Saanich Peninsula Treatment Plant
Environmental Monitoring Program 2023 Report

Capital Regional District | Parks, Recreation & Environmental Services, Environmental Protection

Prepared by:
Marine Programs

Capital Regional District
625 Fisgard Street, Victoria, BC V8W 2S6
T: 250.360.3000 F: 250.360.3079
www.crd.bc.ca

August 2024

SAANICH PENINSULA TREATMENT PLANT
ENVIRONMENTAL MONITORING PROGRAM
2023 REPORT

EXECUTIVE SUMMARY

The Capital Regional District (CRD) has been operating the Saanich Peninsula Treatment Plant (SPTP) since February 2000. The treatment plant serves North Saanich, Central Saanich and the Town of Sidney, as well as the Victoria International Airport, the Institute of Ocean Sciences and the Tseycum, Tsartlip, and Pauquachin First Nations communities. It is a conventional secondary level wastewater treatment plant which has periodically produced Class A biosolids. The treatment plant discharges un-disinfected secondary effluent into the marine receiving environment (Bazan Bay) through an outfall located approximately 1,580 metres (m) from the shoreline at a depth of 30 m. Residual solids left over from the treatment process are currently disposed of at the Hartland Landfill. The CRD undertakes monitoring to meet provincial and federal regulatory requirements, as well as to assess the impacts of the outfall on the marine environment and human health. Information is often used to inform the CRD's Regional Source Control Program (RSCP) and treatment plant operations. This monitoring is stipulated by the BC Ministry of Environment and Climate Change Strategy (ENV) through the Municipal Wastewater Regulation under the *Environmental Management Act* and the federal Wastewater Systems Effluent Regulations under the *Fisheries Act*.

Historically, the CRD developed the monitoring program in consultation with the Marine Monitoring Advisory Group (MMAG). Subsequently, the long-term monitoring program was revised in collaboration with ENV, and the regular use of the MMAG has been discontinued.

The 2023 Wastewater and Marine Environment Program consisted of the following components:

- daily, weekly and monthly analysis of wastewater for federal and provincial compliance monitoring, treatment plant performance parameters and quarterly analysis for priority substances
- quarterly wastewater toxicity testing
- monthly analysis of biosolids for fecal coliforms and metals
- a twice-yearly surface monitoring program, consisting of five sampling days within a 30-day period, once each in summer and winter

The Saanich Peninsula Treatment Plant Liquid Waste Management Plan is currently under review. Initial meetings with the Technical Advisory Committee, including municipal engineers, the Institute of Ocean Sciences (Pat Bay, Sidney, BC), airport representatives and First Nations, are anticipated to begin in 2024.

WASTEWATER MONITORING

Compliance Monitoring and Treatment Plant Performance

The CRD conducted wastewater monitoring on a regular basis to profile the chemical and physical constituents of influent and effluent, determine concentrations relative to provincial and federal regulatory limits and assess treatment plant performance. Parameters monitored for regulatory compliance were all below the applicable effluent regulatory limits. Influent and effluent quality was within expected ranges and met all treatment plant operating objectives.

Priority Substances

In addition to the compliance and treatment plant performance monitoring, over 630 substances were analyzed in the SPTP influent and effluent on a quarterly basis. These substances were monitored to comprehensively assess potential risks of the wastewater discharge to organisms living in the marine environment around the outfall.

Approximately 48% of substances were detected in more than 50% of the samples, and included most of the conventional parameters, metals, some organics, and high-resolution parameters. Most frequently detected substances were below BC and Canadian Water Quality Guidelines (WQG), even in undiluted effluent. Only enterococci, WAD cyanide, nitrogen, total cadmium, total and dissolved copper, total nickel, dissolved zinc, and high-resolution total polychlorinated biphenyls exceeded guidelines in undiluted effluent, prior to discharge to the marine receiving environment.

Water quality guidelines must be met outside of the initial dilution zone (IDZ) (an area with a radius of approximately 100 m around the outfall). In order to predict levels at the edge of the IDZ, estimated minimum initial dilution factors were applied to all substance concentrations. All substances were predicted to be below WQG after the application of this dilution factor, including those substances that were above guidelines in undiluted effluent, except for enterococci. As such, impacts of these discharged substances to aquatic life are likely minimal. Surface water monitoring was undertaken to assess the human health and shellfish impacts of the effluent bacteriological exceedances (see Surface Water Monitoring section below).

Toxicity Testing

In 2023, all acute toxicity tests passed with no mortality. Chronic toxicity tests had an impact on Rainbow trout embryo survival and viability, with EC25 (effluent concentration at which 25% of the organisms show an observable effect) concentrations of 51.5% for survival and 58.8% for reproduction, and on *Ceriodaphnia* reproduction, with an IC25 (effluent concentration at which 25% of the organisms are inhibited) of 68.2%.

BIOSOLIDS MONITORING

No biosolids were produced at the SPTP in 2023. All sludge generated at the facility was disposed of at the Hartland Landfill. The CRD monitored the sludge in 2023 to inform the CRD's Regional Source Control Program (RSCP), and all regulated parameters were below Class A biosolids limits.

SURFACE WATER MONITORING

Bacteriology

Surface water (1 m depth) fecal coliform and enterococci concentrations were low at all stations, with geometric means of 3 CFU/100 mL or less. IDZ stations also had low bacteriology concentrations, with geometric means of 2 CFU/100 mL or less, below BC and Health Canada recreational and shellfish guidelines. There were no elevated geometric mean fecal coliform or enterococci concentrations observed at any station, on any sampling date, and no samples that exceeded the Health Canada enterococci single sample guideline of 70 CFU/100 mL.

Overall, results indicate that adverse health effects from recreational primary contact activities and shellfish harvesting are not expected. However, an area of approximately 17.65 km^2 around the outfall is closed for shellfish harvesting, as a standard Fisheries and Oceans Canada procedure near industrial and sanitary wastewater outfalls. Shellfish closures have a minimum radius around an outfall of 300 m, but closure areas are usually larger near bigger urban centres, such as for the SPTP outfall, where there are other potential sources of bacterial contamination (e.g., stormwater discharges, marinas, septic systems, sewage pumps), in addition to the wastewater outfall.

Extended Monitoring

WQG exceedances were observed for boron in the water column surrounding the SPTP outfall at all stations and sampling events, including at the reference station. These exceedances are expected, as boron is naturally occurring in the environment at higher levels. Nickel also exceeded WQG in two samples, which has not been observed in recent years. The CRD will continue to monitor metals in waters around the outfall and the reference station to assess environmental significance.

Nutrients

Nutrient content in receiving water is analyzed to provide a qualitative comparison between outfall and reference stations. There were some seasonal patterns in the nutrient results, which were consistent between the reference and the IDZ stations. Results were within the ranges measured in previous years and those of the pre- and post-discharge assessment programs. As was observed in previous monitoring years, high variability, both spatially and temporally, was evident in the data. Fluctuations in nutrient concentrations are attributed to natural variation in the Salish Sea, rather than to an effect from the SPTP discharge.

SEAFLOOR MONITORING

Seafloor monitoring (i.e., benthic community structure and sediment chemistry) was conducted in 2020. This component is conducted every four years, since before the plant commenced discharging in 2000. The next sampling event is planned for 2024.

OVERALL ASSESSMENT

Based on tests used to monitor effluent quality and surface water in 2023, all components of the Saanich Peninsula Wastewater Treatment Plant were in compliance. As in previous years, influent and effluent quality was within expected ranges and met regulatory limits and operating certificate compliance requirements on all sampling dates. All substances, with the exception of bacterial indicators, for which there are BC or Canadian WQG, met these guidelines when the estimated minimum initial environmental dilution of the effluent was factored in, indicating that the predicted levels of substances in the environment were not likely to be at concentrations of concern to aquatic life. Surface water fecal coliform and enterococci data confirmed that the discharge to the receiving environment was below thresholds set to protect recreational activities and shellfish consumers. As expected, boron exceeded WQG at every station and sampling depth, including at the reference station, as the natural concentrations of boron are above WQG in the Salish Sea. ENV is working on updating the boron guideline. Nickel also exceeded guidelines in two surface water samples, which has not been previously observed. Surface water nutrient concentrations were within ranges measured in previous monitoring programs and showed no detectable effect from the discharge.

SAANICH PENINSULA TREATMENT PLANT
ENVIRONMENTAL MONITORING PROGRAM
2023 REPORT

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

Terms & Abbreviations

ALK	Alkalinity
AVS	Acid Volatile Sulphide
BC OMRR	Organic Matter Recycling Regulations
BOD	Biochemical Oxygen Demand
CALA	Canadian Association for Laboratory Accreditation
CBOD	Carbonaceous Biochemical Oxygen Demand
CCME	Canadian Council of Ministers of the Environment
CFU	Colony-forming unit
Cl	Chloride
COD	Chemical Oxygen Demand
COND	Conductivity
CSSP	Canadian Shellfish Sanitation Program
ENT	Enterococci
ENV	BC Ministry of Environment and Climate Change Strategy
FC	Fecal Coliform
IDZ	Initial Dilution Zone
LWMP	Liquid Waste Management Program
MMAG	Marine Monitoring Advisory Group
NH_3	Ammonia
NO_2	Nitrite
NO_3	Nitrate
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PDBE	Polybrominated diphenyl ethers
PFOS	Perfluorooctanesulfonic acid
PFHpA	Perfluoroheptanoic acid
PFHxA	Perfluorohexanoic acid
PFNA	Perfluorononanoic acid
PFoSA	Perfluorooctanesulfonamide
PFOA	Perfluorooctanoic acid
PFPeA	Perfluoropentanoic acid
PFBS	Perfluorobutanesulfonic acid
PFHxS	Perfluorohexanesulfonic acid
PPCP	Pharmaceuticals and personal care products
Q+	Quarterly Plus
QA/QC	Quality Assessment/Quality Control
RSCP	Regional Source Control Program
SCADA	Supervisory Control and Data Acquisition
SDI	Swartz Dominance Index
SPTP	Saanich Peninsula Treatment Plant
SQG	Sediment quality guidelines
TA	Total abundance
TDP	Total dissolved phosphorus
TKN	Total Kjeldahl nitrogen
TOC	Total organic carbon
TP	Total phosphorus
TR	Taxa richness
TRC	Total residual chlorine
TSS	Total Suspended Solids
TWQRP	Technical Water Quality Review Panel
UN NH_3	Unionized Ammonia
US EPA	US Environmental Protection Agency

v/v	Volume per volume
WAD	Weak acid dissociable (WAD) cyanide
WMEP	Wastewater Marine Environment Program
WQG	Water Quality Guidelines
WSER	Wastewater Systems Effluent Regulations

SAANICH PENINSULA TREATMENT PLANT
ENVIRONMENTAL MONITORING PROGRAM
2023 REPORT

1.0 BACKGROUND

The Saanich Peninsula Treatment Plant (SPTP) started operations in February 2000. This Capital Regional District (CRD) treatment plant serves North Saanich, Central Saanich and the Town of Sidney, as well as the Victoria International Airport, the Institute of Ocean Sciences and Tseycum, Tsartlip, and Pauquachin First Nations communities. It is a conventional secondary level wastewater treatment plant, which has periodically produced Class A biosolids. The treatment facility discharges undisinfected secondary-treated effluent into the marine receiving environment (Bazan Bay) through an outfall located approximately 1,580 m from the shoreline at a depth of 30 m. Residual sludge from the treatment process is currently disposed of at the Hartland Landfill. The Wastewater and Marine Environment Program (WMEP) includes regular monitoring, as stipulated by the BC Ministry of Environment and Climate Change Strategy (ENV), through the Municipal Wastewater Regulation under the *Environmental Management Act* and the federal Wastewater Systems Effluent Regulations (WSER) under the *Fisheries Act*. The facility operates under a Provincial Operational Certificate (#ME-15445), and the Saanich Peninsula Liquid Waste Management Plan (LWMP) (CRD, 2009a).

The Saanich Peninsula LWMP committed the CRD to carry out a pre- and post-discharge assessment program and to develop a long-term monitoring program. The pre-discharge program was conducted from October 1998 to January 2000. The post-discharge program was initiated in February 2000 (when treatment plant operation began) and completed in February 2001. The results presented in Aquametrix Research Ltd. (2000, 2001a and 2001b) guided the development of the long-term monitoring program in consultation with the Marine Monitoring Advisory Group (MMAG). The MMAG consists of university and government scientists with expertise in the fields of marine biology, chemistry, toxicology, oceanography and public health. This independent group historically reviewed CRD marine monitoring and assessment programs and made recommendations.

Subsequently, the long-term monitoring program was revised in collaboration with ENV, and the regular use of the MMAG discontinued. This revised program was implemented in January 2013 and is summarized in Table 2.1.

In addition, the initial Technical Water Quality Review Panel (TWQRP) suggested a number of conditions that would prompt a reevaluation of the need for disinfection at the SPTP, one of which was 10 years of plant operation. This reevaluation was initiated in 2011 with the MMAG receiving formal delegation to undertake the review. In 2015, the MMAG confirmed that disinfection continues to be unnecessary to meet recreational water quality guidelines around the outfall and requested that the CRD continue to assess the potential benefits of disinfection to nearby shellfish resources in consultation with First Nation and other shellfish stakeholders. In January 2020, staff advised the Saanich Peninsula Wastewater Commission that installation of disinfection at the SPTP does not appear to present any significant benefit to nearby shellfish resources, as the ongoing surface water bacteriological monitoring indicates that levels around the outfall are well below thresholds to protect shellfish harvesting. Staff therefore recommended that disinfection not be installed at that time. Staff continue to meet with W̱SÁNEĆ First Nations and other shellfish stakeholders to assess potential future disinfection need, as well as to identify other areas on the Saanich Peninsula where shellfish harvesting could be restored but are outside the influence of the SPTP.

The SPTP LWMP is currently under review. Initial meetings with the Technical Advisory Committee, including municipal engineers, the Institute of Ocean Sciences (Pat Bay, Sidney, BC), airport representatives and First Nations, are anticipated to begin in 2024.

2.0 INTRODUCTION

The objectives of the SPTP WMEP are to:

- Comply with federal and provincial wastewater regulations.
- Assess the effects of the wastewater discharge on the marine environment and the potential for human health risks (related to the presence of bacteria in surface water).
- Determine waste loads to the marine receiving environment.
- Monitor influent, effluent and sludge quality (both as part of regulatory requirements and to optimize treatment plant performance).
- Supply information to the CRD's Regional Source Control Program (RSCP) and treatment plant operators.
- Provide scientific guidance to wastewater managers regarding the use of the marine environment for the disposal of municipal wastewater.

This report presents the results of the 2023 SPTP WMEP in one integrated report. The components of the current WMEP are presented in Table 2.1. These components, the parameters that are measured for each, and the sampling frequency were determined based on regulatory requirements (i.e., for compliance monitoring), a review of the pre- and post-discharge assessment programs, similar monitoring and assessment programs, and recommendations of the MMAG. The following sections present summaries of the methods used for sample collection and processing, and for data analysis of each component of the 2023 WMEP. Detailed information can be found in any technical reports and independent consultant reports referred to in the individual sections. Methods were selected for each of these components, based on internationally recognized standards, as well as sampling and analytical protocols.

Outfall and reference stations for the sea surface and seafloor components of the WMEP were chosen by the MMAG, following recommendations by the consultant (Aquametrix) that conducted the pre- and post-discharge monitoring program. The reference station was chosen because oceanographic computer modelling indicated it would be far enough away from the plume effects, while being at a similar depth to the outfall stations.

Table 2.1 SPTP Wastewater and Marine Environment Program Components, Parameters, Frequency and Stations

Component	Parameter	Frequency and Stations
Wastewater Monitoring	compliance monitoring (CBOD, FC, flow, unionized NH_3, pH @ 15°C, TSS)[1]	daily to twice per month at the influent and final effluent sampling points[2] federal – every two weeks provincial – monthly
	treatment plant performance (ALK, CBOD, COD, COND, Cl, NH_3, NO_2, NO_3, BOD, TDP, TKN, TP, TSS)[1]	twice per week to monthly[3] at the influent and final effluent sampling points
	influent and effluent priority substances[4]	quarterly[5] at the influent and effluent sampling points
	chronic toxicity testing	annually at the effluent sampling point (*Ceriodaphnia dubia* survival and reproduction, Rainbow trout embryo-alevin survival and development, echinoderm (*Strongylocentrotus)* fertilization, seven-day Pacific topsmelt survival and growth)
	acute toxicity testing	quarterly at the effluent sampling point (Rainbow trout 96-hour LC50, *Daphnia magna* 48-hour LC50)
Sludge Monitoring	metals, moisture, FC[1]	monitored monthly for informational purposes
Surface Water Monitoring	indicator bacteria (FC, ENT)[1]	10 times a year (5-in-30 samples collected in the winter and in the summer) at 19 stations (14 outfall stations, four IDZ stations and one reference station)
	nutrients (NH_3, NO_2, NO_3, TDP, TKN, TP), COND, salinity, pH, temperature and TOC[1]	10 times a year (5-in-30 samples collected in the winter and in the summer) at five stations (four IDZ stations and one reference station)
	metals	twice yearly (winter and summer) at five stations (four IDZ stations and one reference station)
Seafloor	particle size analysis, TOC[1], AVS[1] and sediment chemistry[4]	every four years at two stations[6] (one outfall terminus station and one reference station)
	benthic community structure (including TA, TR, SDI)[7]	

Notes:

[1] ALK - alkalinity, AVS - acid volatile sulphide, CBOD - carbonaceous biochemical oxygen demand, COD - chemical oxygen demand, COND - conductivity, Cl - chloride, FC - fecal coliforms, ENT - enterococci, NH_3 - ammonia, NO_3 - nitrate, NO_2 - nitrite, BOD - biochemical oxygen demand, TDP - total dissolved phosphorus, TKN - total Kjeldahl nitrogen, TOC - total organic carbon, TP - total phosphorus, TSS - total suspended solids

[2] Frequency is listed in Appendix A.

[3] Frequency depends on the operation of the facility and what the operators need to optimize treatment plant performance.

[4] All parameters are listed in Appendix A.

[5] January and July additional Q+ sampling conducted one day before and one day after the quarterly sampling event.

[6] Conducted in 2020. Next time will be 2024, 2028, etc.

[7] TA - total abundance, TR - taxa richness, SDI - Swartz Dominance index

3.0 WASTEWATER MONITORING

3.1 Introduction

The CRD conducts wastewater monitoring on a regular basis at the SPTP to assess compliance with the operational certificate under the LWMP and the federal WSER, to assess treatment plant performance and to profile the physical and chemical constituents of treated wastewater before it is released to the marine receiving environment. These data provide an indication of which components may be of concern in the receiving environment and can be used to direct the efforts of the WMEP and the CRD's RSCP.

Wastewater monitoring at the SPTP consists of quarterly composite analyses for all priority substances, supplemented by additional "quarterly plus" (Q+) composite sampling occurring one day before and one day after the quarterly sampling events in January and July. The Q+ monitoring program is intended to increase the precision of the quarterly sampling events for key substances of interest (Appendix A).

The list of priority substances was adapted from the US Environmental Protection Agency (US EPA) National Recommended Water Quality Criteria; Priority Toxic Pollutants list (US EPA, 2002). The CRD reviews its list on a periodic basis to determine the need to delete or add substances depending on new developments in terms of analytical techniques, potential presence in wastewaters and potential effects on human health and the receiving environment, alignment with OceanWise's Pollution Tracker parameters, and upon ENV review. Influent is analyzed for a subset list of substances (Appendix A).

Detailed statistical trend analyses are undertaken every three to five years to quantitatively assess temporal trends in concentrations and loadings of wastewater parameters. In 2012, Golder Associates (Golder, 2013) updated the previous trend assessment to include the 2009-2011 results, expanding the total SPTP dataset from 2000-2011. Results of this assessment were presented in the 2011 annual report (CRD, 2012). The most recent trend assessment was completed in 2017 (Golder, 2019) and included the next three years of wastewater data (2012-2015). Results were included in the 2016 annual report (CRD, 2017). The next trend assessment for the SPTP is planned for the next one to two years.

3.2 Methods

Information on wastewater sampling and analytical methods is presented below and in any independent consultants' reports referenced in the individual sections. Sampling and analytical methods used for each of these components were based on recognized standards and protocols (APHA, 1992; BC MWLAP, 2003). Samples were either collected as composites (i.e., over a 24-hour period) or individual grabs (i.e., discrete one-time) depending on the parameters that were being analyzed.

3.2.1 Compliance Monitoring and Treatment Plant Performance

The CRD operators and sampling technicians regularly monitor effluent quality and flow, as required by the ENV operational certificate under the SPTP LWMP and federal regulations. Table 3.1 presents parameters, effluent regulatory limits, frequency and sampling methods used to assess compliance.

Influent and effluent samples were also collected periodically to assess the efficiency of the treatment plant processes (see Table 2.1 for a list of parameters and monitoring frequency). Flow was measured continuously with a Supervisory Control and Data Acquisition (SCADA) system.

Operators and technicians collected composite influent and effluent samples using on-site automated ISCO™ samplers (http://www.isco.com). Influent samples were collected from a sampling point situated where the wastewater had entered the treatment plant and been screened to <6 mm, but prior to transfer to the settling tanks (i.e., before primary treatment). Effluent samples were collected from a sampling port situated where the final effluent is discharged to the marine receiving environment. Sub-samples (consisting of 400 mL) were collected every 30 minutes and composited into one sample representing the 24-hour period. Grab samples (i.e., one-time discrete samples) were collected for the analysis of parameters not suited to composite sampling, such as fecal coliforms, pH, oil and grease, and volatile organic compounds. Laboratory analyses including parameters required by WSER were conducted at Bureau Veritas Laboratories Inc. (Burnaby, BC), and by the CRD Water Quality Lab (Victoria, BC), both Canadian Association for Laboratory Accreditation (CALA) certified labs.

Table 3.1 SPTP Effluent Compliance Monitoring Parameters, Regulatory Limits, Frequency and Sampling Methods

Parameter	Effluent Regulatory Limit	Required Frequency of Monitoring[4]	Sampling Method
CBOD	provincial – 45 mg/L maximum federal – 25 mg/L average	provincial – 2x per week federal – 2x per month	24-hr composite
TSS[1]	provincial – 45 mg/L maximum federal – 25 mg/L average	provincial – 2x per week federal – 2x per month	24-hr composite
flow[1]	24,953 m^3/day (average daily)[2] 56,000 m^3/day (maximum daily)	continuously	SCADA[3]
pH[1]	6-9	2x per week	grab
unionized ammonia[1], pH @ 15°C	provincial – required, but no limit federal –1.25 mg/L maximum	provincial – monthly federal – 2x per month	24-hr composite
fecal coliforms	required, but no limit	provincial – monthly	grab
total residual chlorine	federal – 0.02 mg/L average	only when used as part of the treatment process[5]	grab

Notes:
[1] Parameters which are also analyzed in influent.
[2] Limit determined on an annual basis = [12,200 m^3/d * (1.0316 $^{\text{calendar year—1999}}$)]
[3] SCADA system
[4] As described in the operating certificate or the federal WSER.
[5] Chlorine was not used as part of the SPTP treatment process in 2022. As such, total residual chlorine was not monitored.
CBOD = carbonaceous biochemical oxygen demand; TSS = total suspended solids; FC = fecal coliforms

3.2.2 Priority Substances

CRD technicians collected influent and effluent samples, using methods similar to those used for compliance parameters, but with the following adaptations:

- Sampling equipment (i.e., hoses, sieves and carboys) was cleaned thoroughly prior to use by an external private laboratory (SGS AXYS Analytical Services), following trace cleaning procedures, including triple rinses with solvents, acids and distilled water.
- The CRD WMEP automated ISCO™ samplers (different from the on-site SPTP automated ISCO™ samplers used by the operators for the compliance and treatment plant performance monitoring) were used to collect influent and effluent composite samples. Two different samplers were used: one for influent and one for effluent. Sub-samples (consisting of 400 mL) were collected every 30 minutes and composited into one sample representing the 24-hour period.
- Composite samples were collected into a fluorinated, pre-cleaned 20 L carboy and continuously and thoroughly mixed before and during sample splitting to ensure sample homogeneity.

- Grab samples were collected using the ISCO™ sampler manual pumping setting (i.e., at the end of each composite sample interval) and transferred into appropriate sample bottles on site.

Sampling technicians immediately dispatched the samples to qualified laboratories (i.e., certified by the Canadian Association for Laboratory Accreditation) to conduct chemical analyses. Bureau Veritas (Burnaby, BC) conducted analyses for conventional parameters including federally regulated parameters (i.e., pH @ 15°C, unionized ammonia, TSS, CBOD) and priority substances; and SGS AXYS Analytical Services conducted analyses for high-resolution parameters. Laboratory and CRD staff chose analytical methods to ensure that method detection limits were low enough for comparisons to ENV approved (BCMoE&CCS, 2019) and working (BCMoE&CCS, 2017) WQG and the Canadian Council of Ministers of the Environment (CCME 2003) *Canadian Water Quality Guidelines for the Protection of Aquatic Life*.

Wastewater was analyzed for a comprehensive list of priority substances that included conventional parameters (included for the assessment of potential effects on the marine receiving environment and for comparison to the compliance treatment plant performance results), metals, halogenated compounds, polycyclic aromatic hydrocarbons, polybrominated diphenyl ethers, polychlorinated biphenyls, pesticides, pharmaceuticals and personal care products, nonylphenols and fluorinated compounds (Appendix A).

DATA QUALITY ASSESSMENT

The CRD and laboratory staff followed rigorous quality assessment/quality control (QA/QC) procedures for both field sampling and laboratory analyses. Within each batch that was analyzed quarterly (i.e., four batches in 2023 that included samples from McLoughlin Point WWTP), one sample was randomly chosen for laboratory triplicate analysis, one sample was randomly chosen for field triplicate analysis, and one sample for a matrix spike. Both Bureau Veritas and SGS AXYS Analytical also conducted internal QA/QC analysis, including method analyte spikes, method blanks and standard reference materials.

DATA ANALYSIS

Percent frequencies of detection were determined for each substance by adding the number of times the compound was detected, dividing it by the total number of samples collected in the year and multiplying it by 100. A frequency of greater than 50% was selected as a percentage above which meaningful statistical analyses could be conducted. For non-detectable results (i.e., less than the method detection limits), the method detection limit was used for calculating the substance mean concentrations. For those substances detected greater than 50% of the time in the effluent, predictions of substance concentrations in the receiving environment were made by dividing maximum substance concentrations in effluent by the estimated minimum initial dilution factor of 153:1 (Hayco, 2005). This estimated minimum initial dilution factor was determined by a receiving environment dye study undertaken December 7-9, 2004, and was determined to occur within approximately 50 m south of the outfall at a depth of 24.4 m at slack tide (Hayco 2005). Predicted environmental concentrations, as well as the original sample concentrations (i.e., without the initial dilution factor), were compared to:

- ENV approved (BCMoE&CCS, 2019) and working (BCMoE&CCS, 2017) WQG;
- CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Lif*e (CCME, 2003); and
- Health Canada guidelines for the protection of human health (Health Canada, 2012).

These comparisons give an indication of the potential for receiving environment effects.

Annual loadings were determined by first calculating the quarterly loadings (January, April, July and October), averaging these values and multiplying by the number of days in the year. Quarterly loadings were calculated by averaging the total flow over the two sampling days and multiplying the average flow by the concentration of each substance measured that quarter. Loadings were calculated only for substances detected in >50% of sampling events.

Substances for which minimum initial dilution and loading calculations were not appropriate were noted as n/a (not applicable). For example, pH, conductivity and hardness do not lend themselves to loading calculations (e.g., pH is a discrete measurement and calculating a loading over time is not appropriate).

3.2.3 Toxicity Testing

Acute toxicity testing refers to the assessment of adverse effects of a substance resulting from either a single exposure or from multiple exposures to a substance in a short period of time (usually less than 24 hours). Acute toxicity testing was conducted by Nautilus Environmental (Burnaby, BC) on a quarterly basis using effluent collected from the SPTP in January, April, July and October. Tests consisted of a 96-hour Rainbow trout LC50 and a 48-hour *Daphnia magna* LC50. The LC50 test measures the lethal concentration that kills 50% of organisms over the test period. Anything less than 100% v/v is a fail.

Chronic toxicity testing refers to the assessment of adverse health effects from repeated exposures, often at lower levels, to a substance over a longer period of time (weeks or years). Chronic toxicity results are reported as either the LC50, which is the concentration at which 50% of the test organisms die during the test period, or as the EC50 or EC25, which are the concentrations at which a negative impact is observed on 50% or 25%, respectively, of the organisms in the specified test period (e.g., decreased fertilization or growth). Chronic toxicity testing was conducted by Nautilus Environmental using effluent collected from the SPTP in November and December. Tests consisted of a seven-day *Oncorhynchus mykiss* (Rainbow trout) embryo-alevin, a seven-day *Atherinops affinis* (Topsmelt) survival and growth, a six-day *Ceriodaphnia* survival and reproduction, and an echinoid fertilization test.

3.3 Results and Discussion

3.3.1 Compliance Monitoring and Treatment Plant Performance

Flow data are presented in Appendix B1. Flow measurements indicate that the mean daily flow in 2023 was slightly lower than in 2022 (9,459 m^3/d in 2023 vs 9,833 m^3/d in 2022). There were no exceedances of the permitted average or maximum daily allowable flow in 2023. Figure 3.1 presents the SPTP flows from 2011-2023 indicating that flows are not increasing significantly over time. Provincial wastewater compliance monitoring and treatment plant performance monitoring results are summarized in Table 3.2. Federal wastewater compliance parameters are summarized in Table 3.3. The complete raw data sets are presented in Appendices B2 (influent) and B3 (effluent).

In 2023, all SPTP effluent results were below provincial and federal regulatory limits.

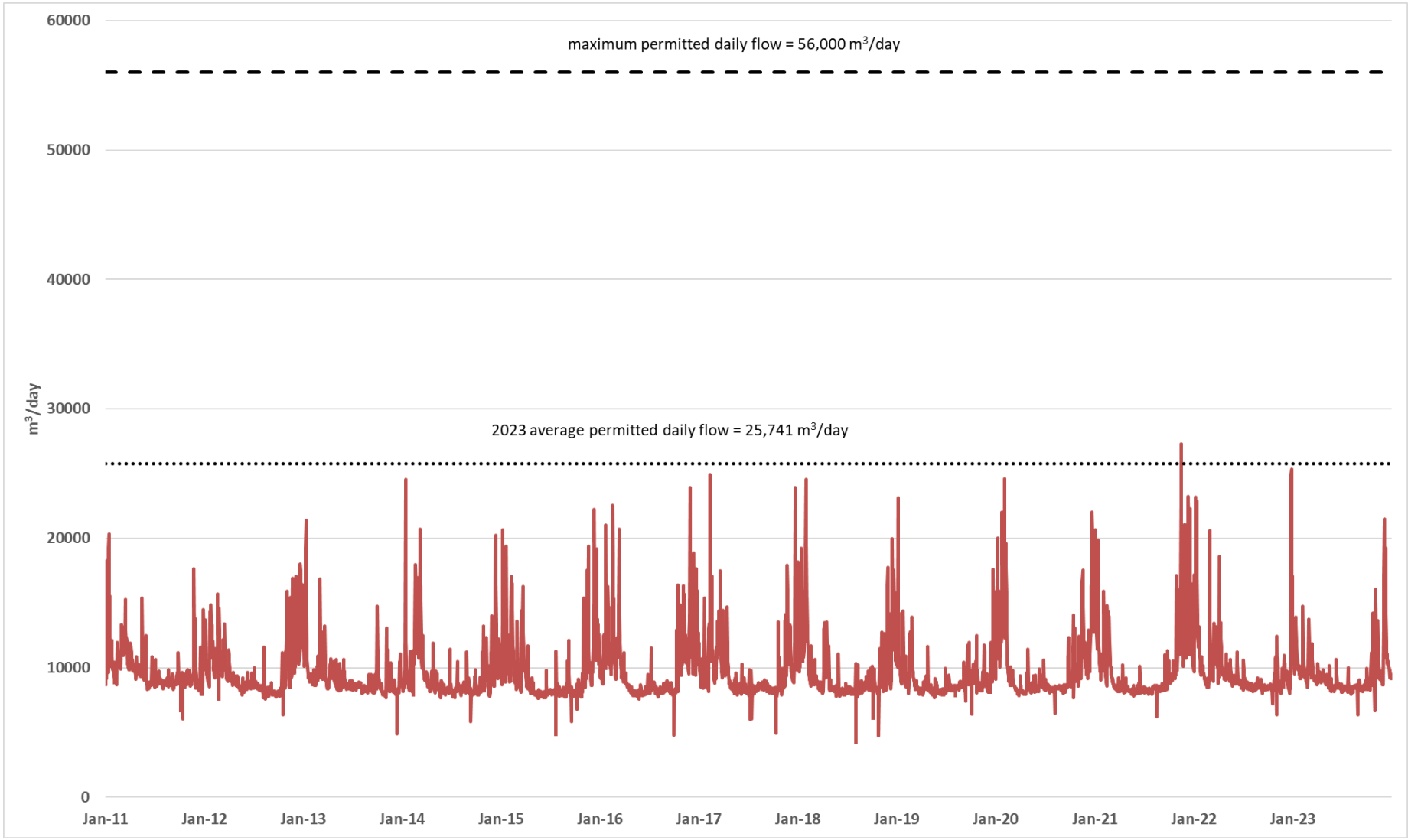


Figure 3.1 SPTP Effluent flows from 2011-2023

Table 3.2 SPTP 2023 Provincial Compliance Monitoring and Treatment Plant Performance Results

Parameter and Unit	Effluent Regulatory Limit	Influent				Effluent			
		n	Mean	Min	Max	*n*	Mean	Min	Max
CBOD (mg/L)	45 maximum	5	218	150	280	107	5	1	15.2
TSS (mg/L)	45 maximum	5	205	56	290	29	13	6	26
Flow (m^3/d)	25,741 average daily 56,000 maximum daily	---	---	---	---	365	9,459	6,350	21,488
pH (pH units)	6-9	33	7.44	7.2	7.88	33	7.21	6.8	7.77
NH_3 (mg/L N)	required, but no limit	33	31.0	1.3	55.2	33	3.7	0.041	18.2
Fecal coliform (CFU/100 mL)	required, but no limit	9	11,844,444	1,800,000	67,000,000	33	38,358	1,500	600,000
Alkalinity (mg/L)	*	12	194	17.3	249	12	49	22.9	108
Chloride (mg/L)	*	17	166	71	297	16	147	77	243
COD (mg/L)	*	56	744	272	1,430	57	314	40	950
BOD (mg/L)	*	52	256	110	535	106	17	3	48.3
Nitrate (mg/L N)	*	29	0.47	0.005	12.8	28	13.3	0.01	17.7
Nitrite (mg/L N)	*	33	0.11	0.0025	3	32	1	0.003	4.63
TKN (mg/L N)	*	29	49.9	16.6	86.9	29	9	0.2	58
TP (mg/L P)	*	20	5,8	3,6	8,9	20	2,2	3,3	4,3

Notes:
CBOD = carbonaceous biochemical oxygen demand, COD = chemical oxygen demand, FC = fecal coliforms, NH_3 = ammonia, BOD = biochemical oxygen demand, TDP = total dissolved phosphorus, TKN = total Kjeldahl nitrogen, TP = total phosphorus, TSS = total suspended solids
Average daily flows limit determined on an annual basis = [12,200 m^3/d * ($1.0316^{\text{calendar year -1999}}$)].
* Measured to assess treatment plant performance.
Shaded value indicates exceedance to permitted maximum.

Table 3.3 Saanich Peninsula Treatment Plant Federal Wastewater Compliance Results 2023

Saanich Peninsula Treatment Plant Secondary Effluent				
	CBOD (mg/L)	Unionized ammonia (mg/L N)	pH @ 15°C	TSS (mg/L)
Federal Limit	25 average	1.25 max	---	25 average
Number of samples	107	28	28	29
January	4.5	0.03	6.4	10.0
February	4.8	0.05	6.5	11.0
March	5.9	0.09	6.8	16.0
April	7.6	0.02	6.5	17.3
May	6.5	0.05	6.6	11.0
June	5.2	0.05	6.5	18.5
July	4.3	0.03	6.6	13.5
August	5.4	0.05	6.1	16.5
September	5.1	0.05	6.4	17.5
October	4.4	0.03	6.9	8.9
November	6.4	0.03	6.7	10.0
December	5.5	0.001	6.8	12.5

3.3.2 Priority Substances

Over 630 priority substances were analyzed in the SPTP influent and effluent, including high-resolution parameters (Appendix B4). Approximately 48% of these were detected in effluent in greater than 50% of the samples and are listed in Table 3.4. These include most of the conventional variables (TSS, BOD, CBOD, nutrients, etc.), metals, some organics and high-resolution parameters.

Table 3.4 presents annual mean, minimum and maximum effluent concentrations, and loadings of the priority substances detected in greater than 50% of sampling events. The 1:153 estimated minimum initial dilution factor (Hayco, 2005) was applied to the maximum concentrations and the resulting concentrations were then compared to the ENV approved (BCMoE&CCS, 2019) and working (BCMoE&CCS, 2017) WQG, the CCME *Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 2003), and the Health Canada *Guidelines for Canadian Recreational Water Quality* (Health Canada, 2012) to assess predicted environmental concentrations. It should be noted that not all substances (e.g., alkalinity, conductivity, hardness and pH) discharged to the marine receiving environment could be assessed by extrapolating effluent concentrations using predicted minimum initial dilution. These parameters are not suitable for effluent dilution calculations (e.g., pH of 7.0 cannot be divided by estimated minimum initial dilution of 1:153).

