

Core Area Stormwater Quality Program

2021 Report

Capital Regional District | Parks & Environmental Services, Environmental Protection

Including the jurisdictions of:

City of Colwood
Township of Esquimalt
City of Langford
District of Oak Bay
District of Saanich
City of Victoria
Town of View Royal
Esquimalt First Nation
Songhees First Nation
Department of National Defence

Prepared by
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July 2022



CORE AREA STORMWATER QUALITY PROGRAM 2021 REPORT

Table of Contents

Contents

1.0	INTRODUCTION.....	1
2.0	RESULTS AND DISCUSSION	1
2.1	STORMWATER DISCHARGE EVALUATIONS	1
2.1.1	<i>Public Health Ratings</i>	<i>1</i>
2.1.2	<i>Environmental Concern Ratings.....</i>	<i>4</i>
2.1.3	<i>Aqueous Metals in Storm Drains.....</i>	<i>5</i>
2.2	SOURCE INVESTIGATIONS	8
2.2.1	<i>Bacterial Investigations</i>	<i>8</i>
2.2.2	<i>Chemical Contaminant Investigations</i>	<i>8</i>
2.3	MAJOR WATERCOURSE MONITORING	9
2.3.1	<i>Watershed Monitoring Data.....</i>	<i>9</i>
3.0	2022 PROGRAM.....	11

List of Figures

Figure A.	Number of Discharges Assigned a High Public Health Concern Rating Over Time	2
Figure B.	Core Area 2021 Stormwater Discharges Requiring Action for Public Health and Environmental Concerns (Metchosin to Esquimalt Border)	6
Figure C.	Core Area 2021 Stormwater Discharges Requiring Action for Public Health and Environmental Concerns (Esquimalt to Central Saanich Border)	7
Figure D.	Hilsenhoff Biotic Indices for Benthic Macroinvertebrates for Streams Sampled in 2021	12

List of Tables

Table A.	Number of Discharges with a High Public Health Concern Rating from 2011 to 2021	3
Table B.	Stormwater Discharges Assigned a High Public Health Concern Rating in 2020 and 2021.....	3
Table C.	Discharges Recommended for Action Due to Elevated Sediment Chemical Contaminant Concentrations	5
Table D.	2021 Summary of CRD Stormwater Bacterial Source Investigations in the Core Area....	8
Table E.	2021 Summary of CRD Stormwater Contaminant Source Investigations in the Core Area	9

List of Appendices

Appendix A	Location of Stormwater Discharges
Appendix B	Core Area Stormwater Public Health Concern Ratings
Appendix C	Core Area Stormwater Discharge Bacterial Data (2020-2022)
Appendix D	<i>Escherichia Coli</i> Sampling Quality Assurance and Quality Control Program for 2021
Appendix E	2021 Core Area Stormwater Contaminant Data (2019-2021)
Appendix F	2021 Watercourse Monitoring Data
Appendix G	CRD Public Health and Environmental Concern Rating System

Terms & Abbreviations

Ag	silver
As	arsenic
CaCO ₃	calcium carbonate
Cd	cadmium
CCME	Canadian Council of Ministers of the Environment
CFU	colony-forming unit
Cn	contaminants
Cr	chromium
CRD	Capital Regional District
Cu	copper
d/s	downstream
DIS	dissolved state
DND	Department of National Defence
ENV	BC Ministry of Environment and Climate Change Strategy
EPT	Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)
FC	Fecal Coliform
HBI	Hilsenhoff Biotic Index
Hg	mercury
HPAH	High molecular weight polycyclic aromatic hydrocarbons
ISQG	Interim Sediment Quality Guidelines
LPAH	Low molecular weight polycyclic aromatic hydrocarbons
LWMP	Liquid Waste Management Program
MMAG	Marine Monitoring Advisory Group
MSQG	Marine Sediment Quality Guidelines
NH ₃	ammonia
NO ₂	nitrite
NO ₃	nitrate
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PEL	probable effects level
QA/QC	quality assessment/quality control
SPSO	sewage pump station overflow
SQG	sediment quality guidelines
TOC	total organic carbon
TOT	total state
TEU	toxic equivalent unit
u/s	upstream
WQG	Water Quality Guidelines
Zn	zinc

CORE AREA STORMWATER QUALITY PROGRAM 2021 REPORT

1.0 INTRODUCTION

The Capital Regional District (CRD), Stormwater Quality Program (Program) works to identify and reduce contamination in stormwater, creeks and the ocean through monitoring, assessment, collaboration and education. In the core area, this work fulfills commitments in the Core Area Liquid Waste Management Plan (LWMP) and is done in partnership with participating municipalities and First Nations, with the goal of protecting human health and the environment. Program results are communicated to the participating partners and reports are available on the CRD website (www.crd.bc.ca).

The program assesses stormwater discharges in the core area and assigns priority ratings for mitigative action for municipalities to consider. CRD staff identify contamination and impacts from stormwater through bacterial and chemical sampling. Where contamination is found, CRD staff work with municipal staff to find and eliminate the source. The storm drain systems are owned and operated by the municipalities and the municipalities have the responsibility to carry out remedial measures where possible. In addition, CRD staff also conduct sampling in twelve major watercourses and the near-shore marine environment.

This report summarizes the results of work completed in 2021 (early 2022 data is considered when possible). Water and sediment quality data, including details about sampling locations and how discharges are rated for public health and environmental concern, are available in the Appendices.

2.0 RESULTS AND DISCUSSION

2.1 Stormwater Discharge Evaluations

The Program evaluates water and/or sediment quality in approximately 550 core area stormwater discharges from the coastline between the Colwood-Metchosin border in the west and the Saanich-Central Saanich border in the east, including Esquimalt Lagoon, Esquimalt and Victoria harbours, the Gorge, Portage Inlet and the City of Langford coastline along Saanich Inlet (see Appendix A for locations).

2.1.1 Public Health Ratings

Each year, CRD staff sample a selection of stormwater discharges for analysis of bacterial levels. *E.coli* is measured as an indicator of fecal contamination and possible presence of pathogens. Staff assign a “public health concern rating” to each discharge based on the extent of *E.coli* contamination in the discharge flow and potential for the public to contact the flow. While the CRD does not actually evaluate public health risk, this method is used to prioritize the discharges. This service allows appropriate jurisdictions to undertake remedial measures where they will have the most benefit. Appendix G describes the CRD public health concern rating system.

In 2021, CRD staff sampled 173 stormwater discharges twice for *E.coli* concentrations (in winter and summer). These discharges included those previously rated as high- and moderate-priority, with a subset of low-priority discharges (to monitor for change).

Forty-five percent of the discharges had one or more *E.coli* counts greater than 200 colony forming units (CFU)/100 mL, a level that indicates sources of sewage or animal waste with potential to cause adverse effects for public members engaging in primary recreational activities (e.g., swimming, diving). However, many of these discharges have low flows or are located where there is little risk of public contact. Considering the likelihood for contact, staff assigned the following public health concern ratings to allow prioritization:

- 93 low ratings
- 55 moderate ratings, and
- 25 high ratings (Table A, Figure B, Figure C)

The number of high-rated discharges continued to decrease in 2021 (Figure A and Table A). This decline continued despite aging wastewater and stormwater conveyance infrastructure, and continuing building development and renovations (which create the potential for stormwater-sewage cross-connections). The decrease highlights the ongoing efforts by the municipalities to replace, repair and reline old conveyance infrastructure, and work with residents and property owners to repair cross-connections.

While the total number of high-rated discharges has decreased, some of the individual discharges on the list have changed over time. In 2021, four of the previously high-rated discharges were assigned a lower rating, due to lower bacterial counts, while two discharges were added to the high-rated list, due to newly-identified contaminant sources or fluctuation that resulted in higher counts.

Of the 25 high-rated discharges in the core area, 15 have remained high-rated for at least five years (see Appendix E). The causes of contamination in these discharges are often costly or difficult to repair or remediate, and some discharges have multiple sources of contamination in a single catchment, making it difficult to track.

The public health concern ratings for each discharge and bacterial stormwater data, can be found in appendices B and C.

Figure A. Number of Discharges Assigned a High Public Health Concern Rating Over Time

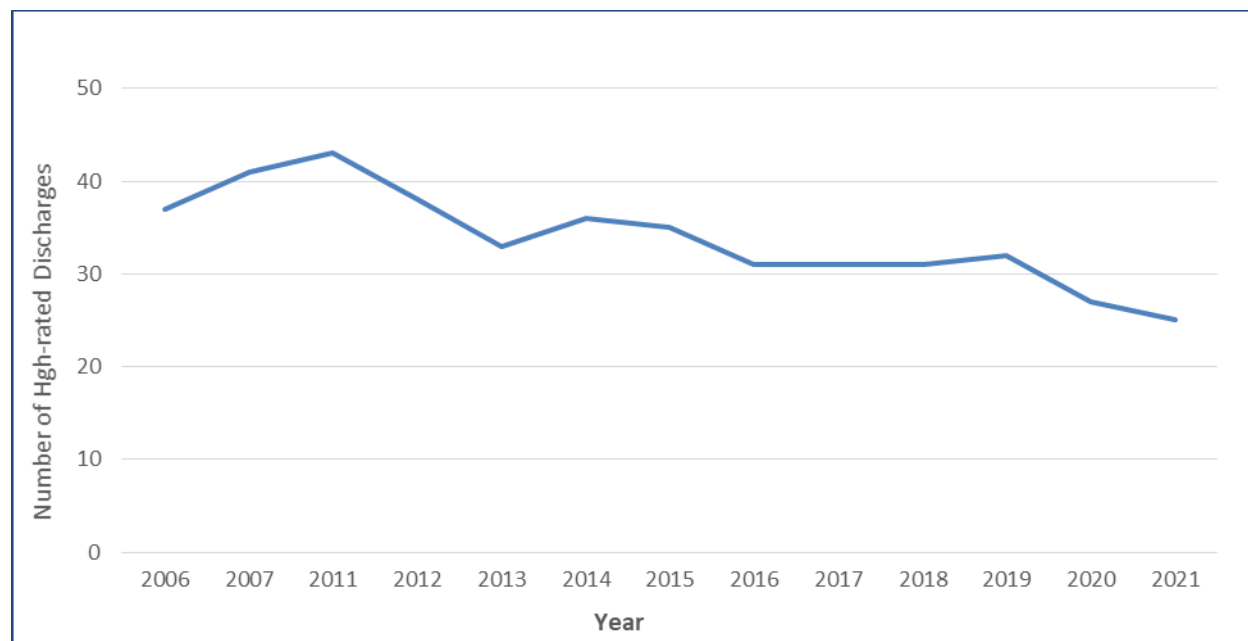


Table A. Number of Discharges with a High Public Health Concern Rating from 2011 to 2021

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Number of Discharges Assessed	(186)	(114)	(150)	(142)	(152)	(164)	(167)	(168)	(175)	(180)	(175)
	Number of Discharges Assigned a High Public Health Concern Rating										
Colwood	1	0	0	1	0	0	0	1	0	0	0
View Royal	1	1	0	0	0	0	0	0	1	0	0
Esquimalt	7	7	8	7	5	6	6	7	5	4	3
Esquimalt private ¹	*	*	0	0	1	0	2	1	1	0	0
DND	0	0	0	0	0	0	0	0	0	0	0
Saanich	2	3	4	5	5	6	4	1	3	4	4
Saanich private ¹	*	0	0	0	0	0	0	0	0	0	0
Victoria	20	17	13	12	14	11	11	15	14	13	12
Victoria private ¹	3	1	1	2	2	2	2	1	1	1	0
Oak Bay	9	9	7	9	8	6	6	5	6	5	6
Langford	0	0	0	0	0	0	0	0	0	0	0
Total	43	38	33	36	35	31	31	31	31	27	25

Notes:

¹ Discharges that are not part of the municipal infrastructure are not under municipal jurisdiction, and are separated out from the municipal totals.

*Private discharges included in the municipal totals.

Table B. Stormwater Discharges Assigned a High Public Health Concern Rating in 2020 and 2021

Jurisdiction	Stormwater Discharges Rated High for Public Health Concern	
	2020	2021
City of Colwood	-	-
Township of Esquimalt	744B, 781, 805, 806	744B, 805, 806
Township of Esquimalt – private ¹	-	-
City of Langford	-	-
District of Oak Bay	245, 318, 320, 322, 323	245, 249, 318, 320, 322, 323
District of Saanich	503, 506, 580, 581	503, 505, 580, 581
City of Victoria	214, 216, 222, 229, 603, 607, 610, 611, 614, 619, 650, 758A, 777A	214, 216, 222, 229, 230, 603, 607, 611, 614, 619, 650, 777A
City of Victoria – private ¹	649	-
Town of View Royal	-	-
Esquimalt First Nation	-	-
Songhees First Nation	-	-
DND	-	-

Notes:

¹ Discharges that are not part of the municipal infrastructure are not under municipal jurisdiction. Refer to Figure B and Figure C for stormwater discharge locations.

2.1.2 Environmental Concern Ratings

Through monitoring and ratings, CRD staff also prioritize stormwater discharges based on their potential for environmental impact. While CRD staff prioritize stormwater discharges based on environmental concern ratings, local governments are responsible for addressing high-rated stormwater discharges based on their own priorities.

Ratings are based on concentrations of metals and organic contaminants [polycyclic aromatic hydrocarbons (PAH)] measured in sediment within the stormwater collection system (e.g., manholes, ditches and creeks) relative to sediment quality guidelines (for the protection of marine aquatic life). Discharges are sampled for consecutive years until the rating and contaminant(s) are confirmed. Once confirmed as a high-rated discharge, the discharge is targeted for corrective action starting with an investigation to locate the contaminant source(s). Appendix G contains detailed information about the CRD environmental concern rating system. Stormwater discharge sediment data and ratings can be found in Appendix E.

In 2021, CRD staff collected 20 stormwater sediment samples (16 at discharge points and four at upstream locations). Based on the concentrations of metals and PAHs, this data resulted in environmental concern ratings for 16 discharges, as follows:

- Nine were assigned a low rating
- Six were assigned a moderate rating, and
- One was assigned a high rating

The discharge assigned a high rating (discharge 737; Esquimalt) has had known contamination for many years and is on the corrective action list. CRD staff narrowed down the source of contamination to Garthland Place and informed Esquimalt staff. The discharge was previously rated as high concern based on elevated zinc and PAHs, however the most recent sample only had elevated PAHs. Two recent water samples did not have elevated metals, and PAHs were not detected. CRD staff will determine if the source of hydrocarbons is ongoing or due to historical practices in 2022.

The discharge assigned a high rating in 2020 (discharge 692; Saanich) had a lower concentration of zinc and was assigned a moderate rating in 2021. CRD staff will continue to monitor this discharge to confirm contamination levels are declining.

CRD staff make recommendations for corrective action to find and eliminate sources of chemical contamination in a catchment when a rating remains high for two consecutive years and the specific parameter(s) of concern are confirmed. Based on data up to 2021, the CRD recommends 20 discharges for corrective action in the core area (shown in Table C). Locations of high-rated discharges in 2021, and those identified for corrective action, are shown on Figure B and Figure C.

The number of discharges recommended for action has fluctuated from 18 to 22 for the past seven years. Many discharges recommended for action have been a concern for more than five years. A number of the discharges with elevated metals are in large catchments with industrial land use, and along shorelines where historical practices or contaminated fill may have resulted in contamination (e.g., discharges 614, 620, 627, 629, 634, 636). Spills are more common in these areas as well.

Sources of contaminants in stormwater sediment can be complex to find and eliminate, as sediment is not always present when sampling, and contaminant levels fluctuate over time. Sources of contamination can occur as non-point sources (e.g., from roadways, parking lots) and transient point sources (e.g., spills). In some cases, sediment results reflect past practices that are no longer occurring. In 2019, CRD staff started to collect water samples for contaminant analysis to supplement the sediment data. This will enable staff to detect more recent practices and also evaluate the bioavailability of the measured contaminants.

The CRD Source Control education program has increased awareness of products used on commercial and private sites that have the potential to leach into surrounding waterways. As well, the use and maintenance of stormwater rehabilitation units (that capture the sediments before they reach the

environment) has increased. The CRD and municipalities will continue to work together to identify and eliminate potential sources of contamination for these discharges.

2.1.3 Aqueous Metals in Storm Drains

In 2019, CRD staff started routinely measuring contaminants in water to provide more information about contaminant concentrations, sources, bioavailability, loadings, and to determine if a source is ongoing or dependent on precipitation. Data collected from 2019 to early 2022 are provided in Appendix E.

Data from 102 discharges indicate that 84% of stormwater discharges in the core area had one or more metal concentrations (predominantly copper) elevated above the BC freshwater and/or marine guideline for protection of aquatic life in.

While the impact of these storm drain discharges on the marine environment is unknown, CRD staff have measured elevated zinc and copper in three locations in the ocean adjacent to storm drains along Victoria Harbour (between Belleville Street and Jutland Road) which have some of the highest levels of contamination.

The highest concentrations occurred in stormwater discharge 629 along the Victoria shoreline at Rock Bay. An upstream copper measurement at this location was more than 10,000 times greater than the marine water quality guideline. Exceedances for aluminum, cadmium, chromium, iron, lead and zinc were 10 to 100 times greater than guidelines. CRD staff have narrowed down one source of contamination to a block on John Street and City of Victoria staff are investigating further.

