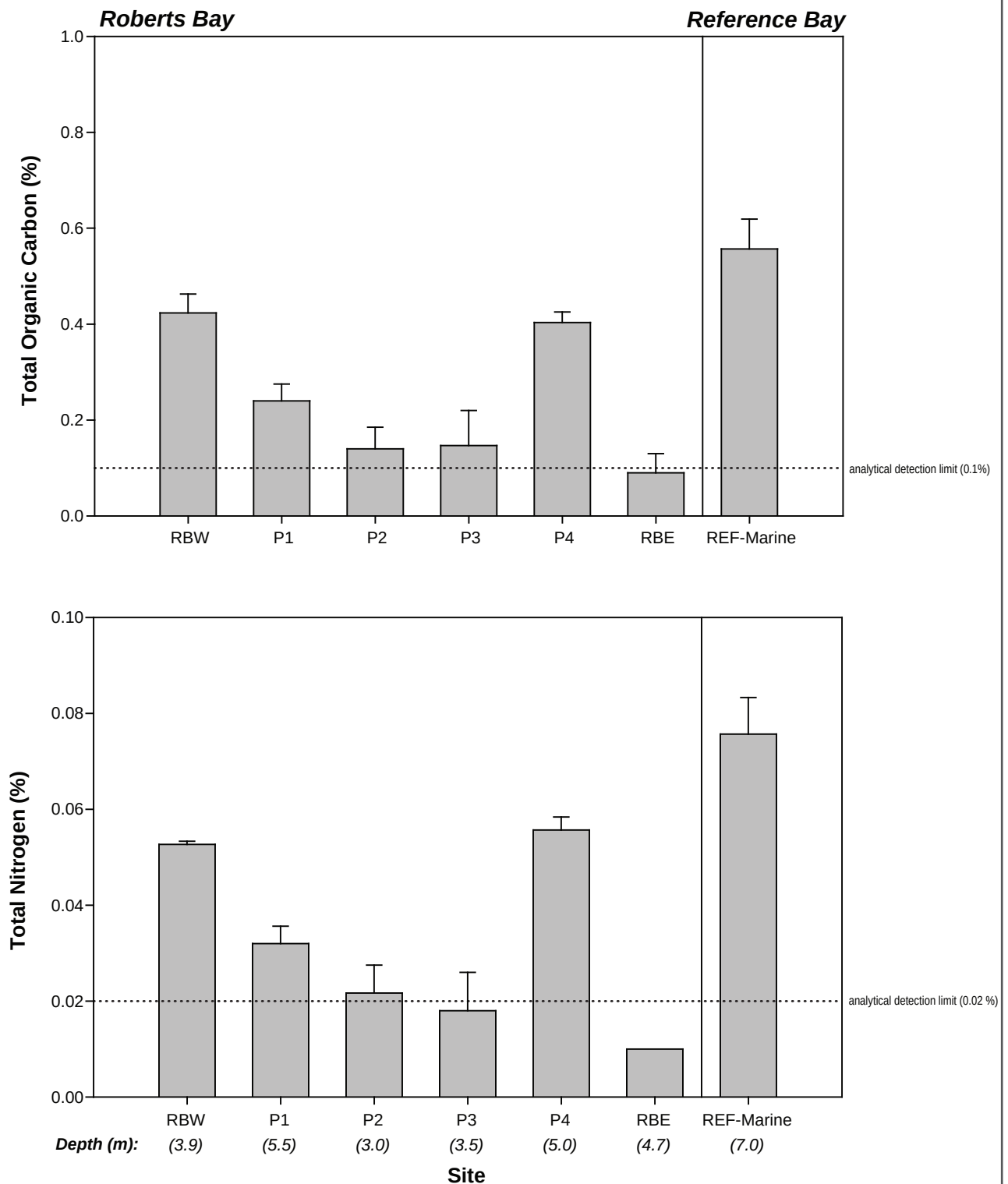
Sediment quality samples were collected from six sites at Roberts Bay and one site at Reference Bay in mid-August 2010. Sediments were analyzed for grain size and various physico-chemical parameters. The 2010 sediment quality program focused on characterizing the natural variation in marine sediments and characterizing sediments in potential infrastructure footprint areas. Complete results of sediment quality analyses are provided in Appendix 3.6-1, and select parameters are shown graphically in Figures 3.6-1 to 3.6-9.

Roberts Bay and Reference Bay sediments were composed of sand-silt-clay mixtures, with no gravel (Figure 3.6-1). Roberts Bay sediments were composed mostly of sand (70% to 90%), with some silt, and small amounts of clay. A single replicate collected at site P2 was the exception to this, as it was 98.8% silt. The other two replicates collected at this site had similar particle size compositions as the other Roberts Bay sites. Reference Bay sediments were composed on average of 57% sand, 39% silt, and 4% clay, and were generally less sandy and more silty than Roberts Bay sediments.

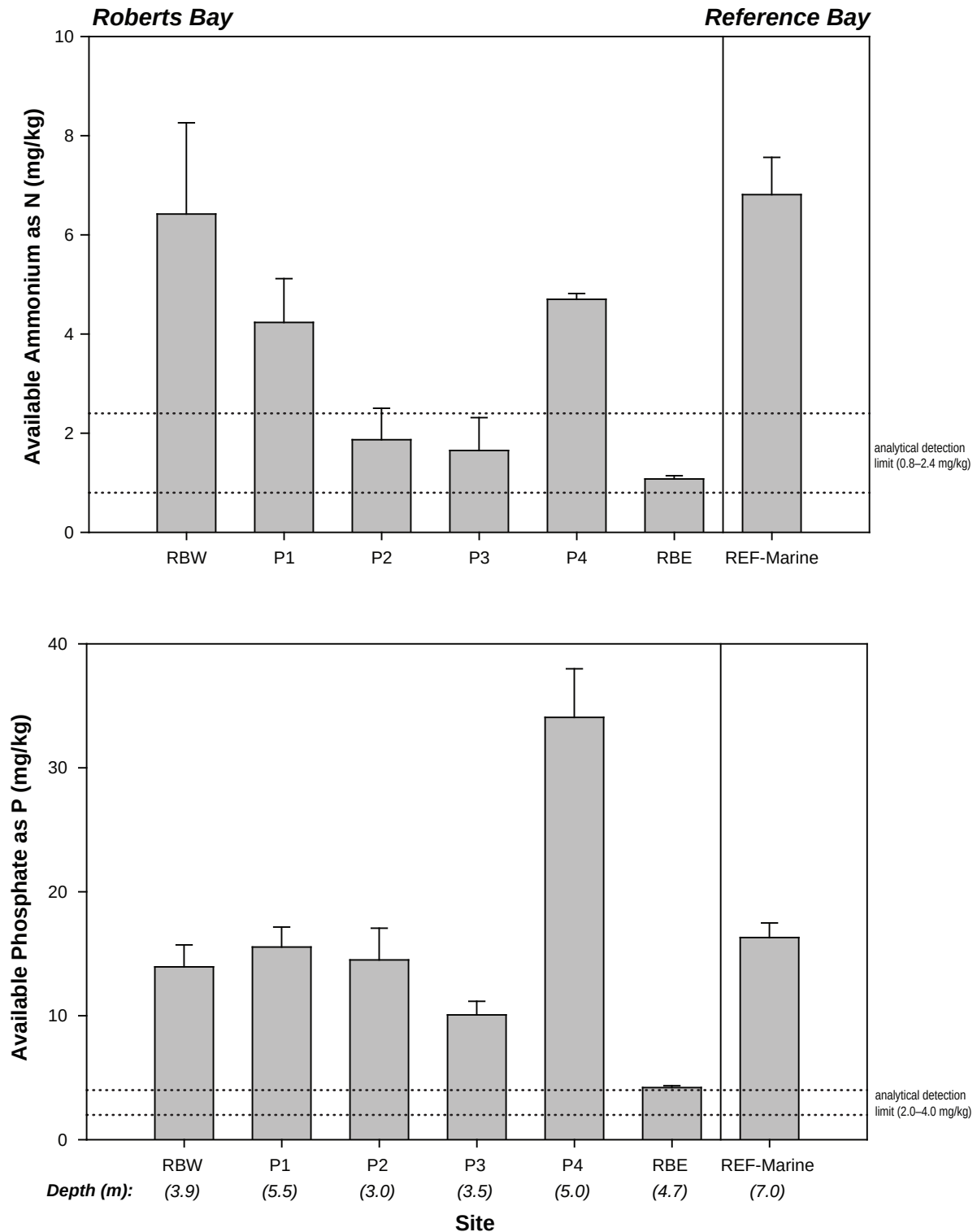
Concentrations of several parameters co-varied with the fine particle composition of the sediment. In general, sites with higher proportions of silt and clays (e.g., REF-AEMP, RBW and P4) contained the highest concentrations of total organic carbon (TOC) (Figure 3.6-2), total nitrogen (Figure 3.6-2), available ammonium (Figure 3.6-3), and molybdenum (Figure 3.6-8). Conversely, the sand-dominated RBE site with the lowest proportions of silt and clay contained the lowest concentrations of these parameters, and also had the lowest levels of available phosphate, aluminum, arsenic, chromium, copper, iron, manganese, molybdenum, nickel, and zinc.



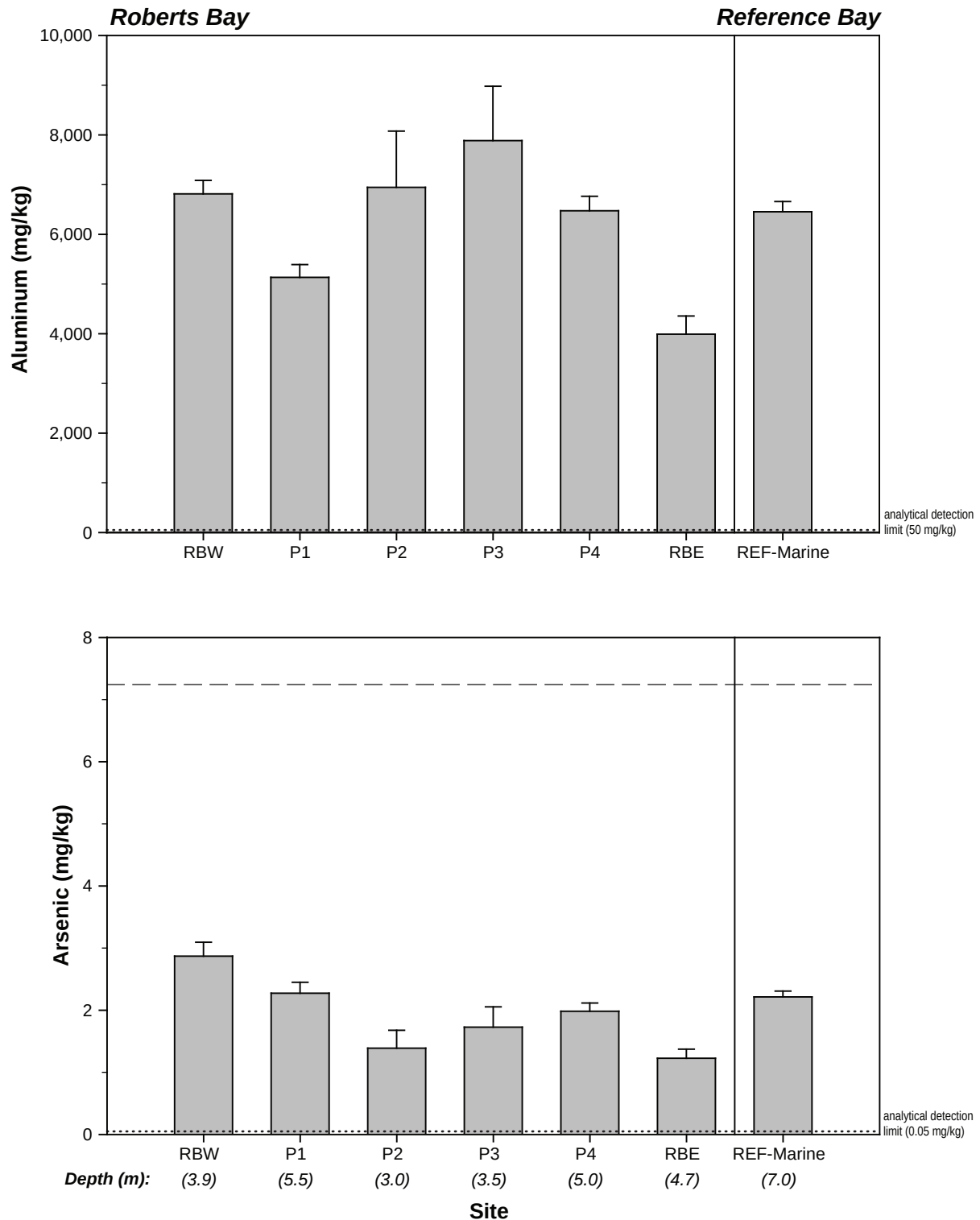
Notes: Values represent the mean of triplicate samples; error bars represent standard error of the mean.
Numbers in parentheses indicate sampling depths in metres.



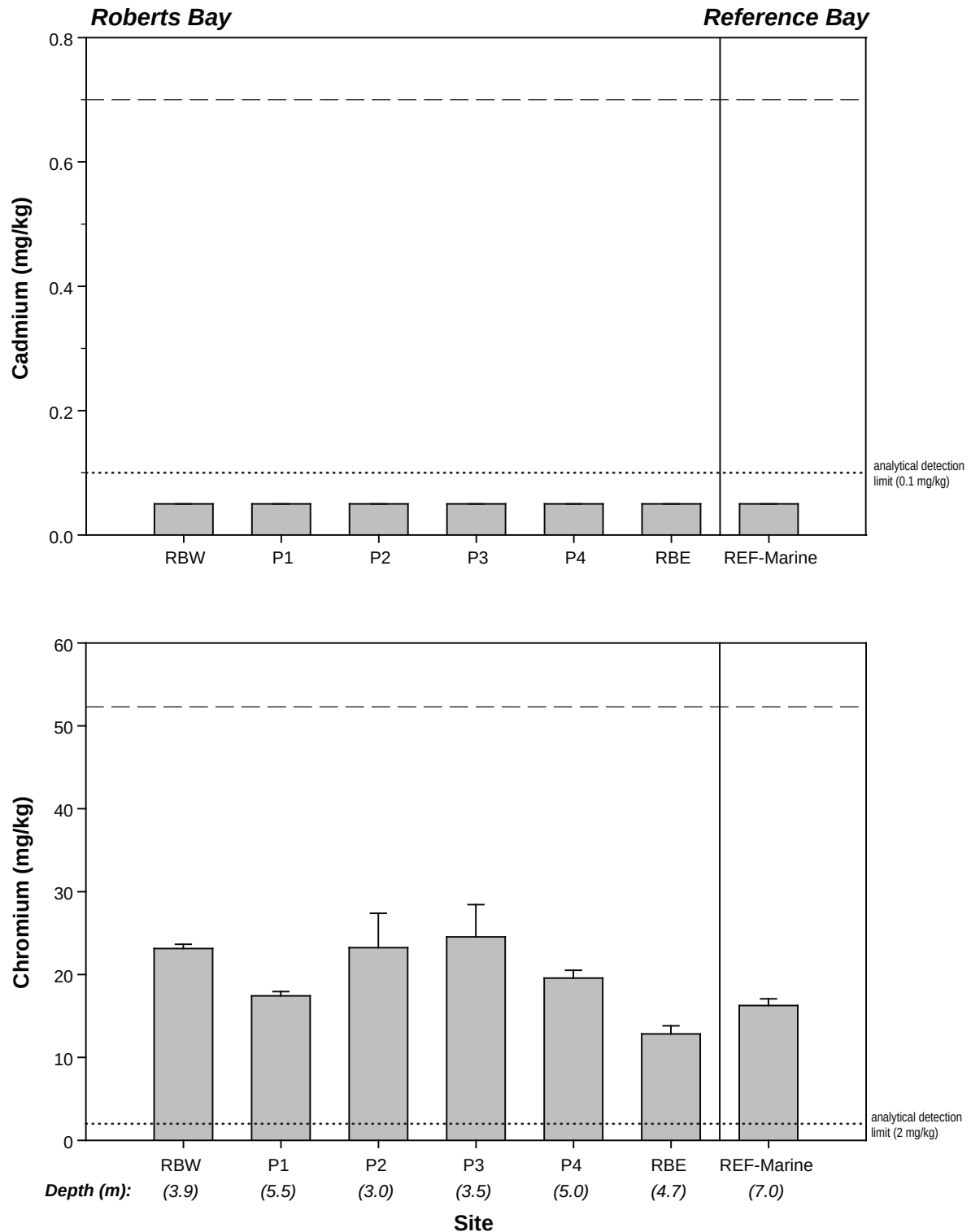
Notes: Error bars represent standard error of the mean of triplicate samples.
 Numbers in parentheses indicate sampling depths in metres.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.



Notes: Error bars represent standard error of the mean of triplicate samples.
 Numbers in parentheses indicate sampling depths in metres.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.



Notes: Error bars represent standard error of the mean of triplicates samples.
 Numbers in parentheses indicate sampling depths in metres.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.
 Dashed line represents the CCME interim marine sediment quality guideline (ISQG) for arsenic (7.24 mg/kg).
 CCME probable effects level (PEL) for arsenic (41.6 mg/kg) not shown.



Notes: Error bars represent standard error of the mean of triplicate samples.

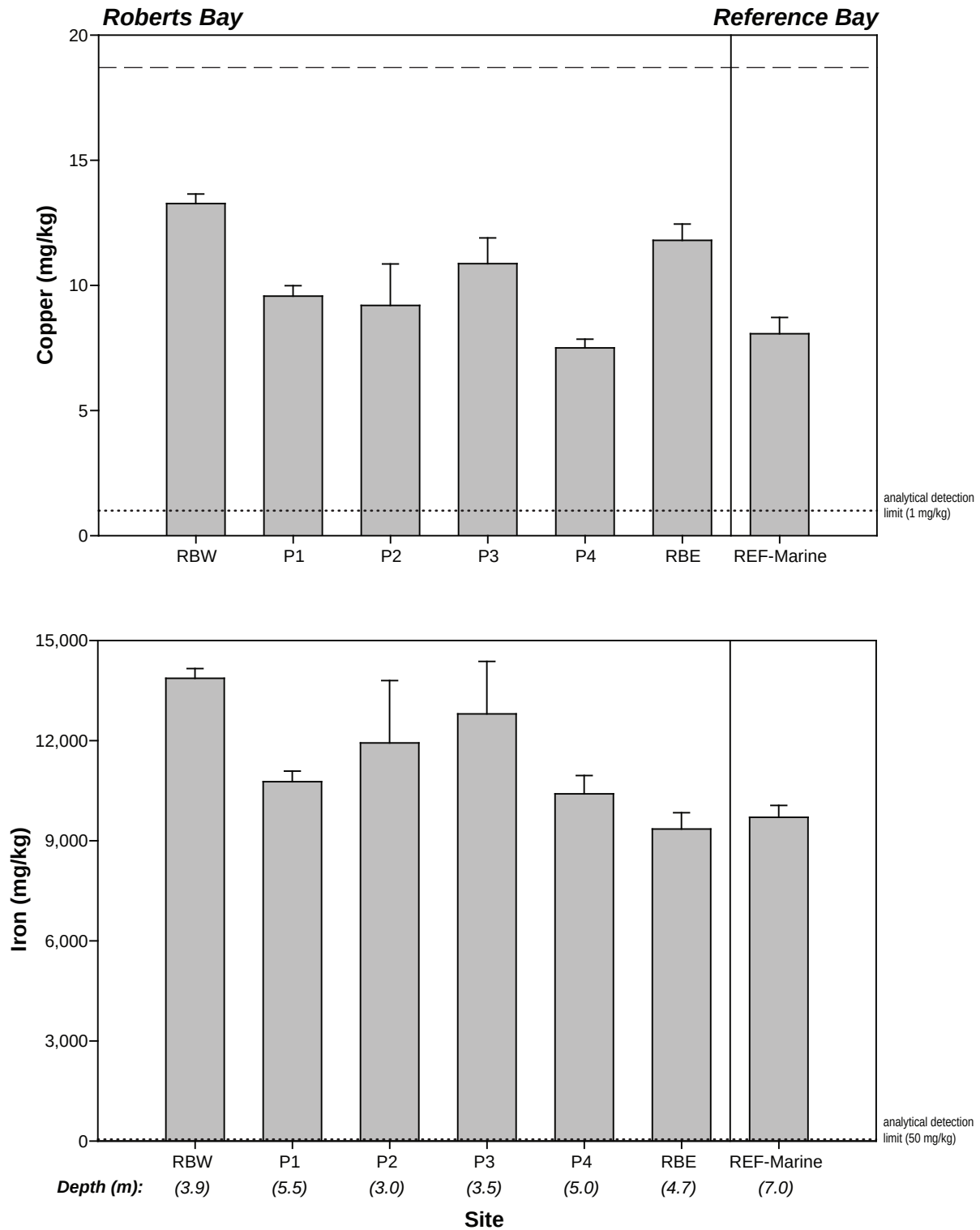
Numbers in parentheses indicate sampling depths in metres.

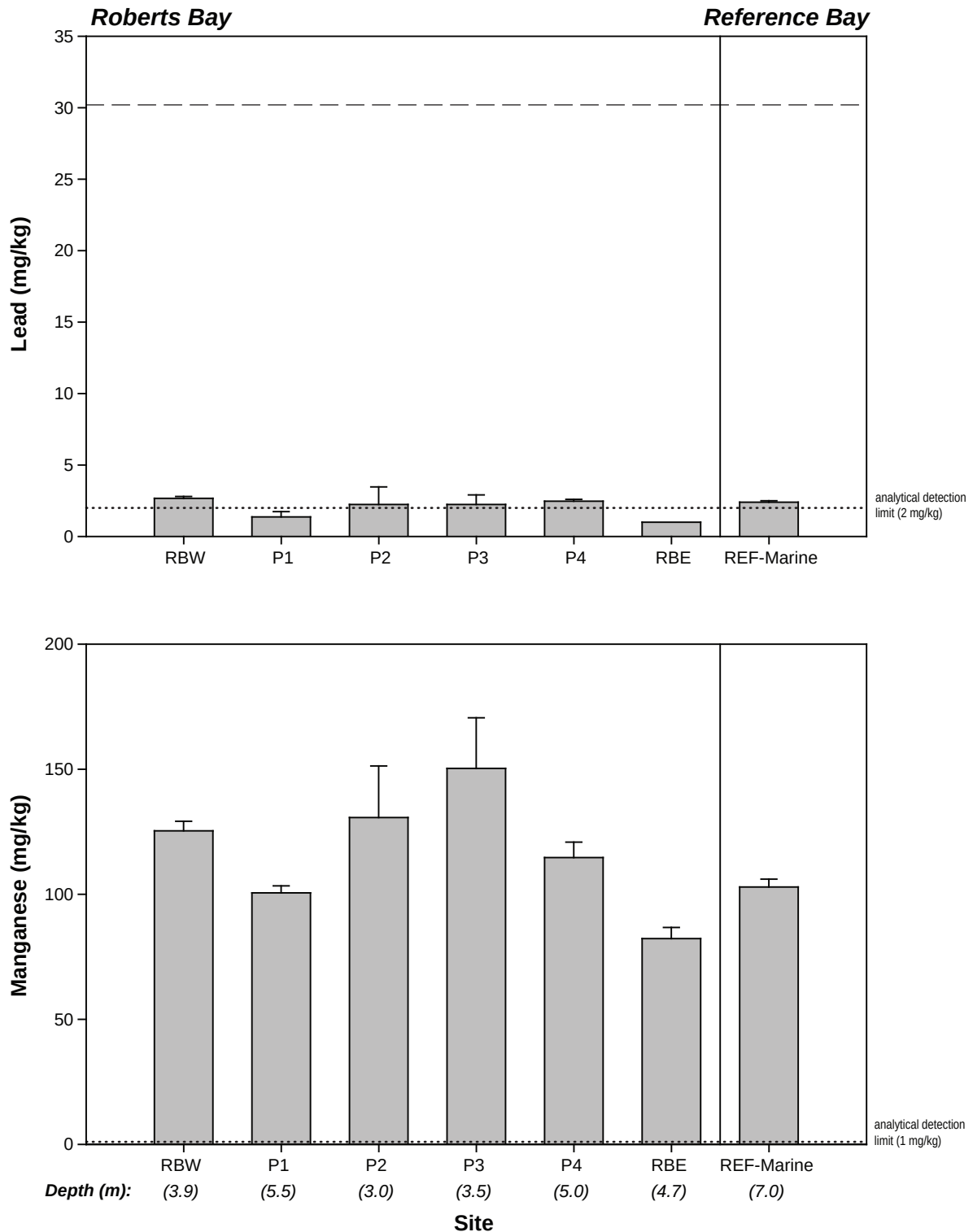
Dotted lines represent analytical detection limits.

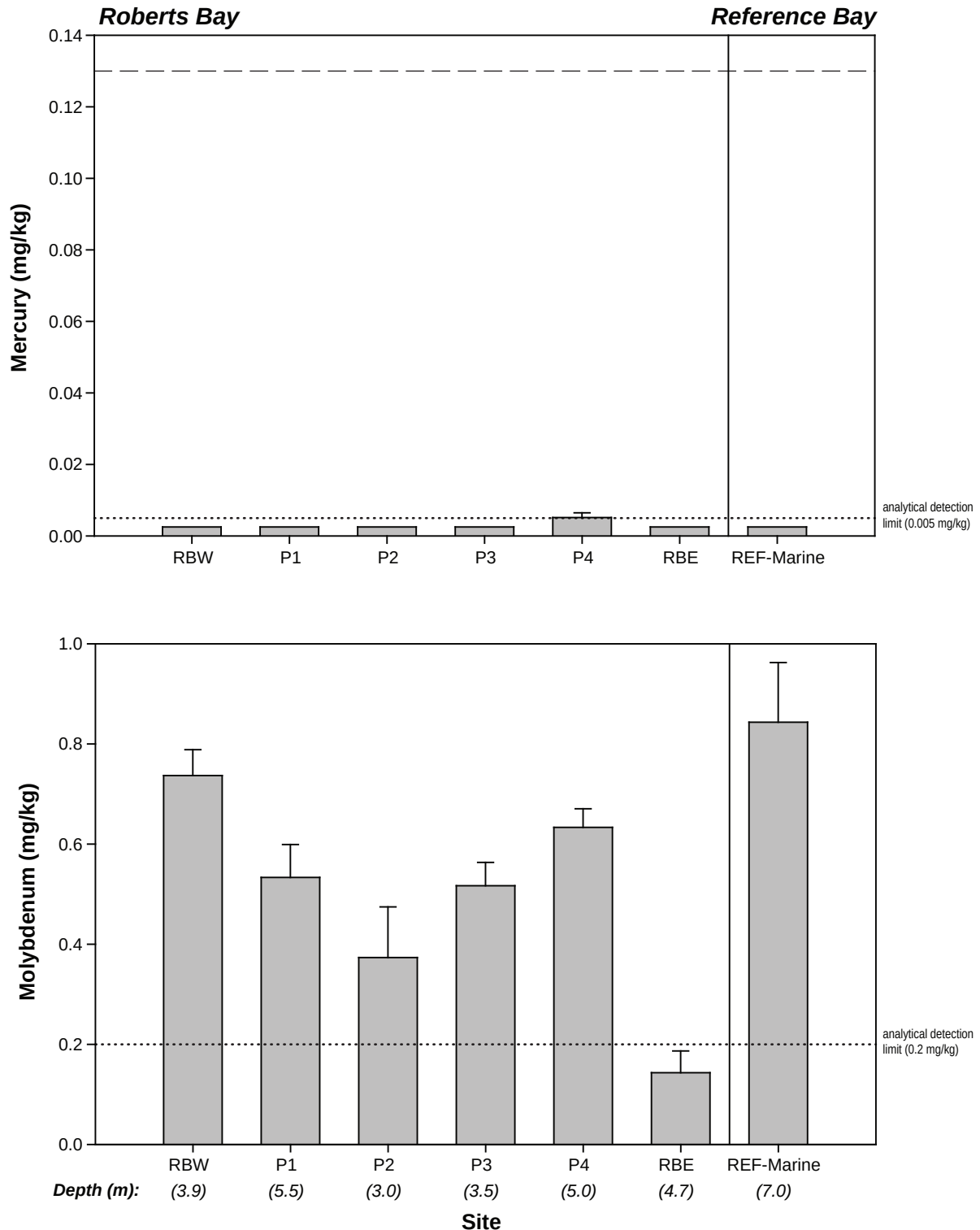
Values below the analytical detection limit are plotted at half the detection limit.

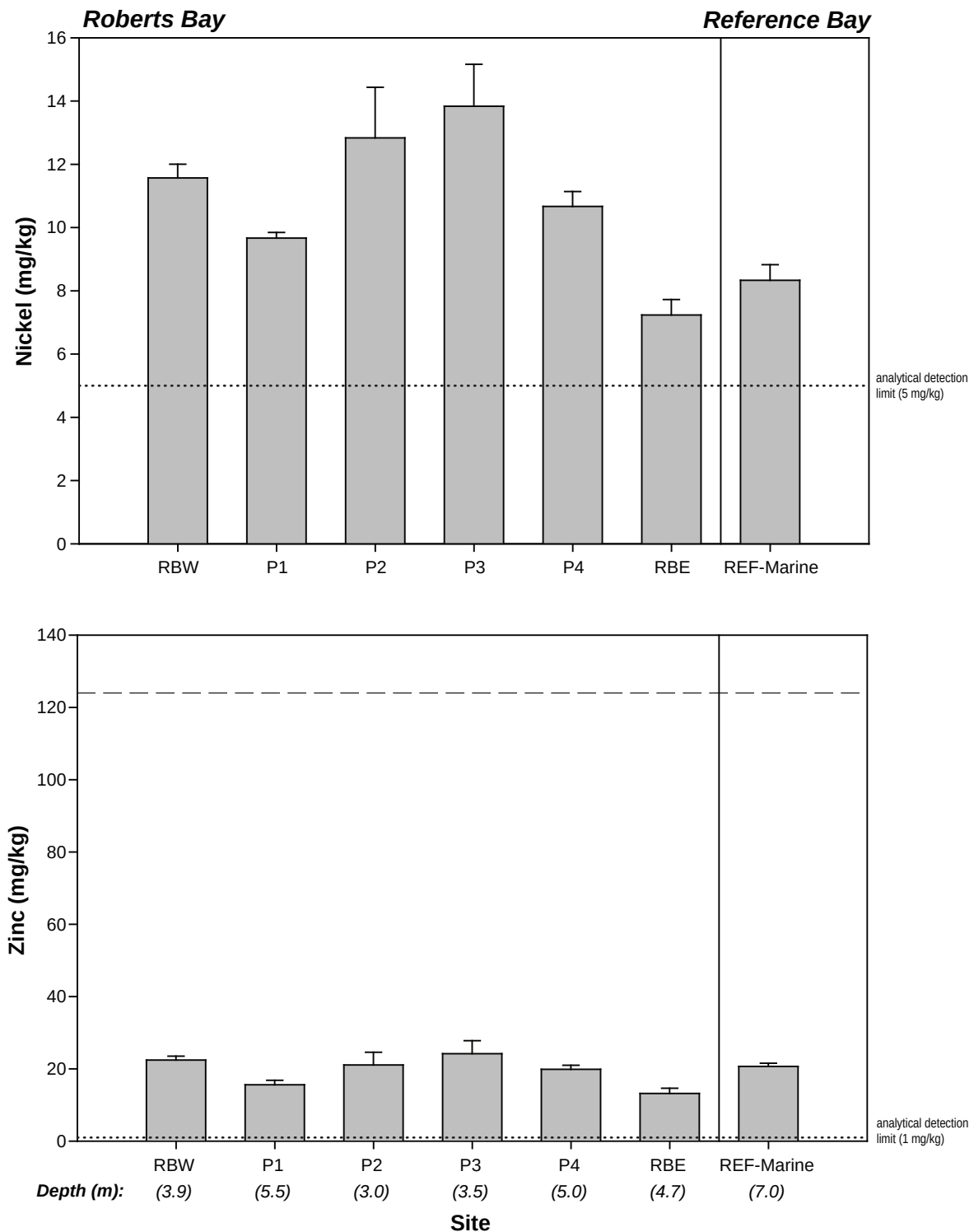
Dashed lines represent the CCME interim marine sediment quality guidelines (ISQGs) for cadmium (0.7 mg/kg) and chromium (52.3 mg/kg).

CCME probable effects levels (PELs) for cadmium (4.2 mg/kg) and chromium (160 mg/kg) not shown.









Notes: Error bars represent standard error of the mean of triplicate samples.
 Numbers in parentheses indicate sampling depths in metres.
 Dotted lines represent analytical detection limits.
 Dashed line represents the CCME interim marine sediment quality guideline (ISQG) for zinc (124 mg/kg).
 CCME probable effects level (PEL) for zinc (271 mg/kg) not shown.

Project area sediments were analyzed for various polycyclic aromatic and extractable hydrocarbons. Concentrations of polycyclic aromatic hydrocarbons (PAHs) were below analytical detection limits in all sediment samples collected from Roberts and Reference bays (Appendix 3.6-1). At sites P1, P2, and P4, concentrations of EPH19-32 (extractable petroleum hydrocarbons with a carbon range between 19 and 32) and HEPH (heavy extractable petroleum hydrocarbons) were occasionally above the detection limit of 40 mg/kg. Concentrations of EPH19-32 and HEPH were nearly identical, and detectable concentrations ranged between 44 and 92 mg/kg.

3.6.1 Comparisons with CCME Sediment Quality Guidelines

All sediment samples collected were compared to CCME guidelines for the protection of marine aquatic life. These included the interim marine sediment quality guidelines (ISQGs) and the probable effects levels (PELs; CCME 2002). The more conservative ISQGs are levels below which adverse biological effects are rarely observed. The higher PELs correspond to concentrations above which negative effects frequently occur. Sediment metal and polycyclic aromatic hydrocarbon concentrations did not exceed a single CCME guideline.

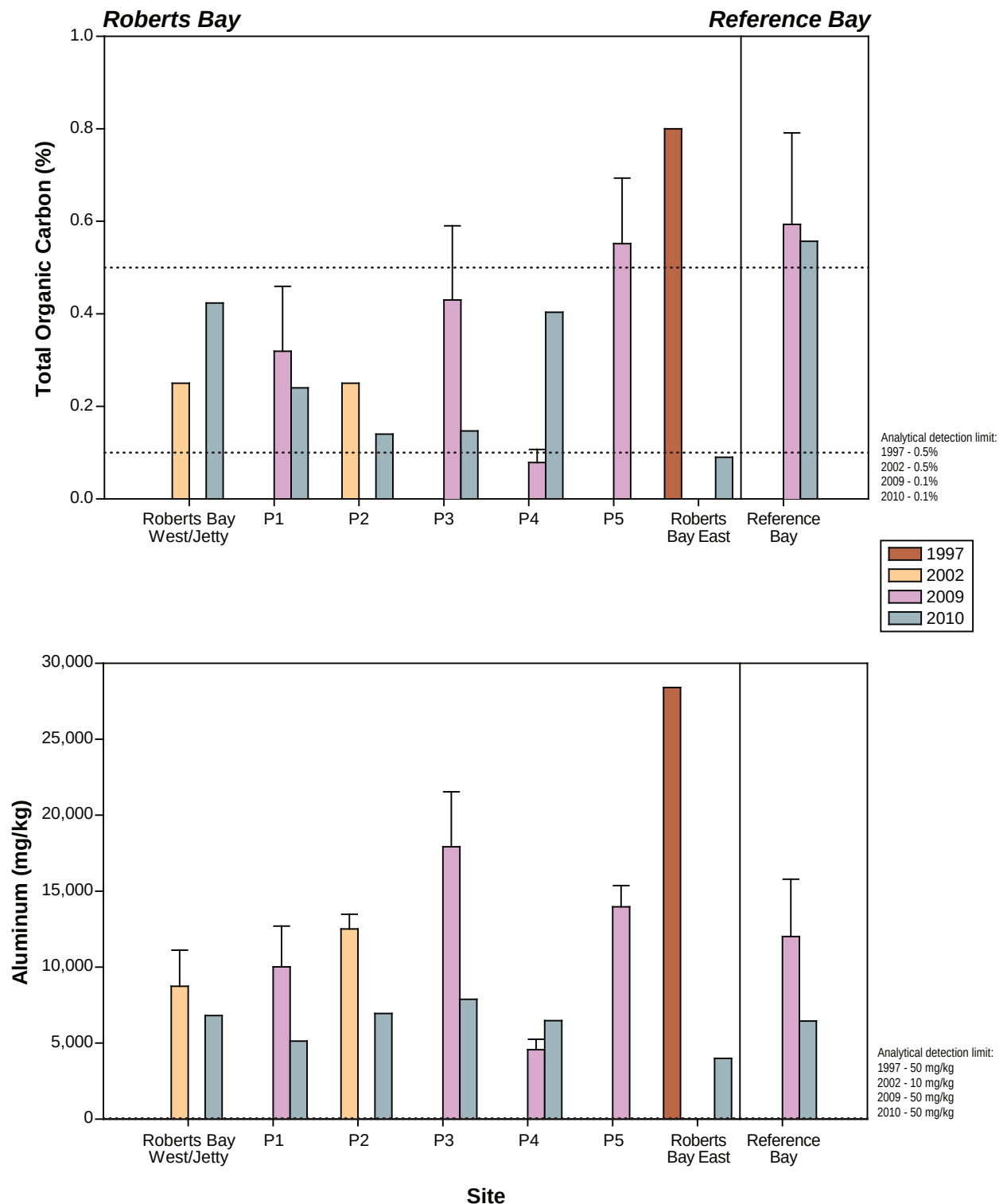
3.6.2 Historical Trends in Sediment Quality

Marine sediment quality data for Roberts Bay and/or Reference Bay were collected in: 1997, 2002, 2009, and 2010. All historical sediment quality samples were collected between mid-August and early September. Historical sediment quality trends are shown in Figures 3.6-10 to 3.6-15. For graphing purposes, historical data were grouped according to sampling site location. Several historical sites were near or within the footprints of the five port options shown in Figure 2.1-1 (P1 to P5). Site “Roberts Bay West/Jetty” includes data from historical sites: RB3, RB4 (2002); and RBW (2010). Site “P1” includes data from: ST2, ST7, ST8 (2009); and P1 (2010). Site “P2” includes data from: RB1, RB2 (2002); and P2 (2010). Site “P3” includes data from: ST9, ST10 (2009); and P3 (2010). Site “P4” includes data from: RTF1, DW3 (2009); and P4 (2010). Site “P5” includes data from: DW1 and DW2 (2009). Site “Roberts Bay East” includes data from: Stn 5 (1997) and RBE (2010). Site “Reference Bay” includes data from: RP1, RP2, RP3 (2009); and REF-Marine (2010). Historical sampling sites that did not correspond to sites sampled in 2010 were not included in the historical sediment quality plots.

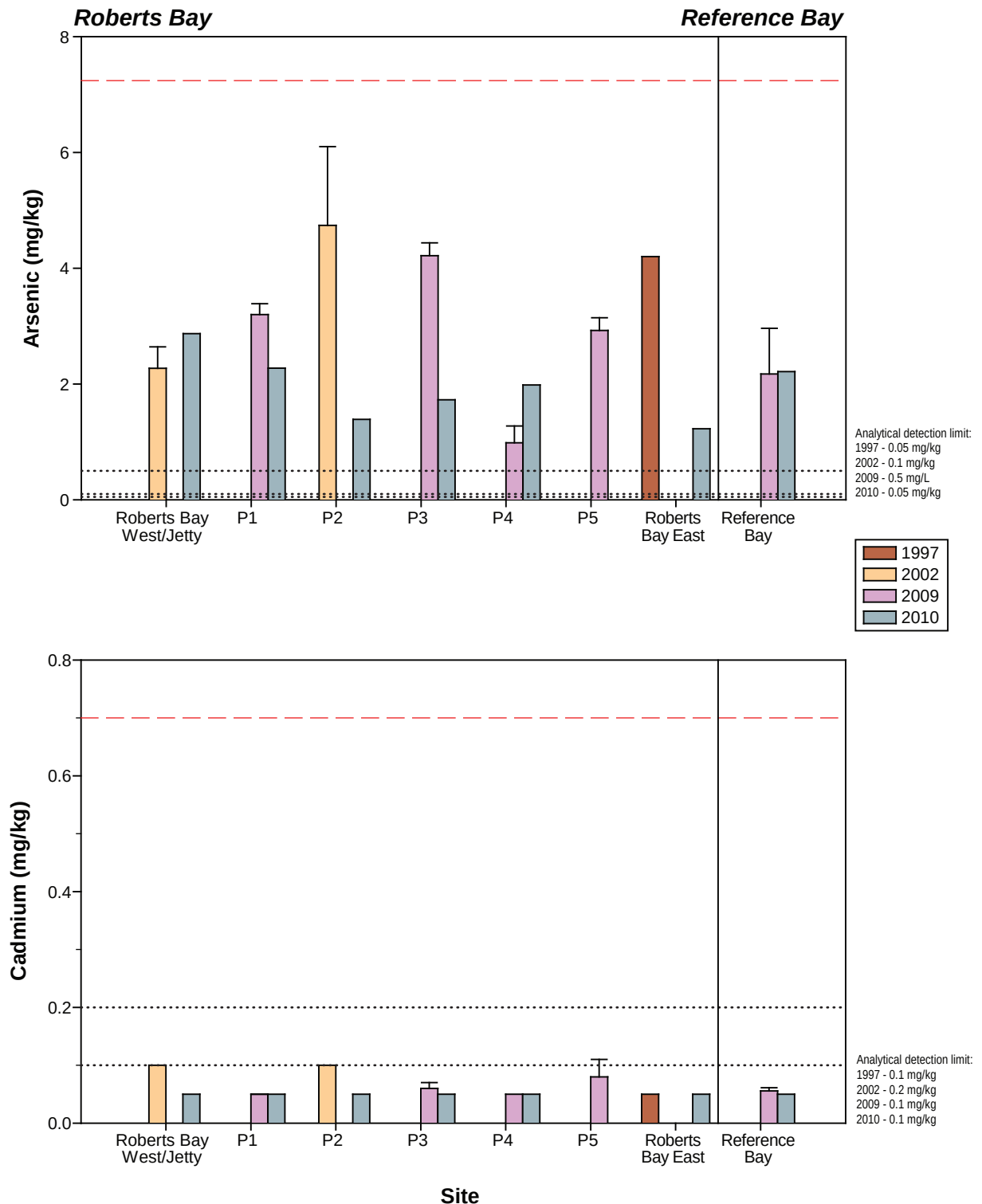
The differences among annual data sets in terms of specific sampling locations and sampling depths can have a significant effect on averages of parameters. Comparisons between years are further complicated by differences in analytical methodology and detection limits. Figure 2.3-2 shows the historical sediment quality sampling locations, and Table 2.3-2 presents the methodological details of historical sediment quality sampling.