The maximum concentrations of most parameters were below guidelines in undiluted effluent (i.e., prior to discharge). Parameters not meeting WQG in undiluted effluent (maximum concentrations) included: enterococci, WAD cyanide, nitrogen, total cadmium, dissolved and total copper, total nickel, total zinc, and total polychlorinated biphenyls (high-res) (Table 3.4). These exceedances have also been observed in previous years. All results were below WQG after application of the estimated minimum initial dilution factor (i.e., the maximum predicted concentration in the environment), with the exception of enterococci. Effluent concentrations have consistently been below WQG from 2000-2023, after estimated minimum initial dilution has been applied (CRD, 2002-2021). CRD staff will continue to monitor effluent to determine whether exceedances of BC WQG are changing in frequency over time.

3.3.3 Toxicity Testing

Table 3.5 presents the results from the 2023 acute toxicity testing. There was no mortality observed for either acute toxicity test (Rainbow trout or *Daphnia*) in any of the samples (January, April, July and October). Table 3.6 presents the results from the 2023 chronic toxicity testing, which indicated an impact on Rainbow trout embryo survival and viability, with EC25 (effluent concentration at which 25% of the organisms show an observable effect) concentrations of 51.5% for survival and 58.8% for reproduction, and on *Ceriodaphnia* reproduction, with an IC25 (effluent concentration at which 25% of the organisms are inhibited) of 68.2%.

3.4 Overall Assessment

Overall, the 2023 wastewater monitoring results were generally consistent with previous years. There were no exceedances to permitted compliance parameter requirements stipulated under the provincial operational certificate and federal WSER, indicating that from an operational perspective, wastewaters were as expected. In addition, because all priority substances met applicable WQG in the marine receiving environment (following the application of estimated minimum initial dilution factors), with the exception of bacteriological indicators, it is not likely that significant effects on aquatic life will occur as a result of the substances being discharged. The use of an estimated minimum initial dilution factor allows for a conservative (i.e., protective) estimate of potential effects because the predicted average initial factors are actually much higher in the marine receiving environments around the outfall (Hayco, 2005). Direct risk to human health and shellfish harvesting, as a result of the bacteriological indicator exceedances in effluent, was assessed via surface water and water column monitoring in the receiving environment (see Section 5.0).

Table 3.4 Annual Concentrations and Loadings of Frequently Detected Substances (>50% of the time) in SPTP Effluent, 2023

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Conventionals											
Enterococci	TOT	CFU / 100 mL	1	100	3,482,222	5,748	14,000	580	91.5	n/a	35d, 70d
Fecal Coliforms	TOT	CFU / 100 mL	1	100	23,044,444	15,150	64,000	1,500	418	n/a	
Alkalinity - Total - Ph 4.5	TOT	mg/L	1	100	344	73.75	105	30	0.686	697,601	
Total/SAD Cyanide	TOT	mg/L	0.0005	100	0.006	0.002	0.002	0.001	0.00001	17	
WAD Cyanide	TOT	mg/L	0.0005	100	0.006	0.001	0.002	0.001	0.00001	11	0.001a
Alkalinity - Bicarbonate	TOT	mg/L	1	100	420	89.8	129	36	0.843	848,945	
Hardness (as CaCO3)	DIS	mg/L	0.5	100	177	101	114	87	0.745	957,960	
Hardness (as CaCO3)	DIS	mg/L	0.5	100	177	101	114	87	0.745	957,960	
Sulphate	DIS	mg/L	10	100	57.6	39.8	44	37	0.288	375,995	
N - Nh3 (As N)	TOT	mg/L	0.015	100	33.0	0.433	1.1	0.1	0.007	35,447^	19.7
N - Nh3 (As N)- Unionized	TOT	mg/L	0.0005	75	0.069	0.001	0.002	0.001	0.00005	7.90	
N - No2 (As N)	DIS	mg/L	0.005	100	n/d	2.31	4.63	0.46	0.030	21,849	
N - No3 (As N)	DIS	mg/L	0.005	100	0.035	12.1	14.5	7.66	0.095	114,596	
N - No3 + No2 (As N)	DIS	mg/L	0.2	100	0.035	14.2	16.6	9.85	0.108	134,673	
N - Tkn (As N)	TOT	mg/L	0.4	100	85.0	8.81	15.6	1.43	0.102	83,286	
N - Total (As N)	TOT	mg/L	0.4	100	108	23.1	26.4	16.5	0.173	218,030	3.7a
Organic Carbon	TOT	mg/L	0.5	100	232	16.8	20	13	0.131	158,438	
P - Po4 - Ortho (As P)	DIS	mg/L	0.03	100	5.96	1.13	2.20	0.016	0.014	10,703	
P - Po4 - Total (As P)	TOT	mg/L	0.03	100	10,060	1,693	2,900	427	19.0	16,018,141	
BOD	TOT	mg/L	2	100	400	18.8	27	14	0.176	177,356	
CBOD	TOT	mg/L	2	100	476	5.9	9	3.2	0.059	55,808	
COD	TOT	mg/L	10	100	1,010	61.5	82	50	0.536	581,729	
pH	TOT	pH	0	100	13.4	7.44	7.77	6.95	0.051	n/a	7.0-8.7b.c
pH @ 15° C	DIS	pH	0	100	13.8	6.60	6.71	6.44	0.044	n/a	
TSS	TOT	mg/L	1	100	388	9.35	13	6.8	0.085	125,707^	
Conductivity	TOT	µS/cm	2	100	1612	855	910	800	5.95	n/a	
Sulfide	TOT	mg/L	0.0018	88	7.19	0.019	0.028	0.0018	0.000	179	
Chloride-D	DIS	mg/L	10	100	209.2	147.5	170	130	1.11	1,395,203	
Metals Dissolved											
Aluminum-D	DIS	µg/L	0.5	100	268	16.3	28.3	11.6	0.185	154	
Antimony-D	DIS	µg/L	0.02	100	0.544	0.291	0.569	0.201	0.004	2.8	
Arsenic-D	DIS	µg/L	0.02	100	1.41	0.325	0.497	0.241	0.003	3.1	12.5a,c
Barium-D	DIS	µg/L	0.02	100	20.5	8.30	17.43	4.93	0.114	79	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Bismuth-D	DIS	µg/L	0.02	100	0.359	0.244	0.381	0.114	0.002	2.3	
Boron-D	DIS	µg/L	0.02	100	333	263	469	191	3.07	2,490	
Cadmium-D	DIS	µg/L	0.005	88	0.133	0.015	0.033	0.005	0.000	0.14	0.12b,c
Calcium-D	DIS	mg/L	0.05	100	35.6	20.6	22.3	17.7	0.146	194,382	
Chromium-D	DIS	µg/L	0.1	100	9.27	0.615	1.36	0.33	0.009	5.8	56b,c
Cobalt-D	DIS	µg/L	0.01	100	1.27	0.322	0.568	0.232	0.004	3.0	
Copper-D	DIS	µg/L	0.1	100	44.7	9.68	20.3	4.95	0.133	92	<2(lt), 3(st)a
Iron-D	DIS	µg/L	1	100	896	129	228	72.8	1.49	1,218	
Lead-D	DIS	µg/L	0.02	100	2.29	0.384	0.738	0.258	0.005	3.6	<2(lt), 140(st)a
Lithium-D	DIS	µg/L	0.02	100	4.66	3.3	5.28	2.55	0.035	31	
Magnesium-D	DIS	mg/L	0.25	100	21.5	12.1	14.2	10.4	0.093	114,572	
Manganese-D	DIS	µg/L	0.05	100	67.4	33.7	62.3	24.8	0.407	319	100b
Molybdenum-D	DIS	µg/L	0.05	100	6.64	1.29	2.83	0.636	0.018	12	
Nickel-D	DIS	µg/L	0.02	100	33.8	2.255	4.06	1.53	0.027	21	8.3b
Phosphorus-D	DIS	µg/L	2	100	7,715	1,577	3,130	113	20.5	14,913	
Potassium-D	DIS	mg/L	0.05	100	29.6	15.7	20.2	13.4	0.132	148,861	
Selenium-D	DIS	µg/L	0.04	100	1.83	0.161	0.363	0.101	0.002	1.5	2a
Silicon-D	DIS	µg/L	0.2	100	5,353	3,690	5,790	2,830	37.8	34,904	
Silver-D	DIS	µg/L	0.005	75	0.047	0.011	0.024	0.005	0.000	0.10	1.5(lt), 3(st)a
Sodium-D	DIS	mg/L	0.2	100	166	101	108	96.4	0.706	952,758	
Strontium-D	DIS	µg/L	0.2	100	165	121	214	83.4	1.40	1,144	
Sulfur-D	DIS	mg/L	0.02	100	48.0	12.8	13.9	11.2	0.091	121,312	
Tin-D	DIS	µg/L	0.2	100	4.31	0.704	1.31	0.45	0.009	6.7	
Uranium-D	DIS	µg/L	0.001	100	0.048	0.008	0.016	0.003	0.000	0.07	
Vanadium-D	DIS	µg/L	0.001	80	0.747	0.348	0.41	0.27	0.003	3.3	
Zinc-D	DIS	µg/L	1	100	204	35.4	63.2	17.3	0.413	335	10(lt), 55(st)a
Zirconium-D	DIS	µg/L	0.1	100	0.61	0.256	0.61	0.11	0.004	2.4	
Metals Total											
Aluminum	TOT	µg/L	0.5	100	368	24.2	34.9	17.7	0.228	229	
Antimony	TOT	µg/L	0.02	100	0.55	0.235	0.271	0.188	0.002	2.2	
Arsenic	TOT	µg/L	0.02	100	0.778	0.271	0.346	0.209	0.002	2.6	12.5a,c
Barium	TOT	µg/L	0.02	100	27.5	7.27	8.78	5.84	0.057	69	
Cadmium	TOT	µg/L	0.005	100	0.253	0.017	0.032	0.006	0.0002	0.16	0.12b,c
Calcium	TOT	mg/L	0.05	100	36.5	19.4	20.7	17.3	0.135	183,032	
Chromium	TOT	µg/L	0.1	100	11.7	1.96	8.81	0.34	0.058	18	56b,c

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Cobalt	TOT	µg/L	0.01	100	0.87	0.275	0.359	0.235	0.002	2.6	
Copper	TOT	µg/L	0.1	100	80.4	10.1	13.8	5.99	0.090	95	<2(lt), 3(st)a
Iron	TOT	µg/L	1	100	1,240	141	228	109	1.49	1,333	
Lead	TOT	µg/L	0.02	100	2.97	0.361	0.426	0.307	0.003	3.4	<2(lt), 140(st)a
Magnesium	TOT	mg/L	0.25	100	21.7	11.1	13.3	8.96	0.087	105,421	
Manganese	TOT	µg/L	0.05	100	62.6	30.2	42	24.8	0.275	285	100b
Molybdenum	TOT	µg/L	0.05	100	11.7	2.63	9.28	0.786	0.061	25	
Nickel	TOT	µg/L	0.02	100	44.2	7.63	35.5	1.52	0.232	72	8.3b
Phosphorus	TOT	µg/L	2	100	5,120	261	261	261	1.71	2,469	
Potassium	TOT	mg/L	0.05	100	29.1	14.4	16.9	11.7	0.110	135,855	
Selenium	TOT	µg/L	0.04	100	0.570	0.136	0.168	0.109	0.001	1.3	2a
Silver	TOT	µg/L	0.005	100	0.175	0.019	0.027	0.011	0.000	0.18	1.5(lt), 3(st)a
Tin	TOT	µg/L	0.2	100	2.40	0.531	0.68	0.42	0.004	5.0	
Zinc	TOT	µg/L	1	100	160	<0.01	n/d	n/d	n/d	n/d	10(lt), 55(st)a
Organic Compounds											
1,4-Dioxane	TOT	µg/L	0.1	75	0.604	0.215	0.24	0.19	0.002	2.0	
Phenolics											
Total Phenols	TOT	mg/L	0.0015	100	0.0692	0.0033	0.0043	0.0024	0.00003	31	
Polycyclic Aromatic Hydrocarbons											
Low Molecular Weight PAH`s	TOT	µg/L	0.01	75	0.528	0.069	0.16	0.01	0.001	0.65	
Phenanthrene	TOT	µg/L	0.01	75	0.192	0.018	0.026	0.01	0.000	0.17	
Total PAH	TOT	µg/L	0.02	100	0.852	0.082	0.16	0.034	0.001	0.78	
Pesticides											
HIGH RESOLUTION PARAMETERS											
Organics											
1,7-Dimethylxanthine	TOT	ng/L	6.18	100	37800	305	512	42.7	3.346	2.88	
Pentachlorobenzene	TOT	ng/L	0.0223	100	n/m	0.040	0.07	0.025	0.0005	0.0004	
Perfluorobutanoic acid	TOT	ng/L	1.61	80	20.0	19.1	41.8	9.9	0.273	0.181	
1,2-dichlorobenzene	TOT	ng/L	0.223	100	n/m	0.562	0.918	0.299	0.006	0.005	
1,4-dichlorobenzene	TOT	ng/L	0.223	100	n/m	26.0	38.1	17.4	0.249	0.246	
Hexachlorobutadiene	TOT	ng/L	0.0488	100	n/m	0.212	0.49	0.064	0.003	0.002	
Hormones & Sterols											
Estrone	TOT	ng/L	3.28	80	49.7	28.6	77.2	2.84	0.505	0.270	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Nonylphenols											
4-Nonylphenol Diethoxylates	TOT	ng/L	6	100	1304	296	569	18.6	3.72	2.80	
4-Nonylphenol Monoethoxylates	TOT	ng/L	11.1	100	4426	574	921	238	6.02	5.43	
Nonylphenol	TOT	ng/L	8.93	100	1432	66.7	109	9.26	0.712	0.631	
PAH											
1-Methylphenanthrene	TOT	ng/L	0.203	100	8.40	0.861	1.39	0.453	0.009	0.008	
2,3,5-trimethylnaphthalene	TOT	ng/L	0.209	100	14.5	1.98	3.14	0.887	0.021	0.019	
2,6-dimethylnaphthalene	TOT	ng/L	0.371	100	30.8	1.22	2.38	0.735	0.016	0.012	
2-Methylnaphthalene	TOT	ng/L	0.166	100	23.1	3.79	6.87	1.83	0.045	0.036	
Acenaphthene	TOT	ng/L	0.239	100	47.6	10.1	14.8	8.18	0.097	0.095	
Acenaphthylene	TOT	ng/L	0.119	100	1.05	0.539	0.836	0.35	0.005	0.005	
Benzo[a]anthracene	TOT	ng/L	0.0894	100	5.47	0.240	0.368	0.161	0.002	0.002	
Benzo[b]fluoranthene	TOT	ng/L	0.148	80	4.78	0.268	0.524	0.15	0.003	0.003	
Benzo[ghi]perylene	TOT	ng/L	0.113	80	3.54	0.233	0.406	0.136	0.003	0.002	
Chrysene	TOT	ng/L	0.0841	100	8.93	0.593	0.896	0.277	0.006	0.006	
Dibenzothiophene	TOT	ng/L	0.141	100	17.6	1.71	2.72	1.13	0.018	0.016	
Fluoranthene	TOT	ng/L	0.112	100	47.1	6.15	9.76	4.24	0.064	0.058	
Fluorene	TOT	ng/L	0.165	80	27.0	2.77	5.09	0.265	0.033	0.026	
Indeno(1,2,3-C,D)Pyrene	TOT	ng/L	0.132	60	3.89	0.253	0.529	0.122	0.003	0.002	
Naphthalene	TOT	ng/L	0.221	100	72.8	6.52	9.6	4.36	0.063	0.062	
Phenanthrene	TOT	ng/L	0.147	100	143	14.0	19.8	10.1	0.129	0.132	
Pyrene	TOT	ng/L	0.11	100	28.8	3.50	5	2.48	0.033	0.033	
PBDE											
Pbde 100	TOT	pg/L	1.41	100	n/m	245	341	114	2.23	0.002	
Pbde 116	TOT	pg/L	1.41	75	n/m	20.9	66.9	1.69	0.437	0.0002	
Pbde 119/120	TOT	pg/L	1.41	100	n/m	6.91	17.6	1.88	0.115	0.00007	
Pbde 138/166	TOT	pg/L	1.41	100	n/m	11.4	14.8	5.79	0.097	0.0001	
Pbde 140	TOT	pg/L	1.41	100	n/m	3.61	5.17	1.64	0.034	0.00003	
Pbde 15	TOT	pg/L	1.41	75	n/m	1.60	2.29	1.16	0.015	0.00002	
Pbde 153	TOT	pg/L	1.41	100	n/m	106	143	43.2	0.935	0.001	
Pbde 154	TOT	pg/L	1.41	100	n/m	83.3	111	33	0.725	0.001	
Pbde 155	TOT	pg/L	1.41	100	n/m	6.68	8.59	3.71	0.056	0.00006	
Pbde 17/25	TOT	pg/L	1.41	100	n/m	12.7	16.4	8.59	0.107	0.0001	
Pbde 183	TOT	pg/L	1.41	100	n/m	21.3	47.7	6.38	0.312	0.0002	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Pbde 203	TOT	pg/L	3.92	100	n/m	20.3	47.3	6.1	0.309	0.0002	
Pbde 206	TOT	pg/L	34.1	100	n/m	129	233	59.1	1.52	0.001	
Pbde 207	TOT	pg/L	19.6	100	n/m	148	262	68.8	1.71	0.001	
Pbde 208	TOT	pg/L	24.6	100	n/m	104	184	59.4	1.20	0.001	
Pbde 209	TOT	pg/L	428	100	n/m	1888	2730	1340	17.8	0.018	
Pbde 28/33	TOT	pg/L	1.41	100	n/m	26.1	34.3	16	0.224	0.0002	
Pbde 37	TOT	pg/L	1.41	75	n/m	2.78	4.64	1.41	0.030	0.00003	
Pbde 47	TOT	pg/L	1.41	100	n/m	1309	1720	677	11.2	0.012	
Pbde 49	TOT	pg/L	1.41	100	n/m	29.5	40.9	13.9	0.267	0.0003	
Pbde 51	TOT	pg/L	1.41	100	n/m	4.14	6.00	1.99	0.039	0.00004	
Pbde 66	TOT	pg/L	1.41	100	n/m	27.4	36.8	17.6	0.241	0.0003	
Pbde 7	TOT	pg/L	1.41	50	n/m	2.16	2.9	1.28	0.019	0.00002	
Pbde 71	TOT	pg/L	1.41	100	n/m	4.95	8.28	2.9	0.054	0.00005	
Pbde 75	TOT	pg/L	1.41	75	n/m	2.06	2.69	1.34	0.018	0.00002	
Pbde 79	TOT	pg/L	1.41	50	n/m	19.3	41.1	1.35	0.269	0.0002	
Pbde 85	TOT	pg/L	1.41	100	n/m	43.1	63.2	20.5	0.413	0.0004	
Pbde 99	TOT	pg/L	1.41	100	n/m	1167	1600	539	10.458	0.011	
Decachloro Biphenyl	TOT	pg/L	-999	100	n/m	3.50	4.34	2.65	0.028	0.00003	
PCB											
PCB 105	TOT	pg/L	1.08	100	n/m	6.95	8.30	3.21	0.054	0.00007	900a
PCB 107/124	TOT	pg/L	1.29	60	n/m	1.10	1.54	0.821	0.010	0.00001	
PCB 109	TOT	pg/L	1.16	80	n/m	1.39	1.91	0.913	0.012	0.00001	
PCB 11	TOT	pg/L	0.831	100	n/m	68.5	110	35.3	0.719	0.001	
PCB 110/115	TOT	pg/L	1.23	100	n/m	23.9	30.2	12.5	0.197	0.0002	
PCB 114	TOT	pg/L	1.18	60	n/m	1.08	1.46	0.756	0.010	0.00001	
PCB 118	TOT	pg/L	1.45	100	n/m	19.6	24.3	10.8	0.159	0.0002	
PCB 12/13	TOT	pg/L	0.822	80	n/m	3.21	4.19	1.87	0.027	0.00003	
PCB 128/166	TOT	pg/L	1.62	100	n/m	3.54	4.95	1.83	0.032	0.00003	
PCB 129/138/160/163	TOT	pg/L	1.61	100	n/m	25.9	31.2	14.5	0.204	0.0002	
PCB 130	TOT	pg/L	2.1	60	n/m	1.86	2.20	1.26	0.014	0.00002	
PCB 132	TOT	pg/L	1.89	100	n/m	7.23	9.66	3.58	0.063	0.00007	
PCB 135/151/154	TOT	pg/L	0.94	100	n/m	7.30	9.47	4.54	0.062	0.00007	
PCB 136	TOT	pg/L	0.752	80	n/m	2.55	3.80	0.904	0.025	0.00002	
PCB 141	TOT	pg/L	1.76	80	n/m	3.77	6.20	1.96	0.041	0.00004	
PCB 144	TOT	pg/L	1	60	n/m	1.27	1.60	1	0.010	0.00001	
PCB 146	TOT	pg/L	1.58	100	n/m	4.52	6.44	3.03	0.042	0.00004	
PCB 147/149	TOT	pg/L	1.6	100	n/m	15.3	24.2	6.88	0.158	0.0001	
PCB 15	TOT	pg/L	0.851	100	n/m	7.55	9.62	6.11	0.063	0.00007	
PCB 153/168	TOT	pg/L	1.29	100	n/m	22	30.5	13.7	0.199	0.0002	
PCB 155	TOT	pg/L	0.724	80	n/m	2.16	4.08	0.868	0.027	0.00002	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
PCB 156/157	TOT	pg/L	1.61	80	n/m	3.09	4.10	1.94	0.027	0.00003	
PCB 158	TOT	pg/L	1.27	80	n/m	2.42	3.55	1.45	0.023	0.00002	
PCB 16	TOT	pg/L	0.858	100	n/m	7.07	9.50	5.08	0.062	0.00007	
PCB 164	TOT	pg/L	1.42	80	n/m	1.54	2.23	1.02	0.015	0.00001	
PCB 167	TOT	pg/L	1.3	60	n/m	1.34	1.64	1.02	0.011	0.00001	
PCB 17	TOT	pg/L	0.731	100	n/m	5.27	6.87	4.17	0.045	0.00005	
PCB 170	TOT	pg/L	1.13	100	n/m	5.14	7.00	2.73	0.046	0.00005	
PCB 171/173	TOT	pg/L	1.32	60	n/m	1.71	2.86	1.15	0.019	0.00002	
PCB 176	TOT	pg/L	0.891	60	n/m	1.02	1.26	0.675	0.008	0.00001	
PCB 177	TOT	pg/L	1.23	100	n/m	3.19	5.66	1.66	0.037	0.00003	
PCB 178	TOT	pg/L	1.22	80	n/m	1.71	2.09	1.41	0.014	0.00002	
PCB 179	TOT	pg/L	0.875	80	n/m	1.82	2.91	1.05	0.019	0.00002	
PCB 18/30	TOT	pg/L	0.703	100	n/m	11.0	14.5	7.94	0.095	0.0001	
PCB 180/193	TOT	pg/L	0.943	100	n/m	12.6	15.9	7.01	0.104	0.0001	
PCB 183/185	TOT	pg/L	1.15	80	n/m	3.6	5.66	1.37	0.037	0.00003	
PCB 184	TOT	pg/L	0.823	100	n/m	6.16	19.8	1.38	0.129	0.00006	
PCB 187	TOT	pg/L	0.968	100	n/m	7.20	10.7	3.45	0.070	0.00007	
PCB 19	TOT	pg/L	0.778	100	n/m	2.15	3.19	1.08	0.021	0.00002	
PCB 190	TOT	pg/L	1.02	60	n/m	1.18	1.69	0.707	0.011	0.00001	
PCB 194	TOT	pg/L	0.731	80	n/m	3.64	5.55	1.93	0.036	0.00003	
PCB 195	TOT	pg/L	0.808	60	n/m	1.32	2.15	0.707	0.014	0.00001	
PCB 196	TOT	pg/L	0.703	80	n/m	1.49	3.13	0.843	0.020	0.00001	
PCB 198/199	TOT	pg/L	0.703	80	n/m	3.98	7.88	1.54	0.052	0.00004	
PCB 2	TOT	pg/L	0.703	100	n/m	4.96	8.11	3.19	0.053	0.00005	
PCB 20/28	TOT	pg/L	0.768	100	n/m	18.8	25.5	11.3	0.167	0.0002	
PCB 202	TOT	pg/L	0.703	60	n/m	1.14	1.64	0.676	0.011	0.00001	
PCB 203	TOT	pg/L	0.703	80	n/m	2.27	3.8	1.53	0.025	0.00002	
PCB 206	TOT	pg/L	0.887	80	n/m	4.07	10.6	1.98	0.069	0.00004	
PCB 208	TOT	pg/L	0.703	60	n/m	2.37	5.44	0.703	0.036	0.00002	
PCB 209	TOT	pg/L	0.703	80	n/m	4.95	10.1	1.53	0.066	0.00005	
PCB 21/33	TOT	pg/L	0.803	100	n/m	10.5	14.9	6.25	0.097	0.0001	
PCB 22	TOT	pg/L	0.8	100	n/m	7.41	10.7	4.37	0.070	0.00007	
PCB 25	TOT	pg/L	0.731	80	n/m	1.64	2.01	1.05	0.013	0.00002	
PCB 26/29	TOT	pg/L	0.785	100	n/m	3.66	5.32	2.63	0.035	0.00003	
PCB 27	TOT	pg/L	0.703	80	n/m	1.19	1.53	0.887	0.010	0.00001	
PCB 3	TOT	pg/L	0.703	100	n/m	6.48	8.39	3.14	0.055	0.00006	
PCB 31	TOT	pg/L	0.745	100	n/m	17.3	22.7	9.74	0.148	0.0002	
PCB 32	TOT	pg/L	0.771	100	n/m	4.15	5.36	2.36	0.035	0.00004	
PCB 35	TOT	pg/L	0.829	80	n/m	1.92	2.68	1.28	0.018	0.00002	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
PCB 37	TOT	pg/L	0.804	100	n/m	5.07	6.4	2.61	0.042	0.00005	
PCB 4	TOT	pg/L	1.29	80	n/m	5.69	6.3	4.85	0.041	0.00005	
PCB 40/41/71	TOT	pg/L	0.913	100	n/m	8.16	10.4	3.04	0.068	0.00008	
PCB 42	TOT	pg/L	1.06	80	n/m	3.97	5.49	1.79	0.036	0.00004	
PCB 44/47/65	TOT	pg/L	0.849	100	n/m	40.4	88.8	12.8	0.580	0.0004	
PCB 48	TOT	pg/L	0.896	80	n/m	2.89	4.16	1.69	0.027	0.00003	
PCB 49/69	TOT	pg/L	0.827	100	n/m	9.84	12.5	5.03	0.082	0.00009	
PCB 5	TOT	pg/L	0.809	80	n/m	1.71	3.79	0.836	0.025	0.00002	
PCB 50/53	TOT	pg/L	0.888	100	n/m	2.57	3.64	2.07	0.024	0.00002	
PCB 52	TOT	pg/L	0.871	100	n/m	23.9	31.2	13	0.204	0.0002	
PCB 56	TOT	pg/L	0.703	100	n/m	5.54	6.83	2.72	0.045	0.00005	
PCB 59/62/75	TOT	pg/L	0.703	80	n/m	1.45	1.67	1.25	0.011	0.00001	
PCB 6	TOT	pg/L	0.794	100	n/m	3.99	5.51	2.81	0.036	0.00004	
PCB 60	TOT	pg/L	0.703	80	n/m	3.39	4.01	1.66	0.026	0.00003	
PCB 61/70/74/76	TOT	pg/L	0.703	100	n/m	25.9	35.9	11	0.235	0.0002	
PCB 64	TOT	pg/L	0.721	100	n/m	7.49	9.28	4.61	0.061	0.00007	
PCB 66	TOT	pg/L	0.703	100	n/m	10.7	14.4	4.42	0.094	0.0001	
PCB 68	TOT	pg/L	0.703	80	n/m	4.69	14.3	1.42	0.093	0.00004	
PCB 7	TOT	pg/L	0.761	80	n/m	2.63	4.43	0.901	0.029	0.00002	
PCB 77	TOT	pg/L	0.703	80	n/m	1.48	1.63	1.33	0.011	0.00001	
PCB 8	TOT	pg/L	0.751	100	n/m	10.1	12.7	7.16	0.083	0.0001	
PCB 82	TOT	pg/L	1.93	80	n/m	2.92	3.6	2.05	0.024	0.00003	
PCB 83/99	TOT	pg/L	1.64	100	n/m	12.9	16.8	8.16	0.110	0.0001	
PCB 84	TOT	pg/L	1.87	80	n/m	5.84	7.78	2.65	0.051	0.00006	
PCB 85/116/117	TOT	pg/L	1.42	100	n/m	4.10	5.18	2.28	0.034	0.00004	
PCB 86/87/97/108/119/125	TOT	pg/L	1.48	100	n/m	17.4	21.2	9.45	0.139	0.0002	
PCB 88/91	TOT	pg/L	1.68	80	n/m	3.16	4.08	2.21	0.027	0.00003	
PCB 9	TOT	pg/L	0.768	60	n/m	1.55	3.55	0.768	0.023	0.00001	
PCB 90/101/113	TOT	pg/L	1.41	100	n/m	24.0	29	12.3	0.190	0.0002	
PCB 92	TOT	pg/L	1.67	100	n/m	4.54	5.6	2.64	0.037	0.00004	
PCB 93/95/98/100/102	TOT	pg/L	1.66	100	n/m	21.4	27.3	10.7	0.178	0.0002	
PCB174	TOT	pg/L	1.11	100	n/m	4.17	6.19	2.6	0.040	0.000039	
PCB45/51	TOT	pg/L	0.928	100	n/m	5.93	10.5	2.7	0.069	0.00006	
Dichloro Biphenyls	TOT	pg/L	variable	100	n/m	93.8	145	35.3	0.948	0.0009	
Heptachloro Biphenyls	TOT	pg/L	variable	80	n/m	41	51.6	15.3	0.337	0.0004	
Hexachloro biphenyls	TOT	pg/L	variable	100	n/m	21.8	21.8	21.8	0.142	0.0002	
Monochloro Biphenyls	TOT	pg/L	variable	100	n/m	23.9	44.8	9.82	0.293	0.0002	
Nonachloro Biphenyls	TOT	pg/L	variable	100	n/m	6.68	16	1.98	0.105	0.00006	
Octachloro Biphenyls	TOT	pg/L	variable	100	n/m	7.43	16.1	2.68	0.105	0.00007	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Pentachloro Biphenyls	TOT	pg/L	variable	100	n/m	131	164	26.2	1.07	0.001	
Tetrachloro Biphenyls	TOT	pg/L	variable	100	n/m	135	188	53.6	1.23	0.001	
Trichloro Biphenyls	TOT	pg/L	variable	100	n/m	77.6	120	45.1	0.784	0.0007	
PCB Teq 3	TOT	pg/L	variable	100	0.224	0.032	0.123	0.003	0.001	0.0000003	
PCB Teq 4	TOT	pg/L	variable	100	1.09	0.927	0.976	0.876	0.006	0.00001	
PCBs Total	TOT	pg/L	variable	100	n/m	589	781	192	5.10	0.0056	100a
PCDD											
1,2,3,4,6,7,8-HPCDD	TOT	pg/L	0.557	100	14.6	1.08	1.52	0.59	0.010	0.00001	
HEPTA-DIOXINS	TOT	pg/L	variable	80	22.1	1.45	2.33	0.531	0.015	0.00001	
OCDD	TOT	pg/L	0.557	100	81.4	4.99	8.35	2.72	0.055	0.00005	
OCDF	TOT	pg/L	0.557	60	3.00	0.858	1.5	0.531	0.010	0.00001	
Pesticides											
2,4-DDD	TOT	ng/L	0.0453	100	n/m	2.31	4.16	0.579	0.027	0.022	
4,4-DDE	TOT	ng/L	0.0447	75	n/m	0.078	0.096	0.056	0.001	0.001	
ABHC	TOT	ng/L	0.0583	50	n/m	0.057	0.063	0.046	0.0004	0.001	
Alpha-Endosulfan	TOT	ng/L	0.152	50	n/m	0.178	0.243	0.106	0.002	0.002	
Beta-Endosulfan	TOT	ng/L	0.244	100	n/m	0.392	0.497	0.322	0.003	0.004	1.6b
Beta-Hch Or Beta-Bhc	TOT	ng/L	0.117	50	n/m	0.085	0.117	0.056	0.001	0.001	
Dieldrin	TOT	ng/L	0.112	75	n/m	0.173	0.266	0.106	0.002	0.002	
HCH, Gamma	TOT	ng/L	0.0712	100	n/m	0.096	0.109	0.081	0.001	0.001	
Hexachlorobenzene	TOT	ng/L	0.0223	100	n/m	0.047	0.063	0.033	0.0004	0.0004	
Methoxyclor	TOT	ng/L	0.223	0	n/m	n/d	n/d	n/d	n/d	n/d	
Mirex	TOT	ng/L	0.0447	0	n/m	n/d	n/d	n/d	n/d	n/d	
Octachlorostyrene	TOT	ng/L	0.0447	25	n/m	0.027	0.045	0.009	0.0003	0.0003	
Oxychlordane	TOT	ng/L	0.0447	25	n/m	0.048	0.062	0.042	0.0004	0.0005	
PFOS											
6:2 FTS	TOT	ng/L	1.45	50	7.03	5.26	11.5	1.42	0.075	0.050	
MeFOSAA	TOT	ng/L	0.403	50	1.76	1.82	3.19	1.32	0.021	0.017	
PFBS	TOT	ng/L	0.403	100	3.18	2.94	4.1	1.54	0.027	0.028	
PFDA	TOT	ng/L	0.403	60	1.62	1.44	3.19	0.786	0.021	0.014	
PFHpA	TOT	ng/L	0.403	80	3.78	2.75	3.48	1.71	0.023	0.026	
PFHxA	TOT	ng/L	0.403	100	8.83	9.92	11.6	8	0.076	0.094	
PFHxS	TOT	ng/L	0.403	100	3.85	3.76	4.42	3.09	0.029	0.036	
PFNA	TOT	ng/L	0.403	60	1.89	1.34	3.19	0.631	0.021	0.013	
PFOA	TOT	ng/L	0.403	100	3.62	5.00	5.89	4.04	0.038	0.047	
PFOS	TOT	ng/L	0.403	100	5.93	3.39	4.23	2.32	0.028	0.032	
PFPeA	TOT	ng/L	0.806	100	11.2	12.5	22	6.66	0.144	0.118	
PPCP											
2-Hydroxy-Ibuprofen	TOT	ng/L	4.61	100	34960	2859	10500	364	68.6	27.0	

Table 3.4, continued

Parameter	State	Units	Detection Limit	Freq (%)	Influent Concentration (avg)	Effluent Concentration (avg)	Max	Min	Max diluted (153)	Average Eff Load kg/year	WQG
Acetaminophen	TOT	ng/L	3.09	100	192200	220	784	3.75	5.12	2.08	
Androstenedione	TOT	ng/L	1.03	80	212	5.64	9.14	1.68	0.060	0.053	
Azithromycin	TOT	ng/L	1.55	100	274	309	590	152	3.86	2.93	
Bisphenol A	TOT	ng/L	8.85	100	142	105	218	50.2	1.42	0.994	900b
Caffeine	TOT	ng/L	6.18	100	104680	351	678	11.1	4.43	3.32	
Carbamazepine	TOT	ng/L	0.309	100	479	487	580	410	3.79	4.61	
Ciprofloxacin	TOT	ng/L	1.55	100	433	217	254	136	1.66	2.05	
Clarithromycin	TOT	ng/L	0.309	100	132	128	165	107	1.08	1.21	
Dehydronifedipine	TOT	ng/L	0.309	100	3.38	11.0	17.3	8.14	0.113	0.104	
Diltiazem	TOT	ng/L	0.773	100	459	387	498	318	3.25	3.66	
Diphenhydramine	TOT	ng/L	0.618	100	1148	665	1020	283	6.67	6.29	
Enrofloxacin	TOT	ng/L	0.618	60	3.66	1.37	2.66	0.648	0.017	0.013	
Erythromycin-H2O	TOT	ng/L	1.55	80	10.4	14.3	35.7	1.57	0.233	0.135	
Fluoxetine	TOT	ng/L	0.155	100	41.8	26.3	36.4	12.4	0.238	0.248	
Furosemide	TOT	ng/L	4.12	100	1224	594	1310	124	8.56	5.62	
Gemfibrozil	TOT	ng/L	0.824	100	40.1	32.4	65.7	5.85	0.429	0.306	
Glyburide	TOT	ng/L	0.824	100	3.52	2.51	3.12	2.03	0.020	0.024	
Hydrochlorothiazide	TOT	ng/L	4.59	100	2172	1920	2310	1710	15.1	18.2	
Ibuprofen	TOT	ng/L	4.12	100	14380	624	2540	86.3	16.6	5.90	
Miconazole	TOT	ng/L	0.309	100	7.74	1.16	2.08	0.613	0.014	0.011	
Naproxen	TOT	ng/L	2.06	100	9604	568	1440	110	9.41	5.37	
Ofloxacin	TOT	ng/L	0.618	100	53.4	20.9	35.4	10.4	0.231	0.198	
Sulfamethoxazole	TOT	ng/L	0.618	100	1537	344	473	284	3.09	3.26	
Sulfanilamide	TOT	ng/L	6.18	100	107	113	145	85.5	0.948	1.07	
Thiabendazole	TOT	ng/L	0.309	100	24.7	24.9	32.3	19.9	0.211	0.235	
Triclocarban	TOT	ng/L	0.412	60	1.83	0.562	0.813	0.412	0.005	0.005	
Triclosan	TOT	ng/L	6.18	100	32.0	13.7	16.1	9.9	0.105	0.130	
Trimethoprim	TOT	ng/L	0.309	100	439	335	403	228	2.63	3.17	
Tylosin	TOT	ng/L	0.618	100	8.56	6.59	11.3	1.86	0.074	0.062	
Warfarin	TOT	ng/L	0.412	100	14.2	16.4	68.1	1.78	0.445	0.155	

Notes:

[1] As determined by Hayco (2005); n/a=not applicable; ND=not detected; --- parameter does not lend itself to calculating loading, e.g., pH.

a=BC Approved Water Quality Guideline; b=BC Working Water Quality Guideline; c=CCME Water Quality Guideline for the protection of Aquatic Life; d=Health Canada Guidelines for Recreational Water Quality; lt=long term; st=short term.