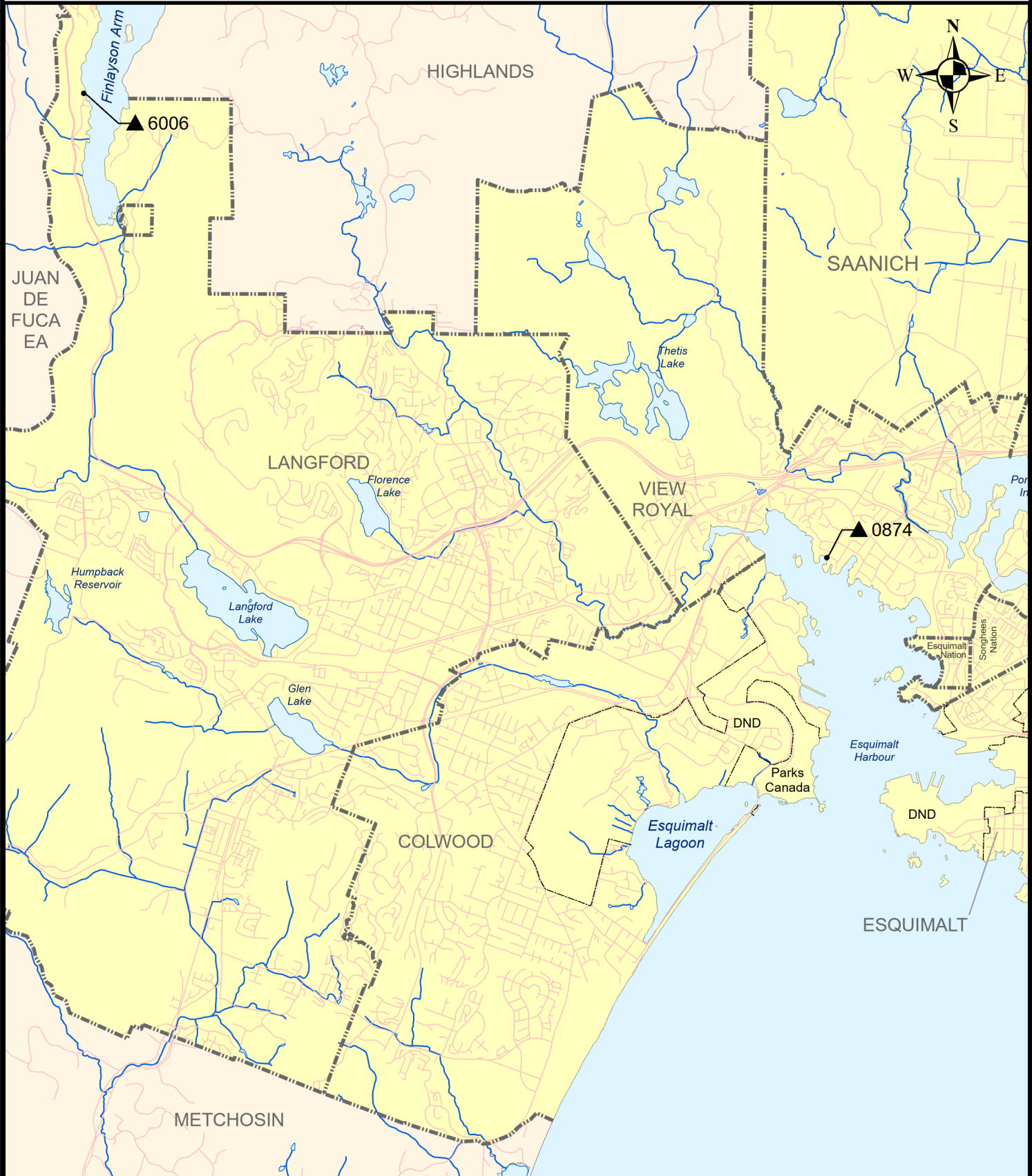
Table C. Discharges Recommended for Action Due to Elevated Sediment Chemical Contaminant Concentrations

Jurisdiction	Discharges Recommended for Corrective Action	Total
City of Colwood	-	0
Township of Esquimalt	737, 742, 749, 806	4
Township of Esquimalt – private ¹	-	0
City of Langford	6006	1
District of Oak Bay	250, 306, 307, 310	4
District of Saanich	505	1
District of Saanich – private ¹	-	-
City of Victoria	216, 603, 614, 620, 627, 629, 634, 636	8
City of Victoria – private ¹	649	1
Town of View Royal	874	1
DND	-	0
Total		20

Notes:

¹ Discharges that drain from private property do not fall under municipal jurisdiction.

Figure B - Core Area 2021
 Stormwater Discharges Requiring Action for Public Health and Environmental Concerns
 (Metchosin to Esquimalt Border)



Kilometres

0 0.5 1

Projection: UTM ZONE 10N NAD 83

Discharges Requiring Action

- High Public Health Rating
- ▲ High Environmental Rating and/or Recommended for Action

--- Municipal Boundaries

--- DND Boundaries

~ Streams and Rivers

— Roads

■ Stormwater Monitoring Area

Important This map is for general information purposes only. The Capital Regional District (CRD) makes no representations or warranties regarding the accuracy or completeness of this map or the suitability of the map for any purpose. **This map is not for navigation.** The CRD **will not be liable** for any damage, loss or injury resulting from the use of the map or information on the map and the map may be changed by the CRD at any time.

Figure C - Core Area 2021
Stormwater Discharges Requiring Action for Public Health and Environmental Concerns
(Esquimalt to Central Saanich Border)



0 1 2 Kilometres
Projection: UTM ZONE 10N NAD 83

Discharges Requiring Action

- High Public Health Rating
- ▲ High Environmental Rating and/or Recommended for Action

- Municipal Boundaries
- DND Boundaries
- ~ Streams and Rivers
- Roads
- Stormwater Monitoring Area

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2.2 Source Investigations

In 2021, CRD staff conducted source investigations in the catchment areas of 16 stormwater discharges identified as having a high public health or high environmental concern rating.

2.2.1 Bacterial Investigations

Bacterial source tracking investigations were conducted in nine stormwater catchment areas and the results of these investigations are presented in Table D.

CRD staff worked with Esquimalt and Parks Canada staff to fix two sources of sewage entering the marine environment through drains 744B (Gorge Creek) and 912 (Fort Rod Hill). Investigations are ongoing in eight discharges due to presence of multiple sources, lower bacteria counts or lack of flows available to sample in 2021.

Table D. 2021 Summary of CRD Stormwater Bacterial Source Investigations in the Core Area

Discharge #	Municipality	# of Sampling Events	Investigation Status
245	Oak Bay	2	Ongoing; source intermittent with foam
567A	Saanich	1	Ongoing; <i>E. coli</i> counts low; odour complaint follow-up
603	Victoria	1	Ongoing; source narrowed to Niagara Street
653	Saanich	1	Fixed; Saanich and CRD staff identified a cross-connection
744B	Esquimalt	1	Ongoing; Esquimalt fixed one source; another source exists
805	Esquimalt	5	Ongoing; one source narrowed to Juno Street
806	Esquimalt	4	Ongoing; multiple sources
854	DND/Esquimalt	1	Ongoing; eliminated DND as a source
912	Parks Canada/Colwood	1	Fixed

2.2.2 Chemical Contaminant Investigations

CRD staff conducted chemical contaminant source investigations in three stormwater catchment areas and continued to respond to sediment releases and oil spills. These investigations are summarized in Table E.

Investigations are ongoing in these catchments; however, a source was narrowed down for metals in discharge 629 and the City of Victoria has been notified. While investigations to the source of mercury in discharge 505 are ongoing, the area has been narrowed down to a few blocks and may be the result of historical contamination. CRD staff were involved in spill responses in Cecilia Creek where the source was identified by City of Victoria staff and construction dewatering practices were improved. However, sediment releases from construction activities continue to be a consistent source of contamination in the CRD. CRD staff were also involved in coordinating an oil spill response in the Gorge Waterway in 2021.

Table E. 2021 Summary of CRD Stormwater Contaminant Source Investigations in the Core Area

Discharge #	Municipality	Sampling Events (#)	Contaminant of Concern	Investigation Status
505	Saanich	2	Mercury	Ongoing; partially narrowed down; confirming results
629	Victoria	3	Aluminum, arsenic, cadmium, copper, iron, lead, nickel, silver and zinc	Narrowed a source down to the 600 block of John St.; City of Victoria is investigating, other smaller sources exist.
742	Esquimalt	2	Mercury	Narrowed to a block, but continuing to narrow further

Notes:

PAH is polycyclic aromatic hydrocarbons; LPAH are the low molecular weight PAH and HPAHs the high molecular weight PAHs.
 SWRU: stormwater retention unit
 COV: City of Victoria

Many of the discharges with elevated metals are in large catchments with industrial land use and along shorelines where historical practices or contaminated fill may have resulted in contamination (e.g., discharges 614, 620, 627, 629, 634, and 636). Spills are more common in these areas. These sources are challenging to narrow down and remediate.

Overall, CRD staff have narrowed down sources in 11 of the 20 stormwater catchments on the action list and continue to work with municipal staff on eliminating or lessening these sources (see previous reports for detail).

2.3 Major Watercourse Monitoring

CRD staff monitor a number of watercourses to provide information about watershed health to internal CRD, provincial and municipal staff, community groups and the public. In 2021, CRD staff continued to monitor Bee, Bowker, Cecelia, Colquitz, Colwood, Craigflower, Douglas, Hospital, Noble, Selleck and Tod creeks, Goldstream River and Mill Stream. See Appendix F for the watercourse data.

Each year, CRD staff collect water quality data twice at the discharge of each creek, providing a snapshot of creek health conditions in the wet and dry seasons. In addition, staff conduct more comprehensive watershed health assessments in two to three core area watercourses each year, with the goal to assess each watercourse in this manner every five years.

In 2021, CRD staff assessed the health of Douglas Creek and Goldstream River watersheds more thoroughly through the following activities:

- measuring water quality at least five times in 30 days in both summer and fall at various locations in the watersheds,
- measuring additional water quality parameters, including metals, and
- collecting benthic invertebrate animals for assessment of biological community health.

CRD watercourse data are compared to the British Columbia Ministry of Environment and Climate Change (BC ENV), Water Quality Guidelines (WQG) for protection of freshwater aquatic life. These data were also compared to data from the previous 5-in-30 assessment data.

2.3.1 Watershed Monitoring Data

The CRD data indicate that the water quality parameters of most concern in core area creeks are bacteria, phosphorus, turbidity and metals. Some sites also experience low dissolved oxygen and elevated

temperature in the summer. This is consistent with what is seen throughout the region and elsewhere wherever there is increased human presence. The BC ENV Vancouver Island phosphorus objective was exceeded in all CRD creeks, due to human and animal presence in these watersheds.

DOUGLAS CREEK WATERSHED

Water Quality Data

The Douglas Creek watershed lies entirely within the municipality of Saanich. Weekly data collected over the summer and fall in Douglas Creek indicated that urban residential land use continues to impact water quality and that the parameters of concern were consistent with those measured in 2016 (when the creek was last sampled in this manner).

The parameters that exceeded BC ENV approved WQG were copper, *E.coli*, iron, phosphorus, suspended solids, temperature and turbidity. Phosphorus and temperature measurements were lower in the summer of 2021 compared to 2016, despite the occurrence of record high temperatures recorded in the region early in the summer.

In 2021, with the exception of temperature measurements which only exceeded in the summer, copper and phosphorus measurements were elevated in both seasons (summer and fall), while iron, suspended solids, turbidity, zinc and *E.coli* only exceeded in fall and appeared to be influenced by rainfall.

Iron and suspended solid measurements only exceeded downstream at the discharge, while temperature only exceeded upstream where the creek daylights near Robinwood Drive. The remaining parameters of concern exceeded guidelines upstream and downstream.

Benthic Invertebrate Community Data

Benthic macroinvertebrates live in or on the bottom of streams and are indicators of stream health. Their community composition reflects the overall condition of the aquatic environment and depends on nearby water and sediment quality, as well as hydrology.

Compared to the 2016 data, the 2021 benthic invertebrate community data collected at the discharge of Douglas Creek showed reductions in abundance (4413 verses 2641), species richness (37 to 23), Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) (EPT) abundance (243 verses 78) and EPT richness (5 verses 3). A slight increase in Hilsenhoff Biotic Index (HBI; 5.09 verses 5.85) indicates the amount of organic and nutrient pollution in the stream may have slightly increased, based on species distribution and their tolerance to such pollution.

There can be variation in a benthic community from year to year. It is unknown how other factors such as water quality during other times of the year, the June 2021 heat dome, or stream-side restoration work which occurred upstream in early August may have affected the creek organisms.

A comparison of the HBI from all invertebrate data collected in 2021 are shown in Figure D.

GOLDSTREAM RIVER WATERSHED

Water Quality Data

Water quality in Goldstream River was good in 2021. The only guideline exceedances measured were of the Vancouver Island Objective for total phosphorus and the new dissolved copper WQG (which was not available during the previous assessment of Goldstream River in 2016).

Compared to 2016 measurements, there were fewer exceedances of phosphorus in 2021 and more exceedances of copper. The chronic dissolved copper guideline calculated for individual samples using the BC Biotic Ligand Model was exceeded in a number of samples in 2021. While copper concentrations are relatively low in Goldstream River (0.32 to 0.85 µg/L), the watercourse is more sensitive to copper inputs

due to low levels of organic carbon and other parameters that can ameliorate the toxicity of copper found in more polluted streams. While copper measurements exceed the guidelines in many cases, it is important to note the concentrations are consistent with background levels of copper found in other BC streams (median of 0.54 µg/L and 90th percentile of 1.25 µg/L) and is not likely to be a concern for aquatic animals who have acclimated to those background levels of copper. However, additional inputs of copper could have adverse effects to the aquatic life in this river.

Benthic Invertebrate Community Data

Benthic invertebrate community data collected downstream of Finlayson Arm Bridge in 2021 could not be compared to the 2016 sample as the 2016 sampling location was found to be marine-influenced which resulted in different benthic invertebrate communities. However, health metrics and indices indicated that the Goldstream River was healthier than Douglas Creek. Goldstream River had much higher abundance (15,600), richness (42), EPT abundance (6700), EPT richness (15) and a lower HBI (4.53). An HBI of 4.53, is considered good, with some organic pollution (see Figure D).

HYDROMETRIC DATA

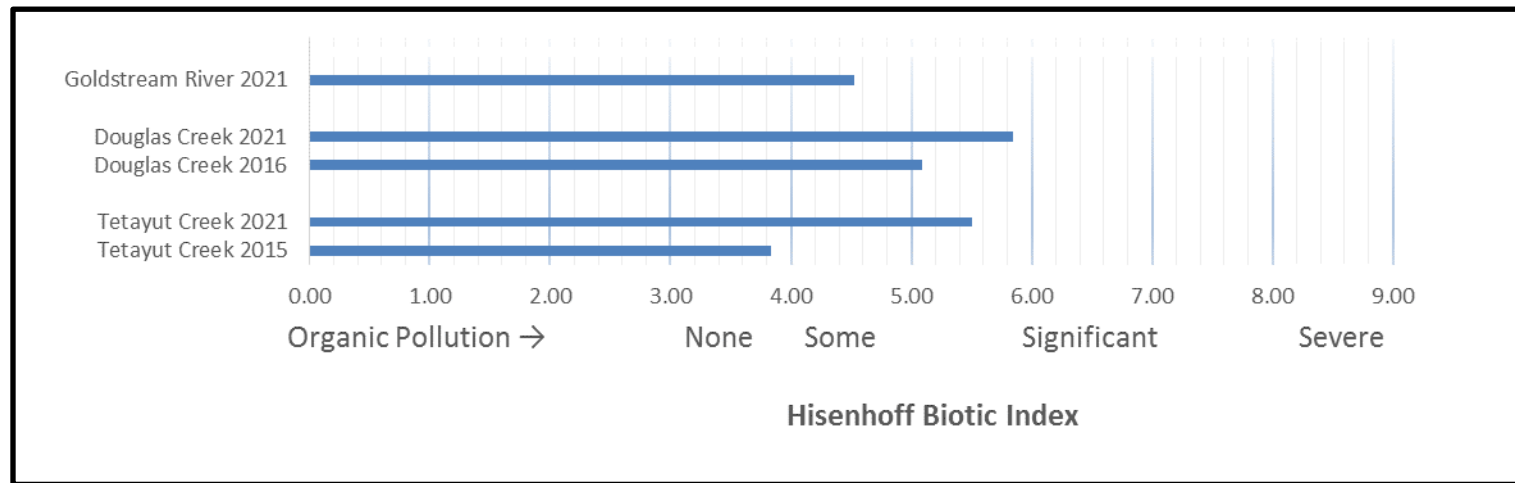
Water quality is important in creeks, but hydrological changes and physical alteration are also a concern. Therefore, flow data are also collected continuously at fixed hydrometric stations in Cecelia, Colquitz (two sites), Colwood, Bowker, Douglas and Hospital creeks. Hydrological data is presented in FlowWorks. For access to this data contact brudolph@crd.bc.ca.

In the spring of 2021, CRD staff hired SLR Consulting to conduct in-stream discharge measurements at the flow monitoring locations with the goal to refine or develop (where necessary) stage-discharge curves to ensure they are adequately predicting discharge. The consultants are aiming to collect in-stream discharge measurements in a variety of flow conditions and the project is set to be completed in the spring of 2023.

3.0 2022 PROGRAM

The Program will continue to work with municipal partners, First Nations and the community to achieve LWMP goals to identify stormwater discharges of public health and environmental concern, and investigate the sources of contamination. CRD staff will continue to work with our partners to reduce bacteria and contaminant concentrations in stormwater discharges, creeks and the marine receiving environment. Focused water quality and benthic invertebrate sampling will be undertaken in Colquitz and Colwood creeks in 2022.