Overall there were few apparent trends in sediment quality, as most parameters were highly variable both spatially and temporally. Concentrations of copper and chromium were higher than CCME ISQGs in some samples collected from Roberts Bay in 1997 and 2009 (Figure 3.6-12). However, chromium and copper concentrations were below guideline concentrations in samples collected from comparable sites in 2010. Historical sediment quality parameters were always well below CCME PELs.

Various hydrocarbons were measured and analysed in the 2002, 2009, and 2010 sediment quality sampling programs. All hydrocarbon concentrations were below detection limits in 2002 and 2009. In 2010, concentrations were above detection limits for two categories of hydrocarbons (see Section 3.6).



Notes: Error bars represent standard error of the mean of multiple sampling sites.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.



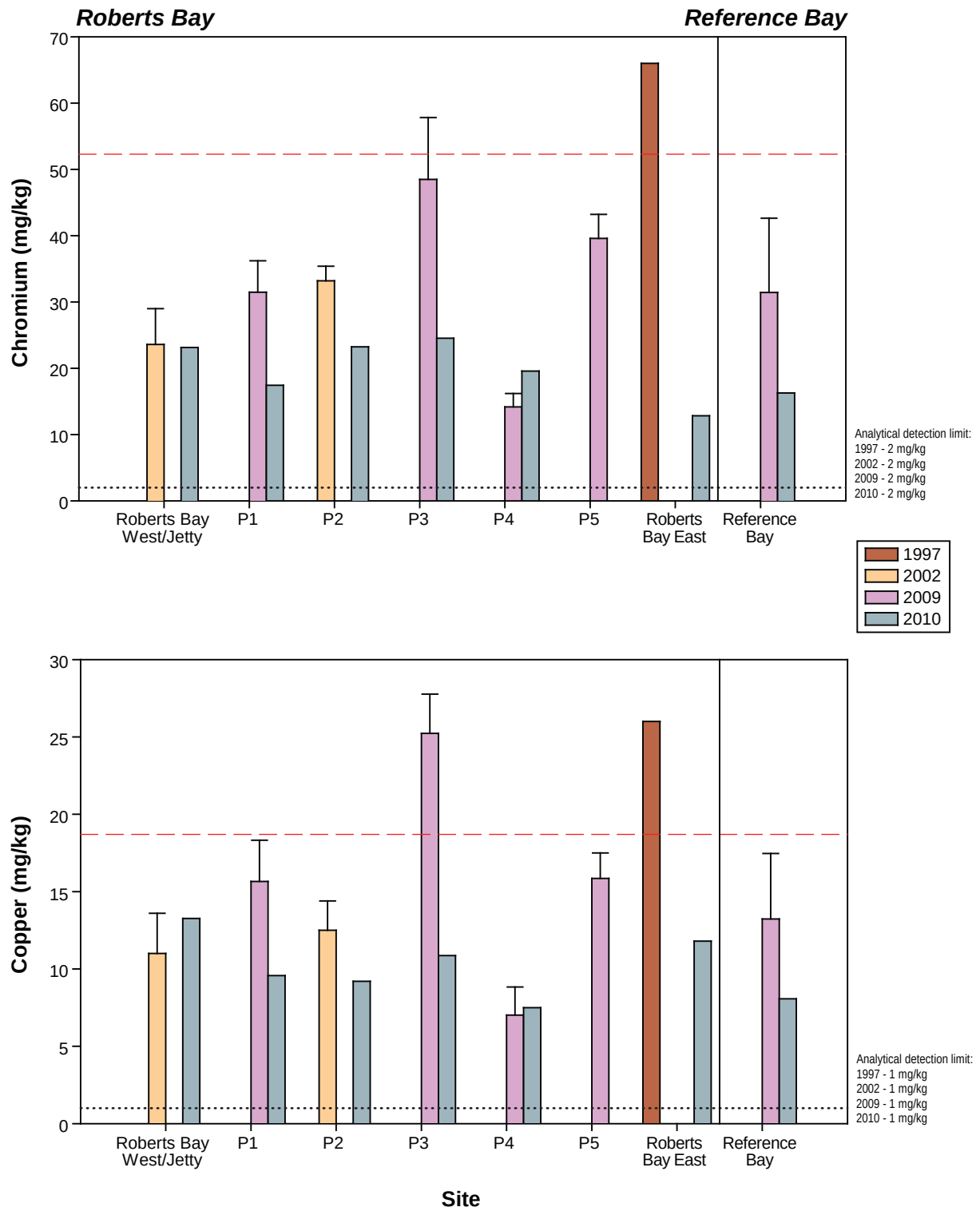
Notes: Error bars represent standard error of the mean of multiple sampling sites.

Dotted lines represent analytical detection limits.

Values below the analytical detection limit are plotted at half the detection limit.

Red dashed lines represent the CCME interim marine sediment quality guidelines (ISQGs) for arsenic (7.24 mg/kg) and cadmium (0.7 mg/kg).

CCME probable effects levels (PELs) for arsenic (41.6 mg/kg) and cadmium (4.2 mg/kg) not shown.



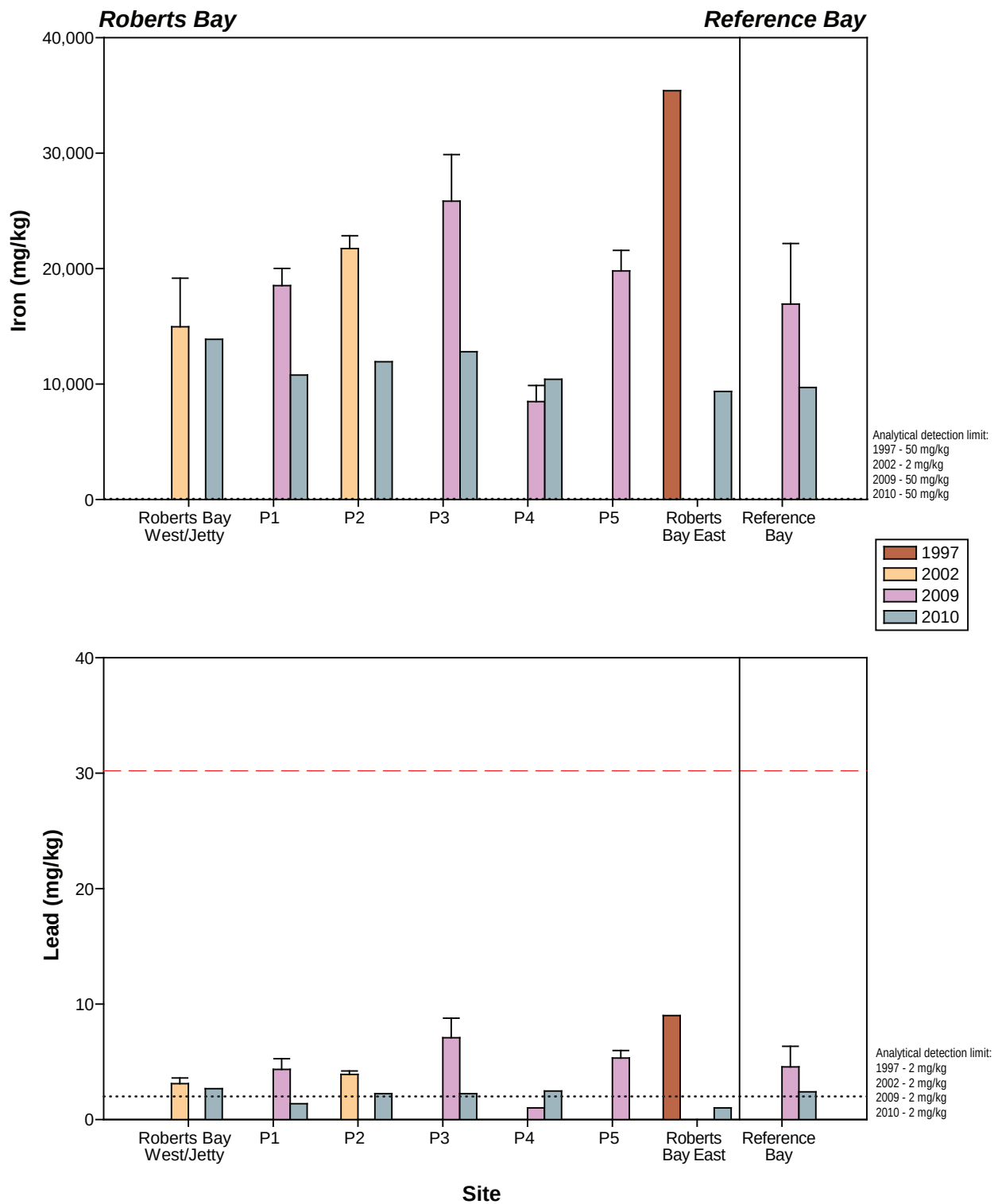
Notes: Error bars represent standard error of the mean of multiple sampling sites.

Dotted lines represent analytical detection limits.

Values below the analytical detection limit are plotted at half the detection limit.

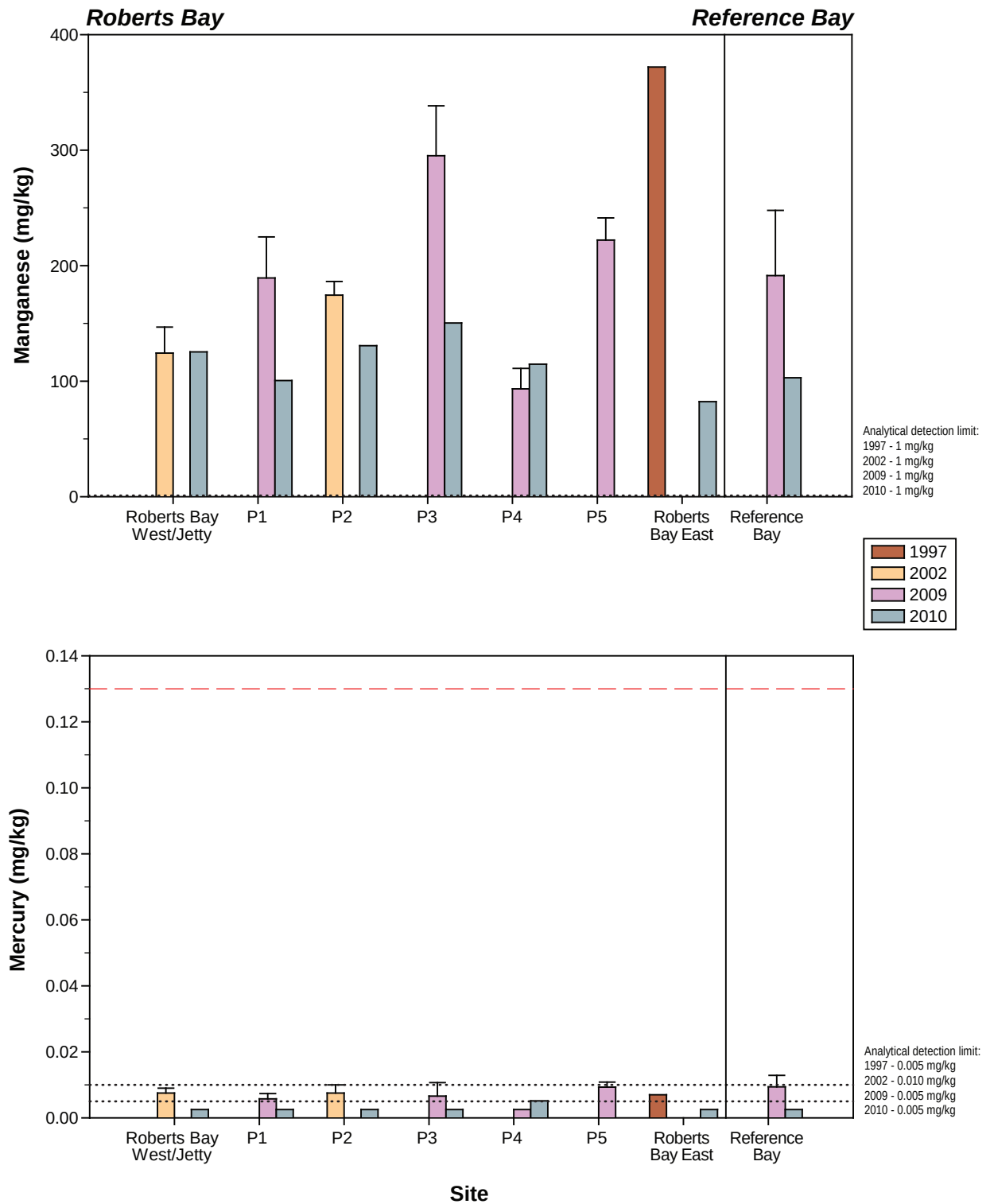
Red dashed lines represent the CCME interim marine sediment quality guidelines (ISQGs) for chromium (52.3 mg/kg) and copper (18.7 mg/kg).

CCME probable effects levels (PELs) for chromium (160 mg/kg) and copper (108 mg/kg) not shown.

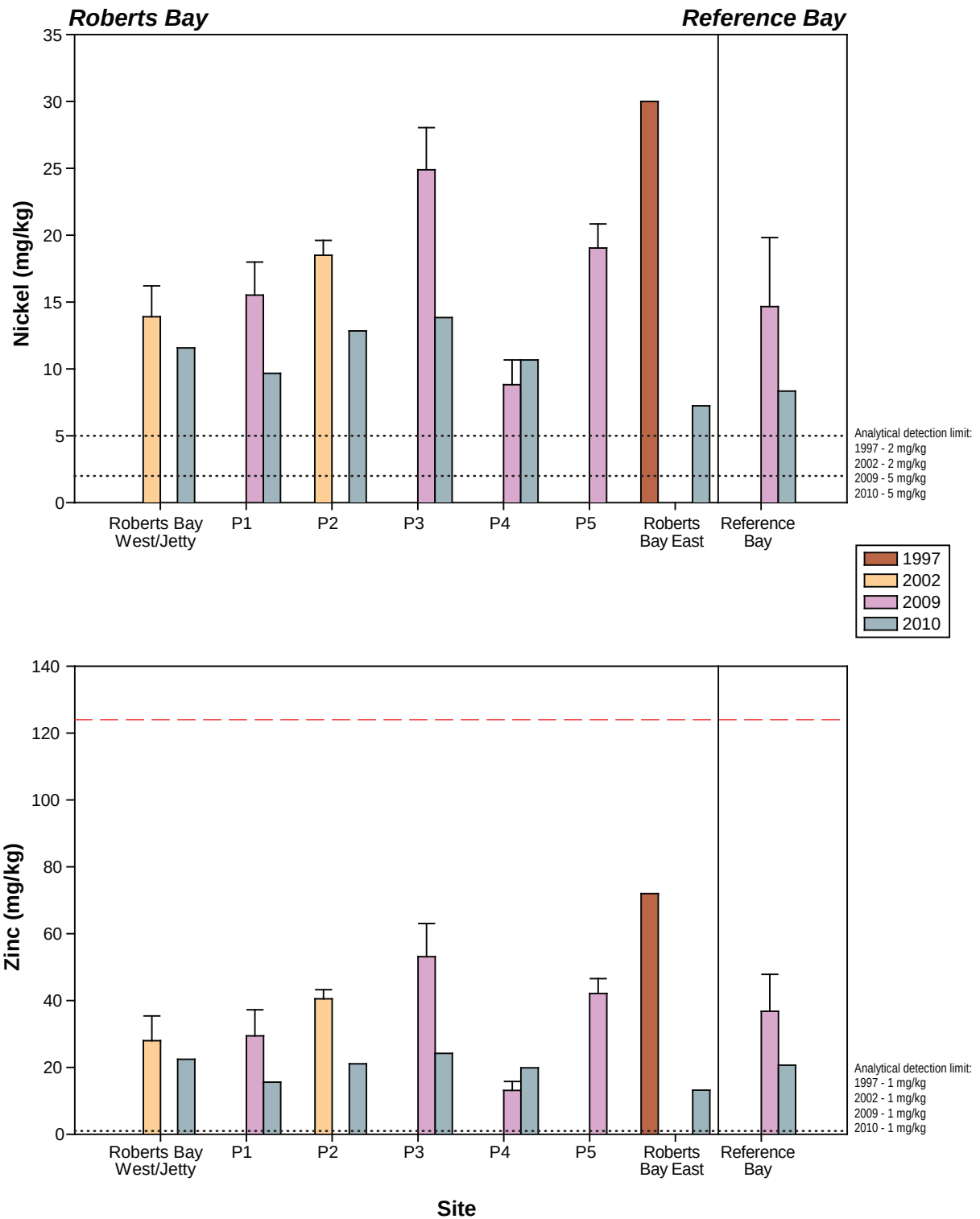


Notes: Error bars represent standard error of the mean of multiple sampling sites.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.
 Red dashed line represent the CCME interim marine sediment quality guideline (ISQG) for lead (30.2 mg/kg).
 CCME probable effects level (PEL) for lead (112 mg/kg) not shown.

Figure 3.6-13



Notes: Error bars represent standard error of the mean of multiple sampling sites.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.
 Red dashed line represent the CCME interim marine sediment quality guideline (ISQG) for mercury (0.13 mg/kg).
 CCME probable effects level (PEL) for mercury (0.70 mg/kg) not shown.



Notes: Error bars represent standard error of the mean of multiple sampling sites.
 Dotted lines represent analytical detection limits.
 Values below the analytical detection limit are plotted at half the detection limit.
 Red dashed line represent the CCME interim marine sediment quality guideline (ISQG) for zinc (124 mg/kg).
 CCME probable effects level (PEL) for zinc (271 mg/kg) not shown.

3.7 PHYTOPLANKTON

Phytoplankton are free-floating autotrophic algae that play an important role in many aquatic systems as primary producers and prey for higher trophic levels. Phytoplankton biomass (as chlorophyll *a*) samples were collected from four sites in Roberts Bay and two sites in Reference Bay. Surface waters (top 1 m) were sampled for chlorophyll *a* in April, July, August, and September at all sites, except for REF-Marine, which was only sampled during July and August. Phytoplankton taxonomy samples were collected at one site in Roberts Bay (ST4) and one site in Reference Bay (REF-4) in both August and September. Chlorophyll *a* results are provided in Appendix 3.7-1 and phytoplankton taxonomic results are provided in Appendices 3.7-2 and 3.7-3.

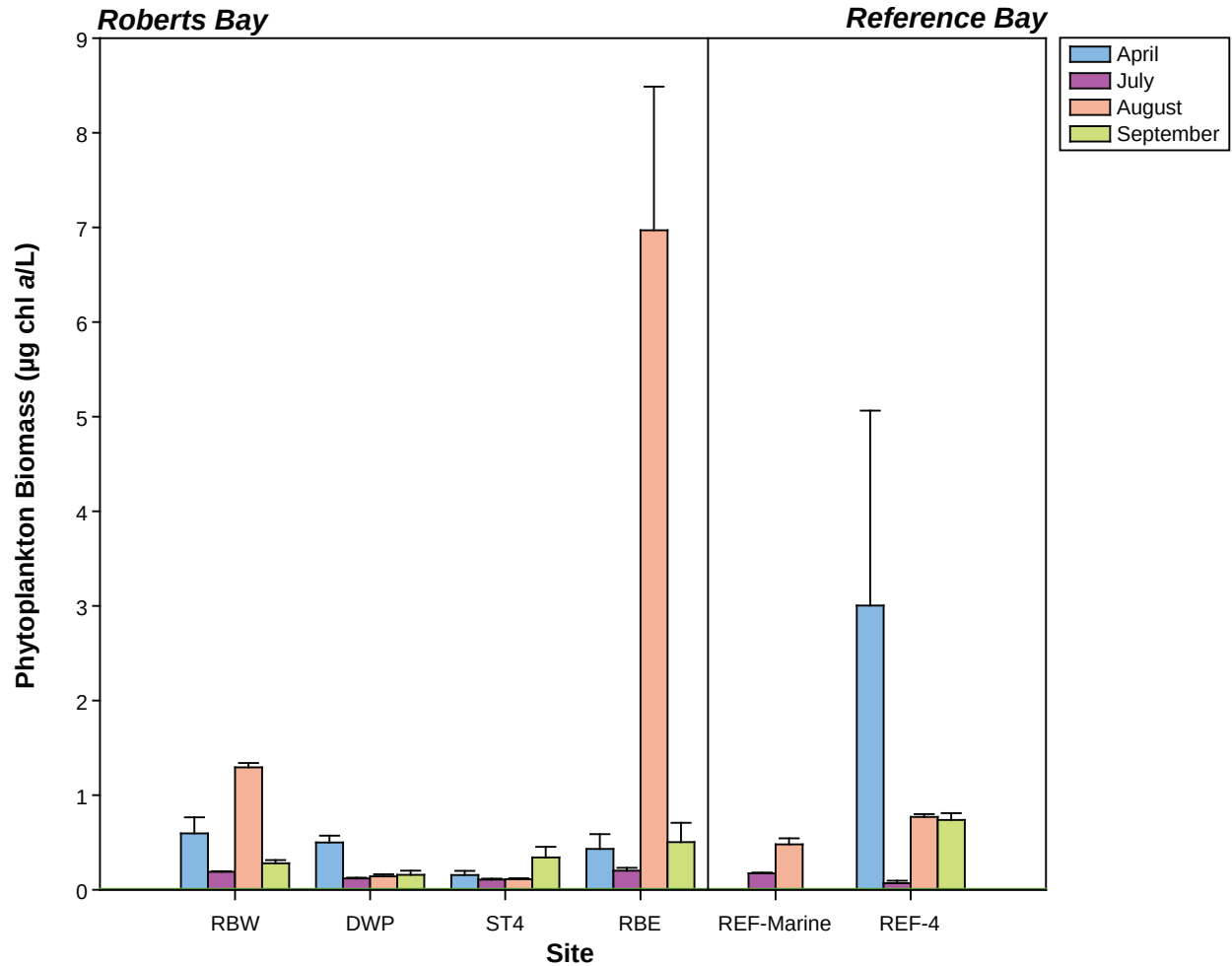
Average phytoplankton biomass (as chlorophyll *a*) was low in the Hope Bay region, and generally ranged from 0.07 µg chl *a*/L to 1.3 µg chl *a*/L (Figure 3.7-1). Phytoplankton biomass at most sites was probably limited by low under-ice light levels in April, and low surface nutrient levels in summer and fall. Exceptions to these low biomass levels were the August phytoplankton biomass at RBE, which was consistently high in all replicates (ranging from 5.3 µg chl *a*/L to 10 µg chl *a*/L), and a single April replicate at REF-4 (7.1 µg chl *a*/L). The high biomass levels at RBE may have been due to the wind-driven suspension of periphyton at this shallow site. Overall, there was no apparent seasonal trend in phytoplankton biomass.

Phytoplankton abundance, biomass (as carbon), taxonomy, richness, and diversity samples were collected from two sites: ST4 in Roberts Bay and REF-4 in Reference Bay during August and September (Figures 3.7-2 to 3.7-4). The two sites were similar for all variables, and showed similar seasonal trends.

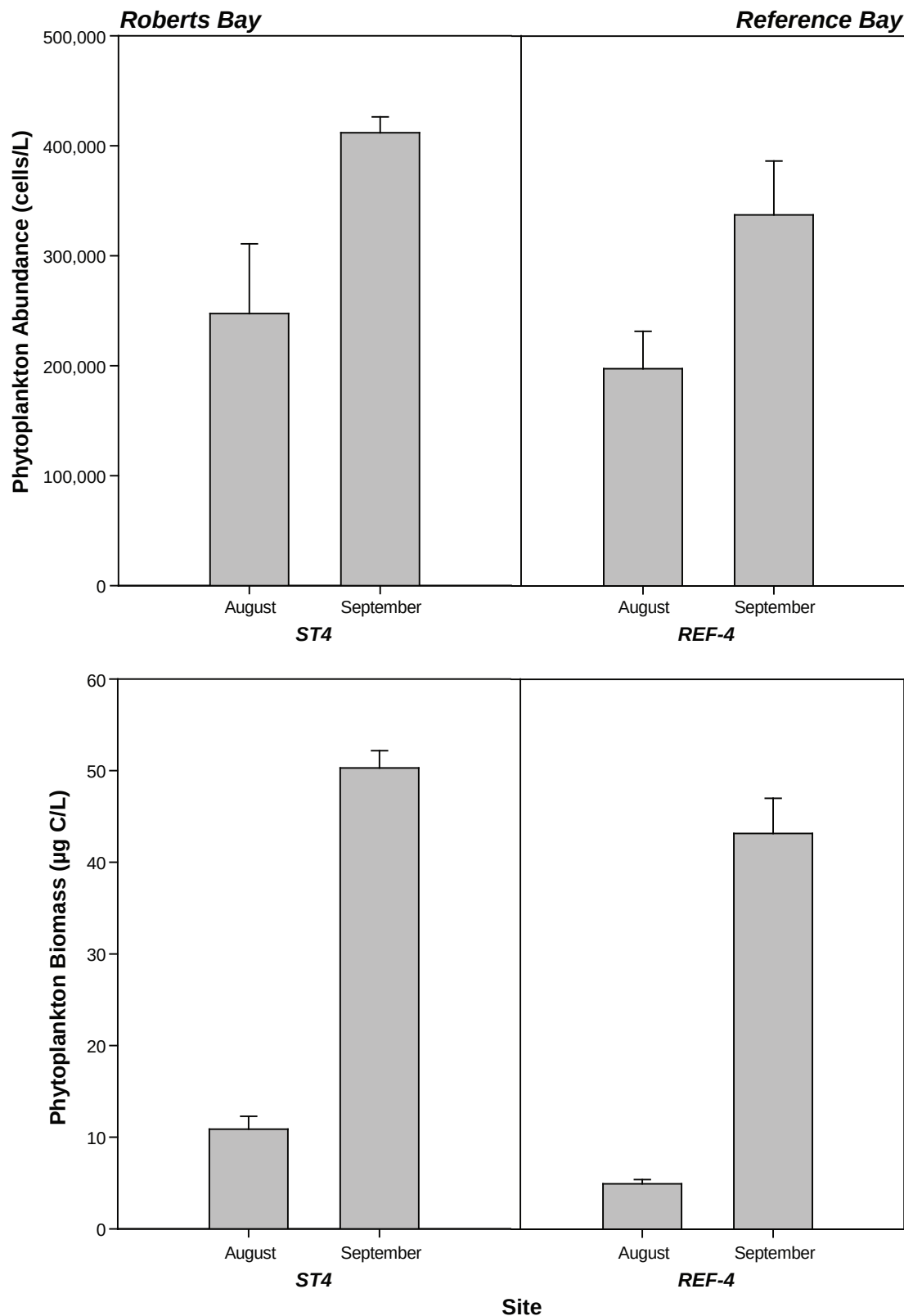
At both ST4 and REF-4, average phytoplankton abundance was lowest in August (247,000 cells/L and 198,000 cells/L, respectively) and highest in September (421,000 cells/L and 337,000 cells/L, respectively) (Figure 3.7-2). A similar but more dramatic trend was apparent for carbon-based phytoplankton biomass, which was approximately five- to ten-fold lower in August (10.9 µg C/L at ST4 and 4.9 µg C/L at REF-4) than in September (50.3 µg C/L at ST4 and 43.2 µg C/L) (Figure 3.7-2). This suggests that the September phytoplankton assemblages were dominated by larger-celled organisms than the August assemblages.

Overall, the phytoplankton assemblages and seasonal trends were similar at both sites, as cryptophytes and diatoms numerically accounted for more than 90% of the phytoplankton community at both sites (Figure 3.7-3). However, the relative dominance of each taxa changed from August to September. In August, cryptophytes were numerically dominant at both sites, averaging 85% at ST4 and 90% at REF-4. Because of their small size and lack of distinguishing characteristics, cryptophytes were identified only to the level of phylum, so the dominant species is/are unknown. In September, diatoms became the dominant taxon numerically, making up an average of 73% of the phytoplankton community at ST4 and 75% at REF-4. *Leptocylindrus danicus* was the dominant diatom species observed at both sites (Plate 3.7-1). The most obvious difference between sites was the presence of chlorophytes (green algae), which accounted for 8.3% of the phytoplankton assemblage at REF-4 in August, but were not observed at ST4 (Figure 3.7-3).

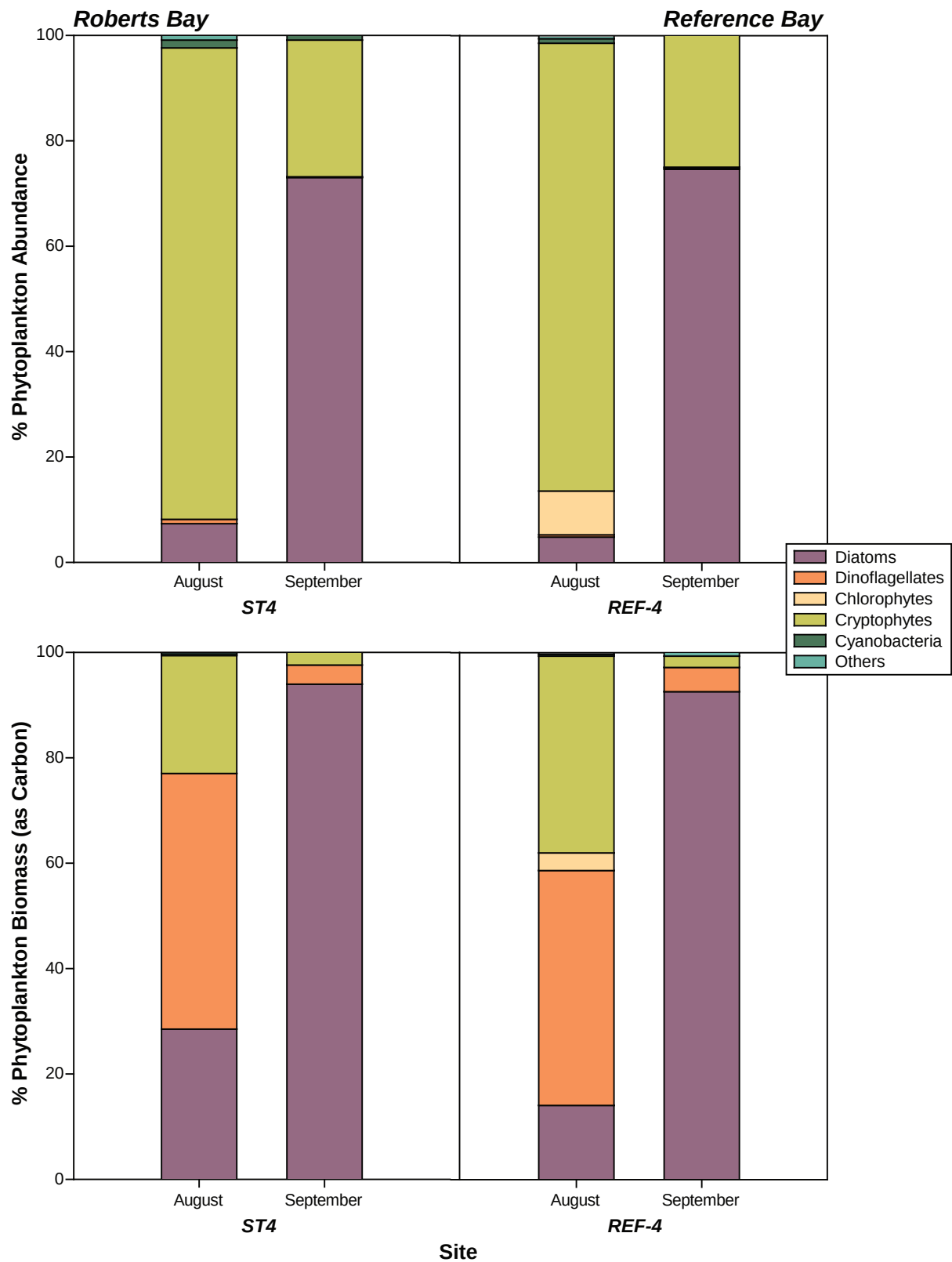
The relative composition of the phytoplankton assemblage in terms of carbon biomass reflects phytoplankton cell size as well as abundance. The relatively small cryptophytes represented a small proportion of phytoplankton biomass as carbon (less than 38% in August, and less than 3% in September) despite being numerically dominant in August and abundant in September. Diatoms tend to be larger and consequently represented a greater proportion of phytoplankton biomass than their proportional numerical abundance. The dinoflagellates present in Roberts Bay and Reference Bay were much larger than both cryptophytes and diatoms, so despite representing less than 1% of the numerical abundance, they made-up 45 to 49% of phytoplankton biomass as carbon in August, and 3 to 5% in September (Figure 3.7-3).



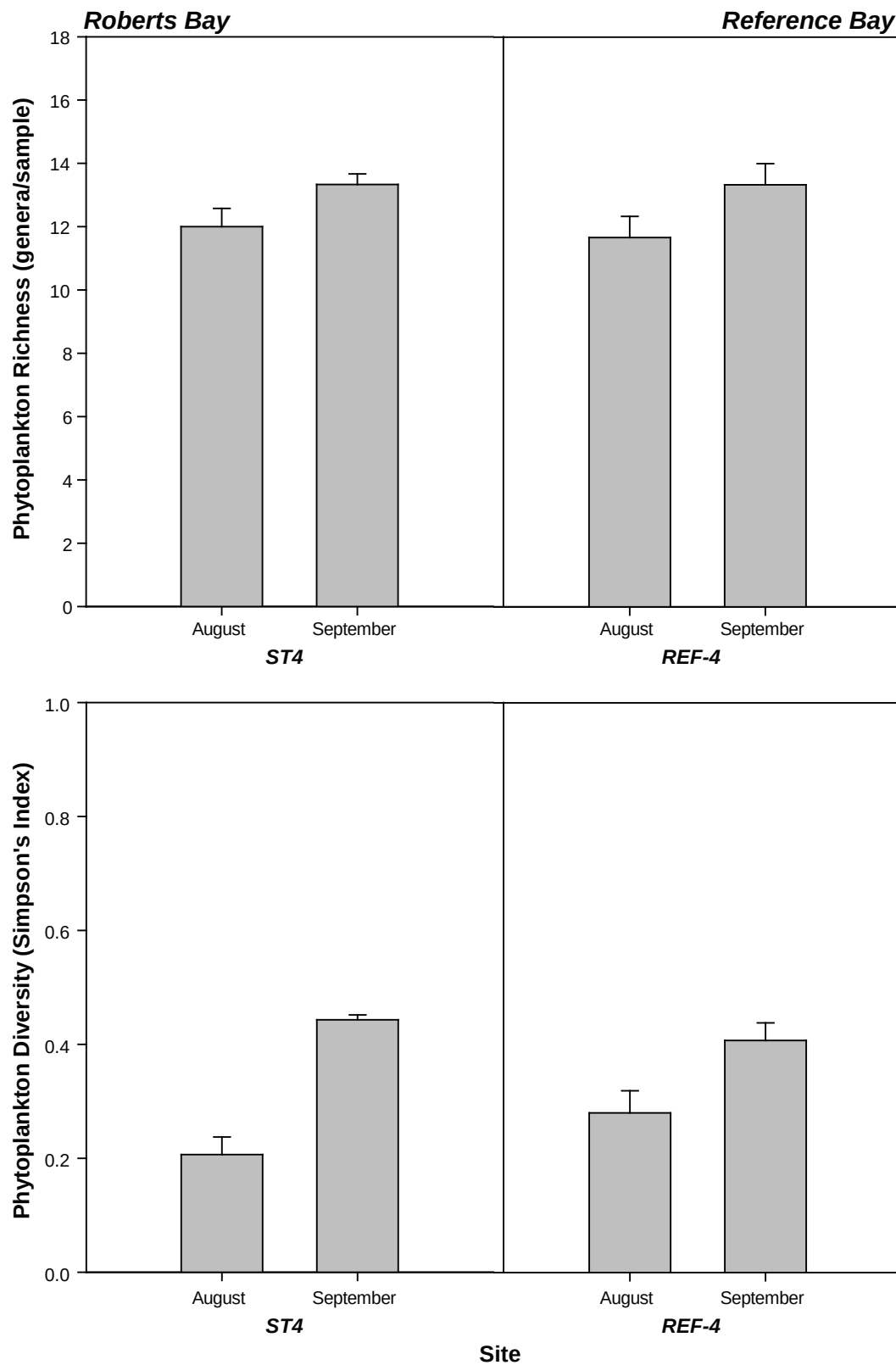
Notes: Error bars represent standard error of the mean of triplicate samples.
Dotted line represents analytical detection limit (0.01 µg chl a/L).



Note: Error bars represent standard error of the mean of triplicate samples.



Note: Values represent the mean of triplicate samples.



Note: Error bars represent standard error of the mean of triplicate samples.

The composition of phytoplankton biomass (as carbon) was similar between sites, but varied seasonally. In August, dinoflagellates dominated the phytoplankton carbon biomass (averaging 49% at ST4 and 45% at REF-4); *Ceratium arcticum* (Plate 3.7-2) and the toxic *Protoceratium reticulatum* were the largest contributors to dinoflagellate biomass in both Roberts Bay and Reference Bay. Cryptophytes and diatoms also made important biomass contributions (cryptophytes averaged 22% at ST4 and 37% at REF-4; diatoms averaged 29% at ST4 and 14% at REF-4). In September, diatoms dominated the carbon biomass, representing 94% of biomass at ST4 and 93% at REF-4 (Figure 3.7-3).



Plate 3.7-1. *Leptocylindrus danicus* (diatom), the dominant species numerically and in terms of carbon biomass in Roberts Bay and Reference Bay in September.



Plate 3.7-2. *Ceratium arcticum* (dinoflagellate), a large contributor to phytoplankton carbon biomass in Roberts Bay and Reference Bay in August.

Phytoplankton genus richness was similar between the two sites (Figure 3.7-4). Richness was slightly lower in August (averaging 12 genera/sample at both sites) than in September (averaging 13 genera/sample at both sites). Simpson's diversity index was also similar between the two sites, and followed the same seasonal trend. In August, average Simpson's diversity was 0.21 at ST4 and 0.28 at REF-4, while in September, Simpson's diversity increased to 0.44 at ST4 and 0.41 at REF-4 (Figure 3.7-4). In general, taxonomic diversity was low to moderate.

3.7.1 Historical Trends in Phytoplankton

Prior to 2010, marine phytoplankton biomass samples (as chlorophyll *a*) were collected from 2006 to 2009, and taxonomy samples were collected in 2007 and 2009. For graphing purposes, historical data were grouped according to sampling site location. Site "Roberts Bay West" includes data from historical sites: ST1, ST2, ST3 (2009); and RBW (2010). Site "Roberts Bay East" includes data from: unnamed

sampling site (2006-2008); ST0 (2009); and RBE (2010). Site "Roberts Bay Pelagic" includes data from: ST4, ST5, ST6 (2009); and ST4 (2010). Site "Reference Bay" includes data from: REF-4, RP3 (2009); and REF-4, REF-MARINE (2010). Historical sampling sites that did not correspond to sites sampled in 2010 were not included in the historical phytoplankton biomass plots. Figures 2.1-1 and 2.1-2 show the historical phytoplankton sampling locations, and Table 2.3-3 presents the methodological details of historical phytoplankton sampling.

Overall, phytoplankton biomass (as chl *a*) was low, rarely exceeding 1.5 µg chl *a*/L (Figure 3.7-5). Compared to historical data collected in Roberts Bay East, the average biomass level in 2010 was relatively high at 2.0 µg chl *a*/L. Chlorophyll concentrations at this site were <1 µg chl *a*/L in April, July, and September, but the high chlorophyll concentrations measured in August drove up the average for 2010. This could have been due to the suspension of periphyton since high levels of TSS were also observed during this time.

In 2007, taxonomic analysis of marine phytoplankton in Roberts Bay revealed that cyanobacteria and dinoflagellates were the major contributors to phytoplankton biomass. In 2009 and 2010, dinoflagellates, diatoms, cryptophytes, and chrysophytes (2009 only) made up the majority of the carbon biomass, with cyanobacteria making a negligible contribution. .

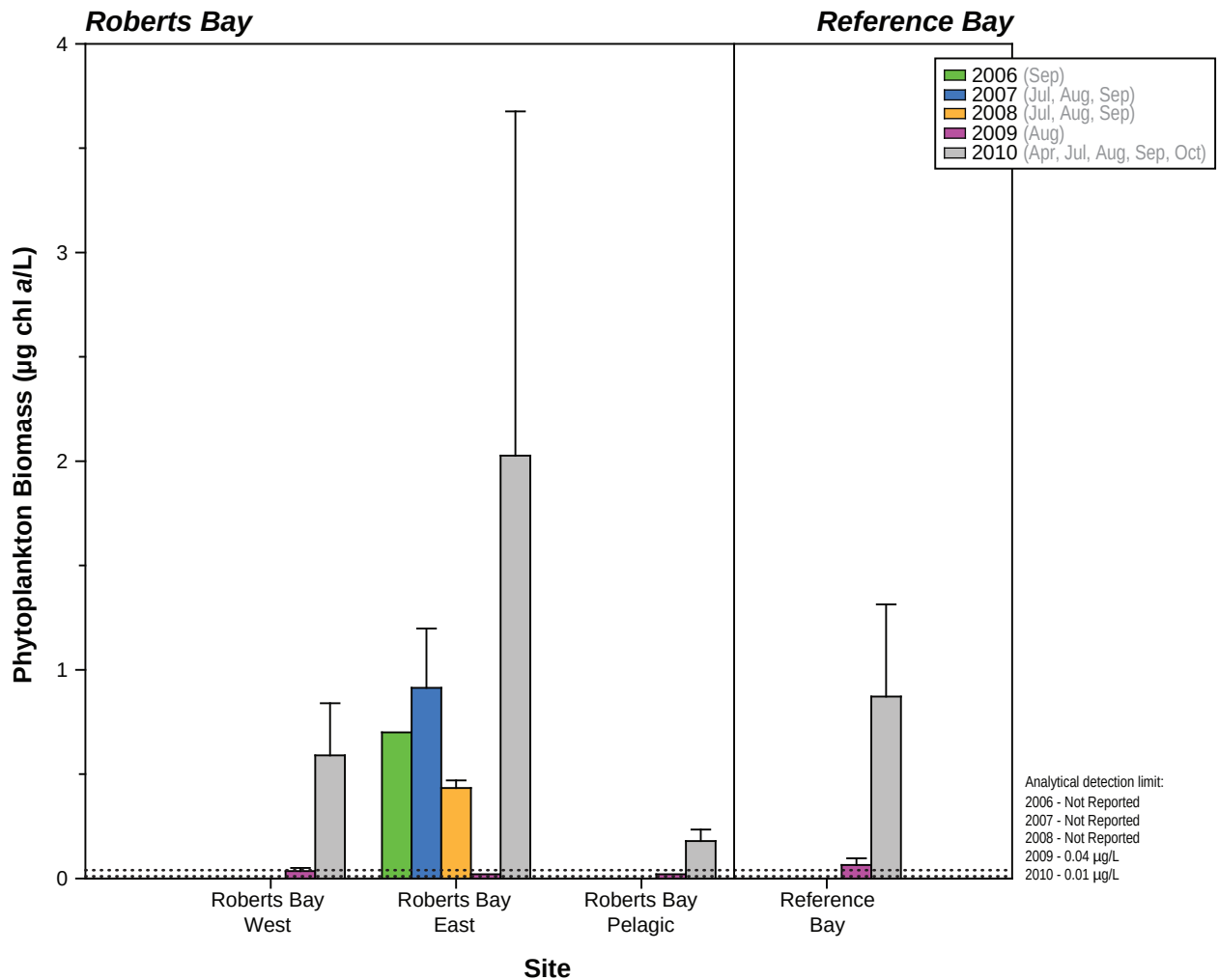
Historical trends should be interpreted with caution due to limited amounts of data, annual differences in sample collection location, sampling date, and sampling methodologies (e.g., discrete samples in 2006, 2009, and 2010 vs. depth-integrated samples in 2007 and 2008).