*Concentrations are incorporated into compliance monitoring mean values presented in Table 3.2 and Table 3.3. ^loadings for NH_3 and TSS were calculated using available daily/weekly data rather than quarterly data only, in order to increase accuracy.

Shaded cells indicate an exceedance of one or more WQG. Note that this table does not include the results of the compliance and treatment plant performance monitoring, as discussed in Section 3.3.1 and presented in Table 3.2.

Table 3.5 2023 Acute Toxicity Results

Wastewater Concentration	Rainbow trout LC50 96-hour (Onchorhynchus mykiss)				Daphnia magna LC50 48-hour			
%v/v	mortality # (96-hr)				mortality # (48-hr)			
	Jan	Apr	Aug	Oct	Jan	Apr	Aug	Oct
0	0	0	0	0	0	0	0	0
6.25	0	0	0	0	0	0	0	0
12.5	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0

Table 3.6 2023 Chronic Toxicity Results

Test	Endpoint (%v/v)	
	EC50 or LC50	EC25 or LC25
Rainbow trout (*Onchorhynchus mykiss*) embryo/alevin test		
• embryo survival	>100	51.5
• embryo viability	>100	58.8
7-day Topsmelt (*Atherinops affinis*) survival and growth test		
• survival	>100	---
• growth	>100	>100
6-day *Ceriodaphnia* test		
• survival	>100	---
• reproduction	>100	68.2
Echinoid fertilization (*Strongylocentrotus purpuratus*)	>100	>100

Notes:
EC50 = Concentration that causes an observable effect in 50% of the test organisms.
EC25 = Concentration that causes an observable effect in 25% of the test organisms.
LC25 = Lethal Concentration to 25% of organisms in the test duration.
LC50 = Lethal Concentration to 50% of organisms in the test duration.
v/v = volume per volume
-- Not tested

4.0 BIOSOLIDS MONITORING

4.1 Introduction

In the SPTP LWMP, the CRD and its partner municipalities on the Saanich Peninsula made a commitment to implement a biosolids management plan, based on the following specific commitments:

- Pursue an effective and diversified program for the beneficial use of Class A biosolids that incorporates an economically viable and long-term solution.
- Mitigate nuisances associated with the production and application of biosolids, including odour, noise, truck traffic and dust.
- Manage biosolids to ensure that detrimental effects to public health and the environment are avoided.

The SPTP can produce Class A biosolids, in accordance with the pathogen reduction and vector attraction reduction processes in the ENV (BC MoE, 2002) *Organic Matter Recycling Regulations* (BC OMRR). These regulations define process and quality criteria for biosolids production and establish land application and distribution requirements. The regulations are set to protect human and environmental health.

In 2008, the CRD developed the PenGrow program to produce a soil enhancer product from the Class A biosolids. Biosolids were an end product of the sewage treatment process and were produced when solids (i.e., sludge) were treated. The product was cured and stored at the CRD's Hartland Landfill and the PenGrow program was intermittently in production until early 2011.

In July 2011, the PenGrow program was put on hold following CRD Board motions that ended "the production, storage and distribution of biosolids for land application at all CRD facilities and parks", including Hartland Landfill, and indicated the region "does not support the application of biosolids on farmland in the CRD under any circumstances." These restrictions were subsequently relaxed slightly to allow for out of region non-agricultural land application in the short term. CRD staff are currently investigating longer-term beneficial use options for the biosolids and sludge. A long-term management strategy is expected by June 2024. Until markets for the biosolids can be developed and implemented, all sludge will be disposed of as controlled waste at the Hartland Landfill. The SPTP disposed of 3,723 tonnes of sludge in 2023.

Starting in 2013, the CRD commenced monitoring the sludge to help inform the RSCP on the partitioning behaviour of some wastewater contaminants between the solid and liquid phases of the treatment processes. Metals were of primary interest, as they fall under the RSCP's regulatory regime.

4.2 Methods

Sludge was produced at the SPTP and analyzed on a monthly basis for similar parameters as previous years (Table 4.1).

4.3 Results and Discussion

In 2023, 34 parameters were monitored in the SPTP sludge. For those parameters that are BC OMRR regulated, all results were far below the Class A biosolids limit (Table 4.1), similar to previous years.

4.4 Overall Assessment

No biosolids were produced at the SPTP in 2023. It is unknown if or when production will recommence. However, the sludge monitoring data collected to inform the CRD's RSCP showed that all OMRR regulated parameters continue to be far below Class A biosolids limits. The sludge will continue to be disposed of as controlled waste at the Hartland Landfill until their long-term use is determined.

Table 4.1 SPTP Sludge Monitoring, 2023

Parameter	Units	Class A Biosolids Limit (mg/kg)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Regulated Parameters															
Arsenic	mg/kg dry	75	1.00	1.06	0.84	0.99	0.77	0.72	0.71	0.65	0.62	1.80	1.07	1.05	0.94
Cadmium	mg/kg dry	20	0.65	0.71	0.63	1.46	1.09	0.72	0.58	0.59	0.58	0.60	0.75	0.83	0.77
Chromium	mg/kg dry	1,060	7.71	7.09	6.16	6.13	4.16	6.63	5.75	6.4	9.14	12.4	9.06	11.8	7.70
Cobalt	mg/kg dry	151	1.25	1.33	1.05	1.06	0.93	0.87	0.91	0.99	0.86	3.51	1.51	1.46	1.3
Copper	mg/kg dry	757	195	183	152	175	147	164	176	193	171	138	155	160	167
Lead	mg/kg dry	505	7.22	7.72	8.12	6.89	7.22	6.93	6.31	8.79	6.76	7.18	8.08	7.95	7.43
Mercury	mg/kg dry	5	0.19	0.63	0.28	0.31	0.32	0.24	0.32	0.31	0.29	0.20	0.24	0.21	0.29
Molybdenum	mg/kg dry	20	3.52	3.52	3.01	3.56	2.95	2.83	2.82	2.91	2.89	2.54	2.80	3.25	3.05
Nickel	mg/kg dry	181	8.11	5.97	5.06	4.62	3.98	4.86	4.35	4.23	4.52	10.8	7.15	8.83	6.04
Selenium	mg/kg dry	14	2.13	2.10	1.77	1.87	1.75	1.71	2.17	2.00	1.56	1.33	1.72	1.91	1.84
Thallium	mg/kg dry	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vanadium	mg/kg dry	656	5.50	5.80	4.30	4.60	3.00	2.00	2.00	2.40	2.10	17.10	6.40	7.40	5.22
Zinc	mg/kg dry	1,868	253	253	224	244	271	325	332	359	313	276	287	272	284
Unregulated Parameters															
Moisture	%	n/a	77.0	74.0	75.0	79.0	78.0	77.0	74.0	71.0	72.0	68.0	68.0	65.0	73.2
Aluminum	mg/kg dry	n/a	1,930	1,890	1,210	1,370	876	768	681	826	717	5,090	1,940	2,260	1,630
Antimony	mg/kg dry	n/a	0.78	0.76	1.17	0.69	0.71	0.72	0.67	0.71	0.76	0.55	0.69	0.68	0.7
Barium	mg/kg dry	n/a	39.7	48.3	42.5	47.4	38.4	46.7	32.5	34.7	31.9	42.2	44.3	49.3	41.5
Beryllium	mg/kg dry	n/a	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bismuth	mg/kg dry	n/a	16.3	14.7	12.8	14.1	13.8	12.4	14.4	16	14.2	12.2	11.6	13.9	13.9
Boron	mg/kg dry	n/a	9.4	12	12.2	16	12.9	7.1	6.8	7.4	6.6	4.9	6	8.3	9.1
Calcium	mg/kg dry	n/a	5,260	6,670	5,590	5,850	5,940	5,020	4,370	4,810	4,100	6,150	5,050	5,680	5,374
Iron	mg/kg dry	n/a	3,040	3,450	2,720	3,410	2,450	1,950	1,770	2,080	1,820	8,190	4,250	4,170	3,275
Lithium	mg/kg dry	n/a	0.85	0.84	0.63	0.51	<0.5	<0.5	<0.5	<0.5	<0.5	3.94	0.88	1.22	1.3
Magnesium	mg/kg dry	n/a	3,470	3,210	2,530	3,160	3,950	4,460	4,440	3,620	4,070	5,290	3,520	2,640	3,697
Manganese	mg/kg dry	n/a	53.6	58.5	43.4	49.9	35.7	31.3	29.1	31.5	28.9	129	54.8	56.7	50.2
Phosphorus	mg/kg dry	n/a	---	---	---	---	---	---	---	---	---	---	12,700	9,640	11,170
Potassium	mg/kg dry	n/a	5,070	4,700	3,480	4,050	5,370	5,740	6,330	4,640	5,010	4,280	3,690	2,690	4,588
Silver	mg/kg dry	n/a	0.89	1.13	0.81	0.96	1.21	0.88	0.97	1.00	1.11	0.72	1.08	0.72	0.96
Sodium	mg/kg dry	n/a	565	493	437	586	616	756	687	567	414	397	330	323	514
Strontium	mg/kg dry	n/a	22.5	24.0	22.1	23.2	20.6	20.4	16.8	16.5	14.2	25.9	18.3	22.2	20.6

Table 4.1, continued

Parameter	Units	Class A Biosolids Limit (mg/kg)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Tin	mg/kg dry	n/a	10.3	9.7	7.7	9.0	8.3	7.9	7.8	8.4	7.9	6.7	7.9	7.3	8.2
Titanium	mg/kg dry	n/a	36.7	40.6	23.1	25	17.2	14.7	20.9	16.5	14.7	55.7	43.1	27.2	28.0
Zirconium	mg/kg dry	n/a	1.54	2.37	2.08	3.11	3.88	0.81	1.72	1.13	1.04	<0.5	0.77	<0.5	1.8
WAD Cyanide	mg/kg dry	n/a	0.3	0.11	0.085	0.11	0.096	0.095	0.068	0.063	0.089	0.13	0.094	0.0001	0.10

Notes:
*From Organic Matter Recycling Regulation (B.C. Reg. 18/2002, Schedule 4 Section 3, February 28, 2019), which references Trade Memorandum T-4-93 'Safety Guidelines for Fertilizers and Supplements' (Sept 1997) and contains maximum acceptable metal concentrations based on annual application rates (mg metal/kg product) 4,400 kg/ha – yr.
--- Indicates data not available / sample not collected.

5.0 RECEIVING ENVIRONMENT MONITORING

Receiving environment monitoring is undertaken to assess human health and environmental impacts of the SPTP outfall. In addition, the results are used to verify the environmental concentrations of parameters that are predicted using wastewater concentration data and the 1:153 minimum initial dilution factor determined during the 2004 dye study (Hayco, 2005) (discussed in Section 3.0).

5.1 Introduction

The CRD conducts receiving environment monitoring adjacent to the SPTP wastewater discharge to assess the potential for human health risk for those participating in recreational activities (e.g., swimmers, kayakers) at the surface near the outfall (see Appendix C1 for site coordinates). In addition, monitoring data are used to assess potential risks to shellfish harvesting in the vicinity of the SPTP outfall, although there is no commitment in the LWMP to meet this standard outside of shellfish growing areas. Finally, surface waters are monitored to ensure that the outfall diffuser is functioning as expected and a minimum initial dilution of 153:1 is being achieved.

A review of the SPTP WMEP was conducted in 2011/2012, in partnership with ENV, including the surface water component. As a result of the review, the surface water sampling program was revised. Beginning in 2013, the fecal coliform sampling was switched from monthly to twice yearly, 5-in-30 sampling (Table 2.1) in order to align more closely with the ENV fecal coliform guideline, based on the geometric mean of 5 samples collected in 30 days not exceeding 200 CFU/100 mL. In addition, enterococci were analysed along with fecal coliforms, as they are a more persistent tracer of human waste in the marine environment, with a more direct correlation with adverse human health impacts. Metal and conventional parameter concentrations were also added as extended analyses to the surface water monitoring program (Appendix C2) to confirm environmental concentrations that were previously only predicted by using wastewater data (Section 3.0) and applied minimum initial dilution factors.

5.2 Methods

The CRD sampling technicians sampled surface waters and the water column over two sampling periods (“winter”, i.e., January/February 2023 and “summer”, i.e., June/July 2023) using a 5 m research vessel positioned by global positioning system.

Each sampling period consisted of five individual sampling days occurring over a 30-day period (“5-in-30”). Nineteen stations at different distances from the outfall terminus were sampled. Sampling stations consisted of 14 outfall stations, one reference station located near Sidney Island, and four variable stations located at the edge of the IDZ (Figure 5.1). Station codes describe the distance from the outfall terminus in metres with compass direction (i.e., 100N = 100 m north of the outfall). The variable IDZ stations were selected at the time of sampling based on a computer model prediction (Lorax, 2023) of what depth and direction the effluent plume would most likely be trapped due to tides, current flow and direction. See Appendix C1 for a list of stations and coordinates.

Surface samples were collected at a depth of 1 m using a sampling pole. Sterile wide-mouth bottles were placed in the pole holder with the lid removed, submerged to collection depth, brought to the surface, and then excess water poured off before the lid was screwed on tightly.

IDZ samples and reference station samples were collected at three depths for each station: “top” (1 m below the surface), “middle” (calculated trapping depth from the computer model prediction), and “bottom” (1 m above the seafloor). An open, set, horizontal Van Dorn sampling bottle was deployed to the appropriate depth and closed using a weighted messenger. The bottle was then pulled back to the surface and decanted into the required sample containers. All samples were stored in coolers with ice until delivery to the analytical laboratory.

Surface water samples were analyzed by Bureau Veritas Laboratories Inc. (Burnaby, BC) for various parameters, depending on the sampling site and the sampling day. A larger list of parameters, including

metals, was analyzed on a single day of each five-day sampling series and results compared to applicable BC WQG. See Appendix A for the list of surface water parameters and the analytical frequency for each.

Bacteriology results were averaged as geometric means and compared to the provincial and federal enterococci guidelines of 35 CFU/100 mL and to the single sample maximum of 70 CFU/100 mL (BCMoE&CCS, 2019, Health Canada, 2012). In addition, results were compared to Canadian Shellfish Sanitation Program (CSSP) guidelines for shellfish harvesting, which require that the geomean of fecal coliform results not exceed 14 CFU/100 mL and not more than 10% of the samples exceed 43 CFU/100 mL (CSSP, 2019).

IDZ samples were analysed for parameters that reflect the suite of nutrients in the SPTP Wastewater Monitoring Program. Both programs monitor ammonia, total Kjeldahl nitrogen (TKN), nitrate, nitrite, total phosphorus, conductivity, pH, salinity, and total organic carbon. While some parameters may not be relevant in the marine receiving environment (e.g., ammonia is measured in wastewater, but is primarily found in the ammonium form in marine waters), they are still monitored to allow for direct comparison of the two sets of results. This suite of nutrients has also been monitored since before the SPTP commenced discharging into Bazan Bay, as part of the pre-discharge monitoring program.

CRD - Parks & Environmental Services - Sep 30, 2014 - Technologist: SR - Map Document: SaanPenSurfaceSampleLocations2013.mxd

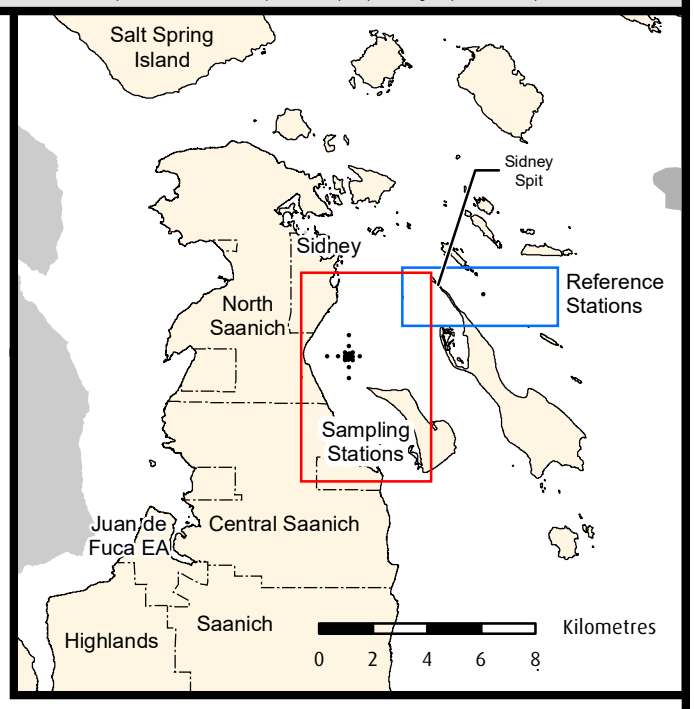
Figure 5.1 - Saanich Peninsula Treatment Plant Outfall Sampling and Reference Locations

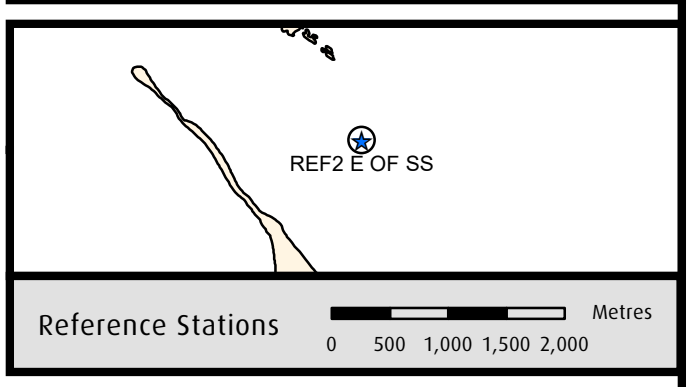
Sampling Stations (fecal coliform)
Reference Stations (fecal coiform)
Denotes station where seafloor was sampled and sea surface was sampled for nutrients
Outfall Pipe
Diffuser
Municipal Boundaries
Initial dilution zone (100 meters from diffuser)
Area Defined as Bazan Bay for Nitrate Calculations (see Section 5.2.3)

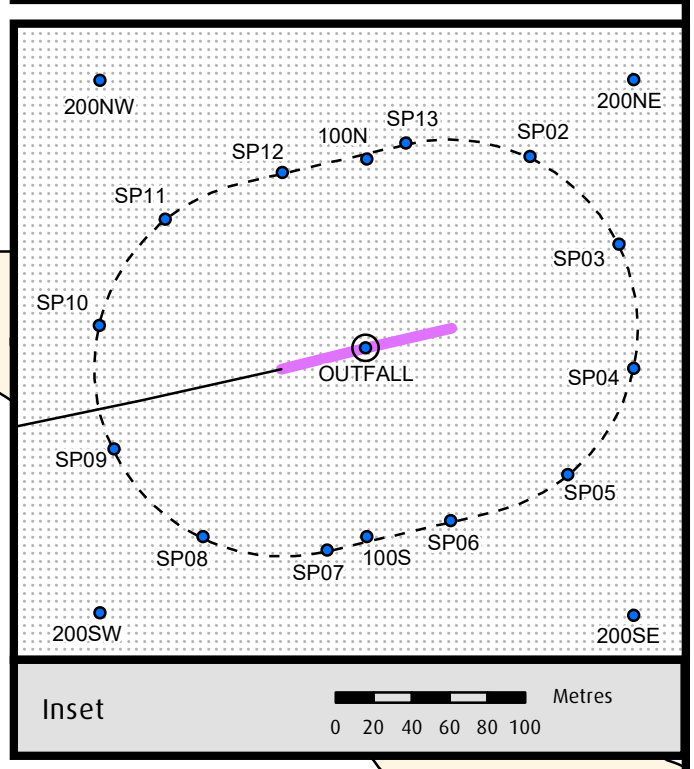
Metres
0 200 400 600 800

Projection: UTM ZONE 10N NAD 83

Sidney
Bazan Bay
North Saanich
Central Saanich
Tsawout First Nation
James Island
800N
400N
800W
400W
400E
400S
800S
See Inset







N
W E
S

Making a difference...together

5.3 Results and Discussion

Bacteriology

Results show that all stations had very low concentrations of fecal coliforms and enterococci for both the summer and winter 5-in-30 sampling programs (Figure 5.2, Table 5.1, Table 5.2, Table 5.3 and Table 5.4). Figure 5.2 utilizes the maximum value detected for each sampling depth on each sampling event for the calculated geomeans. No single sample or geomean was over the respective human recreation or shellfish harvesting guidelines at the surface water (1 m depth) stations throughout the water column, with a maximum geomean of 3 CFU/100 mL recorded for fecal coliforms and 2 CFU/100mL for enterococci (Table 5.1 and Table 5.2). The IDZ stations had a maximum geomean of 2 CFU/100 mL for fecal coliform and 1 CFU/100 mL for enterococci (Table 5.3 and Table 5.4).

All surface water fecal coliform concentrations were well below the conservatively predicted environmental concentration of 418 CFU/100 mL, after the minimal initial dilution (1:153) (Hayco, 2005) was applied to the maximum effluent fecal coliform concentration of 64,000 CFU/100 mL (Table 3.4). Similar observations were made for enterococci, where surface water results were well below the 92 CFU/100 mL that was predicted using the maximum effluent enterococci concentration of 14,000 CFU/100 mL and the 153:1 dilution factor.

These results are generally consistent with previous years and previous studies (CRD, 2002-2023), including Island Health's summer beach sampling program that involves monitoring the nearshore environment in Bazan Bay, targeting beaches that are most commonly used for recreation.

Overall, the bacteriological sampling results, and previous dye study results (Hayco, 2005), indicate that the plume was predominantly trapped below the surface and that adverse health effects from recreational primary contact activities or the consumption of shellfish are not likely. There were no enterococci or fecal coliform geomean results or single sample results that exceeded the BC or Health Canada guidelines for the protection of human health, or the CSSP guidelines for shellfish harvesting. The values in Figure 5.2 use the maximum concentrations for each sampling day and depth to build a "worst case" scenario, (e.g., a geomean of 3 CFU/100mL) for summer middle depth fecal coliform.

As a conservative measure by the federal government, an area of approximately 17.65 km^2 around the outfall is closed for shellfish harvesting, as a standard Fisheries and Oceans Canada procedure near industrial and sanitary wastewater outfalls. Shellfish closures have a minimum radius around an outfall of 300 m, but closure areas are usually larger near bigger urban centres, such as for the SPTP outfall, where there are other potential sources of bacterial contamination (e.g., stormwater discharges, marinas, septic systems, sewage pumps), in addition to the wastewater outfall.

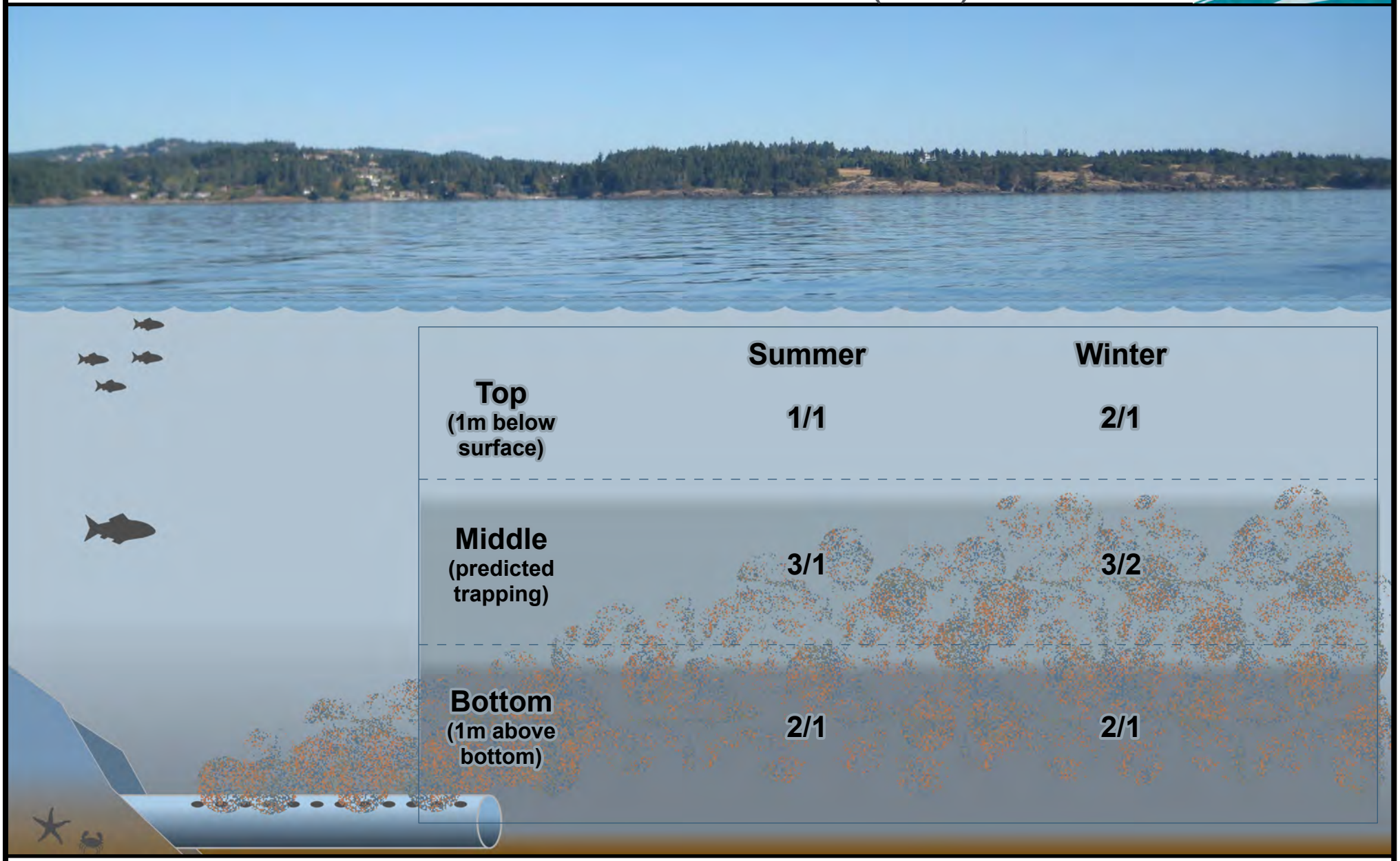
Metals

The extended suite of metals was analyzed at the four IDZ sites and a reference site on one day of sampling for each round of 5-in-30 sampling. Results are detailed in Appendix C2. For those parameters that were detected and had relevant BC and CCME WQG, only boron and nickel had WQG exceedances. Boron exceeded WQG at every station and every sampling event, including the reference station. This is a common occurrence, as the natural concentrations of boron are above WQG in the Salish Sea. ENV is working on updating the boron guideline. Nickel exceeded guidelines at two surface level IDZ stations, which has not been observed in previous years. Nickel will be assessed again in 2024 to see if this was an anomaly or the beginning of a trend.

Making a difference...together

Figure 5.2 - Saanich Peninsula Waste Water Treatment Plant Water Column Sampling

Fecal Coliform and Enterococci Results (5 in 30)



Fecal Coliform — **10/41** — Enterococci

Saanich Peninsula Waste Water Treatment Plant IDZ station geometric means of fecal coliform and enterococci counts CFU/100mL (maximum concentrations).

Notes:

Each value is the geometric mean of each maximum value detected at each sampling event (i.e. n=5)
Sampled 5 times in 30 days during each season.
Geometric mean count shown in red if fecal count exceeds 200 CFU/100mL or enterococci count exceeds 20 CFU/100mL.

Table 5.1 SPTP Surface Sites 5 Sampling Events in 30 Days Fecal Coliform 2023

Station		Winter Fecal coliforms (CFU/100mL)						Summer Fecal coliforms (CFU/100mL)					
		1	2	3	4	5	Geomean	1	2	3	4	5	Geomean
Outfall Sites	Outfall	1	2	46	11	<1	3	<1	<1	<1	<1	---	1
	100N	2	3	1	5	<1	2	<1	<1	3	<1	---	1
	100S	<1	5	1	<1	<1	1	<1	<1	1	<1	---	1
	200NE	2	9	<1	<1	<1	1	<1	<1	<1	1	---	1
	200NW	<1	6	<1	<1	<1	1	1	<1	<1	<1	---	1
	200SE	<1	3	1	<1	<1	1	<1	<1	1	<1	---	1
	200SW	3	<1	<1	<1	<1	1	<1	<1	<1	1	---	1
	400E	31	3	<1	<1	<1	2	<1	<1	3	<1	---	1
	400N	1	5	5	<1	<1	1	<1	<1	<1	<1	---	1
	400S	1	3	1	<1	<1	1	3	<1	<1	1	---	1
	400W	3	4	<1	<1	<1	1	<1	<1	<1	<1	---	1
	800N	<1	4	<1	<1	<1	1	<1	<1	<1	<1	---	1
	800S	2	21	<1	<1	1	2	<1	<1	<1	<1	---	1
	800W	2	1	<1	<1	<1	1	<1	<1	1	<1	---	1
Reference Site	Reference 2	2	<1	<1	<1	<1	1	<1	1	<1	<1	---	1

Notes:
Shaded cells exceed BC Approved WQG = 200 CFU/100 mL (geometric mean over five samples).
<1 replaced with 0.5 for Geomean calculation.
--- Indicates incomplete sampling due to adverse weather conditions.

Table 5.2 SPTP Surface Sites 5 Sampling Events in 30 Days Enterococci 2023

Station		Winter Enterococci (CFU/100mL)						Summer Enterococci (CFU/100mL)					
		1	2	3	4	5	Geomean	1	2	3	4	5	Geomean
Outfall Sites	Outfall	1	1	23	5	<1	2	<1	<1	1	<1	---	1
	100N	3	<1	<1	3	<1	1	<1	<1	<1	<1	---	1
	100S	1	1	<1	<1	<1	1	1	<1	1	<1	---	1
	200NE	3	<1	<1	<1	<1	1	<1	<1	<1	<1	---	1
	200NW	1	<1	<1	<1	<1	1	<1	<1	1	<1	---	1
	200SE	<1	2	<1	<1	<1	1	<1	<1	<1	<1	---	1
	200SW	<1	1	<1	<1	<1	1	<1	<1	1	<1	---	1
	400E	5	1	<1	<1	<1	1	<1	<1	1	<1	---	1
	400N	1	4	6	<1	<1	1	<1	<1	1	<1	---	1
	400S	1	<1	<1	<1	<1	1	2	<1	<1	<1	---	1
	400W	1	<1	<1	<1	1	1	<1	<1	<1	<1	---	1
	800N	1	1	<1	<1	<1	1	<1	<1	<1	<1	---	1
	800S	1	7	<1	<1	<1	1	<1	1	1	<1	---	1
	800W	1	2	<1	<1	1	1	<1	1	<1	<1	---	1
Reference Site	Reference 2	2	1	<1	1	<1	1	1	<1	1	<1	---	1

Notes:
Shaded cells exceed BC Approved WQG = 20 CFU/100 mL (geometric mean over 5 samples).
<1 replaced with 0.5 for Geomean calculation.
--- Indicates incomplete sampling due to adverse weather conditions.

Table 5.3 SPTP IDZ Sites 5 Sampling Events in 30 Days Fecal Coliform 2023

Station		Winter Fecal coliforms (CFU/100mL)						Summer Fecal coliforms (CFU/100mL)					
		Day 1	Day 2	Day 3	Day 4	Day 5	Geomean	Day 1	Day 2	Day 3	Day 4	Day 5	Geomean
Reference	Top	<1	1	<1	9	<1	1	1	<1	1	<1	---	1
	Middle	1	9	4	2	<1	2	1	4	<1	6	---	2
	Bottom	<1	10	6	<1	<1	1	<1	<1	<1	<1	---	1
Station 1	Top	1	5	<1	7	<1	2	<1	<1	<1	<1	---	1
	Middle	1	1	<1	7	<1	1	7	1	<1	3	---	2
	Bottom	<1	<1	1	1	<1	1	7	<1	<1	<1	---	1
Station 2	Top	<1	4	<1	<1	<1	1	---	<1	<1	<1	---	1
	Middle	<1	1	<1	4	<1	1	---	<1	<1	<1	---	1
	Bottom	<1	1	<1	1	<1	1	1	<1	1	<1	---	1
Station 3	Top	<1	1	2	<1	<1	1	---	<1	<1	<1	---	1
	Middle	1	2	2	<1	1	1	---	<1	<1	<1	---	1
	Bottom	<1	1	1	<1	<1	1	---	2	<1	<1	---	1
Station 4	Top	2	<1	<1	<1	<1	1	<1	1	<1	<1	---	1
	Middle	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	---	1
	Bottom	2	<1	<1	<1	<1	1	<1	<1	<1	<1	---	1

Notes:
Shaded cells exceed BC Approved WQG = 200 CFU/100 mL (geometric mean over 5 samples).
<1 replaced with 0.5 for Geomean calculation.
--- Indicates incomplete sampling due to adverse weather conditions.

Table 5.4 SPTP IDZ Sites 5 Sampling Events in 30 Days Enterococci 2023

Station		Winter Enterococci (CFU/100mL)						Summer Enterococci (CFU/100mL)					
		Day 1	Day 2	Day 3	Day 4	Day 5	Geomean	Day 1	Day 2	Day 3	Day 4	Day 5	Geomean
Reference	Top	<1	2	<1	2	<1	1	<1	1	1	<1	---	1
	Middle	<1	6	2	<1	<1	1	<1	<1	<1	2	---	1
	Bottom	1	5	<1	<1	1	1	<1	<1	<1	<1	---	1
Station 1	Top	2	1	<1	2	<1	1	<1	<1	<1	<1	---	1
	Middle	1	<1	<1	2	<1	1	<1	<1	<1	<1	---	1
	Bottom	<1	<1	<1	1	<1	1	1	<1	1	<1	---	1
Station 2	Top	<1	<1	<1	<1	<1	1	---	<1	<1	<1	---	1
	Middle	<1	1	<1	1	<1	1	---	<1	<1	<1	---	1
	Bottom	<1	<1	<1	1	<1	1	<1	<1	<1	<1	---	1
Station 3	Top	<1	1	<1	<1	<1	1	---	<1	<1	<1	---	1
	Middle	1	1	<1	<1	1	1	---	<1	<1	<1	---	1
	Bottom	<1	<1	1	<1	<1	1	---	1	1	<1	---	1
Station 4	Top	2	1	<1	1	<1	1	1	<1	1	<1	---	1
	Middle	<1	<1	<1	<1	<1	1	1	<1	<1	<1	---	1
	Bottom	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	---	1

Notes:
Shaded cells exceed BC Approved WQG = 20 CFU/100 mL (geometric mean over 5 samples).
<1 replaced with 0.5 for Geomean calculation.
--- Indicates incomplete sampling due to adverse weather conditions.

Nutrients

The potential effects of the SPTP discharge on nutrient concentrations in the marine receiving environment were assessed by qualitatively comparing the 2023 IDZ and reference station data. Data are presented in Appendix C3.

The 2023 mean concentrations of nutrients and other measured parameters (i.e., ammonia, TKN, nitrite, nitrate, total phosphorus, dissolved phosphorus), exhibited no consistent (qualitative) differences between outfall and reference stations (Appendix C3). The average concentrations of nutrients in 2023 were also within the ranges measured during the pre- and post-discharge studies (Aquametrix Research Ltd., 2000 and 2001a), and were consistent with recent monitoring years and the concentrations expected in Juan de Fuca Strait. The average surface water result for nitrate was 0.33 mg/L N at the reference station and 0.31 mg/L N at the IDZ stations. For comparison, ambient nitrate concentrations in the Juan de Fuca Strait area are typically in the order of 0.140-0.420 mg/L N (Lewis, 1974 and 1978, as cited in Harrison *et al*., 1994).

Figure 5.3 and Figure 5.4 present 2013-2023 total nitrogen and nitrate results from the reference area and outfall monitoring stations. Comparison of this data to the Mackas and Harrison (1997) study of area background concentrations indicates that the monitoring results are well within background concentrations.