Figure D. Hilsenhoff Biotic Indices for Benthic Macroinvertebrates for Streams Sampled in 2021

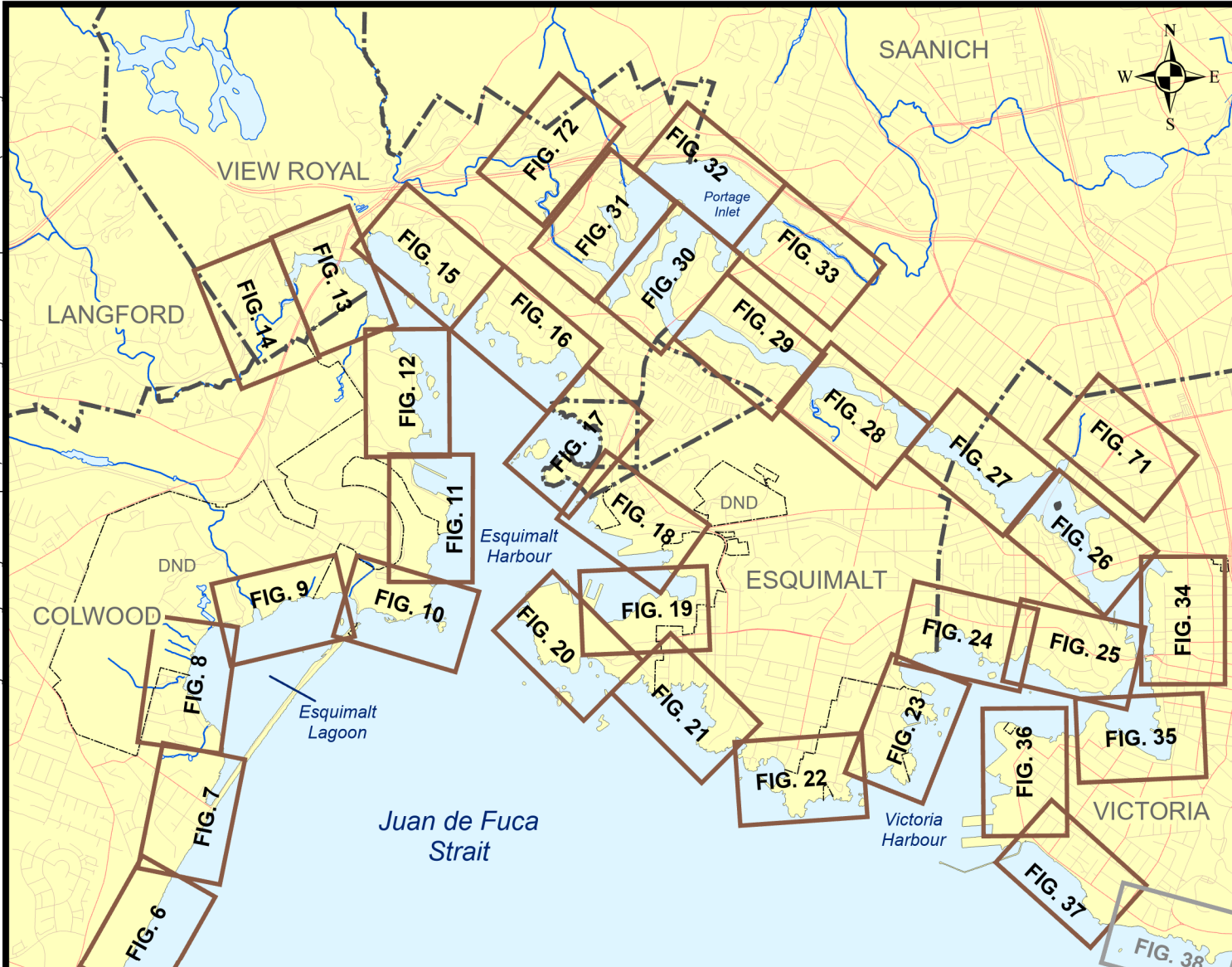


Notes:

The Hilsenhoff Biotic Index is a measure of benthic invertebrate communities that indicates higher organic pollution with increasing score. Benthic invertebrate data collected in Goldstream River in 2016 were not comparable as the same location was marine-influenced.

APPENDIX A

LOCATION OF STORMWATER DISCHARGES



LEVEL OF CONCERN

Sediment Chemical Contaminant Rating*

- HIGH - Mitigative Measures Required
- MODERATE - Surveillance Required
- LOW - No Action Required

0521 Site ID number
(2004) (Year Sampled)

Public Use of Shoreline

- High
- Moderate
- Low



Shoreline Segment Number

Stream/Ditch*

Culvert*

Storm Drain Pipe*

Lake/Pond/Reservoir*

Wetland*

Stormwater Catchment*

Public Health Rating*

- HIGH - Mitigative Measures Required
- MODERATE - Surveillance Required
- LOW - No Action Required
- NR** NOT RATED - Insufficient Data
- NV** NOT VISITED

* Only the most recent ratings are displayed in the figures.
See Appendix G for CRD Rating System.

Core Stormwater Monitoring Area

Unsewered Areas

* Based on best known data. May contain errors and omissions.

Colour orthophoto-2021.
Lots based on 2022 data.



Kilometres

0 0.5 1

Projection: UTM ZONE 10N NAD 83

Figure 1 - Core Area 2021

Key Index for Figures 5 - 37, 71, 72 and Legend

Municipal Boundaries

DND Boundaries

Major Roads

Minor Roads

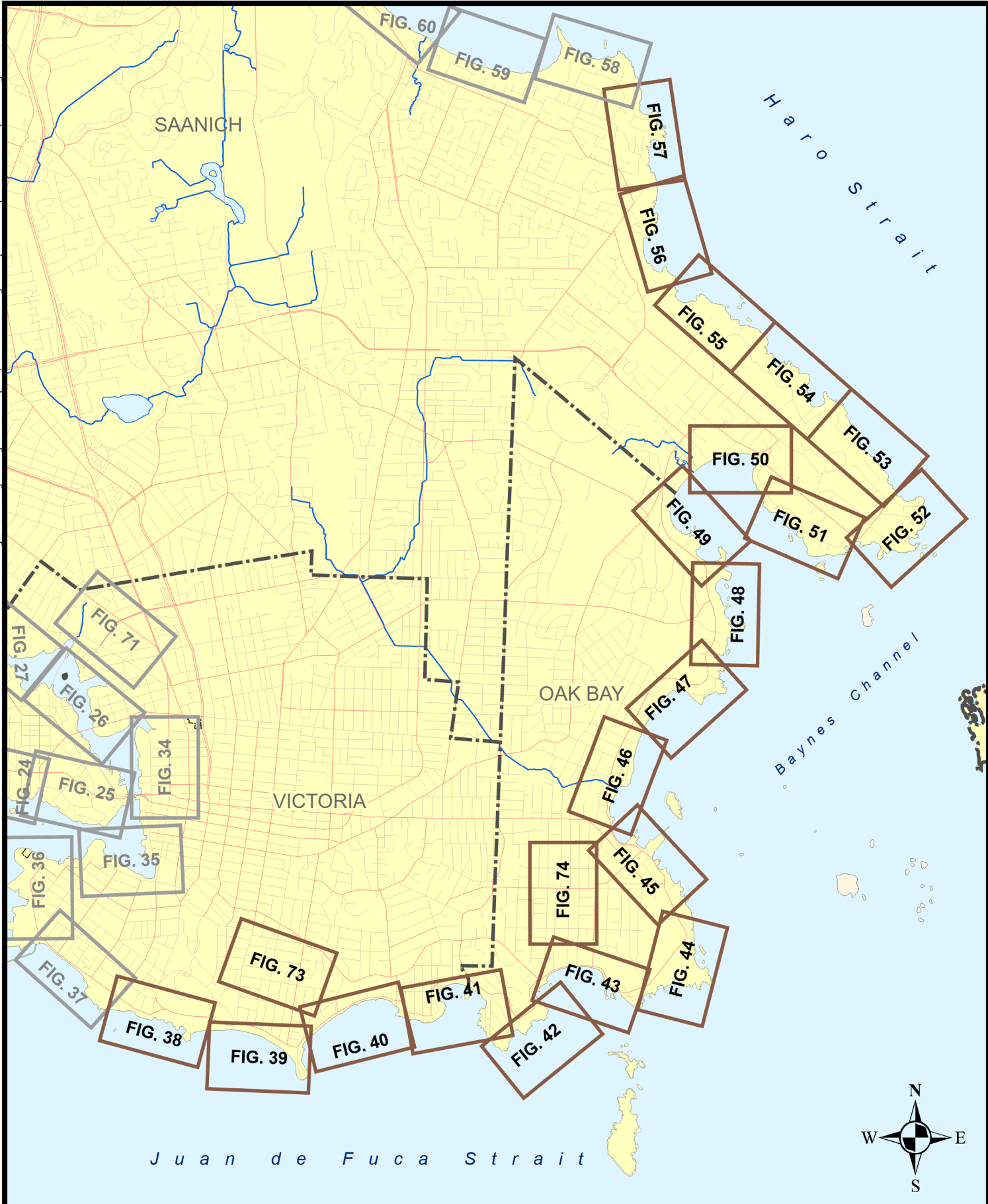
Map Tiles (see adjacent index page)

Map Tiles (this index page)

Streams and Rivers

Core Stormwater Monitoring Area

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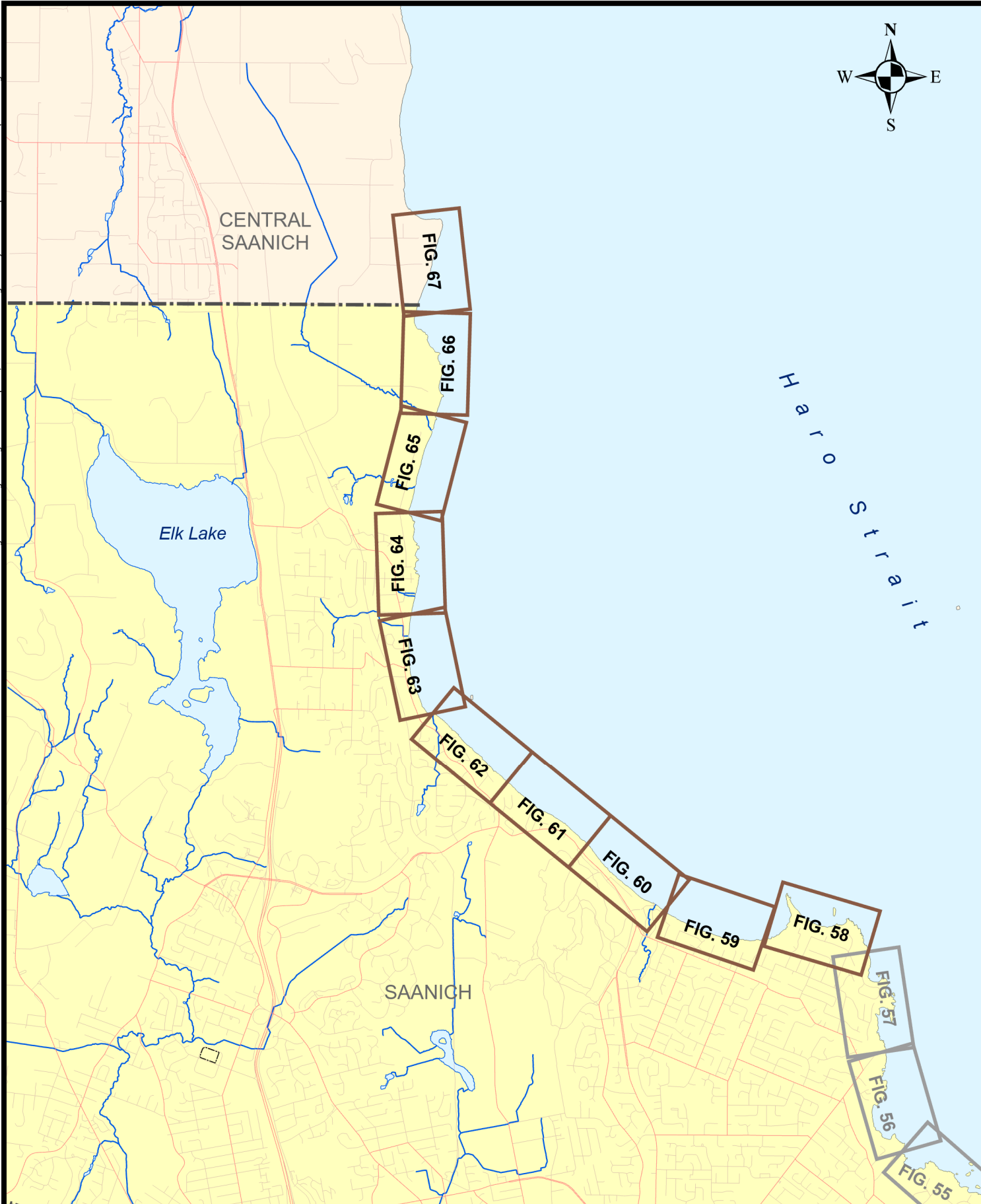
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Projection: UTM ZONE 10N NAD 83

Figure 2 - Core Area 2021
Key Index for Figures 38 - 57, 73, 74

- Municipal Boundaries
- DND Boundaries
- Major Roads
- Minor Roads
- Streams and Rivers
- Core Stormwater Monitoring Area
- FIG. 25 Map Tiles (see adjacent index page)
- FIG. 45 Map Tiles (this index page)

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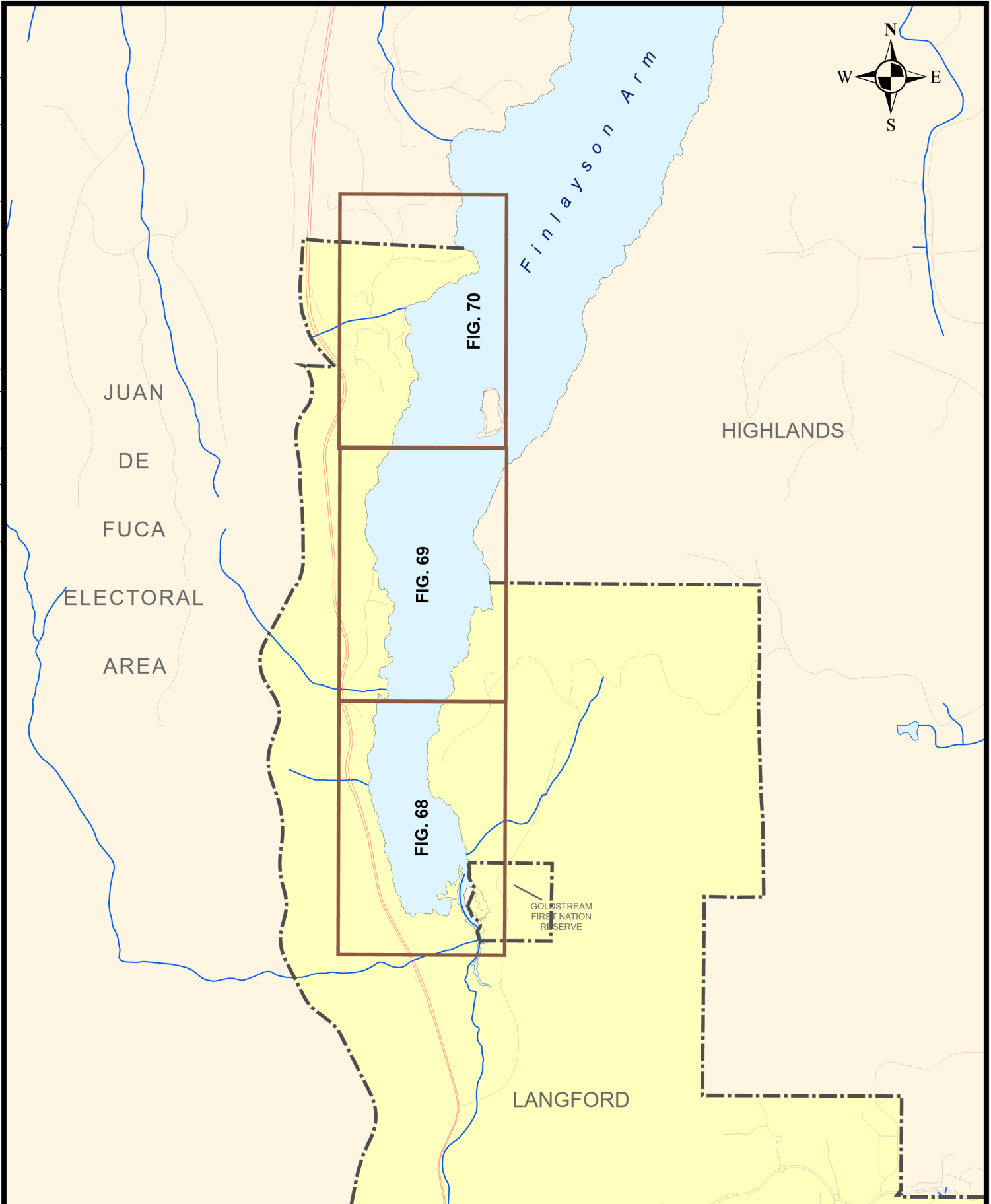
0 0.5 1 Kilometres

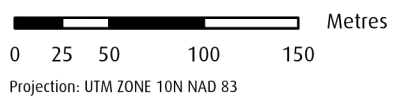
Projection: UTM ZONE 10N NAD 83

Figure 3 - Core Area 2021
Key Index for Figures 58 - 67

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> — Municipal Boundaries - - - DND Boundaries — Major Roads | <ul style="list-style-type: none"> — Minor Roads FIG. 58 Map Tiles (see adjacent index page) FIG. 60 Map Tiles (this index page) | <ul style="list-style-type: none"> Streams and Rivers Core Stormwater Monitoring Area |
|---|---|---|

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For Legend
See Figure 1

For Area Key Index
See
Figure 1



Figure 5
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 1

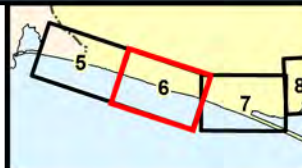
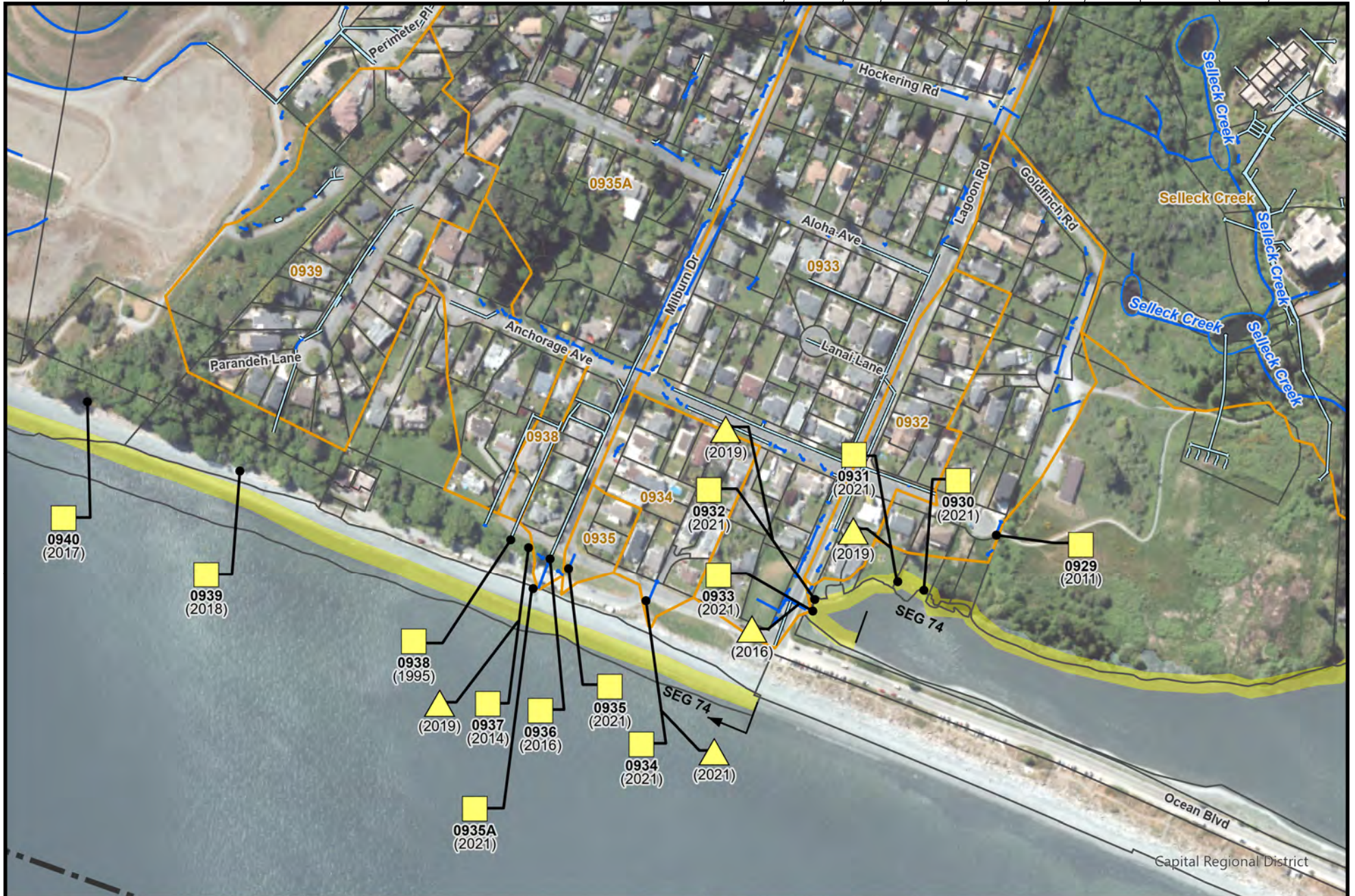