3.8 BENTHOS

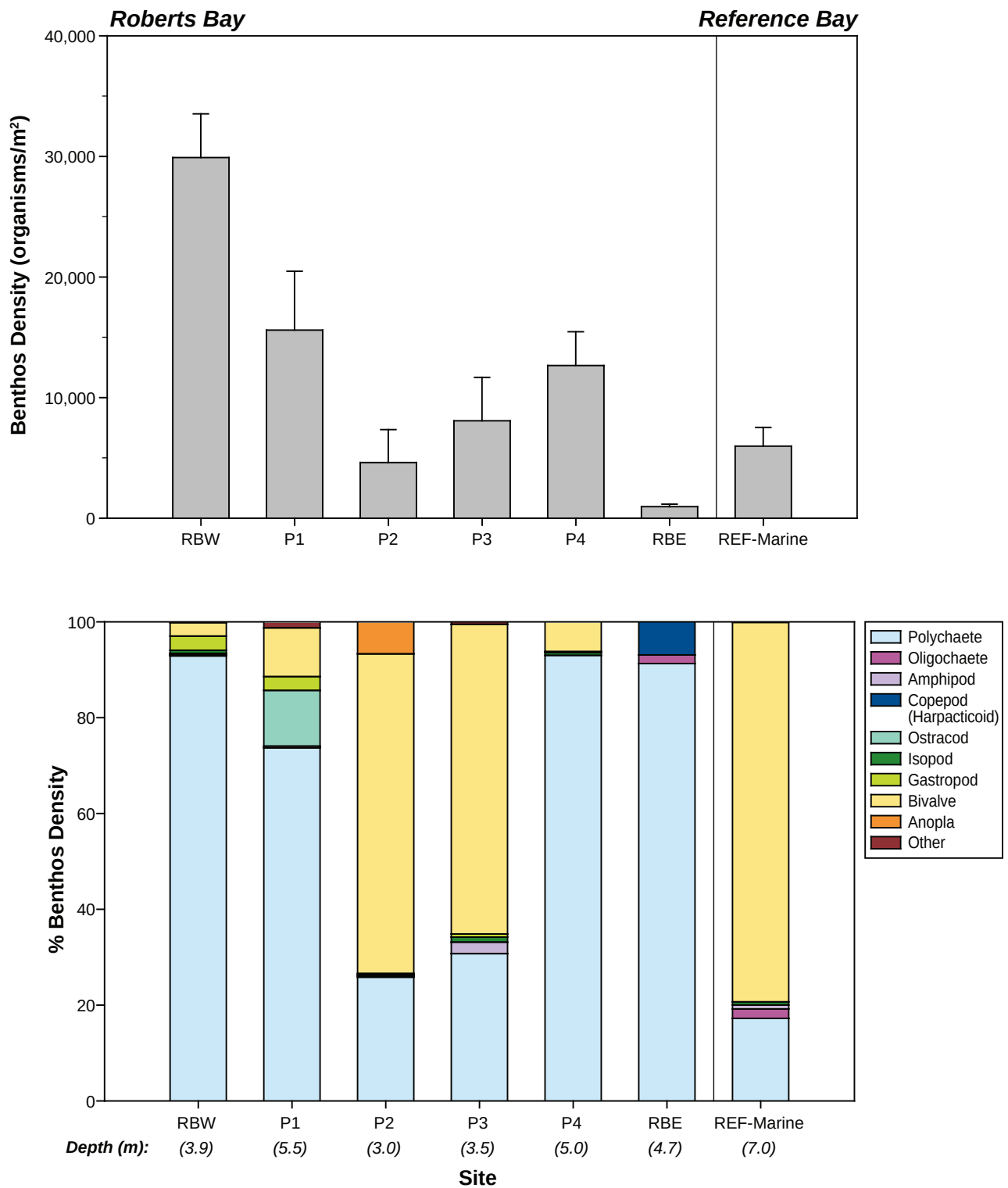
Benthic macroinvertebrates (benthos or macrobenthos) are organisms greater than 0.5 mm in size that live on or in the sediment (i.e., benthic zone) and are ecologically important as food sources for fish. Because of their close association with the sediment and their limited mobility, benthos are useful indicators of sediment quality and local environmental conditions. Benthos samples were collected from six sites in Roberts Bay and one site in Reference Bay in August, 2010. Complete results of benthos taxonomic analysis are provided in Appendix 3.8-1.

Average benthos density was highly variable, ranging from 959 organisms/m² at RBE to 29,900 organisms/m² at RBW (Figure 3.8-1). Site RBE, which had the lowest benthos density, also had the lowest proportion of fine sediments (silts and clays) and the highest proportion of sand. Nematodes were abundant at this site (Appendix 3.8-1), but were not included in the total density calculation because many nematodes would likely be lost through the benthos sieving process, and counts would therefore be very uncertain. There was no obvious relationship between sample depth and benthos density, which is not surprising given the narrow range of sampling depths (3 to 7 m).

The benthos community composition was variable among sites (Figure 3.8-1). Sites with highest benthos density (e.g., RBW, P1, P4) tended to be dominated by polychaetes. The polychaete genus *Nephtys* was particularly abundant at these sites. Conversely, sites with lowest benthos density (e.g., P2, P3, REF-Marine) tended to be dominated by bivalves. RBE was an exception to this pattern as this site was dominated by polychaetes and nematodes despite having the lowest total benthos density. Polychaetes made up between 73% and 93% of the benthos assemblage at sites RBE, P1, P4, and RBW, and represented at least 17% of the benthos at all sites. Bivalves made up between 65% and 79% of the benthos assemblage at sites P2, P3, and REF-Marine, with the small Baltic clam (*Macoma balthica*) making up most of the bivalve assemblage (Appendix 3.8-1). Site RBE was the only site where no bivalves were sampled, and it was also the only site to have a significant harpacticoid copepod community (6.9%). Site P1 was the only site to have a significant ostracod community (12%).



Notes: Error bars represent standard error of the mean of multiple sampling periods and/or multiple sampling sites.
Dotted lines represent analytical detection limits.



Notes: Values represent the mean of replicate samples; error bars represent standard error of the mean.
 Numbers in parentheses indicate sampling depth in metres.
 Three discrete replicates were collected at sites P1, P2, P3, and P4; five composite replicates each consisting of three pooled samples were collected at sites RBE, RBW, and REF-Marine.

Figure 3.8-1

Average benthos genus richness ranged from 3 genera/sample at site RBE to 15 genera/sample at site RBW. The pattern in genus richness closely followed the benthos density trend, with sites with greater densities having correspondingly higher richness (Figure 3.8-2).

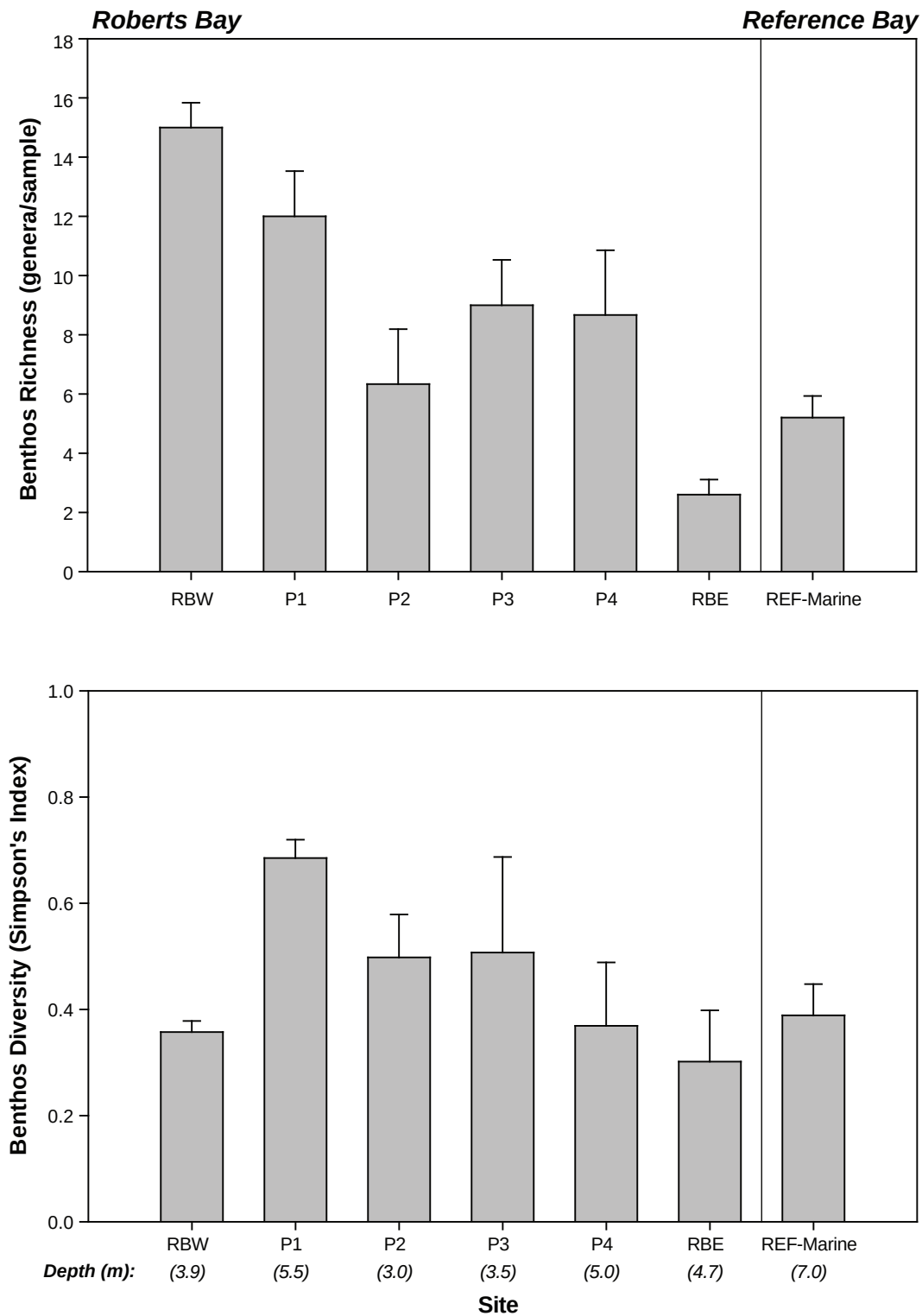
Average Simpson's diversity levels were generally similar across sites, ranging from 0.30 to 0.51 (Figure 3.8-2). This is indicative of low to moderate taxonomic diversity. The one exception to this was site P1, which had a higher average Simpson's diversity of 0.69.

3.8.1 Historical Trends in Benthos

Prior to 2010, marine benthos samples were collected in 1997, 1998, and 2009. For graphing purposes, historical data were grouped according to sampling site location. Several historical sites were near or within the footprints of the five port options shown in Figure 2.1-1 (P1 to P5). Site "Roberts Bay West/Jetty" includes data from site RBW (2010). Site "P1" includes data from: ST2, ST7, ST8 (2009); and P1 (2010). Site "P2" includes data from site P2 (2010). Site "P3" includes data from: ST9, ST10 (2009); and P3 (2010). Site "P4" includes data from: RTF1, DW3 (2009); and P4 (2010). Site "P5" includes data from: DW1 and DW2 (2009). Site "Roberts Bay East" includes data from: Stn 5 (1997 and 1998) and RBE (2010). Site "Reference Bay" includes data from: RP1, RP2, RP3 (2009); and REF-Marine (2010). Historical sampling sites that did not correspond to sites sampled in 2010 were not included in the historical benthos density plots. Table 2.3-5 presents the methodological details of historical benthos sampling.

Figure 3.8-3 shows the mean benthos density in Roberts Bay and Reference Bay from 1997 to 2010. Overall, average benthos densities ranged from 959 organisms/m² at Roberts Bay East in 2010 to 32,700 organisms/m² at P4 in 2009. Roberts Bay East, the only site with more than two years of historical data, had consistently low benthos density across all years sampled.

Benthos taxa assemblages varied between years. Benthos assemblages in Roberts Bay and Reference Bay in 2010 generally contained more polychaetes and fewer copepods, cumaceans, isopods and amphipods than in 2009. The benthos assemblage at Roberts Bay East, the only site with more than two years data, varied each year. Roberts Bay East was dominated by nematode worms (84%) in 1997, bivalves (41%) and polychaetes (32%) in 1998, and polychaetes (91%) in 2010. Notably, nematodes were excluded from benthos analysis in certain years (e.g., 2009 and 2010). Historical trends should be interpreted with caution because of the high degree of within-year variability and the variation in sites and methodologies among years.

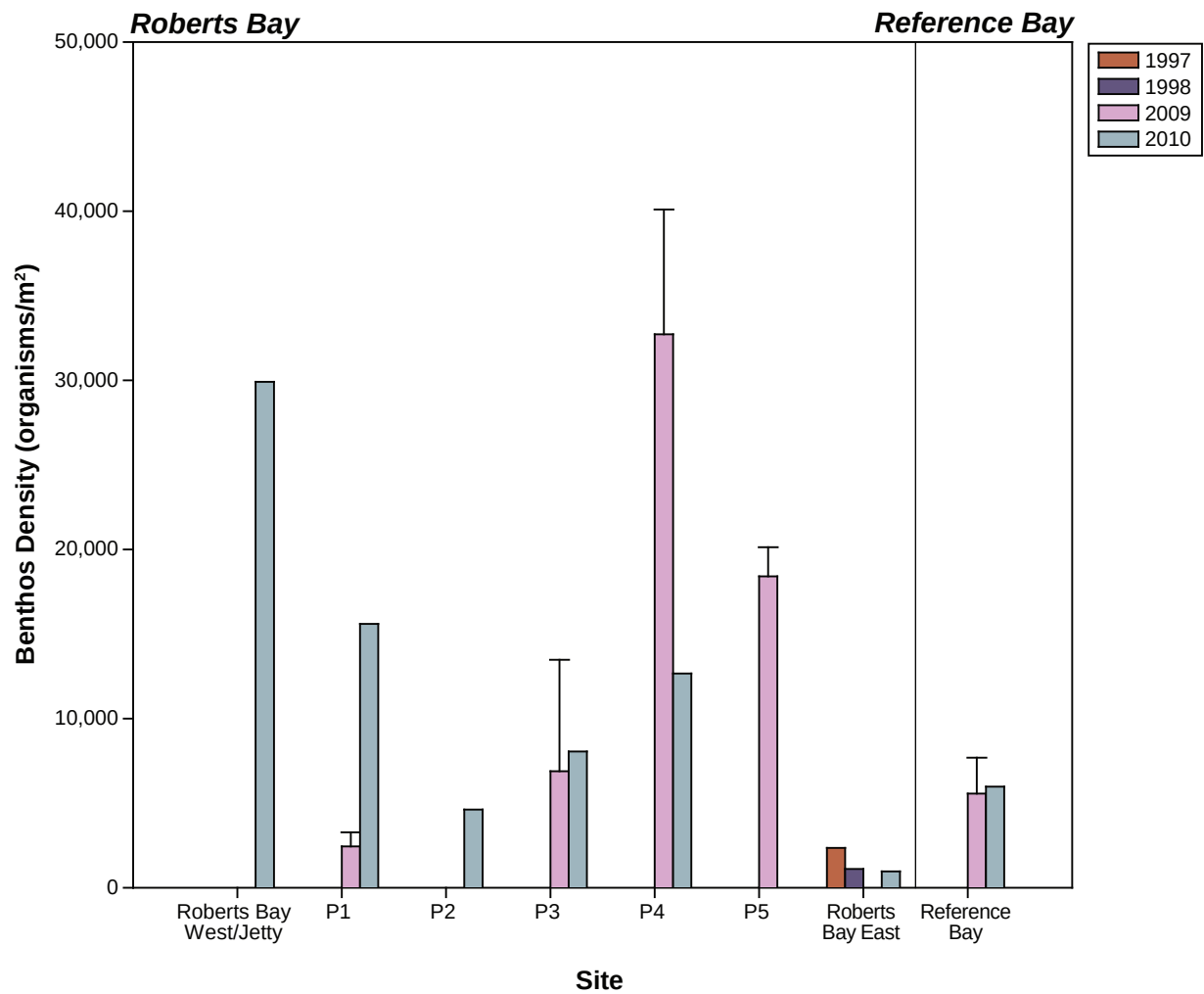


Notes: Error bars represent standard error of the mean of replicate samples.

Numbers in parentheses indicate sampling depth in metres.

Three discrete replicates were collected at sites P1, P2, P3, and P4; five composite replicates each consisting of three pooled samples were collected at sites RBE, RBW, and REF-Marine.

Figure 3.8-2



Note: Error bars represent standard error of the mean of multiple sampling sites.

References

References

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Appendix 3.2-1

Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

RBE 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.58	21.53	-1.44	26.43
1.85	21.58	-1.42	26.49
1.90	21.63	-1.39	26.52
1.90	21.61	-1.41	26.51
1.91	21.63	-1.39	26.53
1.91	21.63	-1.40	26.53
1.92	21.60	-1.41	26.51
1.93	21.63	-1.38	26.52
2.11	21.60	-1.38	26.48
2.33	21.59	-1.39	26.46
2.50	21.58	-1.38	26.46
2.65	21.59	-1.38	26.46
2.80	21.59	-1.38	26.46
2.97	21.59	-1.39	26.46
3.11	21.59	-1.39	26.47
3.25	21.60	-1.39	26.48
3.28	21.60	-1.38	26.47
3.36	21.62	-1.38	26.50
3.37	21.61	-1.38	26.49

RBW 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.67	21.68	-1.40	26.60
1.73	21.67	-1.40	26.59
1.75	21.67	-1.40	26.59
1.76	21.69	-1.39	26.61
1.77	21.70	-1.39	26.62

RBW (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.78	21.71	-1.39	26.63
1.78	21.70	-1.38	26.62
1.83	21.70	-1.38	26.61
1.97	21.68	-1.38	26.59
2.12	21.67	-1.38	26.57
2.27	21.64	-1.38	26.53
2.42	21.63	-1.38	26.52
2.58	21.63	-1.38	26.51
2.77	21.63	-1.38	26.51
2.94	21.63	-1.38	26.51
3.17	21.63	-1.38	26.51
3.42	21.63	-1.38	26.51
3.72	21.63	-1.38	26.51
3.89	21.63	-1.38	26.51
4.09	21.63	-1.38	26.51
4.29	21.63	-1.38	26.52
4.50	21.63	-1.38	26.51
4.54	21.63	-1.38	26.52

DWP 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.79	21.69	-0.92	26.19
2.06	21.67	-0.94	26.18
2.39	21.65	-0.96	26.17
2.62	21.66	-0.97	26.20
2.65	21.69	-0.98	26.24
2.65	21.78	-0.93	26.32

DWP (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
2.65	21.71	-0.99	26.27
2.66	21.75	-0.97	26.30
2.66	21.76	-0.91	26.27
2.76	21.71	-0.93	26.23
2.92	21.67	-0.92	26.16
3.02	21.70	-0.96	26.23
3.31	21.66	-0.99	26.22
3.59	21.66	-1.01	26.23
3.86	21.66	-1.02	26.24
4.13	21.66	-1.03	26.25
4.31	21.66	-1.04	26.26
4.53	21.66	-1.05	26.25
4.69	21.68	-1.05	26.29
4.86	21.67	-1.06	26.28
5.03	21.66	-1.06	26.27
5.29	21.66	-1.07	26.28
5.41	21.66	-1.08	26.29
5.53	21.66	-1.08	26.28
5.70	21.65	-1.08	26.28
5.89	21.65	-1.08	26.28
6.15	21.65	-1.09	26.28
6.39	21.65	-1.10	26.29
6.62	21.65	-1.11	26.30
6.85	21.64	-1.11	26.28
7.06	21.65	-1.11	26.31
7.25	21.65	-1.12	26.31
7.50	21.64	-1.12	26.30
7.80	21.64	-1.13	26.31
8.10	21.64	-1.14	26.31
8.40	21.65	-1.14	26.32

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

DWP (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
8.50	21.65	-1.14	26.33
8.82	21.65	-1.15	26.33
9.11	21.66	-1.15	26.35
9.36	21.69	-1.14	26.38
9.59	21.74	-1.11	26.42
9.82	22.05	-1.06	26.79
10.12	22.40	-0.75	26.97
10.51	22.63	-0.39	26.96
10.80	22.68	-0.15	26.80
11.07	22.68	-0.05	26.72
11.32	22.72	0.00	26.72
11.57	22.72	0.04	26.69
11.93	22.73	0.06	26.69
12.23	22.74	0.07	26.69
12.55	22.75	0.08	26.70
12.96	22.76	0.08	26.70
13.24	22.77	0.08	26.72
13.37	22.78	0.09	26.72

ST3 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.85	19.59	-1.47	23.87
2.35	19.62	-1.45	23.90
2.67	19.65	-1.45	23.93
2.98	19.65	-1.45	23.93
3.33	19.65	-1.44	23.93
3.56	19.66	-1.44	23.94

ST3 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
3.87	19.69	-1.44	23.98
4.17	19.69	-1.44	23.98
4.52	19.70	-1.44	23.99
4.92	19.71	-1.44	24.00
5.22	19.72	-1.44	24.01
5.62	19.73	-1.43	24.03
5.81	19.73	-1.44	24.03
6.04	19.73	-1.44	24.03
6.28	19.74	-1.44	24.05
6.66	19.75	-1.44	24.05
7.03	19.78	-1.44	24.10
7.03	19.77	-1.44	24.09
7.32	19.79	-1.44	24.11
7.72	19.80	-1.44	24.12
8.04	19.80	-1.43	24.12
8.43	19.82	-1.43	24.14
8.83	19.84	-1.42	24.15
9.14	19.89	-1.40	24.21
9.44	20.05	-1.25	24.31
9.46	20.11	-1.19	24.33

ST3.5 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.54	21.14	-1.71	26.15
1.75	21.61	-1.44	26.54
1.77	21.60	-1.46	26.56
1.78	21.60	-1.46	26.55

ST3.5 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.80	21.60	-1.46	26.54
1.84	21.61	-1.45	26.54
1.84	21.58	-1.52	26.57
1.84	21.60	-1.45	26.54
1.84	21.57	-1.49	26.54
1.84	21.58	-1.50	26.55
1.84	21.57	-1.49	26.53
1.85	21.57	-1.48	26.52
1.85	21.55	-1.58	26.59
1.85	21.61	-1.46	26.56
2.21	21.61	-1.43	26.54
3.00	21.61	-1.42	26.53
3.35	21.62	-1.42	26.53
4.04	21.61	-1.42	26.53
4.68	21.62	-1.42	26.53
5.43	21.62	-1.42	26.53
6.24	21.66	-1.42	26.58
6.93	21.66	-1.39	26.56
7.69	21.64	-1.39	26.53
8.44	21.65	-1.41	26.56
9.23	21.73	-1.40	26.66
10.02	22.36	-1.07	27.21
10.86	22.65	-0.63	27.19
11.89	22.72	-0.39	27.07
12.79	22.77	-0.28	27.04
13.08	22.77	-0.13	26.90
13.19	22.76	-0.12	26.89
13.20	22.75	-0.12	26.87
13.21	22.75	-0.12	26.87
13.23	22.76	-0.12	26.88

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST3.5 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
13.30	22.77	-0.14	26.90
13.41	22.77	-0.16	26.93
13.56	22.77	-0.20	26.97

ST4 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.72	21.58	-1.46	26.52
1.98	21.52	-1.43	26.41
2.15	21.58	-1.41	26.48
2.28	21.59	-1.41	26.48
2.70	21.59	-1.40	26.48
3.13	21.60	-1.40	26.49
3.73	21.60	-1.39	26.49
4.29	21.60	-1.39	26.49
4.94	21.60	-1.39	26.48
5.88	21.61	-1.39	26.49
6.73	21.61	-1.39	26.49
7.47	21.61	-1.39	26.49
8.19	21.63	-1.38	26.52
9.04	22.21	-1.18	27.11
9.94	22.53	-0.71	27.11
10.93	22.66	-0.44	27.03
11.97	22.74	-0.26	26.98
12.94	22.76	-0.18	26.93
14.04	22.70	-0.22	26.89
15.01	22.74	-0.24	26.96
15.90	22.77	-0.23	26.98

ST4 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
16.77	22.80	-0.22	27.03
17.69	22.80	-0.21	27.02
18.65	22.80	-0.24	27.04
19.64	22.81	-0.26	27.07
20.64	22.82	-0.28	27.09
21.62	22.82	-0.30	27.11
22.67	22.82	-0.32	27.13
23.73	22.83	-0.33	27.15
24.76	22.83	-0.35	27.16
25.97	22.83	-0.37	27.18
27.04	22.83	-0.38	27.19
28.36	22.83	-0.40	27.21
29.55	22.83	-0.41	27.22
30.85	22.83	-0.42	27.23
31.98	22.83	-0.43	27.24
33.07	22.83	-0.44	27.25
34.02	22.83	-0.44	27.25
34.93	22.83	-0.45	27.26
35.91	22.84	-0.46	27.27
37.33	22.84	-0.46	27.27
38.70	22.84	-0.47	27.28
39.91	22.84	-0.47	27.28
40.90	22.84	-0.48	27.29
42.00	22.84	-0.48	27.29
42.73	22.84	-0.49	27.30
43.35	22.84	-0.49	27.30
44.46	22.84	-0.49	27.30
45.35	22.84	-0.49	27.30
46.28	22.84	-0.49	27.30
46.34	22.85	-0.49	27.31

ST4 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.73	21.60	-1.36	26.46
1.73	21.60	-1.37	26.46
1.73	21.61	-1.37	26.48
1.91	21.63	-1.36	26.50
2.63	21.63	-1.32	26.46
3.26	21.60	-1.34	26.44
3.88	21.58	-1.36	26.44
4.52	21.59	-1.38	26.47
5.33	21.70	-1.35	26.58
6.04	21.83	-1.24	26.65
6.68	21.86	-1.13	26.60
7.24	21.86	-1.08	26.55
7.78	21.95	-1.07	26.65
8.38	22.39	-0.93	27.12
8.89	22.47	-0.59	26.92
9.48	22.50	-0.46	26.85
10.11	22.56	-0.37	26.84
10.77	22.63	-0.31	26.88
11.50	22.68	-0.24	26.88
12.25	22.73	-0.20	26.91
13.07	22.68	-0.20	26.85
13.84	22.68	-0.24	26.88
14.62	22.78	-0.22	26.99
15.43	22.80	-0.19	27.00
16.33	22.78	-0.21	26.99
17.24	22.80	-0.25	27.04
18.22	22.81	-0.25	27.06
19.44	22.81	-0.28	27.09
20.77	22.81	-0.30	27.10
21.70	22.82	-0.32	27.13

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST4 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
22.50	22.82	-0.33	27.14
23.11	22.82	-0.34	27.15
24.43	22.82	-0.35	27.16
25.45	22.82	-0.37	27.17
27.01	22.82	-0.39	27.19
28.08	22.83	-0.40	27.21
29.27	22.83	-0.42	27.22
30.25	22.83	-0.43	27.23
31.39	22.83	-0.44	27.24
32.52	22.83	-0.45	27.25
33.87	22.83	-0.45	27.26
34.79	22.83	-0.46	27.27
36.10	22.83	-0.47	27.28
37.04	22.83	-0.47	27.28
38.29	22.84	-0.48	27.28
40.06	22.84	-0.48	27.29
41.56	22.84	-0.49	27.30
42.52	22.84	-0.49	27.30
43.54	22.84	-0.50	27.31
44.84	22.84	-0.50	27.31
45.82	22.85	-0.50	27.32
46.49	22.84	-0.51	27.32

ST5 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.41	21.44	-1.45	26.33
1.58	21.47	-1.45	26.36

ST5 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.82	21.49	-1.45	26.39
1.88	21.48	-1.45	26.37
1.89	21.48	-1.45	26.37
1.89	21.47	-1.45	26.37
1.99	21.49	-1.45	26.39
2.20	21.48	-1.44	26.37
2.24	21.48	-1.43	26.37
2.55	21.49	-1.44	26.38
2.95	21.65	-1.43	26.58
3.15	21.64	-1.42	26.56
3.15	21.64	-1.42	26.56
3.26	21.60	-1.41	26.49
3.39	21.75	-1.36	26.65
3.82	21.80	-1.22	26.60
4.12	21.71	-1.20	26.47
4.31	21.64	-1.25	26.42
4.57	21.72	-1.29	26.55
4.91	21.85	-1.21	26.66
5.27	21.85	-1.12	26.57
5.50	21.87	-1.10	26.58
5.95	21.84	-1.09	26.54
6.27	21.85	-1.09	26.55
6.60	21.84	-1.08	26.53
7.10	21.66	-1.15	26.36
7.37	21.69	-1.27	26.49
7.57	21.75	-1.29	26.59
7.78	21.80	-1.27	26.64
8.14	21.92	-1.15	26.70
8.60	22.20	-1.01	26.94
8.93	22.30	-0.87	26.94

ST5 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
9.11	22.36	-0.72	26.89
9.32	22.46	-0.65	26.96
9.77	22.56	-0.50	26.96
10.30	22.59	-0.37	26.88
10.71	22.62	-0.31	26.88
11.09	22.64	-0.30	26.89
11.62	22.66	-0.28	26.89
12.17	22.67	-0.26	26.89
12.67	22.65	-0.25	26.85
13.39	22.67	-0.29	26.91
13.81	22.68	-0.29	26.93
14.34	22.75	-0.26	26.99
14.99	22.79	-0.21	26.99
15.33	22.79	-0.19	26.98
15.73	22.80	-0.18	26.99
16.17	22.81	-0.18	26.99
16.44	22.81	-0.19	27.00
17.23	22.81	-0.20	27.01
17.64	22.81	-0.21	27.03
17.75	22.81	-0.21	27.03
18.07	22.81	-0.22	27.03
18.55	22.82	-0.23	27.05
18.97	22.82	-0.24	27.06
19.23	22.83	-0.25	27.08
19.63	22.83	-0.25	27.09
19.73	22.83	-0.26	27.09
19.85	22.83	-0.26	27.09
20.20	22.83	-0.27	27.10
20.81	22.82	-0.29	27.10
21.23	22.82	-0.30	27.11

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST5 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
21.72	22.82	-0.31	27.12
22.01	22.82	-0.32	27.13
22.42	22.82	-0.32	27.14
22.84	22.82	-0.33	27.14
23.42	22.82	-0.34	27.15
23.98	22.83	-0.35	27.16
24.41	22.82	-0.35	27.16
24.75	22.82	-0.36	27.16
25.18	22.81	-0.37	27.17
25.51	22.82	-0.38	27.18
26.15	22.82	-0.38	27.18
26.57	22.82	-0.38	27.18
26.98	22.82	-0.38	27.19
27.24	22.82	-0.38	27.19
27.78	22.82	-0.39	27.19
28.21	22.82	-0.39	27.20
28.62	22.82	-0.40	27.20
29.11	22.82	-0.40	27.21
29.58	22.83	-0.41	27.21
29.94	22.83	-0.41	27.22
30.25	22.83	-0.41	27.22
30.38	22.82	-0.42	27.22
30.75	22.83	-0.42	27.22
31.35	22.83	-0.42	27.23
31.83	22.83	-0.43	27.23
32.44	22.83	-0.43	27.24
33.17	22.83	-0.44	27.24
33.49	22.83	-0.44	27.25
34.03	22.83	-0.45	27.25
34.45	22.83	-0.45	27.26

ST5 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
34.84	22.83	-0.45	27.26
35.13	22.83	-0.45	27.26
35.75	22.83	-0.46	27.26
36.18	22.83	-0.46	27.27
36.70	22.83	-0.46	27.27
36.94	22.83	-0.47	27.27
37.46	22.83	-0.47	27.27
38.00	22.84	-0.47	27.28
38.64	22.83	-0.47	27.28
39.43	22.84	-0.47	27.28
40.29	22.84	-0.48	27.29
41.21	22.84	-0.48	27.29
42.04	22.84	-0.48	27.30
42.91	22.84	-0.49	27.30
43.72	22.84	-0.49	27.30
44.27	22.84	-0.49	27.30
44.83	22.85	-0.49	27.30
45.72	22.84	-0.49	27.31
45.87	22.84	-0.50	27.31

ST6 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.53	21.56	-1.54	26.56
1.98	21.55	-1.45	26.47
2.00	21.55	-1.41	26.44
2.04	21.55	-1.39	26.42
2.07	21.55	-1.39	26.41

ST6 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
2.57	21.68	-1.37	26.57
3.24	21.67	-1.25	26.46
3.76	21.59	-1.31	26.40
4.51	21.59	-1.37	26.46
5.12	21.60	-1.38	26.48
5.74	21.60	-1.39	26.48
6.42	21.78	-1.36	26.70
7.07	21.76	-1.17	26.50
7.77	21.81	-1.20	26.59
8.57	22.29	-1.09	27.14
9.31	22.51	-0.61	26.99
10.03	22.66	-0.40	27.00
10.78	22.69	-0.26	26.91
11.68	22.76	-0.18	26.93
12.57	22.78	-0.13	26.91
13.40	22.73	-0.17	26.88
14.28	22.80	-0.17	26.98
15.15	22.81	-0.14	26.97
16.19	22.82	-0.15	26.98
17.12	22.81	-0.18	27.00
17.97	22.82	-0.20	27.03
18.64	22.82	-0.21	27.04
19.36	22.83	-0.23	27.06
19.97	22.83	-0.25	27.07
20.66	22.82	-0.27	27.09
21.41	22.82	-0.28	27.10
22.04	22.81	-0.30	27.11
22.77	22.81	-0.33	27.12
23.57	22.83	-0.33	27.15
24.28	22.82	-0.34	27.15

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST6 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
25.20	22.81	-0.35	27.15
25.98	22.81	-0.38	27.17
26.91	22.82	-0.39	27.19
27.80	22.82	-0.40	27.20
28.76	22.82	-0.41	27.21
29.65	22.82	-0.42	27.22
30.57	22.83	-0.42	27.23
31.56	22.83	-0.43	27.24
32.50	22.83	-0.44	27.24
33.55	22.83	-0.44	27.25
34.53	22.83	-0.45	27.26
35.57	22.83	-0.46	27.26
36.56	22.83	-0.46	27.27
37.61	22.83	-0.47	27.28
38.59	22.83	-0.48	27.28
39.78	22.84	-0.48	27.29
40.80	22.84	-0.48	27.29
41.85	22.84	-0.49	27.29
42.96	22.84	-0.49	27.30
44.21	22.84	-0.49	27.30
45.15	22.84	-0.50	27.31
45.93	22.85	-0.50	27.31

ST7 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.45	21.32	-1.50	26.20
1.70	21.31	-1.46	26.17

ST7 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
2.12	21.33	-1.44	26.16
2.85	21.34	-1.43	26.16
3.53	21.37	-1.41	26.19
3.58	21.38	-1.42	26.22
4.16	21.37	-1.40	26.18
4.55	21.53	-1.40	26.40
6.05	21.60	-1.35	26.44
6.86	21.62	-1.35	26.47
7.33	21.79	-1.36	26.70
8.07	22.05	-1.23	26.94
8.75	22.18	-0.94	26.85
9.44	22.27	-0.78	26.83
10.24	22.44	-0.65	26.93
11.11	22.43	-0.55	26.84
12.14	22.49	-0.52	26.88
13.19	22.51	-0.49	26.88
14.01	22.56	-0.46	26.92
14.75	22.62	-0.44	26.98
15.70	22.67	-0.39	27.00
16.68	22.65	-0.38	26.97
17.43	22.66	-0.39	26.99
18.85	22.70	-0.39	27.04
19.73	22.75	-0.38	27.10
20.98	22.81	-0.34	27.13
22.24	22.80	-0.33	27.12
23.24	22.81	-0.34	27.13
23.85	22.81	-0.34	27.14
24.86	22.81	-0.36	27.15
25.92	22.81	-0.38	27.17
26.96	22.81	-0.39	27.19

ST7 (continued) 24-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
27.81	22.81	-0.40	27.19
28.94	22.82	-0.41	27.21
30.28	22.82	-0.42	27.22
31.42	22.82	-0.43	27.23
32.51	22.83	-0.44	27.24
33.66	22.83	-0.44	27.25
34.79	22.83	-0.45	27.26
35.92	22.83	-0.46	27.26
37.19	22.83	-0.46	27.27
38.34	22.84	-0.47	27.28
39.48	22.84	-0.47	27.28
40.37	22.84	-0.47	27.28
41.47	22.84	-0.47	27.28
43.01	22.84	-0.48	27.29
44.31	22.84	-0.48	27.29
45.54	22.85	-0.49	27.30
46.46	22.85	-0.50	27.31

REF-7 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.60	21.54	-1.29	26.31
1.60	21.51	-1.25	26.24
1.82	21.53	-1.31	26.32
1.85	21.56	-1.32	26.37
2.21	21.52	-1.33	26.32
2.63	21.52	-1.34	26.33
3.09	21.52	-1.35	26.35

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-7 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
3.69	21.54	-1.36	26.37
4.25	21.56	-1.36	26.40
5.03	21.62	-1.35	26.47
5.71	21.63	-1.35	26.48
6.49	21.64	-1.34	26.49
7.24	21.66	-1.34	26.51
7.98	21.79	-1.28	26.63
8.80	22.38	-0.93	27.10
9.67	22.63	-0.52	27.06
10.42	22.68	-0.30	26.95
11.26	22.70	-0.21	26.89
12.12	22.72	-0.17	26.88
12.82	22.80	-0.15	26.96

REF-5 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.76	21.53	-1.33	26.33
1.95	21.56	-1.34	26.39
1.96	21.54	-1.34	26.36
1.99	21.59	-1.34	26.43
2.01	21.62	-1.34	26.46
2.03	21.65	-1.33	26.50
2.04	21.71	-1.33	26.57
2.04	21.68	-1.33	26.53
2.06	21.71	-1.32	26.57
2.21	21.56	-1.32	26.37
2.75	21.53	-1.33	26.34

REF-5 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
3.40	21.62	-1.35	26.46
4.19	21.61	-1.34	26.46
5.19	21.62	-1.35	26.48
6.01	21.63	-1.33	26.47
6.90	21.62	-1.34	26.47
7.87	21.63	-1.34	26.47
8.53	21.64	-1.35	26.50
9.22	21.66	-1.34	26.52
9.80	21.87	-1.30	26.76
10.43	22.49	-0.93	27.25
11.10	22.70	-0.50	27.14
11.79	22.79	-0.22	27.01
12.42	22.81	-0.12	26.94
13.13	22.81	-0.08	26.91
13.72	22.82	-0.07	26.91
14.51	22.83	-0.07	26.92
15.07	22.82	-0.09	26.93
15.90	22.82	-0.11	26.95
16.85	22.82	-0.13	26.96
17.72	22.82	-0.16	26.99
18.53	22.81	-0.19	27.00
19.22	22.81	-0.22	27.04
19.96	22.81	-0.25	27.06
20.68	22.80	-0.28	27.07
21.54	22.80	-0.30	27.10
22.40	22.80	-0.33	27.10
23.23	22.80	-0.34	27.12
24.09	22.80	-0.35	27.13
24.96	22.80	-0.36	27.13
25.65	22.80	-0.37	27.14

REF-5 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
26.61	22.80	-0.38	27.15
27.48	22.80	-0.38	27.16
28.34	22.80	-0.39	27.16
29.12	22.80	-0.39	27.16
30.02	22.80	-0.40	27.17
30.95	22.80	-0.41	27.17
31.77	22.79	-0.41	27.18
32.70	22.79	-0.42	27.18
33.78	22.79	-0.44	27.19
34.68	22.77	-0.46	27.18
35.93	22.76	-0.49	27.19
36.96	22.74	-0.51	27.20
37.97	22.74	-0.53	27.21
39.11	22.74	-0.54	27.22
40.27	22.74	-0.55	27.22
41.27	22.73	-0.56	27.22
41.78	22.73	-0.58	27.23
41.78	22.73	-0.58	27.24

REF-4 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.44	21.49	-1.15	26.12
1.79	21.53	-1.25	26.27
1.80	21.51	-1.21	26.21
1.81	21.54	-1.27	26.30
1.83	21.56	-1.27	26.33
1.93	21.53	-1.28	26.29

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-4 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
2.44	21.55	-1.29	26.32
2.88	21.61	-1.29	26.41
3.30	21.62	-1.28	26.42
3.79	21.61	-1.29	26.41
4.18	21.62	-1.29	26.43
4.68	21.62	-1.29	26.42
5.18	21.61	-1.30	26.42
5.87	21.62	-1.32	26.44
6.60	21.62	-1.32	26.45
7.34	21.63	-1.31	26.45
8.19	21.64	-1.31	26.46
8.68	21.63	-1.32	26.46
9.22	21.67	-1.31	26.50
10.09	22.14	-1.18	27.02
11.03	22.68	-0.52	27.14
11.64	22.76	-0.24	26.98
12.44	22.80	-0.12	26.94
13.44	22.81	-0.07	26.90
14.20	22.82	-0.06	26.90
15.13	22.82	-0.07	26.91
15.92	22.79	-0.10	26.90
16.85	22.82	-0.13	26.96
17.72	22.81	-0.15	26.97
18.79	22.80	-0.18	26.99
20.10	22.80	-0.23	27.02
21.04	22.80	-0.26	27.05
22.32	22.80	-0.29	27.08
23.46	22.80	-0.31	27.09
24.49	22.80	-0.33	27.10
25.41	22.80	-0.34	27.11