Similar to previous years (CRD, 2002-2021), nutrient concentrations in 2023 exhibited high natural spatial and temporal variability, which is typical of the Salish Sea (Mackas and Harrison, 1997). Nutrient concentrations are expected to vary due to seasonal physiochemical and biological cycles in marine waters. From autumn through spring, surface-layer nitrogen concentrations are generally high in the Salish Sea because of reduced stratification, sustained tidal and wind mixing and low phytoplankton productivity. In summer, nitrogen concentrations are much lower, coinciding with low salinity and high temperatures influenced by surface water from the Fraser River freshet (Mackas and Harrison, 1997). Ammonia values show a seasonal variation, with total nitrogen and nitrate (Figure 5.3 and Figure 5.4, Appendix C3) lower in the summer and higher in the winter and TKN and nitrite (Appendix C3) higher in the summer and lower in the winter.

Nutrient monitoring results from 2002-2023 have shown no indication of potential for anthropogenic eutrophication due to the outfall. Mackas and Harrison (1997) indicate that the potential for eutrophication of the Salish Sea and Haro straits is low for two reasons: first, high ambient nitrate and ammonia concentrations make total primary productivity relatively insensitive to moderate changes; second, the exchange of water by currents is rapid, and water entering the Salish Sea carries naturally high nutrient concentrations. Natural nitrogen inputs into the straits from estuarine circulation are estimated to be an order of magnitude higher than all anthropogenic and atmospheric inputs combined (Mackas and Harrison, 1997). SPTP outfall loadings of nitrogen-based nutrients to Bazan Bay were approximately 461 tonnes N/year in 2022 (Table 3.4), whereas, the net natural nitrogen input to the Salish Sea estuarine system totals approximately 400-600 tonnes N/day (i.e., 146,000-219,000 tonnes N/year) (Mackas and Harrison, 1997).

Finally, Bazan Bay naturally contains 15-46 tonnes of nitrate alone, if one uses the typical ambient nitrate concentrations in the Juan de Fuca Strait area (0.140-0.420 mg/L N; Lewis 1974, 1978, as cited in Harrison *et al.*, 1994) and an assumed volume of 110,105,000 m^3 (volume calculated for the area enclosed by Sidney to James Island to Cordova Spit; Figure 5.1). Bazan Bay is also well flushed, as is evidenced by the fact that the 2023 surface water nitrate concentrations (Appendix C3) remained within the ambient Juan de Fuca nitrate concentrations. Overall, the 2023 surface water data showed no evidence of any significant effect of the SPTP discharge on nutrients in the Bazan Bay receiving environment.

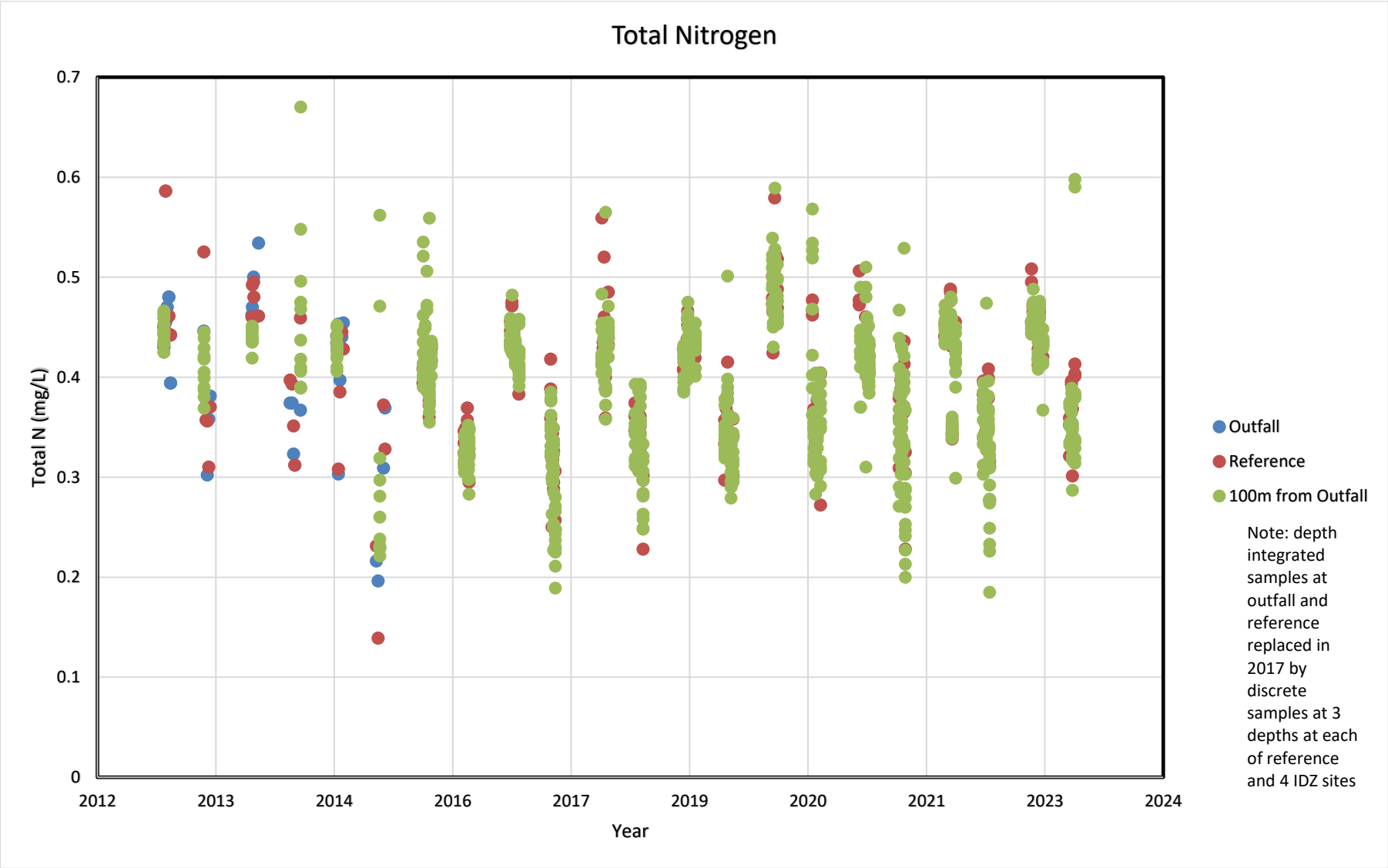


Figure 5.3 SPTP Total Nitrogen Sampling Results 2013-2023

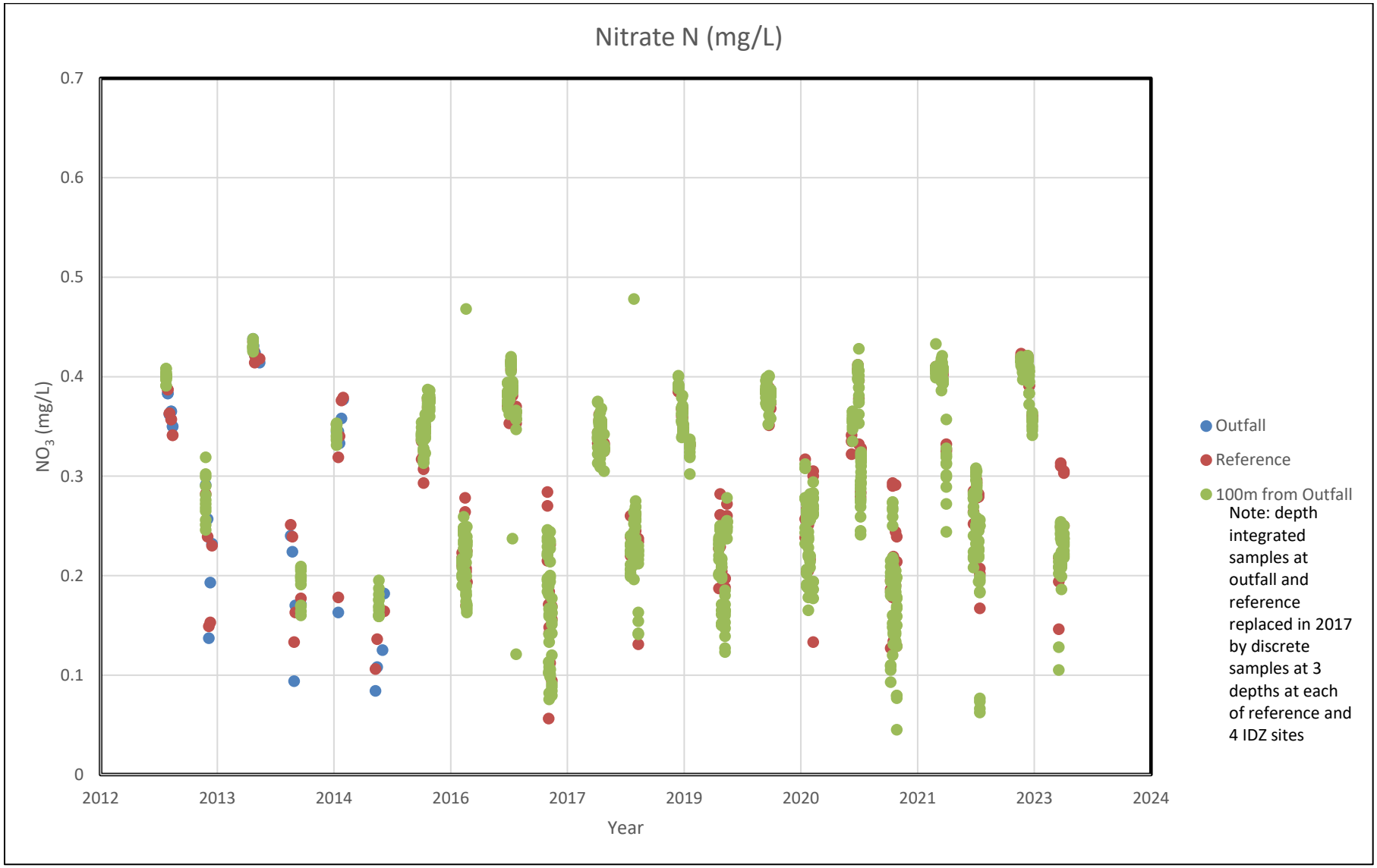


Figure 5.4 SPTP Nitrate Sampling Results 2013-2023

5.4 Overall Assessment

Overall, the 2023 bacteriology results indicated that the outfall plume was predominantly trapped below the ocean surface. In addition, the potential for human exposure to high bacterial concentrations from the wastewater discharge was low around the outfalls, as demonstrated by geometric mean results that were below thresholds used to assess potential human health risks in surface waters. Effects on shellfish consumers were not expected. Most extended analysis monitoring parameters were either non-detect or below applicable WQG, except for boron, which exceeded WQG at every station and sampling event, including the reference station, as well as nickel in two samples. The CRD will continue to monitor metals in waters around the outfall to assess environmental significance.

The 2023 nutrient results were consistent with previous years and there was no evidence of an effect on nutrient concentrations in the receiving environment from the SPTP discharge. There were no qualitative differences between the reference and IDZ stations, and results were within the ranges measured in previous years and ambient measurements throughout Juan de Fuca Strait and the Strait of Georgia.

6.0 SEAFLOOR MONITORING

The WMEP monitors the effects of the SPTP wastewater discharge on the seafloor at the end of the outfall once every four years. Seafloor sampling was last conducted in 2020 and will next be conducted in 2024. Results from the 2020 seafloor monitoring program are found in CRD (2021).

7.0 OVERALL CONCLUSIONS

Overall, the results of the WMEP monitoring conducted in 2023 did not indicate any significant negative effects from the SPTP discharge on the Bazan Bay receiving environment.

The CRD conducted wastewater monitoring on a regular basis to profile the chemical and physical constituents of influent and effluent. Influent and effluent quality was within expected ranges and met provincial and federal compliance requirements and treatment plant operational objectives. All priority substances, for which there are BC and Canadian WQG, met these guidelines after estimated minimum initial dilution of the effluent was factored in, except for bacteriological indicators. This indicates that the substances measured in the effluent were not likely at concentrations high enough to be of concern to aquatic life after discharge to the marine environment.

Effluent toxicity testing resulted in no acute toxicity, and no major impairment to survival and reproductive endpoints.

No biosolids were generated in 2023 but monitoring of dewatered sludge was undertaken to inform the CRD's RSCP. Monitoring results of the SPTP sludge showed that all BC OMRR regulated parameters were far below Class A biosolids limits.

Surface water monitoring was used to assess the human and environmental effects of the SPTP discharge and to confirm the minimum initial dilution factor of 1:153 determined during the 2004 dye study. Results from 2023 showed that most stations had very low concentrations of fecal coliforms and enterococci, even though environmental concentrations were predicted to be higher, based on effluent bacterial concentrations and the 1:153 dilution factor. Bacterial station geometric means were 3 or less CFU/100 mL for all stations and depths in 2023 indicating adverse health effects from recreational primary contact activities or shellfish consumption were not expected.

Boron exceeded WQG at all IDZ stations, as well as at the reference station, and is naturally found at high levels in the Salish Sea. Nickel exceeded guidelines in two samples and will be assessed again in 2024.

There was some seasonality (winter vs. summer sampling events) observed in nutrient concentrations in 2023, but these were consistent between the outfall IDZ stations and the reference station. As was observed in previous monitoring years, high temporal and spatial variation was evident in the data. Monitoring results were within the ranges measured in previous monitoring years and in ambient samples collected throughout

the Salish Sea. Overall, there was no evidence of nutrient enrichment in the receiving environment resulting from the SPTP discharge.

8.0 REFERENCES

APHA (American Public Health Association) (1992). Standard Methods for the Examination of Water and Wastewater. 21st Edition. APHA Press.

Aquametrix Research Ltd. (2000). Pre-Discharge Marine Assessment Program for the Saanich Peninsula Treatment Plant Wastewater Outfall. Prepared for the Capital Regional District, Scientific Programs, Victoria, BC.

Aquametrix Research Ltd. (2001a). Post-Discharge Marine Assessment Program for the Saanich Peninsula Treatment Plant Wastewater Outfall. Water Column Results – Final Report. Prepared for the Capital Regional District, Scientific Programs, Victoria, BC.

Aquametrix Research Ltd. (2001b). Post-Discharge Marine Assessment Program for the Saanich Peninsula Wastewater Outfall. Oceanography and the Physical Environment. Results. Prepared for the Capital Regional District.

Avocet Consulting (2007). Sediment Quality Guideline Reliability Analysis. Prepared for the Capital Regional District.

BC MOE (British Columbia Ministry of Environment) (2002). Environmental Management Act and Health Act, Organic Matter Recycling Regulation. Queens Printer, Victoria, BC.

BCMoE&CCS (2017) British Columbia Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture. Water Protection & Sustainability Branch, British Columbia Ministry of Environment & Climate Change Strategy, Victoria, BC, Canada.

BCMoE&CCS (2019) British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture. Water Protection & Sustainability Branch, British Columbia Ministry of Environment & Climate Change Strategy, Victoria, BC, Canada.

BC MWLAP (British Columbia Ministry of Water, Land and Air Protection) (2003). British Columbia Field Sampling Manual For Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples. Prepared and published by Water, Air and Climate Change Branch, Ministry of Water, Land and Air Protection, Province of British Columbia.

CCME (2003) Canadian Water Quality Guidelines for the Protection of Aquatic Life: Summary Tables 2002 update, In Canadian Environmental Quality Guidelines. Canadian Council for Ministers of the Environment, Winnipeg, MB, Canada.

CRD (2002). Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2000/2001 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2003). Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2002 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2004). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2003 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2005). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2004 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2006). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2005 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2007a). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2006 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2007b). CRD Macaulay and Clover Points Wastewater and Marine Environment Program – 2006 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2008). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2007 Annual Report. Prepared by the Capital Regional District, Marine Programs, Environmental Services department.

CRD (2009a) Saanich Peninsula Liquid Waste Management Plan, Consolidated Version. Originally published October 1996, Amended and Consolidated October 2009. Prepared by the Capital Regional District

CRD (2009b). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2008 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2010). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2009 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2011). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2010 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2012). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2011 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2013). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2012 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2014). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2013 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2015). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2014 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2016). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2015 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2017). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2016 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2018). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2017 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2020). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2018 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2020). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2019 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2021). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2020 Annual Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2022). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2021 Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CRD (2023). CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2022 Report. Prepared by the Capital Regional District, Environmental Services department, Victoria, BC, Canada.

CSSP (Canadian Shellfish Sanitation Program) (2019) Canadian Shellfish Sanitation Program – Manual of Operations. https://www.inspection.gc.ca/food/food-specific-requirements-and-guidance/fish/canadian-shellfish-sanitation-program/eng/1527251566006/1527251566942. Accessed online December 18, 2019.

Golder (2013) 2011 Trend Assessment for Substances in Macaulay Point and Clover Point Wastewater and the Saanich Peninsula Wastewater and Biosolids. Final Report prepared for the Capital Regional District Scientific Programs Division, Victoria, BC.

Golder (2017). Updated Guidance Manual for Assessment and Analysis of WMEP Data. Prepared for the Capital Regional District Scientific Programs Division, Victoria, BC.

Golder (2019) 2017 Trend Assessment for Substances in Macaulay Point and Clover Point Wastewater, Saanich Peninsula Wastewater and Biosolids, and Ganges Wastewater and Mixed Liquor. Draft Report prepared for the Capital Regional District Scientific Programs Division, Victoria, BC.

Harrison, P.J., Mackas, D.L., Frost, B.W., MacDonald, R.W. and Crecelius, E.A. (1994) An Assessment of Nutrients, Plankton and Some Pollutants in the Water Column of Juan de Fuca Strait, Strait of Georgia and Puget Sound and their Transboundary Transport. Proceedings of the BC/Washington Symposium on the marine Environments January 13 and 14, 1994.

Hayco (2005). Saanich Peninsula Wastewater Treatment Plant Outfall Diffuser Evaluation. Prepared for the Capital Regional District, Scientific Programs, Victoria, BC.

Health Canada (2012) Guidelines for Canadian Recreational Water Quality Third Edition. Published by authority of the Minister of Health. 161 pp.

Lewis, A. G. (1974). Monthly nutrient and chlorophyll values for Juan de Fuca Strait, June–December 1973. Institute of Oceanography Data Report 40, University of British Columbia, 17 pp.

Lewis, A. G. (1978). Concentrations of nutrients and chlorophyll on a cross-channel transect in Juan de Fuca Strait, British Columbia. Journal of the Fisheries Research Board of Canada. 35:305–314.

Lorax Environmental (2023). Wastewater Discharge and Dispersion Model. Prepared for Capital Regional District, Scientific Programs, Victoria, BC.

Mackas, D.L, and P.J. Harrison (1997). Nitrogenous Nutrient Sources and Sinks in the Juan de Fuca Strait/Strait of Georgia/Puget Sound Estuarine System: Assessing the Potential for Eutrophication. Estuarine, Coastal and Shelf Science. 44:1-21.

Pearson, T.H. and R. Rosenberg (1978) Macrobenthic succession in relation to organic enrichment and pollution of the marine environment. Oceanography and Marine Biology Annual Reviews. 16: 229-311.

PSAMP (2002). Wastewater Discharge and Dispersion Model. Prepared for Capital Regional District, Scientific Programs, Victoria, BC.

US EPA (2002). Puget Sound Update 2002. Eighth Report of the Puget Sound Ambient Monitoring Program. Puget Sound Water Quality Action Team. Olympia, Washington, USA.

WDOE (1991) Sediment Quality Guidelines.

APPENDIX A

Parameter List for the Saanich Peninsula Wastewater and Marine Environment Program 2023

Appendix A Parameter List for the Saanich Peninsula Wastewater and Marine Environment Program 2023

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
CONVENTIONAL VARIABLES				
alkalinity	minimum twice per week to monthly	√		
biochemical oxygen demand	influent - weekly; effluent - 3 times/week	√		
carbonaceous biochemical oxygen demand	minimum 2 times/week	√		
chemical oxygen demand	weekly	√		
chloride	1 time/month	√		
conductivity	4-5 times/month	√		√
cyanide (strong acid dissociable)		√		
cyanide (weak acid dissociable)		√		
fecal coliform	weekly	√	√	√
enterococci			√	√
hardness (as $CaCO_3$)		√		
hardness (as $CaCO_3$), dissolved		√		
ammonia	2-3 times/month	√	√	√
total Kjeldahl nitrogen	2-3 times/month	√	√	√
nitrate	2-3 times/month	√	√	√
nitrite	2-3 times/month	√	√	√
nitrogen, total		√	√	√
oil & grease, mineral		√		
oil & grease, total		√		
organic carbon, total		√	√	√
pH	daily	√	√	√
phosphate, dissolved	1 time/month		√	√
phosphate, total	1 time/month		√	√
salinity		√		√
sulphate		√		√
sulphide		√		√
suspended solids, total	daily	√		√
temperature		√		√

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
METALS TOTAL		√		
aluminum		√	√	
antimony		√	√	
arsenic		√	√	
barium		√	√	
beryllium		√	√	
bismuth			√	
cadmium		√	√	
calcium		√	√	
chromium		√	√	
chromium VI		√	√	
cobalt		√	√	
copper		√	√	
iron		√	√	
lead		√	√	
magnesium		√	√	
manganese		√	√	
mercury		√	√	
molybdenum		√	√	
nickel		√	√	
phosphorus		√	√	
potassium		√	√	
selenium		√	√	
silver		√	√	
sodium			√	
thallium		√	√	
tin		√	√	
zinc		√	√	

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
METALS - OTHER				
dibutyltin		√		
dibutyltin dichloride		√		
monobutyltin		√		
monobutyltin trichloride		√		
tributyltin		√		
tributyltin chloride		√		
methyl mercury		√		
METALS DISSOLVED				
aluminum		√		
antimony		√		
arsenic		√		
barium		√		
beryllium		√		
cadmium		√		
calcium		√		
chromium		√		
cobalt		√		
copper		√		
iron		√		
lead		√		
magnesium		√		
manganese		√		
mercury		√		
molybdenum		√		
nickel		√		
phosphorus		√		
potassium		√		
selenium		√		
silver		√		
thallium		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
tin		√		
zinc		√		
ALDEHYDES				
acrolein		√		
PHENOLIC COMPOUNDS				
total phenols		√		
2-chlorophenol		√		
2,4 & 2,5 -dichlorophenol		√		
2,4,6-trichlorophenol		√		
4-chloro-3-methylphenol		√		
pentachlorophenol		√		
2,4-dimethylphenol		√		
2,4-dinitrophenol		√		
2-methyl-4,6-dinitrophenol		√		
2-nitrophenol		√		
4-nitrophenol		√		
4,6-dinitro-2-methylphenol		√		
phenol		√		
2,4-DDD		√		
ORGANOCHLORINE PESTICIDES				
2,4-DDE		√		
2,4-DDT		√		
4,4-DDD		√		
4,4-DDE		√		
4,4-DDT		√		
aldrin		√		
alpha-chlordane		√		
alpha-endosulfan		√		
alpha-HCH		√		
beta-endosulfan		√		
beta-HCH		√		
chlordane		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
delta-HCH		√		
dieldrin		√		
endosulfan sulphate		√		
endrin		√		
endrin aldehyde		√		
gamma-chlordane		√		
gamma-HCH		√		
heptachlor		√		
heptachlor epoxide		√		
methoxyclor		√		
mirex		√		
octachlorostyrene		√		
total endosulfan		√		
toxaphene		√		
POLYCYCLIC AROMATIC HYDROCARBONS				
2-chloronaphthalene		√		
2-methylnaphthalene		√		
acenaphthene		√		
acenaphthylene		√		
anthracene		√		
benzo(a)anthracene		√		
benzo(a)pyrene		√		
benzo(b)fluoranthene		√		
benzo(g,h,i)perylene		√		
benzo(k)fluoranthene		√		
chrysene		√		
dibenzo(a,h)anthracene		√		
fluoranthene		√		
fluorene		√		
indeno(1,2,3-c,d)pyrene		√		
naphthalene		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
phenanthrene		√		
pyrene		√		
total high molecular weight – PAH		√		
total low molecular weight – PAH		√		
total PAH		√		
SEMIVOLATILE ORGANICS				
bis(2-ethylhexyl)phthalate		√		
butylbenzyl phthalate		√		
diethyl phthalate		√		
dimethyl phthalate		√		
di-n-butyl phthalate		√		
di-n-octyl phthalate		√		
MISCELLANEOUS SEMIVOLATILE ORGANICS				
1,2,4-trichlorobenzene		√		
1,2-diphenylhydrazine		√		
2,4-dinitrotoluene		√		
2,6-dinitrotoluene		√		
3,3-dichlorobenzidine		√		
4-bromophenyl phenyl ether		√		
4-chlorophenyl phenyl ether		√		
benzidine		√		
bis(2-chloroethoxy)methane		√		
bis(2-chloroethyl)ether		√		
bis(2-chloroisopropyl)ether		√		
hexachlorobenzene		√		
hexachlorobutadiene		√		
hexachlorocyclopentadiene		√		
hexachloroethane		√		
isophorone		√		
nitrobenzene		√		
N-nitrosodimethylamine		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
N-nitrosodi-n-propylamine		√		
N-nitrosodiphenylamine		√		
VOLATILE ORGANICS				
Monocyclic Aromatic Hydrocarbons				
1,2-dichlorobenzene		√		
1,3-dichlorobenzene		√		
1,4-dichlorobenzene		√		
1,2-dibromoethane		√		
1,4-dioxane		√		
benzene		√		
carbon tetrachloride		√		
chlorobenzene		√		
ethylbenzene		√		
styrene		√		
toluene		√		
m & p xylenes		√		
o-xylene		√		
xylenes		√		
Aliphatic				
acrylonitrile		√		
methyl tertiary butyl ether		√		
Chlorinated Aliphatic				
1,1,1,2-tetrachloroethane		√		
1,1,1-trichloroethane		√		
1,1,2,2-tetrachloroethane		√		
1,1,2-trichloroethane		√		
1,1-dichloroethane		√		
1,1-dichloroethene		√		
1,2-dichloroethane		√		
1,2-dichloropropane		√		
2-chloroethylvinyl ether		√		
bromomethane		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
chloroethane		√		
chloroethene		√		
chloromethane		√		
cis-1,2-dichloroethene		√		
cis-1,3-dichloropropene		√		
dibromoethane		√		
dibromomethane		√		
dichlorodifluoromethane		√		
dichloromethane		√		
tetrabromomethane		√		
tetrachloroethene		√		
tetrachloromethane		√		
trans-1,2-dichloroethene		√		
trans-1,3-dichloropropene		√		
trichloroethene		√		
trichlorofluoromethane		√		
vinyl chloride		√		
Trihalomethanes				
bromodichloromethane		√		
bromoform		√		
chlorodibromomethane		√		
tribromomethane		√		
trichloromethane		√		
Ketones				
4-methyl-2 pentanone		√		
dimethyl ketone		√		
endrin ketone		√		
methyl ethyl ketone		√		
TERPENES				
alpha-terpineol		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
TOXICITY				
acute toxicity	quarterly	√		
chronic toxicity	annually	√		
HIGH RESOLUTION ANALYSES				
Nonylphenols				
4-Nonylphenols		√		
4-Nonylphenol monoethoxylates		√		
4-Nonylphenol diethoxylates		√		
Octylphenol		√		
PAHs				
Naphthalene		√		
Acenaphthylene		√		
Acenaphthene		√		
Fluorene		√		
Phenanthrene		√		
Anthracene		√		
Fluoranthene		√		
Pyrene		√		
Benz[a]anthracene		√		
Chrysene		√		
Benzo[b]fluoranthene		√		
Benzo[j,k]fluoranthenes		√		
Benzo[e]pyrene		√		
Benzo[a]pyrene		√		
Perylene		√		
Dibenz[a,h]anthracene		√		
Indeno[1,2,3-cd]pyrene		√		
Benzo[ghi]perylene		√		
2-Methylnaphthalene		√		
2,6-Dimethylnaphthalene		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
2,3,5-Trimethylnaphthalene		√		
1-Methylphenanthrene		√		
Dibenzothiophene		√		
PBDEs		√		
PCBs		√		
Pesticides				
1,3-Dichlorobenzene		√		
1,4-Dichlorobenzene		√		
1,2-Dichlorobenzene		√		
1,3,5-Trichlorobenzene		√		
1,2,4-Trichlorobenzene		√		
1,2,3-Trichlorobenzene		√		
1,2,4,5-/1,2,3,5-Tetrachlorobenzene		√		
1,2,3,4-Tetrachlorobenzene		√		
Pentachlorobenzene		√		
Hexachlorobutadiene		√		
Hexachlorobenzene		√		
HCH, alpha		√		
HCH, beta		√		
HCH, gamma		√		
Heptachlor		√		
Aldrin		√		
Octachlorostyrene		√		
Chlordane, oxy-		√		
Chlordane, gamma (trans)		√		
Chlordane, alpha (cis)		√		
Nonachlor, trans-		√		
Nonachlor, cis-		√		
2,4'-DDD		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
4,4'-DDD		√		
2,4'-DDE		√		
4,4'-DDE		√		
2,4'-DDT		√		
4,4'-DDT		√		
Mirex		√		
HCH, delta		√		
Heptachlor Epoxide		√		
alpha-Endosulphan		√		
Dieldrin		√		
Endrin		√		
beta-Endosulphan		√		
Endosulphan Sulphate		√		
Endrin Aldehyde		√		
Endrin Ketone		√		
Methoxychlor		√		
PFOS				
Perfluoroheptanoic Acid (PFHpA)		√		
Perfluorohexanoic Acid (PFHxA)		√		
Perfluorononanoic Acid (PFNA)		√		
Perfluorooctane Sulfonamide (PFOSA)		√		
Perfluorooctanesulfonic acid		√		
Perfluorooctanoic acid (PFOA)		√		
Perfluoropentanoic Acid (PFPeA)		√		
PFBS		√		
PFDoA		√		
PFHxS		√		
PFUnA		√		
PCDD				

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
1,2,3,4,6,7,8-HPCDD		√		
1,2,3,4,6,7,8-HPCDF		√		
1,2,3,4,7,8,9-HPCDF		√		
1,2,3,4,7,8-HXCDD		√		
1,2,3,4,7,8-HXCDF		√		
1,2,3,6,7,8-HXCDD		√		
1,2,3,6,7,8-HXCDF		√		
1,2,3,7,8,9-HXCDD		√		
1,2,3,7,8,9-HXCDF		√		
1,2,3,7,8-PECDD		√		
1,2,3,7,8-PECDF		√		
2,3,4,6,7,8-HXCDF		√		
2,3,4,7,8-PECDF		√		
2,3,7,8-TCDD		√		
2,3,7,8-TCDF		√		
OCDD		√		
OCDF		√		
TOTAL HEPTA-DIOXINS		√		
TOTAL HEPTA-FURANS		√		
TOTAL HEXA-DIOXINS		√		
TOTAL HEXA-FURANS		√		
TOTAL PENTA-DIOXINS		√		
TOTAL PENTA-FURANS		√		
TOTAL TETRA-DIOXINS		√		
TOTAL TETRA-FURANS		√		
PPCPs				
2-Hydroxy-Ibuprofen		√		
Acetaminophen		√		
Azithromycin		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
Bisphenol A		√		
Caffeine		√		
Carbadox		√		
Carbamazepine		√		
Cefotaxime		√		
Ciprofloxacin		√		
Clarithromycin		√		
Clinafloxacin		√		
Cloxacillin		√		
Dehydronifedipine		√		
Digoxigenin		√		
Digoxin		√		
Diltiazem		√		
Diphenhydramine		√		
Enrofloxacin		√		
Erythromycin-H2O		√		
Flumequine		√		
Fluoxetine		√		
Furosemide		√		
Gemfibrozil		√		
Glipizide		√		
Glyburide		√		
Hydrochlorothiazide		√		
Ibuprofen		√		
Lincomycin		√		
Lomefloxacin		√		
Miconazole		√		
Naproxen		√		
Norfloxacin		√		

Appendix A, continued

Parameter	Compliance Monitoring and Treatment Plant Performance	Wastewater Priority Substances	Receiving Environment	
	Influent and Effluent - Sampling Frequency	Sampled Quarterly	5 Samples in 30 Days (summer and winter) 1st day	5 Samples in 30 Days (summer and winter) 2nd-5th day
Norgestimate		√		
Ofloxacin		√		
Ormetoprim		√		
Oxacillin		√		
Oxolinic Acid		√		
Penicillin G		√		
Penicillin V		√		
Roxithromycin		√		
Sarafloxacin		√		
Sulfachloropyridazine		√		
Sulfadiazine		√		
Sulfadimethoxine		√		
Sulfamerazine		√		
Sulfamethazine		√		
Sulfamethizole		√		
Sulfamethoxazole		√		
Sulfanilamide		√		
Sulfathiazole		√		
Thiabendazole		√		
Triclocarban		√		
Triclosan		√		
Trimethoprim		√		
Tylosin		√		
Virginiamycin		√		
Warfarin		√		
PFAS		√		

APPENDIX B

Wastewater Monitoring

Appendix B1 Saanich Peninsula Treatment Plant Effluent Flow (m^3) in 2023

Appendix B2 Compliance and Treatment Plant Performance Influent Results 2023

Appendix B3 Compliance and Treatment Plant Performance Effluent Results 2023

Appendix B4 Influent and Effluent Priority Substance Concentrations 2023

Appendix B1 Saanich Peninsula Treatment Plant Effluent Flow (m^3) in 2023

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	11,565	9,713	12,476	8,672	8,844	8,423	8,092	8,278	8,563	8,385	8,871	8,951
2	11,327	9,367	13,517	8,992	8,738	8,638	8,130	8,368	8,302	9,949	16,064	13,340
3	10,589	9,320	11,932	8,880	8,669	8,160	8,590	8,368	8,490	9,090	10,655	11,769
4	10,148	9,361	11,473	10,312	8,774	8,375	8,442	8,226	9,083	8,789	15,007	17,260
5	9,941	9,829	11,044	9,354	9,484	8,442	8,399	7,973	8,660	8,704	11,734	21,488
6	9,508	9,993	10,605	9,318	8,801	8,321	8,567	8,052	8,419	8,601	10,279	13,606
7	10,663	14,773	10,022	9,121	9,033	8,366	8,417	8,521	8,474	8,311	9,733	12,152
8	11,447	12,105	9,838	9,164	8,881	8,567	8,178	8,365	8,298	8,394	9,217	10,983
9	11,120	11,648	9,576	9,421	8,701	8,557	8,392	8,335	8,218	9,179	9,362	15,896
10	11,080	10,663	9,369	9,700	8,750	10,643	8,611	8,284	8,601	8,807	10,172	19,253
11	10,231	10,071	9,259	9,220	8,649	9,309	8,439	8,292	8,322	8,595	13,641	14,072
12	13,926	10,107	10,628	8,918	8,629	9,185	8,411	8,112	8,267	8,405	12,233	11,895
13	13,284	9,900	11,832	9,397	8,428	9,419	8,571	8,318	8,311	8,268	11,872	11,105
14	11,999	9,383	10,618	8,979	8,647	8,619	8,541	8,549	8,391	8,418	10,365	10,729
15	11,516	9,269	10,014	8,863	9,227	8,664	8,311	8,609	8,201	8,975	9,822	11,037
16	11,659	9,182	9,704	9,275	10,151	8,605	8,446	8,517	8,180	9,225	9,408	10,335
17	10,855	9,265	9,396	9,055	9,725	8,434	8,593	8,587	8,473	9,892	9,189	10,225
18	10,790	9,047	9,248	9,056	8,654	8,663	8,398	8,663	8,549	11,180	9,136	10,180
19	10,289	8,965	9,319	9,024	8,468	8,811	8,371	8,433	8,551	9,241	9,444	10,544
20	9,871	9,301	9,369	9,426	8,296	8,557	8,424	8,515	8,688	8,975	9,132	10,216
21	10,036	9,197	9,083	9,237	8,195	8,658	8,275	8,592	8,573	8,619	9,661	10,235
22	10,025	8,799	8,986	9,319	9,161	8,691	8,122	8,565	8,488	8,848	9,721	10,132
23	9,881	8,752	8,939	9,864	8,466	8,530	8,393	8,518	8,323	8,686	9,314	9,889
24	10,182	8,491	9,354	9,648	8,175	8,356	9,984	8,678	8,710	13,419	9,016	9,902
25	9,657	8,549	9,169	9,130	8,333	8,636	9,968	8,558	8,780	14,218	8,889	9,237
26	9,503	9,821	9,184	9,138	8,484	8,708	8,897	8,263	8,545	9,969	9,143	9,785
27	9,433	10,222	9,054	9,029	8,238	8,698	8,470	8,368	8,912	8,968	8,936	9,679
28	9,188	13,769	8,872	8,953	8,473	8,635	8,433	8,608	9,054	8,469	8,789	9,459
29	9,233	---	8,806	8,909	8,587	8,734	8,116	6,350	8,556	8,603	8,690	9,530
30	9,172	---	8,758	9,074	8,294	8,578	8,258	8,568	8,330	8,474	8,686	9,302
31	9,470	---	8,901	---	8,273	---	8,394	8,776	---	6,689	---	9,169
TOTAL Flow (m3/day)	327,588	278,862	308,345	276,448	270,228	260,982	263,633	259,209	255,312	284,345	306,181	361,355
Average	10,567	9,959	9,947	9,215	8,717	8,699	8,504	8,362	8,510	9,172	10,206	11,657
Maximum	13,926	14,773	13,517	10,312	10,151	10,643	9,984	8,776	9,083	14,218	16,064	21,488
Minimum	9,172	8,491	8,758	8,672	8,175	8,160	8,092	6,350	8,180	6,689	8,686	8,951
n	31	28	31	30	31	30	31	31	30	31	30	31
											Annual Average	**9,459**