Figure 6
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See
Figure 1

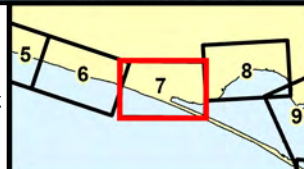


Figure 7
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 1

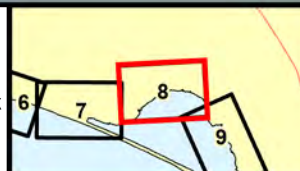


Figure 8
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 1

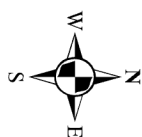


Figure 9
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83

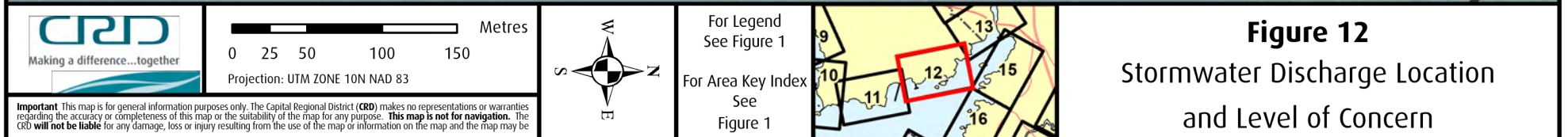


For Legend
See Figure 1
For Area Key Index
See
Figure 1



Figure 11
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



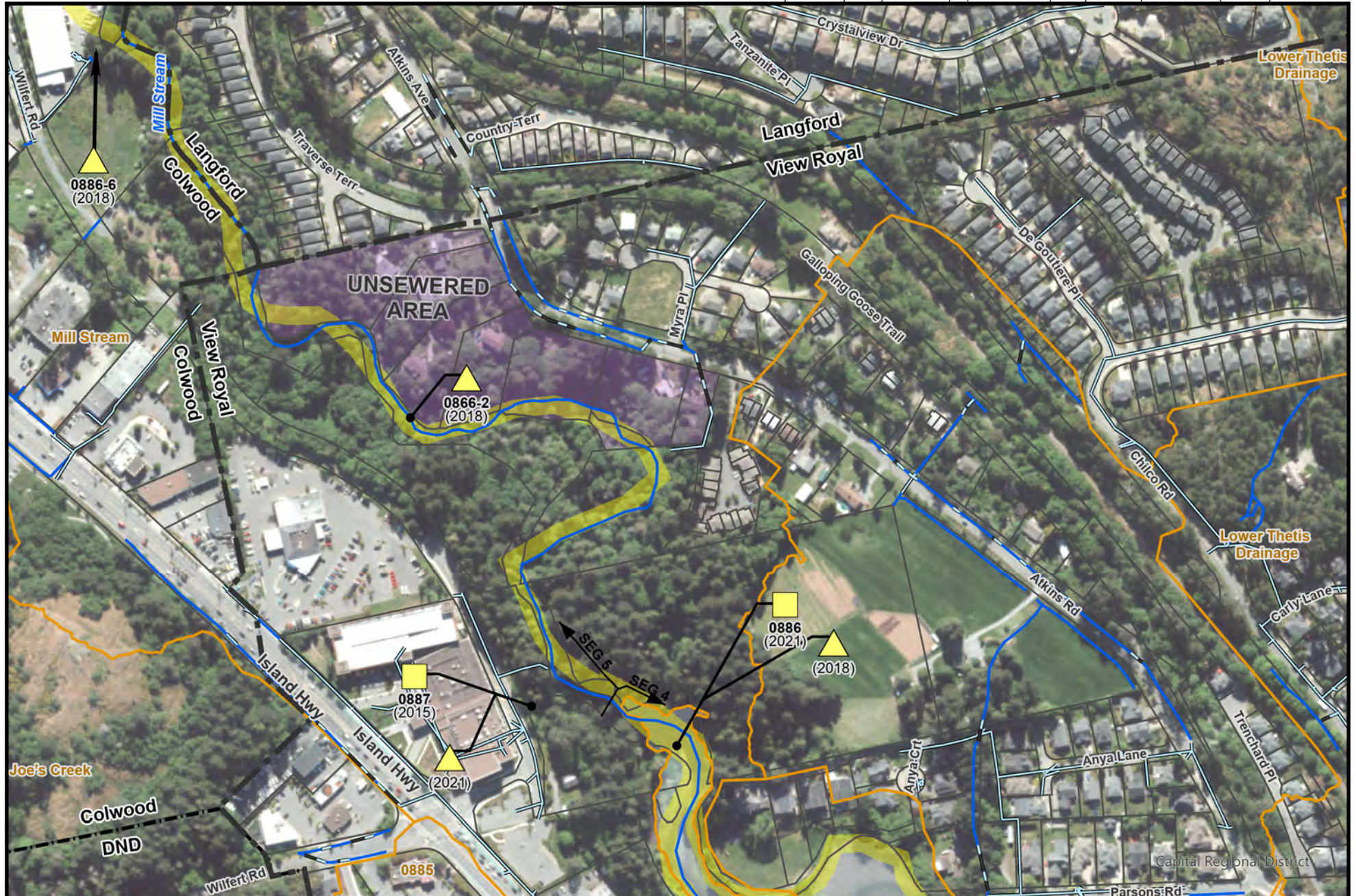
For Legend
See Figure 1

For Area Key Index
See
Figure 1



Figure 13
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



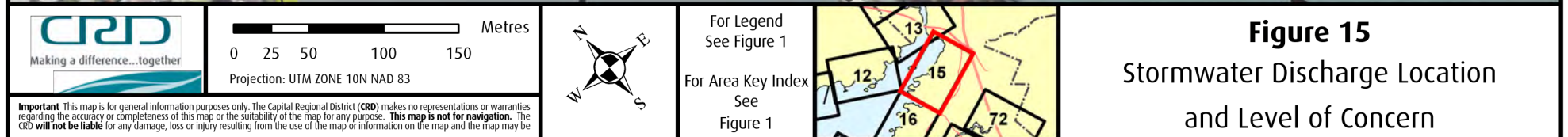
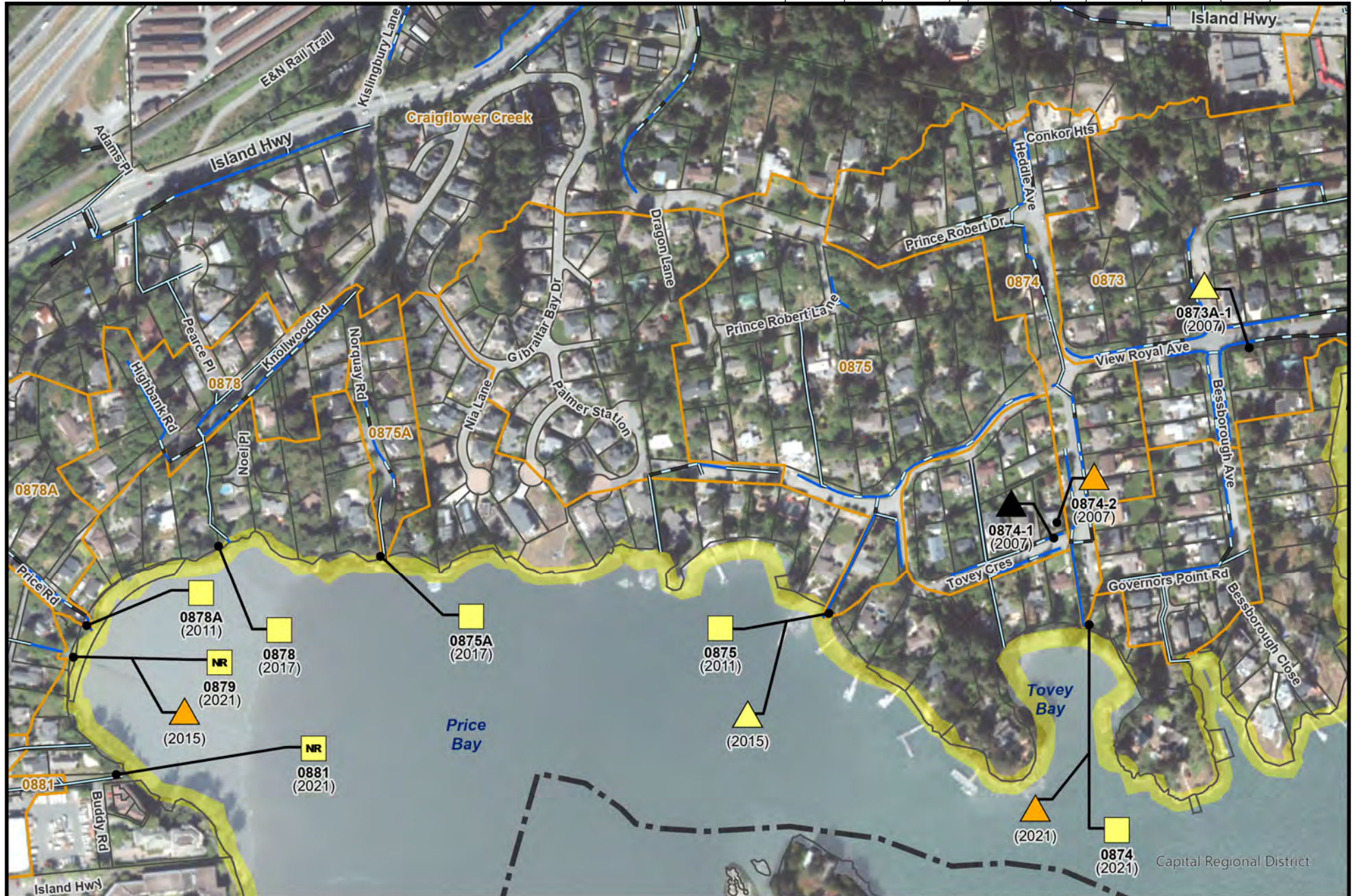
For Legend
See Figure 1

For Area Key Index
See
Figure 1



Figure 14
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See
Figure 1



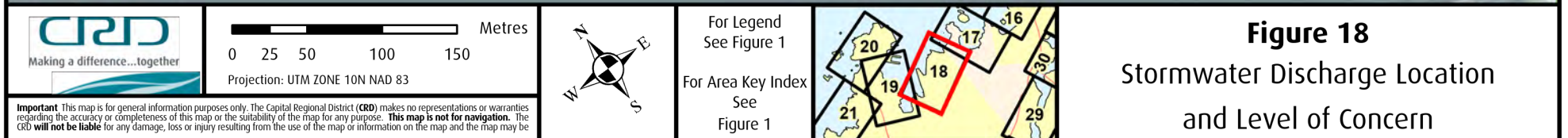
Figure 16
Stormwater Discharge Location
and Level of Concern

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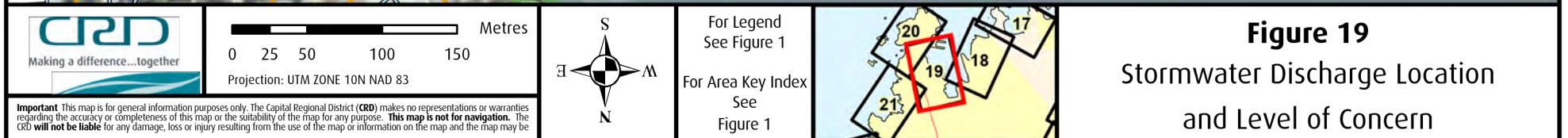


	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 17 Stormwater Discharge Location and Level of Concern
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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 1