REF-4 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
26.41	22.80	-0.35	27.13
27.50	22.80	-0.36	27.13
28.45	22.81	-0.37	27.15
29.34	22.81	-0.37	27.15
30.70	22.80	-0.38	27.16
32.04	22.80	-0.39	27.16
33.09	22.80	-0.40	27.17
34.44	22.78	-0.42	27.17
35.72	22.77	-0.44	27.17
37.03	22.76	-0.47	27.18
37.92	22.75	-0.50	27.19
39.04	22.73	-0.52	27.18
40.54	22.72	-0.54	27.20
42.00	22.71	-0.57	27.20
43.34	22.71	-0.60	27.22
44.52	22.70	-0.62	27.23
45.75	22.70	-0.64	27.24
46.80	22.70	-0.65	27.26
47.75	22.69	-0.67	27.26
48.80	22.69	-0.67	27.27
49.91	22.69	-0.68	27.27
51.21	22.69	-0.68	27.27
52.63	22.69	-0.69	27.28
54.02	22.69	-0.70	27.28
55.23	22.69	-0.71	27.29
56.42	22.68	-0.72	27.29
57.78	22.68	-0.72	27.30
58.96	22.69	-0.73	27.30
59.26	22.69	-0.73	27.31

REF-3 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.55	21.48	-1.10	26.08
1.80	21.50	-1.18	26.16
2.15	21.48	-1.22	26.17
2.74	21.49	-1.25	26.21
3.56	21.59	-1.27	26.35
4.24	21.63	-1.26	26.40
4.92	21.61	-1.25	26.37
5.64	21.61	-1.28	26.40
6.38	21.64	-1.27	26.43
7.20	21.62	-1.29	26.42
7.88	21.64	-1.29	26.45
8.66	21.73	-1.29	26.56
9.35	22.34	-0.92	27.04
10.26	22.64	-0.47	27.04
11.07	22.76	-0.19	26.94
11.85	22.76	-0.07	26.83
12.55	22.74	-0.08	26.81
13.58	22.80	-0.08	26.90
14.42	22.81	-0.05	26.88
15.35	22.81	-0.05	26.89
16.05	22.81	-0.08	26.91
16.98	22.79	-0.11	26.91
17.83	22.80	-0.15	26.95
18.87	22.79	-0.17	26.97
19.82	22.80	-0.20	27.00
20.67	22.80	-0.21	27.02
21.51	22.80	-0.24	27.03
22.41	22.80	-0.27	27.06
23.31	22.80	-0.29	27.07
24.20	22.80	-0.30	27.09

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-3 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
25.10	22.80	-0.32	27.10
25.92	22.80	-0.33	27.11
26.63	22.81	-0.33	27.13
27.56	22.81	-0.34	27.13
28.44	22.81	-0.35	27.14
29.20	22.81	-0.35	27.14
30.06	22.81	-0.36	27.15
31.03	22.81	-0.36	27.15
31.96	22.81	-0.37	27.15
33.01	22.80	-0.38	27.15
33.91	22.81	-0.39	27.17
34.96	22.80	-0.40	27.16
35.74	22.79	-0.42	27.18
36.65	22.78	-0.44	27.18
37.51	22.77	-0.45	27.18
38.65	22.74	-0.49	27.17
39.57	22.74	-0.52	27.19
40.45	22.73	-0.54	27.20
41.38	22.72	-0.56	27.21
42.36	22.71	-0.58	27.21
43.28	22.71	-0.59	27.22
44.26	22.71	-0.61	27.23
45.21	22.71	-0.62	27.24
46.13	22.70	-0.62	27.24
46.61	22.70	-0.63	27.24
47.54	22.70	-0.64	27.24
48.20	22.69	-0.65	27.25
48.25	22.70	-0.66	27.26
48.72	22.69	-0.66	27.26
49.76	22.69	-0.67	27.26

REF-3 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
50.86	22.69	-0.68	27.27
51.76	22.69	-0.69	27.27
52.77	22.69	-0.69	27.28
53.60	22.69	-0.70	27.28
54.68	22.69	-0.70	27.28
55.54	22.69	-0.70	27.29
56.36	22.69	-0.71	27.29
57.39	22.69	-0.71	27.29
58.33	22.69	-0.71	27.29
59.43	22.69	-0.72	27.29
60.43	22.68	-0.72	27.29
61.29	22.68	-0.72	27.30
62.33	22.69	-0.73	27.30
63.27	22.69	-0.73	27.30
63.80	22.69	-0.73	27.31
63.81	22.69	-0.73	27.31

REF-2 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.51	21.48	-0.98	25.96
1.67	21.53	-1.10	26.14
1.87	21.45	-1.18	26.09
2.00	21.47	-1.22	26.16
2.03	21.51	-1.25	26.25
2.05	21.52	-1.25	26.26
2.56	21.44	-1.28	26.18
3.27	21.43	-1.30	26.18

REF-2 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
3.32	21.43	-1.30	26.18
3.58	21.43	-1.31	26.19
4.42	21.51	-1.31	26.29
5.41	21.64	-1.28	26.44
6.28	21.65	-1.27	26.45
7.27	21.64	-1.28	26.43
7.92	21.65	-1.30	26.47
8.80	22.00	-1.27	26.90
9.69	22.52	-0.75	27.13
10.41	22.63	-0.41	26.97
11.11	22.68	-0.23	26.88
11.95	22.74	-0.16	26.89
12.73	22.72	-0.11	26.82
13.58	22.78	-0.09	26.87
14.46	22.70	-0.12	26.80
15.30	22.70	-0.20	26.88
16.24	22.75	-0.21	26.95
17.09	22.73	-0.23	26.93
17.97	22.76	-0.25	26.99
19.05	22.75	-0.28	27.00
20.16	22.77	-0.29	27.04
21.22	22.78	-0.30	27.06
22.22	22.79	-0.31	27.08
23.18	22.81	-0.32	27.11
24.20	22.81	-0.32	27.12
25.26	22.81	-0.33	27.13
26.40	22.81	-0.34	27.14
27.43	22.81	-0.35	27.15
28.36	22.81	-0.36	27.16
29.22	22.82	-0.37	27.17

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-2 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
30.30	22.82	-0.37	27.17
31.28	22.82	-0.38	27.18
32.54	22.82	-0.38	27.18
33.59	22.82	-0.39	27.18
34.64	22.81	-0.40	27.19
35.78	22.82	-0.41	27.20
37.01	22.80	-0.43	27.20
38.08	22.81	-0.44	27.22
38.93	22.81	-0.45	27.22
39.85	22.80	-0.46	27.22
41.01	22.78	-0.48	27.21
42.12	22.74	-0.51	27.19
43.36	22.71	-0.56	27.20
44.44	22.71	-0.60	27.22
45.46	22.71	-0.62	27.24
45.52	22.72	-0.63	27.26
45.58	22.72	-0.63	27.27
45.67	22.72	-0.63	27.27
45.68	22.71	-0.63	27.26
45.70	22.72	-0.63	27.27
45.90	22.72	-0.63	27.27
45.98	22.72	-0.63	27.26
46.30	22.72	-0.63	27.27
46.95	22.71	-0.64	27.27
47.74	22.71	-0.65	27.27
48.28	22.71	-0.66	27.27
49.11	22.70	-0.67	27.27
49.96	22.70	-0.67	27.28
50.94	22.70	-0.68	27.28
51.76	22.70	-0.69	27.28

REF-2 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
52.57	22.69	-0.69	27.29
53.16	22.69	-0.70	27.29
53.99	22.69	-0.70	27.29
54.62	22.70	-0.70	27.30
55.61	22.69	-0.71	27.30
56.65	22.69	-0.71	27.30
57.68	22.69	-0.71	27.30
58.63	22.69	-0.72	27.30
59.52	22.69	-0.72	27.30
59.90	22.70	-0.72	27.31

REF-1 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.44	21.38	-0.52	25.45
1.95	21.43	-0.81	25.75
1.96	21.45	-1.14	26.07
1.99	21.44	-1.12	26.04
2.03	21.53	-1.13	26.17
2.03	21.51	-1.14	26.15
2.04	21.47	-1.11	26.07
2.05	21.46	-1.13	26.07
2.12	21.47	-1.02	25.98
2.13	21.55	-1.13	26.18
2.13	21.52	-1.09	26.11
2.13	21.48	-1.11	26.07
2.14	21.50	-1.07	26.06
2.15	21.51	-1.12	26.13

REF-1 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
2.15	21.51	-1.12	26.13
2.19	21.47	-0.95	25.92
2.64	21.40	-1.17	26.03
3.55	21.64	-1.16	26.33
4.42	21.64	-1.11	26.29
5.38	21.64	-1.17	26.33
5.90	21.64	-1.19	26.36
6.89	21.72	-1.19	26.47
7.80	22.11	-1.06	26.87
8.85	22.38	-0.62	26.83
9.88	22.55	-0.36	26.82
10.73	22.54	-0.24	26.70
11.55	22.57	-0.23	26.73
12.48	22.59	-0.23	26.76
13.52	22.63	-0.22	26.80
14.46	22.64	-0.22	26.81
15.36	22.68	-0.22	26.87
16.19	22.70	-0.20	26.87
17.12	22.73	-0.21	26.92
18.17	22.77	-0.22	26.98
19.23	22.79	-0.21	26.99
20.44	22.81	-0.23	27.04
21.58	22.81	-0.25	27.06
22.64	22.82	-0.26	27.07
22.98	22.83	-0.28	27.10

Appendix 3.2-1. Winter Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-0 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.86	21.39	-0.66	25.56
1.92	21.45	-0.76	25.74
1.94	21.48	-0.82	25.82
1.95	21.57	-0.87	25.99
1.95	21.51	-0.86	25.90
1.96	21.55	-0.83	25.93
2.21	21.41	-0.88	25.79
2.59	21.50	-0.89	25.91
2.95	21.53	-0.90	25.97
3.32	21.56	-0.88	25.98
3.71	21.57	-0.88	26.00
4.10	21.61	-0.88	26.04
4.49	21.63	-0.88	26.07
4.82	21.66	-0.89	26.12
5.20	21.69	-0.92	26.19
5.59	21.71	-0.94	26.23
5.72	21.76	-0.93	26.28
5.96	21.73	-0.94	26.26
6.47	21.66	-0.99	26.21
6.85	21.67	-1.04	26.26
7.32	21.71	-1.04	26.31
7.65	21.97	-0.95	26.58
8.13	22.20	-0.67	26.64
8.64	22.24	-0.51	26.55
9.11	22.31	-0.43	26.57
9.60	22.38	-0.34	26.58
10.20	22.44	-0.29	26.62
10.82	22.50	-0.23	26.64
11.29	22.53	-0.20	26.65
11.56	22.55	-0.18	26.67

REF-0 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
12.18	22.60	-0.16	26.70
12.75	22.62	-0.14	26.72
13.24	22.64	-0.13	26.73
13.77	22.67	-0.12	26.76
14.27	22.68	-0.11	26.77
14.83	22.71	-0.11	26.80
15.38	22.72	-0.10	26.81
15.98	22.72	-0.10	26.82
16.47	22.74	-0.10	26.84
16.98	22.75	-0.11	26.86
17.54	22.76	-0.12	26.88
18.22	22.77	-0.13	26.90
18.90	22.78	-0.15	26.93
19.59	22.79	-0.16	26.96
20.25	22.80	-0.17	26.97
20.86	22.79	-0.18	26.97
21.54	22.80	-0.19	26.98
22.13	22.81	-0.19	27.00
22.71	22.80	-0.19	27.00
23.41	22.80	-0.20	27.00
24.11	22.81	-0.20	27.01
24.75	22.80	-0.21	27.01
25.49	22.81	-0.21	27.01
26.28	22.81	-0.22	27.02
27.08	22.82	-0.23	27.05
27.89	22.82	-0.25	27.06
28.92	22.82	-0.26	27.08
29.93	22.83	-0.27	27.09
30.76	22.83	-0.28	27.11
31.58	22.83	-0.28	27.11

REF-0 (continued) 26-Apr-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
32.52	22.84	-0.29	27.12
33.45	22.84	-0.29	27.12
34.67	22.84	-0.30	27.14
35.82	22.84	-0.32	27.15
36.77	22.84	-0.33	27.16
37.73	22.84	-0.34	27.17
39.03	22.85	-0.35	27.18
40.15	22.85	-0.35	27.19
41.19	22.85	-0.37	27.20
42.20	22.85	-0.38	27.21
43.18	22.85	-0.39	27.22
44.15	22.85	-0.39	27.23
45.03	22.86	-0.40	27.24
45.49	22.86	-0.41	27.24
45.53	22.86	-0.41	27.25

Appendix 3.2-2

Summer and Fall Marine CTD Data for Roberts Bay and
Reference Bay, Hope Bay Belt Project, 2010

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

RBE 20-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.65	24.27	8.74	22.03
1.09	24.27	8.70	22.06
1.24	24.29	8.74	22.05
1.46	24.28	8.65	22.11
1.51	24.24	8.68	22.04
1.51	24.08	8.67	21.89

RBE 15-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.73	5.75	10.99	4.36
0.75	5.53	10.99	4.18
0.76	5.97	10.95	4.55
0.78	5.95	10.96	4.53
0.80	6.16	10.63	4.75
0.82	5.97	10.87	4.56
0.82	5.65	11.00	4.28
0.83	6.07	10.79	4.65
0.83	5.90	10.95	4.49
0.84	5.75	10.99	4.36
0.85	5.83	10.98	4.43
0.85	6.10	10.90	4.66
0.86	6.16	10.89	4.71
0.86	6.25	10.89	4.79
0.86	5.93	10.91	4.52
0.86	6.21	10.91	4.75
0.88	5.97	10.92	4.55
0.88	6.27	10.89	4.80
0.89	6.25	10.89	4.78

RBE 15-Aug-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.90	6.27	10.89	4.80

RBE 30-Sep-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.76	23.17	3.37	24.53
1.25	23.17	3.37	24.54
1.66	23.17	3.38	24.53
2.24	23.18	3.39	24.53
2.71	23.19	3.41	24.52
3.73	23.24	3.43	24.57
3.91	23.26	3.43	24.59

RBW 20-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.81	24.28	8.95	21.91
1.43	24.28	8.95	21.91
1.98	24.27	8.85	21.97
2.49	24.29	8.84	21.99
2.93	24.27	8.76	22.02
3.43	24.28	8.67	22.09
3.99	24.34	8.57	22.21
4.53	24.22	8.39	22.21
4.72	24.26	7.99	22.49

RBW 15-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
1.32	25.39	11.23	21.61
2.50	25.44	11.24	21.65
3.73	25.92	11.26	22.09
3.40	25.79	11.32	21.94

RBW 30-Sep-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.85	23.66	3.72	24.84
1.49	23.68	3.72	24.86
2.18	23.67	3.71	24.85
2.85	23.67	3.71	24.85
3.60	23.67	3.71	24.86
4.89	23.67	3.69	24.87
4.22	23.68	3.69	24.88

DWP 15-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
1.58	26.68	10.70	23.16
2.79	26.70	10.80	23.11
3.59	26.69	10.85	23.07
4.27	26.73	10.82	23.12
5.02	26.72	10.84	23.11
5.77	26.72	10.84	23.11
6.39	26.73	10.85	23.10
7.18	26.73	10.82	23.13
8.20	26.73	10.84	23.11

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

DWP (continued) 15-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
8.85	26.73	10.84	23.11
10.10	26.73	10.85	23.10
10.96	26.72	10.85	23.10

ST2 21-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.68	24.47	9.36	21.85
1.01	24.48	8.97	22.10
1.72	24.47	8.71	22.26
2.54	24.47	8.58	22.34
3.70	24.49	8.50	22.40
4.69	24.46	8.36	22.46
5.35	24.41	8.04	22.62
6.26	24.36	7.64	22.83
6.49	24.35	7.56	22.87

ST2 15-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.76	25.49	14.31	20.01
1.19	25.51	12.89	20.79
1.92	25.51	12.31	21.11
2.46	25.53	12.01	21.29
2.94	25.65	11.76	21.55
3.45	25.75	11.65	21.70
3.61	25.78	11.57	21.78
3.88	26.00	11.51	22.02

ST2 15-Aug-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
3.75	25.97	11.45	22.02
4.37	25.93	11.47	21.97

ST3 21-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.51	24.07	8.31	22.10
0.62	24.07	8.23	22.15
0.84	24.07	8.19	22.17
2.10	24.07	8.14	22.21
3.03	24.07	8.12	22.22
3.93	24.07	8.11	22.23
4.68	24.08	8.09	22.25
5.79	24.25	8.00	22.47
6.68	24.20	7.30	22.88
8.21	24.11	6.71	23.18
9.68	24.01	6.24	23.40

ST3 15-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.65	26.82	11.67	22.69
1.15	26.82	11.53	22.78
1.82	26.82	11.47	22.81
2.67	26.83	11.43	22.84
3.04	26.83	11.40	22.86
3.80	26.82	11.40	22.86
4.56	26.82	11.39	22.85

ST3 15-Aug-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
5.34	26.82	11.37	22.86
5.96	26.82	11.35	22.88
6.70	26.81	11.34	22.87
7.25	26.79	11.30	22.88
8.18	26.77	11.26	22.89
8.84	26.77	11.24	22.90
9.28	26.76	11.20	22.91
9.38	26.76	11.18	22.92

ST4 21-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.70	23.70	8.10	21.86
1.57	23.70	8.06	21.88
3.95	23.93	7.97	22.18
5.16	24.20	7.73	22.61
6.04	24.21	7.36	22.86
7.07	24.04	7.06	22.88
7.93	23.97	6.62	23.10
8.31	23.99	6.08	23.48
8.92	23.94	5.63	23.75
9.91	23.69	4.71	24.13
11.04	23.59	3.87	24.64
12.38	23.76	3.30	25.27
13.51	23.55	2.37	25.76
14.43	23.47	1.83	26.10
15.59	23.36	1.56	26.20
16.64	23.28	1.25	26.36
17.41	23.25	1.06	26.47

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST4 21-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
18.54	23.17	0.87	26.54
19.91	23.13	0.69	26.64
21.96	23.03	0.54	26.65
24.31	23.01	0.30	26.83
26.05	22.99	0.18	26.90
28.52	22.96	0.06	26.97
30.80	22.92	-0.03	27.00
32.73	22.92	0.00	27.08
34.60	22.90	-0.17	27.09
36.09	22.89	-0.20	27.11
37.50	22.89	-0.24	27.14
39.07	22.89	-0.27	27.16
40.92	22.88	-0.30	27.17
42.32	22.88	-0.32	27.20
43.17	22.86	-0.35	27.20
44.10	22.86	-0.34	27.20
45.48	22.85	-0.37	27.20
46.99	22.85	-0.41	27.24
48.80	22.83	-0.44	27.25

ST4 15-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.86	26.72	10.71	23.18
2.28	26.72	10.69	23.20
3.70	26.72	10.68	23.20
4.83	26.72	10.64	23.22
5.92	26.69	10.36	23.38
6.15	26.71	10.52	23.29

ST4 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
6.19	26.71	10.62	23.24
6.21	26.71	10.60	23.25
6.24	26.71	10.46	23.33
6.25	26.70	10.58	23.25
6.30	26.71	10.60	23.25
6.89	26.70	10.05	23.59
8.75	26.70	9.11	24.21
10.40	26.06	6.42	25.46
12.47	24.86	3.11	26.71
14.38	24.07	1.95	26.73
14.60	23.97	1.87	26.69
14.84	23.98	2.10	26.50
14.96	23.89	1.73	26.70
15.19	23.91	1.94	26.55
15.20	23.93	2.13	26.42
15.33	23.85	1.53	26.82
15.53	23.89	1.99	26.48
15.92	23.86	1.94	26.49
16.45	23.67	1.22	26.86
16.75	23.58	1.10	26.85
17.77	23.51	1.04	26.82
18.35	23.51	1.00	26.86
19.01	23.44	0.89	26.86
19.23	23.44	0.87	26.87
19.76	23.42	0.82	26.90
20.20	23.40	0.74	26.93
21.12	23.36	0.67	26.96
21.69	23.31	0.56	26.99
22.12	23.27	0.49	27.00
23.35	23.24	0.43	27.01

ST4 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
23.70	23.23	0.39	27.03
23.76	23.20	0.33	27.05
24.16	23.17	0.27	27.05
24.97	23.15	0.19	27.10
25.56	23.12	0.21	27.05
25.61	23.13	0.20	27.07
25.75	23.11	0.20	27.04
25.86	23.11	0.16	27.08
25.87	23.10	0.19	27.04
25.89	23.10	0.14	27.09
25.92	23.10	0.16	27.07
26.07	23.11	0.18	27.06
26.20	23.11	0.18	27.06
26.32	23.08	0.06	27.12
26.51	23.09	0.14	27.07
26.56	23.09	0.18	27.03
26.60	23.09	0.15	27.06
26.67	23.10	0.14	27.07
26.97	23.06	0.01	27.14
28.34	23.04	-0.02	27.15
29.38	23.04	-0.06	27.17
30.33	23.00	-0.11	27.17
31.00	22.99	-0.12	27.17
31.03	22.99	-0.13	27.18
31.09	22.99	-0.12	27.16
31.17	22.99	-0.14	27.19
31.27	22.98	-0.16	27.19
31.98	22.97	-0.17	27.18
32.00	22.96	-0.17	27.18
32.74	22.96	-0.18	27.19

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST4 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
32.74	22.97	-0.19	27.20
33.02	22.96	-0.20	27.20
33.06	22.96	-0.22	27.21
33.85	22.95	-0.25	27.23
34.71	22.94	-0.28	27.25
35.88	22.92	-0.32	27.25
36.91	22.91	-0.34	27.26
37.94	22.91	-0.36	27.27
39.22	22.89	-0.39	27.27
40.23	22.87	-0.40	27.26
41.07	22.87	-0.41	27.27
41.19	22.87	-0.40	27.27
41.19	22.86	-0.39	27.24
41.39	22.87	-0.41	27.26
41.42	22.87	-0.42	27.27
41.46	22.87	-0.39	27.26
41.49	22.86	-0.41	27.26
41.75	22.87	-0.39	27.25
42.41	22.87	-0.45	27.30
43.71	22.84	-0.48	27.29
43.96	22.84	-0.49	27.30
44.10	22.84	-0.44	27.25
44.15	22.84	-0.46	27.27
44.16	22.84	-0.45	27.26
44.20	22.84	-0.44	27.26
44.33	22.84	-0.45	27.26
44.38	22.83	-0.45	27.25
44.43	22.83	-0.43	27.24
44.44	22.84	-0.45	27.27
44.49	22.84	-0.44	27.26

ST4 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
44.51	22.84	-0.43	27.25
44.52	22.84	-0.45	27.26
44.55	22.85	-0.45	27.26
44.56	22.84	-0.45	27.26
44.60	22.84	-0.43	27.25
44.60	22.84	-0.45	27.26
44.67	22.85	-0.46	27.28
44.71	22.84	-0.45	27.25
44.71	22.84	-0.45	27.26
44.72	22.84	-0.44	27.25
44.74	22.84	-0.42	27.24
44.77	22.84	-0.45	27.26
44.85	22.85	-0.42	27.25
44.92	22.85	-0.41	27.24
44.99	22.84	-0.43	27.25
45.06	22.84	-0.45	27.26
45.07	22.85	-0.40	27.24
45.08	22.85	-0.40	27.23
45.23	22.85	-0.37	27.19

ST4 01-Oct-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.99	23.36	3.45	24.69
1.61	23.35	3.45	24.68
2.26	23.35	3.45	24.69
2.81	23.36	3.46	24.69
3.39	23.36	3.46	24.69
4.03	23.36	3.46	24.69

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
4.54	23.38	3.47	24.70
5.06	23.41	3.49	24.72
5.73	23.43	3.52	24.73
6.40	23.48	3.57	24.74
6.86	23.55	3.59	24.80
7.35	23.59	3.60	24.84
7.94	23.60	3.61	24.85
8.48	23.61	3.62	24.86
9.02	23.61	3.64	24.84
9.56	23.69	3.64	24.92
9.97	23.67	3.62	24.92
10.32	23.66	3.62	24.91
10.64	23.68	3.63	24.92
11.13	23.69	3.63	24.94
11.65	23.71	3.63	24.96
12.06	23.72	3.63	24.96
12.41	23.72	3.63	24.97
12.76	23.72	3.64	24.96
13.13	23.73	3.65	24.96
13.57	23.78	3.69	24.99
14.02	23.82	3.71	25.02
14.40	23.84	3.71	25.04
14.79	23.86	3.71	25.06
15.11	23.86	3.71	25.07
15.45	23.86	3.69	25.08
15.90	23.90	3.70	25.12
16.26	23.93	3.68	25.17
16.74	24.02	3.63	25.32
17.15	24.02	3.52	25.40
17.71	24.31	3.14	26.04

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
18.25	24.24	2.74	26.29
18.78	24.22	2.60	26.37
19.28	24.18	2.50	26.41
19.69	24.16	2.43	26.44
20.11	24.13	2.34	26.48
20.41	24.09	2.23	26.52
20.68	24.05	2.08	26.61
21.08	24.00	1.89	26.70
21.50	23.92	1.77	26.70
21.88	23.88	1.65	26.76
22.19	23.81	1.50	26.80
22.43	23.75	1.39	26.82
22.63	23.70	1.33	26.80
22.74	23.69	1.24	26.87
22.98	23.67	1.18	26.89
23.35	23.64	1.10	26.92
23.72	23.60	1.05	26.91
24.07	23.58	1.01	26.94
24.55	23.57	0.93	26.98
24.98	23.52	0.86	26.99
25.26	23.50	0.80	27.01
25.63	23.46	0.71	27.04
26.10	23.42	0.64	27.04
26.60	23.39	0.59	27.06
27.05	23.37	0.55	27.06
27.42	23.36	0.54	27.06
27.85	23.36	0.51	27.08
28.22	23.33	0.43	27.11
28.60	23.30	0.38	27.12
29.07	23.28	0.35	27.12

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
29.41	23.26	0.31	27.13
30.01	23.25	0.24	27.18
30.47	23.20	0.18	27.17
30.81	23.19	0.15	27.18
31.32	23.16	0.11	27.18
31.70	23.14	0.09	27.18
32.03	23.14	0.07	27.19
32.27	23.14	0.06	27.19
32.63	23.13	0.05	27.20
32.92	23.12	0.03	27.20
33.19	23.11	0.01	27.20
33.51	23.10	-0.03	27.23
33.83	23.08	-0.08	27.24
34.28	23.06	-0.10	27.24
34.68	23.05	-0.12	27.24
35.07	23.04	-0.13	27.24
35.55	23.04	-0.14	27.25
35.89	23.03	-0.15	27.24
36.18	23.03	-0.16	27.25
36.53	23.02	-0.17	27.26
36.92	23.03	-0.18	27.27
37.27	23.01	-0.21	27.28
37.67	23.00	-0.23	27.27
38.11	23.00	-0.25	27.29
38.39	22.98	-0.26	27.28
38.68	22.98	-0.27	27.29
39.05	22.97	-0.29	27.29
39.50	22.97	-0.29	27.29
39.86	22.97	-0.30	27.30
40.29	22.96	-0.31	27.30

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
40.74	22.96	-0.33	27.31
41.09	22.96	-0.34	27.31
41.47	22.95	-0.35	27.31
41.98	22.94	-0.35	27.31
42.45	22.94	-0.36	27.31
42.52	22.94	-0.36	27.31
42.56	22.94	-0.36	27.31
42.66	22.94	-0.36	27.31
42.78	22.94	-0.37	27.32
43.07	22.93	-0.38	27.32
43.47	22.93	-0.38	27.32
43.70	22.94	-0.38	27.33
43.93	22.94	-0.38	27.33
44.10	22.94	-0.38	27.32
44.28	22.93	-0.38	27.32
44.46	22.94	-0.38	27.33
44.53	22.93	-0.38	27.32
44.59	22.94	-0.38	27.33
44.77	22.94	-0.38	27.33
44.93	22.93	-0.39	27.33
45.07	22.93	-0.39	27.33
45.27	22.94	-0.40	27.34
45.57	22.93	-0.41	27.34
45.88	22.93	-0.42	27.35
46.15	22.92	-0.42	27.35
46.57	22.92	-0.43	27.34
46.99	22.92	-0.43	27.34
47.58	22.92	-0.43	27.35
47.84	22.92	-0.43	27.35
47.85	22.92	-0.43	27.35

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
48.02	22.92	-0.44	27.35
48.35	22.91	-0.44	27.35
48.35	22.92	-0.44	27.35
48.63	22.92	-0.45	27.36
49.07	22.91	-0.46	27.36
49.56	22.91	-0.46	27.36
49.82	22.91	-0.47	27.36
50.14	22.91	-0.47	27.36
50.39	22.91	-0.47	27.36
50.49	22.90	-0.47	27.36
50.61	22.90	-0.48	27.37
50.83	22.91	-0.48	27.37
51.07	22.90	-0.48	27.36
51.34	22.90	-0.48	27.36
51.48	22.90	-0.49	27.37
51.74	22.90	-0.49	27.37
52.09	22.90	-0.50	27.38
52.56	22.89	-0.51	27.38
52.94	22.88	-0.52	27.37
53.42	22.89	-0.52	27.38
53.89	22.89	-0.52	27.38
54.32	22.88	-0.52	27.38
54.83	22.88	-0.53	27.38
55.38	22.88	-0.53	27.38
55.63	22.89	-0.53	27.39
55.81	22.88	-0.53	27.38
55.91	22.88	-0.53	27.38
56.04	22.88	-0.53	27.38
56.23	22.88	-0.53	27.38
56.35	22.88	-0.52	27.37

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
56.35	22.89	-0.53	27.38
56.38	22.88	-0.53	27.38
56.40	22.89	-0.53	27.39
56.45	22.88	-0.53	27.38
56.57	22.88	-0.52	27.38
56.73	22.88	-0.53	27.38
56.84	22.88	-0.53	27.38
56.92	22.88	-0.52	27.38
56.95	22.88	-0.52	27.38
56.99	22.88	-0.52	27.37
57.02	22.89	-0.52	27.38
57.03	22.88	-0.52	27.38
57.04	22.89	-0.52	27.38
57.09	22.88	-0.54	27.38
57.11	22.88	-0.52	27.37
57.13	22.89	-0.52	27.38
57.14	22.87	-0.55	27.39
57.19	22.88	-0.52	27.38
57.23	22.88	-0.52	27.38
57.30	22.88	-0.54	27.38
57.30	22.88	-0.53	27.38
57.40	22.87	-0.53	27.37
57.43	22.88	-0.53	27.38
57.44	22.88	-0.53	27.39
57.47	22.88	-0.53	27.38
57.48	22.87	-0.54	27.38
57.48	22.88	-0.54	27.38
57.51	22.87	-0.54	27.38
57.55	22.88	-0.54	27.38
57.59	22.87	-0.55	27.39

ST4 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
57.70	22.87	-0.54	27.38
57.77	22.87	-0.54	27.38
57.84	22.87	-0.53	27.37
57.92	22.87	-0.52	27.36
57.99	22.87	-0.53	27.37
58.00	22.87	-0.53	27.36
58.09	22.87	-0.53	27.37
58.27	22.88	-0.52	27.37
58.42	22.87	-0.53	27.37
58.60	22.87	-0.52	27.36
58.63	22.87	-0.53	27.36
58.65	22.87	-0.53	27.37
58.71	22.87	-0.54	27.38
58.76	22.87	-0.54	27.38
58.94	22.87	-0.53	27.37
58.97	22.86	-0.48	27.31

ST5 21-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
0.50	23.52	7.94	21.78
0.67	23.51	7.93	21.77
1.09	23.51	7.91	21.79
1.91	23.52	7.90	21.81
2.48	23.54	7.88	21.84
2.60	23.53	7.88	21.83
3.52	23.59	7.85	21.91
4.27	24.10	7.61	22.58
4.92	24.03	7.06	22.87

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST5 21-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
5.79	24.10	6.89	23.05
6.52	24.07	6.81	23.08
7.28	24.12	6.71	23.19
7.92	24.01	6.54	23.20
8.51	23.89	6.10	23.37
9.24	23.78	5.22	23.86
9.95	23.79	4.60	24.32
10.31	23.68	4.02	24.62
11.13	23.63	3.39	25.05
11.88	23.54	2.90	25.32
12.62	23.60	2.50	25.71
13.55	23.52	2.24	25.83
14.40	23.48	1.92	26.05
15.17	23.37	1.47	26.28
16.27	23.31	1.18	26.45
16.85	23.25	0.75	26.74
17.08	23.24	0.78	26.70
17.24	23.26	0.95	26.58
17.54	23.24	0.74	26.75
17.60	23.21	0.75	26.70
17.78	23.19	0.79	26.63
17.90	23.17	0.65	26.72
18.59	23.14	0.51	26.81
19.17	23.11	0.44	26.83
19.28	23.10	0.43	26.83
19.31	23.09	0.38	26.86
20.34	23.07	0.30	26.91
21.59	23.03	0.21	26.94
22.14	23.01	0.16	26.96
22.65	23.01	0.12	26.98

ST5 21-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
24.64	22.98	0.06	26.99
26.41	22.95	-0.06	27.07
29.09	22.93	-0.15	27.11
30.60	22.91	-0.21	27.15
32.14	22.93	-0.23	27.19
32.90	22.93	-0.24	27.20
33.78	22.92	-0.25	27.19
34.76	22.90	-0.27	27.19
35.61	22.90	-0.29	27.20
36.17	22.89	-0.31	27.21
36.19	22.90	-0.33	27.23
36.44	22.90	-0.33	27.23
36.68	22.90	-0.33	27.23
37.28	22.89	-0.36	27.25
38.14	22.89	-0.35	27.24
39.05	22.90	-0.37	27.27
39.68	22.89	-0.37	27.25
41.16	22.88	-0.38	27.25
43.27	22.88	-0.41	27.28
45.72	22.86	-0.43	27.27
47.98	22.86	-0.47	27.31
50.13	22.87	-0.45	27.31
52.15	22.86	-0.47	27.30
53.88	22.82	-0.52	27.30
55.18	22.81	-0.55	27.31
56.72	22.81	-0.57	27.32
58.07	22.81	-0.58	27.33
59.39	22.81	-0.60	27.35
60.94	22.81	-0.60	27.34
62.58	22.81	-0.60	27.35

ST5 21-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
64.25	22.80	-0.59	27.33
66.13	22.81	-0.61	27.36
68.37	22.80	-0.63	27.37
69.21	22.81	-0.63	27.37

ST5 15-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.15	26.77	10.77	23.20
3.21	26.77	10.72	23.23
4.86	26.76	10.65	23.26
5.05	26.74	10.63	23.26
5.10	26.75	10.60	23.29
5.15	26.74	10.62	23.27
5.29	26.74	10.64	23.25
5.36	26.74	10.46	23.37
6.63	26.64	10.19	23.44
7.81	26.58	10.06	23.47
7.83	26.59	9.78	23.66
8.47	26.58	9.07	24.12
9.71	26.21	6.99	25.21
11.76	25.48	4.63	26.20
13.32	24.67	3.41	26.24
13.36	24.58	3.75	25.87
13.69	24.56	3.69	25.88
14.03	24.60	2.32	27.06
15.29	23.83	1.45	26.86
16.89	23.66	1.08	26.97
17.56	23.53	1.02	26.86

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST5 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
17.86	23.51	1.08	26.78
17.98	23.50	1.07	26.79
18.05	23.50	1.08	26.77
18.17	23.50	1.07	26.78
18.23	23.50	1.08	26.77
18.27	23.50	1.07	26.77
18.40	23.47	0.87	26.92
19.05	23.43	0.85	26.88
19.22	23.43	0.81	26.91
19.90	23.42	0.68	27.01
20.96	23.32	0.47	27.07
22.04	23.22	0.35	27.05
22.72	23.20	0.30	27.06
22.86	23.20	0.25	27.11
24.04	23.14	0.19	27.09
24.29	23.15	0.16	27.13
24.98	23.12	0.10	27.15
26.11	23.09	0.01	27.18
27.05	23.05	-0.06	27.20
27.64	23.03	-0.12	27.21
27.84	23.03	-0.10	27.20
28.07	23.01	-0.08	27.16
28.24	23.01	-0.08	27.16
28.29	23.00	-0.09	27.16
28.45	22.99	-0.16	27.20
28.53	23.00	-0.09	27.15
28.70	23.00	-0.11	27.17
28.76	23.00	-0.10	27.16
28.79	23.00	-0.12	27.18
28.90	23.00	-0.11	27.18

ST5 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
28.94	22.99	-0.21	27.24
28.97	23.00	-0.11	27.17
29.00	23.00	-0.11	27.17
29.13	22.99	-0.12	27.17
30.13	22.95	-0.26	27.24
31.37	22.95	-0.29	27.27
32.42	22.91	-0.35	27.28
33.47	22.89	-0.39	27.27
34.63	22.88	-0.41	27.28
35.80	22.89	-0.41	27.29
36.98	22.90	-0.41	27.31
38.14	22.89	-0.44	27.33
39.34	22.88	-0.45	27.31
40.65	22.87	-0.45	27.30
41.16	22.87	-0.45	27.30
41.21	22.87	-0.48	27.34
41.22	22.87	-0.46	27.31
41.30	22.87	-0.46	27.31
41.38	22.87	-0.47	27.31
41.43	22.87	-0.46	27.31
41.51	22.86	-0.46	27.31
42.11	22.86	-0.50	27.33
43.08	22.85	-0.52	27.33
44.11	22.84	-0.52	27.33
44.94	22.84	-0.53	27.34
45.84	22.84	-0.53	27.33
46.25	22.83	-0.55	27.34
46.36	22.83	-0.57	27.35
47.37	22.83	-0.59	27.37
48.32	22.82	-0.60	27.36

ST5 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
49.45	22.81	-0.61	27.37
50.46	22.81	-0.61	27.37
51.53	22.80	-0.62	27.37
52.47	22.80	-0.62	27.37
53.30	22.80	-0.63	27.37
54.43	22.80	-0.64	27.37
55.70	22.80	-0.64	27.37
55.78	22.79	-0.63	27.36
55.88	22.80	-0.65	27.38
55.88	22.79	-0.64	27.36
55.92	22.80	-0.64	27.38
56.04	22.79	-0.65	27.37
56.86	22.80	-0.65	27.38
58.09	22.81	-0.64	27.39
59.11	22.80	-0.63	27.37
60.02	22.80	-0.63	27.37
60.46	22.80	-0.63	27.37
60.55	22.80	-0.61	27.35

ST5 01-Oct-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.66	23.29	3.40	24.66
1.36	23.29	3.41	24.65
2.06	23.29	3.44	24.62
2.70	23.35	3.47	24.66
3.19	23.37	3.55	24.64
3.87	23.56	3.59	24.82
4.55	23.56	3.59	24.82

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST5 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
5.14	23.58	3.60	24.83
5.83	23.59	3.61	24.84
6.45	23.60	3.61	24.85
7.04	23.60	3.61	24.85
7.52	23.61	3.61	24.85
8.18	23.61	3.61	24.86
8.76	23.61	3.61	24.86
9.23	23.61	3.61	24.86
9.80	23.61	3.61	24.86
10.31	23.62	3.61	24.87
10.80	23.62	3.61	24.87
11.46	23.62	3.61	24.87
12.01	23.62	3.61	24.87
12.67	23.62	3.61	24.87
13.32	23.63	3.62	24.88
13.71	23.68	3.63	24.92
13.79	23.68	3.65	24.91
14.21	23.69	3.64	24.92
14.70	23.69	3.65	24.92
15.33	23.70	3.65	24.92
15.91	23.71	3.65	24.94
16.23	23.73	3.66	24.96
16.34	23.72	3.65	24.95
16.55	23.74	3.66	24.97
16.57	23.76	3.67	24.98
17.00	24.12	3.56	25.48
17.27	24.12	3.51	25.53
17.61	24.25	3.36	25.80
17.94	24.28	2.97	26.14
18.40	24.23	2.68	26.32

ST5 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
18.89	24.20	2.44	26.47
19.37	24.08	2.02	26.69
19.89	23.95	1.93	26.61
20.48	23.93	1.89	26.62
20.98	23.92	1.81	26.67
21.46	23.87	1.67	26.72
21.89	23.83	1.60	26.74
22.42	23.80	1.51	26.77
22.98	23.77	1.46	26.78
23.55	23.75	1.38	26.82
24.08	23.72	1.24	26.91
24.51	23.61	1.06	26.93
25.06	23.57	1.00	26.92
25.62	23.55	0.99	26.91
26.14	23.55	0.97	26.93
26.68	23.53	0.96	26.92
27.38	23.54	0.95	26.93
27.94	23.53	0.94	26.93
28.19	23.53	0.93	26.94
28.72	23.53	0.90	26.96
29.24	23.53	0.85	26.99
29.75	23.52	0.72	27.10
30.31	23.48	0.37	27.37
30.79	23.19	0.09	27.24
31.23	23.10	-0.01	27.21
31.73	23.08	-0.03	27.21
32.12	23.08	-0.05	27.22
32.62	23.07	-0.06	27.22
33.08	23.06	-0.08	27.23
33.53	23.05	-0.09	27.22

ST5 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
33.73	23.06	-0.09	27.23
34.20	23.06	-0.09	27.23
34.61	23.05	-0.11	27.24
35.14	23.04	-0.13	27.24
35.56	23.04	-0.14	27.25
36.10	23.04	-0.17	27.27
36.66	23.03	-0.22	27.30
37.14	22.99	-0.30	27.32
37.54	22.96	-0.33	27.31
37.95	22.94	-0.34	27.30
38.44	22.95	-0.34	27.32
38.94	22.95	-0.34	27.32
39.47	22.95	-0.34	27.31
39.99	22.95	-0.34	27.30
40.53	22.95	-0.34	27.31
41.09	22.95	-0.34	27.31
41.73	22.95	-0.34	27.32
42.32	22.96	-0.35	27.33
42.74	22.95	-0.37	27.33
43.25	22.94	-0.37	27.32
43.77	22.95	-0.38	27.34
44.28	22.94	-0.39	27.33
44.83	22.94	-0.41	27.36
45.43	22.92	-0.46	27.38
46.03	22.90	-0.48	27.37
46.73	22.90	-0.49	27.37
47.36	22.89	-0.50	27.37
48.01	22.88	-0.51	27.37
48.78	22.88	-0.51	27.38
49.44	22.89	-0.52	27.38