Appendix B2 Compliance and Treatment Plant Performance Influent Results 2023

Date 2023	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2023-01-03	---	---	---	---	---	---	28.3	---	<0.005	0.125	42.5	4800	7.3	---	---
2023-01-05	---	254	---	---	696	---	---	---	---	---	---	---	---	---	---
2023-01-11	---	218	---	---	692	---	---	---	---	---	---	---	---	---	---
2023-01-17	178	---	---	94.3	---	---	31.1	---	<0.005	<0.02	34.7	---	7.2	---	---
2023-01-17	---	---	---	---	---	4100000	1.7	---	<0.005	---	---	5150	7.4	---	---
2023-01-18	---	209	---	---	528	---	---	---	---	---	---	---	---	---	---
2023-01-18	---	200	150	150	508	4300000	1.5	0.0025	<0.005	<0.02	39.3	4180	7.6	6.79	190
2023-01-19	---	220	200	71	483	2900000	27	0.034	<0.005	<0.02	28.6	4160	7.39	6.66	56
2023-01-19	---	---	---	---	---	2600000	1.6	---	<0.005	---	---	4070	7.51	---	---
2023-01-26	---	272	---	---	272	---	---	---	---	---	---	---	---	---	---
2023-02-02	---	218	---	---	770	---	---	---	---	---	---	---	---	---	---
2023-02-07	---	---	---	---	---	---	31.2	---	<0.005	<0.02	46.5	5000	7.7	---	---
2023-02-09	---	227	---	---	430	---	---	---	---	---	---	---	---	---	---
2023-02-16	---	236	---	---	996	---	---	---	---	---	---	---	---	---	---
2023-02-21	210	---	---	190	---	---	35.1	---	<0.005	<0.02	48	---	7.6	---	---
2023-02-23	---	306	---	---	566	---	---	---	---	---	---	---	---	---	---
2023-03-02	---	251	---	---	1050	---	---	---	---	---	---	---	---	---	---
2023-03-07	---	---	---	---	---	---	31.7	---	<0.005	<0.02	46.1	5300	7.4	6.76	---
2023-03-09	---	256	---	---	1020	---	---	---	---	---	---	---	---	---	---
2023-03-16	---	237	---	---	847	---	---	---	---	---	---	---	---	---	---
2023-03-21	206	---	---	201	---	---	32	---	<0.005	<0.02	51	---	7.3	---	---
2023-03-23	---	303	---	---	1150	---	---	---	---	---	---	---	---	---	---
2023-03-29	---	292	---	---	1010	---	---	---	---	---	---	---	---	---	---
2023-04-04	---	---	---	---	---	---	35.9	---	<0.005	<0.02	54.9	5900	7.39	---	---
2023-04-05	---	295	---	---	1180	---	---	---	---	---	---	---	---	---	---
2023-04-13	---	204	---	---	620	---	---	---	---	---	---	---	---	---	---
2023-04-18	101	---	---	91.3	---	---	33.9	---	<0.005	<0.02	53.6	---	7.4	---	---
2023-04-20	---	270	270	93	669	11000000	49	0.099	<0.005	<0.02	70.2	8030	7.86	6.86	270
2023-04-20	---	---	---	---	536	---	---	---	---	---	---	---	---	---	---
2023-04-26	---	300	---	---	653	---	---	---	---	---	---	---	---	---	---
2023-05-02	---	---	---	---	---	---	41	---	<0.005	<0.02	55.2	6480	7.3	---	---
2023-05-04	---	535	---	---	1430	---	---	---	---	---	---	---	---	---	---
2023-05-11	---	292	---	---	598	---	---	---	---	---	---	---	---	---	---
2023-05-16	226	---	---	121	---	---	38.7	---	0.01	0.025	53.9	---	7.6	---	---
2023-05-18	---	303	---	---	633	---	---	---	---	---	---	---	---	---	---
2023-05-25	---	267	---	---	695	---	---	---	---	---	---	---	---	---	---
2023-06-01	---	283	---	---	618	---	---	---	---	---	---	---	---	---	---

Appendix B2, continued

Date 2023	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2023-06-06	---	---	---	---	---	---	55.2	---	<0.005	<0.02	86.9	8900	7.88	---	---
2023-06-08	---	297	---	---	1070	---	---	---	---	---	---	---	---	---	---
2023-06-15	---	231	---	---	646	---	---	---	---	---	---	---	---	---	---
2023-06-20	235	---	---	136	---	---	39.1	---	3.11	12.8	16.6	---	7.4	6.58	---
2023-06-22	---	271	---	---	646	---	---	---	---	---	---	---	---	---	---
2023-06-29	---	305	---	---	1110	---	---	---	---	---	---	---	---	---	---
2023-07-04	---	---	---	---	---	---	36.8	---	<0.01	<0.025	58.1	6790	7.3	---	---
2023-07-06	---	291	---	---	632	---	---	---	---	---	---	---	---	---	---
2023-07-11	---	---	---	---	---	8400000	44	---	<0.005	---	---	6230	7.47	---	---
2023-07-12	---	300	280	150	682	1800000	46	0.066	<0.005	<0.02	55.3	6950	7.56	6.72	290
2023-07-13	---	---	---	---	---	67000000	2	---	<0.005	---	---	5630	7.51	---	---
2023-07-13	---	270	---	---	731	---	---	---	---	---	---	---	---	---	---
2023-07-18	249	---	---	246	---	---	40.3	---	0.052	0.144	49.5	---	7.6	---	---
2023-07-20	---	290	---	---	902	---	---	---	---	---	---	---	---	---	---
2023-07-27	---	276	---	---	1330	---	---	---	---	---	---	---	---	---	---
2023-08-03	---	258	---	---	1310	---	---	---	---	---	---	---	---	---	---
2023-08-07	---	---	---	---	---	---	38.9	---	<0.01	<0.025	58.1	6580	7.4	---	---
2023-08-10	---	---	---	---	1200	---	---	---	---	---	---	---	---	---	---
2023-08-17	---	247	---	---	807	---	---	---	---	---	---	---	---	---	---
2023-08-22	226	---	---	297	---	---	42.3	---	<0.01	<0.025	58.2	---	7.4	---	---
2023-08-24	---	276	---	---	1020	---	---	---	---	---	---	---	---	---	---
2023-08-31	---	248	---	---	663	---	---	---	---	---	---	---	---	---	---
2023-09-05	---	---	---	---	---	---	39.4	---	<0.01	<0.01	58.3	6740	7.3	---	---
2023-09-07	---	288	---	---	675	---	---	---	---	---	---	---	---	---	---
2023-09-14	---	261	---	---	301	---	---	---	---	---	---	---	---	---	---
2023-09-19	228	---	---	292	---	---	34.7	---	<0.01	<0.025	53.1	---	7.5	---	---
2023-09-21	---	246	---	---	604	---	---	---	---	---	---	---	---	---	---
2023-09-28	---	234	---	---	551	---	---	---	---	---	---	---	---	---	---
2023-10-03	---	---	---	---	---	---	36.2	---	0.0158	0.025	50	5930	7.3	---	---
2023-10-05	---	225	---	---	660	---	---	---	---	---	---	---	---	---	---
2023-10-12	---	221	---	---	771	---	---	---	---	---	---	---	---	---	---
2023-10-17	226	---	---	227	---	---	37.3	---	0.014	0.033	55	---	7.2	---	---
2023-10-19	---	230	190	130	667	4500000	1.3	0.0054	<0.005	0.027	47.6	---	7.45	7.17	220
2023-10-19	---	235	---	---	745	---	---	---	---	---	---	---	---	---	---
2023-10-26	---	201	---	---	826	---	---	---	---	---	---	---	---	---	---
2023-11-02	---	240	---	---	480	---	---	---	---	---	---	---	---	---	---
2023-11-07	---	---	---	---	---	---	31	---	<0.005	0.02	50.3	5700	7.4	---	---
2023-11-08	---	---	---	---	540	---	---	---	---	---	---	---	---	---	---

Appendix B2, continued

Date 2023	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2023-11-16	---	160	---	---	879	---	---	---	---	---	---	---	---	---	---
2023-11-21	221	---	---	163	---	---	37	---	<0.005	<0.02	52.6	---	7.4	---	---
2023-11-23	---	240	---	---	611	---	---	---	---	---	---	---	---	---	---
2023-11-30	---	230	---	---	628	---	---	---	---	---	---	---	---	---	---
2023-12-05	---	---	---	---	---	---	16	---	0.281	0.101	30.2	3600	7.3	---	---
2023-12-07	---	110	---	---	346	---	---	---	---	---	---	---	---	---	---
2023-12-12	17.3	---	---	163	---	---	27	---	0.0553	0.107	43.5	---	7.3	---	---
2023-12-14	---	170	---	---	434	---	---	---	---	---	---	---	---	---	---
2023-12-21	---	>201	---	---	548	---	---	---	---	---	---	---	---	---	---
2023-12-28	---	293	---	---	669	---	---	---	---	---	---	---	---	---	---
Mean	194	256	218	166	744	11,844,444	31	0.041	0.110	0.47	50	5806	7.4	6.8	205
Min	17.3	110	150	71	272	1,800,000	1.3	0.0025	0.003	0.01	16.6	3600	7.2	6.58	56
Max	249	535	280	297	1430	67,000,000	55.2	0.099	3	13	87	8900	7.88	7.17	290
n	12	52	5	17	56	9	33	5	33	29	29	20	33	7	5

Notes: ALK-alkalinity, BOD-total biochemical oxygen demand, COD-chemical oxygen demand, CL-chloride, COND-conductivity, NH_3-ammonia, UNION NH_3-unionized ammonia
NO_3-nitrate, NO_2-nitrite, TDP-total dissolved phosphorus, TP-total phosphorous, TKN-total Kjeldahl nitrogen, CBOD- carbonaceous biochemical oxygen demand, TRC-total residual chlorine, TSS-total suspended solids

Appendix B3 Compliance and Treatment Plant Performance Effluent Results 2023

Date 2023	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
2023-01-03	---	---	---	---	---	1700	<0.1	<0.1	0.0773	13.9	7.89	3300	7.3	6.5	---	13
2023-01-04	---	9.07	<4	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-01-05	---	7.18	<4	---	821	---	---	---	---	---	---	---	---	---	---	---
2023-01-10	---	16.7	4.81	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-01-11	---	17.6	5.44	---	806	---	---	---	---	---	---	---	---	---	---	---
2023-01-17	35.2	---	11.2	89.6	---	74000	0.759	<0.1	0.39	14	2.19	---	7	6.49	0.02	11
2023-01-17	---	15.8	<4	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-01-17	---	---	---	---	---	16000	0.1	---	0.46	---	---	2900	6.95	---	---	---
2023-01-18	---	23.5	4.17	---	446	---	---	---	---	---	---	---	---	---	---	---
2023-01-18	---	14	6.2	170	54	64000	0.1	<0.0005	0.619	14.5	1.43	2180	7.46	6.44	---	10
2023-01-19	---	3.9	<2	77	40	9500	0.041	<0.0005	0.0347	13.9	<0.4	332	7.11	6.34	---	6
2023-01-19	---	---	---	---	---	9500	0.13	---	0.68	---	---	2180	7.19	---	---	---
2023-01-25	---	21	5.11	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-01-26	---	18.4	5.06	---	526	---	---	---	---	---	---	---	---	---	---	---
2023-02-01	---	21.6	7.43	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-02-02	---	16.5	4.92	---	432	---	---	---	---	---	---	---	---	---	---	---
2023-02-07	---	---	---	---	---	22000	<0.1	<0.1	0.358	14	2.7	3300	6.9	6.48	0	11
2023-02-08	---	20	4.94	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-02-09	---	16	5.45	---	64	---	---	---	---	---	---	---	---	---	---	---
2023-02-15	---	22.9	5.33	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-02-16	---	17.8	<4	---	62	---	---	---	---	---	---	---	---	---	---	---
2023-02-21	22.9	---	---	78.1	---	15000	0.43	<0.1	0.415	16.1	0.74	---	7	6.42	0	11
2023-02-22	---	15.5	4.16	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-02-23	---	14.8	4.3	---	626	---	---	---	---	---	---	---	---	---	---	---
2023-03-01	---	34.1	15.2	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-03-02	---	23.8	7.89	---	580	---	---	---	---	---	---	---	---	---	---	---
2023-03-07	---	---	---	---	---	9400	0.16	0.12	0.0975	14.8	1.71	2300	7	6.81	0	12
2023-03-08	---	16.1	4.46	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-03-09	---	11.1	4.81	---	55	---	---	---	---	---	---	---	---	---	---	---
2023-03-15	---	15.7	<4	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-03-16	---	16.2	<4	---	649	---	---	---	---	---	---	---	---	---	---	---
2023-03-21	23.7	---	---	---	---	43000	<0.1	<0.1	0.108	15.4	2.69	---	6.8	6.77	0.01	20
2023-03-22	---	17.4	6.62	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-03-23	---	18.2	6.49	---	700	---	---	---	---	---	---	---	---	---	---	---
2023-03-28	---	18.2	5.85	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-03-29	---	16.6	3.65	---	950	---	---	---	---	---	---	---	---	---	---	---
2023-04-04	---	12	4.89	---	---	45000	<0.1	<0.1	0.175	14.8	2.24	4300	6.92	6.59	0	13
2023-04-05	---	16.3	4.46	---	350	---	---	---	---	---	---	---	---	---	---	---
2023-04-12	---	13.3	4.36	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-04-13	---	25.4	5.11	---	704	---	---	---	---	---	---	---	---	---	---	---
2023-04-18	35.5	---	---	122	---	39000	2.73	0.002	0.402	16.6	5.63	---	7	6.39	0.01	26
2023-04-19	---	38.5	10.3	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-04-20	---	27	9	130	82	15000	0.48	0.00054	1.32	14	11	2500	7.55	6.61	---	13
2023-04-20	---	42.3	10.1	---	640	---	---	---	---	---	---	---	---	---	---	---
2023-04-25	---	34.6	11.1	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-04-26	---	30.6	9.5	---	749	---	---	---	---	---	---	---	---	---	---	---
2023-05-02	---	---	---	---	---	110000	7.25	<0.1	0.411	17.7	9.56	1010	7.3	6.78	0.01	12
2023-05-03	---	20.1	6.2	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-05-04	---	17	7.86	---	356	---	---	---	---	---	---	---	---	---	---	---
2023-05-10	---	9.79	7.71	---	---	---	---	---	---	---	---	---	---	---	---	---

Appendix B3, continued

Date 2023	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
2023-05-11	---	19.3	5.66	---	50	---	---	---	---	---	---	---	---	---	---	---
2023-05-16	62.3	---	---	125	---	2400	7.98	<0.1	2.06	17.5	15.8	---	7.6	6.48	0	10
2023-05-17	---	17.1	4.86	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-05-18	---	14.6	5.25	---	276	---	---	---	---	---	---	---	---	---	---	---
2023-05-24	---	20.2	7.88	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-05-25	---	17.7	6.52	---	581	---	---	---	---	---	---	---	---	---	---	---
2023-05-31	---	37.5	6.87	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-06-01	---	25.8	7.11	---	586	---	---	---	---	---	---	---	---	---	---	---
2023-06-06	---	---	---	---	---	4200	8.2	<0.1	4.22	12.7	8.42	1600	7.09	6.45	0.02	13
2023-06-07	---	16.4	4.91	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-06-08	---	17.3	4.94	---	61	---	---	---	---	---	---	---	---	---	---	---
2023-06-14	---	12.4	5.73	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-06-15	---	16.2	6.42	---	400	---	---	---	---	---	---	---	---	---	---	---
2023-06-20	79	---	---	121	---	5600	13.3	<0.1	<0.005	<0.02	58.3	---	7.5	---	0	24
2023-06-21	---	16.5	6.95	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-06-22	---	17	6.06	---	101	---	---	---	---	---	---	---	---	---	---	---
2023-06-28	---	12	3.79	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-06-29	---	<3	3.27	---	52	---	---	---	---	---	---	---	---	---	---	---
2023-06-29	---	10.5	2.33	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-07-04	---	---	---	---	---	2100	7.64	<0.1	---	---	11.3	2260	7.3	6.72	0	14
2023-07-05	---	14.3	4.02	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-07-06	---	14.3	4.6	---	73	---	---	---	---	---	---	---	---	---	---	---
2023-07-11	---	---	---	---	---	3800	0.53	---	4.27	---	---	1080	7.45	---	---	---
2023-07-12	---	20	5.2	150	60	1500	0.6	0.0007	4.31	12.3	7.19	587	7.64	6.63	---	7.6
2023-07-12	---	12.4	2.77	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-07-13	---	---	---	---	---	7200	0.42	---	4.63	---	---	427	7.5	---	---	---
2023-07-13	---	12.8	3.35	---	586	---	---	---	---	---	---	---	---	---	---	---
2023-07-18	53.8	---	---	216	---	15000	6.16	<0.1	0.888	14.3	8.16	---	7.4	6.52	0.02	---
2023-07-19	---	9.54	3.54	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-07-20	---	11.8	3.92	---	65	---	---	---	---	---	---	---	---	---	---	---
2023-07-26	---	19.5	5.25	---	---	---	---	---	---	---	---	---	---	---	---	19
2023-07-27	---	16.3	5.63	---	441	---	---	---	---	---	---	---	---	---	---	---
2023-08-02	---	13.5	4.14	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-08-03	---	9.91	<4	---	580	---	---	---	---	---	---	---	---	---	---	---
2023-08-07	---	---	---	---	---	23000	5.54	<0.1	4.6	15.6	8.31	2350	6.8	6.06	0.03	11
2023-08-09	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-08-10	---	---	---	---	272	---	---	---	---	---	---	---	---	---	---	---
2023-08-16	---	11.1	5	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-08-17	---	14.6	7.3	---	167	---	---	---	---	---	---	---	---	---	---	---
2023-08-22	34	---	---	243	---	2900	4.88	<0.1	0.584	15.4	8.42	---	6.9	6.18	0.04	22
2023-08-23	---	29.5	4.32	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-08-24	---	48.3	6.58	---	657	---	---	---	---	---	---	---	---	---	---	---
2023-08-30	---	28.4	6.34	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-08-31	---	28.9	7.34	---	650	---	---	---	---	---	---	---	---	---	---	---
2023-09-05	---	---	---	---	---	600000	9.36	---	1.43	11.8	13.3	3520	7.2	6.34	0	21
2023-09-06	---	18.4	6.75	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-09-07	---	28.5	6.13	---	63	---	---	---	---	---	---	---	---	---	---	---
2023-09-13	---	14.6	5.94	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-09-14	---	19	4.81	---	69	---	---	---	---	---	---	---	---	---	---	---
2023-09-19	71.4	---	---	123	---	5400	7.96	<0.1	1.15	13.5	11.3	---	7.3	6.41	0.01	14
2023-09-20	---	15.7	5.17	---	---	---	---	---	---	---	---	---	---	---	---	---

Appendix B3, continued

Date 2023	ALK	BOD	CBOD	CL	COD	FC	NH_3	Unionized NH_3	NO_2	NO_3	TKN	PO_4	pH	pH@15	TRC	TSS
units	mg/L	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
permitted max			45										6-9			45
2023-09-21	---	14.3	3.72	---	51	---	---	---	---	---	---	---	---	---	---	---
2023-09-27	---	15.8	4.03	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-09-28	---	16.9	3.97	---	53	---	---	---	---	---	---	---	---	---	---	---
2023-10-03	---	---	---	---	---	8600	16.2	<0.1	0.552	12.1	15.6	1360	7.4	7	0.02	9
2023-10-04	---	9.56	5.6	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-10-05	---	7.1	4.64	---	60	---	---	---	---	---	---	---	---	---	---	---
2023-10-11	---	9.83	4.45	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-10-12	---	11.1	3.01	---	631	---	---	---	---	---	---	---	---	---	---	---
2023-10-17	108	---	---	175	---	4900	18.2	<0.1	2.16	10.1	19.4	---	7.5	7.08	---	11
2023-10-18	---	9.64	3.32	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-10-19	---	14	3.2	140	50	4200	1.1	0.0016	2.19	7.66	15.6	---	7.77	6.71	---	6.8
2023-10-19	---	9.38	2.71	---	383	---	---	---	---	---	---	---	---	---	---	---
2023-10-25	---	24.2	8.55	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-10-26	---	9.79	4.06	---	617	---	---	---	---	---	---	---	---	---	---	---
2023-11-01	---	10	4.3	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-11-02	---	22	5	---	45	---	---	---	---	---	---	---	---	---	---	---
2023-11-07	---	---	---	---	---	2100	0.47	<0.1	1.69	12.3	2.23	3700	7.2	6.62	0.07	9
2023-11-07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-11-08	---	---	---	---	57	---	---	---	---	---	---	---	---	---	---	---
2023-11-15	---	15	7.2	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-11-16	---	12	7.1	---	67	---	---	---	---	---	---	---	---	---	---	---
2023-11-21	26.1	---	---	231	---	4800	0.88	0.0013	1.21	14.2	3.19	---	6.8	6.74	0.01	11
2023-11-22	---	18	6.5	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-11-23	---	13	7.1	---	83	---	---	---	---	---	---	---	---	---	---	---
2023-11-29	---	14	6.7	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-11-30	---	12	7.4	---	71	---	---	---	---	---	---	---	---	---	---	---
2023-12-05	---	---	---	---	---	71000	1.6	0.002	1.19	11.7	2.53	3700	7	6.65	0.02	13
2023-12-06	---	13	5.1	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-12-07	---	6.6	5	---	44	---	---	---	---	---	---	---	---	---	---	---
2023-12-12	41.1	---	---	166	---	24000	0.067	<0.0005	0.125	12	4.09	---	7.1	7.04	0.17	12
2023-12-13	---	11	5	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-12-14	---	9.3	4.9	---	76	---	---	---	---	---	---	---	---	---	---	---
2023-12-20	---	10.6	4.64	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-12-21	---	12.4	5.64	---	45	---	---	---	---	---	---	---	---	---	---	---
2023-12-27	---	14.7	5.65	---	---	---	---	---	---	---	---	---	---	---	---	---
2023-12-28	---	19.1	8.02	---	95	---	---	---	---	---	---	---	---	---	---	---
Mean	49	17	5.4	147	314	38,358	3.7	0.04	1	13	9	2244	7	7	0.02	13.29
Min	22.9	3	1.0	77	40	1,500	0.04	0.00025	0.0025	0.01	0.2	332	6.8	6.06	0	6
Max	108	48.3	15	243	950	600,000	18.2	0.1	4.63	17.7	58.3	4300	7.77	7.08	0.17	26
n	12	106	107	16	57	33	33.0	28	32	28	29	20	33	28	22	29

Notes: ALK-alkalinity, BOD-total biochemical oxygen demand, COD-chemical oxygen demand, CL-chloride, COND-conductivity, NH_3-ammonia, union NH_3-unionized ammonia, NO_3-nitrate, NO_2-nitrite, TDP-total dissolved phosphorus, TP-total phosphorus, TKN-total Kjeldahl nitrogen, CBOD- carbonaceous biochemical oxygen demand, UN NH_3-unionized ammonia, TRC-total residual chlorine, TSS-total suspended solids. Shaded value indicates exceedance to permitted maximum.

Appendix B4 Influent and Effluent Priority Substance Concentrations 2023

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Enterococci	TOT	CFU/100 mL	520000	13000	1200000	7100	380000	770	5200000	14000	4400000	2700	1300000	1100	1800000	1200	630000	580
Fecal Coliforms	TOT	CFU/100 mL	4100000	16000	4300000	64000	2900000	9500	11000000	15000	8400000	3800	1800000	1500	67000000	7200	4500000	4200
Alkalinity - Total - Ph 4.5	TOT	mg/L	---	---	190	30	170	35	250	61	---	---	220	53	---	---	200	99
Chloride	DIS	mg/L	---	---	150	170	71	77	93	130	---	---	150	150	---	---	130	140
Total/SAD Cyanide	TOT	mg/L	0.00079	0.0016	0.00147	0.00157	0.00087	0.00064	0.00255	0.00212	0.0067	0.00234	<0.0025	0.0012	<0.0025	0.00232	0.00121	0.0014
WAD Cyanide	TOT	mg/L	<0.0005	0.00143	0.001	0.00076	0.0008	0.00079	0.00095	0.00142	0.0073	0.00155	<0.0025	0.00094	<0.0025	0.00159	0.00073	0.00124
Alkalinity - Bicarbonate	TOT	mg/L	---	---	230	36	210	43	310	74	---	---	270	65	---	---	240	120
Alkalinity - Carbonate	TOT	mg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Alkalinity - Hydroxide	TOT	mg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Alkalinity - Phenolphthalein - Ph 8.3	TOT	mg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Hardness (as CaCO3)	DIS	mg/L	130	114	96.7	111	83.1	84.4	76.6	87	98.6	98.5	99.6	101	97.5	93.8	104	97.9
Hardness (as CaCO3)	TOT	mg/L	113	101	99.8	101	89.5	82.4	88.5	89.2	98.5	80.1	98.8	92.7	106	91.8	110	94.4
Sulphate	DIS	mg/L	---	---	38	44	39	30	32	37	---	---	34	37	---	---	40	41
N - Nh3 (As N)	TOT	mg/L	1.7	0.1	1.5	0.1	27	0.041	49	0.48	44	0.53	46	0.6	2	0.42	1.3	1.1
N - Nh3 (As N)- Unionized	TOT	mg/L	---	---	0.0025	<0.0005	0.034	<0.0005	0.099	0.00054	---	---	0.066	0.0007	---	---	0.0054	0.0016
N - No2 (As N)	DIS	mg/L	<0.005	0.46	<0.005	0.619	<0.005	0.035	<0.005	1.32	<0.005	4.27	<0.005	4.31	<0.005	4.63	<0.005	2.19
N - No3 (As N)	DIS	mg/L	---	---	<0.02	14.5	<0.02	13.9	<0.02	14	---	---	<0.02	12.3	---	---	0.027	7.66
N - No3 + No2 (As N)	DIS	mg/L	---	---	<0.02	15.1	<0.02	14.1	<0.02	15.4	---	---	<0.02	16.6	---	---	0.027	9.85
N - Tkn (As N)	TOT	mg/L	---	---	39.3	1.43	28.6	<0.4	70.2	11	---	---	55.3	7.19	---	---	47.6	15.6
N - Total (As N)	TOT	mg/L	---	---	39.3	16.5	28.6	12.8	70.2	26.4	---	---	57.7	23.8	---	---	47.6	25.5
Organic Carbon	TOT	mg/L	---	---	96	15	41	12	130	20	---	---	150	19	---	---	110	13
P - Po4 - Ortho (As P)	DIS	mg/L	---	---	2.7	2.2	2.3	0.18	4.9	2.1	---	---	4.2	0.21	---	---	3.1	0.016
P - Po4 - Total (As P)	TOT	µg/L	5150	2900	4180	2180	4160	332	8030	2500	6230	1080	6950	587	5630	427	---	---
Oil & Grease, Mineral	TOT	mg/L	<2	<2	2	<2	<2	<2	4.9	<2	<2	<2	<2	<2	2.6	<2	<2	<2
Oil & grease, total	TOT	mg/L	23	<1	26	<1	8.1	<1	31	<1	11	<1	13	<1	21	<1	14	<1
BOD	TOT	mg/L	---	---	200	14	220	3.9	270	27	---	---	300	20	---	---	230	14
CBOD	TOT	mg/L	---	---	150	6.2	200	<2	300	9	---	---	280	5.2	---	---	190	3.2
COD	TOT	mg/L	---	---	508	54	483	42	669	82	---	---	682	60	---	---	667	50
pH	NoRs	pH	---	---	---	---	7.39	7.11	---	---	---	---	---	---	---	---	---	---
pH	TOT	pH	7.4	6.95	7.6	7.46	---	---	7.86	7.55	7.47	7.45	7.56	7.64	7.51	7.5	7.45	7.77
pH @ 15° C	NoRs	pH	---	---	6.79	6.44	6.66	6.34	6.91	6.61	---	---	6.72	6.63	---	---	7.17	6.71
TSS	TOT	mg/L	---	---	190	10	56	6	270	13	---	---	290	7.6	---	---	220	6.8
H2S	TOT	mg/L	0.2	0.019	0.43	0.024	---	---	---	---	---	---	---	---	---	---	---	---
Sulfide	TOT	mg/L	0.18	0.018	0.49	0.022	0.22	0.019	1.3	0.0082	9.6	0.028	13	0.027	4.1	<0.0018	2.8	0.021
Tetrabromomethane	TOT	µg/L	---	---	<50	<50	<50	<50	<50	<50	---	---	<50	<50	---	---	<50	<50
4-Methyl-2-Pentanone	TOT	µg/L	---	---	<10	<10	<10	<10	<10	<10	---	---	<10	<10	---	---	<10	<10
Dimethyl Ketone	TOT	µg/L	---	---	35	<15	23	<15	140	130	---	---	57	<15	---	---	44	<15
Endrin Ketone	TOT	ng/L	---	---	---	<0.294	---	<0.106	---	---	---	---	---	<0.105	---	---	---	<0.112
Isophorone	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Uranium	DIS	µg/L	---	---	---	---	---	---	0.0808	0.0093	0.0126	0.0039	0.0029	0.0155	0.0191	0.0028	0.0296	0.0045
Lithium	DIS	µg/L	---	---	---	---	---	---	2.15	2.55	2.91	2.65	3.02	2.92	2.83	2.78	3.06	2.97
Potassium	DIS	mg/L	15.5	13.4	14	13.6	11.5	10.5	17.4	15.6	19.5	17.2	17.9	20.2	18.9	17.1	16.1	15.2
Potassium	TOT	mg/L	14.4	12	13	11.7	11.6	9.95	17.6	15.8	18	14.7	18.6	16.7	19.8	16.9	16.7	14.5
Sodium	DIS	mg/L	---	---	---	---	---	---	---	---	112	100	105	108	108	98.5	91	96.4
Barium	DIS	µg/L	18.7	7.5	7.53	6.44	6.87	6.82	4.83	4.93	10.1	8.72	9.24	8.66	7.91	8.61	8.09	6.77
Barium	TOT	µg/L	16.6	6.79	16	6.16	11.8	6.95	15.7	5.84	18	8.73	19.6	8.78	9.28	8.69	13.4	6.78
Beryllium	DIS	µg/L	0.218	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium	TOT	µg/L	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Calcium	DIS	mg/L	27.2	22.3	18	21.1	19.1	20.4	15.9	17.7	18.9	21.5	21.8	19.8	18.2	20.3	22.7	21.5
Calcium	TOT	mg/L	21.4	19.7	20.1	19.2	21.4	20.1	19.6	18.1	19.6	17.3	20	20.1	20.5	20	24.6	20.7
Magnesium	DIS	mg/L	15.1	14.2	12.6	14	8.58	8.12	8.97	10.4	12.5	10.9	11	12.5	12.6	10.5	11.5	10.7
Magnesium	TOT	mg/L	14.5	12.6	12.1	12.8	8.75	7.83	9.59	10.7	12	8.96	11.9	10.3	13.2	10.2	11.9	10.3
Strontium	DIS	µg/L	---	---	---	---	---	---	66.9	83.4	108	107	106	98.7	100	97.8	113	111
Thallium	DIS	µg/L	0.0251	0.0023	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	TOT	µg/L	0.01	<0.002	0.0039	<0.002	0.0042	<0.002	0.0056	<0.002	0.004	<0.002	0.0066	<0.002	<0.002	<0.002	0.0037	<0.002
Antimony	DIS	µg/L	0.497	0.262	0.21	0.22	0.223	0.267	0.149	0.22	0.113	0.288	0.3	0.295	0.256	0.283	0.238	0.28
Antimony	TOT	µg/L	0.51	0.221	0.217	0.188	0.232	0.251	0.166	0.226	0.364	0.252	0.45	0.269	0.307	0.271	0.24	0.262
Arsenic	DIS	µg/L	2.02	0.354	0.306	0.292	0.328	0.234	0.402	0.296	0.3	0.253	0.263	0.304	0.308	0.241	0.46	0.342
Arsenic	TOT	µg/L	0.53	0.309	0.366	0.255	0.377	0.227	0.451	0.298	0.363	0.209	0.451	0.238	0.353	0.243	0.636	0.346
Boron	DIS	µg/L	---	---	---	---	---	---	136	191	213	236	243	226	210	221	197	209
Silicon	DIS	µg/L	---	---	---	---	---	---	3900	3560	3000	2900	2900	3110	2710	2830	3550	3160
Aluminum	DIS	µg/L	507	28.3	33.8	12.2	33.6	14.1	24.4	14.8	31.4	11.5	14.5	14.3	32.2	14.6	35.5	12.7
Aluminum	TOT	µg/L	428	34.9	178	25.9	162	17.8	199	30.4	166	17.7	221	19.3	54.6	18.4	253	20.9
Bismuth	DIS	µg/L	---	---	---	---	---	---	0.17	0.194	0.113	0.193	0.18	0.368	0.361	0.164	0.253	0.114
Lead	DIS	µg/L	3.52	0.488	0.44	0.288	0.459	0.249	0.382	0.302	0.527	0.378	0.344	0.379	0.579	0.324	0.502	0.297
Lead	TOT	µg/L	1.82	0.397	1.27	0.367	1.3	0.275	1.51	0.426	2.16	0.35	2.25	0.351	0.779	0.35	2	0.307
Tin	DIS	µg/L	7.21	0.61	0.7	0.46	0.7	0.37	0.99	0.66	0.55	0.66	0.73	0.93	1	0.68	0.51	0.53
Tin	TOT	µg/L	2.1	0.45	1.08	0.42	0.82	0.37	1.72	0.56	1.24	0.57	1.34	0.68	1.37	0.68	0.82	0.46
Phosphorus	DIS	µg/L	4080	3130	3520	2300	2760	257	5420	2350	5670	923	376	456	4510	226	3640	113
Phosphorus	TOT	µg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5120	261
Selenium	DIS	µg/L	0.614	0.109	0.141	0.101	0.193	0.121	0.271	0.163	6	0.219	0.158	0.168	0.169	0.155	0.178	0.122
Selenium	TOT	µg/L	0.46	0.127	0.242	0.109	0.255	0.122	0.393	0.168	0.299	0.13	0.455	0.16	0.24	0.142	0.241	0.118
Sulfur	DIS	mg/L	---	---	---	---	---	---	---	---	81.3	13	13.1	11.2	11.7	13.2	13.8	13.9
Chromium III	TOT	mg/L	0.0041	<0.00099	0.002	<0.00099	<0.005	<0.00099	0.0065	0.0028	0.022	0.0041	<0.005	<0.005	0.014	<0.005	<0.099	<0.00099
Chromium VI	TOT	mg/L	<0.00099	<0.00099	<0.00099	<0.00099	<0.005	<0.00099	<0.00099	<0.00099	<0.00099	0.0047	<0.005	<0.005	<0.005	<0.005	<0.099	<0.00099
Dibutyltin	TOT	µg/L	---	---	0.003	<0.001	0.008	<0.001	<0.001	<0.001	---	---	0.009	<0.001	---	---	---	---
Dibutyltin Dichloride	TOT	µg/L	---	---	0.004	<0.001	0.011	<0.001	<0.001	<0.001	---	---	0.011	<0.001	---	---	---	---
Methyl Mercury	TOT	µg/L	---	---	---	---	0.367	<0.023	---	---	---	---	---	---	---	---	---	---
Methyl Mercury	TOT	ng/L	---	---	0.36	<0.05	---	---	0.26	<0.05	---	---	0.054	<0.05	---	---	0.54	<0.05
Monobutyltin	TOT	µg/L	---	---	0.019	0.034	<0.001	0.01	0.002	0.011	---	---	0.009	0.011	---	---	---	---
Monobutyltin Trichloride	TOT	µg/L	---	---	0.031	0.054	<0.001	0.017	0.003	0.017	---	---	0.014	0.018	---	---	---	---
Tributyltin	TOT	µg/L	---	---	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	---	---	<0.001	<0.001	---	---	---	---
Tributyltin Chloride	TOT	µg/L	---	---	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	---	---	<0.001	<0.001	---	---	---	---
Cadmium	DIS	µg/L	0.232	0.0331	0.0147	0.0191	0.0185	0.0192	0.0275	0.0109	0.0214	0.013	0.0063	0.0111	0.0342	0.0054	0.0196	<0.005
Cadmium	TOT	µg/L	0.173	0.0284	0.0993	0.0221	0.142	0.0251	0.219	0.0317	0.123	0.0116	0.214	0.01	0.0667	0.0089	0.143	0.0059
Chromium	DIS	µg/L	6.23	0.37	0.45	0.36	0.45	0.33	0.38	0.45	1.18	0.7	0.78	0.98	25.7	0.72	0.41	0.35
Chromium	TOT	µg/L	4.14	0.76	2.04	0.72	0.7	0.32	6.51	2.84	22.3	8.81	1.78	0.81	13.8	0.9	1.15	0.34
Cobalt	DIS	µg/L	1.79	0.306	0.265	0.252	0.276	0.25	0.409	0.335	0.293	0.284	0.298	0.335	0.364	0.303	0.287	0.248
Cobalt	TOT	µg/L	0.693	0.256	0.36	0.242	0.374	0.237	0.611	0.359	0.487	0.275	0.53	0.291	0.396	0.287	0.484	0.254
Copper	DIS	µg/L	30.1	12.9	19.7	7.64	25.3	6.39	23.4	9.41	23.2	10.2	7.87	8.29	30.4	7.07	16.5	4.95
Copper	TOT	µg/L	52.7	11.6	33.4	10.1	37.3	7.82	57.4	13.8	52.2	10.1	63.5	9.64	39.1	9.34	30.5	5.99
Iron	DIS	µg/L	681	97.8	386	75.2	190	57.8	705	171	389	115	125	135	355	131	401	119
Iron	TOT	µg/L	789	124	493	109	346	65.6	1560	228	480	124	689	140	466	143	655	144
Manganese	DIS	µg/L	53.3	27.3	25.4	24.8	31.1	30.1	23.7	40.3	31.8	31.3	34.3	28.4	28.5	32.4	29.7	28.8
Manganese	TOT	µg/L	37.3	24.8	31	24.8	40.6	31.1	42.4	42	34.7	27.2	37.1	32.6	31.6	32.3	39	31
Mercury	DIS	µg/L	0.0053	<0.0019	0.0055	<0.0019	0.0038	<0.0019	0.0028	<0.0019	<0.038	<0.0019	<0.038	<0.0019	0.002	<0.0019	0.0049	<0.0019
Mercury	TOT	µg/L	<0.038	0.0025	<0.038	0.0033	<0.038	<0.0019	<0.038	0.0035	<0.038	0.0033	<0.038	<0.0019	<0.038	<0.0019	<0.038	<0.038
Molybdenum	DIS	µg/L	2.09	1.15	0.917	0.957	1.52	1.04	0.912	2.83	0.057	0.859	0.795	0.636	21	0.837	1.23	1.24
Molybdenum	TOT	µg/L	4.23	1.33	2.3	1.26	1.51	1.04	6.06	5.43	20.9	9.28	1.32	0.786	15.4	0.811	1.2	1.17
Nickel	DIS	µg/L	17.9	1.73	1.78	1.57	1.73	1.55	2.26	2.04	2.53	2.04	2.32	3	104	2.54	1.84	1.57
Nickel	TOT	µg/L	13.6	2.65	6.77	2.67	2.11	1.54	26.1	12.2	85.5	35.5	3.83	2.31	58.3	2.51	2.59	1.52