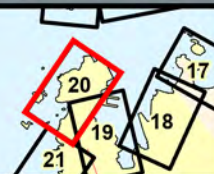


Figure 20
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



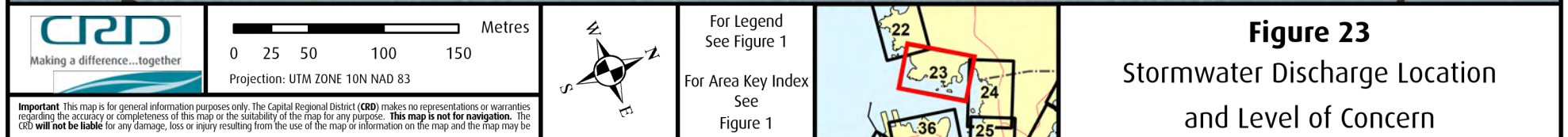
For Legend
See Figure 1

For Area Key Index
See
Figure 1

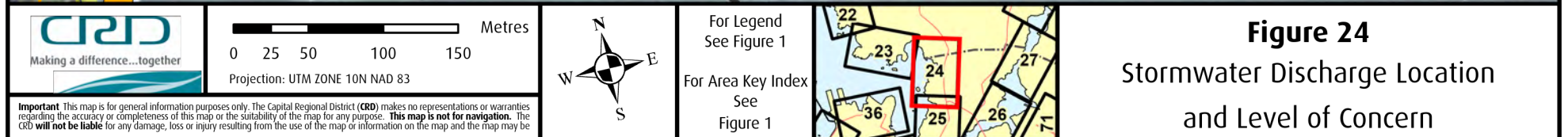


Figure 22
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



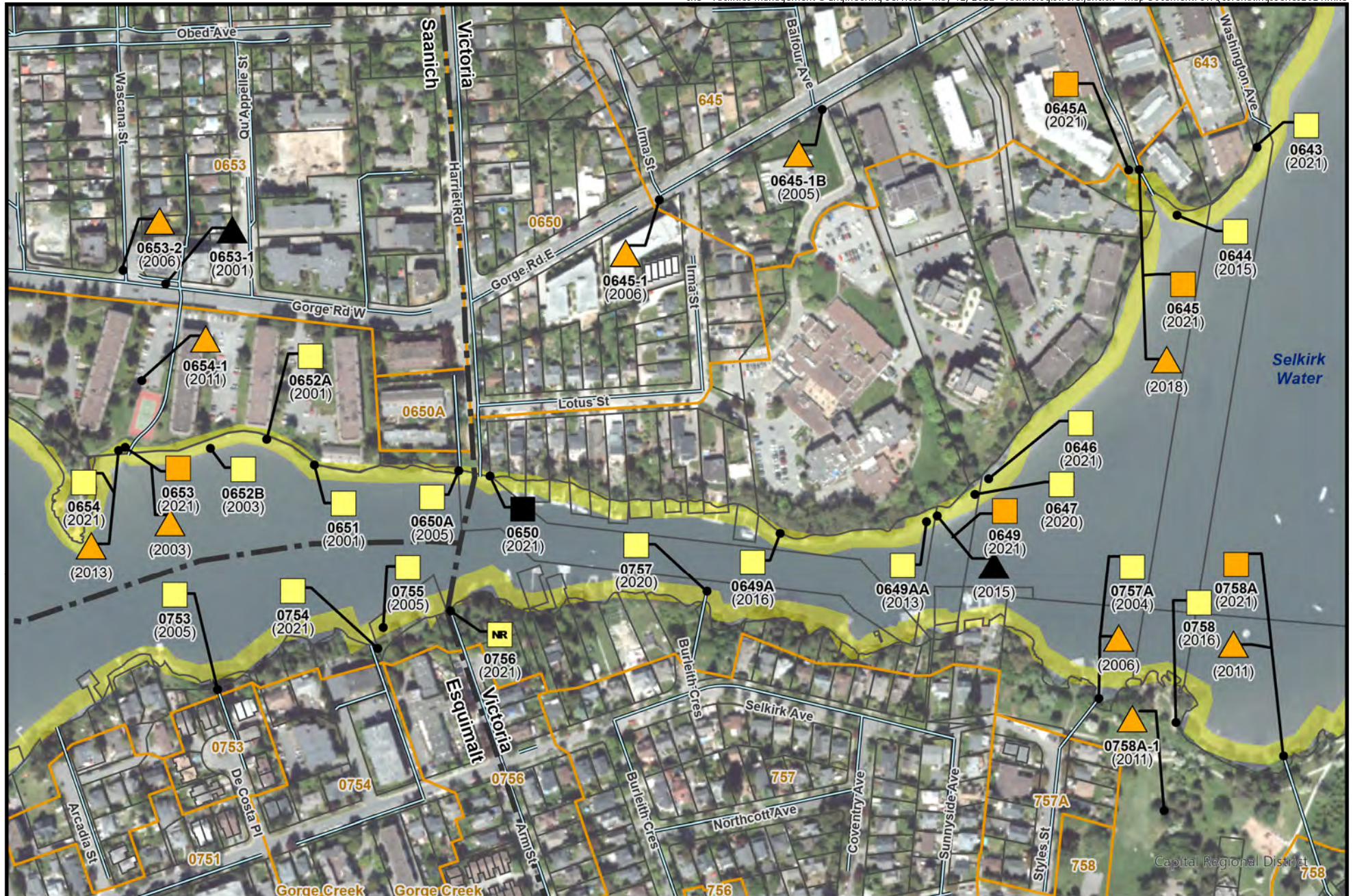
For Legend
See Figure 1

For Area Key Index
See
Figure 1



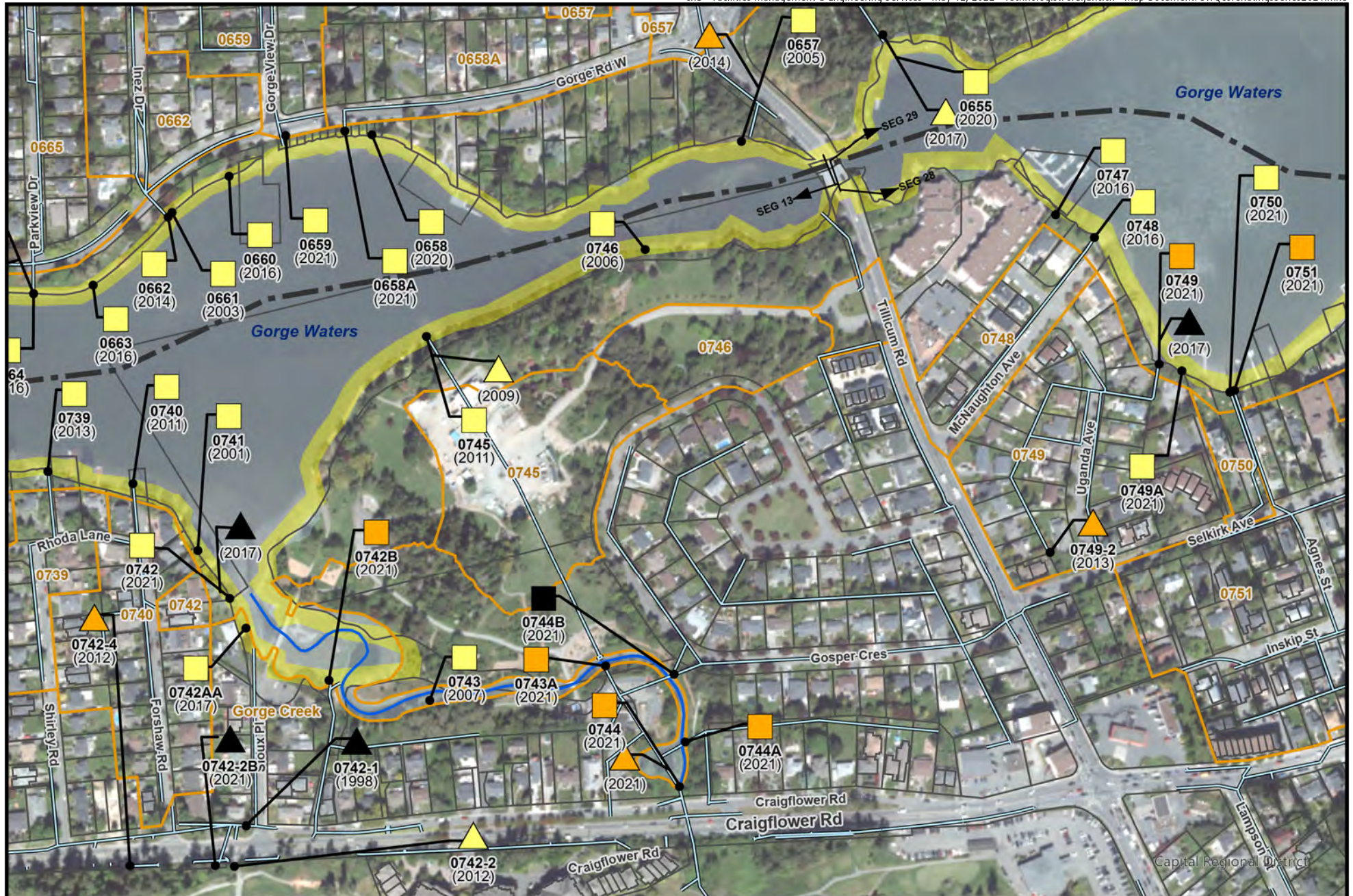
Figure 25
Stormwater Discharge Location
and Level of Concern

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	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 27 Stormwater Discharge Location and Level of Concern
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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



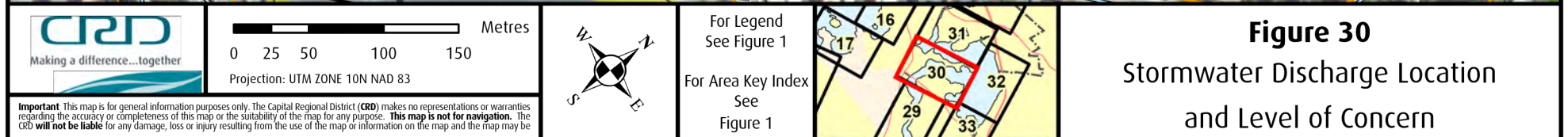
For Legend
See Figure 1

For Area Key Index
See
Figure 1

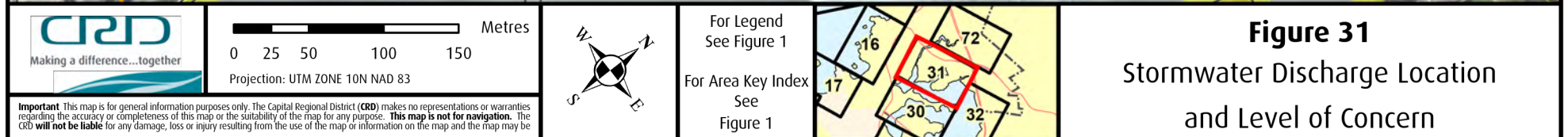


Figure 28
Stormwater Discharge Location
and Level of Concern

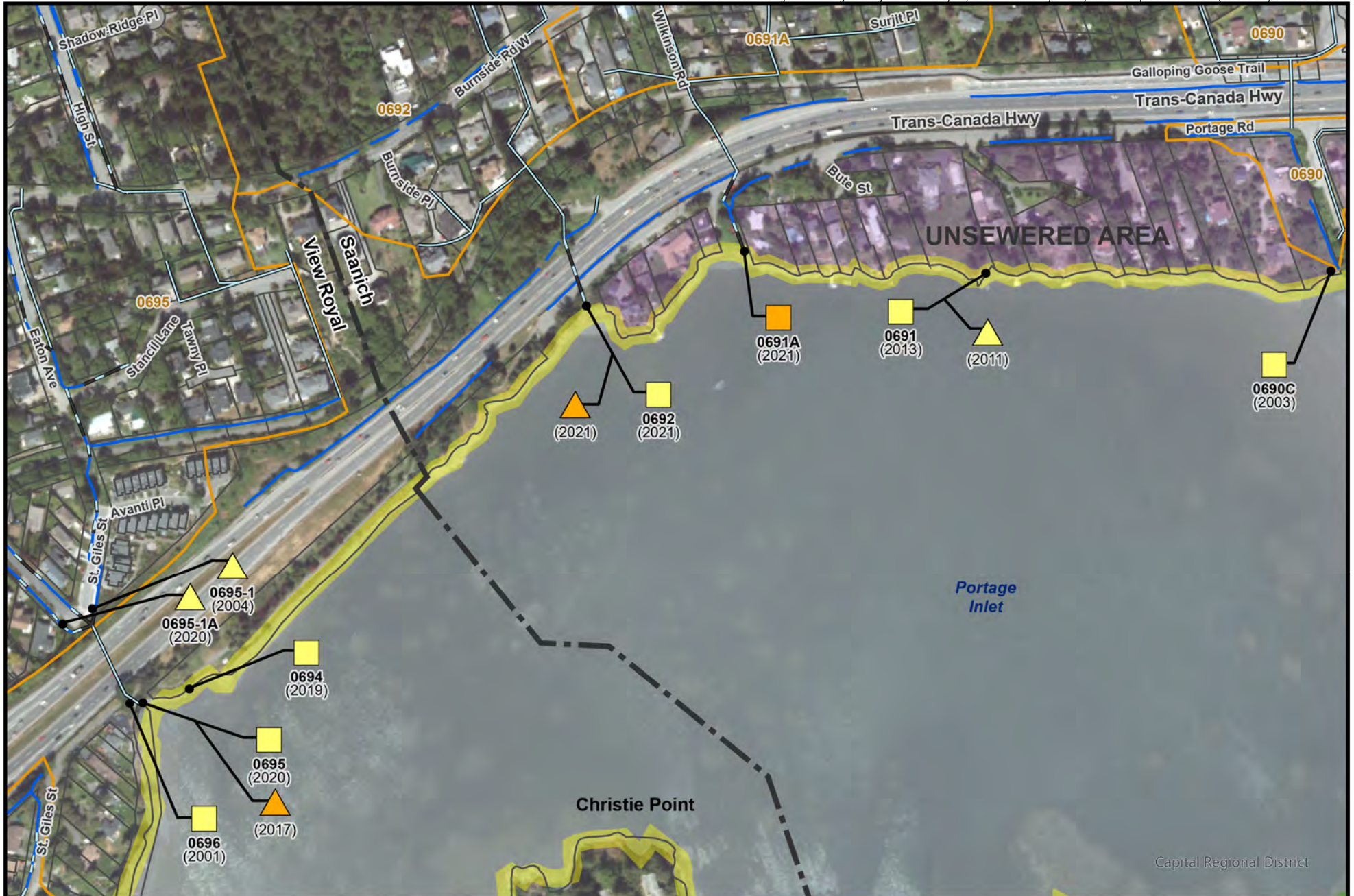
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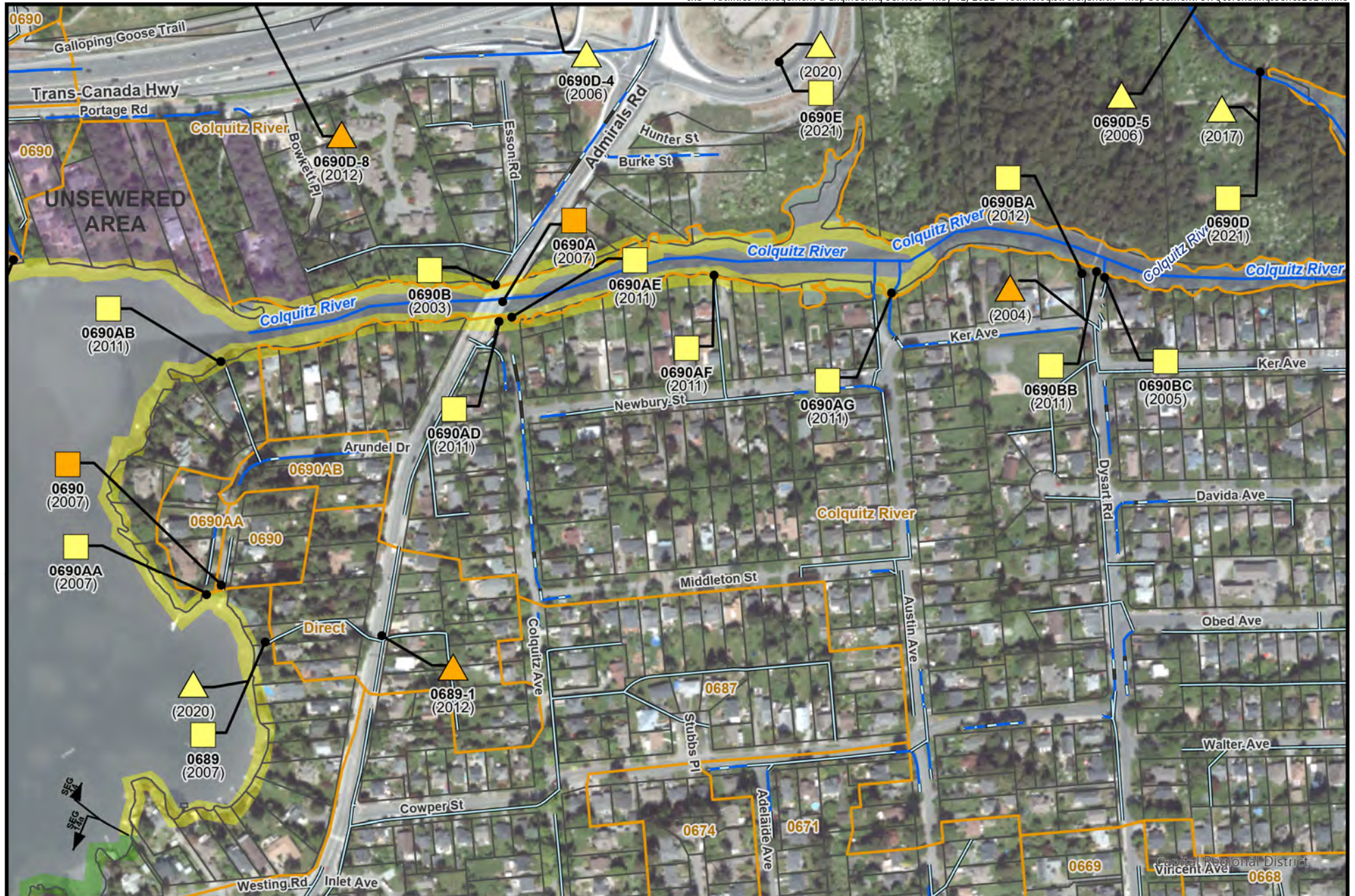


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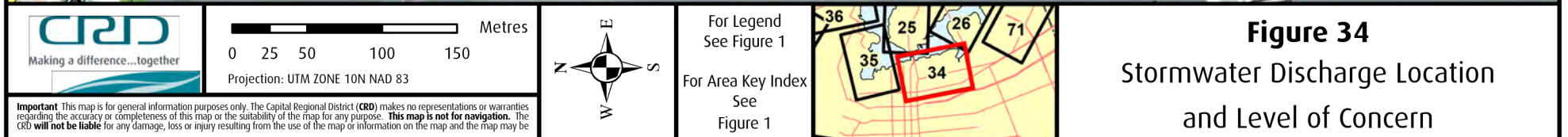
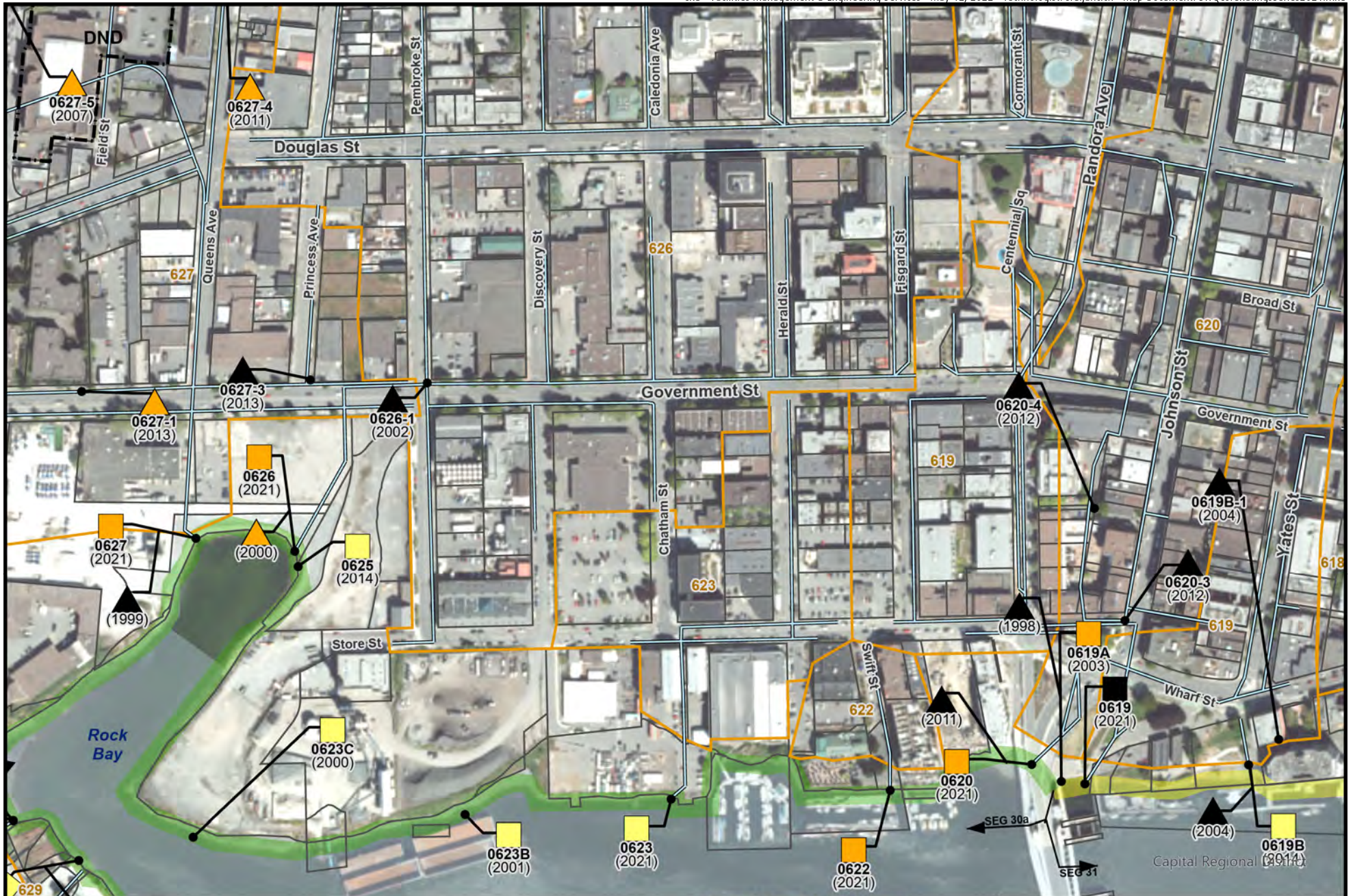
CRD Making a difference...together	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 32 Stormwater Discharge Location and Level of Concern
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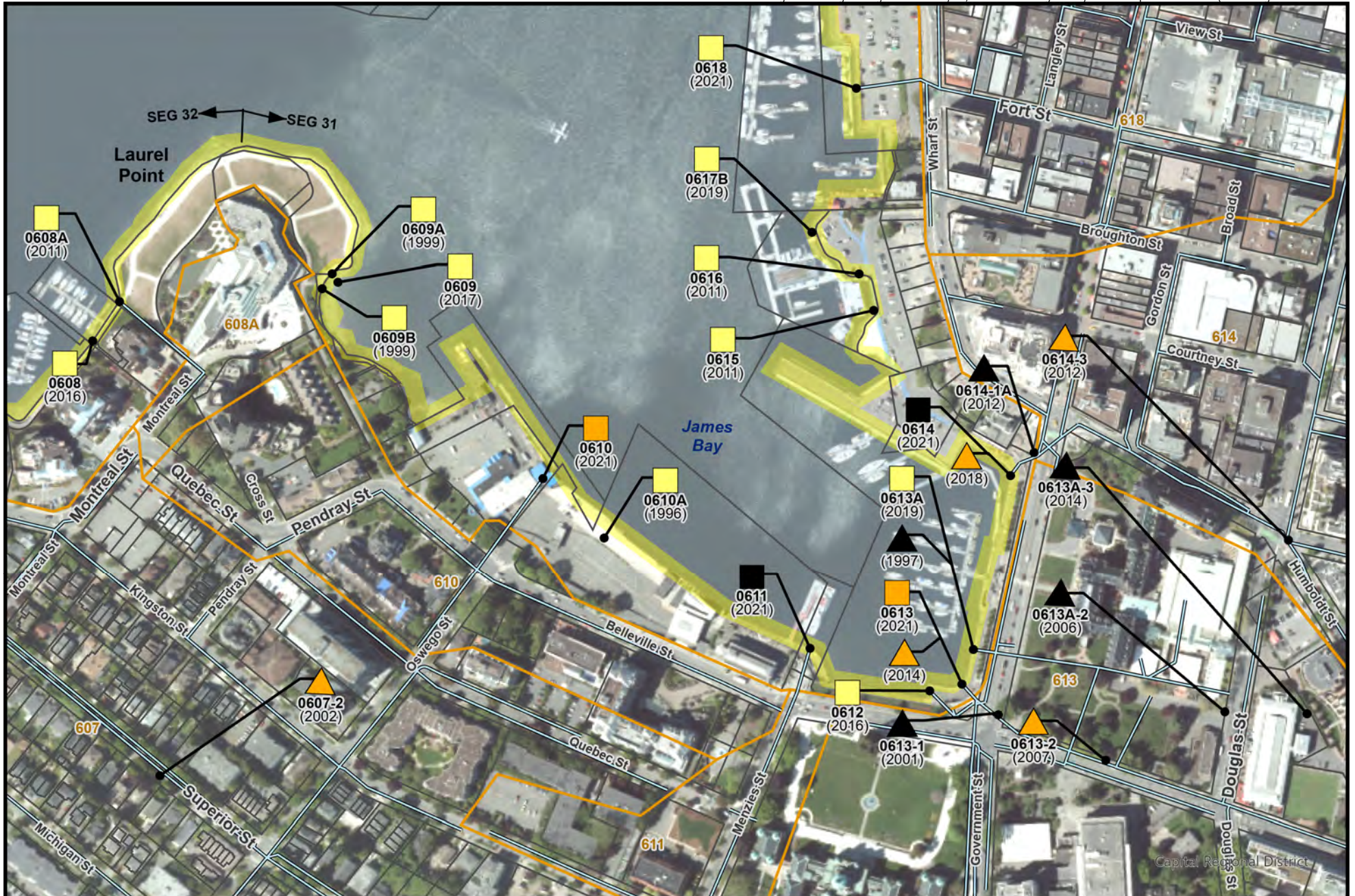