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST5 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
50.22	22.88	-0.52	27.38
50.95	22.88	-0.52	27.38
51.79	22.89	-0.53	27.39
52.55	22.89	-0.53	27.40
53.56	22.88	-0.54	27.38
54.31	22.88	-0.54	27.39
55.12	22.88	-0.55	27.40
55.95	22.88	-0.56	27.41
56.90	22.88	-0.57	27.42
57.90	22.87	-0.58	27.41
58.85	22.87	-0.59	27.42
59.88	22.87	-0.59	27.41
60.80	22.87	-0.59	27.42
61.87	22.87	-0.59	27.42
62.88	22.87	-0.60	27.42
63.89	22.87	-0.60	27.42
64.90	22.87	-0.60	27.43
66.06	22.87	-0.60	27.42
67.14	22.87	-0.60	27.43
68.21	22.87	-0.60	27.43
69.27	22.87	-0.60	27.42
70.30	22.87	-0.59	27.41
70.97	22.87	-0.58	27.41
71.07	22.87	-0.58	27.41
71.16	22.87	-0.58	27.40
71.27	22.87	-0.58	27.40
71.43	22.88	-0.58	27.41
71.61	22.87	-0.59	27.41
71.74	22.88	-0.58	27.42
71.92	22.88	-0.58	27.41

ST5 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
72.12	22.88	-0.58	27.41
72.31	22.88	-0.57	27.40
72.42	22.87	-0.58	27.40
72.54	22.87	-0.58	27.40
72.64	22.87	-0.58	27.41
72.80	22.88	-0.58	27.42
73.01	22.87	-0.59	27.41
73.34	22.87	-0.58	27.41
73.54	22.88	-0.57	27.41
73.78	22.87	-0.58	27.41
74.03	22.87	-0.59	27.42
74.15	22.87	-0.59	27.41
74.33	22.88	-0.59	27.42
74.57	22.88	-0.58	27.41
74.80	22.87	-0.58	27.41
74.96	22.87	-0.58	27.41
75.17	22.87	-0.59	27.41
75.39	22.87	-0.58	27.41
75.60	22.88	-0.57	27.41
75.82	22.87	-0.58	27.40
76.05	22.88	-0.56	27.39
76.29	22.87	-0.56	27.39
76.47	22.88	-0.57	27.40
76.68	22.88	-0.57	27.40
76.95	22.88	-0.56	27.40
77.22	22.87	-0.56	27.39
77.44	22.88	-0.56	27.39
77.69	22.87	-0.56	27.39
77.98	22.88	-0.58	27.41
78.28	22.88	-0.58	27.41

ST5 01-Oct-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
78.65	22.87	-0.58	27.40
79.07	22.87	-0.57	27.40

ST6 15-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.03	26.73	10.12	23.57
1.21	26.74	10.31	23.46
1.98	26.74	10.39	23.41
2.67	26.74	10.46	23.37
3.08	26.75	10.50	23.35
4.06	26.75	10.53	23.33
4.79	26.75	10.52	23.33
5.34	26.75	10.54	23.32
6.56	26.74	10.53	23.32
7.04	26.75	10.53	23.33
8.03	26.70	10.50	23.30
8.84	26.66	10.42	23.31
9.72	26.53	10.29	23.27
10.43	26.03	9.96	23.00
11.20	25.80	8.80	23.52
12.20	25.60	8.06	23.81
13.16	24.51	6.41	23.80
14.14	24.13	4.22	24.98
15.03	24.06	3.20	25.70
15.52	23.92	2.81	25.85
16.90	23.70	2.25	26.04
17.83	23.52	1.87	26.13
18.74	23.44	1.46	26.38

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST6 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
19.66	23.42	1.17	26.60
20.30	23.38	1.07	26.63
21.18	23.30	0.90	26.68
22.36	23.28	0.78	26.75
23.26	23.24	0.70	26.77
24.17	23.20	0.57	26.83
25.11	23.18	0.47	26.90
26.23	23.16	0.42	26.92
27.16	23.16	0.39	26.94
28.08	23.10	0.34	26.91
28.69	23.06	0.22	26.97
29.49	23.05	0.17	26.99
30.61	23.04	0.12	27.02
31.65	23.03	0.07	27.05
32.60	23.01	0.03	27.06
33.69	22.96	-0.03	27.05
34.33	22.95	-0.12	27.12
35.06	22.94	-0.17	27.15
35.54	22.94	-0.21	27.18
36.54	22.92	-0.23	27.17
37.72	22.93	-0.27	27.22
38.80	22.90	-0.26	27.18
39.54	22.91	-0.30	27.22
41.00	22.87	-0.33	27.20
42.03	22.85	-0.41	27.24
42.97	22.84	-0.44	27.26
44.01	22.83	-0.45	27.25
45.00	22.84	-0.49	27.29
46.23	22.83	-0.50	27.30
47.26	22.83	-0.52	27.31

ST6 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
48.16	22.82	-0.54	27.32
49.43	22.82	-0.56	27.34
50.34	22.82	-0.55	27.32
51.14	22.81	-0.57	27.33
51.90	22.81	-0.59	27.35
52.92	22.81	-0.60	27.35
53.62	22.80	-0.59	27.33
54.28	22.80	-0.61	27.35
54.97	22.81	-0.60	27.34
55.90	22.81	-0.62	27.37
56.87	22.80	-0.61	27.35
58.02	22.81	-0.62	27.37
58.51	22.81	-0.64	27.38
59.34	22.80	-0.64	27.38
60.29	22.80	-0.64	27.38
60.97	22.80	-0.67	27.40
60.99	22.79	-0.66	27.38
61.01	22.80	-0.67	27.39
61.08	22.80	-0.67	27.40
61.19	22.79	-0.66	27.38
61.27	22.80	-0.66	27.39
61.48	22.80	-0.67	27.40
61.50	22.80	-0.66	27.39
61.56	22.80	-0.67	27.40
61.63	22.80	-0.67	27.40
61.74	22.80	-0.66	27.38
62.21	22.80	-0.66	27.39
63.00	22.80	-0.67	27.40
64.20	22.80	-0.68	27.40
64.59	22.80	-0.69	27.42

ST6 15-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
64.74	22.79	-0.68	27.40

ST6 30-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.12	23.55	3.58	24.82
2.09	23.55	3.58	24.82
3.05	23.55	3.58	24.82
4.15	23.56	3.58	24.83
5.01	23.56	3.59	24.83
5.81	23.57	3.59	24.83
6.76	23.57	3.59	24.82
7.54	23.58	3.59	24.84
8.36	23.58	3.60	24.84
9.19	23.60	3.60	24.85
9.90	23.59	3.60	24.84
10.64	23.60	3.60	24.86
11.25	23.59	3.61	24.83
12.09	23.61	3.61	24.86
12.81	23.61	3.62	24.85
13.46	23.63	3.62	24.87
14.27	23.63	3.63	24.86
15.04	23.64	3.63	24.87
15.52	23.65	3.64	24.88
16.17	23.68	3.65	24.90
16.68	23.69	3.66	24.91
17.27	23.69	3.66	24.90
17.92	23.69	3.68	24.89
18.50	23.73	3.69	24.93

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

ST6 30-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
19.26	23.77	3.70	24.97
19.81	23.82	3.69	25.03
20.38	23.82	3.63	25.08
20.85	23.82	3.52	25.17
21.75	24.29	3.24	25.94
22.20	24.33	3.11	26.09
22.56	24.31	2.98	26.17
22.96	24.29	2.83	26.27
23.47	24.27	2.64	26.40
23.91	24.17	2.33	26.53
24.66	24.14	2.07	26.71
25.32	23.98	1.64	26.89
26.27	23.76	1.25	26.95
26.83	23.66	0.96	27.08
27.58	23.50	0.78	27.03
28.36	23.43	0.62	27.07
28.93	23.37	0.54	27.08
29.41	23.35	0.49	27.09
30.06	23.34	0.45	27.11
30.54	23.30	0.41	27.10
31.05	23.30	0.37	27.13
31.60	23.28	0.32	27.15
32.34	23.25	0.26	27.17
32.91	23.22	0.20	27.18
33.61	23.20	0.13	27.22
34.44	23.14	0.05	27.21
35.18	23.14	0.01	27.24
35.84	23.10	-0.11	27.30
36.60	23.05	-0.17	27.30
37.49	23.02	-0.21	27.29

ST6 30-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
37.93	23.01	-0.23	27.29
38.56	23.00	-0.27	27.32
39.10	22.97	-0.31	27.31
39.66	22.96	-0.32	27.31
40.15	22.96	-0.33	27.32
40.63	22.95	-0.34	27.31
41.22	22.95	-0.35	27.32
41.81	22.96	-0.36	27.34
42.66	22.95	-0.37	27.34
43.27	22.92	-0.40	27.32
43.99	22.93	-0.41	27.34
44.64	22.92	-0.42	27.34
45.15	22.92	-0.43	27.34
45.62	22.91	-0.44	27.35
46.14	22.91	-0.45	27.35
46.83	22.91	-0.45	27.35
47.56	22.91	-0.47	27.37
48.31	22.90	-0.47	27.36
49.16	22.91	-0.48	27.37
49.83	22.91	-0.48	27.37
50.44	22.90	-0.50	27.38
51.27	22.89	-0.51	27.38
52.06	22.89	-0.52	27.38
52.88	22.89	-0.52	27.39
53.60	22.89	-0.54	27.40
54.46	22.88	-0.55	27.40
55.18	22.88	-0.56	27.41
55.98	22.88	-0.57	27.42
56.93	22.87	-0.59	27.42
57.96	22.87	-0.60	27.42

ST6 30-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
59.05	22.86	-0.60	27.42
60.31	22.87	-0.61	27.44
61.58	22.87	-0.61	27.44
62.62	22.87	-0.61	27.43
63.66	22.87	-0.62	27.44
64.92	22.87	-0.62	27.45
66.10	22.86	-0.63	27.44
67.45	22.87	-0.64	27.45
68.60	22.86	-0.64	27.46
70.17	22.87	-0.65	27.47
71.57	22.87	-0.65	27.47
73.26	22.86	-0.65	27.46
74.28	22.86	-0.65	27.46
74.78	22.87	-0.65	27.47

REF-Marine 13-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.08	22.39	8.33	20.41
1.63	22.30	8.25	20.37
2.26	22.28	7.86	20.58
2.86	22.25	7.66	20.66
3.23	22.25	7.48	20.77
3.82	22.24	7.43	20.78
4.15	22.22	7.35	20.81
4.85	22.22	7.28	20.86
6.12	22.46	7.27	21.10
7.35	22.82	6.95	21.67
8.44	23.48	6.63	22.57

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-Marine 13-Jul-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
9.01	24.29	5.97	23.89
10.09	24.29	4.63	24.86
11.03	23.62	3.57	24.90
12.06	23.37	2.47	25.46
12.59	23.37	1.84	25.97
13.37	23.24	1.53	26.07
13.95	23.16	1.35	26.13
14.88	23.11	1.06	26.31
15.86	23.05	0.90	26.37

REF-Marine 19-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.76	19.35	8.73	17.21
1.47	19.41	9.12	17.08
2.02	21.00	9.27	18.53
2.59	25.04	9.79	22.15
3.13	25.09	10.53	21.74
3.41	25.13	10.73	21.66

REF-Marine 29-Sep-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.87	23.62	4.00	24.58
1.54	23.63	4.00	24.59
2.22	23.63	4.00	24.59
2.92	23.62	4.00	24.58
3.47	23.62	4.00	24.58

REF-Marine 29-Sep-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
4.20	23.63	4.00	24.59
4.86	23.63	4.00	24.59
5.72	23.63	4.01	24.58
6.27	23.66	4.02	24.61
6.90	23.70	4.04	24.64
7.48	23.73	4.05	24.67
7.98	23.79	4.06	24.72
8.74	23.80	4.07	24.73
9.15	23.82	4.07	24.75
9.59	23.82	4.08	24.75
10.25	23.82	4.12	24.72
10.87	24.06	4.20	24.92
11.77	24.25	4.22	25.12
12.42	24.28	4.22	25.16
12.93	24.29	4.21	25.17
13.57	24.27	4.20	25.16
14.34	24.36	4.22	25.25
14.99	24.44	4.21	25.34
15.87	24.52	4.14	25.50
16.54	24.58	3.98	25.68
16.55	24.58	4.03	25.65
16.57	24.57	3.76	25.85
16.68	24.53	3.40	26.09
16.69	24.55	4.04	25.60
16.75	24.52	4.00	25.60
16.88	24.36	3.17	26.08
16.92	24.29	3.16	26.00
17.29	24.27	3.68	25.56

REF-7 16-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.61	21.36	7.51	19.84
0.89	21.37	7.58	19.81
1.15	21.40	7.39	19.96
2.24	21.90	7.13	20.62
3.45	21.94	6.88	20.80
4.93	23.71	6.71	22.77
6.73	23.69	4.00	24.66
7.46	23.26	2.73	25.13
8.46	23.37	2.08	25.79
9.37	23.42	1.82	26.05
10.56	23.40	1.54	26.26
11.52	23.31	1.34	26.32
12.29	23.21	1.17	26.35
12.70	23.23	0.96	26.54
12.73	23.23	0.84	26.65
12.74	23.23	0.83	26.66

REF-7 19-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
1.11	19.45	9.14	17.11
1.89	19.48	9.23	17.09
2.93	25.07	9.90	22.11
3.79	25.25	10.50	21.92
4.79	25.67	10.68	22.21
5.54	25.84	10.88	22.25
6.47	26.49	10.99	22.79
7.37	26.53	11.09	22.77
8.38	26.35	10.01	23.27

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-7 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
9.36	26.23	9.29	23.63
10.48	26.16	8.92	23.81
11.66	25.07	7.86	23.40
12.58	24.91	5.94	24.58
13.19	24.73	5.10	25.00

REF-7 29-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.07	23.65	3.91	24.68
1.71	23.66	3.92	24.69
2.50	23.66	3.92	24.69
3.01	23.66	3.92	24.68
3.68	23.66	3.92	24.68
4.24	23.66	3.92	24.68
5.09	23.68	3.93	24.70
5.79	23.68	3.93	24.70
6.21	23.68	3.94	24.69
6.79	23.69	3.95	24.70
7.43	23.71	3.95	24.72
8.02	23.71	3.96	24.71
8.72	23.73	3.98	24.72
9.46	23.74	3.98	24.72
10.15	23.75	4.00	24.72
11.03	23.84	4.02	24.80
11.63	23.94	4.03	24.91
12.41	24.05	4.04	25.04
12.94	24.06	4.04	25.05
13.67	24.07	4.02	25.07

REF-7 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
14.46	24.04	4.00	25.05
15.42	24.05	4.02	25.05
16.52	24.06	4.01	25.08
16.77	24.07	4.00	25.09
16.93	24.05	3.99	25.07
16.94	24.07	4.02	25.06
16.95	24.07	4.01	25.08
16.95	24.05	4.00	25.06
17.01	24.08	4.03	25.07
17.24	24.07	4.03	25.06
17.25	24.07	4.03	25.06
17.33	24.08	4.03	25.07
17.34	24.07	4.03	25.07
17.46	24.08	4.03	25.08
17.55	24.08	4.02	25.08
17.60	24.07	4.02	25.06
17.60	24.07	4.02	25.07
17.79	24.12	4.03	25.11
17.86	24.14	4.08	25.10
17.90	24.13	4.04	25.13
17.92	24.14	4.04	25.14
17.93	24.14	4.05	25.12
17.94	24.15	4.04	25.15
18.46	24.20	4.08	25.17
18.84	24.18	4.06	25.16

REF-6 16-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.60	20.52	7.02	19.26
1.40	22.66	6.81	21.59
2.65	22.82	6.42	22.01
3.63	22.84	6.28	22.12
4.36	22.82	6.16	22.18
5.45	23.48	5.46	23.37
6.82	23.27	3.52	24.53
8.29	23.32	2.47	25.41
9.52	23.43	1.72	26.15
10.70	23.28	1.41	26.23
12.13	23.12	0.94	26.42
13.14	23.08	0.71	26.57
13.98	23.06	0.53	26.69
14.90	23.03	0.45	26.73
16.10	23.03	0.38	26.78
17.24	23.00	0.31	26.82
18.39	22.97	0.28	26.80
19.36	22.95	0.21	26.83
20.12	22.94	0.15	26.86
20.89	22.93	0.13	26.87
21.63	22.91	0.06	26.91
22.74	22.86	-0.01	26.91
23.56	22.87	-0.05	26.96
24.78	22.86	-0.11	27.00
25.91	22.84	-0.17	27.02
27.10	22.82	-0.20	27.02
28.46	22.81	-0.21	27.02
29.47	22.81	-0.25	27.06
30.43	22.81	-0.27	27.07
31.67	22.80	-0.29	27.08

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-6 16-Jul-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
31.85	22.84	-0.26	27.09

REF-6 19-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
1.13	20.18	9.21	17.77
2.18	24.49	9.77	21.62
2.92	25.09	10.21	21.94
3.91	25.63	10.41	22.33
4.68	26.11	10.70	22.61
5.31	26.44	10.97	22.76
6.13	26.57	11.22	22.73
6.87	26.64	11.14	22.84
7.38	26.58	10.93	22.91
8.38	26.38	10.43	23.03
9.30	26.33	9.60	23.52
10.03	26.18	9.02	23.75
10.96	25.62	8.55	23.51
11.79	25.21	7.26	23.96
12.34	25.10	6.22	24.57
13.03	24.97	5.55	24.92
13.70	24.71	5.06	25.00
14.39	24.67	4.52	25.37
15.08	24.38	4.05	25.40
15.95	24.24	3.50	25.67
17.03	24.16	3.12	25.89
18.04	24.07	2.86	25.99
18.82	23.93	2.59	26.03
19.14	23.88	2.19	26.30

REF-6 19-Aug-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
19.97	23.80	2.02	26.35
20.88	23.59	1.69	26.36
21.96	23.53	1.37	26.56
23.09	23.44	1.24	26.56
23.98	23.41	1.03	26.70
24.84	23.34	0.92	26.71
25.79	23.15	0.68	26.68
26.80	23.13	0.46	26.84
27.70	23.02	0.36	26.78
28.50	23.00	0.18	26.92
29.44	22.99	0.08	27.00
30.58	22.94	0.01	26.99
31.44	22.93	-0.07	27.05
31.83	22.95	-0.11	27.11

REF-6 29-Sep-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.66	23.49	3.87	24.53
1.47	23.50	3.87	24.54
2.46	23.50	3.88	24.53
3.38	23.51	3.88	24.55
3.92	23.52	3.88	24.55
4.72	23.52	3.89	24.55
5.32	23.53	3.89	24.56
5.84	23.54	3.90	24.56
6.47	23.57	3.92	24.57
7.61	23.59	3.94	24.59
8.69	23.61	3.97	24.59

REF-6 29-Sep-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
9.88	23.67	3.99	24.65
10.86	23.76	4.00	24.74
11.94	23.92	3.92	24.98
12.53	23.90	3.87	25.00
13.37	23.92	3.84	25.04
14.14	23.94	3.83	25.07
14.80	24.04	3.83	25.18
15.40	24.08	3.83	25.22
15.90	24.10	3.84	25.24
16.41	24.09	3.82	25.25
16.92	24.14	3.93	25.21
17.48	24.34	3.97	25.41
18.30	24.42	3.89	25.57
18.89	24.43	3.69	25.74
19.50	24.46	3.18	26.17
20.29	24.26	2.28	26.69
20.97	24.01	1.95	26.66
21.83	23.91	1.82	26.65
22.64	23.91	1.71	26.75
23.77	23.87	1.39	26.97
24.79	23.62	0.87	27.10
25.75	23.47	0.79	26.98
26.68	23.46	0.76	27.00
27.28	23.46	0.69	27.05
27.69	23.42	0.49	27.18
28.40	23.28	0.29	27.17
29.38	23.17	0.15	27.16
29.89	23.12	0.07	27.17
30.67	23.11	0.03	27.19
31.49	23.07	-0.03	27.19

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-6 29-Sep-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
32.16	23.05	-0.06	27.19
33.19	23.03	-0.08	27.18
33.66	23.03	-0.09	27.19
33.76	23.02	-0.09	27.19
33.80	23.03	-0.10	27.19
33.80	23.02	-0.10	27.18
33.92	23.02	-0.09	27.17
34.13	23.01	-0.11	27.18
34.52	23.00	-0.13	27.19
34.61	23.00	-0.14	27.19

REF-5 16-Jul-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.51	22.83	6.42	22.02
1.01	22.84	6.43	22.02
1.42	22.83	6.42	22.03
1.91	22.84	6.41	22.05
2.65	22.87	6.34	22.12
3.48	23.02	6.22	22.35
3.81	23.04	5.89	22.60
4.07	22.99	5.61	22.73
4.45	23.24	5.34	23.19
5.13	23.54	3.98	24.50
5.92	23.27	3.19	24.79
6.38	23.42	2.53	25.47
6.99	23.57	2.25	25.89
7.59	23.88	2.18	26.32
8.31	23.74	2.06	26.25

REF-5 16-Jul-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
9.32	23.55	1.77	26.26
10.16	23.35	1.36	26.36
10.99	23.19	1.03	26.44
11.75	23.19	0.81	26.63
12.48	23.21	0.70	26.74
13.32	23.15	0.65	26.71
14.12	23.11	0.54	26.75
15.05	23.07	0.48	26.75
16.12	22.99	0.35	26.76
16.93	22.95	0.23	26.82
17.96	22.93	0.13	26.88
18.73	22.93	0.05	26.95
19.64	22.92	0.01	26.97
20.42	22.91	0.01	26.96
21.11	22.92	-0.03	27.00
22.17	22.89	-0.06	27.00
22.74	22.86	-0.09	26.98
23.47	22.85	-0.15	27.02
24.29	22.85	-0.17	27.03
24.85	22.86	-0.18	27.05
25.70	22.85	-0.18	27.05
26.62	22.84	-0.21	27.06
27.52	22.84	-0.24	27.08
28.74	22.83	-0.23	27.06
29.78	22.82	-0.28	27.09
31.02	22.82	-0.32	27.13
32.57	22.81	-0.33	27.12
33.47	22.82	-0.35	27.15
34.59	22.80	-0.35	27.13
35.85	22.79	-0.38	27.14

REF-5 16-Jul-10 (continued)			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
36.85	22.79	-0.42	27.17
37.86	22.78	-0.44	27.18
38.77	22.78	-0.46	27.19
39.71	22.77	-0.48	27.20
40.54	22.77	-0.48	27.20
41.77	22.77	-0.49	27.21
42.08	22.78	-0.50	27.23

REF-5 19-Aug-10			
Depth (m)	Conductivity (µS/cm)	Temperature (°C)	Salinity
0.54	25.52	9.59	22.73
1.44	25.53	10.14	22.40
2.37	25.55	10.36	22.28
3.32	25.59	10.48	22.25
4.30	25.62	10.55	22.24
5.22	26.01	10.60	22.58
6.30	26.43	10.65	22.95
7.27	26.44	10.36	23.14
8.52	26.38	9.87	23.39
9.53	26.34	9.27	23.74
10.56	26.10	8.84	23.79
11.66	25.76	8.31	23.80
12.75	25.07	7.09	23.94
13.90	24.78	5.67	24.64
15.06	24.49	4.68	25.04
16.13	24.20	3.83	25.37
17.04	24.06	3.10	25.77

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-5 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
18.09	23.81	2.56	25.92
19.11	23.69	2.08	26.16
20.25	23.60	1.69	26.38
21.42	23.51	1.44	26.47
22.33	23.43	1.27	26.52
23.28	23.38	1.04	26.65
24.35	23.32	0.88	26.72
25.29	23.24	0.71	26.76
26.25	23.21	0.55	26.87
27.17	23.20	0.50	26.89
28.15	23.08	0.43	26.80
28.95	23.05	0.24	26.93
29.78	23.05	0.19	26.97
30.80	22.99	0.09	26.98
31.94	22.93	0.00	26.99
32.78	22.91	-0.10	27.04
33.51	22.90	-0.15	27.08
34.52	22.88	-0.19	27.09
35.55	22.86	-0.25	27.12
36.49	22.83	-0.29	27.11
37.40	22.82	-0.35	27.15
38.26	22.83	-0.37	27.18
39.00	22.83	-0.37	27.18
39.79	22.81	-0.39	27.17
40.68	22.82	-0.40	27.19
41.46	22.81	-0.41	27.19
41.59	22.83	-0.41	27.22

REF-5 29-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
1.07	23.49	3.86	24.54
2.02	23.50	3.86	24.54
2.98	23.49	3.86	24.54
3.50	23.50	3.85	24.55
4.45	23.50	3.85	24.55
5.37	23.51	3.85	24.56
6.17	23.52	3.85	24.57
7.00	23.52	3.85	24.57
8.08	23.53	3.85	24.58
8.12	23.53	3.85	24.58
8.76	23.52	3.85	24.58
9.58	23.57	3.86	24.62
10.20	23.58	3.85	24.65
10.76	23.58	3.85	24.64
11.73	23.58	3.83	24.65
12.88	23.57	3.81	24.65
13.92	23.83	3.78	24.98
14.57	23.95	3.75	25.14
15.31	24.04	3.71	25.27
16.38	24.04	3.64	25.33
17.69	24.30	3.52	25.73
18.70	24.43	2.98	26.30
19.66	24.23	2.08	26.81
21.11	24.02	1.52	27.04
22.29	23.60	0.90	27.05
23.46	23.47	0.67	27.09
24.74	23.37	0.55	27.07
25.75	23.34	0.47	27.10
26.76	23.31	0.38	27.14
28.17	23.25	0.31	27.13

REF-5 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
29.57	23.22	0.26	27.13
30.39	23.20	0.21	27.16
31.46	23.18	0.14	27.18
32.51	23.15	0.09	27.19
33.99	23.13	0.03	27.21
35.01	23.08	-0.02	27.19
36.23	23.08	-0.05	27.22
36.97	23.06	-0.09	27.23
38.16	23.03	-0.13	27.23
39.07	23.02	-0.16	27.24
40.04	23.00	-0.19	27.24
40.80	22.99	-0.22	27.25
41.62	22.98	-0.27	27.28
42.81	22.91	-0.33	27.25
43.77	22.88	-0.36	27.23
43.93	22.37	-0.35	26.57

REF-4 16-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.51	22.60	6.32	21.85
0.67	22.60	6.34	21.84
1.58	22.60	6.35	21.83
2.40	22.59	6.34	21.82
2.99	22.66	6.29	21.92
3.95	23.01	5.65	22.73
4.95	23.15	4.08	23.98
5.74	23.17	2.83	24.96
6.50	23.18	2.42	25.28

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-4 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
7.76	23.41	2.02	25.88
8.65	23.56	1.62	26.39
9.61	23.35	1.35	26.36
10.66	23.25	1.05	26.48
11.43	23.18	0.79	26.62
12.75	23.08	0.61	26.66
13.74	23.04	0.45	26.74
14.72	22.98	0.33	26.76
15.36	22.98	0.22	26.85
16.62	22.96	0.14	26.91
18.02	22.93	0.09	26.92
18.93	22.91	0.03	26.94
19.84	22.89	-0.02	26.96
21.05	22.85	-0.09	26.96
22.22	22.83	-0.17	27.01
23.41	22.83	-0.23	27.05
24.55	22.83	-0.24	27.08
25.57	22.83	-0.26	27.09
26.69	22.82	-0.29	27.10
27.98	22.81	-0.29	27.09
28.95	22.81	-0.34	27.13
29.92	22.81	-0.34	27.13
31.89	22.80	-0.35	27.12
32.90	22.80	-0.38	27.15
33.87	22.80	-0.40	27.17
34.81	22.79	-0.42	27.17
35.75	22.79	-0.44	27.19
36.72	22.78	-0.45	27.19
38.13	22.78	-0.48	27.22
39.47	22.77	-0.50	27.22

REF-4 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
40.63	22.77	-0.48	27.19
41.72	22.77	-0.51	27.22
42.93	22.76	-0.52	27.22
43.94	22.76	-0.53	27.24
44.65	22.76	-0.54	27.24
45.63	22.77	-0.55	27.25
46.74	22.76	-0.54	27.24
48.21	22.76	-0.55	27.25
49.55	22.77	-0.56	27.27
50.72	22.77	-0.56	27.26
52.23	22.77	-0.57	27.28
53.40	22.78	-0.57	27.28
54.46	22.77	-0.56	27.27
55.62	22.78	-0.58	27.30
56.87	22.79	-0.57	27.29
58.45	22.79	-0.57	27.29
60.09	22.80	-0.56	27.30
60.57	22.80	-0.57	27.31

REF-4 19-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.51	25.67	9.72	22.81
0.54	25.69	10.25	22.48
0.84	25.68	10.43	22.37
1.55	25.82	10.51	22.45
2.34	26.08	10.60	22.65
3.28	26.23	10.66	22.75
3.99	26.28	10.66	22.79

REF-4 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
4.71	26.31	10.68	22.81
5.55	26.39	10.68	22.89
6.48	26.59	10.58	23.15
7.39	26.53	10.11	23.38
8.26	26.46	9.63	23.63
8.94	26.44	9.33	23.80
9.86	26.20	8.91	23.85
10.67	25.97	8.48	23.90
11.58	25.86	8.03	24.11
12.57	25.43	7.42	24.08
13.45	25.10	6.41	24.44
13.91	24.98	5.69	24.83
14.86	24.61	5.01	24.93
15.91	24.32	4.10	25.29
16.92	24.04	3.36	25.55
17.83	23.88	2.69	25.89
18.81	23.71	2.13	26.15
19.81	23.53	1.74	26.24
20.71	23.44	1.39	26.44
21.39	23.40	1.18	26.57
22.19	23.35	1.01	26.65
23.22	23.31	0.87	26.72
24.15	23.27	0.74	26.77
25.24	23.18	0.64	26.75
26.23	23.14	0.49	26.83
27.12	23.13	0.38	26.90
27.95	23.10	0.33	26.91
28.79	23.07	0.23	26.97
29.63	23.05	0.18	26.98
30.65	23.03	0.12	27.01

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-4 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
31.83	22.99	0.07	27.00
32.86	22.95	-0.01	27.02
33.82	22.94	-0.05	27.05
34.82	22.93	-0.09	27.06
35.83	22.91	-0.14	27.08
36.62	22.89	-0.17	27.08
37.67	22.88	-0.23	27.13
38.63	22.88	-0.26	27.15
39.37	22.87	-0.28	27.15
40.45	22.85	-0.31	27.15
41.44	22.84	-0.33	27.15
42.28	22.83	-0.36	27.17
43.26	22.82	-0.39	27.19
43.86	22.82	-0.39	27.19
44.74	22.82	-0.40	27.19
45.79	22.81	-0.41	27.19
46.60	22.81	-0.44	27.21
47.41	22.80	-0.46	27.23
48.10	22.80	-0.46	27.21
48.90	22.80	-0.47	27.23
49.80	22.81	-0.48	27.24
50.71	22.80	-0.49	27.25
51.58	22.80	-0.48	27.23
52.49	22.80	-0.50	27.26
53.41	22.80	-0.50	27.25
54.31	22.81	-0.49	27.25
55.05	22.81	-0.50	27.26
55.98	22.80	-0.50	27.26
56.78	22.81	-0.52	27.27
57.53	22.81	-0.51	27.27

REF-4 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
57.92	22.81	-0.52	27.27
58.60	22.81	-0.52	27.28
59.51	22.81	-0.53	27.28
60.00	22.81	-0.52	27.29

REF-4 29-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.94	23.26	3.70	24.39
1.81	23.26	3.70	24.39
2.74	23.26	3.70	24.40
3.89	23.27	3.69	24.41
4.88	23.26	3.70	24.39
5.70	23.28	3.70	24.42
6.31	23.28	3.71	24.40
6.49	23.30	3.71	24.42
6.56	23.29	3.71	24.42
6.57	23.30	3.71	24.42
6.58	23.30	3.71	24.43
6.78	23.29	3.71	24.42
6.80	23.29	3.71	24.42
7.12	23.30	3.71	24.43
7.45	23.31	3.71	24.44
7.90	23.33	3.72	24.45
8.17	23.33	3.72	24.46
8.80	23.35	3.73	24.47
9.32	23.40	3.74	24.52
9.89	23.45	3.76	24.56
10.51	23.60	3.76	24.73

REF-4 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
11.28	23.76	3.74	24.92
11.91	23.92	3.68	25.16
12.50	23.98	3.64	25.26
13.16	24.00	3.57	25.33
13.79	24.01	3.46	25.43
14.48	24.06	3.40	25.54
15.07	24.06	3.36	25.57
15.74	24.09	3.41	25.57
16.70	24.54	3.39	26.11
17.66	24.38	2.77	26.43
18.85	24.18	2.51	26.40
20.02	24.17	2.13	26.70
21.22	23.88	1.58	26.81
22.40	23.76	1.32	26.89
23.37	23.68	1.04	27.03
24.65	23.55	0.75	27.12
25.97	23.39	0.55	27.09
27.39	23.33	0.41	27.14
28.62	23.28	0.31	27.16
29.93	23.24	0.22	27.19
31.42	23.20	0.09	27.25
32.73	23.12	0.01	27.21
34.09	23.08	-0.05	27.23
35.49	23.06	-0.10	27.23
37.05	23.05	-0.13	27.25
38.56	23.02	-0.18	27.26
40.10	23.01	-0.22	27.28
41.67	22.99	-0.28	27.30
43.15	22.94	-0.34	27.30
43.96	22.92	-0.38	27.30

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-4 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
45.06	22.90	-0.40	27.29
45.79	22.88	-0.43	27.29
46.55	22.87	-0.45	27.30
47.31	22.87	-0.47	27.31
48.66	22.85	-0.49	27.31
49.75	22.84	-0.50	27.31
51.20	22.83	-0.51	27.30
52.66	22.83	-0.52	27.31
54.09	22.82	-0.53	27.31
55.71	22.83	-0.53	27.31
56.95	22.83	-0.53	27.31
57.84	22.83	-0.54	27.32
58.66	22.82	-0.54	27.31
59.28	22.82	-0.54	27.32
59.29	22.82	-0.54	27.32

REF-3 16-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.57	22.49	6.56	21.58
1.26	22.49	6.60	21.55
2.04	22.49	6.62	21.54
2.76	22.52	6.47	21.66
3.74	23.12	5.66	22.83
4.56	23.07	3.92	24.01
5.29	23.02	2.74	24.84
6.30	23.01	1.93	25.47
7.17	23.00	1.36	25.92
8.12	23.04	0.95	26.31

REF-3 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
9.72	23.01	0.75	26.45
11.00	23.02	0.60	26.59
11.95	22.96	0.48	26.61
12.83	22.92	0.27	26.74
13.75	22.90	0.15	26.83
15.00	22.89	0.05	26.89
15.83	22.89	0.01	26.93
17.09	22.86	-0.06	26.95
18.22	22.85	-0.11	26.98
19.48	22.85	-0.15	27.02
20.69	22.84	-0.18	27.03
21.83	22.83	-0.21	27.04
22.99	22.82	-0.23	27.04
24.25	22.81	-0.27	27.07
25.60	22.81	-0.32	27.11
27.11	22.80	-0.36	27.14
28.34	22.81	-0.36	27.15
29.64	22.80	-0.39	27.17
31.09	22.80	-0.40	27.17
31.89	22.80	-0.41	27.18
32.99	22.80	-0.43	27.19
34.19	22.80	-0.43	27.19
35.38	22.80	-0.44	27.20
36.62	22.79	-0.46	27.21
37.96	22.79	-0.46	27.22
39.20	22.79	-0.48	27.22
40.54	22.78	-0.49	27.23
41.71	22.79	-0.50	27.24
42.79	22.79	-0.51	27.24
43.98	22.77	-0.51	27.23

REF-3 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
45.16	22.78	-0.53	27.25
46.51	22.78	-0.53	27.25
47.53	22.78	-0.54	27.27
48.49	22.77	-0.55	27.25
49.40	22.78	-0.57	27.29
50.26	22.78	-0.56	27.29
51.28	22.78	-0.57	27.29
52.54	22.78	-0.57	27.29
53.58	22.78	-0.57	27.29
55.24	22.79	-0.57	27.30
56.62	22.79	-0.57	27.29
57.96	22.80	-0.57	27.31
59.21	22.80	-0.57	27.31
60.26	22.80	-0.58	27.31
61.60	22.79	-0.58	27.30
62.94	22.80	-0.58	27.31
62.98	22.80	-0.58	27.32
64.03	22.80	-0.58	27.32
64.06	22.81	-0.59	27.34

REF-3 19-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.50	25.63	10.35	22.37
1.20	25.66	10.42	22.36
1.71	25.70	10.46	22.37
2.51	25.79	10.55	22.40
3.20	25.83	10.59	22.41
3.96	26.11	10.63	22.66

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-3 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
4.73	26.59	10.79	23.01
5.40	26.61	10.76	23.05
6.08	26.58	10.55	23.16
6.97	26.49	10.06	23.38
7.66	26.50	9.65	23.65
8.27	26.48	9.47	23.76
9.05	26.47	9.32	23.85
9.79	26.39	9.20	23.85
10.54	25.74	8.81	23.46
11.25	25.55	7.78	23.95
11.94	25.26	6.92	24.25
12.77	25.16	6.06	24.76
13.42	25.04	5.64	24.94
14.15	24.90	5.22	25.10
14.78	24.64	4.89	25.05
15.54	24.52	4.35	25.32
16.33	24.10	3.65	25.39
17.17	23.96	2.85	25.86
18.01	23.77	2.43	25.98
18.86	23.53	1.93	26.10
19.70	23.44	1.50	26.34
20.58	23.33	1.14	26.50
21.43	23.22	0.87	26.60
22.28	23.17	0.66	26.72
23.12	23.14	0.54	26.78
23.82	23.12	0.44	26.85
24.03	23.12	0.36	26.92
24.67	23.10	0.33	26.91
25.38	23.10	0.28	26.96
26.02	23.06	0.26	26.92

REF-3 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
26.85	23.04	0.18	26.98
27.58	23.03	0.13	26.99
28.33	23.01	0.10	27.01
28.95	23.00	0.08	27.01
29.45	22.98	0.03	27.03
30.14	22.97	0.01	27.03
30.89	22.96	-0.04	27.06
31.35	22.94	-0.06	27.06
31.97	22.91	-0.08	27.03
32.38	22.90	-0.15	27.09
32.94	22.89	-0.19	27.10
33.52	22.88	-0.22	27.11
34.29	22.86	-0.25	27.12
34.97	22.86	-0.27	27.13
35.45	22.86	-0.26	27.12
35.90	22.86	-0.29	27.15
36.93	22.85	-0.31	27.15
37.79	22.83	-0.34	27.16
38.69	22.83	-0.35	27.16
39.52	22.83	-0.36	27.17
40.24	22.82	-0.38	27.18
40.70	22.83	-0.37	27.17
41.52	22.82	-0.39	27.18
42.33	22.82	-0.39	27.18
43.19	22.82	-0.42	27.20
44.19	22.81	-0.42	27.20
45.16	22.80	-0.43	27.20
46.22	22.80	-0.44	27.20
47.06	22.81	-0.46	27.23
47.90	22.80	-0.46	27.22

REF-3 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
48.65	22.80	-0.47	27.23
49.47	22.80	-0.48	27.23
50.31	22.80	-0.48	27.23
51.13	22.80	-0.49	27.24
51.96	22.80	-0.49	27.25
52.97	22.80	-0.49	27.24
54.15	22.80	-0.50	27.24
55.14	22.80	-0.50	27.25
55.99	22.81	-0.50	27.25
56.92	22.80	-0.49	27.24
57.73	22.80	-0.49	27.25
58.62	22.80	-0.50	27.25
59.47	22.80	-0.51	27.26
60.39	22.80	-0.51	27.26
61.38	22.81	-0.51	27.26
62.12	22.81	-0.50	27.26
63.05	22.81	-0.50	27.26
64.04	22.81	-0.52	27.27
64.24	22.81	-0.52	27.28

REF-3 29-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.53	23.49	3.75	24.61
1.22	23.49	3.75	24.61
1.99	23.49	3.75	24.61
2.80	23.50	3.74	24.63
3.54	23.49	3.74	24.63
4.20	23.51	3.74	24.65

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-3 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
5.03	23.51	3.74	24.64
5.69	23.53	3.73	24.68
6.67	23.57	3.71	24.74
7.27	23.59	3.71	24.77
7.94	23.60	3.70	24.79
8.84	23.62	3.68	24.82
9.32	23.69	3.68	24.89
9.82	23.76	3.68	24.98
10.65	23.85	3.69	25.07
11.20	23.88	3.66	25.12
12.32	24.05	3.56	25.40
13.27	24.06	3.37	25.56
14.37	24.08	3.13	25.77
15.43	24.09	2.98	25.91
16.17	24.08	2.82	26.02
17.06	24.07	2.70	26.10
18.05	24.06	2.55	26.23
18.88	24.03	2.33	26.36
19.76	24.00	2.08	26.55
20.67	23.99	1.99	26.60
21.30	23.97	1.80	26.74
22.01	23.90	1.55	26.86
23.10	23.68	1.18	26.92
23.59	23.60	0.95	27.01
24.41	23.51	0.80	27.03
25.48	23.46	0.71	27.05
26.17	23.42	0.60	27.08
27.22	23.34	0.47	27.10
27.77	23.31	0.36	27.16
28.58	23.27	0.22	27.23

REF-3 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
29.62	23.17	0.07	27.24
30.50	23.11	-0.01	27.22
31.18	23.08	-0.05	27.23
32.08	23.07	-0.08	27.23
33.24	23.05	-0.12	27.24
33.98	23.04	-0.15	27.25
34.76	23.01	-0.19	27.26
35.46	23.00	-0.23	27.28
36.43	22.97	-0.27	27.27
37.18	22.95	-0.31	27.28
38.11	22.93	-0.34	27.28
39.21	22.92	-0.37	27.29
39.84	22.90	-0.39	27.29
40.97	22.89	-0.40	27.29
41.95	22.88	-0.42	27.29
42.82	22.89	-0.43	27.31
43.55	22.87	-0.44	27.30
44.42	22.86	-0.46	27.30
44.93	22.86	-0.47	27.30
45.82	22.85	-0.47	27.30
46.37	22.85	-0.47	27.29
46.48	22.86	-0.47	27.31
46.88	22.85	-0.47	27.30
47.03	22.85	-0.48	27.31
47.57	22.85	-0.48	27.30
47.89	22.84	-0.49	27.30
47.93	22.85	-0.49	27.31
48.17	22.84	-0.50	27.30
48.45	22.84	-0.51	27.31
49.08	22.84	-0.51	27.31