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Silver	DIS	µg/L	0.016	0.0106	0.0273	<0.005	0.0307	<0.005	0.0261	0.0124	0.0087	0.014	0.0106	0.0112	0.0489	0.0122	0.0317	0.0068
Silver	TOT	µg/L	0.182	0.021	0.038	0.015	0.027	<0.01	0.079	0.027	0.136	0.022	0.188	0.022	0.076	0.017	0.035	0.011
Titanium	DIS	µg/L	---	---	---	---	---	---	1.02	<0.5	0.69	<0.5	<0.5	1.03	0.98	<0.5	0.77	<0.5
Vanadium	DIS	µg/L	---	---	---	---	---	---	1.15	0.41	0.22	0.21	0.25	0.35	0.28	0.27	0.34	0.3
Zinc	DIS	µg/L	381	39.9	19.1	36.5	26.7	33.3	29.7	38.6	16.5	31.7	32.8	24.3	22.9	30.2	16.6	17.3
Zinc	TOT	µg/L	95.5	36.6	69.9	32.9	77.1	34.3	118	43.9	112	29	127	31.1	36.5	31.1	94.1	18.1
Zirconium	DIS	µg/L	---	---	---	---	---	---	0.35	0.17	0.44	0.13	0.15	0.61	0.49	0.13	0.4	0.11
1,1,1,2-Tetrachloroethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Dichlorodifluoromethane	TOT	µg/L	---	---	<2	<2	<2	<2	<2	<2	---	---	<2	<2	---	---	<2	<2
Nitrobenzene	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
N-nitrosodimethylamine	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
N-Nitrosodi-N-Propylamine	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Benzene	TOT	µg/L	---	---	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Ethylbenzene	TOT	µg/L	---	---	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Toluene	TOT	µg/L	---	---	0.7	<0.4	0.87	<0.4	0.57	<0.4	---	---	1.8	0.55	---	---	1.8	<0.4
Xylenes	TOT	µg/L	---	---	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
1,2,3,4-Tetrachlorobenzene	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.21	---	---	---	<0.223
1,3,5-Trichlorobenzene	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.21	---	---	---	<0.223
1,4-Dioxane	TOT	µg/L	---	---	<0.1	0.19	0.25	0.22	<0.17	<0.21	---	---	0.58	0.22	---	---	<0.66	0.24
1,7-Dimethylxanthine	TOT	ng/L	---	---	32500	42.7	51800	298	38400	202	---	---	38100	512	---	---	28200	469
37CL-2,3,7,8-TCDD	TOT	%Recov	---	---	62.2	66	69.9	39	66.3	71	---	---	75.8	74.6	---	---	74.5	80.2
Acrolein	NoRs	µg/L	---	---	<2.8	<2.8	<2.8	<2.8	3.5	<2.8	---	---	---	---	---	---	---	---
Acrolein	TOT	µg/L	---	---	---	---	---	---	---	---	---	---	<2.8	<2.8	---	---	<2.8	<2.8
Acrylonitrile	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Delta-Hch Or Delta-Bhc	TOT	ng/L	---	---	---	<0.112	---	<0.106	---	---	---	---	---	<0.105	---	---	---	<0.112
Dibromomethane	TOT	µg/L	---	---	<2	2.6	<2	<2	<2	<2	---	---	<2	<2	---	---	<2	4.6
Pentachlorobenzene	TOT	ng/L	---	---	---	0.07	---	0.032	---	---	---	---	---	0.025	---	---	---	0.034
Perfluorobutanoic acid	TOT	ng/L	---	---	6.06	16.9	47.8	41.8	<12.8	<12.8	---	---	9.45	9.9	---	---	23.8	14.1
Tetrachloromethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Trans-Chlordane	TOT	ng/L	---	---	---	<0.0449	---	0.057	---	---	---	---	---	<0.042	---	---	---	<0.0447
Trans-Nonachlor	TOT	ng/L	---	---	---	<0.0449	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
Tribromomethane	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Trichloromethane	TOT	µg/L	---	---	2.4	<1	3.9	1.2	2.4	1.3	---	---	2.4	1.2	---	---	1.7	<1
1,2-diphenylhydrazine	TOT	µg/L	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	---	---	<0.05	<0.05	---	---	<0.05	<0.05
2,4-dinitrotoluene	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
2,6-dinitrotoluene	TOT	µg/L	---	---	<0.34	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
3,3-dichlorobenzidine	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
4-Bromophenyl Phenyl Ether	TOT	µg/L	---	---	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	---	---	<0.05	<0.05	---	---	<0.05	<0.05
4-Chlorophenyl Phenyl Ether	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Hexachlorocyclopentadiene	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Hexachloroethane	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Alpha-Terpineol	TOT	µg/L	---	---	8.2	<5	<5	<5	5.5	<5	---	---	8.8	<5	---	---	7.9	<5
1,1,1-trichloroethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1,2,2-tetrachloroethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1,2-trichloroethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1-dichloroethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,1-dichloroethene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,2,3-Trichlorobenzene	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.21	---	---	---	<0.223
1,2,4,5-/1,2,3,5-Tetrachlorobenzene	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.21	---	---	---	<0.223
1,2,4-trichlorobenzene	TOT	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	---	---	<0.2	<0.2	---	---	<0.2	<0.2

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
1,2,4-trichlorobenzene	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.21	---	---	---	<0.223
1,2-dibromoethane	TOT	µg/L	---	---	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	---	---	<0.2	<0.2	---	---	<0.2	<0.2
1,2-dichlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,2-dichlorobenzene	TOT	ng/L	---	---	---	0.49	---	0.299	---	---	---	---	---	0.918	---	---	---	0.54
1,2-dichloroethane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,2-dichloropropane	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,3-dichlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,3-dichlorobenzene	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.21	---	---	---	<0.223
1,4-dichlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
1,4-dichlorobenzene	TOT	ng/L	---	---	---	17.4	---	22.8	---	---	---	---	---	25.8	---	---	---	38.1
Bromodichloromethane	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Bromomethane	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Chlorobenzene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Chlorodibromomethane	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Chloroethane	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Chloroethene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Chloromethane	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Cis-1,2-Dichloroethene	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
cis-1,3-dichloropropene	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Hexachlorobutadiene	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Hexachlorobutadiene	TOT	ng/L	---	---	---	0.212	---	0.081	---	---	---	---	---	0.064	---	---	---	0.49
M & P Xylenes	TOT	µg/L	---	---	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Methyl Ethyl Ketone	TOT	µg/L	---	---	<50	<50	<50	<50	<50	<50	---	---	<50	<50	---	---	<50	<50
Methyl Tertiary Butyl Ether	TOT	µg/L	---	---	<4	<4	<4	<4	<4	<4	---	---	<4	<4	---	---	<4	<4
O-Xylene	TOT	µg/L	---	---	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4	<0.4	---	---	<0.4	<0.4
Styrene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Tetrachloroethene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Trans-1,2-Dichloroethene	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
trans-1,3-dichloropropene	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Trichloroethene	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Trichlorofluoromethane	TOT	µg/L	---	---	<4	<4	<4	<4	<4	<4	---	---	<4	<4	---	---	<4	<4
17 beta-Estradiol 3-benzoate	TOT	ng/L	---	---	<3.42	<0.864	<4.21	<0.71	<8.36	<1.43	---	---	<3.31	<0.781	---	---	<6.17	<0.824
Allyl Trenbolone	TOT	ng/L	---	---	<2.26	<1.39	<1.51	<1.5	<9.57	<2.27	---	---	<3.12	1.92	---	---	<3.22	<0.901
Androstenedione	TOT	ng/L	---	---	254	7.11	188	6.96	206	9.14	---	---	260	<3.29	---	---	153	1.68
Androsterone	TOT	ng/L	---	---	101	<212	227	<160	163	<159	---	---	85.7	-999	---	---	<118	<379
Desogestrel	TOT	ng/L	---	---	<252	<44.9	<913	<91.9	<853	<139	---	---	<1480	<119	---	---	<335	<54.7
Mestranol	TOT	ng/L	---	---	<353	<56.7	<175	<38	<176	<103	---	---	-999	<99.9	---	---	<201	<25.9
Norethindrone	TOT	ng/L	---	---	<6.07	<2.58	<13.5	<2.12	<6.28	<4.49	---	---	<6.61	<7.99	---	---	<6.47	<2.27
norgestrel	TOT	ng/L	---	---	<27	<2.86	<33	<4.42	<28.1	<13.9	---	---	89.7	<3.23	---	---	<31.3	<5.88
Progesterone	TOT	ng/L	---	---	30.8	<1.13	15.3	<1.16	57.2	3.21	---	---	35.1	<0.896	---	---	23.2	1.71
Testosterone	TOT	ng/L	---	---	75.3	<0.432	67.1	<1.23	51.4	<1.38	---	---	70.5	<2.98	---	---	37.3	<1.23
Total Phenols	TOT	mg/L	---	---	0.035	0.0024	0.027	<0.0015	0.042	0.0039	---	---	0.066	0.0026	---	---	<0.03	0.0022
2,4 + 2,5 Dichlorophenol	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
2,4,6-Tribromophenol	TOT	%	---	---	115	108	41	61	89	120	---	---	69	79	---	---	54	96
2-Chlorophenol	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
4-Chloro-3-Methylphenol	TOT	µg/L	---	---	<1	<1	<1	<1	<1	<1	---	---	<1	<1	---	---	<1	<1
Pentachlorophenol	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
2,4-dimethylphenol	TOT	µg/L	---	---	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
2,4-dinitrophenol	TOT	µg/L	---	---	<6.5	<6.5	<6.5	<6.5	<6.5	<6.5	---	---	<6.5	<6.5	---	---	<6.5	<6.5
2-Methyl-4,6-Dinitrophenol	TOT	µg/L	---	---	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
2-Nitrophenol	TOT	µg/L	---	---	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
Phenol	TOT	µg/L	---	---	11.8	<2.5	4.5	<2.5	10.2	<2.5	---	---	12.7	<2.5	---	---	10	<2.5

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
2,4,6-trichlorophenol	TOT	µg/L	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5	<0.5	---	---	<0.5	<0.5
Conductivity	TOT	µS/cm	---	---	980	870	660	500	950	800	---	---	1100	840	---	---	1000	910
Filter and HNO3 Preservation	NoRs	No Units	-999	-999	-999	-999	-999	-999	---	---	---	---	---	---	---	---	---	---
17 alpha-Dihydroequilin	TOT	ng/L	---	---	<7.82	<2.16	<7.39	<1.77	<3.92	<2.09	---	---	<4.31	<1.95	---	---	<7.96	<2.06
17 alpha-Estradiol	TOT	ng/L	---	---	<31.3	<8.64	<29.6	<7.1	<15.7	<8.35	---	---	23.3	<7.81	---	---	<31.8	11.1
17 alpha-Ethinyl-Estradiol	TOT	ng/L	---	---	<38.8	<10.7	<18.5	<6.44	<12	<8.94	---	---	<10.8	<4.88	---	---	<19.9	<5.15
17 beta-Estradiol	TOT	ng/L	---	---	<15.6	<4.32	30.6	<3.55	23.5	<4.17	---	---	<8.62	<4.44	---	---	<15.9	<4.12
Equilenin	TOT	ng/L	---	---	<1.56	<0.432	<1.48	<0.355	<2.26	<0.417	---	---	<1.35	<0.997	---	---	<2.35	<0.434
Equilin	TOT	ng/L	---	---	<7.82	<2.16	<7.39	<1.77	<3.92	<2.09	---	---	<4.31	<1.95	---	---	<7.96	<2.06
Estriol	TOT	ng/L	---	---	155	<22.9	176	<13.5	394	<42	---	---	226	<46.6	---	---	139	<30.8
Estrone	TOT	ng/L	---	---	50.2	3.52	40.6	<2.84	61.7	10.3	---	---	56.7	49	---	---	39.4	77.2
4-Nitrophenol	TOT	µg/L	---	---	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
4-n-Octylphenol	TOT	ng/L	---	---	<3.37	<1.16	<5.07	<1.12	<3.72	<3.19	---	---	<6.99	<2.84	---	---	<3.9	<1.77
4-Nonylphenol Diethoxylates	TOT	ng/L	---	---	1600	234	558	227	1350	569	---	---	1100	18.6	---	---	1910	433
4-Nonylphenol Monoethoxylates	TOT	ng/L	---	---	4020	336	3110	238	3350	751	---	---	6820	921	---	---	4830	624
Np	TOT	ng/L	---	---	1000	106	621	109	1300	58	---	---	2550	51.1	---	---	1690	9.26
1-Methylphenanthrene	TOT	ng/L	---	---	6.74	0.871	5.59	0.453	8.58	1.39	---	---	10.7	0.668	---	---	10.4	0.925
2,3,5-trimethylnaphthalene	TOT	ng/L	---	---	12	2.12	7.94	1.17	16.6	2.59	---	---	22.5	3.14	---	---	13.6	0.887
2,6-dimethylnaphthalene	TOT	ng/L	---	---	38.7	1.05	29.9	0.758	32.6	2.38	---	---	12.1	1.16	---	---	40.5	0.735
2-Chloronaphthalene	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
2-Methylnaphthalene	TOT	µg/L	---	---	0.023	<0.01	<0.01	<0.01	0.029	<0.01	---	---	<0.01	<0.01	---	---	0.016	<0.01
2-Methylnaphthalene	TOT	ng/L	---	---	21	3.4	14.2	1.83	19.7	4.77	---	---	29.5	6.87	---	---	31	2.08
Acenaphthene	TOT	µg/L	---	---	0.04	<0.01	0.032	<0.01	0.035	0.011	---	---	0.02	<0.01	---	---	0.045	<0.01
Acenaphthene	TOT	ng/L	---	---	40.8	10.2	29.7	8.18	42.9	14.8	---	---	32.7	8.76	---	---	91.8	8.53
Acenaphthylene	TOT	µg/L	---	---	0.025	<0.01	<0.01	<0.01	<0.01	<0.01	---	---	0.077	<0.01	---	---	<0.01	<0.01
Acenaphthylene	TOT	ng/L	---	---	1.64	0.557	0.878	0.44	0.734	0.512	---	---	0.916	0.836	---	---	1.09	0.35
Anthracene	TOT	µg/L	---	---	0.032	0.019	<0.01	<0.01	0.017	<0.01	---	---	<0.01	<0.01	---	---	<0.01	<0.01
Anthracene	TOT	ng/L	---	---	2.75	<0.205	3.86	<0.0954	4.58	<0.667	---	---	4.14	<0.287	---	---	4.97	0.335
Benzo(B)Fluoranthene + Benzo(J)Fluoranthene	TOT	µg/L	---	---	0.039	<0.01	<0.01	<0.01	0.033	<0.01	---	---	0.018	<0.01	---	---	<0.01	<0.01
Benzo(K)Fluoranthene	TOT	µg/L	---	---	<0.01	<0.01	<0.01	<0.01	0.021	<0.01	---	---	<0.01	<0.01	---	---	<0.01	<0.01
Benzo[a]anthracene	TOT	µg/L	---	---	<0.01	<0.01	<0.01	<0.01	0.27	<0.01	---	---	<0.01	<0.01	---	---	<0.01	<0.01
Benzo[a]anthracene	TOT	ng/L	---	---	3.44	0.229	2.35	0.161	4.62	0.368	---	---	6.22	0.184	---	---	10.7	0.257
Benzo[a]pyrene	TOT	µg/L	---	---	0.0072	<0.005	<0.005	<0.005	0.0063	<0.005	---	---	0.044	<0.005	---	---	<0.005	<0.005
Benzo[a]pyrene	TOT	ng/L	---	---	1.69	<0.296	2.38	<0.0926	3.08	0.384	---	---	3.86	<0.273	---	---	9.74	<0.218
Benzo[b]fluoranthene	TOT	µg/L	---	---	0.039	<0.01	<0.01	<0.01	0.033	<0.01	---	---	<0.01	<0.01	---	---	<0.01	<0.01
Benzo[b]fluoranthene	TOT	ng/L	---	---	2.58	0.179	2.9	0.524	3.84	0.333	---	---	4.73	<0.155	---	---	9.84	0.15
Benzo[e]pyrene	TOT	ng/L	---	---	2.25	<0.284	2.65	<0.0877	3.48	0.436	---	---	5.16	<0.262	---	---	8.35	0.215
Benzo[ghi]perylene	TOT	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02
Benzo[ghi]perylene	TOT	ng/L	---	---	1.9	0.276	1.71	0.136	<2.56	0.406	---	---	4.44	<0.207	---	---	7.08	0.138
Benzo[J,K]Fluoranthenes	TOT	ng/L	---	---	1.89	<0.201	1.58	<0.0704	2.84	0.267	---	---	3.2	<0.201	---	---	9.55	<0.155
Chrysene	TOT	µg/L	---	---	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	---	---	0.016	<0.01	---	---	<0.01	<0.01
Chrysene	TOT	ng/L	---	---	5.08	0.714	3.49	0.277	6.19	0.896	---	---	10.8	0.416	---	---	19.1	0.662
dibenzo(a,h)anthracene	TOT	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02
dibenzo(a,h)anthracene	TOT	ng/L	---	---	3.35	<0.14	3.24	0.112	3.77	<0.295	---	---	<0.488	<0.277	---	---	<1.48	<0.123
Dibenzothiophene	TOT	ng/L	---	---	13.4	1.22	9.69	1.13	16.7	1.95	---	---	17.8	2.72	---	---	30.2	1.52
Fluoranthene	TOT	µg/L	---	---	0.045	<0.01	0.014	<0.01	0.043	<0.01	---	---	0.042	<0.01	---	---	0.076	0.034
Fluoranthene	TOT	ng/L	---	---	34.3	5.29	30.9	4.24	44.2	6.94	---	---	45.6	4.52	---	---	80.7	9.76
Fluorene	TOT	µg/L	---	---	0.045	<0.01	0.042	<0.01	0.029	<0.01	---	---	0.028	<0.01	---	---	0.032	<0.01
Fluorene	TOT	ng/L	---	---	<24.6	2.93	17.7	1.54	23.1	5.09	---	---	21.7	<0.265	---	---	47.8	4.02

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
High Molecular Weight PAH`s	TOT	µg/L	---	---	0.13	<0.02	<0.02	<0.02	0.42	<0.02	---	---	0.15	<0.02	---	---	0.11	0.034
Indeno(1,2,3-C,D)Pyrene	TOT	µg/L	---	---	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	---	---	<0.02	<0.02	---	---	<0.02	<0.02
Indeno(1,2,3-C,D)Pyrene	TOT	ng/L	---	---	3.28	0.288	1.41	0.122	6.31	0.529	---	---	1.89	<0.195	---	---	6.57	<0.132
Low Molecular Weight PAH`s	TOT	µg/L	---	---	0.35	0.057	0.14	<0.05	0.36	0.048	---	---	0.33	0.16	---	---	0.28	<0.01
Naphthalene	TOT	µg/L	---	---	0.055	0.018	0.029	<0.01	0.046	0.01	---	---	0.039	<0.01	---	---	0.05	<0.01
Naphthalene	TOT	ng/L	---	---	68.8	6.2	43.7	4.36	58	7.64	---	---	68.6	9.6	---	---	125	4.79
Perylene	TOT	ng/L	---	---	1.78	<0.277	1.11	<0.0932	1.08	<0.287	---	---	0.8	<0.297	---	---	5.61	1.03
Phenanthrene	TOT	µg/L	---	---	0.11	0.019	0.034	0.011	0.13	0.026	---	---	0.099	0.018	---	---	0.14	<0.01
Phenanthrene	TOT	ng/L	---	---	108	14.8	91	10.1	135	19.8	---	---	138	14.2	---	---	242	10.9
Pyrene	TOT	µg/L	---	---	0.039	0.014	<0.01	<0.01	0.036	0.017	---	---	0.029	<0.01	---	---	0.037	<0.01
Pyrene	TOT	ng/L	---	---	24	3.41	19.7	2.48	27.6	3.98	---	---	30.6	2.61	---	---	42.3	5
Total PAH	TOT	µg/L	---	---	0.48	0.07	0.15	<0.05	0.78	0.065	---	---	0.48	0.16	---	---	0.39	0.034
Pbde 10	TOT	pg/L	---	---	---	5.38	---	<1.7	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 100	TOT	pg/L	---	---	---	341	---	114	---	---	---	---	---	310	---	---	---	215
Pbde 105	TOT	pg/L	---	---	---	<3.99	---	<1.42	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 116	TOT	pg/L	---	---	---	66.9	---	<1.69	---	---	---	---	---	2.89	---	---	---	12
Pbde 119/120	TOT	pg/L	---	---	---	17.6	---	1.88	---	---	---	---	---	4.41	---	---	---	3.75
Pbde 12/13	TOT	pg/L	---	---	---	<1.12	---	1.46	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 126	TOT	pg/L	---	---	---	<2.31	---	<1.34	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 128	TOT	pg/L	---	---	---	<2.11	---	<1.34	---	---	---	---	---	<2.07	---	---	---	<2.29
Pbde 138/166	TOT	pg/L	---	---	---	14.6	---	5.79	---	---	---	---	---	14.8	---	---	---	10.3
Pbde 140	TOT	pg/L	---	---	---	5.17	---	1.64	---	---	---	---	---	4.68	---	---	---	2.95
Pbde 15	TOT	pg/L	---	---	---	1.16	---	1.55	---	---	---	---	---	2.29	---	---	---	<1.41
Pbde 153	TOT	pg/L	---	---	---	138	---	43.2	---	---	---	---	---	143	---	---	---	100
Pbde 154	TOT	pg/L	---	---	---	109	---	33	---	---	---	---	---	111	---	---	---	80.3
Pbde 155	TOT	pg/L	---	---	---	8.4	---	3.71	---	---	---	---	---	8.59	---	---	---	6
Pbde 17/25	TOT	pg/L	---	---	---	16.4	---	8.59	---	---	---	---	---	15.3	---	---	---	10.6
Pbde 181	TOT	pg/L	---	---	---	<3.63	---	<2.5	---	---	---	---	---	<2.22	---	---	---	<1.69
Pbde 183	TOT	pg/L	---	---	---	15.2	---	6.38	---	---	---	---	---	47.7	---	---	---	16.1
Pbde 190	TOT	pg/L	---	---	---	<5.93	---	<4.3	---	---	---	---	---	<4.01	---	---	---	<3.36
Pbde 203	TOT	pg/L	---	---	---	11.7	---	6.1	---	---	---	---	---	47.3	---	---	---	16.2
Pbde 206	TOT	pg/L	---	---	---	142	---	59.1	---	---	---	---	---	233	---	---	---	81.7
Pbde 207	TOT	pg/L	---	---	---	192	---	68.8	---	---	---	---	---	262	---	---	---	70.4
Pbde 208	TOT	pg/L	---	---	---	106	---	59.4	---	---	---	---	---	184	---	---	---	65.5
Pbde 209	TOT	pg/L	---	---	---	2730	---	1440	---	---	---	---	---	2040	---	---	---	1340
Pbde 28/33	TOT	pg/L	---	---	---	34.3	---	16	---	---	---	---	---	31.5	---	---	---	22.6
Pbde 30	TOT	pg/L	---	---	---	<1.4	---	<1.34	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 32	TOT	pg/L	---	---	---	<1.12	---	<1.34	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 35	TOT	pg/L	---	---	---	<1.12	---	<1.34	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 37	TOT	pg/L	---	---	---	4.64	---	2.97	---	---	---	---	---	2.09	---	---	---	<1.41
Pbde 47	TOT	pg/L	---	---	---	1670	---	677	---	---	---	---	---	1720	---	---	---	1170
Pbde 49	TOT	pg/L	---	---	---	40.9	---	13.9	---	---	---	---	---	37.8	---	---	---	25.4
Pbde 51	TOT	pg/L	---	---	---	4.93	---	1.99	---	---	---	---	---	6	---	---	---	3.63
Pbde 66	TOT	pg/L	---	---	---	34.5	---	17.6	---	---	---	---	---	36.8	---	---	---	20.5
Pbde 7	TOT	pg/L	---	---	---	<1.28	---	<1.61	---	---	---	---	---	2.9	---	---	---	2.83
Pbde 71	TOT	pg/L	---	---	---	8.28	---	2.9	---	---	---	---	---	4.65	---	---	---	3.95
Pbde 75	TOT	pg/L	---	---	---	2.53	---	<1.34	---	---	---	---	---	2.69	---	---	---	1.67
Pbde 77	TOT	pg/L	---	---	---	<1.12	---	<1.34	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 79	TOT	pg/L	---	---	---	33.4	---	41.1	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 8/11	TOT	pg/L	---	---	---	<1.12	---	<1.34	---	---	---	---	---	<1.35	---	---	---	<1.41
Pbde 85	TOT	pg/L	---	---	---	52.4	---	20.5	---	---	---	---	---	63.2	---	---	---	36.3

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Pbde 99	TOT	pg/L	---	---	---	1600	---	539	---	---	---	---	---	1490	---	---	---	1040
Decachloro Biphenyl	TOT	pg/L	---	---	---	4.34	---	<-999	---	<-999	---	---	---	<-999	---	---	---	2.65
PCB	TOT	pg/L	---	---	---	6.33	---	3.49	---	15.2	---	---	---	30.8	---	---	---	6.62
PCB 10	TOT	pg/L	---	---	---	<0.716	---	<3.66	---	<0.881	---	---	---	<0.675	---	---	---	<0.829
PCB 103	TOT	pg/L	---	---	---	0.731	---	<2.08	---	<0.689	---	---	---	<1.41	---	---	---	<1.53
PCB 104	TOT	pg/L	---	---	---	0.751	---	<1.68	---	<0.676	---	---	---	<0.675	---	---	---	<0.703
PCB 105	TOT	pg/L	---	---	---	7.24	---	3.21	---	8.3	---	---	---	8.2	---	---	---	7.8
PCB 106	TOT	pg/L	---	---	---	<0.707	---	<1.55	---	<0.676	---	---	---	<0.899	---	---	---	<1.31
PCB 107/124	TOT	pg/L	---	---	---	0.851	---	<1.54	---	0.821	---	---	---	1	---	---	---	<1.29
PCB 109	TOT	pg/L	---	---	---	0.968	---	<1.44	---	1.7	---	---	---	0.913	---	---	---	1.91
PCB 11	TOT	pg/L	---	---	---	62.6	---	35.3	---	85.8	---	---	---	110	---	---	---	48.9
PCB 110/115	TOT	pg/L	---	---	---	25.4	---	12.5	---	30.2	---	---	---	26.7	---	---	---	24.7
PCB 111	TOT	pg/L	---	---	---	<0.707	---	<1.74	---	<0.676	---	---	---	<1.12	---	---	---	<1.22
PCB 112	TOT	pg/L	---	---	---	<0.707	---	<1.74	---	<0.676	---	---	---	<1.13	---	---	---	<1.24
PCB 114	TOT	pg/L	---	---	---	0.756	---	<1.46	---	0.786	---	---	---	1.24	---	---	---	<1.18
PCB 118	TOT	pg/L	---	---	---	19.4	---	10.8	---	21.9	---	---	---	21.5	---	---	---	24.3
PCB 12/13	TOT	pg/L	---	---	---	2.58	---	<3.85	---	3.56	---	---	---	4.19	---	---	---	1.87
PCB 120	TOT	pg/L	---	---	---	<0.707	---	<1.58	---	<0.676	---	---	---	<1.1	---	---	---	<1.24
PCB 121	TOT	pg/L	---	---	---	<0.707	---	<1.75	---	<0.676	---	---	---	<1.12	---	---	---	<1.24
PCB 122	TOT	pg/L	---	---	---	<0.707	---	<1.64	---	<0.693	---	---	---	<1.01	---	---	---	<1.46
PCB 123	TOT	pg/L	---	---	---	1.37	---	<1.5	---	0.755	---	---	---	<0.91	---	---	---	<1.38
PCB 126	TOT	pg/L	---	---	---	<0.707	---	<1.65	---	<0.676	---	---	---	<0.888	---	---	---	<1.28
PCB 127	TOT	pg/L	---	---	---	<0.707	---	<1.63	---	<0.676	---	---	---	<0.91	---	---	---	<1.3
PCB 128/166	TOT	pg/L	---	---	---	3.43	---	1.83	---	4.07	---	---	---	3.42	---	---	---	4.95
PCB 129/138/160/163	TOT	pg/L	---	---	---	22.7	---	14.5	---	31.2	---	---	---	30.3	---	---	---	30.6
PCB 130	TOT	pg/L	---	---	---	1.26	---	<2.2	---	1.82	---	---	---	1.91	---	---	---	<2.1
PCB 131	TOT	pg/L	---	---	---	<0.707	---	<2.14	---	<1.06	---	---	---	<1.64	---	---	---	<2.31
PCB 132	TOT	pg/L	---	---	---	6.77	---	3.58	---	9.66	---	---	---	7.34	---	---	---	8.82
PCB 133	TOT	pg/L	---	---	---	0.718	---	<2.09	---	<0.962	---	---	---	<1.51	---	---	---	<1.94
PCB 134/143	TOT	pg/L	---	---	---	1.34	---	<2.17	---	1.4	---	---	---	<1.6	---	---	---	<2.13
PCB 135/151/154	TOT	pg/L	---	---	---	6.8	---	4.54	---	9.47	---	---	---	7.67	---	---	---	8.04
PCB 136	TOT	pg/L	---	---	---	2.74	---	<0.904	---	3.8	---	---	---	2.46	---	---	---	2.83
PCB 137	TOT	pg/L	---	---	---	1.27	---	<2.1	---	1.45	---	---	---	<1.4	---	---	---	<1.82
PCB 139/140	TOT	pg/L	---	---	---	0.799	---	<1.97	---	<0.861	---	---	---	<1.31	---	---	---	<1.82
PCB 14	TOT	pg/L	---	---	---	1.62	---	<3.56	---	<0.815	---	---	---	<0.675	---	---	---	<0.795
PCB 141	TOT	pg/L	---	---	---	3.44	---	<1.96	---	4.47	---	---	---	2.8	---	---	---	6.2
PCB 142	TOT	pg/L	---	---	---	<0.707	---	<2.2	---	<1.03	---	---	---	<1.58	---	---	---	<2.15
PCB 144	TOT	pg/L	---	---	---	1.21	---	<1.11	---	1.6	---	---	---	1.41	---	---	---	<1
PCB 145	TOT	pg/L	---	---	---	<0.707	---	<0.945	---	<0.676	---	---	---	<0.701	---	---	---	<0.759
PCB 146	TOT	pg/L	---	---	---	3.03	---	3.7	---	3.4	---	---	---	6.44	---	---	---	6.05
PCB 147/149	TOT	pg/L	---	---	---	15.3	---	6.88	---	24.2	---	---	---	14.6	---	---	---	15.5
Pcb 148	TOT	pg/L	---	---	---	<0.707	---	<1.18	---	<0.786	---	---	---	<0.942	---	---	---	<1.03
PCB 15	TOT	pg/L	---	---	---	9.62	---	6.11	---	6.14	---	---	---	8.32	---	---	---	7.54
PCB 150	TOT	pg/L	---	---	---	<0.707	---	<0.931	---	<0.676	---	---	---	<0.681	---	---	---	<0.744
PCB 152	TOT	pg/L	---	---	---	<0.707	---	<0.91	---	<0.676	---	---	---	<0.703	---	---	---	<0.766
PCB 153/168	TOT	pg/L	---	---	---	21	---	13.7	---	20	---	---	---	30.5	---	---	---	24.8
PCB 155	TOT	pg/L	---	---	---	1.89	---	<0.868	---	4.08	---	---	---	2.14	---	---	---	1.82
PCB 155L	TOT	%Recov	---	---	---	62.8	---	61.1	---	21.5	---	---	---	69.5	---	---	---	63.9
PCB 156157	TOT	pg/L	---	---	---	2.84	---	<1.94	---	4.1	---	---	---	3.25	---	---	---	3.31
PCB 158	TOT	pg/L	---	---	---	1.88	---	<1.45	---	2.99	---	---	---	2.21	---	---	---	3.55
PCB 159	TOT	pg/L	---	---	---	<0.707	---	<1.5	---	<0.71	---	---	---	<1.04	---	---	---	<1.47
PCB 16	TOT	pg/L	---	---	---	9.5	---	5.08	---	7.27	---	---	---	6.79	---	---	---	6.7
PCB 161	TOT	pg/L	---	---	---	<0.707	---	<1.5	---	<0.729	---	---	---	<1.08	---	---	---	<1.45