CRD Making a difference...together	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 33 Stormwater Discharge Location and Level of Concern
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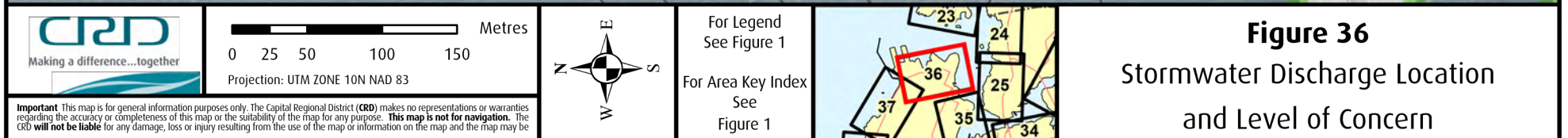


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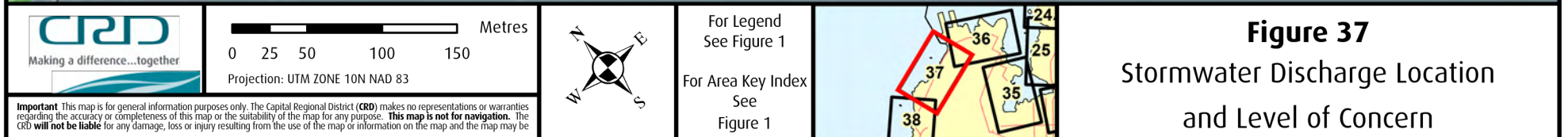


	0 25 50 100 150 Metres Projection: UTM ZONE 10N NAD 83		For Legend See Figure 1 For Area Key Index See Figure 1		Figure 35 Stormwater Discharge Location and Level of Concern
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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83

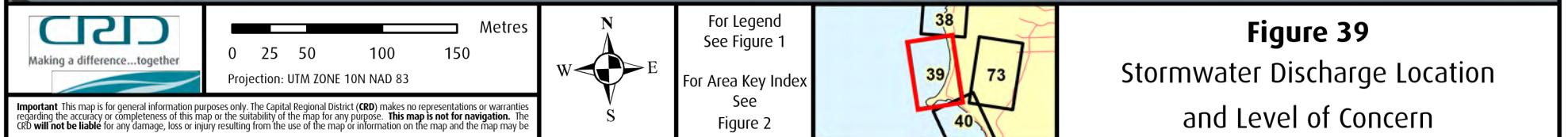


For Legend
See Figure 1
For Area Key Index
See
Figure 2

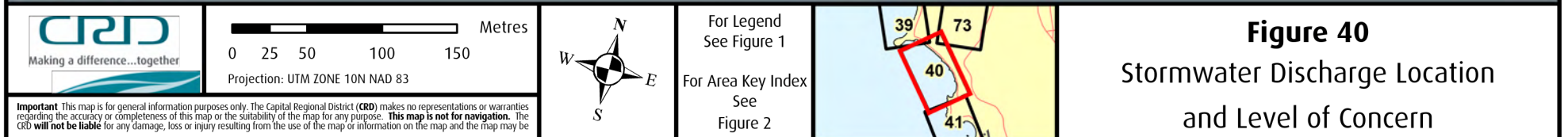


Figure 38
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83

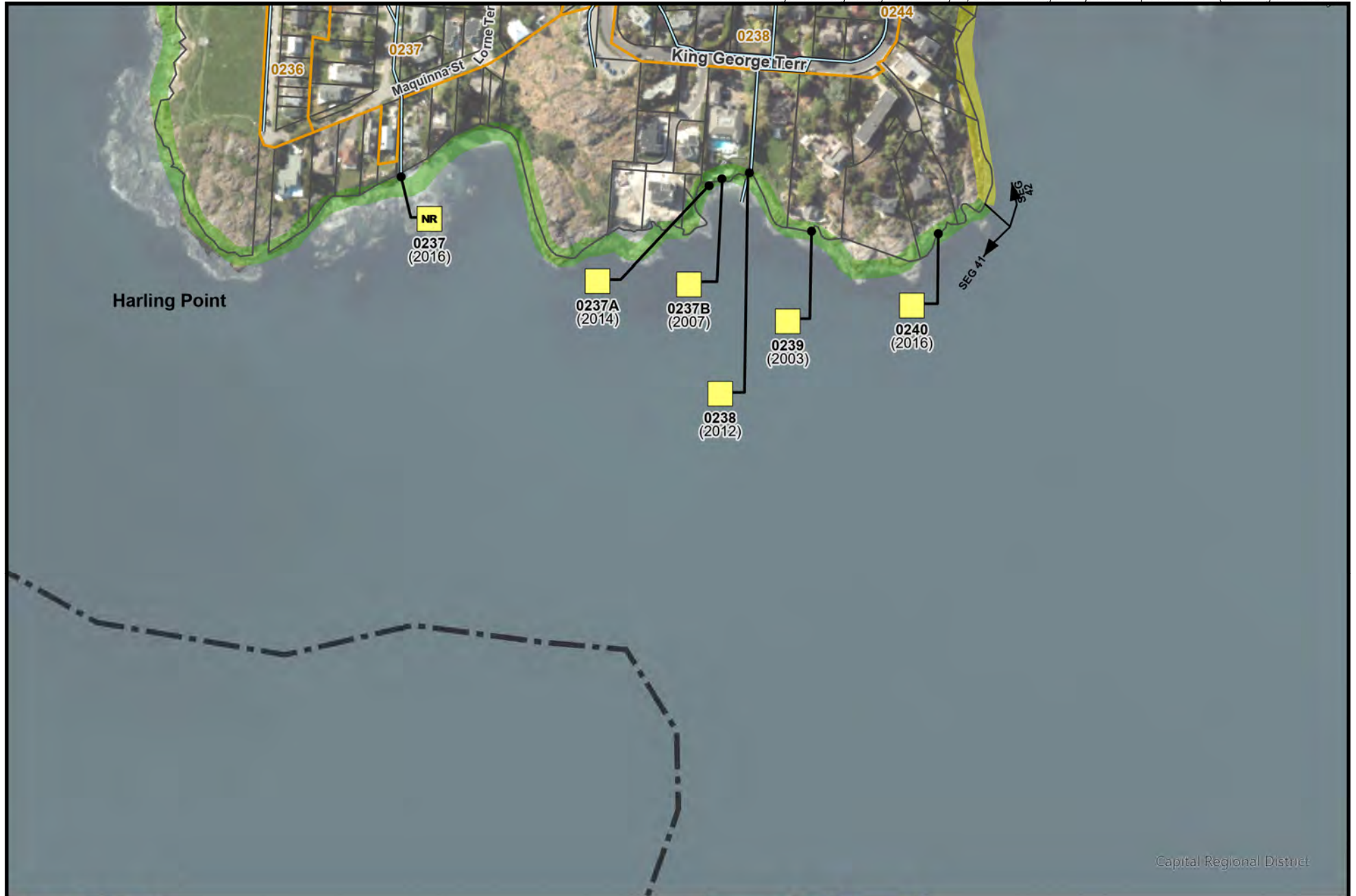


For Legend
See Figure 1
For Area Key Index
See
Figure 2



Figure 41
Stormwater Discharge Location
and Level of Concern

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Capital Regional District



0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 2



Figure 42
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1
For Area Key Index
See
Figure 2



Figure 44
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 2



Figure 45
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

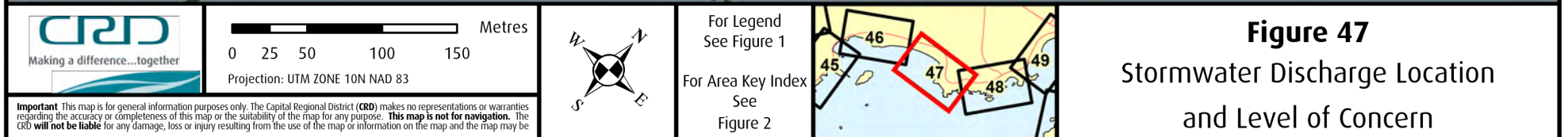
For Legend
See Figure 1

For Area Key Index
See
Figure 2

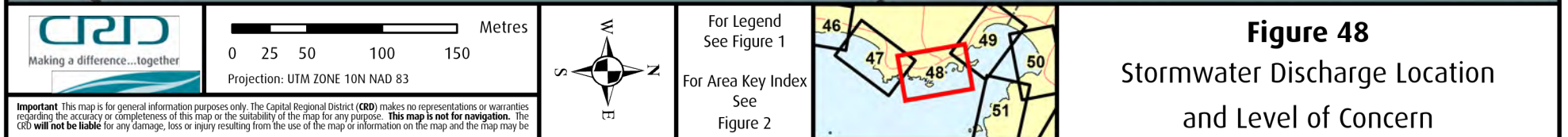
Figure 46

Stormwater Discharge Location and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



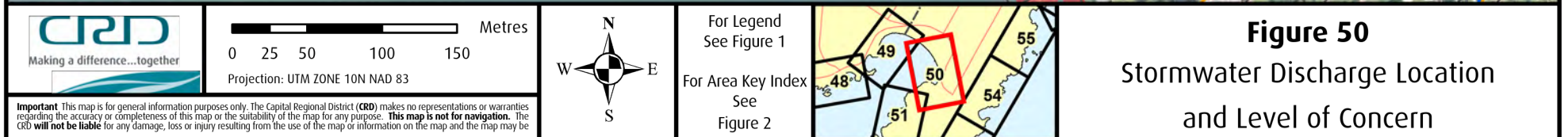
For Legend
See Figure 1

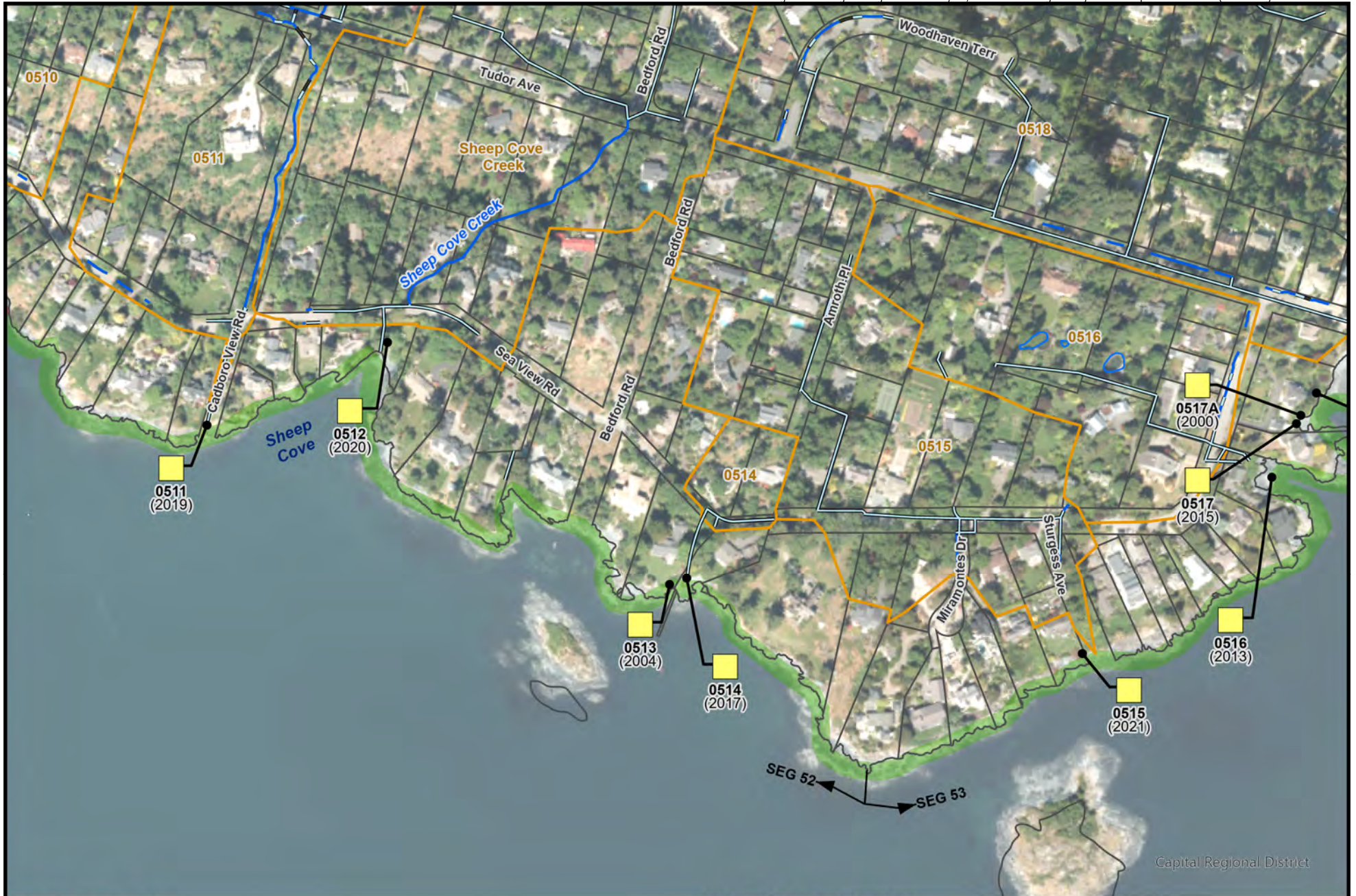
For Area Key Index
See
Figure 2



Figure 49
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 2



Figure 51
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 2

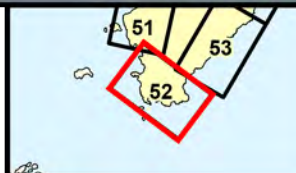
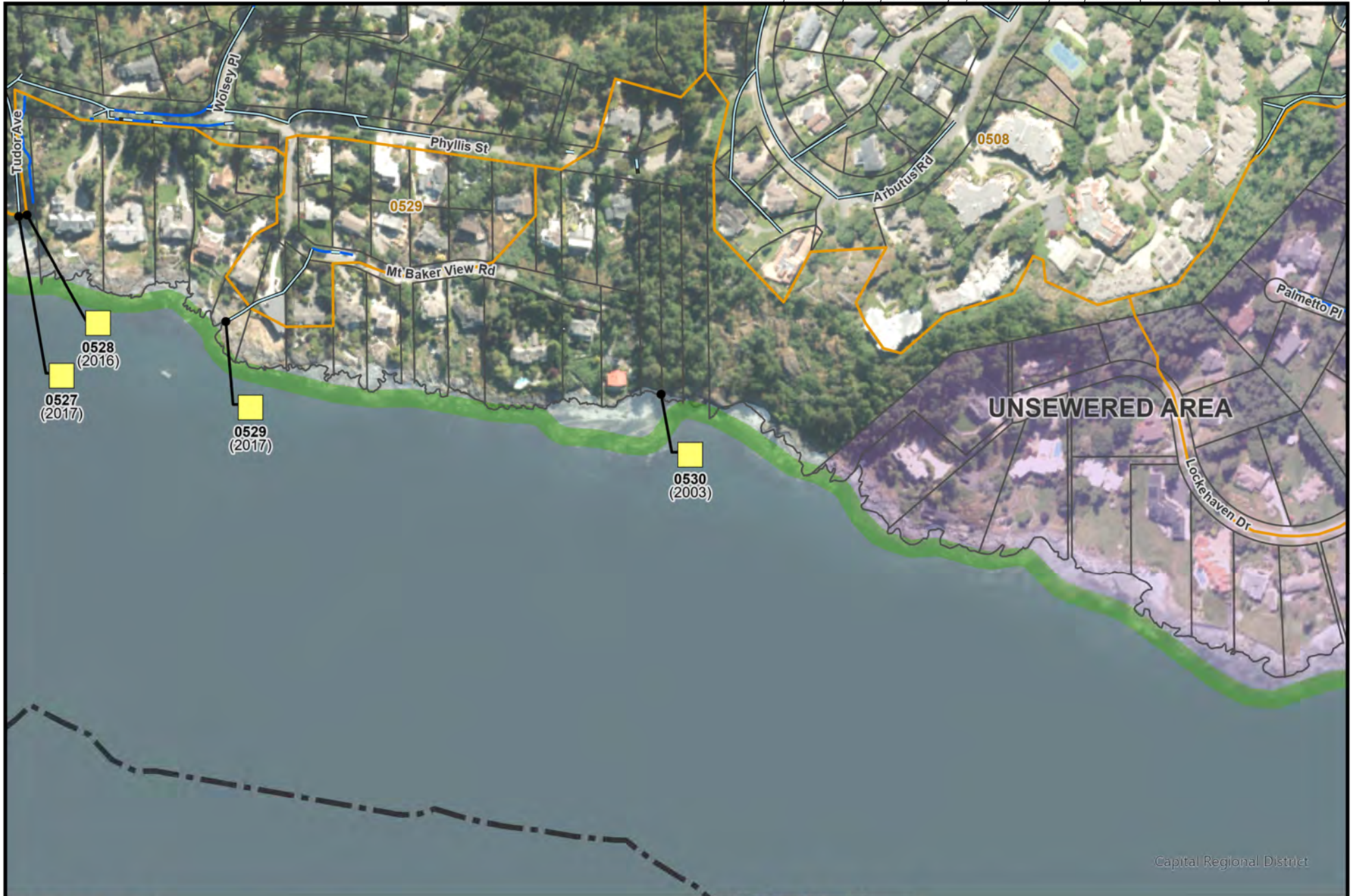