REF-3 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
49.74	22.83	-0.52	27.31
50.00	22.83	-0.52	27.31
51.12	22.83	-0.53	27.32
51.70	22.83	-0.53	27.32
52.81	22.82	-0.54	27.31
53.74	22.83	-0.54	27.32
54.49	22.83	-0.54	27.32
55.18	22.82	-0.54	27.32
56.05	22.83	-0.54	27.32
56.87	22.83	-0.54	27.32
57.55	22.83	-0.54	27.32
58.46	22.83	-0.55	27.32
59.05	22.83	-0.55	27.33
59.98	22.84	-0.55	27.34
60.66	22.83	-0.55	27.34
60.96	22.83	-0.56	27.33
61.89	22.82	-0.56	27.33

REF-2 16-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.53	22.60	5.95	22.09
0.57	22.59	6.36	21.81
0.70	22.55	6.58	21.63
1.39	22.60	6.65	21.64
2.12	22.61	6.64	21.65
3.21	22.66	6.62	21.72
4.30	22.98	5.87	22.55
5.13	23.00	3.68	24.10

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-2 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
5.77	23.04	2.33	25.18
6.55	22.99	1.55	25.76
7.48	23.20	1.16	26.34
8.47	22.95	1.04	26.13
9.32	22.96	0.70	26.42
10.30	22.93	0.43	26.62
10.78	22.94	0.28	26.76
11.95	22.94	0.22	26.82
13.04	22.89	0.15	26.81
14.16	22.85	-0.01	26.89
15.21	22.84	-0.13	26.99
16.80	22.83	-0.20	27.04
17.85	22.82	-0.25	27.07
19.17	22.80	-0.28	27.08
20.06	22.80	-0.33	27.11
21.38	22.80	-0.36	27.14
22.54	22.80	-0.37	27.14
23.32	22.80	-0.39	27.17
24.39	22.80	-0.41	27.19
25.84	22.80	-0.42	27.19
26.83	22.80	-0.43	27.20
27.89	22.79	-0.43	27.19
29.20	22.79	-0.44	27.19
30.19	22.80	-0.44	27.20
31.14	22.79	-0.45	27.21
32.13	22.78	-0.48	27.23
33.30	22.78	-0.50	27.24
34.39	22.78	-0.51	27.24
35.30	22.78	-0.52	27.25
36.06	22.78	-0.53	27.26

REF-2 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
37.30	22.77	-0.53	27.25
38.42	22.77	-0.55	27.27
39.62	22.77	-0.56	27.27
40.74	22.77	-0.56	27.27
41.63	22.78	-0.56	27.28
43.13	22.78	-0.56	27.28
44.48	22.78	-0.56	27.28
45.78	22.78	-0.58	27.30
46.69	22.78	-0.55	27.28
47.71	22.78	-0.57	27.30
48.27	22.78	-0.57	27.29
48.92	22.78	-0.57	27.29
49.81	22.78	-0.58	27.30
50.87	22.78	-0.58	27.30
52.14	22.78	-0.58	27.30
53.50	22.79	-0.58	27.31
54.68	22.79	-0.58	27.31
55.69	22.79	-0.58	27.31
56.35	22.79	-0.59	27.32
57.20	22.79	-0.58	27.31
58.06	22.80	-0.58	27.32
59.21	22.80	-0.58	27.32
60.17	22.80	-0.58	27.32
61.02	22.80	-0.59	27.32
61.80	22.80	-0.59	27.33
62.24	22.81	-0.58	27.33

REF-2 19-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.54	25.81	9.88	22.84
0.72	25.81	10.03	22.75
1.29	25.82	10.09	22.71
1.82	25.97	10.13	22.83
2.30	26.01	10.20	22.82
2.83	26.23	10.29	22.98
3.32	26.29	10.36	23.00
3.86	26.32	10.35	23.03
4.58	26.50	10.22	23.29
5.19	26.49	10.15	23.32
6.14	26.49	9.88	23.49
6.81	26.46	9.72	23.57
7.54	26.43	9.56	23.64
8.25	26.38	9.38	23.71
8.93	26.44	9.24	23.87
9.57	26.36	9.17	23.83
10.29	25.99	8.76	23.74
10.90	25.84	8.07	24.05
11.57	25.62	7.61	24.14
11.89	25.46	6.83	24.53
12.61	25.40	6.47	24.72
13.35	25.19	6.07	24.79
14.17	24.97	5.60	24.89
15.02	24.81	5.00	25.16
15.69	24.71	4.64	25.33
16.55	24.30	4.06	25.30
17.30	24.14	3.39	25.64
18.05	23.84	2.57	25.94
18.99	23.39	1.82	26.01
19.70	23.30	1.17	26.44

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-2 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
20.56	23.23	0.89	26.60
21.32	23.20	0.68	26.73
21.65	23.19	0.61	26.79
22.57	23.08	0.44	26.79
23.35	23.04	0.28	26.88
24.18	23.02	0.17	26.95
25.09	23.01	0.10	26.99
25.54	23.01	0.10	27.01
26.34	22.99	0.03	27.04
27.34	22.98	-0.01	27.06
28.17	22.97	-0.02	27.05
29.08	22.94	-0.07	27.07
29.79	22.94	-0.11	27.09
30.83	22.92	-0.13	27.09
31.61	22.92	-0.17	27.12
32.36	22.93	-0.18	27.14
33.22	22.93	-0.20	27.16
33.77	22.93	-0.18	27.14
34.52	22.91	-0.20	27.14
35.44	22.91	-0.21	27.15
36.32	22.92	-0.24	27.18
37.13	22.91	-0.23	27.16
38.16	22.91	-0.25	27.18
39.08	22.88	-0.28	27.17
39.54	22.89	-0.29	27.19
40.26	22.88	-0.31	27.19
40.98	22.89	-0.32	27.22
41.57	22.88	-0.33	27.21
42.45	22.88	-0.31	27.19
43.13	22.88	-0.34	27.22

REF-2 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
44.02	22.88	-0.34	27.21
44.75	22.88	-0.35	27.22
45.48	22.88	-0.36	27.23
46.32	22.88	-0.35	27.22
46.99	22.87	-0.37	27.23
47.82	22.86	-0.38	27.22
48.64	22.87	-0.39	27.25
49.38	22.88	-0.38	27.24
49.88	22.88	-0.38	27.25
50.52	22.88	-0.39	27.25
51.15	22.87	-0.38	27.24
52.07	22.88	-0.39	27.26
53.01	22.86	-0.39	27.24
53.85	22.86	-0.41	27.25
54.54	22.86	-0.42	27.26
55.44	22.87	-0.42	27.26
55.96	22.87	-0.41	27.27
56.34	22.87	-0.40	27.25
57.12	22.87	-0.41	27.26
57.90	22.87	-0.41	27.26
58.49	22.88	-0.41	27.27
59.11	22.87	-0.42	27.27
60.02	22.87	-0.42	27.26
60.73	22.87	-0.41	27.27
61.39	22.88	-0.42	27.28
61.87	22.88	-0.41	27.26
61.90	22.89	-0.42	27.29
61.91	22.90	-0.42	27.30

REF-2 29-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.98	23.51	3.71	24.67
1.81	23.52	3.71	24.68
2.63	23.52	3.71	24.68
3.39	23.53	3.71	24.69
4.19	23.53	3.70	24.70
4.85	23.53	3.70	24.70
5.51	23.52	3.70	24.69
6.16	23.52	3.71	24.68
6.80	23.56	3.71	24.73
7.70	23.55	3.70	24.71
8.51	23.63	3.70	24.82
9.11	23.65	3.69	24.84
9.67	23.67	3.67	24.88
10.23	23.72	3.65	24.96
11.02	23.80	3.63	25.06
11.73	23.84	3.63	25.11
12.25	23.89	3.59	25.20
12.79	23.91	3.57	25.23
13.54	23.96	3.57	25.29
14.31	24.15	3.57	25.50
14.92	24.26	3.53	25.67
15.54	24.40	3.44	25.91
16.45	24.39	3.32	25.99
17.11	24.36	3.19	26.06
17.99	24.33	3.01	26.16
18.75	24.25	2.72	26.30
19.30	24.20	2.54	26.39
20.10	24.09	2.24	26.51
21.01	24.02	2.12	26.53
21.73	24.01	1.90	26.70

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-2 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
22.36	23.91	1.49	26.93
22.95	23.68	0.94	27.12
23.76	23.49	0.80	26.99
24.31	23.45	0.74	27.01
24.86	23.44	0.66	27.06
25.55	23.39	0.53	27.12
26.33	23.32	0.45	27.09
27.07	23.30	0.34	27.16
27.70	23.24	0.25	27.17
28.59	23.20	0.14	27.20
29.55	23.12	0.05	27.19
30.52	23.11	0.01	27.21
31.12	23.11	-0.01	27.22
31.97	23.10	-0.04	27.25
32.57	23.08	-0.08	27.26
33.19	23.06	-0.14	27.27
34.22	23.01	-0.17	27.24
34.64	23.01	-0.18	27.24
35.33	23.01	-0.19	27.25
36.06	23.00	-0.21	27.26
36.75	22.98	-0.23	27.26
37.66	22.97	-0.26	27.26
38.64	22.96	-0.27	27.27
39.56	22.94	-0.31	27.27
40.50	22.93	-0.31	27.26
41.22	22.93	-0.32	27.27
42.38	22.93	-0.33	27.27
43.11	22.92	-0.34	27.27
43.94	22.92	-0.35	27.28
44.97	22.92	-0.37	27.29

REF-2 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
45.33	22.92	-0.41	27.32
46.12	22.87	-0.47	27.32
46.87	22.85	-0.49	27.31
47.64	22.84	-0.49	27.30
48.40	22.85	-0.50	27.31
49.31	22.84	-0.51	27.31
50.43	22.83	-0.52	27.31
51.15	22.83	-0.53	27.32
52.11	22.83	-0.54	27.32
53.07	22.82	-0.55	27.32
54.18	22.82	-0.55	27.32
55.01	22.82	-0.55	27.32
56.03	22.82	-0.55	27.32
57.25	22.82	-0.55	27.32
57.94	22.82	-0.55	27.32
58.86	22.82	-0.55	27.32
59.03	22.82	-0.55	27.32
59.03	22.82	-0.55	27.32
59.11	22.82	-0.55	27.32
59.13	22.82	-0.54	27.31
59.14	22.83	-0.54	27.32
59.15	22.83	-0.54	27.32

REF-1 16-Jul-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.55	22.74	5.86	22.30
0.94	22.74	6.03	22.19
1.57	22.74	6.08	22.15

REF-1 16-Jul-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
2.62	22.75	6.11	22.14
3.51	22.75	6.01	22.21
4.84	22.95	5.59	22.70
5.89	23.03	4.12	23.81
7.34	23.00	2.17	25.27
8.17	22.97	1.19	26.03
8.87	22.95	0.64	26.46
9.59	22.91	0.40	26.62
9.94	22.91	0.23	26.77
10.84	22.86	0.10	26.82
11.30	22.86	-0.01	26.91
12.04	22.85	-0.08	26.96
12.68	22.85	-0.13	27.00
13.35	22.84	-0.16	27.02
14.21	22.84	-0.20	27.05
14.98	22.84	-0.22	27.07
15.66	22.84	-0.21	27.06
16.69	22.82	-0.22	27.05
17.96	22.81	-0.26	27.07
19.01	22.81	-0.31	27.12
19.96	22.81	-0.33	27.13
21.14	22.81	-0.34	27.14
22.24	22.81	-0.35	27.15
22.99	22.79	-0.38	27.15
23.76	22.78	-0.44	27.19
24.57	22.77	-0.47	27.21
25.60	22.77	-0.50	27.23
26.57	22.77	-0.53	27.25

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-1 19-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.72	26.30	9.42	23.61
1.16	26.31	9.58	23.52
1.67	26.30	9.66	23.46
2.17	26.32	9.68	23.46
2.75	26.31	9.71	23.43
3.12	26.31	9.72	23.43
3.73	26.31	9.71	23.43
4.26	26.31	9.71	23.43
4.85	26.33	9.69	23.46
5.62	26.45	9.64	23.61
6.32	26.52	9.49	23.78
6.92	26.54	9.42	23.84
7.66	26.55	9.41	23.87
8.20	26.54	9.36	23.88
8.71	26.41	9.25	23.83
9.13	26.35	9.04	23.92
9.92	25.98	8.80	23.70
10.45	25.93	8.11	24.12
11.37	25.29	7.71	23.74
12.04	25.23	6.49	24.52
12.76	25.20	5.98	24.86
13.48	25.06	5.69	24.92
14.13	24.94	5.35	25.04
14.68	24.77	4.94	25.16
15.40	24.53	4.39	25.31
16.37	24.25	3.78	25.47
17.05	23.94	3.16	25.59
17.82	23.77	2.41	25.99
18.49	23.61	1.94	26.18
19.26	23.36	1.43	26.29

REF-1 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
19.71	23.32	1.05	26.58
20.32	23.30	0.85	26.72
21.03	23.29	0.77	26.77
21.28	23.27	0.70	26.80
22.08	23.22	0.66	26.78
22.84	23.13	0.53	26.78
23.59	23.05	0.35	26.83
23.79	23.04	0.22	26.93

REF-1 29-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.71	23.58	3.73	24.74
1.47	23.59	3.73	24.74
2.16	23.59	3.73	24.74
3.07	23.59	3.74	24.74
3.63	23.59	3.74	24.74
4.25	23.59	3.73	24.75
5.11	23.59	3.73	24.74
5.83	23.59	3.73	24.75
6.46	23.60	3.73	24.75
7.21	23.60	3.73	24.76
8.06	23.60	3.73	24.76
8.95	23.68	3.73	24.84
10.23	23.69	3.71	24.88
10.83	23.69	3.68	24.90
11.80	23.77	3.64	25.02
12.43	23.83	3.58	25.13
13.63	24.01	3.54	25.37

REF-1 29-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
14.08	24.05	3.51	25.44
14.56	24.08	3.50	25.49
14.93	24.12	3.46	25.57
15.53	24.18	3.35	25.72
16.18	24.35	3.27	25.97
16.75	24.32	3.34	25.89
17.83	24.32	3.35	25.88
19.05	24.35	3.16	26.07
19.93	24.36	2.97	26.23
21.13	24.31	2.43	26.61
22.10	24.16	1.24	27.45
23.13	23.50	0.76	27.05
23.75	23.37	0.59	27.03
24.93	23.35	0.54	27.05
25.88	23.27	0.39	27.09
26.99	23.27	0.40	27.06
28.00	23.25	0.36	27.07
28.30	23.25	0.36	27.08
28.31	23.24	0.36	27.07
28.38	23.24	0.36	27.07

REF-0 19-Aug-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.52	26.45	9.58	23.65
1.03	26.44	9.54	23.67
1.63	26.45	9.52	23.69
2.07	26.45	9.50	23.71
2.83	26.45	9.50	23.71

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-0 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
3.54	26.45	9.49	23.71
4.23	26.45	9.49	23.71
4.90	26.45	9.49	23.71
5.38	26.46	9.48	23.73
6.06	26.46	9.48	23.73
7.05	26.46	9.47	23.74
7.66	26.47	9.47	23.75
8.37	26.31	9.43	23.61
9.20	25.81	8.38	23.81
10.08	25.63	7.69	24.10
10.68	25.49	7.23	24.28
10.83	25.46	6.82	24.53
11.13	25.27	6.62	24.48
11.18	25.27	6.19	24.79
11.91	25.20	6.01	24.83
12.69	25.14	5.86	24.88
13.16	25.07	5.65	24.96
13.78	25.00	5.36	25.10
14.53	24.55	5.05	24.84
15.23	24.36	4.04	25.39
15.94	24.27	3.49	25.71
16.35	24.24	3.20	25.91
17.50	24.21	3.08	25.97
18.15	23.88	2.82	25.80
19.12	23.60	2.28	25.89
20.11	23.39	1.59	26.20
20.95	23.37	1.19	26.52
21.51	23.38	1.10	26.61
22.08	23.37	1.06	26.63
23.02	23.36	1.00	26.66

REF-0 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
23.77	23.28	0.89	26.66
24.65	23.25	0.77	26.72
25.36	23.17	0.68	26.70
26.09	23.12	0.51	26.78
27.03	23.05	0.35	26.84
27.77	23.02	0.25	26.88
28.37	23.00	0.15	26.95
29.20	23.00	0.10	26.98
29.98	23.00	0.08	27.00
30.65	22.99	0.04	27.03
31.34	22.96	-0.01	27.04
32.09	22.95	-0.03	27.04
32.96	22.93	-0.07	27.05
33.46	22.89	-0.14	27.06
34.21	22.87	-0.19	27.07
34.92	22.87	-0.24	27.11
35.63	22.85	-0.26	27.11
36.30	22.83	-0.32	27.14
36.74	22.83	-0.37	27.18
37.52	22.83	-0.39	27.20
38.35	22.83	-0.40	27.21
39.03	22.83	-0.40	27.20
39.97	22.82	-0.41	27.20
40.64	22.84	-0.41	27.22
41.30	22.82	-0.43	27.22
42.06	22.83	-0.47	27.26
42.77	22.83	-0.45	27.25
43.63	22.82	-0.47	27.26
44.35	22.82	-0.47	27.25
44.83	22.82	-0.48	27.26

REF-0 19-Aug-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
45.70	22.83	-0.47	27.27
46.50	22.83	-0.47	27.27
47.03	22.82	-0.47	27.25
47.89	22.82	-0.50	27.28
48.75	22.83	-0.52	27.31
49.36	22.83	-0.53	27.31
50.32	22.81	-0.52	27.29
50.59	22.84	-0.52	27.32

REF-0 30-Sep-10			
Depth (m)	Conductivity (μ S/cm)	Temperature (°C)	Salinity
0.99	23.58	3.56	24.87
1.79	23.58	3.55	24.87
2.83	23.58	3.55	24.87
3.60	23.58	3.55	24.87
4.66	23.59	3.55	24.88
4.98	23.58	3.55	24.88
5.55	23.58	3.55	24.88
5.69	23.58	3.55	24.87
6.06	23.59	3.55	24.87
6.66	23.58	3.55	24.87
7.26	23.59	3.55	24.88
7.51	23.59	3.55	24.88
8.31	23.59	3.55	24.88
8.33	23.59	3.55	24.88
8.45	23.59	3.55	24.88
9.08	23.59	3.56	24.88
10.15	23.60	3.55	24.89

Appendix 3.2-2. Summer and Fall Marine CTD Data for Roberts Bay and Reference Bay, Hope Bay Belt Project, 2010

REF-0 30-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
10.61	23.60	3.55	24.89
11.86	23.59	3.55	24.88
12.32	23.60	3.55	24.89
13.26	23.60	3.55	24.88
13.81	23.61	3.55	24.90
14.75	23.61	3.56	24.90
15.60	23.62	3.57	24.91
16.35	23.64	3.59	24.90
17.45	23.67	3.60	24.93
17.50	23.67	3.63	24.91
18.21	23.72	3.68	24.93
19.11	23.93	3.72	25.14
19.93	24.03	3.65	25.31
20.80	24.07	3.52	25.46
21.74	24.36	3.33	25.94
22.61	24.28	3.12	26.01
23.33	24.21	2.89	26.12
23.43	24.20	2.86	26.13
23.50	24.21	2.83	26.17
23.61	24.21	2.89	26.12
23.74	24.19	2.67	26.28
24.46	24.11	2.57	26.26
24.66	24.11	2.54	26.28
24.75	24.10	2.45	26.35
25.34	24.09	2.36	26.41
25.99	24.01	2.10	26.53
26.72	23.88	1.99	26.47
26.74	23.88	1.87	26.57
27.53	23.82	1.71	26.63
28.41	23.74	1.59	26.63

REF-0 30-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
28.50	23.73	1.43	26.75
29.17	23.63	1.26	26.77
29.58	23.61	1.15	26.84
29.72	23.60	1.24	26.76
30.58	23.57	1.07	26.85
31.18	23.54	0.90	26.98
31.85	23.47	0.69	27.06
32.50	23.33	0.39	27.15
33.25	23.26	0.35	27.10
33.92	23.24	0.29	27.13
34.52	23.22	0.25	27.13
35.16	23.21	0.23	27.13
35.20	23.20	0.23	27.13
35.51	23.21	0.23	27.13
36.13	23.21	0.22	27.15
36.69	23.19	0.19	27.15
37.42	23.18	0.18	27.15
37.90	23.19	0.18	27.16
38.67	23.19	0.17	27.16
39.07	23.18	0.16	27.16
39.88	23.18	0.15	27.17
40.35	23.18	0.14	27.18
40.94	23.18	0.11	27.20
41.57	23.15	0.05	27.22
42.10	23.13	-0.01	27.25
42.79	23.11	-0.06	27.26
43.48	23.08	-0.11	27.26
44.03	23.06	-0.15	27.28
44.60	23.05	-0.18	27.29
45.26	23.03	-0.20	27.28
45.66	23.03	-0.20	27.28

REF-0 30-Sep-10 (continued)			
Depth (m)	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	Salinity
46.04	23.03	-0.20	27.29
46.16	23.03	-0.22	27.30
46.96	23.02	-0.23	27.30
47.30	23.02	-0.23	27.30
47.95	23.02	-0.23	27.30
48.58	23.02	-0.23	27.30
49.27	23.02	-0.24	27.30
49.77	23.02	-0.23	27.30
50.50	23.03	-0.23	27.31
51.08	23.03	-0.24	27.31
51.65	23.02	-0.25	27.31
52.37	23.03	-0.27	27.34
53.13	23.00	-0.32	27.36
53.95	22.99	-0.34	27.35
54.59	22.98	-0.35	27.35
55.23	22.98	-0.36	27.36
56.00	22.98	-0.36	27.36
56.54	22.97	-0.38	27.36
57.32	22.97	-0.39	27.37
58.13	22.96	-0.40	27.37
58.80	22.96	-0.41	27.38
59.68	22.96	-0.42	27.38
60.46	22.95	-0.43	27.38
61.15	22.95	-0.44	27.39
61.70	22.94	-0.45	27.38
62.38	22.94	-0.45	27.39
63.13	22.94	-0.44	27.37

Appendix 3.3-1

Winter Marine Dissolved Oxygen Concentrations, Hope
Bay Belt Project, 2010

Appendix 3.3-1. Winter Marine Dissolved Oxygen Concentrations, Hope Bay Belt Project, 2010

RBE 24-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2	10.17	85.8
2.5	10.14	85.5
3	10.13	85.4

RBW 24-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2	9.95	83.9
2.5	9.94	83.9
3	9.93	83.8
3.5	9.94	83.8
4	9.94	83.8

DWP 24-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2	9.82	83.0
3	9.80	82.9
4	9.77	82.7
5	9.74	82.3
6	9.71	82.2
7	9.70	82.1
8	9.63	81.4
9	9.54	80.7
10	8.21	71.3

DWP (continued) 24-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
11	8.06	70.5
12	8.01	70.1
13	7.92	69.3

ST4 23-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2	9.65	81.6
3	9.60	81.2
4	9.55	80.8
5	9.52	80.6
6	9.50	80.3
7	9.44	79.9
8	8.50	73.1
9	8.25	71.9
10	8.18	71.4
11	8.17	71.4
12	8.16	70.9
13	7.91	69.1
14	7.84	68.5
15	7.79	68.0
16	7.74	67.6
17	7.71	67.3
18	7.69	67.1
19	7.68	66.9
20	7.62	66.4
22	7.50	65.4

ST4 (continued) 23-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
24	7.46	64.8
26	7.43	64.5
28	7.37	64.0
30	7.36	63.7
32	7.32	63.4
34	7.29	63.2
36	7.24	62.8
38	7.19	62.3
40	7.15	61.1
45	7.08	61.3
48	7.05	61.0

REF4 23-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
2	9.42	79.4
3	9.44	79.6
4	9.49	80.1
5	9.51	80.2
6	9.49	80.0
7	9.43	79.6
8	9.37	79.3
9	9.34	79.0
10	8.52	72.8
11	7.80	67.5
12	7.75	67.9
13	7.74	67.7

Appendix 3.3-1. Winter Marine Dissolved Oxygen Concentrations, Hope Bay Belt Project, 2010

REF4 (continued)		
23-Apr-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
14	7.73	67.6
15	7.69	67.3
16	7.61	66.2
17	7.51	65.6
18	7.49	65.4
19	7.52	65.5
20	7.55	65.7
22	7.52	65.5
24	7.48	64.9
26	7.42	64.4
28	7.39	64.2
30	7.25	62.7
32	7.12	61.6
34	7.06	61.1
36	7.00	60.6
38	6.89	59.7
40	6.30	54.4
45	5.76	49.6
50	5.60	48.2

Appendix 3.3-2

Summer and Fall Marine Dissolved Oxygen Concentrations,
Hope Bay Belt Project, 2010

Appendix 3.3-2. Summer and Fall Marine Dissolved Oxygen Concentrations, Hope Bay Belt Project, 2010

RBE 17-Aug-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	9.75	98.1
0.5	9.46	96.1
1	9.52	98.1
1.5	8.14	85.3
2	8.45	88.7
2.5	8.68	90.5
3	8.75	91.3
3.5	8.31	86.6
4	8.22	85.5
4.5	8.12	85.3

RBE 30-Sep-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	12.68	96.0
0.5	12.69	96.0
1	12.68	96.0
1.5	12.68	95.9
2	12.67	95.8
2.5	12.67	95.7
3	12.65	95.7
3.5	12.65	95.7

RBW 15-Aug-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	8.72	88.7
0.5	8.80	89.4

RBW 15-Aug-10 (continued)		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
1	8.91	90.1
1.5	8.66	89.3

RBW 30-Sep-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	12.50	95.6
0.5	12.49	95.4
1	12.47	95.4
1.5	12.49	95.4
2	12.48	95.4
2.5	12.48	95.3
3	12.49	95.4
3.5	12.48	95.3
4	12.48	95.3
4.5	12.48	95.2
5	12.47	95.3
5.5	12.51	95.7

DWP 22-Jul-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	10.9	109.8
1	10.88	109.6
2	10.88	109.6
3	10.93	108.1
4	10.96	109.3
5	10.92	108.9

DWP 22-Jul-10 (continued)		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
6	11.02	109.5
7	11.07	110
8	11.1	109.6
9	11.22	110.5
10	11.34	111.2
11	11.39	111.8
12	11.65	112.8
13	13.37	115.2

DWP 17-Aug-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	9.66	99.3
1	9.86	101.3
2	9.66	99.1
3	9.60	98.5
4	9.58	98.2
5	9.56	98.1
6	9.61	98.2
7	9.66	98.3
8	9.69	98.6
9	10.37	102.3
10	12.31	108.6
11	12.39	109.5

Appendix 3.3-2. Summer and Fall Marine Dissolved Oxygen Concentrations, Hope Bay Belt Project, 2010

ST4 17-Aug-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	9.14	94.6
1	9.26	95.5
2	9.34	96.1
3	9.38	96.1
4	9.39	96.4
5	9.43	96.4
6	9.44	96.7
7	9.52	96.9
8	9.64	97.0
9	10.31	100.8
10	11.20	103.5
11	11.77	105.5
12	11.74	103.1
13	12.18	103.8
14	12.38	102.5
15	12.55	103.2
16	12.57	103.4
18	12.52	100.9
20	12.44	99.8
22	12.37	98.9
24	12.29	97.7
26	12.22	97.2
28	12.11	95.8
29	12.13	95.9

ST4 01-Oct-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	12.70	96.3
1	12.96	97.0
2	12.93	97.6
3	12.94	97.5
4	12.90	97.6
5	12.93	97.8
6	12.92	98.0
7	12.92	98.0
8	12.96	98.2
9	12.96	98.1
10	12.95	98.1
11	12.95	98.1
12	12.94	98.1
13	12.94	98.1
14	12.94	98.0
15	12.90	97.9
16	12.88	97.7
17	12.76	96.9
18	12.75	96.9
19	12.71	96.5
20	12.64	96.0
21	12.90	96.2
22	12.98	95.3
23	12.97	95.2
24	13.04	95.1
25	12.84	92.8
26	12.75	90.9
27	12.73	89.7
28	12.77	89.3

REF-Marine 13-Jul-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	10.91	106.7
1	10.91	106.8
2	11.05	106
3	11.07	106.2
4	11.13	106.6
5	11.08	106.1
6	11.16	106.9
7	11.4	108.1
8	11.65	109.3
9	12.77	113.8
10	12.95	113.4
11	13.07	109.1
12	12.94	106.1
13	12.67	103.5
14	12.53	101.5
15	12.19	98.5
16	12.18	98.5
17	12.03	96.5
18	11.89	95.6

REF-Marine 21-Aug-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	9.63	100.2
1	9.62	99.7
2	9.63	99.9
3	9.81	100.3
4	10.00	100.3

Appendix 3.3-2. Summer and Fall Marine Dissolved Oxygen Concentrations, Hope Bay Belt Project, 2010

REF-Marine 21-Aug-10 (continued)		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
5	10.09	99.7
6	10.33	100.8
7	10.33	101.6

REF-Marine 08-Sep-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	12.40	96.7
0.5	12.56	96.1
1	12.52	96.1
1.5	12.54	94.1
2	12.40	95.6
2.5	12.41	95.1
3	12.38	95.0
3.5	12.38	95.1
4	12.40	95.6
4.5	12.46	95.1
5	12.40	95.0
5.5	12.40	95.0
6	12.43	94.8
6.5	12.47	94.8
7	12.47	94.9
7.5	12.36	94.5
8	12.33	94.5
8.5	12.31	94.6
9	12.38	94.4
9.5	12.25	94.4
10	12.24	93.8

REF-Marine 08-Sep-10 (continued)		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
10.5	12.29	94.4
11	12.25	94.3
11.5	12.29	94.1
12	12.24	94.2
12.5	12.25	93.5
13	12.20	93.5
13.5	12.24	93.8
14	12.19	93.7
14.5	12.19	93.4
15	12.10	93.2
15.5	12.10	93.1
16	12.10	93.1
16.5	12.11	93.1

REF-4 21-Aug-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	9.3	98
0.9	9.4	97.7
1.7	9.5	98.5
2.6	9.6	101.1
3.5	10.1	101.2
4.3	10.3	101.5
5.2	10.4	102
6.1	10.8	103.1
6.9	10.8	103.5
7.8	11.1	103.9
8.7	11.3	105

REF-4 21-Aug-10 (continued)		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
9.5	11.4	105
10.4	11.6	105
11.3	11.7	105.7
12.1	11.8	105.3
13.0	12.0	105
13.9	12.4	105.5
14.7	12.3	103.9
15.6	12.6	105.4
16.5	12.7	105.1
17.3	12.7	104.5
18.2	12.7	103.5
19.1	12.6	102.7
19.9	12.6	101.7
20.8	12.5	101.2
21.7	12.3	98.9
22.5	12.3	98.8
23.4	12.2	98.6
24.2	12.2	97.8
25.1	12.2	97.7

REF-4 29-Sep-10		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
0	12.71	97.1
1	12.71	97.1
2	12.68	96.9
3	12.69	96.9
4	12.66	96.8

Appendix 3.3-2. Summer and Fall Marine Dissolved Oxygen Concentrations, Hope Bay Belt Project, 2010

REF-4		
29-Sep-10 (continued)		
Depth (m)	Dissolved Oxygen (mg/L)	Dissolved Oxygen Saturation (%)
5	12.67	96.6
6	12.69	96.7
7	12.64	96.7
8	12.61	96.6
9	12.60	96.4
10	12.57	96.0
11	12.60	96.3
12	12.37	94.5
13	12.30	94.2
14	12.21	92.7
15	12.09	91.9
16	12.09	90.6
17	12.02	90.2
18	12.03	89.5
19	12.02	89.4
20	12.00	88.7
21	12.12	89.1
22	12.25	92.5
23	12.14	87.8
24	12.07	86.8
25	11.83	88.6
26	11.89	84.8
27	11.77	84.1
28	11.70	82.2
29	11.71	82.2
30	11.80	82.7

Appendix 3.5-1

Marine Water Quality, Hope Bay Belt Project, 2010

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	ST4 24-Apr-10					REF-4 24-Apr-10					DWP 24-Apr-10		RBE 25-Apr-10		RBW 25-Apr-10	REF-Marine 13-Jul-10		
				1	1	2	1	1	1	2	1	1	1	1	1	2	1	1	1	1	
Depth Zone				Surface	Pycnocline	Pycnocline	Pycnocline	Deep	Surface	Surface	Pycnocline	Pycnocline	Deep	Surface	Deep	Surface	Surface	Surface	Surface	Deep	
Depth (m)				2.5	9.5	9.5	17.5	41.5	2.5	2.5	9.5	17.5	41.5	2.5	11.5	3	3	3	1	17	
ALS Sample ID	Units	RDL ^a		L880489-1	L880489-2	L880489-3	L880489-9	L880489-4	L880489-5	L880489-6	L880489-7	L880489-8	L880489-10	L880489-11	L880489-12	L880493-1	L880493-2	L880493-3	L909785-5	L909785-6	
Physical Tests																					
Conductivity	µS/cm	2.0	7.0-8.7 dependent on background levels dependent on background levels <10% fluctuation ^c	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32400	41100	
Hardness (as CaCO ₃)	mg/L	0.86-4.3		5140	5080	5140	5410	5400	5170	5090	5390	5170	5220	5060	5100	4990	4990	5120	3870	5180	
pH	pH	0.1		7.72	7.72	7.66	7.63	7.63	7.71	7.65	7.62	7.63	7.59	7.69	7.73	7.75	7.72	7.73	7.92	7.91	
Total Suspended Solids	mg/L	3.0		7.0	5.0	14.3	<3.0	10.3	8.3	<3.0	8.0	3.7	7.0	<3.0	6.3	8.3	<3.0	10.3	10.8	11.5	
Turbidity	NTU	0.1		0.23	0.13	0.14	0.17	0.19	0.16	0.19	0.18	0.22	0.16	0.16	0.16	0.22	0.19	0.16	0.40	0.72	
Salinity (EC)	g/L	1.0		-	-	-	-	-	-	-	-	-	-	-	-	-	26.7	26.5	26.6	-	-
Anions and Nutrients																					
Alkalinity, Total (as CaCO ₃)	mg/L	2.0	3.6	-	-	-	-	-	-	-	-	-	-	-	-	120	119	118	96.3	116	
Bromide (Br)	mg/L	2.5-25		43.6	44.4	44.6	47.1	45.9	44.2	44.8	42.2	43.3	47.5	45.5	46.3	42.9	42.2	43.7	<25	<25	
Chloride (Cl)	mg/L	25-250		15100	15300	15300	15600	15600	15100	15100	15200	14900	15700	15200	15300	15200	15200	15200	11500	15500	
Fluoride (F)	mg/L	0.03-1		0.91	0.96	0.95	0.91	0.96	0.96	1.02	0.92	0.96	0.93	0.93	0.91	0.93	0.92	0.95	0.598	0.743	
Sulfate (SO ₄)	mg/L	25-250		2070	2100	2100	2140	2140	2070	2080	2080	2050	2160	2080	2090	2080	2080	2080	1500	2060	
Ammonia as N	mg/L	0.001-0.01		0.0098	<0.0050	<0.0050	0.155	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.016	
Nitrate+Nitrite-N	mg/L	0.006		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate (as N)	mg/L	0.006-2.5		0.0358	0.0669	0.0675	0.0789	0.0821	0.0450	0.0422	0.0331	0.0854	0.105	0.0364	0.0747	0.0252	0.0243	0.0318	<2.5	<2.5	
Nitrite (as N)	mg/L	0.002-0.5		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0252	0.0243	-	<0.50	<0.50	
Ortho Phosphate as P	mg/L	0.001		0.0369	0.0403	0.0396	0.0462	0.0456	0.0376	0.0374	0.0362	0.0486	0.0552	0.0358	0.0440	-	-	-	-	-	
Total Phosphorus	mg/L	0.002		0.0382	0.0404	0.0421	0.0454	0.0472	0.0419	0.0410	0.0384	0.0459	0.0565	0.0384	0.0425	0.0371	0.0359	0.0379	0.0265	0.0484	
Silicate (as SiO ₄)	mg/L	0.025-1		1.27	1.45	1.45	1.74	2.02	1.57	1.45	1.33	2.03	2.69	1.31	1.57	-	-	-	-	-	
Organic / Inorganic Carbon																					
Total Organic Carbon	mg/L	0.5-1		1.3	1.1	1.1	1.0	<1.0	1.2	1.2	1.3	<1.0	1.2	1.2	1.2	1.1	1.2	1.80	1.60		
Total Metals																					
Aluminum (Al)-Total	mg/L	0.005-0.01	0.0125 ^c	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.010	0.029	0.015	
Antimony (Sb)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Arsenic (As)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
Barium (Ba)-Total	mg/L	0.001		0.0114	0.0128	0.0121	0.0141	0.0122	0.0112	0.0120	0.0111	0.0136	0.0132	0.0118	0.0133	0.0115	0.0115	0.0112	0.0105	0.0139	
Beryllium (Be)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Bismuth (Bi)-Total	mg/L	0.0005	0.000012	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Boron (B)-Total	mg/L	0.1		3.61	3.74	3.67	3.91	3.83	3.77	3.86	3.86	3.84	3.85	3.75	3.78	3.77	3.73	3.81	2.80	3.64	
Cadmium (Cd)-Total	mg/L	0.00002-0.00012		<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	
Calcium (Ca)-Total	mg/L	0.1-0.5		338	324	328	326	333	329	336	326	339	340	319	315	320	321	331	242	342	
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Chromium (Cr)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Cobalt (Co)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Copper (Cu)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0033	0.0034	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0011	
Gallium (Ga)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Iron (Fe)-Total	mg/L	0.01-0.3		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.30	<0.30	
Lead (Pb)-Total	mg/L	0.00005-0.001	0.000016 ^d	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Lithium (Li)-Total	mg/L	0.02		0.158	0.159	0.155	0.164	0.159	0.161	0.163	0.161	0.163	0.161	0.160	0.161	0.161	0.158	0.162	0.124	0.162	
Magnesium (Mg)-Total	mg/L	0.2-1		1070	1030	1040	1050	1060	1040	1060	1030	1070	1090	1020	1010	1020	1020	1040	793	1050	
Manganese (Mn)-Total	mg/L	0.00005-0.0005		0.00154	0.00121	0.00115	0.00154	0.00253	0.00470	0.00225	0.00184	0.00159	0.00319	0.00148	0.00112	0.00233	0.00147	0.00145	0.00247	0.00177	
Mercury (Hg)-Total	mg/L	0.00001		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)-Total	mg/L	0.002		0.0092	0.0089	0.0087	0.0094	0.0091	0.0090	0.0094	0.0090	0.0092	0.0091	0.0091	0.0091	0.0087	0.0082	0.0095	0.0073	0.0093	
Nickel (Ni)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00118	0.00081	
Phosphorus (P)-Total	mg/L	1-3		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<3.0	<3.0	
Potassium (K)-Total	mg/L	4-20		339	344	342	345	355	342	341	343	357	351	342	336	340	339	337	235	313	
Rhenium (Re)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Rubidium (Rb)-Total	mg/L	0.005		0.0870	0.0891	0.0863	0.0913	0.0890	0.0890	0.0903	0.0890	0.0916	0.0893	0.0888	0.0881	0.0885	0.0877	0.0879	0.0680	0.0890	
Selenium (Se)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	
Silicon (Si)-Total	mg/L	0.1-0.5		0.68	0.74	0.65	0.73	0.82	0.65	0.64	0.64	0.99	1.21	0.60	0.72	0.52	<0.50	0.70	<0.50	<0.50	
Silver (Ag)-Total	mg/L	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020		
Sodium (Na)-Total	mg/L	4-20																			