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
PCB 162	TOT	pg/L	---	---	---	<0.707	---	<1.57	---	<0.702	---	---	---	<1.02	---	---	---	<1.39
PCB 164	TOT	pg/L	---	---	---	1.02	---	<1.51	---	1.64	---	---	---	1.29	---	---	---	2.23
PCB 165	TOT	pg/L	---	---	---	<0.707	---	<1.68	---	<0.75	---	---	---	<1.12	---	---	---	<1.52
PCB 167	TOT	pg/L	---	---	---	1.02	---	<1.42	---	1.32	---	---	---	1.64	---	---	---	<1.3
PCB 169	TOT	pg/L	---	---	---	<0.707	---	<1.59	---	<0.676	---	---	---	<0.998	---	---	---	<1.26
PCB 17	TOT	pg/L	---	---	---	6.87	---	4.21	---	4.17	---	---	---	5.88	---	---	---	5.2
PCB 170	TOT	pg/L	---	---	---	4.61	---	2.73	---	5.72	---	---	---	7	---	---	---	5.66
PCB 171/173	TOT	pg/L	---	---	---	1.15	---	<1.51	---	2.86	---	---	---	1.7	---	---	---	<1.32
PCB 172	TOT	pg/L	---	---	---	<0.707	---	<1.54	---	<1.12	---	---	---	1.89	---	---	---	<1.32
PCB 175	TOT	pg/L	---	---	---	<0.707	---	<1.37	---	<0.992	---	---	---	<0.825	---	---	---	<1.18
PCB 176	TOT	pg/L	---	---	---	0.855	---	<1.08	---	1.22	---	---	---	<0.675	---	---	---	1.26
PCB 177	TOT	pg/L	---	---	---	1.95	---	1.66	---	3.43	---	---	---	3.23	---	---	---	5.66
PCB 178	TOT	pg/L	---	---	---	1.41	---	<1.47	---	1.82	---	---	---	1.76	---	---	---	2.09
PCB 179	TOT	pg/L	---	---	---	1.78	---	<1.05	---	2.91	---	---	---	1.12	---	---	---	2.22
PCB 18/30	TOT	pg/L	---	---	---	14.5	---	7.94	---	10.9	---	---	---	10.2	---	---	---	11.6
PCB 180/193	TOT	pg/L	---	---	---	10.1	---	7.01	---	14.9	---	---	---	15.9	---	---	---	14.9
PCB 181	TOT	pg/L	---	---	---	<0.707	---	<1.44	---	<0.985	---	---	---	<0.83	---	---	---	<1.22
PCB 182	TOT	pg/L	---	---	---	<0.707	---	<1.39	---	<0.942	---	---	---	<0.795	---	---	---	<1.12
PCB 183/185	TOT	pg/L	---	---	---	1.96	---	<1.37	---	3.58	---	---	---	5.43	---	---	---	5.66
PCB 184	TOT	pg/L	---	---	---	4.09	---	1.38	---	19.8	---	---	---	3.09	---	---	---	2.42
PCB 186	TOT	pg/L	---	---	---	<0.707	---	<1.13	---	<0.748	---	---	---	<0.675	---	---	---	<0.9
PCB 187	TOT	pg/L	---	---	---	4.97	---	3.45	---	7.22	---	---	---	10.7	---	---	---	9.66
PCB 188	TOT	pg/L	---	---	---	<0.707	---	<1.06	---	<1.12	---	---	---	<0.675	---	---	---	<0.809
PCB 189	TOT	pg/L	---	---	---	<0.707	---	<1.34	---	<0.676	---	---	---	<0.675	---	---	---	<1.34
PCB 19	TOT	pg/L	---	---	---	2.51	---	2.26	---	1.08	---	---	---	1.71	---	---	---	3.19
PCB 190	TOT	pg/L	---	---	---	<0.707	---	<1.18	---	1.17	---	---	---	1.13	---	---	---	1.69
PCB 191	TOT	pg/L	---	---	---	<0.707	---	<1.13	---	<0.817	---	---	---	<0.675	---	---	---	<1.01
PCB 192	TOT	pg/L	---	---	---	<0.707	---	<1.23	---	<0.85	---	---	---	<0.69	---	---	---	<1.01
PCB 194	TOT	pg/L	---	---	---	1.93	---	<2.1	---	4.31	---	---	---	5.55	---	---	---	4.31
PCB 195	TOT	pg/L	---	---	---	<0.707	---	<2.15	---	0.764	---	---	---	1.37	---	---	---	1.6
PCB 196	TOT	pg/L	---	---	---	0.843	---	<1.5	---	0.893	---	---	---	3.13	---	---	---	1.08
PCB 197/200	TOT	pg/L	---	---	---	<0.707	---	<1.12	---	0.899	---	---	---	<0.675	---	---	---	0.876
PCB 198/199	TOT	pg/L	---	---	---	2.06	---	<1.54	---	4.38	---	---	---	7.88	---	---	---	4.05
PCB 2	TOT	pg/L	---	---	---	3.53	---	3.19	---	8.11	---	---	---	5.9	---	---	---	4.07
PCB 20/28	TOT	pg/L	---	---	---	25.5	---	11.3	---	20.2	---	---	---	21.3	---	---	---	15.9
PCB 201	TOT	pg/L	---	---	---	<0.707	---	<1.07	---	<0.676	---	---	---	1.3	---	---	---	<0.703
PCB 202	TOT	pg/L	---	---	---	0.748	---	<1.35	---	<0.676	---	---	---	1.64	---	---	---	1.3
PCB 203	TOT	pg/L	---	---	---	1.58	---	<1.53	---	2.32	---	---	---	3.8	---	---	---	2.12
PCB 204	TOT	pg/L	---	---	---	<0.707	---	<1.12	---	<0.676	---	---	---	<0.675	---	---	---	<0.703
PCB 205	TOT	pg/L	---	---	---	<0.707	---	<1.47	---	<0.676	---	---	---	<0.675	---	---	---	<0.703
PCB 206	TOT	pg/L	---	---	---	2.05	---	<3.74	---	1.98	---	---	---	10.6	---	---	---	1.98
PCB 207	TOT	pg/L	---	---	---	<0.707	---	<2.63	---	<0.774	---	---	---	1.8	---	---	---	<0.717
PCB 208	TOT	pg/L	---	---	---	1.15	---	<2.51	---	2.07	---	---	---	5.44	---	---	---	<0.703
PCB 209	TOT	pg/L	---	---	---	4.34	---	<1.53	---	6.13	---	---	---	10.1	---	---	---	2.65
PCB 21/33	TOT	pg/L	---	---	---	14.9	---	6.25	---	12.4	---	---	---	12.4	---	---	---	6.51
PCB 22	TOT	pg/L	---	---	---	10.7	---	4.37	---	8.23	---	---	---	7.56	---	---	---	6.18
PCB 23	TOT	pg/L	---	---	---	<0.707	---	<1.26	---	<0.676	---	---	---	<0.75	---	---	---	<0.792
PCB 24	TOT	pg/L	---	---	---	<0.707	---	<1.07	---	<0.676	---	---	---	<0.675	---	---	---	<0.703
PCB 25	TOT	pg/L	---	---	---	2.01	---	<1.05	---	1.81	---	---	---	1.98	---	---	---	1.34
PCB 26/29	TOT	pg/L	---	---	---	5.32	---	2.63	---	3.69	---	---	---	3.85	---	---	---	2.8
PCB 27	TOT	pg/L	---	---	---	1.53	---	<0.981	---	0.887	---	---	---	1.45	---	---	---	1.08
PCB 3	TOT	pg/L	---	---	---	5.35	---	3.14	---	8.39	---	---	---	8.1	---	---	---	7.44
PCB 31	TOT	pg/L	---	---	---	22.7	---	9.74	---	19.3	---	---	---	20.1	---	---	---	14.7

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
PCB 32	TOT	pg/L	---	---	---	5.36	---	2.36	---	4.5	---	---	---	4.13	---	---	---	4.4
PCB 34	TOT	pg/L	---	---	---	<0.707	---	<1.18	---	<0.676	---	---	---	<0.769	---	---	---	<0.814
PCB 35	TOT	pg/L	---	---	---	1.65	---	<1.29	---	2.68	---	---	---	2.68	---	---	---	1.28
PCB 36	TOT	pg/L	---	---	---	<0.707	---	<1.13	---	<0.676	---	---	---	<0.728	---	---	---	<0.765
PCB 37	TOT	pg/L	---	---	---	6.4	---	2.61	---	6.02	---	---	---	5.59	---	---	---	4.71
PCB 38	TOT	pg/L	---	---	---	<0.707	---	<1.23	---	<0.676	---	---	---	<0.773	---	---	---	<0.802
PCB 4	TOT	pg/L	---	---	---	6.3	---	<5.65	---	4.85	---	---	---	5.87	---	---	---	5.77
PCB 40/41/71	TOT	pg/L	---	---	---	10.4	---	3.04	---	9.5	---	---	---	9.74	---	---	---	8.14
PCB 42	TOT	pg/L	---	---	---	5.49	---	<1.79	---	5.1	---	---	---	3.93	---	---	---	3.52
PCB 43	TOT	pg/L	---	---	---	0.892	---	<2.19	---	<0.699	---	---	---	<1.16	---	---	---	<1.13
PCB 44/47/65	TOT	pg/L	---	---	---	42.2	---	12.8	---	34.1	---	---	---	88.8	---	---	---	24.2
PCB 46	TOT	pg/L	---	---	---	1.63	---	<2.06	---	0.872	---	---	---	<1.17	---	---	---	<1.07
PCB 48	TOT	pg/L	---	---	---	4.16	---	<1.69	---	3.4	---	---	---	2.74	---	---	---	2.48
PCB 49/69	TOT	pg/L	---	---	---	12	---	5.03	---	11.5	---	---	---	12.5	---	---	---	8.17
PCB 5	TOT	pg/L	---	---	---	1.12	---	<3.79	---	1.32	---	---	---	1.47	---	---	---	0.836
PCB 50/53	TOT	pg/L	---	---	---	3.64	---	2.15	---	2.48	---	---	---	2.07	---	---	---	2.52
PCB 52	TOT	pg/L	---	---	---	31.2	---	13	---	27.5	---	---	---	28.5	---	---	---	19.4
PCB 54	TOT	pg/L	---	---	---	<0.707	---	<1.55	---	<0.705	---	---	---	<0.901	---	---	---	<0.794
PCB 55	TOT	pg/L	---	---	---	<0.707	---	<1.7	---	<0.676	---	---	---	<0.79	---	---	---	<0.703
PCB 56	TOT	pg/L	---	---	---	6.18	---	2.72	---	6.69	---	---	---	5.27	---	---	---	6.83
PCB 57	TOT	pg/L	---	---	---	<0.707	---	<1.53	---	<0.676	---	---	---	<0.786	---	---	---	<0.703
PCB 58	TOT	pg/L	---	---	---	<0.707	---	<1.58	---	<0.676	---	---	---	<0.776	---	---	---	<0.703
PCB 59/62/75	TOT	pg/L	---	---	---	1.67	---	<1.29	---	1.61	---	---	---	1.43	---	---	---	1.25
PCB 6	TOT	pg/L	---	---	---	3.2	---	5.51	---	4.31	---	---	---	4.1	---	---	---	2.81
PCB 60	TOT	pg/L	---	---	---	3.94	---	<1.66	---	4.01	---	---	---	3.98	---	---	---	3.35
PCB 61/70/74/76	TOT	pg/L	---	---	---	31.6	---	11	---	35.9	---	---	---	27.8	---	---	---	23
PCB 63	TOT	pg/L	---	---	---	<0.707	---	<1.49	---	0.761	---	---	---	0.898	---	---	---	<0.703
PCB 64	TOT	pg/L	---	---	---	8.88	---	4.61	---	8.46	---	---	---	9.28	---	---	---	6.21
PCB 66	TOT	pg/L	---	---	---	12	---	4.42	---	14.4	---	---	---	12.8	---	---	---	9.97
PCB 67	TOT	pg/L	---	---	---	<0.707	---	<1.41	---	<0.676	---	---	---	<0.691	---	---	---	<0.703
PCB 68	TOT	pg/L	---	---	---	2.97	---	<1.42	---	2.27	---	---	---	14.3	---	---	---	2.48
PCB 7	TOT	pg/L	---	---	---	2.82	---	<3.62	---	0.901	---	---	---	1.39	---	---	---	4.43
PCB 72	TOT	pg/L	---	---	---	28.6	---	<1.45	---	<0.676	---	---	---	<0.75	---	---	---	<0.703
PCB 73	TOT	pg/L	---	---	---	<0.707	---	<1.26	---	<0.676	---	---	---	<0.76	---	---	---	<0.703
PCB 77	TOT	pg/L	---	---	---	1.33	---	<1.63	---	1.39	---	---	---	1.44	---	---	---	1.59
PCB 78	TOT	pg/L	---	---	---	<0.707	---	<1.73	---	<0.676	---	---	---	<0.796	---	---	---	<0.703
PCB 79	TOT	pg/L	---	---	---	<0.707	---	<1.4	---	<0.676	---	---	---	<0.688	---	---	---	<0.703
PCB 8	TOT	pg/L	---	---	---	12.7	---	8.4	---	11.3	---	---	---	10.8	---	---	---	7.16
PCB 80	TOT	pg/L	---	---	---	<0.707	---	<1.48	---	<0.676	---	---	---	<0.688	---	---	---	<0.703
PCB 81	TOT	pg/L	---	---	---	<0.707	---	<1.46	---	<0.676	---	---	---	<0.728	---	---	---	<0.703
PCB 82	TOT	pg/L	---	---	---	3.17	---	<2.56	---	3.24	---	---	---	3.6	---	---	---	2.05
PCB 83/99	TOT	pg/L	---	---	---	12.4	---	8.16	---	14.7	---	---	---	16.8	---	---	---	12.3
PCB 84	TOT	pg/L	---	---	---	6.79	---	<2.65	---	7.78	---	---	---	6.42	---	---	---	5.56
PCB 85/116/117	TOT	pg/L	---	---	---	4.67	---	2.28	---	5.18	---	---	---	3.97	---	---	---	4.42
PCB 86/87/97/108/119/125	TOT	pg/L	---	---	---	18.6	---	9.45	---	21.2	---	---	---	19.9	---	---	---	17.8
PCB 88/91	TOT	pg/L	---	---	---	3.2	---	<2.34	---	3.97	---	---	---	4.08	---	---	---	2.21
PCB 89	TOT	pg/L	---	---	---	<0.707	---	<2.39	---	<0.803	---	---	---	<1.69	---	---	---	<1.84
PCB 9	TOT	pg/L	---	---	---	1.22	---	<3.55	---	0.892	---	---	---	1.31	---	---	---	<0.768
PCB 90/101/113	TOT	pg/L	---	---	---	27.4	---	12.3	---	28.9	---	---	---	29	---	---	---	22.2
PCB 92	TOT	pg/L	---	---	---	4.91	---	2.64	---	5.6	---	---	---	5.1	---	---	---	4.46
PCB 93/95/98/100/102	TOT	pg/L	---	---	---	25.6	---	10.7	---	27.3	---	---	---	22.8	---	---	---	20.7
PCB 94	TOT	pg/L	---	---	---	<0.707	---	<2.59	---	<0.781	---	---	---	<1.63	---	---	---	<1.77
PCB 96	TOT	pg/L	---	---	---	<0.707	---	<1.33	---	<0.676	---	---	---	<0.675	---	---	---	<0.703

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
PCB174	TOT	pg/L	---	---	---	3.07	---	2.97	---	6.19	---	---	---	2.6	---	---	---	6.03
PCB-205L	TOT	%Recov	---	---	---	76.8	---	75.4	---	64	---	---	---	80.2	---	---	---	71.2
PCB39	TOT	pg/L	---	---	---	<0.707	---	<1.18	---	<0.676	---	---	---	<0.683	---	---	---	<0.729
PCB45/51	TOT	pg/L	---	---	---	6.98	---	2.7	---	4.48	---	---	---	10.5	---	---	---	4.99
Dichloro Biphenyls	TOT	pg/L	---	---	---	104	---	35.3	---	108	---	---	---	145	---	---	---	76.6
Heptachloro Biphenyls	TOT	pg/L	---	---	---	15.3	---	<-999	---	48.1	---	---	---	47	---	---	---	51.6
Hexachloro biphenyls	TOT	pg/L	---	---	---	---	---	21.8	---	---	---	---	---	---	---	---	---	---
Monochloro Biphenyls	TOT	pg/L	---	---	---	15.2	---	9.82	---	31.7	---	---	---	44.8	---	---	---	18.1
Nonachloro Biphenyls	TOT	pg/L	---	---	---	2.05	---	<-999	---	1.98	---	---	---	16	---	---	---	<-999
Octachloro Biphenyls	TOT	pg/L	---	---	---	2.68	---	<-999	---	6.63	---	---	---	16.1	---	---	---	4.31
Pentachloro Biphenyls	TOT	pg/L	---	---	---	161	---	26.2	---	161	---	---	---	164	---	---	---	142
Tetrachloro Biphenyls	TOT	pg/L	---	---	---	169	---	53.6	---	142	---	---	---	188	---	---	---	122
Trichloro Biphenyls	TOT	pg/L	---	---	---	120	---	45.1	---	80.3	---	---	---	72.3	---	---	---	70.2
PCB Teq 3	TOT	pg/L	---	---	0.247	0.0124	0.0756	0.00848	0.169	0.123	---	---	0.257	0.00297	---	---	0.37	0.0132
PCB Teq 4	TOT	pg/L	---	---	1.15	0.976	0.914	0.876	1.04	0.935	---	---	1.13	0.898	---	---	1.24	0.952
PCBs Total	TOT	pg/L	---	---	---	680	---	192	---	692	---	---	---	781	---	---	---	598
1,2,3,4,6,7,8-HPCDD	TOT	pg/L	---	---	17.4	1.19	8.77	0.848	8.49	1.52	---	---	12.9	0.59	---	---	25.2	1.25
1,2,3,4,6,7,8-HPCDF	TOT	pg/L	---	---	1.53	<0.572	1.42	1.01	1.66	0.709	---	---	1.78	<0.531	---	---	1.57	<0.557
1,2,3,4,7,8,9-HPCDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	1.17	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,4,7,8-HXCDD	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	0.571	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,4,7,8-HXCDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	0.603	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,6,7,8-HXCDD	TOT	pg/L	---	---	0.636	<0.572	<0.513	<0.515	0.824	0.518	---	---	0.735	<0.531	---	---	1.05	<0.557
1,2,3,6,7,8-HXCDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,7,8,9-HXCDD	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.616	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,7,8,9-HXCDF	TOT	pg/L	---	---	<0.552	<0.572	0.563	0.607	0.612	0.552	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,7,8-PECDD	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
1,2,3,7,8-PECDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	0.578	<0.531	---	---	<0.531	<0.557
2,3,4,6,7,8-HXCDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	0.604	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
2,3,4,7,8-PECDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
2,3,7,8-TCDD	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
2,3,7,8-TCDF	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
HEPTA-DIOXINS	TOT	pg/L	---	---	32	2.03	6.79	0.848	8.49	1.52	---	---	23.5	<0.531	---	---	39.6	2.33
Hepta-Furans	TOT	pg/L	---	---	1.54	<0.572	1.42	<0.515	3.12	<0.512	---	---	3.11	<0.531	---	---	2.24	<0.557
HEXA-DIOXINS	TOT	pg/L	---	---	0.636	<0.572	<0.513	<0.515	<0.533	0.518	---	---	2.82	<0.531	---	---	6.34	<0.557
HEXA-FURANS	TOT	pg/L	---	---	<0.552	<0.572	1.19	<0.515	0.612	0.552	---	---	0.755	<0.531	---	---	1.29	<0.557
OCDD	TOT	pg/L	---	---	92.7	5.09	49.3	2.72	60.2	8.35	---	---	79	3.08	---	---	126	5.73
OCDF	TOT	pg/L	---	---	2.26	<0.572	1.97	0.589	4.16	1.5	---	---	2.63	<0.531	---	---	3.97	1.1
Penta-Dioxins	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	1.42	<0.557
Penta-Furans	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	0.578	<0.531	---	---	<0.531	<0.557
Tetra-Dioxins	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	<0.546	<0.531	---	---	<0.531	<0.557
Tetra-Furans	TOT	pg/L	---	---	<0.552	<0.572	<0.513	<0.515	<0.533	<0.512	---	---	0.567	<0.531	---	---	<0.531	<0.557
2,4-DDD	TOT	ng/L	---	---	---	4.16	---	1.3	---	---	---	---	---	3.2	---	---	---	0.579
2,4-DDE	TOT	ng/L	---	---	---	<0.0449	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
2,4-DDT	TOT	ng/L	---	---	---	<0.0656	---	<1.43	---	---	---	---	---	<0.111	---	---	---	<0.085
4,4-DDD	TOT	ng/L	---	---	---	<0.0506	---	<1.61	---	---	---	---	---	<0.115	---	---	---	<0.0665
4,4-DDE	TOT	ng/L	---	---	---	0.096	---	0.071	---	---	---	---	---	<0.0561	---	---	---	0.09
4,4-DDT	TOT	ng/L	---	---	---	<0.0674	---	<1.81	---	---	---	---	---	<0.158	---	---	---	<0.114
ABHC	TOT	ng/L	---	---	---	0.063	---	0.046	---	---	---	---	---	<0.061	---	---	---	<0.0583
Aldrin	TOT	ng/L	---	---	---	<0.0449	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
Alpha Chlordane	TOT	ng/L	---	---	---	<0.0449	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
Alpha-Endosulfan	TOT	ng/L	---	---	---	0.212	---	<0.106	---	---	---	---	---	0.243	---	---	---	<0.152
Beta-Endosulfan	TOT	ng/L	---	---	---	0.497	---	0.389	---	---	---	---	---	0.322	---	---	---	0.361
Beta-Hch Or Beta-Bhc	TOT	ng/L	---	---	---	0.077	---	0.056	---	---	---	---	---	<0.0892	---	---	---	<0.117

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Bis(2-Chloroethoxy)Methane	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Bis(2-Chloroethyl)Ether	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Bis(2-Chloroisopropyl)Ether	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Cis-Nonachlor	TOT	ng/L	---	---	---	<0.0449	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
Dieldrin	TOT	ng/L	---	---	---	0.205	---	<0.106	---	---	---	---	---	0.266	---	---	---	0.116
Endosulfan Sulfate	TOT	ng/L	---	---	---	<0.148	---	<0.106	---	---	---	---	---	<0.147	---	---	---	<0.238
Endrin	TOT	ng/L	---	---	---	<0.112	---	<0.106	---	---	---	---	---	<0.105	---	---	---	<0.112
Endrin Aldehyde	TOT	ng/L	---	---	---	<1.01	---	<0.106	---	---	---	---	---	<0.191	---	---	---	<0.112
HCH, Gamma	TOT	ng/L	---	---	---	0.081	---	0.1	---	---	---	---	---	0.092	---	---	---	0.109
Heptachlor	TOT	ng/L	---	---	---	<0.0449	---	0.048	---	---	---	---	---	<0.042	---	---	---	<0.0447
Heptachlor Epoxide	TOT	ng/L	---	---	---	<0.112	---	<0.106	---	---	---	---	---	<0.105	---	---	---	<0.112
Hexachlorobenzene	TOT	ng/L	---	---	---	0.063	---	0.033	---	---	---	---	---	0.055	---	---	---	0.037
Methoxyclor	TOT	ng/L	---	---	---	<0.225	---	<0.212	---	---	---	---	---	<0.25	---	---	---	<0.223
Mirex	TOT	ng/L	---	---	---	<0.0449	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
Octachlorostyrene	TOT	ng/L	---	---	---	<0.0092	---	0.012	---	---	---	---	---	<0.042	---	---	---	<0.0447
Oxychlordane	TOT	ng/L	---	---	---	0.062	---	<0.0423	---	---	---	---	---	<0.042	---	---	---	<0.0447
3:3 FTCA	TOT	ng/L	---	---	<5.27	<5.28	---	---	<12.8	<12.8	---	---	<8.37	<1.46	---	---	<1.64	<1.61
4:2 FTS	TOT	ng/L	---	---	<5.27	<5.28	---	---	<12.8	<12.8	---	---	<8.37	<1.46	---	---	<1.64	<1.61
5:3 FTCA	TOT	ng/L	---	---	<32.9	<33	---	---	<79.9	<79.9	---	---	<52.3	<9.14	---	---	<10.3	<10.1
6:2 FTS	TOT	ng/L	---	---	<4.75	<4.76	---	---	<11.5	<11.5	---	---	<7.55	1.42	---	---	4.32	3.35
7:3 FTCA	TOT	ng/L	---	---	<32.9	<33	---	---	<79.9	<79.9	---	---	<52.3	<9.14	---	---	<10.3	<10.1
8:2 FTS	TOT	ng/L	---	---	<4.48	<4.49	---	---	<10.9	<10.9	---	---	<7.12	<1.24	---	---	<1.39	<1.37
ADONA	TOT	ng/L	---	---	<5.27	<5.28	---	---	<12.8	<12.8	---	---	<8.37	<1.46	---	---	<1.64	<1.61
HFPO-DA	TOT	ng/L	---	---	<5.27	<5.28	---	---	<12.8	<12.8	---	---	<8.37	<1.46	---	---	<1.64	<1.61
MeFOSAA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	1.36	---	---	<0.41	1.39
N-EtFOSA	TOT	ng/L	---	---	<3.69	<3.69	---	---	<8.95	<8.95	---	---	<5.86	<1.02	---	---	<1.15	<1.13
N-EtFOSAA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	0.685	0.45
N-EtFOSE	TOT	ng/L	---	---	<13.2	<13.2	---	---	<32	<31.9	---	---	<20.9	<3.66	---	---	<4.1	<4.03
NFDHA	TOT	ng/L	---	---	<2.63	<2.64	---	---	<6.39	<6.39	---	---	<4.19	<0.731	---	---	<0.82	<0.806
N-MeFOSA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
N-MeFOSE	TOT	ng/L	---	---	<13.2	<13.2	---	---	<32	<31.9	---	---	<20.9	<3.66	---	---	<4.1	<4.03
PFBS	TOT	ng/L	---	---	2.91	4.1	4.46	2.77	<3.2	3.58	---	---	<2.09	1.54	---	---	3.22	2.7
PFDA	TOT	ng/L	---	---	<1.32	<1.32	0.761	0.786	<3.2	<3.19	---	---	<2.09	1.04	---	---	0.745	0.853
PFDoA	TOT	ng/L	---	---	<1.05	<1.06	<0.531	<0.365	<2.56	<2.56	---	---	<1.67	<0.292	---	---	<0.328	<0.322
PFDoS	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFDS	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	3.44	<0.366	---	---	0.894	<0.403
PFEESA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFHpA	TOT	ng/L	---	---	3.58	3.02	5.61	3.48	<3.2	<3.19	---	---	<2.09	1.71	---	---	4.4	2.34
PFHpS	TOT	ng/L	---	---	4.07	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFHxA	TOT	ng/L	---	---	3.81	11.3	18.4	9.69	5.08	8	---	---	4.98	9.02	---	---	11.9	11.6
PFHxS	TOT	ng/L	---	---	3.18	4	5.05	4.42	3.6	3.36	---	---	3.34	3.91	---	---	4.1	3.09
PFMBA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFMPA	TOT	ng/L	---	---	<2.63	<2.64	---	---	<6.39	<6.39	---	---	<4.19	<0.731	---	---	<0.82	<0.806
PFNA	TOT	ng/L	---	---	<1.32	<1.32	1.66	0.753	<3.2	<3.19	---	---	<2.09	0.631	---	---	1.18	0.789
PFNS	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFOA	TOT	ng/L	---	---	3.31	5.89	4.88	5.41	<3.2	4.04	---	---	<2.09	4.53	---	---	4.63	5.14
PFOS	TOT	ng/L	---	---	7.54	3.42	9.15	4.23	5.99	3.49	---	---	3.02	2.32	---	---	3.93	3.51
PFOSA	TOT	ng/L	---	---	<1.32	<1.32	<0.531	<0.365	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFPeA	TOT	ng/L	---	---	4.78	14.7	22.5	22	<6.39	6.66	---	---	4.94	7.5	---	---	17.4	11.4
PFPeS	TOT	ng/L	---	---	<1.32	<1.33	---	---	<3.21	<3.21	---	---	<2.1	<0.367	---	---	<0.412	0.446
PFTeDA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
PFTrDA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
PFUnA	TOT	ng/L	---	---	<1.32	<1.32	---	---	<3.2	<3.19	---	---	<2.09	<0.366	---	---	<0.41	<0.403
Bis(2-Ethylhexyl)Phthalate	TOT	µg/L	---	---	6.4	<5	<5	<5	6	<5	---	---	7.5	<5	---	---	<5	<5
Butylbenzyl Phthalate	TOT	µg/L	---	---	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---	---	<2.5	<2.5	---	---	<2.5	<2.5
Diethyl Phthalate	TOT	µg/L	---	---	2.03	<0.25	0.41	<0.25	4.93	0.49	---	---	0.55	<0.25	---	---	2.97	1.17
Dimethyl Phthalate	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
Di-N-Butyl Phthalate	TOT	µg/L	---	---	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---	---	2.8	<2.5	---	---	19.4	4.2
Di-N-Octyl Phthalate	TOT	µg/L	---	---	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	---	---	<0.25	<0.25	---	---	<0.25	<0.25
2-Hydroxy-Ibuprofen	TOT	ng/L	---	---	29500	2000	30700	364	42600	10500	---	---	44000	794	---	---	28000	635
Acetaminophen	TOT	ng/L	---	---	185000	3.75	239000	784	201000	286	---	---	175000	14	---	---	161000	13.9
Azithromycin	TOT	ng/L	---	---	280	152	496	590	140	292	---	---	240	270	---	---	212	243
Bisphenol A	TOT	ng/L	---	---	143	90.2	132	50.2	75.8	56.2	---	---	220	218	---	---	139	111
Caffeine	TOT	ng/L	---	---	105000	11.1	101000	428	99400	151	---	---	115000	485	---	---	103000	678
Carbadox	TOT	ng/L	---	---	17.8	<4.32	<5.55	<1.33	2.87	<0.626	---	---	<1.29	<0.611	---	---	<2.39	<0.618
Carbamazepine	TOT	ng/L	---	---	339	521	804	487	330	410	---	---	516	580	---	---	408	439
Cefotaxime	TOT	ng/L	---	---	<26.3	<6.41	<47.8	<5.32	<11.6	<6.2	---	---	<12.8	<5.8	---	---	<23.6	<6.16
Ciprofloxacin	TOT	ng/L	---	---	271	249	685	136	489	254	---	---	363	198	---	---	358	246
Clarithromycin	TOT	ng/L	---	---	202	107	59.8	133	146	165	---	---	116	113	---	---	137	123
Clinafloxacin	TOT	ng/L	---	---	<7.81	<2.16	<40.4	<30.1	<3.92	<2.09	---	---	<4.31	<1.95	---	---	<7.95	<2.06
Cloxacillin	TOT	ng/L	---	---	<11.7	<3.24	<15	<8.54	<5.88	<3.13	---	---	<6.46	<2.93	---	---	<11.9	<3.09
D2-Virginiamycin M1	TOT	%Recov	---	---	140	140	---	---	154	183	---	---	135	153	---	---	120	170
D3-Carbadox	TOT	%Recov	---	---	203	194	---	---	175	188	---	---	182	162	---	---	164	210
D3-Digoxigenin	TOT	%Recov	---	---	221	192	---	---	149	135	---	---	143	114	---	---	165	195
D3-Lincomycin	TOT	%Recov	---	---	238	204	---	---	179	159	---	---	135	131	---	---	58.9	82.4
D3-Ofloxacin	TOT	%Recov	---	---	158	117	---	---	58.4	57.8	---	---	62.1	55.3	---	---	77	84.5
D5-Miconazole	TOT	%Recov	---	---	65.4	53	---	---	120	115	---	---	96.4	119	---	---	114	156
Dehydronifedipine	TOT	ng/L	---	---	2.43	8.14	8.1	9.07	1.28	9.95	---	---	2.93	17.3	---	---	2.16	10.6
Digoxigenin	TOT	ng/L	---	---	<5.86	<1.62	<64.6	<24.2	<2.94	<1.57	---	---	<3.23	<2.6	---	---	<5.97	<1.55
Digoxin	TOT	ng/L	---	---	<23.4	<6.48	64.4	<5.32	<11.8	<6.26	---	---	<12.9	<5.86	---	---	<23.9	<6.18
Diltiazem	TOT	ng/L	---	---	358	342	669	410	437	367	---	---	482	498	---	---	347	318
Diphenhydramine	TOT	ng/L	---	---	996	521	1040	283	1470	785	---	---	1330	1020	---	---	903	716
Enrofloxacin	TOT	ng/L	---	---	<2.34	<0.648	<11.1	<2.66	<1.18	1.02	---	---	<1.29	1.4	---	---	<2.39	1.12
Erythromycin-H2O	TOT	ng/L	---	---	15.2	23.6	21.8	35.7	<2.94	<1.57	---	---	6	8.08	---	---	<5.97	2.67
Flumequine	TOT	ng/L	---	---	<1.17	<0.324	<5.55	<1.33	<0.588	<0.313	---	---	<0.646	<0.293	---	---	<1.19	<0.309
Fluoxetine	TOT	ng/L	---	---	52.8	30.9	31.6	12.4	44	24.3	---	---	41.9	36.4	---	---	38.7	27.3
Furosemide	TOT	ng/L	---	---	910	406	1050	650	1670	124	---	---	1550	1310	---	---	942	480
Gemfibrozil	TOT	ng/L	---	---	19.7	12.6	12.9	5.85	21.9	32.9	---	---	77.6	44.9	---	---	68.4	65.7
Glipizide	TOT	ng/L	---	---	<3.13	<0.864	<2.96	<0.71	<1.57	<0.835	---	---	<1.72	1.25	---	---	<3.95	<0.824
Glyburide	TOT	ng/L	---	---	<3.13	2.12	<2.96	2.03	4.09	3.12	---	---	3.46	3.03	---	---	<3.95	2.27
Hydrochlorothiazide	TOT	ng/L	---	---	2080	1810	1830	1760	2340	1710	---	---	2460	2310	---	---	2150	2010
Ibuprofen	TOT	ng/L	---	---	12000	278	14700	86.3	17500	2540	---	---	14300	128	---	---	13400	87.4
Lincomycin	TOT	ng/L	---	---	<2.34	<0.648	<11.1	<2.66	<1.18	0.695	---	---	<1.29	<0.586	---	---	<2.39	1.04
Lomefloxacin	TOT	ng/L	---	---	<2.34	<0.648	<11.1	<2.66	<1.18	<0.626	---	---	<1.29	<0.586	---	---	<2.39	<0.618
Miconazole	TOT	ng/L	---	---	2.76	0.613	24.1	2.08	2.54	1.13	---	---	5.44	0.957	---	---	3.87	1.04
Naproxen	TOT	ng/L	---	---	6940	404	7790	520	13000	1440	---	---	12300	366	---	---	7990	110
Norfloxacin	TOT	ng/L	---	---	<7.81	<2.16	<55.5	<43.8	<3.92	4.33	---	---	<4.45	<1.95	---	---	<7.95	<2.06
Norgestimate	TOT	ng/L	---	---	<5.86	<1.62	<11.1	<2.66	<2.94	<1.57	---	---	<3.23	<1.46	---	---	<5.97	<1.55
Ofloxacin	TOT	ng/L	---	---	14.3	10.4	89.3	14	96.1	35.4	---	---	25.1	21.7	---	---	42	22.9
Ormetoprim	TOT	ng/L	---	---	<0.586	<0.162	<2.22	<0.532	<0.294	<0.157	---	---	<0.323	<0.146	---	---	<0.597	<0.155
Oxacillin	TOT	ng/L	---	---	<5.86	<1.62	<11.1	<2.66	<2.94	<1.57	---	---	<3.23	<1.46	---	---	<5.97	<1.55
Oxolinic Acid	TOT	ng/L	---	---	<2.34	<0.648	<2.66	<2.24	<1.18	<0.626	---	---	<1.29	<0.586	---	---	<2.39	<0.618
Penicillin G	TOT	ng/L	---	---	13.3	<3.24	<11.1	<2.66	<5.88	<3.13	---	---	<6.46	<2.93	---	---	<11.9	<3.09
Penicillin V	TOT	ng/L	---	---	<5.86	<1.62	<11.1	<4.48	<2.94	<1.57	---	---	<3.23	<1.46	---	---	<5.97	<1.55
Roxithromycin	TOT	ng/L	---	---	<0.586	<0.162	<1.49	<0.308	<0.335	<0.157	---	---	<0.626	<0.146	---	---	2.01	2.77

Appendix B4, continued

Parameter	State	Units	Jan 17 2023		Jan 18 2023		Jan 19 2023		Apr 20 2023		Jul 11 2023		Jul 12 2023		Jul 13 2023		Oct 19 2023	
			Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly	Influent Q+	Effluent Q+	Influent Quarterly	Effluent Quarterly
Sarafloxacin	TOT	ng/L	---	---	<11.7	<3.24	<55.5	<13.3	<5.88	<3.13	---	---	<6.46	<2.93	---	---	<11.9	<3.09
Sulfachloropyridazine	TOT	ng/L	---	---	<2.34	<0.648	<5.55	<1.33	<1.18	<0.626	---	---	<1.29	<0.586	---	---	<2.39	<0.618
Sulfadiazine	TOT	ng/L	---	---	<2.34	<0.648	<5.55	<1.33	<1.18	<0.626	---	---	<1.29	<0.586	---	---	<2.39	<0.618
Sulfadimethoxine	TOT	ng/L	---	---	<1.17	<0.324	1.41	<0.614	<0.588	<0.313	---	---	<0.646	<0.469	---	---	<1.19	<0.309
Sulfamerazine	TOT	ng/L	---	---	<2.34	<0.648	<2.22	<0.592	<1.18	<0.626	---	---	<1.29	<0.854	---	---	<2.39	<0.618
Sulfamethazine	TOT	ng/L	---	---	<2.34	<0.648	<3.39	<1.78	<1.18	<0.857	---	---	<1.29	<0.831	---	---	2.98	<0.618
Sulfamethizole	TOT	ng/L	---	---	<7.82	<2.16	<2.85	<0.684	<1.18	<0.893	---	---	<1.29	<2.14	---	---	<2.39	<0.83
Sulfamethoxazole	TOT	ng/L	---	---	1740	473	737	338	2130	340	---	---	2070	287	---	---	1010	284
Sulfanilamide	TOT	ng/L	---	---	145	145	-999	-999	147	122	---	---	74.9	99.9	---	---	60.2	85.5
Sulfathiazole	TOT	ng/L	---	---	<19.5	<5.4	<5.55	<1.33	<2.94	<1.57	---	---	<3.23	<1.46	---	---	<5.97	<1.55
Thiabendazole	TOT	ng/L	---	---	24.4	25.1	27.5	19.9	19.8	27.1	---	---	32.8	32.3	---	---	19.2	19.9
Triclocarban	TOT	ng/L	---	---	<1.56	<0.432	3.08	0.813	0.997	0.544	---	---	1.54	0.608	---	---	<1.98	<0.412
Triclosan	TOT	ng/L	---	---	31.4	11.3	59.9	16.1	21.8	15.9	---	---	17.1	15.3	---	---	<29.6	9.9
Trimethoprim	TOT	ng/L	---	---	454	403	294	228	731	356	---	---	416	363	---	---	300	325
Tylosin	TOT	ng/L	---	---	<2.34	3.75	27.3	9.39	<1.18	1.86	---	---	9.61	6.65	---	---	<2.39	11.3
Virginiamycin	TOT	ng/L	---	---	<2.75	<0.648	<14.5	<6.32	<1.39	<0.626	---	---	<1.65	<0.586	---	---	<2.39	0.854
Warfarin	TOT	ng/L	---	---	3.74	3.04	3.29	1.78	6.38	3.49	---	---	5.46	5.67	---	---	52.1	68.1