Figure 52
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 2



Figure 53
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 2



Figure 54
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83



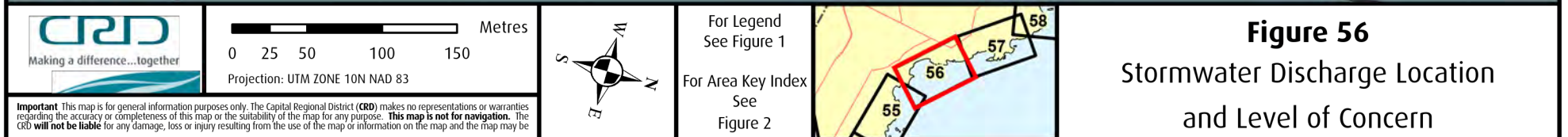
For Legend
See Figure 1

For Area Key Index
See
Figure 2

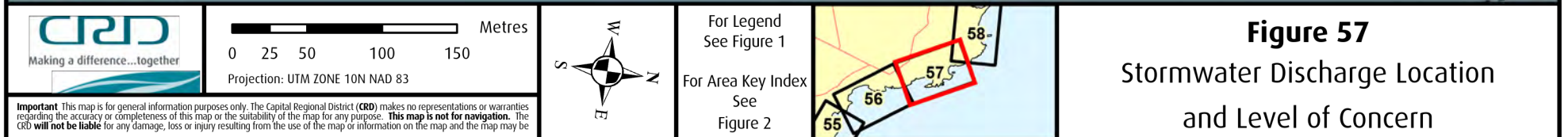


Figure 55
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83



For Legend
See Figure 1

For Area Key Index
See
Figure 3



Figure 58
Stormwater Discharge Location
and Level of Concern

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0 25 50 100 150 Metres
Projection: UTM ZONE 10N NAD 83

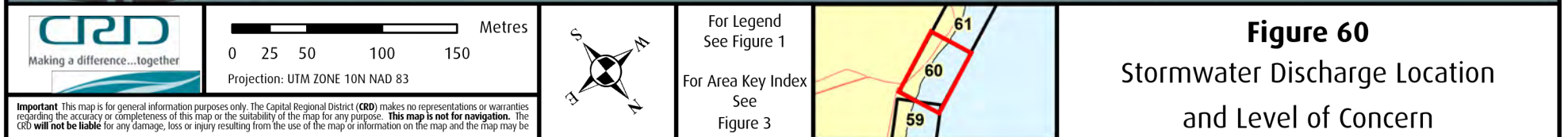


For Legend
See Figure 1
For Area Key Index
See
Figure 3

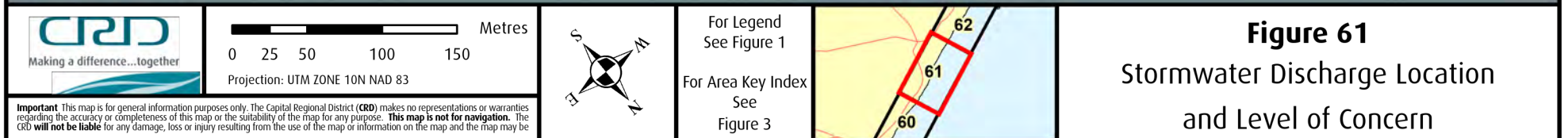


Figure 59
Stormwater Discharge Location
and Level of Concern

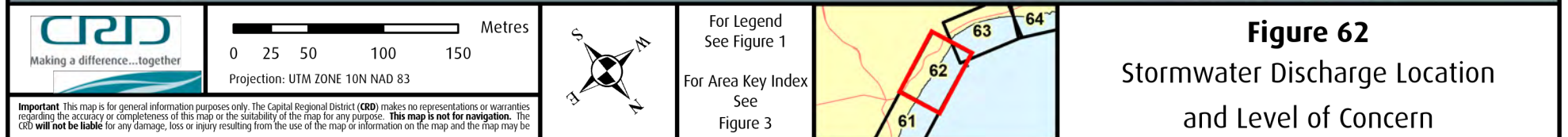
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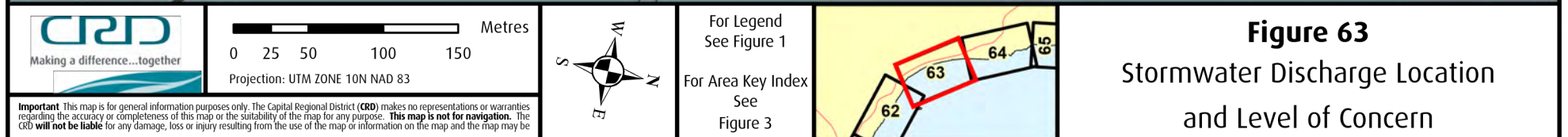
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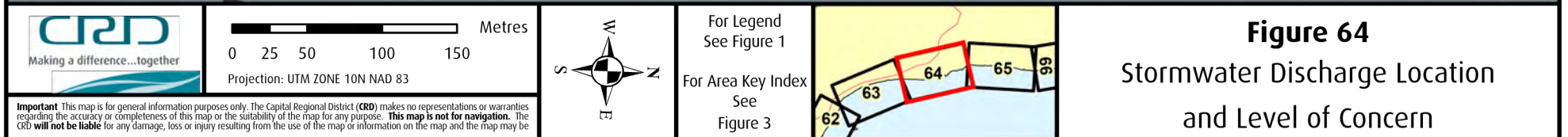
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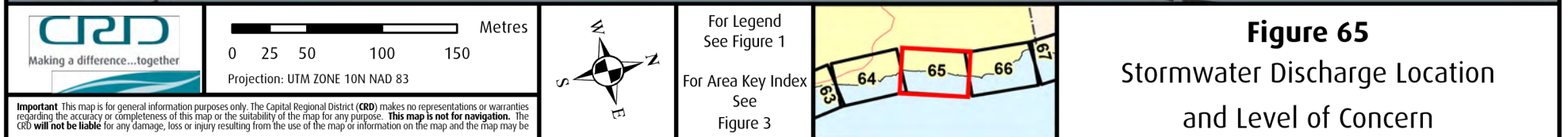
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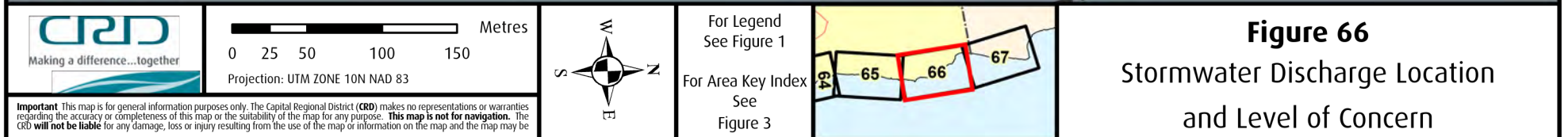
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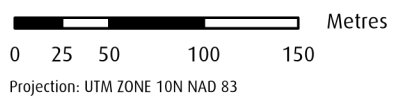
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For Legend
See Figure 1

For Area Key Index
See
Figure 3

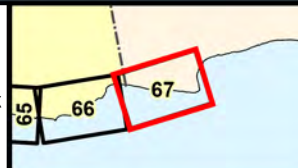
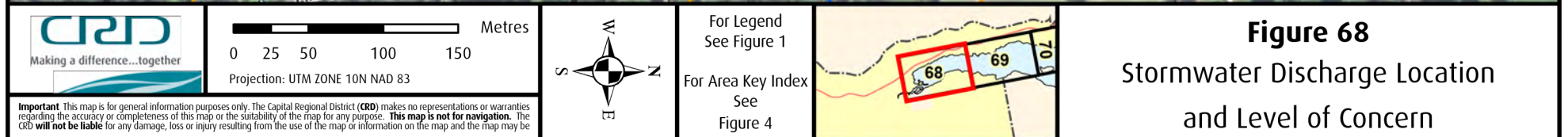
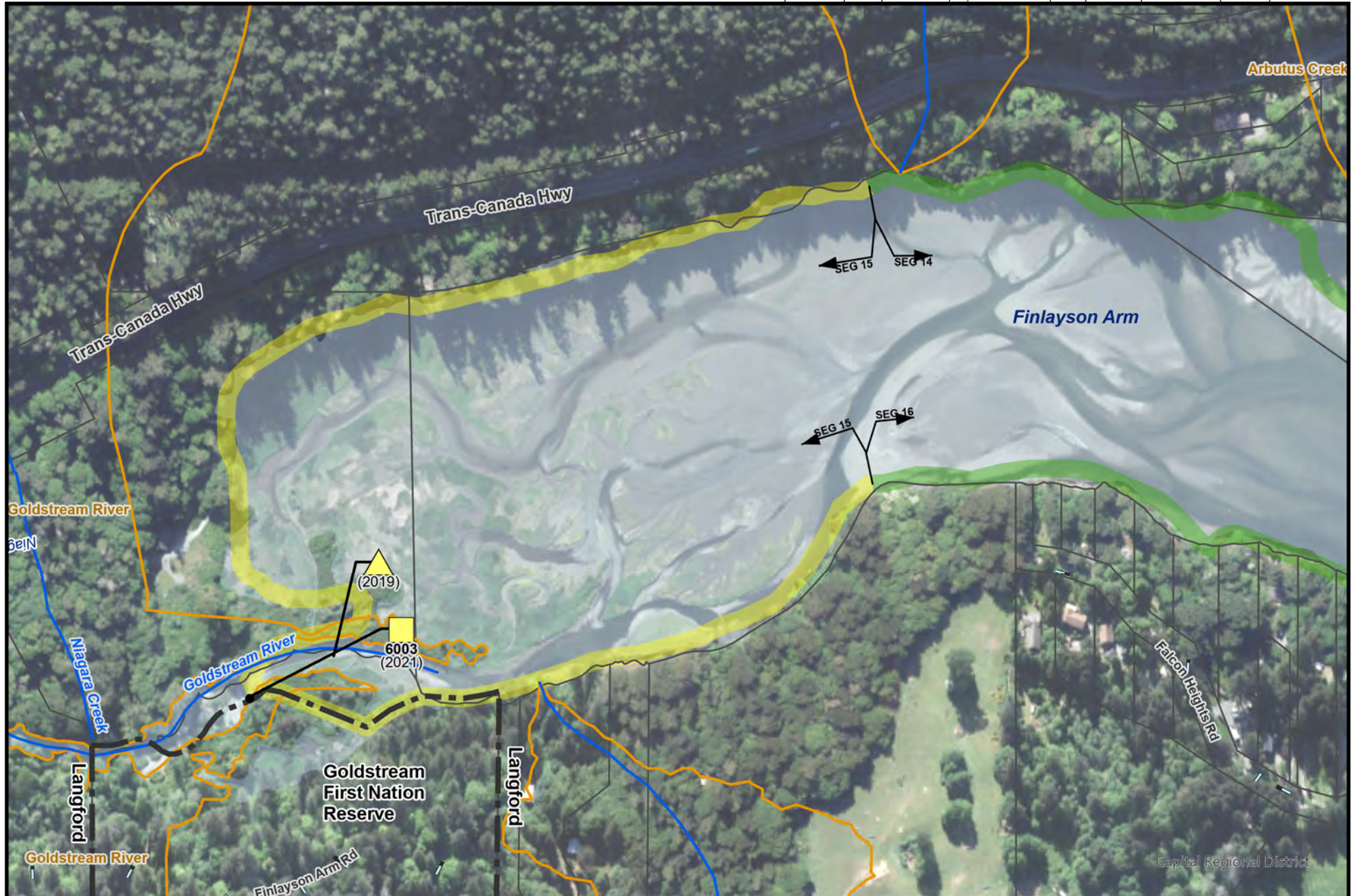
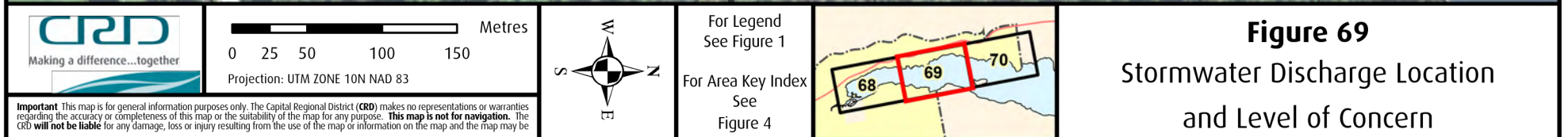