Date Sampled				ST4 24-Apr-10					REF-4 24-Apr-10					DWP 24-Apr-10		RBE 25-Apr-10		RBW 25-Apr-10	REF-Marine 13-Jul-10		
Replicate				1	1 Above Pycnocline	2 Above Pycnocline	1 Below Pycnocline	1	1	2	1 Above Pycnocline	1 Below Pycnocline	1	1	1	1	2	1	1		
Depth Zone Depth (m)				Surface 2.5	9.5	9.5	17.5	Deep 41.5		Surface 2.5	Surface 17.5	Pycnocline 9.5	Pycnocline 17.5	Deep 41.5	Surface 2.5	Deep 11.5	Surface 3	Surface 3	Surface 3	Surface 1	Deep 17
ALS Sample ID		RDL ^a		L880489-1	L880489-2	L880489-3	L880489-9	L880489-4		L880489-5	L880489-6	L880489-7	L880489-8	L880489-10	L880489-11	L880489-12	L880493-1	L880493-2	L880493-3	L909785-5	L909785-6
Titanium (Ti)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Total	mg/L	0.00005-0.0005		0.00262	0.00262	0.00254	0.00256	0.00263		0.00256	0.00252	0.00252	0.00264	0.00265	0.00256	0.00258	0.00247	0.00253	0.00253	0.00196	0.00255
Vanadium (V)-Total	mg/L	0.0005		0.00079	0.00084	0.00081	0.00075	0.00082		0.00074	0.00082	0.00072	0.00074	0.00080	0.00075	0.00070	0.00081	0.00083	0.00074	0.00067	0.00089
Yttrium (Y)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.0008-0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	mg/L	0.0005-0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals																					
Aluminum (Al)-Dissolved	mg/L	0.005-0.01		<0.010	<0.010	<0.010	<0.010	<0.010		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-
Arsenic (As)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	-	-	-	-
Antimony (Sb)-Dissolved	mg/L	0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	-	-	-	-
Barium (Ba)-Dissolved	mg/L	0.001		0.0114	0.0123	0.0129	0.0142	0.0133		0.0114	0.0134	0.0143	0.0149	0.0149	0.0144	0.0142	-	-	-	-	-
Beryllium (Be)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	-	-	-	-
Bismuth (Bi)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	-	-	-	-
Boron (B)-Dissolved	mg/L	0.1		3.62</																	

a) RDL = Realized Detection Limit

b) Canadian water quality guidelines for the protection of marine aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

c) *Interim guideline*

d) Guideline refers to inorganic mercury

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Date Sampled				RBE 20-Jul-10		RBW 20-Jul-10		ST4 22-Jul-10					DWP 22-Jul-10				REF-4 22-Jul-10			
Replicate				1	2	1	2	1	1	2	1	1	1	2	1	1	1	1		
Depth Zone				Surface	Surface	Surface	Surface	Surface	Above Pycnocline	Above Pycnocline	Below Pycnocline	Deep	Surface	Surface	Above Pycnocline	Below Pycnocline	Surface	Above Pycnocline		
Depth (m)				1	1	1	1	1	6	6	14	40	1	1	6	12	1	8		
ALS Sample ID	Units	RDL ^a	CCME Guideline for the Protection of Marine Aquatic Life ^b	L911821-2	L911821-3	L911821-4	L911821-5	L912587-1	L912587-2	L912587-5	L912587-3	L912587-4	L912587-6	L912587-9	L912587-7	L912587-8	L912587-11	L912587-10		
Physical Tests																				
Conductivity	µS/cm	2.0		34000	33900	34200	34300	-	-	-	-	-	-	-	-	-	-	-		
Hardness (as CaCO ₃)	mg/L	0.86-4.3		4380	4210	4260	4220	-	-	-	-	-	-	-	-	-	-	-		
pH		0.1	7.0-8.7	7.84	7.90	7.87	7.88	7.87	7.88	7.88	7.87	7.80	7.88	7.86	7.89	7.88	7.89	7.89		
Total Suspended Solids	mg/L	3.0	dependent on background levels	5.6	6.9	<3.0	7.6	11.3	12.0	12.0	14.0	19.3	10.7	12.0	12.7	11.3	13.3	13.3		
Turbidity	NTU	0.1	dependent on background levels	0.73	0.71	0.45	0.47	0.21	0.23	0.32	0.36	0.58	0.27	0.32	0.22	0.24	0.36	0.30		
Salinity (EC)	g/L	1.0	<10% fluctuation ^c	21.9	21.8	22.1	22.0	-	-	-	-	-	-	-	-	-	-	-		
Anions and Nutrients																				
Alkalinity, Total (as CaCO ₃)	mg/L	2.0		104	96.2	103	98.8	-	-	-	-	-	-	-	-	-	-	-		
Bromide (Br)	mg/L	2.5-25		34.3	34.2	35.5	35.0	36.9	39.8	39.0	46.3	47.9	37.3	37.8	37.6	40.1	36.8	37.2		
Chloride (Cl)	mg/L	25-250		12700	12700	12700	12700	12800	13300	13400	15800	16500	13200	13500	13400	14100	12800	13300		
Fluoride (F)	mg/L	0.03-1		<0.75	<0.75	<0.75	0.92	<0.75	<0.75	0.88	0.78	0.80	0.76	<0.75	<0.75	<0.75	<0.75	<0.75		
Sulfate (SO ₄)	mg/L	25-250		1750	1740	1750	1750	1750	1810	1830	2160	2250	1800	1840	1820	1910	1740	1810		
Ammonia as N	mg/L	0.001-0.01		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	<0.005	<0.005		
Nitrate+Nitrite-N	mg/L	0.006		<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	0.068	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060		
Nitrate (as N)	mg/L	0.006-2.5	3.6	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	0.068	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060		
Nitrite (as N)	mg/L	0.002-5		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020		
Ortho Phosphate as P	mg/L	0.001		-	-	-	-	0.0215	0.0229	0.0225	0.0290	0.0442	0.0214	0.0218	0.0220	0.0240	0.0211	0.0207		
Total Phosphorus	mg/L	0.002		0.0275	0.0277	0.0270	0.0274	0.0260	0.0257	0.0253	0.0335	0.0545	0.0263	0.0265	0.0266	0.0274	0.0241	0.0263		
Silicate (as SiO ₂)	mg/L	0.025-1		-	-	-	-	0.649	0.716	0.758	0.836	2.11	0.683	0.702	0.736	0.779	0.750	0.709		
Organic / Inorganic Carbon																				
Total Organic Carbon	mg/L	0.5-1		1.61	1.44	1.33	1.36	1.26	1.21	1.28	1.14	1.17	1.19	1.17	1.19	1.19	1.33	1.13		
Total Metals																				
Aluminum (Al)-Total	mg/L	0.005-0.01		0.0302	0.0248	0.0151	0.0226	<0.0050	<0.0050	<0.0050	0.0082	0.0054	<0.0050	0.0058	<0.0050	<0.0050	0.0109	<0.0050		
Antimony (Sb)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Arsenic (As)-Total	mg/L	0.0004-0.002	0.0125 ^e	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020		
Barium (Ba)-Total	mg/L	0.001		0.0112	0.0115	0.0114	0.0111	0.0096	0.0100	0.0101	0.0118	0.0127	0.0093	0.0096	0.0101	0.0101	0.0088	0.0101		
Beryllium (Be)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Bismuth (Bi)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Boron (B)-Total	mg/L	0.1		2.96	2.95	3.01	3.07	2.84	2.87	3.01	3.47	3.76	2.77	2.95	3.00	3.10	2.63	3.05		
Cadmium (Cd)-Total	mg/L	0.00002-0.00012	0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012		
Calcium (Ca)-Total	mg/L	0.1-0.5		288	263	285	263	263	257	253	337	335	253	265	267	293	245	250		
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Chromium (Cr)-Total	mg/L	0.001	Cr(VI): 0.0015; Cr(III): 0.0056 ^f	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010		
Cobalt (Co)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Copper (Cu)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010		
Gallium (Ga)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Iron (Fe)-Total	mg/L	0.01-0.3		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050		
Lead (Pb)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010		
Lithium (Li)-Total	mg/L	0.02		0.133	0.136	0.138	0.131	0.115	0.116	0.122	0.143	0.154	0.110	0.118	0.123	0.126	0.107	0.125		
Magnesium (Mg)-Total	mg/L	0.2-1		868	865	862	865	872	865	862	1050	830	872	830	845	803	815	844		
Manganese (Mn)-Total	mg/L	0.00005-0.0005		0.00267	0.00270	0.00225	0.00225	0.00207	0.00215	0.00222	0.00182	0.00292	0.00187	0.00214	0.00210	0.00205	0.00203	0.00204		
Mercury (Hg)-Total	mg/L	0.00001	0.000016 ^{-d}	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
Molybdenum (Mo)-Total	mg/L	0.002		0.0078	0.0078	0.0081	0.0078	0.0066	0.0066	0.0068	0.0091	0.0098	0.00614	0.0069	0.0070	0.0072	0.00602	0.0071		
Nickel (Ni)-Total	mg/L	0.00005-0.0005		0.00067	0.00056	0.00055	0.00055	0.00062	0.00068	0.00088	0.00089	0.00095	<0.00050	0.00063	<0.00050	<0.00050	0.00052	<0.00050		
Phosphorus (P)-Total	mg/L	1-3		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Potassium (K)-Total	mg/L	4-20		269	259	264	258	258	251	245	306	302	244	249	258	265	233	240		
Rhenium (Re)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Rubidium (Rb)-Total	mg/L	0.005		0.0766	0.0774	0.0805	0.0785	0.0664	0.0661	0.0696	0.0815	0.0890	0.0637	0.0682	0.0700	0.0710	0.0607	0.0702		
Selenium (Se)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020		
Silicon (Si)-Total	mg/L	0.1-0.5		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.95	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50		
Silver (Ag)-Total	mg/L	0.0002		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020		
Sodium (Na)-Total	mg/L	4-20		7640	7340	7500	7260	7190	7080	6830	8570	8440	6840	7220	7210	7440	6450	6760		
Strontium (Sr)-Total	mg/L	0.00005-0.05		5.27	5.05	5.18	5.00	4.91	4.84	4.70	5.92	5.78	4.71	4.99	4.95	5.13	4.57	4.66		
Tellurium (Te)-Total	mg/L	0.00050		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Thallium (Tl)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Thorium (Th)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Tin (Sn)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010		

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of marine aquatic life.

a) RDL = Realized Detection Limit

b) Canadian water quality guidelines for the protection of marine aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

c) *Interim guideline*

d) Guideline refers to inorganic mercury

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^a	RBE 20-Jul-10		RBW 20-Jul-10		SY4 22-Jul-10					DWP 22-Jul-10				REF-4 22-Jul-10			
				1	2	1	2	1	1	2	1	1	1	2	1	1	1	1	1	1
Depth Zone Depth (m)				Surface 1	Surface 1	Surface 1	Surface 1	Surface 1	Above Pycnocline 6	Above Pycnocline 6	Below Pycnocline 14	Deep 40	Surface 1	Surface 1	Above Pycnocline 6	Below Pycnocline 12	Surface 1	Above Pycnocline 8	Below Pycnocline 16	Deep 40
ALS Sample ID	Units	RDL ^b		L911821-2	L911821-3	L911821-4	L911821-5	L912587-1	L912587-2	L912587-5	L912587-3	L912587-4	L912587-6	L912587-9	L912587-7	L912587-8	L912587-11	L912587-10	L912587-12	L912587-13
Titanium (Ti)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Total	mg/L	0.00005-0.0005		0.00215	0.00214	0.00217	0.00215	0.00200	0.00194	0.00206	0.00238	0.00257	0.00185	0.00199	0.00205	0.00209	0.00179	0.00206	0.00205	0.00229
Vanadium (V)-Total	mg/L	0.0005		0.00073	0.00070	0.00070	0.00069	0.00061	0.00062	0.00064	0.00075	0.00082	0.00055	0.00059	0.00068	0.00062	0.00057	0.00059	0.00068	0.00067
Yttrium (Y)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.0008-0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	mg/L	0.0005-0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals																				
Aluminum (Al)-Dissolved	mg/L	0.005-0.01		-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.002		-	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Barium (Ba)-Dissolved	mg/L	0.001		-	-	-	-	0.0094	0.0096	0.0105	0.0122	0.0125	0.0099	0.0103	0.0096	0.0101	0.0094	0.0095	0.0105	0.0127
Beryllium (Be)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	0.1		-	-	-	-	2.88	2.92	3.03	3.53	3.66	2.96	3.01	2.98	3.11	2.80	3.01	3.17	3.70
Cadmium (Cd)-Dissolved	mg/L	0.00012		-	-	-	-	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	0.00033	<0.00012	<0.00012	<0.00012	<0.00012
Calcium (Ca)-Dissolved	mg/L	0.5		-	-	-	-	286	267	263	356	332	249	270	259	306	245	261	254	334
Cesium (Cs)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Dissolved	mg/L	0.001		-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Gallium (Ga)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)-Dissolved	mg/L	0.05		-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)-Dissolved	mg/L	0.001		-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (Li)-Dissolved	mg/L	0.02		-	-	-	-	0.117	0.119	0.120	0.144	0.149	0.120	0.123	0.122	0.125	0.114	0.122	0.129	0.152
Magnesium (Mg)-Dissolved	mg/L	1		-	-	-	-	894	876	882	1100	1060	827	853	865	951	816	869	863	1070
Manganese (Mn)-Dissolved	mg/L	0.0005		-	-	-	-	0.00171	0.00197	0.00189	0.00103	<0.00050	0.00202	0.00211	0.00173	0.00183	0.00190	0.00183	0.00189	0.00200
Mercury (Hg)-Dissolved	mg/L	0.00001		-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.002		-	-	-	-	0.0065	0.0067	0.0070	0.0083	0.0085	0.0069	0.0070	0.0070	0.0072	0.0065	0.0070	0.0075	0.0086
Nickel (Ni)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	0.00062	<0.00050	<0.00050	0.00054	0.00061	0.00070	0.00055	0.00088	0.00085	0.00065	0.00082	0.00087
Phosphorus (P)-Dissolved	mg/L	1		-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (K)-Dissolved	mg/L	20		-	-	-	-	265	258	257	324	304	241	255	247	276	238	249	241	313
Rhenium (Re)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Rubidium (Rb)-Dissolved	mg/L	0.005		-	-	-	-	0.0655	0.0673	0.0697	0.0833	0.0853	0.0686	0.0699	0.0681	0.0723	0.0649	0.0693	0.0743	0.0869
Selenium (Se)-Dissolved	mg/L	0.002		-	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon (Si)-Dissolved	mg/L	0.5		-	-	-	-	<0.50	<0.50	<0.50	<0.50	0.87	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.20
Silver (Ag)-Dissolved	mg/L	0.0002		-	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Sodium (Na)-Dissolved	mg/L	20		-	-	-	-	7460	7280	7170	8980	8430	6760	7370	6980	7700	6490	7050	6830	8650
Strontium (Sr)-Dissolved	mg/L	0.05		-	-	-	-	5.08	5.00	4.92	6.16	5.76	4.62	5.05	4.79	5.33	4.60	4.86	4.70	5.98
Tellurium (Te)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (Tl)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thorium (Th)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)-Dissolved	mg/L	0.001		-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.005		-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Dissolved	mg/L	0.001		-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Dissolved	mg/L	0.0005		-	-	-	-	0.00195	0.00196	0.00204	0.00240	0.00254	0.00203	0.00204	0.00207	0.00209	0.00191	0.00205	0.00216	0.00245
Vanadium (V)-Dissolved	mg/L	0.0005		-	-	-	-	0.00054	0.00058	0.00060	0.00088	0.00075	0.00058	0.00062	0.00060	0.00061	0.00058	0.00057	0.00062	0.00069
Yttrium (Y)-Dissolved	mg/L	0.0005		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.005		-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	mg/L	0.0005-0.0015		-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cyanides																				
Cyanide-Total	mg/L	0.001-0.005		0.0012	0.0014															

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	DWP 15-Aug-10			ST4 15-Aug-10					REF-4 15-Aug-10					RBE 15-Aug-10		RBW 15-Aug-10	
				1	1	1	1	Above	2	1	1	1	2	Above	1	1	1	2	1	2
Depth (m)				Surface	Pycnocline	Deep	Surface	Pycnocline	Pycnocline	Pycnocline	Deep	Surface	Surface	Pycnocline	Pycnocline	Deep	Surface	Surface	Surface	Surface
ALS Sample ID	Units	RDL ^a		L921283-1	L921283-2	L921283-3	L921283-4	L921283-5	L921283-6	L921283-7	L921283-8	L923112-1	L923112-2	L923112-3	L923112-4	L923112-5	L921315-1	L921315-2	L921315-3	L921315-4
Physical Tests																				
Conductivity	µS/cm	2.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness (as CaCO ₃)	mg/L	0.86-4.3		4300	4380	4400	4400	4410	4370	4950	5190	4010	4270	4390	4980	5220	762	727	4110	4110
pH	pH	0.1	7.0-8.7	7.82	7.89	7.87	7.89	7.89	7.88	7.85	7.81	8.03	7.96	7.92	7.86	7.75	7.73	7.73	7.90	7.90
Total Suspended Solids	mg/L	3.0	dependent on background levels	7.7	3.7	3.7	<3.0	<3.0	12.3	9.7	7.0	8.3	12.3	9.7	13.0	17.7	23.7	25.0	16.3	15.7
Turbidity	NTU	0.1	dependent on background levels	0.30	0.29	0.42	0.25	0.23	0.18	0.34	0.30	0.36	0.28	0.25	0.38	0.38	15.3	15.7	6.51	6.42
Salinity (EC)	g/L	1.0	<10% fluctuation ^c	-	-	-	-	-	-	-	-	-	-	-	-	-	4.2	4.3	21.2	21.0
Anions and Nutrients																				
Alkalinity, Total (as CaCO ₃)	mg/L	2.0		-	-	-	-	-	-	-	-	-	-	-	-	-	36.5	35.8	103	105
Bromide (Br)	mg/L	2.5-25		36.4	39.8	36.4	39.9	39.8	37.9	43	47	37.3	36.4	41.7	46	46	5.0	5.7	31.1	32.7
Chloride (Cl)	mg/L	25-250		13100	13200	12900	13100	13000	12800	14700	15400	11800	11700	13200	14800	14600	2280	2340	12000	11700
Fluoride (F)	mg/L	0.03-1		<0.75	<0.75	<0.75	<0.75	<0.75	<0.75	0.76	0.84	<0.75	<0.75	<0.75	0.81	0.84	<1.0	<1.0	<0.75	<0.75
Sulfate (SO ₄)	mg/L	25-250		1810	1840	1780	1830	1810	1780	2050	2160	1620	1600	1820	2040	2000	295	303	1670	1610
Ammonia as N	mg/L	0.001-0.01		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0052	<0.0050	0.0052	0.0204	<0.0050	<0.0050	<0.0050	<0.0050
Nitrate+Nitrite-N	mg/L	0.006		<0.0060	<0.0060	0.0066	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0748	0.0189	<0.0060	<0.0060	<0.0060
Nitrate (as N)	mg/L	0.006-2.5	3.6	<0.0060	<0.0060	0.0066	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0748	0.0159	<0.0060	<0.0060	<0.0060
Nitrite (as N)	mg/L	0.002-0.5		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0030	0.0034	<0.0020	<0.0020
Ortho Phosphate as P	mg/L	0.001		0.0218	0.0201	0.0202	0.0216	0.0215	0.0214	0.0263	0.0315	0.0195	0.0201	0.0229	0.0274	0.0489	-	-	-	-
Total Phosphorus	mg/L	0.002		0.0236	0.0220	0.0236	0.0230	0.0238	0.0243	0.0306	0.0331	0.0238	0.0232	0.0262	0.0318	0.0532	0.0385	0.0439	0.0324	0.0309
Salinity (EC)	mg/L	0.025-1		0.686	0.737	0.782	0.667	0.687	0.731	0.847	1.17	1.37	1.59	1.64	1.89	1.6	-	-	-	-
Organic / Inorganic Carbon																				
Total Organic Carbon	mg/L	0.5-1		1.64	1.59	2.03	1.51	1.48	1.52	1.29	1.22	1.79	1.87	1.67	1.46	1.45	4.93	4.98	2.04	1.99
Total Metals																				
Aluminum (Al)-Total	mg/L	0.005-0.01		0.0141	0.0150	0.0252	0.0062	0.0058	0.0053	0.0054	<0.0050	0.0222	0.0105	<0.0050	<0.0050	<0.0050	0.562	0.511	0.319	0.288
Antimony (Sb)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0004-0.002	0.0125 ^c	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Barium (Ba)-Total	mg/L	0.001		0.0107	0.0106	0.0104	0.0105	0.0106	0.0106	0.0121	0.0133	0.0101	0.0103	0.0101	0.0118	0.0127	0.0085	0.0073	0.0114	0.0118
Beryllium (Be)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	0.1		3.37	3.41	3.33	3.38	3.54	3.52	3.99	4.11	3.11	3.20	3.35	3.72	3.94	0.56	0.57	2.93	3.27
Cadmium (Cd)-Total	mg/L	0.00002-0.00012	0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Calcium (Ca)-Total	mg/L	0.1-0.5		289	285	287	289	279	303	321	353	259	266	290	323	347	52.1	49.8	266	267
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	mg/L	0.001	Cr(VI): 0.0015; Cr(III): 0.0056 ^c	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	0.0011	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.00005-0.001		0.0038	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	0.0023	0.0011	0.0012
Gallium (Ga)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)-Total	mg/L	0.01-0.3		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.649	0.616	0.353	0.343
Lead (Pb)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (Li)-Total	mg/L	0.02		0.144	0.148	0.146	0.149	0.153	0.154	0.174	0.180	0.128	0.131	0.136	0.157	0.164	0.025	0.025	0.120	0.134
Magnesium (Mg)-Total	mg/L	0.2-1		875	869	890	885	872	893	986	1090	815	841	871	984	1060	153	146	838	836
Manganese (Mn)-Total	mg/L	0.00005-0.0005		0.00264	0.00261	0.00264	0.00229	0.00220	0.00215	0.00216	0.00128	0.00256	0.00247	0.00232	0.00181	0.00387	0.0154	0.0166	0.00764	0.00823
Mercury (Hg)-Total	mg/L	0.00001	0.000016 ^{c,d}	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.002		0.0075	0.0078	0.0073	0.0076	0.0082	0.0078	0.0086	0.0090	0.0075	0.0072	0.0074	0.0084	0.0090	<0.0020	<0.0020	0.0064	0.0070
Nickel (Ni)-Total	mg/L	0.00005-0.0005		0.00125	0.00072	0.00127	0.00054	0.00061	<0.00050	0.00069	<0.00050	0.00062	0.00066	<0.00050	<0.00050	0.00059	0.00129	0.00124	0.00096	0.00086
Phosphorus (P)-Total	mg/L	1-3		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (K)-Total	mg/L	4-20		270	267	271	270	262	283	302	333	246	258	267	301	321	48.2	45.9	254	256
Rhenium (Re)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Rubidium (Rb)-Total	mg/L	0.005		0.0724	0.0735	0.0715	0.0736	0.0748	0.0756	0.0871	0.0890	0.0678	0.0698	0.0727	0.0825	0.0853	0.0142	0.0148	0.0663	0.0711
Selenium (Se)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon (Si)-Total	mg/L	0.1-0.5		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.92	2.34	1.97	1.12	0.99
Silver (Ag)-Total	mg/L	0.0002		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Sodium (Na)-Total	mg/L	4-20		7470	7360	7410	7380													

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	DWP 15-Aug-10			ST4 15-Aug-10					REF-4 15-Aug-10					RBE 15-Aug-10		RBW 15-Aug-10	
				1	1	1	1	1	2	1	1	1	2	1	1	1	2	1	2	
				Surface	Above Pycnocline 4	Deep 10	Surface	Above Pycnocline 7	Above Pycnocline 7	Below Pycnocline 15	Deep 30	Surface	Surface	Above Pycnocline 8	Below Pycnocline 16	Deep 40	Surface	Surface	Surface	Surface
Depth Zone Depth (m)				L921283-1	L921283-2	L921283-3	L921283-4	L921283-5	L921283-6	L921283-7	L921283-8	L923112-1	L923112-2	L923112-3	L923112-4	L923112-5	L923135-1	L923135-2	L923135-3	L923135-4
ALS Sample ID	Units	RDL ^a																		
Titanium (Ti)-Total	mg/L	0.005		<0.0050	<0.0050	0.0185	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-
Tungsten (W)-Total	mg/L	0.001		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-
Uranium (U)-Total	mg/L	0.00005-0.0005		0.00213	0.00212	0.00221	0.00214	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	0.00210	<0.0010	<0.0010	<0.0010	<0.0010
Vanadium (V)-Total	mg/L	0.0005		0.00066	0.00067	0.00063	0.00063	0.00060	0.00060	0.00060	0.00078	0.00075	0.00065	0.00065	0.00068	0.00078	0.00153	0.00141	0.00123	0.00132
Yttrium (Y)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.0008-0.005		<0.0050	<0.0050	0.0110	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0069	0.0053	<0.0050	0.0065
Zirconium (Zr)-Total	mg/L	0.0005-0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals																				
Aluminum (Al)-Dissolved	mg/L	0.005-0.01		<0.0050	<0.0050	0.0185	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-
Antimony (Sb)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	-	-	-
Arsenic (As)-Dissolved	mg/L	0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	-	-	-
Barium (Ba)-Dissolved	mg/L	0.001		0.0105	0.0106	0.0108	0.0103	0.0105	0.0104	0.0111	0.0130	0.0098	0.0098	0.0098	0.0098	0.0107	0.0114	0.0129	0.0129	0.0129
Beryllium (Be)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	-	-	-
Bismuth (Bi)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	-	-	-	-
Boron (B)-Dissolved	mg/L	0.1		3.33	3.45	3.34														

a) RDL = Realized Detection Limit

b) Canadian water quality guidelines for the protection of marine aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

c) *Interim guideline*

d) Guideline refers to inorganic mercury

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	REF-Marine 19-Aug-10		RBE 30-Sep-10			RBW 30-Sep-10	REF-Marine 28-Sep-10			REF- 29-Sep-10				
				1	2	1	2	1	1	1	2	1	2	1	2	1	1
Depth Zone				Surface	Surface	Surface	Surface	Deep	Surface	Surface	Deep	Deep	Surface	Surface	Above Pycnocline	Below Pycnocline	Deep
Depth (m)				1	1	1	1	2.5	1	1	16.5	16.5	1	1	8	18	48
ALS Sample ID	Units	RDL ^a		L923126-1	L923126-2	L939411-1	L939411-2	L939411-3	L939411-4	L938575-1	L938575-2	L938575-3	L937943-1	L937943-2	L937943-3	L937943-4	L937943-5
Physical Tests																	
Conductivity	µS/cm	2.0	7.0-8.7 dependent on background levels dependent on background levels <10% fluctuation ^c	-	-	37000	37300	37400	37600	37400	38500	39200	-	-	-	-	-
Hardness (as CaCO ₃)	mg/L	0.86-4.3		3010	3000	4890	4860	4460	4550	4630	5200	5300	4470	4550	4910	4440	4870
pH	pH	0.1		7.83	7.88	7.78	7.82	7.84	7.86	7.86	7.85	7.83	7.61	7.77	7.75	7.88	7.84
Total Suspended Solids	mg/L	3.0		9.0	9.0	20.8	18.2	18.8	18.2	12.9	10.9	16.9	10.7	13.3	9.3	8.7	12.7
Turbidity	NTU	0.1		1.06	1.07	1.05	1.11	0.90	0.59	0.42	0.42	0.34	0.21	0.18	0.22	0.22	0.35
Salinity (EC)	g/L	1.0		17.0	17.0	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients																	
Alkalinity, Total (as CaCO ₃)	mg/L	2.0	3.6	49.9	49.5	106	118	113	114	111	109	113	-	-	-	-	-
Bromide (Br)	mg/L	2.5-25		27.8	24.9	36.6	36.9	36.3	36.3	39.5	38.7	41.0	13.7	38.8	39.3	39.0	41.4
Chloride (Cl)	mg/L	25-250		8580	8020	13600	13600	13700	13800	13700	14200	14400	13000	13300	13900	13200	14500
Fluoride (F)	mg/L	0.03-1		<0.75	<0.75	0.690	0.689	0.690	0.690	0.661	0.671	0.671	<0.75	<0.75	<0.75	<0.75	<0.75
Sulfate (SO ₄)	mg/L	25-250		1170	1080	1890	1900	1900	1910	1910	1980	2010	1820	1860	1940	1840	2030
Ammonia as N	mg/L	0.001-0.01		0.0090	0.0068	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0090
Nitrate+Nitrite-N	mg/L	0.006		<0.0060	<0.0060	-	-	-	-	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	0.0552
Nitrate (as N)	mg/L	0.006-2.5		<0.0060	<0.0060	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.0060	<0.0060	<0.0060	<0.0060	0.0552
Nitrite (as N)	mg/L	0.002-0.5		<0.0020	<0.0020	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.0020	<0.0020	<0.0020	<0.0020	0.0020
Ortho Phosphate as P	mg/L	0.001		-	-	-	-	-	-	-	-	-	0.0217	0.0215	0.0284	0.0207	0.0401
Total Phosphorus	mg/L	0.002		0.0177	0.0169	0.0277	0.0273	0.0276	0.0276	0.0271	0.0324	0.0352	0.0270	0.0265	0.0337	0.0269	0.0499
Silicate (as SiO ₄)	mg/L	0.025-1		-	-	-	-	-	-	-	-	-	0.650	0.666	1.26	0.720	1.2
Organic / Inorganic Carbon																	
Total Organic Carbon	mg/L	0.5-1		2.29	2.24	1.67	1.62	1.56	1.57	1.76	1.59	1.51	1.48	1.48	1.33	1.40	1.45
Total Metals																	
Aluminum (Al)-Total	mg/L	0.005-0.01	0.0125 ^c	0.0342	0.0302	0.0275	0.0259	0.0261	0.0169	0.0091	0.0072	0.0071	0.0055	<0.0050	<0.0050	<0.0050	0.0058
Antimony (Sb)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	0.00111	0.00123	0.00113	0.00119	0.00112	0.00123	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Barium (Ba)-Total	mg/L	0.001		0.0077	0.0080	0.0091	0.0091	0.0092	0.0093	0.0099	0.0103	0.0109	0.0095	0.0095	0.0104	0.0099	0.0128
Beryllium (Be)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.0005	0.00012	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	0.1		2.30	2.41	3.34	3.47	3.46	3.46	3.37	3.46	3.57	3.19	3.17	3.41	3.20	3.43
Cadmium (Cd)-Total	mg/L	0.00002-0.00012		<0.00012	<0.00012	<0.00012	0.000040	0.000043	0.000043	0.000042	0.000045	0.000051	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Calcium (Ca)-Total	mg/L	0.1-0.5		199	193	338	336	298	311	312	376	326	287	311	310	292	315
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023
Cobalt (Co)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	0.000070	0.000062	0.000056	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	0.000953	0.000687	0.000665	0.000537	0.000561	0.000544	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Gallium (Ga)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)-Total	mg/L	0.01-0.3		0.067	0.066	<0.050	0.064	0.063	0.045	0.022	0.026	0.027	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)-Total	mg/L	0.00005-0.001	0.000016 ^{c,d}	<0.0010	<0.0010	<0.0010	0.000052	0.000051	<0.000050	<0.000050	<0.000050	<0.000050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (Li)-Total	mg/L	0.02		0.096	0.100	0.135	0.135	0.134	0.133	0.133	0.141	0.142	0.130	0.123	0.136	0.130	0.138
Magnesium (Mg)-Total	mg/L	0.2-1		611	612	982	976	901	917	935	1030	1090	901	940	960	917	988
Manganese (Mn)-Total	mg/L	0.00005-0.0005		0.00278	0.00289	0.00252	0.00302	0.00293	0.00275	0.00254	0.00235	0.00243	0.00227	0.00228	0.00194	0.00231	0.00593
Mercury (Hg)-Total	mg/L	0.00001		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.002		0.0052	0.0054	0.0075	0.0080	0.0079	0.0081	0.0075	0.0080	0.0083	0.0076	0.0074	0.0083	0.0079	0.0086
Nickel (Ni)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	0.000663	0.000643	0.000659	0.000596	0.000603	0.000597	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	1-3		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (K)-Total	mg/L	4-20		189	183	310	306	278	286	287	348	311	271	292	292	271	298
Rhenium (Re)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Rubidium (Rb)-Total	mg/L	0.005		0.0514	0.0528	0.0816	0.0818	0.0822	0.0825	0.0808	0.0840	0.0868	0.0806	0.0782	0.0870	0.0814	0.0891
Selenium (Se)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon (Si)-Total	mg/L	0.1-0.5		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.69
Silver (Ag)-Total	mg/L	0.0002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Sodium (Na)-Total	mg/L	4-20		5010	4870	9010	8890	7980	8280	8220	10000	8620	7700	8310	8320	7730	8450
Strontium (Sr)-Total	mg/L	0.00005-0.05		3.70	3.53	5.26	5.49	5.29	5.39	5.31	5.59	6.10	5.20	5.63	5.63	5.24	5.73
Tellurium (Te)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (Tl)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thorium (Th)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of marine aquatic life.

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	REF-Marine 19-Aug-10		RBE 30-Sep-10			RBW 30-Sep-10	REF-Marine 28-Sep-10			REF-4 29-Sep-10				
				1	2	1	2	1	1	1	2	1	2	1	2	1	1
				Surface 1	Surface 1	Surface 1	Surface 1	Deep 2.5	Surface 1	Surface 1	Deep 16.5	Deep 16.5	Surface 1	Surface 1	Above Pycnocline 8	Below Pycnocline 18	Deep 48
ALS Sample ID	Units	RDL ^a		L923126-1	L923126-2	L939411-1	L939411-2	L939411-3	L939411-4	L938575-1	L938575-2	L938575-3	L937943-1	L937943-2	L937943-3	L937943-4	L937943-5
Titanium (Ti)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Total	mg/L	0.00005-0.0005		0.00143	0.00148	0.00219	0.00194	0.00196	0.00193	0.00189	0.00196	0.00200	0.00217	0.00210	0.00212	0.00212	0.00233
Vanadium (V)-Total	mg/L	0.0005		0.00051	0.00053	0.00069	0.00075	0.00075	0.00076	0.00071	0.00073	0.00070	0.00066	0.00066	0.00070	0.00068	0.00071
Yttrium (Y)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.0008-0.005		<0.0050	<0.0050	<0.0050	<0.0013	<0.0012	0.00276	<0.00080	<0.00080	<0.00080	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	mg/L	0.0005-0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0015
Dissolved Metals																	
Aluminum (Al)-Dissolved	mg/L	0.005-0.01		-	-	-	-	-	-	-	-	-	<0.0050	<0.0050	0.0052	<0.0050	<0.0050
Antimony (Sb)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.002		-	-	-	-	-	-	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Barium (Ba)-Dissolved	mg/L	0.001		-	-	-	-	-	-	-	-	-	0.0097	0.0095	0.0107	0.0098	0.0130
Beryllium (Be)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	0.1		-	-	-	-	-	-	-	-	-	3.28	3.18	3.38	3.26	3.53
Cadmium (Cd)-Dissolved	mg/L	0.00012		-	-	-	-	-	-	-	-	-	<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Calcium (Ca)-Dissolved	mg/L	0.5		-	-	-	-	-	-	-	-	-	290	301	324	293	314
Cesium (Cs)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Dissolved	mg/L	0.001		-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Gallium (Ga)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)-Dissolved	mg/L	0.05		-	-	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)-Dissolved	mg/L	0.001		-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (Li)-Dissolved	mg/L	0.02		-	-	-	-	-	-	-	-	-	0.130	0.128	0.135	0.130	0.140
Magnesium (Mg)-Dissolved	mg/L	1		-	-	-	-	-	-	-	-	-	910	923	997	902	992
Manganese (Mn)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	0.00170	0.00161	0.00081	0.00166	<0.00050
Mercury (Hg)-Dissolved	mg/L	0.00001		-	-	-	-	-	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.002		-	-	-	-	-	-	-	-	-	0.0079	0.0077	0.0084	0.0080	0.0087
Nickel (Ni)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Dissolved	mg/L	1		-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (K)-Dissolved	mg/L	20		-	-	-	-	-	-	-	-	-	274	283	308	274	298
Rhenium (Re)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Rubidium (Rb)-Dissolved	mg/L	0.005		-	-	-	-	-	-	-	-	-	0.0811	0.0805	0.0864	0.0834	0.0913
Selenium (Se)-Dissolved	mg/L	0.002		-	-	-	-	-	-	-	-	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon (Si)-Dissolved	mg/L	0.5		-	-	-	-	-	-	-	-	-	<0.50	<0.50	<0.50	<0.50	0.63
Silver (Ag)-Dissolved	mg/L	0.0002		-	-	-	-	-	-	-	-	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Sodium (Na)-Dissolved	mg/L	20		-	-	-	-	-	-	-	-	-	7790	8070	8670	7820	8430
Strontium (Sr)-Dissolved	mg/L	0.05		-	-	-	-	-	-	-	-	-	5.29	5.46	5.91	5.30	5.71
Tellurium (Te)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (Tl)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thorium (Th)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)-Dissolved	mg/L	0.001		-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.005		-	-	-	-	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Dissolved	mg/L	0.001		-	-	-	-	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	0.00221	0.00215	0.00228	0.00221	0.00238
Vanadium (V)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	0.00069	0.00066	0.00069	0.00068	0.00063
Yttrium (Y)-Dissolved	mg/L	0.0005		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.005		-	-	-	-	-	-	-	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	mg/L	0.0005-0.0015		-	-	-	-	-	-	-	-	-	<0.00050	<0.00050	<0.0015	<0.00050	<0.00050
Cyanides																	
Cyanide, Total	mg/L	0.001-0.005		0.0023	0.0023	0.0014	0.0015	0.0013	0.0014	0.0017	0.0012	<0.0010	-	-	-	-	-
Radiochemistry																	
Radium-226	Bq/L	0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of marine aquatic life.

a) RDL = Realized Detection Limit

b) Canadian water quality guidelines for the protection of marine aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

c) Interim guideline

d) Guideline refers to inorganic mercury

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	ST4 01-Oct-10				
				1	1	1	1	2
Depth Zone				Surface	Above	Below		
Depth (m)				1	Pycnocline 18	Pycnocline 26	Deep 47	Deep 47
ALS Sample ID	Units	RDL ^a		L939416-1	L939416-2	L939416-3	L939416-4	L939416-5
Physical Tests								
Conductivity	µS/cm	2.0	7.0-8.7 dependent on background levels dependent on background levels <10% fluctuation ^c	-	-	-	-	-
Hardness (as CaCO ₃)	mg/L	0.86-4.3		4860	5050	4850	5170	5190
pH	pH	0.1		7.88	7.84	7.89	7.80	7.77
Total Suspended Solids	mg/L	3.0		7.0	8.3	17.0	10.3	21.0
Turbidity	NTU	0.1		0.37	0.24	0.30	0.23	0.23
Salinity (EC)	g/L	1.0		-	-	-	-	-
Anions and Nutrients								
Alkalinity, Total (as CaCO ₃)	mg/L	2.0	3.6	-	-	-	-	-
Bromide (Br)	mg/L	2.5-25		37.5	41.5	39.2	42.6	42.6
Chloride (Cl)	mg/L	25-250		13300	14600	14000	15100	15100
Fluoride (F)	mg/L	0.03-1		<0.75	0.80	0.75	0.80	0.79
Sulfate (SO ₄)	mg/L	25-250		1860	2040	1950	2110	2110
Ammonia as N	mg/L	0.001-0.01		<0.0050	<0.0050	<0.0050	0.0142	0.0164
Nitrate+Nitrite-N	mg/L	0.006		<0.0060	<0.0060	<0.0060	0.0389	0.0394
Nitrate (as N)	mg/L	0.006-2.5		<0.0060	<0.0060	<0.0060	0.0389	0.0394
Nitrite (as N)	mg/L	0.002-0.5		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Ortho Phosphate as P	mg/L	0.001		0.0218	0.0336	0.0255	0.0419	0.0413
Total Phosphorus	mg/L	0.002		0.0265	0.0387	0.0335	0.0462	0.0463
Silicate (as SiO ₂)	mg/L	0.025-1		0.519	1.45	0.651	1.1	1.0
Organic / Inorganic Carbon								
Total Organic Carbon	mg/L	0.5-1		1.69	1.43	1.41	1.25	1.04
Total Metals								
Aluminum (Al)-Total	mg/L	0.005-0.01	0.0125 ^c	0.0108	<0.0050	0.0056	<0.0050	<0.0050
Antimony (Sb)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Barium (Ba)-Total	mg/L	0.001		0.0088	0.0116	0.0092	0.0131	0.0129
Beryllium (Be)-Total	mg/L	0.0005	0.00012	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	0.1		3.14	3.51	3.36	3.69	3.65
Cadmium (Cd)-Total	mg/L	0.00002-0.00012		<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Calcium (Ca)-Total	mg/L	0.1-0.5		304	331	298	340	325
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Gallium (Ga)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)-Total	mg/L	0.01-0.3		<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)-Total	mg/L	0.00005-0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (Li)-Total	mg/L	0.02	0.000016 ^{c,d}	0.132	0.142	0.135	0.148	0.145
Magnesium (Mg)-Total	mg/L	0.2-1		1020	976	946	1040	1000
Manganese (Mn)-Total	mg/L	0.00005-0.0005		0.00226	0.00166	0.00202	0.00142	0.00135
Mercury (Hg)-Total	mg/L	0.00001		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.002		0.0078	0.0084	0.0081	0.0087	0.0086
Nickel (Ni)-Total	mg/L	0.00005-0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total	mg/L	1-3		<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (K)-Total	mg/L	4-20		275	296	267	320	293
Rhenium (Re)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Rubidium (Rb)-Total	mg/L	0.005		0.0797	0.0876	0.0841	0.0904	0.0891
Selenium (Se)-Total	mg/L	0.0004-0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon (Si)-Total	mg/L	0.1-0.5		<0.50	<0.50	<0.50	0.58	0.56
Silver (Ag)-Total	mg/L	0.0002		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Sodium (Na)-Total	mg/L	4-20		8110	8780	7860	9350	8590
Strontium (Sr)-Total	mg/L	0.00005-0.05		5.36	5.75	5.17	6.23	5.72
Tellurium (Te)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (Tl)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thorium (Th)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of marine aquatic life.

a) RDL = Realized Detection Limit

b) Canadian water quality guidelines for the protection of marine aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

c) Interim guideline

d) Guideline refers to inorganic mercury

Appendix 3.5-1. Marine Water Quality, Hope Bay Belt Project, 2010

Site Date Sampled Replicate			CCME Guideline for the Protection of Marine Aquatic Life ^b	ST4 01-Oct-10				
				1	1	1	1	2
				Surface 1	Above Pycnocline 18	Below Pycnocline 26	Deep 47	Deep 47
Depth Zone Depth (m)								
ALS Sample ID	Units	RDL ^a		L939416-1	L939416-2	L939416-3	L939416-4	L939416-5
Titanium (Ti)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Total	mg/L	0.00005-0.0005		0.00213	0.00236	0.00225	0.00241	0.00236
Vanadium (V)-Total	mg/L	0.0005		0.00072	0.00076	0.00075	0.00074	0.00078
Yttrium (Y)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.0008-0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	mg/L	0.0005-0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dissolved Metals								
Aluminum (Al)-Dissolved	mg/L	0.005-0.01		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	mg/L	0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Barium (Ba)-Dissolved	mg/L	0.001		0.00085	0.0112	0.0089	0.0131	0.0131
Beryllium (Be)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	0.1		3.21	3.47	3.41	3.70	3.71
Cadmium (Cd)-Dissolved	mg/L	0.00012		<0.00012	<0.00012	<0.00012	<0.00012	<0.00012
Calcium (Ca)-Dissolved	mg/L	0.5		306	334	321	339	335
Cesium (Cs)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Dissolved	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Gallium (Ga)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron (Fe)-Dissolved	mg/L	0.05		<0.050	<0.050	<0.050	<0.050	<0.050
Lead (Pb)-Dissolved	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Lithium (Li)-Dissolved	mg/L	0.02		0.130	0.141	0.138	0.148	0.147
Magnesium (Mg)-Dissolved	mg/L	1		993	1030	982	1050	1060
Manganese (Mn)-Dissolved	mg/L	0.0005		0.00159	0.00058	0.00145	0.00055	0.00051
Mercury (Hg)-Dissolved	mg/L	0.00001		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.002		0.0077	0.0084	0.0082	0.0087	0.0086
Nickel (Ni)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Dissolved	mg/L	1		<1.0	<1.0	<1.0	<1.0	<1.0
Potassium (K)-Dissolved	mg/L	20		297	309	295	309	301
Rhenium (Re)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Rubidium (Rb)-Dissolved	mg/L	0.005		0.0801	0.0871	0.0837	0.0907	0.0910
Selenium (Se)-Dissolved	mg/L	0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicon (Si)-Dissolved	mg/L	0.5		<0.50	<0.50	<0.50	0.59	0.59
Silver (Ag)-Dissolved	mg/L	0.0002		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Sodium (Na)-Dissolved	mg/L	20		8680	9050	8630	9010	8950
Strontium (Sr)-Dissolved	mg/L	0.05		5.78	6.00	5.75	6.02	5.92
Tellurium (Te)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thallium (Tl)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Thorium (Th)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tin (Sn)-Dissolved	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten (W)-Dissolved	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium (U)-Dissolved	mg/L	0.0005		0.00220	0.00237	0.00226	0.00244	0.00248
Vanadium (V)-Dissolved	mg/L	0.0005		0.00067	0.00073	0.00072	0.00078	0.00076
Yttrium (Y)-Dissolved	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	mg/L	0.0005-0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cyanides								
Cyanide, Total	mg/L	0.001-0.005		-	-	-	-	-
Radiochemistry								
Radium-226	Bq/L	0.005		-	-	-	-	-

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of marine aquatic life.