Notes:
--- data not available

APPENDIX C

Surface Water / IDZ Monitoring

Appendix C1 SPTP Surface Water Stations

Appendix C2 SPTP IDZ Sites Extended Sampling Results 2023

Appendix C3 Surface Water IDZ Nutrient Monitoring Results 2023

Appendix C1 SPTP Surface Water Stations

		Latitude	Longitude
Surface Water Stations	Outfall	48°37.3978	-123°23.1511'
	100N	48°37.4302	-123°23.1511'
	100S	48°37.3654	-123°23.1506'
	200NE	48°37.4440	-123°23.8221'
	200NW	48°37.4433	-123°23.2202'
	200SE	48°37.3522	-123°23.8160'
	200SW	48°37.3522	-123°23.2195'
	400E	48°37.3983	-123°22.5556'
	400N	48°37.5274	-123°23.1518'
	400S	48°37.2682	-123°23.1500'
	400W	48°37.3972	-123°23.3462'
	800N	48°38.5701	-123°23.1529'
	800S	48°37.1391	-123°23.1488'
	800W	48°37.3965	-123°23.5417'
	Reference 2	48°38.5496	-123°19.1139'
IDZ Stations	SP02	48°37.7179	-123°23.1816'
	SP03	48°37.6930	-123°23.1431'
	SP04	48°37.6576	-123°23.1365'
	SP05	48°37.6272	-123°23.1647'
	SP06	48°37.6137	-123°23.2149'
	SP07	48°37.6052	-123°23.2682'
	SP08	48°37.6088	-123°23.3218'
	SP09	48°37.6337	-123°23.3602'
	SP10	48°37.6691	-123°23.3668'
	SP11	48°37.6995	-123°23.3386'
	SP12	48°37.7130	-123°23.2884'
	SP13	48°37.7215	-123°23.2351'

Appendix C2 SPTP IDZ Sites Extended Sampling Results (one sampling day each season) 2023

		Aluminum (µg/L)		Antimony (µg/L)		Arsenic (µg/L)		Barium (µg/L)		Beryllium (µg/L)		Bismuth (µg/L)		Boron (µg/L)		Cadmium (mg/L)		Calcium (µg/L)		Chromium (µg/L)		Cobalt (µg/L)	
		Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
WQ Guidelines						12.5 µg/L *+#								1200 µg/L *		0.00012 mg/L (max)							
Station 1	Top	26.6	21.4	<0.5	<0.5	1.8	1.53	7.8	7.7	<0.5	<0.5	<0.5	<0.5	4,100	3,810	0.088	0.064	358	327	3.19	0.99	0.15	<0.05
	Middle	56.8	27.7	<0.5	<0.5	2.09	1.21	7.9	7	<0.5	<0.5	<0.5	<0.5	4,100	3,590	0.081	0.093	356	319	0.53	<0.5	0.153	<0.05
	Bottom	35.2	20.3	<0.5	<0.5	1.76	1.4	8.8	7.8	<0.5	<0.5	<0.5	<0.5	3,940	3,760	0.094	0.109	359	333	<0.5	<0.5	0.231	<0.05
Station 2	Top	26.1	14.8	<0.5	<0.5	2.01	1.47	8.7	8.4	<0.5	<0.5	<0.5	<0.5	4,170	3,640	0.094	0.091	356	322	<0.5	<0.5	0.169	<0.05
	Middle	48.3	23	<0.5	<0.5	1.96	1.47	8.6	7.4	<0.5	<0.5	<0.5	<0.5	4,160	3,640	0.047	0.072	361	322	<0.5	0.78	0.161	<0.05
	Bottom	102	49.6	<0.5	<0.5	2.04	2.96	8.8	8.9	<0.5	<0.5	<0.5	<0.5	4,070	3,630	0.052	0.664	347	320	<0.5	1.18	0.184	0.647
Station 3	Top	23.8	---	<0.5	---	2.43	---	9.1	---	<0.5	---	<0.5	---	4,130	---	0.071	---	352	---	0.62	---	0.417	---
	Middle	40.1	---	<0.5	---	2.09	---	9.4	---	<0.5	---	<0.5	---	4,160	---	0.047	---	356	---	0.94	---	0.352	---
	Bottom	51.2	23.6	<0.5	<0.5	2.03	1.17	8.4	7.5	<0.5	<0.5	<0.5	<0.5	3,990	3,540	0.093	0.061	351	306	<0.5	<0.5	0.088	<0.05
Station 4	Top	26.3	---	<0.5	---	2.14	---	8.5	---	<0.5	---	<0.5	---	4,170	---	0.063	---	355	---	0.67	---	0.138	---
	Middle	41.5	---	<0.5	---	2.11	---	7.2	---	<0.5	---	<0.5	---	4,130	---	0.093	---	358	---	0.66	---	0.124	---
	Bottom	74.4	---	<0.5	---	2.06	---	9.2	---	<0.5	---	<0.5	---	4,050	---	0.093	---	348	---	1.6	---	0.133	---
Reference 2	Top	36.3	17.2	<0.5	<0.5	2.47	1.42	7.9	7.1	<0.5	<0.5	<0.5	<0.5	4,150	3,750	0.078	0.077	363	322	0.51	0.81	0.111	<0.05
	Middle	43.4	19.6	<0.5	<0.5	2.18	1.32	8.4	7.8	<0.5	<0.5	<0.5	<0.5	4,040	3,650	0.082	0.079	345	320	0.99	<0.5	0.126	<0.05
	Bottom	206	16.6	<0.5	<0.5	2.06	1.35	8.5	7	<0.5	<0.5	<0.5	<0.5	4,010	3,570	0.077	0.061	350	308	<0.5	<0.5	0.185	<0.05
Average of IDZ Stations	Top	25.7	18.1	<0.5	<0.5	2.10	1.50	8.53	8.05	<0.5	<0.5	<0.5	<0.5	4,143	3,725	0.079	0.078	355	325	1.18	0.62	0.219	0.03
	Middle	46.7	25.4	<0.5	<0.5	2.06	1.34	8.28	7.20	<0.5	<0.5	<0.5	<0.5	4,138	3,615	0.067	0.083	358	321	0.60	0.52	0.198	0.03
	Bottom	65.7	31.2	<0.5	<0.5	1.97	1.84	8.80	8.07	<0.5	<0.5	<0.5	<0.5	4,013	3,643	0.083	0.278	351	320	0.59	0.56	0.159	0.23

Notes:
Shaded cells indicate exceedance to BC WQG
* = BC Approved Water Quality Guideline
+ = BC Working Water Quality Guideline
# = CCME Water Quality Guideline for the Protection of Aquatic Life

Appendix C2, continued

		Copper (µg/L)		Iron (µg/L)		Lead (µg/L)		Lithium (µg/L)		Magnesium (mg/L)		Manganese (µg/L)		Mercury (µg/L)		Molybdenum (µg/L)		Nickel (µg/L)		Potassium (mg/L)	
		Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
WQ Guidelines		**2 µg/L (mean of 5 samples) or 140 µg/L (max) ***												**0.02 (µg/L) ***				**7.1 µg/L ***			
Station 1	Top	<0.5	0.83	53	26	0.057	0.085	163	144	1,120	1,020	2.16	2.38	<0.0019	<0.0019	12.1	8.82	12.8	1.12	340	315
	Middle	<0.5	0.61	78	29	<0.05	<0.05	162	137	1,110	965	2.69	2.43	<0.0019	<0.0019	9.13	8.62	1.06	0.44	340	302
	Bottom	<0.5	0.83	49	35	<0.05	<0.05	156	143	1,090	1,010	2.33	2.28	<0.0019	<0.0019	9.38	8.5	0.59	0.48	341	319
Station 2	Top	<0.5	<0.5	37	21	<0.05	<0.05	163	139	1,120	970	2.22	2.15	<0.0019	<0.0019	9.06	9.06	13.5	0.5	349	310
	Middle	<0.5	0.55	71	33	<0.05	0.083	165	140	1,110	1,010	2.66	2.31	<0.0019	<0.0019	9.1	8.58	0.47	0.77	349	321
	Bottom	<0.5	2.02	156	28	0.108	0.932	159	139	1,100	974	3.95	8.42	<0.0019	<0.0019	8.84	8.79	0.59	1.37	337	307
Station 3	Top	<0.5	---	37	---	0.067	---	164	---	1,100	---	2.89	---	<0.0019	---	10.3	---	0.62	---	342	---
	Middle	<0.5	---	55	---	<0.05	---	165	---	1,110	---	2.32	---	<0.0019	---	9.54	---	1.71	---	349	---
	Bottom	<0.5	<0.5	76	35	0.061	0.076	157	137	1,090	952	2.65	2.44	<0.0019	<0.0019	9.16	7.68	0.57	0.31	337	292
Station 4	Top	<0.5	---	42	---	0.102	---	168	---	1,100	---	2.45	---	<0.0019	---	9.65	---	0.26	---	342	---
	Middle	<0.5	---	52	---	0.073	---	164	---	1,110	---	2.42	---	<0.0019	---	8.95	---	0.3	---	343	---
	Bottom	<0.5	---	61	---	<0.05	---	162	---	1,080	---	2.41	---	<0.0019	---	8.91	---	0.2	---	339	---
Reference 2	Top	<0.5	<0.5	56	27	0.051	<0.05	166	149	1,110	1,000	2.72	2.08	<0.0019	<0.0019	9.2	8.33	0.25	0.34	351	314
	Middle	<0.5	<0.5	76	24	<0.05	<0.05	161	142	1,080	959	2.40	2.33	<0.0019	<0.0019	9.2	8.92	<0.2	0.34	337	302
	Bottom	<0.5	<0.5	331	21	0.172	<0.05	160	140	1,070	961	5.89	1.88	<0.0019	<0.0019	9.12	8.32	0.57	0.47	337	301
Average of IDZ Stations	Top	<0.5	0.54	42	24	0.06	0.06	165	142	1,110	995	2.43	2.27	<0.0019	<0.0019	10.28	8.94	6.80	0.81	343	313
	Middle	<0.5	0.58	64	31	0.04	0.05	164	139	1,110	988	2.52	2.37	<0.0019	<0.0019	9.18	8.60	0.89	0.61	345	312
	Bottom	<0.5	1.03	86	33	0.05	0.34	159	140	1,090	979	2.84	4.38	<0.0019	<0.0019	9.07	8.32	0.49	0.72	339	306

Notes:
Shaded cells indicate exceedance to BC WQG
* = BC Approved Water Quality Guideline
+ = BC Working Water Quality Guideline
# = CCME Water Quality Guideline for the Protection of Aquatic Life

		Selenium (µg/L)		Silicon (µg/L)		Silver (µg/L)		Strontium (µg/L)		Sulfur (mg/L)		Thallium (µg/L)		Tin (µg/L)		Titanium (µg/L)		Vanadium (µg/L)		Zinc (µg/L)	
		Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer
WQ Guidelines		2 µg/L *				1.5 µg/L (mean of 5 samples) or 3 µg/L (max) *														1 µg/L (mean of 5 samples) *	
Station 1	Top	<0.5	<0.5	1800	<1000	<0.05	<0.05	6,990	6,640	729	721	<0.05	<0.05	<1	<1	<5	<5	3.03	1.9	<3	9.4
	Middle	<0.5	<0.5	1820	1000	<0.05	<0.05	6,910	6,290	689	677	<0.05	<0.05	<1	<1	<5	<5	3.27	1.54	<3	7.9
	Bottom	<0.5	<0.5	1820	1050	0.068	<0.05	7,040	6,720	727	741	<0.05	<0.05	<1	<1	<5	<5	3.03	1.54	<3	3.7
Station 2	Top	<0.5	<0.5	1790	<1000	0.056	<0.05	7,170	6,500	724	711	<0.05	<0.05	<1	<1	<5	<5	4.2	1.46	3.9	<3
	Middle	<0.5	<0.5	1900	1040	0.065	<0.05	7,190	6,540	759	738	<0.05	<0.05	<1	<1	<5	<5	3.89	1.7	<3	3.2
	Bottom	<0.5	<0.5	1890	1020	<0.05	0.053	6,870	6,410	717	705	<0.05	0.095	<1	<1	6.6	<5	4.36	2.46	<3	7.4
Station 3	Top	<0.5	---	1810	---	<0.05	---	7,300	---	743	---	<0.05	---	<1	---	<5	---	4.52	---	<3	---
	Middle	<0.5	---	1840	---	<0.05	---	7,400	---	733	---	<0.05	---	<1	---	<5	---	5.59	---	3.1	---
	Bottom	<0.5	<0.5	1840	<1000	0.052	<0.05	7,130	6,140	715	662	<0.05	<0.05	<1	<1	<5	<5	4.99	1.59	<3	3.4
Station 4	Top	<0.5	---	1870	---	<0.05	---	7,300	---	727	---	<0.05	---	<1	---	<5	---	5	---	<3	---
	Middle	<0.5	---	1890	---	0.074	---	7,200	---	735	---	<0.05	---	<1	---	<5	---	5.48	---	<3	---
	Bottom	<0.5	---	1850	---	<0.05	---	7,160	---	726	---	<0.05	---	<1	---	<5	---	5.06	---	<3	---
Reference 2	Top	<0.5	<0.5	1860	<1000	<0.05	<0.05	7,300	6,450	746	716	<0.05	<0.05	<1	<1	<5	<5	4.89	1.74	<3	<3
	Middle	<0.5	<0.5	1780	<1000	<0.05	<0.05	7,260	6,470	719	700	<0.05	<0.05	<1	<1	<5	<5	5.43	1.33	<3	<3
	Bottom	<0.5	<0.5	2330	<1000	<0.05	<0.05	7,210	6,330	716	696	<0.05	<0.05	<1	<1	10.9	<5	5.21	1.48	4.5	3.1
Average of IDZ Stations	Top	<0.5	<0.5	1818	500	0.03	0.03	7,190	6,570	731	716	<0.5	<0.5	<1	<1	2.5	<5	4.19	1.68	2.1	5.5
	Middle	<0.5	<0.5	1863	1020	0.05	0.03	7,175	6,415	729	708	<0.5	<0.5	<1	<1	2.5	<5	4.56	1.62	1.9	5.6
	Bottom	<0.5	<0.5	1850	857	0.04	0.03	7,050	6,423	721	703	<0.5	<0.5	<1	<1	3.5	<5	4.36	1.86	1.5	4.8

Notes:
Shaded cells indicate exceedance to BC WQG
* = BC Approved Water Quality Guideline
+ = BC Working Water Quality Guideline
# = CCME Water Quality Guideline for the Protection of Aquatic Life

Appendix C3 SPTP IDZ Sites Nutrient Monitoring Results (first to fifth day of sampling) 2023

NH3 mg/L – 2023							
	BC Approved WQG = 23-33 mg/L N (average over 5 samples) or 3.4-5.0 mg/L N (maximum)						
		Winter					Average
Reference	Top	0.048	0.065	0.063	0.039	0.052	0.053
	Middle	0.055	0.050	0.068	0.040	0.067	0.056
	Bottom	0.044	0.051	0.058	0.036	0.048	0.047
Station 1	Top	0.063	0.058	0.060	0.041	0.067	0.058
	Middle	0.061	0.065	0.065	0.039	0.051	0.056
	Bottom	0.053	0.069	0.068	0.043	0.049	0.056
Station 2	Top	0.059	0.042	0.062	0.051	0.052	0.053
	Middle	0.054	0.047	0.052	0.053	0.050	0.051
	Bottom	0.060	0.056	0.056	0.034	0.063	0.054
Station 3	Top	0.063	0.063	0.058	0.047	0.044	0.055
	Middle	0.083	0.057	0.052	0.042	0.048	0.056
	Bottom	0.058	0.050	0.066	0.037	0.056	0.053
Station 4	Top	0.061	0.057	0.076	0.045	0.049	0.058
	Middle	0.050	0.053	0.062	0.047	0.041	0.051
	Bottom	0.065	0.061	0.064	0.045	0.050	0.057
		Summer					Average
Reference	Top	0.067	0.080	0.069	0.057	---	0.068
	Middle	0.067	0.067	0.070	0.068	---	0.068
	Bottom	0.061	0.085	0.079	0.056	---	0.070
Station 1	Top	---	0.078	0.071	0.068	---	0.072
	Middle	---	0.090	0.075	0.064	---	0.076
	Bottom	0.070	0.075	0.068	0.047	---	0.065
Station 2	Top	---	0.076	0.079	0.073	---	0.076
	Middle	---	0.074	0.078	0.057	---	0.070
	Bottom	---	0.086	0.079	0.055	---	0.073
Station 3	Top	0.082	0.078	0.093	0.054	---	0.077
	Middle	0.078	0.082	0.074	0.056	---	0.073
	Bottom	0.067	0.084	0.073	0.120	---	0.086
Station 4	Top	0.063	0.075	0.068	0.058	---	0.066
	Middle	0.081	0.078	0.078	0.052	---	0.072
	Bottom	0.093	0.076	0.078	0.061	---	0.077

Notes:
WQG calculated from BC Approved Water Quality Guidelines Summary Report, Table 26E (long-term/average) and Table 26F (short-term acute/maximum). Values used for calculations are 30ppt salinity, 10°C, and pH of 8.
--- indicates sample not collected due to inclement weather

Appendix C3, continued

PO_4 Phosphate Total mg/L – 2023							
		Winter					Average
Reference	Top	0.074	0.074	0.070	0.070	0.073	0.072
	Middle	0.062	0.078	0.069	0.071	0.074	0.071
	Bottom	0.069	0.079	0.069	0.071	0.073	0.072
Station 1	Top	0.075	0.075	0.069	0.073	0.073	0.073
	Middle	0.074	0.077	0.071	0.071	0.073	0.073
	Bottom	0.072	0.075	0.069	0.070	0.075	0.072
Station 2	Top	0.075	0.075	0.071	0.071	0.074	0.073
	Middle	0.072	0.076	0.070	0.072	0.074	0.073
	Bottom	0.071	0.079	0.068	0.071	0.074	0.073
Station 3	Top	0.073	0.078	0.070	0.072	0.080	0.075
	Middle	0.074	0.074	0.072	0.071	0.074	0.073
	Bottom	0.076	0.076	0.070	0.071	0.075	0.074
Station 4	Top	0.075	0.074	0.070	0.070	0.078	0.073
	Middle	0.073	0.073	0.070	0.072	0.084	0.074
	Bottom	0.073	0.075	0.068	0.071	0.074	0.072
		Summer					Average
Reference	Top	0.052	0.059	0.054	0.062	---	0.057
	Middle	0.055	0.060	0.061	0.066	---	0.061
	Bottom	0.054	0.060	0.059	0.064	---	0.059
Station 1	Top	---	0.056	0.056	0.061	---	0.058
	Middle	---	0.058	0.057	0.062	---	0.059
	Bottom	0.055	0.059	0.060	0.061	---	0.059
Station 2	Top	---	0.055	0.056	0.057	---	0.056
	Middle	---	0.059	0.055	0.060	---	0.058
	Bottom	---	0.057	0.058	0.059	---	0.058
Station 3	Top	0.054	0.056	0.054	0.056	---	0.055
	Middle	0.055	0.058	0.056	0.063	---	0.058
	Bottom	0.061	0.056	0.056	0.062	---	0.059
Station 4	Top	0.052	0.055	0.056	0.061	---	0.056
	Middle	0.057	0.055	0.059	0.061	---	0.058
	Bottom	0.058	0.054	0.056	0.062	---	0.058

Appendix C3, continued

Total Suspended Solids mg/L – 2023							
		Winter					Average
Reference	Top	10.0	<1	2.8	4.0	1.6	3.8
	Middle	8.4	3.2	4.4	5.6	2.8	4.9
	Bottom	6.4	5.2	9.2	24.0	3.2	9.6
Station 1	Top	2.8	8.0	6.4	30.0	4.0	10.2
	Middle	5.6	3.2	2.0	7.6	2.0	4.1
	Bottom	3.2	<1	<1	34.0	<1	7.7
Station 2	Top	2.8	2.0	<1	12.0	1.6	3.8
	Middle	2.0	8.8	3.2	30.0	5.2	9.8
	Bottom	5.6	9.6	6.4	3.6	4.8	6.0
Station 3	Top	9.2	2.4	8.4	40.0	<1	12.1
	Middle	4.0	5.2	6.8	4.0	<1	4.1
	Bottom	6.0	4.4	6.4	10.0	<1	5.5
Station 4	Top	6.0	3.2	4.0	2.8	<1	3.3
	Middle	5.2	6.8	2.8	7.6	<1	4.6
	Bottom	7.2	9.2	6.0	19.0	<1	8.4
		Summer					Average
Reference	Top	20.0	25.0	3.6	7.2	---	14.0
	Middle	13.0	32.0	10.0	10.0	---	16.3
	Bottom	14.0	18.0	9.6	<1	---	10.5
Station 1	Top	---	36.0	6.8	2.0	---	14.9
	Middle	---	28.0	2.4	10.0	---	13.5
	Bottom	19.0	14.0	7.2	12.0	---	13.1
Station 2	Top	---	11.0	2.0	6.0	---	6.3
	Middle	---	13.0	6.4	38.0	---	19.1
	Bottom	---	12.0	9.6	18.0	---	13.2
Station 3	Top	24.0	8.4	8.4	2.0	---	10.7
	Middle	21.0	8.8	26.0	2.0	---	14.5
	Bottom	64.0	29.0	21.0	7.2	---	30.3
Station 4	Top	17.0	13.0	13.0	8.4	---	12.9
	Middle	20.0	11.0	19.0	3.2	---	13.3
	Bottom	13.0	7.6	18.0	2.4	---	10.3

Appendix C3, continued

TKN mg/L – 2023							
		Winter					Average
Reference	Top	0.074	0.055	<0.02	0.053	0.075	0.053
	Middle	0.089	0.058	<0.02	0.072	0.058	0.057
	Bottom	0.032	0.061	<0.02	0.077	0.076	0.051
Station 1	Top	0.037	0.076	0.046	0.078	<0.02	0.049
	Middle	0.042	0.078	0.024	0.045	0.076	0.053
	Bottom	0.037	0.034	0.030	0.058	0.074	0.047
Station 2	Top	0.029	0.067	<0.02	0.078	0.076	0.052
	Middle	0.040	0.059	<0.02	0.037	0.079	0.045
	Bottom	0.029	0.039	<0.02	0.064	0.081	0.045
Station 3	Top	0.034	0.052	<0.02	0.060	0.090	0.049
	Middle	0.023	0.052	0.025	0.043	0.099	0.048
	Bottom	0.033	0.040	<0.02	0.071	0.078	0.046
Station 4	Top	0.038	0.055	<0.02	0.056	0.071	0.046
	Middle	0.029	0.032	0.036	0.078	0.053	0.046
	Bottom	0.033	0.055	0.033	0.026	0.057	0.041
		Summer					Average
Reference	Top	0.173	0.115	0.088	0.149	---	0.131
	Middle	0.163	0.081	0.129	0.095	---	0.117
	Bottom	0.132	0.081	0.116	0.105	---	0.109
Station 1	Top	---	0.096	0.106	0.071	---	0.091
	Middle	---	0.127	0.109	0.131	---	0.122
	Bottom	0.137	0.119	0.103	0.106	---	0.116
Station 2	Top	---	0.102	0.122	0.116	---	0.113
	Middle	---	0.127	0.117	0.144	---	0.129
	Bottom	---	0.138	0.123	0.357	---	0.206
Station 3	Top	0.262	0.127	0.098	0.527	---	0.254
	Middle	0.149	0.132	0.126	0.358	---	0.191
	Bottom	0.122	0.094	0.128	0.147	---	0.123
Station 4	Top	0.205	0.090	0.127	0.111	---	0.133
	Middle	0.159	0.073	0.099	0.073	---	0.101
	Bottom	0.150	0.078	0.134	0.078	---	0.110

Appendix C3, continued

Sulphate mg/L – 2023							
		Winter					Average
Reference	Top	2,200	2,200	2,300	2,300	2,400	2,280
	Middle	2,200	2,300	2,300	2,300	2,400	2,300
	Bottom	2,200	2,200	2,300	2,300	2,400	2,280
Station 1	Top	2,200	2,200	2,200	2,200	2,300	2,220
	Middle	2,200	2,300	2,300	2,200	2,400	2,280
	Bottom	2,300	2,200	2,200	2,200	2,400	2,260
Station 2	Top	2,200	2,300	2,200	2,200	2,500	2,280
	Middle	2,200	2,300	2,300	2,200	2,400	2,280
	Bottom	2,200	2,200	2,300	2,300	2,500	2,300
Station 3	Top	2,200	2,200	2,200	2,200	2,500	2,260
	Middle	2,200	2,200	2,200	2,300	2,400	2,260
	Bottom	2,200	2,300	2,300	2,200	2,400	2,280
Station 4	Top	2,300	2,200	2,200	2,300	2,400	2,280
	Middle	2,300	2,200	2,200	2,300	2,400	2,280
	Bottom	2,300	2,200	2,200	2,300	2,400	2,280
		Summer					Average
Reference	Top	2,200	2,200	2,200	2,400	---	2,250
	Middle	2,200	2,300	2,300	2,500	---	2,325
	Bottom	2,200	2,300	2,300	2,500	---	2,325
Station 1	Top	---	2,200	2,200	2,300	---	2,233
	Middle	---	2,200	2,300	2,600	---	2,367
	Bottom	2,300	2,300	2,200	2,500	---	2,325
Station 2	Top	---	2,200	2,200	2,500	---	2,300
	Middle	---	2,200	2,200	2,500	---	2,300
	Bottom	---	2,200	2,200	2,400	---	2,267
Station 3	Top	2,100	2,200	2,200	2,500	---	2,250
	Middle	2,200	2,200	2,200	2,500	---	2,275
	Bottom	2,200	2,200	2,200	2,400	---	2,250
Station 4	Top	2,200	2,200	2,200	2,400	---	2,250
	Middle	2,200	2,200	2,300	2,400	---	2,275
	Bottom	2,200	2,200	2,200	2,400	---	2,250

Appendix C3, continued

Nitrate Nitrogen mg/L – 2023							
	BC Approved WQG = 3.7 mg/L (average over 5 samples)						
		Winter					Average
Reference	Top	0.421	0.407	0.419	0.391	0.357	0.399
	Middle	0.419	0.410	0.421	0.391	0.361	0.400
	Bottom	0.423	0.412	0.419	0.391	0.360	0.401
Station 1	Top	0.418	0.397	0.402	0.372	0.351	0.388
	Middle	0.415	0.408	0.419	0.406	0.363	0.402
	Bottom	0.415	0.411	0.415	0.401	0.358	0.400
Station 2	Top	0.420	0.404	0.418	0.383	0.356	0.396
	Middle	0.416	0.409	0.415	0.394	0.357	0.398
	Bottom	0.415	0.406	0.416	0.405	0.355	0.399
Station 3	Top	0.419	0.409	0.416	0.383	0.341	0.394
	Middle	0.420	0.404	0.421	0.395	0.346	0.397
	Bottom	0.416	0.409	0.417	0.405	0.349	0.399
Station 4	Top	0.411	0.408	0.418	0.383	0.364	0.397
	Middle	0.415	0.408	0.421	0.395	0.360	0.400
	Bottom	0.413	0.404	0.412	0.409	0.355	0.399
		Summer					Average
Reference	Top	0.146	0.249	0.210	0.250	---	0.214
	Middle	0.194	0.313	0.246	0.303	---	0.264
	Bottom	0.218	0.310	0.248	0.305	---	0.270
Station 1	Top	---	0.237	0.208	0.250	---	0.232
	Middle	---	0.241	0.222	0.242	---	0.235
	Bottom	0.214	0.243	0.234	0.225	---	0.229
Station 2	Top	---	0.246	0.224	0.218	---	0.229
	Middle	---	0.248	0.211	0.232	---	0.230
	Bottom	---	0.249	0.222	0.230	---	0.234
Station 3	Top	0.105	0.242	0.186	0.220	---	0.188
	Middle	0.202	0.250	0.211	0.237	---	0.225
	Bottom	0.208	0.251	0.220	0.234	---	0.228
Station 4	Top	0.128	0.248	0.199	0.222	---	0.199
	Middle	0.209	0.254	0.219	0.237	---	0.230
	Bottom	0.219	0.253	0.217	0.237	---	0.232

Appendix C3, continued

Nitrite Nitrogen mg/L – 2023							
		Winter					Average
Reference	Top	<0.002	0.002	0.002	<0.002	<0.002	0.001
	Middle	<0.002	0.002	<0.002	0.002	<0.002	0.001
	Bottom	<0.002	<0.002	<0.002	<0.002	<0.002	0.001
Station 1	Top	<0.002	0.002	0.003	<0.002	0.002	0.002
	Middle	<0.002	0.002	0.003	<0.002	<0.002	0.002
	Bottom	<0.002	0.003	0.003	<0.002	0.002	0.002
Station 2	Top	<0.002	0.002	0.002	<0.002	<0.002	0.001
	Middle	<0.002	0.002	0.002	<0.002	<0.002	0.001
	Bottom	<0.002	0.003	0.002	<0.002	0.002	0.002
Station 3	Top	<0.002	0.002	0.003	<0.002	0.002	0.002
	Middle	<0.002	<0.002	0.002	<0.002	0.003	0.002
	Bottom	<0.002	<0.002	0.002	<0.002	0.002	0.002
Station 4	Top	<0.002	<0.002	0.003	<0.002	0.003	0.002
	Middle	<0.002	0.003	0.003	<0.002	0.003	0.002
	Bottom	<0.002	0.003	0.002	<0.002	0.002	0.002
		Summer					Average
Reference	Top	0.002	0.002	0.003	0.004	---	0.003
	Middle	0.002	0.002	0.003	0.003	---	0.003
	Bottom	0.002	0.002	0.005	0.003	---	0.003
Station 1	Top	---	0.003	0.003	0.008	---	0.005
	Middle	---	0.004	0.004	0.008	---	0.005
	Bottom	<0.002	0.003	0.005	0.004	---	0.003
Station 2	Top	---	0.002	0.004	0.003	---	0.003
	Middle	---	0.002	0.003	0.004	---	0.003
	Bottom	---	0.002	0.003	0.003	---	0.003
Station 3	Top	0.003	0.003	0.002	0.003	---	0.003
	Middle	0.003	0.002	0.004	0.003	---	0.003
	Bottom	0.002	0.002	0.004	0.003	---	0.003
Station 4	Top	0.002	0.002	0.003	0.003	---	0.003
	Middle	0.005	0.002	0.004	0.003	---	0.004
	Bottom	0.006	0.002	0.003	0.004	---	0.004

Appendix C3, continued

Salinity – 2023							
		Winter					Average
Reference	Top	31.7	31.5	30.9	30.6	31.0	31.1
	Middle	31.7	31.6	30.9	30.7	31.2	31.2
	Bottom	31.8	31.6	31.2	30.8	31.1	31.3
Station 1	Top	31.4	31.3	30.8	30.5	31.0	31.0
	Middle	31.7	31.3	31.0	30.6	30.9	31.1
	Bottom	31.6	31.4	31.3	31.0	30.8	31.2
Station 2	Top	31.6	31.4	31.0	30.7	30.8	31.1
	Middle	31.8	31.3	31.0	30.5	31.0	31.1
	Bottom	31.9	31.5	31.1	31.0	31.1	31.3
Station 3	Top	31.8	31.5	30.8	30.7	31.0	31.2
	Middle	32.0	31.4	31.0	30.8	30.9	31.2
	Bottom	32.0	31.5	31.0	30.7	31.0	31.2
Station 4	Top	31.6	31.3	31.0	30.1	31.0	31.0
	Middle	31.7	31.4	31.0	30.6	31.0	31.1
	Bottom	31.8	31.5	31.2	31.4	30.8	31.3
		Summer					Average
Reference	Top	30.2	29.0	29.3	30.3	---	29.7
	Middle	30.2	30.3	30.7	31.3	---	30.6
	Bottom	30.3	30.5	30.9	31.2	---	30.7
Station 1	Top	---	28.9	29.0	30.4	---	29.4
	Middle	---	29.1	30.6	30.2	---	30.0
	Bottom	30.3	28.9	30.7	30.6	---	30.1
Station 2	Top	---	28.8	30.6	30.2	---	29.9
	Middle	---	29.0	30.4	30.4	---	29.9
	Bottom	---	29.1	30.6	30.5	---	30.1
Station 3	Top	30.0	29.2	30.4	30.3	---	30.0
	Middle	30.2	29.4	30.6	30.6	---	30.2
	Bottom	30.2	29.3	30.8	30.6	---	30.2
Station 4	Top	30.1	29.1	30.4	30.3	---	30.0
	Middle	30.2	29.1	30.6	30.6	---	30.1
	Bottom	30.2	29.1	30.6	30.6	---	30.1

Appendix C3, continued

N Nitrogen Total mg/L – 2023							
		Winter					Average
Reference	Top	0.495	0.465	0.418	0.443	0.432	0.451
	Middle	0.508	0.470	0.412	0.465	0.420	0.455
	Bottom	0.455	0.473	0.428	0.468	0.436	0.452
Station 1	Top	0.455	0.475	0.451	0.451	0.367	0.440
	Middle	0.456	0.488	0.445	0.451	0.439	0.456
	Bottom	0.453	0.448	0.448	0.459	0.435	0.449
Station 2	Top	0.449	0.472	0.425	0.461	0.431	0.448
	Middle	0.456	0.470	0.420	0.431	0.436	0.443
	Bottom	0.445	0.447	0.415	0.469	0.438	0.443
Station 3	Top	0.453	0.463	0.423	0.443	0.434	0.443
	Middle	0.443	0.456	0.448	0.437	0.448	0.446
	Bottom	0.449	0.449	0.408	0.476	0.429	0.442
Station 4	Top	0.449	0.463	0.435	0.438	0.439	0.445
	Middle	0.444	0.443	0.460	0.473	0.416	0.447
	Bottom	0.446	0.462	0.447	0.435	0.413	0.441
		Summer					Average
Reference	Top	0.321	0.366	0.301	0.403	---	0.348
	Middle	0.359	0.396	0.378	0.401	---	0.384
	Bottom	0.352	0.393	0.368	0.413	---	0.382
Station 1	Top	---	0.335	0.317	0.329	---	0.327
	Middle	---	0.373	0.334	0.381	---	0.363
	Bottom	0.351	0.365	0.342	0.335	---	0.348
Station 2	Top	---	0.350	0.349	0.338	---	0.346
	Middle	---	0.377	0.331	0.379	---	0.362
	Bottom	---	0.389	0.348	0.590	---	0.442
Station 3	Top	0.370	0.372	0.287	0.751	---	0.445
	Middle	0.354	0.384	0.341	0.598	---	0.419
	Bottom	0.332	0.348	0.352	0.384	---	0.354
Station 4	Top	0.335	0.340	0.330	0.336	---	0.335
	Middle	0.373	0.329	0.321	0.314	---	0.334
	Bottom	0.375	0.333	0.354	0.319	---	0.345

Appendix C3, continued

Sulfide mg/L – 2023							
		Winter					Average
Reference	Top	<0.0018	<0.0018	0.008	<0.0018	<0.0018	0.0024
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 1	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 2	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 3	Top	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
Station 4	Top	<0.0018	<0.0018	<0.0018	<0.0018	0.026	0.0059
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018	<0.0018
		Summer					Average
Reference	Top	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
Station 1	Top	---	<0.0018	<0.0018	<0.0018	---	<0.0018
	Middle	---	<0.0018	<0.0018	<0.0018	---	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
Station 2	Top	---	<0.0018	<0.0018	<0.0018	---	<0.0018
	Middle	---	<0.0018	0.002	<0.0018	---	0.0013
	Bottom	---	<0.0018	<0.0018	<0.0018	---	<0.0018
Station 3	Top	<0.0018	---	<0.0018	<0.0018	---	<0.0018
	Middle	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
Station 4	Top	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018
	Middle	<0.0018	<0.0018	0.005	<0.0018	---	0.0018
	Bottom	<0.0018	<0.0018	<0.0018	<0.0018	---	<0.0018

Appendix C3, continued

Total Organic Carbon mg/L – 2023							
		Winter					Average
Reference	Top	0.96	0.85	0.78	+	0.98	0.9
	Middle	0.97	0.82	0.84	+	0.88	0.9
	Bottom	0.74	0.90	0.76	+	0.97	0.8
Station 1	Top	0.76	0.96	0.75	+	0.89	0.8
	Middle	0.82	0.94	0.74	+	0.92	0.9
	Bottom	0.85	0.89	0.80	+	0.96	0.9
Station 2	Top	0.79	0.84	1.10	+	0.92	0.9
	Middle	0.79	0.85	0.84	+	0.94	0.9
	Bottom	0.78	0.89	0.77	+	0.92	0.8
Station 3	Top	0.82	2.10	0.88	+	1.10	1.2
	Middle	0.76	0.86	0.89	+	0.92	0.9
	Bottom	0.78	0.82	0.86	+	0.92	0.8
Station 4	Top	0.88	0.81	0.77	+	0.87	0.8
	Middle	0.81	0.86	0.80	+	0.89	0.8
	Bottom	0.83	0.80	0.72	+	0.86	0.8
		Summer					Average
Reference	Top	53.0	1.20	1.40	1.40	---	14
	Middle	61.0	1.10	1.30	1.30	---	16
	Bottom	72.0	1.10	1.30	1.10	---	19
Station 1	Top	---	1.40	1.30	1.50	---	1.4
	Middle	---	1.10	1.20	1.40	---	1.2
	Bottom	54.0	1.20	1.30	1.30	---	14
Station 2	Top	---	1.30	1.30	1.30	---	1.3
	Middle	---	23.00	1.50	1.30	---	8.6
	Bottom	---	1.20	1.30	1.10	---	1.2
Station 3	Top	67.0	1.20	1.60	1.30	---	18
	Middle	69.0	1.20	1.30	1.40	---	18
	Bottom	73.0	1.40	1.50	1.40	---	19
Station 4	Top	63.0	1.30	1.20	1.50	---	17
	Middle	71.0	1.20	1.30	1.40	---	19
	Bottom	50.0	1.20	1.30	1.40	---	13

Notes:
+data points excluded due to outlier results