a) RDL = Realized Detection Limit

b) Canadian water quality guidelines for the protection of marine aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

c) Interim guideline

d) Guideline refers to inorganic mercury

Appendix 3.5-2

Marine Water Quality QA/QC Blank Samples, Hope Bay
Belt Project, 2010

Appendix 3.5-2. Marine Water Quality QA/QC Blank Samples, Hope Bay Belt Project, 2010

Blank Type Date Sampled ALS Sample ID			Equipment Blank 22-Jun-10 L901015-18	Travel Blank 23-Jun-10 L902060-6	Field Blank 23-Jun-10 L902060-7	Travel Blank 22-Jul-10 L912587-14	Field Blank 15-Aug-10 L923112-6	Field Blank 30-Sep-10 L939411-5	Travel Blank 01-Oct-10 L939416-6
	Units	RDL ^a							
Physical Tests									
Conductivity	µS/cm	2.0	-	-	-	-	-	2.0	-
Hardness (as CaCO ₃)	mg/L	0.5	-	-	-	-	<0.50	<0.50	<0.50
pH	pH	0.1	5.98	5.73	5.70	5.82	5.73	5.64	6.39
Total Suspended Solids	mg/L	3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Turbidity	NTU	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.10
Salinity (EC)	g/L	1.0	-	-	-	-	-	-	-
Anions and Nutrients									
Alkalinity, Total (as CaCO ₃)	mg/L	2.0	-	-	-	-	-	<2.0	-
Bromide (Br)	mg/L	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Sulfate (SO ₄)	mg/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ammonia as N	mg/L	0.005-0.01	<0.0050	<0.010	<0.010	<0.005	<0.0050	0.0161	0.0073
Nitrate+Nitrite-N	mg/L	0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	-	<0.0060
Nitrate (as N)	mg/L	0.005-0.006	<0.0060	<0.0050	<0.0050	<0.0060	<0.0060	<0.0050	<0.0060
Nitrite (as N)	mg/L	0.001-0.002	<0.0020	<0.0010	<0.0010	<0.0020	<0.0020	<0.0010	<0.0020
Ortho Phosphate as P	mg/L	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010
Total Phosphorus	mg/L	0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicate (as SiO ₂)	mg/L	0.005-1	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050
Organic / Inorganic Carbon									
Total Organic Carbon	mg/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.77	0.75
Total Metals									
Aluminum (Al)-Total	mg/L	0.003-0.005	<0.0030	<0.0030	<0.0030	<0.0050	<0.0050	<0.0030	<0.0050
Antimony (Sb)-Total	mg/L	0.00001-0.0005	<0.000010	<0.000010	<0.000010	<0.00050	<0.00050	<0.000010	<0.00050
Arsenic (As)-Total	mg/L	0.00005-0.002	<0.000050	<0.000050	<0.000050	<0.0020	<0.0020	<0.000050	<0.0020
Barium (Ba)-Total	mg/L	0.0001-0.001	<0.00010	<0.00010	<0.00010	<0.0010	<0.0010	<0.00010	<0.0010
Beryllium (Be)-Total	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Bismuth (Bi)-Total	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Boron (B)-Total	mg/L	0.005-0.1	<0.0050	<0.0050	<0.0050	<0.10	<0.10	<0.0050	<0.10
Cadmium (Cd)-Total	mg/L	0.000005-0.00012	<0.0000050	<0.0000050	<0.0000050	<0.00012	<0.00012	<0.0000050	<0.00012
Calcium (Ca)-Total	mg/L	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cesium (Cs)-Total	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Chromium (Cr)-Total	mg/L	0.0005-0.001	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010
Cobalt (Co)-Total	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Copper (Cu)-Total	mg/L	0.0005-0.001	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010
Gallium (Ga)-Total	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Iron (Fe)-Total	mg/L	0.03-0.05	<0.030	<0.030	<0.030	<0.050	<0.050	<0.030	<0.050
Lead (Pb)-Total	mg/L	0.00005-0.001	<0.000050	<0.000050	<0.000050	<0.0010	<0.0010	<0.000050	<0.0010
Lithium (Li)-Total	mg/L	0.0002-0.02	<0.00020	<0.00020	<0.00020	<0.020	<0.020	<0.00020	<0.020
Magnesium (Mg)-Total	mg/L	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Manganese (Mn)-Total	mg/L	0.0002-0.0005	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00050
Mercury (Hg)-Total	mg/L	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Total	mg/L	0.00005-0.002	<0.000050	<0.000050	<0.000050	<0.0020	<0.0020	<0.000050	<0.0020
Nickel (Ni)-Total	mg/L	0.0002-0.0005	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00050
Phosphorus (P)-Total	mg/L	0.3-1	<0.30	<0.30	<0.30	<1.0	<1.0	<0.30	<1.0
Potassium (K)-Total	mg/L	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Rhenium (Re)-Total	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Rubidium (Rb)-Total	mg/L	0.00002-0.005	<0.000020	<0.000020	<0.000020	<0.0050	<0.0050	<0.000020	<0.0050
Selenium (Se)-Total	mg/L	0.0002-0.002	<0.00020	<0.00020	<0.00020	<0.0020	<0.0020	<0.00020	<0.0020
Silicon (Si)-Total	mg/L	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Silver (Ag)-Total	mg/L	0.000005-0.0002	<0.0000050	<0.0000050	<0.0000050	<0.00020	<0.00020	<0.0000050	<0.00020
Sodium (Na)-Total	mg/L	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Strontium (Sr)-Total	mg/L	0.00005-0.005	<0.000050	<0.000050	<0.000050	<0.0050	<0.0050	<0.000050	<0.0050
Tellurium (Te)-Total	mg/L	0.00001-0.0005	<0.000010	<0.000010	<0.000010	<0.00050	<0.00050	<0.000010	<0.00050
Thallium (Tl)-Total	mg/L	0.000002-0.0005	<0.0000020	<0.0000020	<0.0000020	<0.00050	<0.00050	<0.0000020	<0.00050
Thorium (Th)-Total	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Tin (Sn)-Total	mg/L	0.0002-0.001	<0.00020	<0.00020	<0.00020	<0.0010	<0.0010	<0.00020	<0.0010

Shaded cells indicate values that are above analytical detection limits.

a) RDL = Realized Detection Limit

Appendix 3.5-2. Marine Water Quality QA/QC Blank Samples, Hope Bay Belt Project, 2010

Blank Type Date Sampled ALS Sample ID			Equipment Blank 22-Jun-10 L901015-18	Travel Blank 23-Jun-10 L902060-6	Field Blank 23-Jun-10 L902060-7	Travel Blank 22-Jul-10 L912587-14	Field Blank 15-Aug-10 L923112-6	Field Blank 30-Sep-10 L939411-5	Travel Blank 01-Oct-10 L939416-6
Units	RDL ^a								
Titanium (Ti)-Total	mg/L	0.0002-0.005	<0.00020	<0.00020	<0.00020	<0.0050	<0.0050	<0.00020	<0.0050
Tungsten (W)-Total	mg/L	0.00001-0.001	<0.000010	<0.000010	<0.000010	<0.0010	<0.0010	<0.000010	<0.0010
Uranium (U)-Total	mg/L	0.000002-0.0005	<0.0000020	<0.0000020	<0.0000020	<0.00050	<0.00050	<0.0000020	<0.00050
Vanadium (V)-Total	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Yttrium (Y)-Total	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Zinc (Zn)-Total	mg/L	0.003-0.005	<0.0030	<0.0030	<0.0030	<0.0050	<0.0050	<0.0030	<0.0050
Zirconium (Zr)-Total	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Dissolved Metals									
Aluminum (Al)-Dissolved	mg/L	0.003-0.005	<0.0030	<0.0030	<0.0030	<0.0050	<0.0050	<0.0030	<0.0050
Antimony (Sb)-Dissolved	mg/L	0.00001-0.0005	<0.000010	<0.000010	<0.000010	<0.00050	<0.00050	<0.000010	<0.00050
Arsenic (As)-Dissolved	mg/L	0.00005-0.002	<0.000050	<0.000050	<0.000050	<0.0020	<0.0020	<0.000050	<0.0020
Barium (Ba)-Dissolved	mg/L	0.0001-0.001	<0.00010	<0.00010	<0.00010	<0.0010	<0.0010	<0.00010	<0.0010
Beryllium (Be)-Dissolved	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Bismuth (Bi)-Dissolved	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Boron (B)-Dissolved	mg/L	0.005-0.1	<0.0050	<0.0050	<0.0050	<0.10	<0.10	<0.0050	<0.10
Cadmium (Cd)-Dissolved	mg/L	0.000005-0.00012	<0.0000050	<0.0000050	<0.0000050	<0.00012	<0.00012	<0.0000050	<0.00012
Calcium (Ca)-Dissolved	mg/L	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cesium (Cs)-Dissolved	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Chromium (Cr)-Dissolved	mg/L	0.0005-0.001	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010
Cobalt (Co)-Dissolved	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Copper (Cu)-Dissolved	mg/L	0.0005-0.001	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050	<0.0010
Gallium (Ga)-Dissolved	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Iron (Fe)-Dissolved	mg/L	0.03-0.05	<0.030	<0.030	<0.030	<0.050	<0.050	<0.030	<0.050
Lead (Pb)-Dissolved	mg/L	0.00005-0.001	<0.000050	<0.000050	<0.000050	<0.0010	<0.0010	<0.000050	<0.0010
Lithium (Li)-Dissolved	mg/L	0.0002-0.02	<0.00020	<0.00020	<0.00020	<0.020	<0.020	<0.00020	<0.020
Magnesium (Mg)-Dissolved	mg/L	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Manganese (Mn)-Dissolved	mg/L	0.0002-0.0005	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00050
Mercury (Hg)-Dissolved	mg/L	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	mg/L	0.00005-0.002	<0.000050	<0.000050	<0.000050	<0.0020	<0.0020	<0.000050	<0.0020
Nickel (Ni)-Dissolved	mg/L	0.0002-0.0005	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00050
Phosphorus (P)-Dissolved	mg/L	0.3-1	<0.30	<0.30	<0.30	<1.0	<1.0	<0.30	<1.0
Potassium (K)-Dissolved	mg/L	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Rhenium (Re)-Dissolved	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Rubidium (Rb)-Dissolved	mg/L	0.00002-0.005	<0.000020	<0.000020	<0.000020	<0.0050	<0.0050	<0.000020	<0.0050
Selenium (Se)-Dissolved	mg/L	0.0002-0.002	<0.00020	<0.00020	<0.00020	<0.0020	<0.0020	<0.00020	<0.0020
Silicon (Si)-Dissolved	mg/L	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Silver (Ag)-Dissolved	mg/L	0.000005-0.0002	<0.0000050	<0.0000050	<0.0000050	<0.00020	<0.00020	<0.0000050	<0.00020
Sodium (Na)-Dissolved	mg/L	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Strontium (Sr)-Dissolved	mg/L	0.00005-0.005	<0.000050	<0.000050	<0.000050	<0.0050	<0.0050	<0.000050	<0.0050
Tellurium (Te)-Dissolved	mg/L	0.00001-0.0005	<0.000010	<0.000010	<0.000010	<0.00050	<0.00050	<0.000010	<0.00050
Thallium (Tl)-Dissolved	mg/L	0.000002-0.0005	<0.0000020	<0.0000020	<0.0000020	<0.00050	<0.00050	<0.0000020	<0.00050
Thorium (Th)-Dissolved	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Tin (Sn)-Dissolved	mg/L	0.0002-0.001	<0.00020	<0.00020	<0.00020	<0.0010	<0.0010	<0.00020	<0.0010
Titanium (Ti)-Dissolved	mg/L	0.0002-0.005	<0.00020	<0.00020	<0.00020	<0.0050	<0.0050	<0.00020	<0.0050
Tungsten (W)-Dissolved	mg/L	0.00001-0.001	<0.000010	<0.000010	<0.000010	<0.0010	<0.0010	<0.000010	<0.0010
Uranium (U)-Dissolved	mg/L	0.000002-0.0005	<0.0000020	<0.0000020	<0.0000020	<0.00050	<0.00050	<0.0000020	<0.00050
Vanadium (V)-Dissolved	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Yttrium (Y)-Dissolved	mg/L	0.000005-0.0005	<0.0000050	<0.0000050	<0.0000050	<0.00050	<0.00050	<0.0000050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.003-0.005	<0.0030	<0.0030	<0.0030	<0.0050	<0.0050	<0.0030	<0.0050
Zirconium (Zr)-Dissolved	mg/L	0.00005-0.0005	<0.000050	<0.000050	<0.000050	<0.00050	<0.00050	<0.000050	<0.00050
Cyanides									
Cyanide, Total	mg/L	0.0010	-	-	-	-	-	<0.0010	-
Radiochemistry									
Radium-226	Bq/L	0.005	-	-	-	-	-	<0.005	-

Shaded cells indicate values that are above analytical detection limits.

a) RDL = Realized Detection Limit

Appendix 3.6-1

Marine Sediment Quality, Hope Bay Belt Project, 2010

Site			CME Guidelines for the Protection of Aquatic Life ^b	P1			P2			P3			P4		
Date Sampled	Replicate	15-Aug-10			15-Aug-10			15-Aug-10			14-Aug-10				
Depth (m)		1		2	3	1	2	3	1	2	3	1			
ALS Sample ID	Units	RDL ^a		ISO ^c	PEL ^d	L921344-7	L921344-8	L921344-9	L921344-11	L921344-13	L921344-14	L921344-17	L921344-18	L921344-20	L921344-1
Physical Tests															
Moisture	%	0.10			23.2	30.3	23.0	25.7	26.2	27.2	20.6	38.8	17.1	23.5	
pH	pH	0.10			8.04	7.93	8.00	7.95	7.60	7.60	7.63	7.38	7.95	7.40	
Particle Size															
% Gravel (>2mm)	%	0.10			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
% Sand (2.0mm - 0.063mm)	%	0.10			87.5	73.9	82.7	92.8	80.1	<0.10	93.7	72.5	87.2	74.9	
% Silt (0.063mm - 4um)	%	0.10			9.90	21.9	13.8	4.60	10.8	98.8	3.81	17.7	7.50	20.7	
% Clay (<4um)	%	0.10			2.56	4.21	3.49	2.64	9.05	1.22	2.54	9.84	5.35	4.45	
Leachable Anions & Nutrients															
Total Nitrogen by LECO	%	0.020			0.027	0.039	0.030	0.027	0.028	<0.020	<0.020	0.034	<0.020	0.054	
Organic / Inorganic Carbon															
Total Organic Carbon	%	0.10			0.20	0.31	0.21	0.19	0.18	<0.10	<0.10	0.29	0.10	0.42	
Plant Available Nutrients															
Available Ammonium-N	mg/kg	0.8-2.4			3.4	6.0	3.3	3.0	1.8	<1.6	<1.3	2.9	1.4	4.9	
Available Nitrate-N	mg/kg	2.0-6.0			<5.0	<4.3	<4.3	<3.0	<3.8	<3.8	<3.0	<4.3	<3.0	<6.0	
Nitrite-N	mg/kg	0.4-1.2			<1.0	<0.86	<0.86	<0.60	<0.75	<0.75	<0.60	<0.86	<0.60	<1.2	
Available Phosphate-P	mg/kg	2.0-4.0			18.0	12.5	16.1	19.5	11.1	12.9	8.6	12.2	9.4	30.4	
Metals															
Aluminum (Al)	mg/kg	50			4800	5640	4960	5640	9200	5990	6080	9860	7710	6400	
Antimony (Sb)	mg/kg	10			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Arsenic (As)	mg/kg	0.05	7.24	41.6	2.14	2.62	2.06	1.29	1.93	0.949	1.22	2.34	1.62	2.11	
Barium (Ba)	mg/kg	1			17.1	24.6	17.5	16.2	35.9	12.5	17.3	39.7	26.7	27.4	
Beryllium (Be)	mg/kg	0.5			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Bismuth (Bi)	mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
Cadmium (Cd)	mg/kg	0.1	0.7	4.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Calcium (Ca)	mg/kg	50			2450	2760	2410	1710	3120	2000	2010	3370	2920	2650	
Chromium (Cr)	mg/kg	2	52.3	160	17.2	18.4	16.7	17.0	31.1	21.6	17.8	31.3	24.5	19.1	
Cobalt (Co)	mg/kg	2			4.1	4.1	4.1	3.9	6.4	4.4	4.3	6.7	5.3	4.0	
Copper (Cu)	mg/kg	1	18.7	108	9.2	10.4	9.1	7.3	12.5	7.8	9.6	12.9	10.1	7.2	
Iron (Fe)	mg/kg	50			10500	11400	10400	9490	15600	10700	10300	15700	1240		

No sediment quality parameters exceeded CCME guidelines for the protection of marine aquatic life.

a) *RDL = Realized Detection Limit*

b) Canadian sediment quality guidelines for the protection of marine aquatic life, Council of Ministers of the Environment, Updated 2002

c) ISQG = Interim Sediment Quality Guidelines

d) PEL = Probable Effects Level

Site				CCME Guidelines for the Protection of Aquatic Life ^b		P4		RBE			RBW			REF-Marine			
Date Sampled Replicate Depth (m)		15-Aug-10				15-Aug-10			17-Aug-10			19-Aug-10					
		2	3			1	2	3	1	2	3	1	2	3			
ALS Sample ID		Units	RDL ^a	ISQG ^c	PEL ^d	L921344-4	L921344-5	L921370-2	L921370-3	L921370-5	L923230-2	L923230-3	L923230-6	L923230-8	L923230-10	L923230-11	
Physical Tests																	
Moisture		%	0.10			35.3	35.0	18.5	18.5	19.1	22.3	32.8	34.0	31.4	32.3	37.3	
pH		pH	0.10			7.77	7.45	6.95	7.09	7.02	7.73	7.42	7.84	7.72	7.20	7.52	
Particle Size																	
% Gravel (>2mm)		%	0.10			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
% Sand (2.0mm - 0.063mm)		%	0.10			76.6	74.3	90.7	91.4	96.4	72.8	67.6	68.8	56.9	61.3	54.2	
% Silt (0.063mm - 4um)		%	0.10			19.6	20.9	7.03	8.17	2.78	23.0	27.2	27.3	39.3	35.4	41.9	
% Clay (<4um)		%	0.10			3.82	4.79	2.30	0.45	0.82	4.17	5.24	3.87	3.85	3.28	3.94	
Leachable Anions & Nutrients																	
Total Nitrogen by LECO		%	0.020			0.052	0.061	<0.020	<0.020	<0.020	0.052	0.052	0.054	0.073	0.064	0.090	
Organic / Inorganic Carbon																	
Total Organic Carbon		%	0.10			0.36	0.43	0.17	<0.10	<0.10	0.37	0.40	0.50	0.51	0.48	0.68	
Plant Available Nutrients																	
Available Ammonium-N		mg/kg	0.8-2.4			4.7	4.5	0.95	1.16	1.12	5.82	3.58	9.86	7.48	5.31	7.64	
Available Nitrate-N		mg/kg	2.0-6.0			<5.0	<6.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Nitrite-N		mg/kg	0.4-1.2			<1.0	<1.2	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
Available Phosphate-P		mg/kg	2.0-4.0			29.9	41.9	4.4	4.3	3.9	13.5	17.2	11.1	14.2	16.4	18.3	
Metals																	
Aluminum (Al)		mg/kg	50	7.24	41.6	6010	7010	4720	3670	3580	6330	7270	6840	6190	6310	6860	
Antimony (Sb)		mg/kg	10			<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Arsenic (As)		mg/kg	0.05			1.72	2.12	1.18	1.00	1.50	2.51	3.28	2.82	2.13	2.11	2.40	
Barium (Ba)		mg/kg	1	0.7	4.2	25.0	31.0	15.2	8.8	9.0	26.5	30.6	29.1	25.4	26.7	29.4	
Beryllium (Be)		mg/kg	0.5			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bismuth (Bi)		mg/kg	20			<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Cadmium (Cd)		mg/kg	0.1	52.3	160	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Calcium (Ca)		mg/kg	50			2480	2570	2140	2000	1850	3030	3200	3180	3080	3060	3170	
Chromium (Cr)		mg/kg	2			18.2	21.4	14.7	12.4	11.4	22.1	23.7	23.6	15.1	15.9	17.8	
Cobalt (Co)		mg/kg	2	18.7	108	3.9	4.5	4.3	3.9	4.0	4.6	5.2	5.2	3.4	3.5	3.7	
Copper (Cu)		mg/kg	1			7.1	8.2	11.2	11.1	13.1	12.5	13.6	13.7	7.1	7.8	9.3	
Iron (Fe)		mg/kg	50			9510</											

No sediment quality parameters exceeded CCME guidelines for the protection of marine aquatic life.

a) *RDL = Realized Detection Limit*

b) Canadian sediment quality guidelines for the protection of marine aquatic life. Council of Ministers of the Environment. Updated 2002.

c) ISQG = Interim Sediment Quality Guidelines

d) PEL = Probable Effects Level

Appendix 3.7-1

Marine Phytoplankton Biomass (as Chlorophyll *a*), Hope Bay Belt Project, 2010

Appendix 3.7-1. Marine Phytoplankton Biomass (as Chlorophyll a), Hope Bay Belt Project, 2010

Site ID		ST4	ST4	ST4	ST4	ST4	ST4	ST4	ST4	ST4	ST4	ST4
Depth		1 m	1m	1m	1m	1m	1m	1m	1m	1m	1m	1m
Replicate		1	2	3	1	2	3	1	2	3	1	2
Date Sampled	DL	23-Apr-10	23-Apr-10	23-Apr-10	22-Jul-10	22-Jul-10	22-Jul-10	17-Aug-10	17-Aug-10	17-Aug-10	01-Oct-10	01-Oct-10
Chlorophyll a (µg/L)	0.010	0.224	0.165	0.079	0.124	0.093	0.105	0.122	0.119	0.093	0.118	0.462

Site ID		DWP	DWP	DWP	DWP	DWP	DWP	DWP	DWP	DWP	DWP	DWP
Depth		1m	1m	1m	1m	1m	1m	1m	1m	1m	1m	1m
Replicate		1	2	3	1	2	3	1	2	3	1	2
Date Sampled	DL	24-Apr-10	24-Apr-10	24-Apr-10	22-Jul-10	22-Jul-10	22-Jul-10	17-Aug-10	17-Aug-10	17-Aug-10	28-Sep-10	28-Sep-10
Chlorophyll a (µg/L)	0.010	0.625	0.375	0.495	0.107	0.111	0.137	0.108	0.185	0.130	0.195	0.208

Site ID		RBW	RBW	RBW	RBW	RBW	RBW	RBW	RBW	RBW	RBW	RBW
Depth		1m	1m	1m	1m	1m	1m	1m	1m	1m	1m	1m
Replicate		1	2	3	1	2	3	1	2	3	1	2
Date Sampled	DL	24-Apr-10	24-Apr-10	24-Apr-10	20-Jul-10	20-Jul-10	20-Jul-10	17-Aug-10	17-Aug-10	17-Aug-10	30-Sep-10	30-Sep-10
Chlorophyll a (µg/L)	0.010	0.921	0.510	0.357	0.200	0.186	0.184	1.21	1.37	1.30	0.296	0.327

Site ID		RBE	RBE	RBE	RBE	RBE	RBE	RBE	RBE	RBE	RBE	RBE
Depth		1m	1m	1m	1m	1m	1m	1m	1m	1m	1m	1m
Replicate		1	2	3	1	2	3	1	2	3	1	2
Date Sampled	DL	24-Apr-10	24-Apr-10	24-Apr-10	20-Jul-10	20-Jul-10	20-Jul-10	17-Aug-10	17-Aug-10	17-Aug-10	30-Sep-10	30-Sep-10
Chlorophyll a (µg/L)	0.010	0.408	0.713	0.173	0.250	0.203	0.153	5.58	5.33	10.0	0.779	0.107

Site ID		REF-4	REF-4	REF-4	REF-4	REF-4	REF-4	REF-4	REF-4	REF-4	REF-4	REF-4
Depth		1m	1m	1m	1m	1m	1m	1m	1m	1m	1m	1m
Replicate		1	2	3	1	2	3	1	2	3	1	2
Date Sampled	DL	23-Apr-10	23-Apr-10	23-Apr-10	22-Jul-10	22-Jul-10	22-Jul-10	19-Aug-10	19-Aug-10	19-Aug-10	29-Sep-10	29-Sep-10
Chlorophyll a (µg/L)	0.01-0.02	1.09	0.798	7.12	0.061	0.118	0.030	0.816	0.777	0.714	0.878	0.697

Site ID		REF-Marine	REF-Marine	REF-Marine	REF-Marine	REF-Marine	REF-Marine
Depth		1m	1m	1m	1m	1m	1m
Replicate		1	2	3	1	2	3
Date Sampled	DL	13-Jul-10	13-Jul-10	13-Jul-10	19-Aug-10	19-Aug-10	19-Aug-10
Chlorophyll a (µg/L)	0.01-0.02	0.189	0.160	0.171	0.362	0.505	0.573

Note: DL = detection limit

Appendix 3.7-2

Marine Phytoplankton Taxonomy (as Abundance), Hope Bay Belt Project, 2010

Appendix 3.7-2. Marine Phytoplankton Taxonomy (as Abundance), Hope Bay Belt Project, 2010

Site Date	Trophic Category	Toxicity	ST4 Aug-10			REF-4 Aug-10		
			1	2	3	1	2	3
Replicate								
Abundance (cells/L)								
Diatoms								
<i>Asterionella formosa</i>	A							
<i>Chaetoceros curvisetus</i>	A							
<i>Chaetoceros laciniosus</i>	A							
<i>Chaetoceros</i> sp. large	A							
<i>Chaetoceros</i> spp.	A			848				
<i>Cylindrotheca closterium</i>	A							
<i>Leptocylindrus danicus</i>	A		11,021	21,195	19,499	1,696		1,696
<i>Lycmophora abbreviata</i>	A							40
<i>Navicula</i> spp.	A						1,696	
<i>Pseudo-nitzschia cf. delicatula</i>	A		848			9,326	7,630	5,935
<i>Rhizosolenia hebetata</i>	A		160	280	520	560	40	160
<i>Skeletonema costatum</i>	A							
<i>Thalassionema nitzschioides</i>	A							
<i>Thalassiosira cf. aestivalis</i>	A							
Total Diatom Abundance			12,029	22,323	20,019	11,581	9,366	7,830
Dinoflagellates								
<i>Alexandrium</i> spp.	A	PSP	120	120	80			
<i>Ceratium arcticum</i>	A		120	200	360	80		120
<i>Ceratium furca</i>	A							
<i>Cochlodinium cf. citron</i>	H		160		160		40	
<i>Corythodinium</i> sp.	M			40				
<i>Dinophysis acuminata</i>	M	DSP			40			
<i>Dinophysis acuta</i>	M	DSP		40				
<i>Dinophysis rotundata</i>	M						40	
<i>Gymnodinium</i> spp.	H					320		240
<i>Gymnodinium verior</i>	M						120	
<i>Gyrodinium estuariale</i>	H		80			40		80
<i>Gyrodinium</i> sp.	H		1,696	1,696				848
<i>Minuscula bipes</i>	M							
<i>Protoceratium reticulatum</i>	A	Tox	320	400	240	320	160	120
<i>Protoperidinium pellucidum</i>	H							
<i>Protoperidinium</i> spp.	H		160	80	40			
Total Dinoflagellate Abundance			2,656	2,576	920	760	360	1,408
Chlorophyta								
<i>Ankistrodesmus</i> (green fresh water alga)	A					13,565	19,499	16,108
Total Chlorophyta Abundance						13,565	19,499	16,108
Chryptophyta								
Cryptophytes	M		160,234	343,359	160,234	160,234	228,906	114,453
Total Cryptophyta Abundance			160,234	343,359	160,234	160,234	228,906	114,453
Cyanobacteria								
<i>Nodularia</i> sp.	A						848	848
<i>Oscillatoria</i> sp.	A		2,543	3,391	5,087	848	1,696	848
Total Cyanobacteria Abundance			2,543	3,391	5,087	848	2,543	1,696
Others								
<i>Dinobryon balticum</i>	H		2,543	2,543	1,696	848		2,543
<i>Myrionecta rubra</i>	M							
Total Other Abundance			2,543	2,543	1,696	848	0	2,543
Total Phytoplankton Abundance			180,006	374,192	187,956	187,836	260,675	144,038

Notes: A= autotrophic, H= heterotrophic, M= mixotrophic; PSP= Paralytic Shellfish Poison, DSP=Diarrheic Shellfish Poison, Tox= Other toxin

Appendix 3.7-2. Marine Phytoplankton Taxonomy (as Abundance), Hope Bay Belt Project, 2010

Site			ST4			REF4		
Date			Sep-10			Sep-10		
Replicate	Trophic	Toxicity	1	2	3	1	2	3
Abundance (cells/L)	Category							
Diatoms								
<i>Asterionella formosa</i>	A							
<i>Chaetoceros curvisetus</i>	A		4,239			1,696	2,543	9,326
<i>Chaetoceros laciniosus</i>	A		5,935	2,543	3,391	2,543	2,543	2,543
<i>Chaetoceros</i> sp. large	A				40			
<i>Chaetoceros</i> spp.	A			848				
<i>Cylindrotheca closterium</i>	A		848					
<i>Leptocylindrus danicus</i>	A		289,948	274,687	298,426	187,364	272,992	268,753
<i>Lycmophora abbreviata</i>	A			80				
<i>Navicula</i> spp.	A							
<i>Pseudo-nitzschia cf. delicatula</i>	A		2,543	5,087	5,935		848	
<i>Rhizosolenia hebetata</i>	A		280	400	160	280	240	80
<i>Skeletonema costatum</i>	A					848		
<i>Thalassionema nitzschioides</i>	A		848	2,543	2,543	848	848	848
<i>Thalassiosira cf. aestivalis</i>	A		240	240	120	80	80	120
Total Diatom Abundance			304,880	286,429	310,615	193,658	280,094	281,670
Dinoflagellates								
<i>Alexandrium</i> spp.	A	PSP						
<i>Ceratium arcticum</i>	A		160		160	240	80	
<i>Ceratium furca</i>	A							
<i>Cochlodinium cf. citron</i>	H				160	40		
<i>Corythodinium</i> sp.	M					120	40	120
<i>Dinophysis acuminata</i>	M	DSP		80		40		
<i>Dinophysis acuta</i>	M	DSP	80			40		
<i>Dinophysis rotundata</i>	M							40
<i>Gymnodinium</i> spp.	H		280	200	160		240	160
<i>Gymnodinium verior</i>	M			80		40	40	40
<i>Gyrodinium estuariale</i>	H				40	80		40
<i>Gyrodinium</i> sp.	H							
<i>Minuscula bipes</i>	M		40	40			40	40
<i>Protoceratium reticulatum</i>	A	Tox			40			
<i>Protoperidinium pellucidum</i>	H					80		
<i>Protoperidinium</i> spp.	H			240	40	400	80	80
Total Dinoflagellate Abundance			560	640	600	1,080	520	520
Chlorophyta								
<i>Ankistrodesmus</i> (green fresh water alga)	A							1,696
Total Chlorophyta Abundance								1,696
Chryptophyta								
Cryptophytes	M		114,453	91,562	114,453	45,781	91,562	114,453
Total Chryptophyta Abundance			114,453	91,562	114,453	45,781	91,562	114,453
Cyanobacteria								
<i>Nodularia</i> sp.	A							
<i>Oscillatoria</i> sp.	A		3,391	4,239	3,391			
Total Cyanobacteria Abundance			3,391	4,239	3,391			
Others								
<i>Dinobryon balticum</i>	H							
<i>Myrionecta rubra</i>	M							848
Total Other Abundance			0	0	0	0	0	848
Total Phytoplankton Abundance			423,284	382,870	429,059	240,520	372,176	399,186

Notes: A= autotrophic, H= heterotrophic, M= mixotrophic; PSP= Paralytic Shellfish Poison, DSP=Diarrheic Shellfish Poison, Tox= Other toxin

Appendix 3.7-3

Marine Phytoplankton Taxonomy (as Carbon Biomass),
Hope Bay Belt Project, 2010

Appendix 3.7-3. Marine Phytoplankton Taxonomy (as Carbon Biomass), Hope Bay Belt Project, 2010

Site			ST4			REF-4		
Date			Aug-10			Aug-10		
Replicate	Trophic Category	Toxicity	1	2	3	1	2	3
Biomass (µg C/L)								
Diatoms								
Asterionella formosa	A							
Chaetoceros curvisetus	A							
Chaetoceros laciniosus	A							
Chaetoceros sp. large	A							
Chaetoceros spp.	A			0.10				
Cylindrotheca closterium	A							
Leptocylindrus danicus	A		1.75	3.37	3.10	0.27		0.27
Lycmophora abbreviata	A							0.01
Navicula spp.	A						0.13	
Pseudo-nitzschia cf. delicatula	A		0.02			0.26	0.21	0.17
Rhizosolenia hebetata	A		0.16	0.28	0.52	0.56	0.04	0.16
Skeletonema costatum	A							
Thalassionema nitzschioides	A							
Thalassiosira cf. aestivalis	A							
Total Diatom Biomass			1.94	3.75	3.62	1.09	0.38	0.61
Dinoflagellates								
Alexandrium spp.	A	PSP	0.39	0.39	0.26			
Ceratium arcticum	A		1.45	2.42	4.36	0.97		1.45
Ceratium furca	A							
Cochlodinium cf. citron	H		0.31		0.31		0.08	
Corythodinium sp.	M			0.02				
Dinophysis acuminata	M	DSP			0.06			
Dinophysis acuta	M	DSP		0.18				
Dinophysis rotundata	M						0.23	
Gymnodinium spp.	H					0.06		0.05
Gymnodinium verior	M						0.09	
Gyrodinium estuariale	H		0.38			0.19		0.38
Gyrodinium sp.	H		0.09	0.09				0.04
Minuscula bipes	M							
Protoceratium reticulatum	A	Tox	1.64	2.04	1.23	1.64	0.82	0.61
Protoperidinium pellucidum	H							
Protoperidinium spp.	H		0.13	0.06	0.03			
Total Dinoflagellate Biomass			4.39	5.21	6.25	2.86	1.22	2.54
Chlorophyta								
Ankistrodesmus (green fresh water alga)	A					0.14	0.19	0.16
Total Chlorophyte Biomass						0.14	0.19	0.16
Chryptophyta								
Cryptophytes	M		1.76	3.78	1.76	1.76	2.52	1.26
Total Cryptophyte Biomass			1.76	3.78	1.76	1.76	2.52	1.26
Cyanobacteria								
Nodularia sp.	A						0.01	0.01
Oscillatoria sp.	A		0.03	0.03	0.05	0.01	0.02	0.01
Total Cyanobacteria Biomass			0.03	0.03	0.05	0.01	0.03	0.02
Others								
Dinobryon balticum	H		0.04	0.04	0.02	0.01		0.04
Myrionecta rubra	M							
Total Other Biomass			0.04	0.04	0.02	0.01	0.00	0.04
Total Phytoplankton Biomass			8.15	12.80	11.71	5.87	4.34	4.62

Notes: A= autotrophic, H= heterotrophic, M= mixotrophic; PSP= Paralytic Shellfish Poison, DSP=Diarrheic Shellfish Poison, Tox= Other toxin

Appendix 3.7-3. Marine Phytoplankton Taxonomy (as Carbon Biomass), Hope Bay Belt Project, 2010

Site			ST4			REF-4		
Date			Sep-10			Sep-10		
Replicate	Trophic Category	Toxicity	1	2	3	1	2	3
Biomass (µg C/L)								
Diatoms								
Asterionella formosa	A							
Chaetoceros curvisetus	A		0.60			0.24	0.36	1.32
Chaetoceros laciniosus	A		0.75	0.32	0.43	0.32	0.32	0.32
Chaetoceros sp. large	A				0.02			
Chaetoceros spp.	A			0.10				
Cylindrotheca closterium	A		0.02					
Leptocylindrus danicus	A		46.10	43.68	47.45	29.79	43.41	42.73
Lycmophora abbreviata	A			0.03				
Navicula spp.	A							
Pseudo-nitzschia cf. delicatula	A		0.07	0.14	0.17		0.02	
Rhizosolenia hebetata	A		0.28	0.40	0.16	0.28	0.24	0.08
Skeletonema costatum	A					0.04		
Thalassionema nitzschioides	A		0.06	0.18	0.18	0.06	0.06	0.06
Thalassiosira cf. aestivalis	A		0.24	0.24	0.12	0.08	0.08	0.12
Total Diatom Biomass			48.13	45.08	48.52	30.81	44.49	44.64
Dinoflagellates								
Alexandrium spp.	A	PSP						
Ceratium arcticum	A		1.94		1.94	2.90	0.97	
Ceratium furca	A							
Cochlodinium cf. citron	H				0.31	0.08		
Corythodinium sp.	M					0.06	0.02	0.06
Dinophysis acuminata	M	DSP		0.12		0.06		
Dinophysis acuta	M	DSP	0.37			0.18		
Dinophysis rotundata	M							0.23
Gymnodinium spp.	H		0.05	0.04	0.03		0.05	0.03
Gymnodinium verior	M			0.06		0.03	0.03	0.03
Gyrodinium estuariale	H				0.19	0.38		0.19
Gyrodinium sp.	H							
Minuscula bipes	M		0.01	0.01			0.01	0.01
Protoceratium reticulatum	A	Tox			0.20			
Protoperidinium pellucidum	H					0.18		
Protoperidinium spp.	H			0.19	0.03	0.32	0.06	0.06
Total Dinoflagellate Biomass			2.37	0.42	2.71	4.20	1.14	0.61
Chlorophyta								
Ankistrodesmus (green fresh water alga)	A							0.02
Total Chlorophyte Biomass								0.02
Chryptophyta								
Cryptophytes	M		1.26	1.01	1.26	0.50	1.01	1.26
Total Cryptophyte Biomass			1.26	1.01	1.26	0.50	1.01	1.26
Cyanobacteria								
Nodularia sp.	A							
Oscillatoria sp.	A		0.03	0.04	0.03			
Total Cyanobacteria Biomass			0.03	0.04	0.03			
Others								
Dinobryon balticum	H							
Myrionecta rubra	M							0.86
Total Other Biomass			0.00	0.00	0.00	0.00	0.00	0.86
Total Phytoplankton Biomass			51.79	46.56	52.52	35.52	46.64	47.39

Notes: A= autotrophic, H= heterotrophic, M= mixotrophic; PSP= Paralytic Shellfish Poison, DSP=Diarrheic Shellfish Poison, Tox= Other toxin

Appendix 3.8-1

Marine Benthic Invertebrate Taxonomy, Hope Bay Belt
Project, 2010

Appendix 3.8-1. Marine Benthic Invertebrate Taxonomy, Hope Bay Belt Project, 2010

Site ID Sampling Date (m/d/y) Replicate Adult/Juvenile TAXA	P1 15/08/2010						P2 15/08/2010						P3 15/08/2010					
	1		2		3		1		2		3		1		2		3	
	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J
NEMERTEA																		
Nemertea Indet.													78.6					
ANOPLOA							235.8		393.1		393.1							
Anopla Indet.									78.6									
Cerebratulus sp.																		
Lineidae																		
ANNELIDA																		
Polychaeta Errantia																		
Eteone longa													78.6		78.6		78.6	
Harmothoe imbricata Cmplx.	78.6												78.6				78.6	
Hesionidae Indet.																	78.6	
Nephtys ciliata			78.6						78.6									
Nephtys sp.	2,751.6	78.6	8,962.3	2,515.7	8,333.3	786.2	393.1	157.2	314.5		157.2	78.6	943.4	78.6	471.7		786.2	78.6
Pholoe sp.					235.8													
Pholoides asperus																		
Phyllodoce groenlandica																		
Polynoidae Indet.	78.6																	
Polychaeta Sedentaria																		
Amastigos acutus	78.6				78.6													
Aphelocheata monilaris					628.9													
Aricidea sp.	78.6																	
Cossura sp.																		
Axiiothella sp.																		
Capitella capitata Cmplx.																		
Leitoscoloplos sp.	786.2	157.2	157.2	235.8	3,301.9	1,100.6											78.6	
Maldane sp.	78.6																	
Marenzelleria arctica																		
Mediomastus sp.			78.6						471.7				78.6		78.6		314.5	
Notomastus sp.																		
Paraonidae Indet.																		
Pectinaria granulata			1,179.2	707.5	235.8	235.8							550.3	157.2	235.8	78.6	78.6	157.2
Pectinaria sp.				1,572.3		314.5												
Polydora sp.					78.6													
Prionospio sp.																		
Scolecopsis sp.							78.6		314.5		157.2							
Spiophanes sp.							157.2											
Terebellides stroemi																	78.6	78.6
Spio sp.																		
Oligochaeta																		
Enchytraeidae Indet.																		
ARTHROPODA																		
Amphipoda																		
Americhelidium sp.															78.6			
Boeckosimus affinis																		
Gammaracanthus loricatus																		
Gammarus sp.			78.6															
Lysianassidae Indet.																		
Pontoporeia femorata			78.6		78.6								157.2	78.6			78.6	
Copepoda																		
Harpacticoida									78.6									
Ostracoda																		
Ostracoda Indet.	157.2		6,525.2		628.9				78.6									
Cumacea																		
Eudorella pacifica																		
Isopoda																		
Saduria entomon									78.6				78.6		78.6	157.2		
Decapoda																		
Natantia megalops																		
MOLLUSCA																		
Gastropoda																		
Cyllichna sp.	157.2		393.1		628.9	157.2											78.6	
Bivalvia																		
Astarte borealis	314.5				707.5													
Hiatella arctica	550.3				78.6													
Axinopsida orbiculata																		
Macoma balthica	235.8	78.6		78.6	157.2	78.6	471.7	550.3	3,852.2	3,930.8	786.2	471.7	393.1	2,044.0	1,100.6	12,971.7	471.7	1,572.3
Macoma calcarea					78.6													
Macoma sp.																		
Musculus niger	78.6																	
Musculus sp.	235.8																	
Portlandia arctica																		
Rocheffortia tumida													78.6					
UROCHORDATA																		
Ascidacea																		
Rhizomogula globularis	235.8																	
OTHER																		
Unidentified invertebrate eggs							550.3		6,053.5									
Nematoda																		
Total	6,211		22,642		17,925		2,044		10,063		1,730		4,874		15,252		4,088	

Notes: Units are organisms/m².

A=Adult, J=Juvenile; adults and juveniles were combined for analysis.

Nematodes and unidentified invertebrate eggs were excluded from analysis.

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A=Adult, J=Juvenile; adults and juveniles were combined for analysis.
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Site ID	RBE
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Notes: Units are organisms/m².
A=Adult, J=Juvenile; adults and juveniles were combined for analysis.
Nematodes and unidentified invertebrate eggs were excluded from analysis.