Figure 67
Stormwater Discharge Location
and Level of Concern

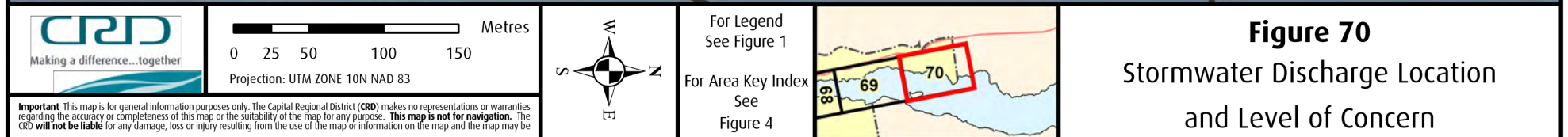
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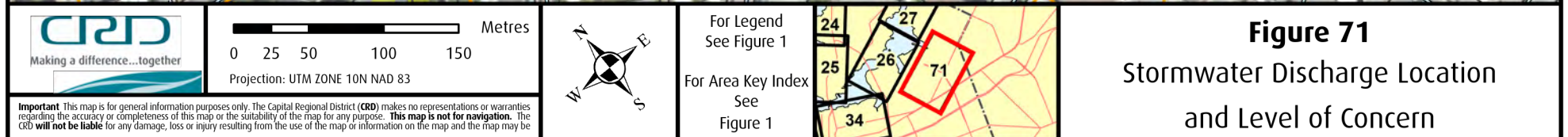
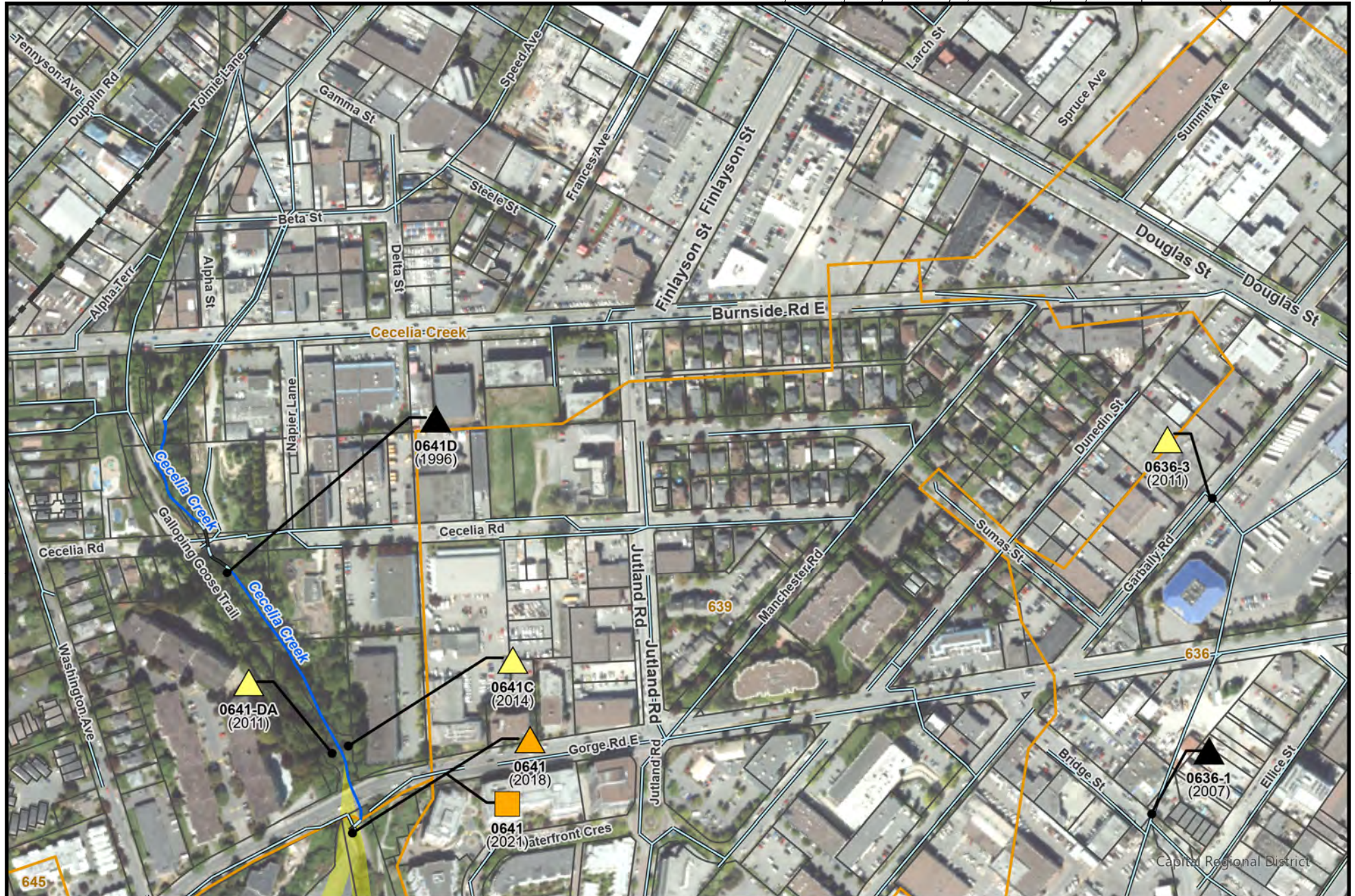
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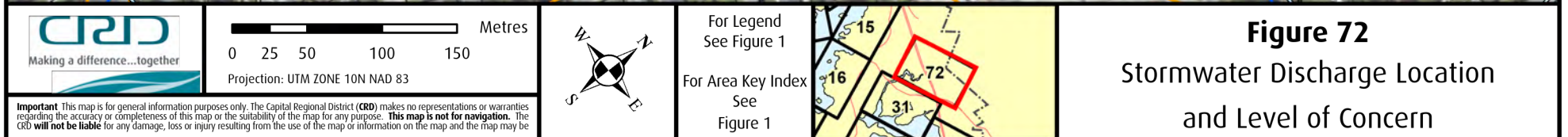
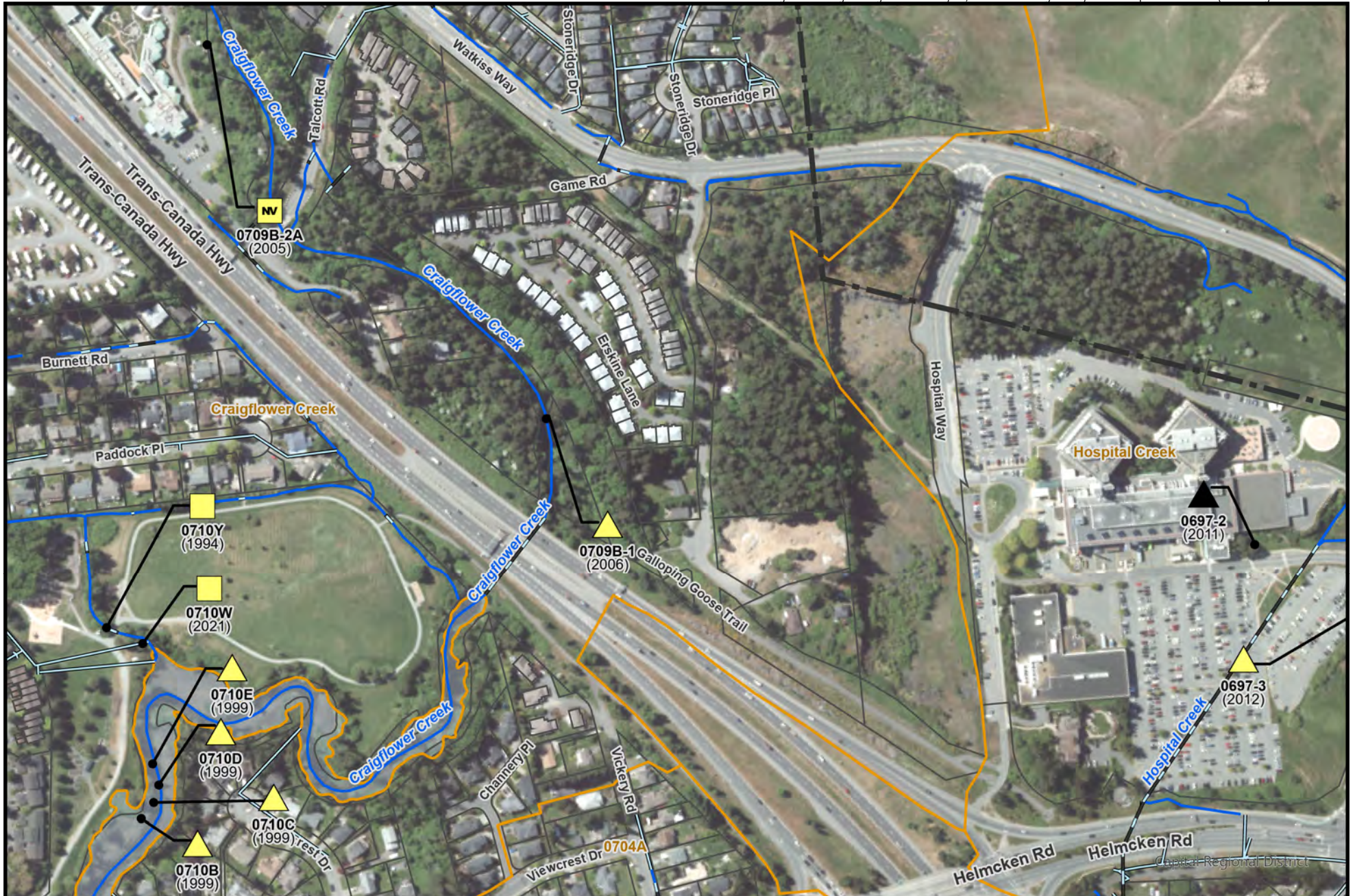
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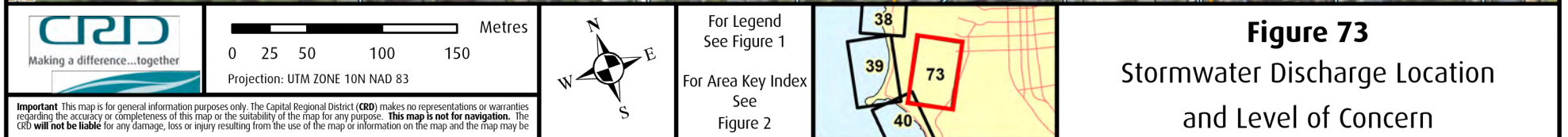
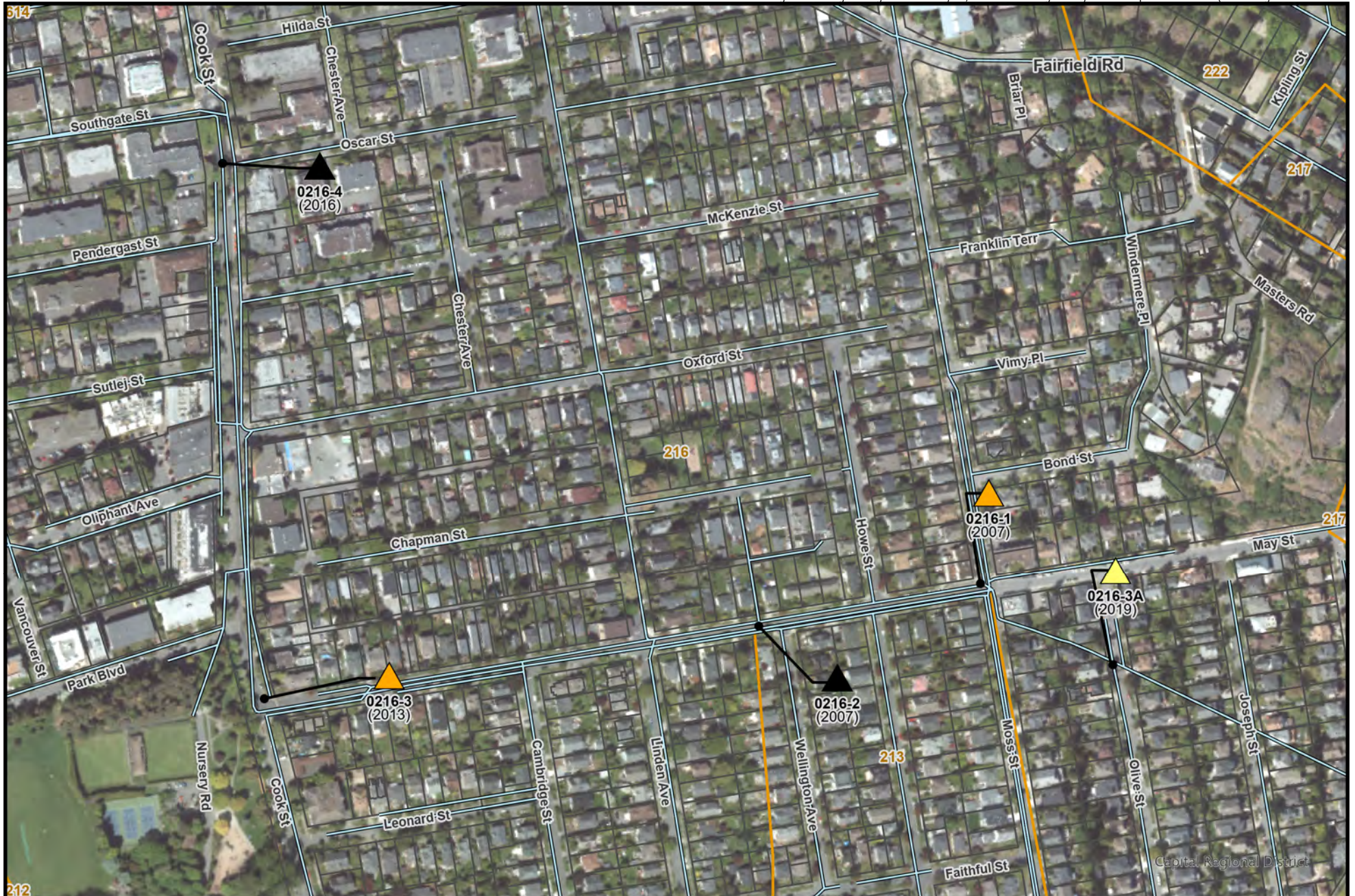
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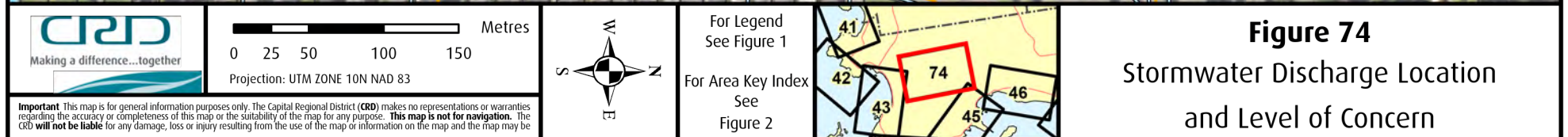
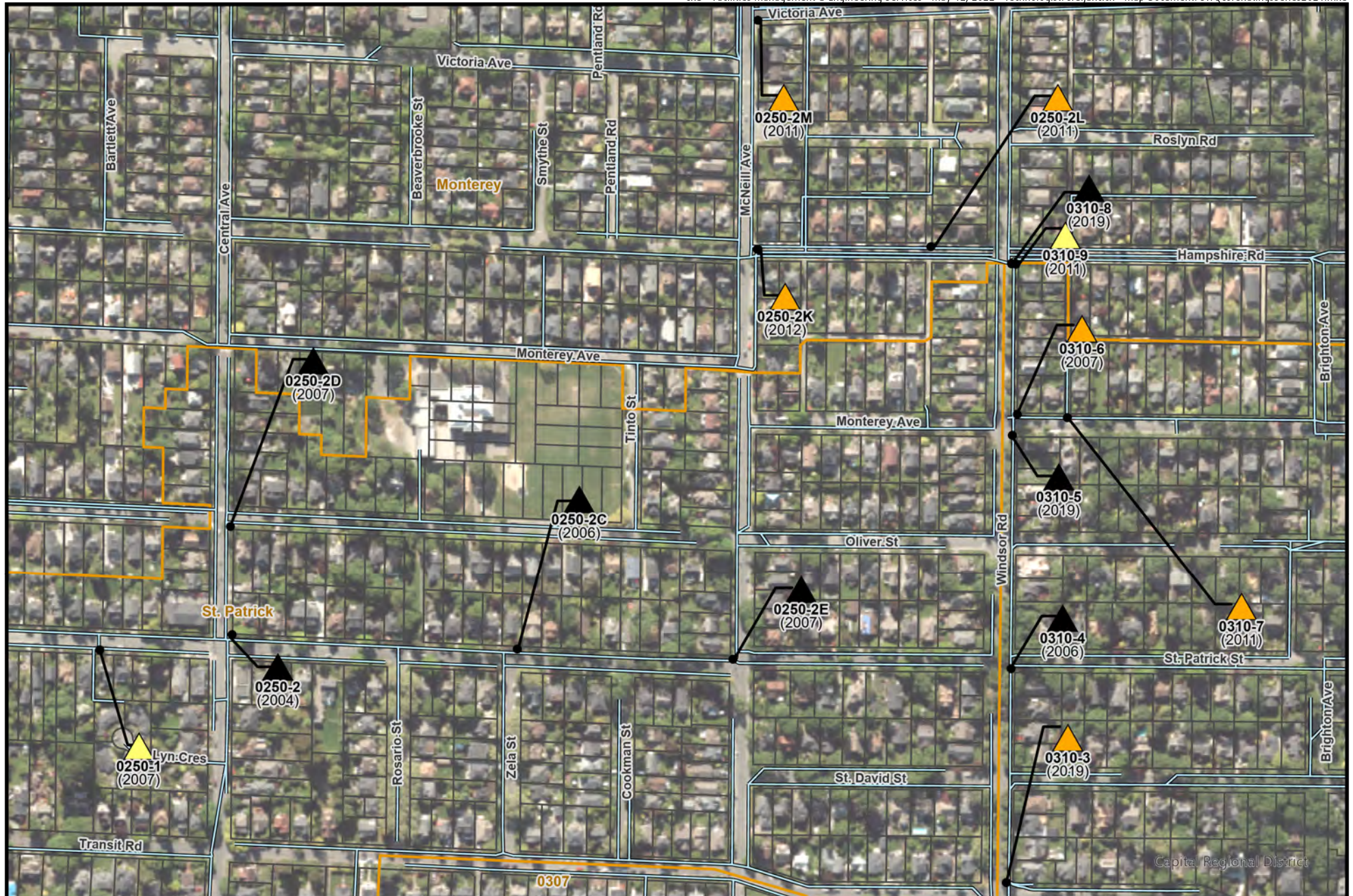
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APPENDIX B

CORE AREA STORMWATER PUBLIC HEALTH CONCERN RATINGS

Table 1 2021 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Fig. No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2019	2020	2021	Comments	Recommendations
0923	Colwood/DND	8	1	1	2	NA	NA	Low	Creek discharges into Esquimalt Lagoon	Resample in 2026
0924	Colwood/DND	8	1	1	2	NA	NA	Low	Creek discharges into Esquimalt Lagoon	Resample in 2026
0925	Colwood/DND	8	1	1	2	NA	NA	Low	Discharges into Esquimalt Lagoon	Resample in 2026
0926	Colwood	8	2	2	4	Low	Low	Moderate	Bee Creek; discharges into Esquimalt Lagoon	Confirm rating
0928	Colwood	8	1	2	3	Low	Low	Low	Selleck Creek; discharges into Esquimalt Lagoon	Continue monitoring creek
0930	Colwood	7	1	2	3	Low	Low	Low	Discharges into Esquimalt Lagoon	Continue monitoring
0931	Colwood	7	1	2	3	Moderate	Low	Low	Lagoona Brook; discharges into Esquimalt Lagoon	Continue monitoring
0932	Colwood	7	1	2	3	Moderate	Low	Low	Discharges into Esquimalt Lagoon	Continue monitoring
0933	Colwood	7	1	2	3	Moderate	Low	Low	Discharges into Esquimalt Lagoon	Continue monitoring
0934	Colwood	7	1	2	3	NA	Low	Low		Resample in 2026
0935	Colwood	7	1	2	3	NA	NA	Low		Confirm rating
0935A	Colwood	7	1	2	3	Moderate	Low	Low	Public beach	Continue monitoring
0940A	Colwood	6	1	1	2	Low	Low	Low	New pipe; low flow in summer	Resample in 2026
0916	Colwood/DND	7	1	2	3	Moderate	Low	Low	Colwood Creek; birds present	Continue monitoring
0722AA	Esquimalt	30	1	2	3	Moderate	Moderate	Low	Lower counts confirmed	Confirm rating
0727	Esquimalt	29	1	2	3	Moderate	Moderate	Low		Confirm rating
0736A	Esquimalt private	29	1	2	3	Moderate	Low	Low	Glen Vale strata	Continue monitoring
0737	Esquimalt	29	1	2	3	Low	Low	Low		Resample in 2026
0742	Esquimalt	28	2	2	4	Moderate	Moderate	Low		Confirm rating
0742b	Esquimalt	28	2	2	4	Moderate	Low	Moderate		Confirm rating
0743A	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate	May be influenced by creek flows	Continue monitoring
0744	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate	Gorge Creek	Continue monitoring
0744A	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate	Low flow	Continue monitoring
0744B	Esquimalt	28	3	2	5	High	High	High	One cross-connection fixed	Continue source investigations
0749	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate		Continue monitoring;
0749A	Esquimalt private	28	1	2	3	Moderate	Moderate	Low	Private pipe	Confirm rating
0750	Esquimalt	28	1	2	3	NA	NA	Low	Rarely flows	Resample in 2026
0751	Esquimalt	28	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0754	Esquimalt	27	1	2	3	Moderate	Low	Low		Resample in 2026
0779	Esquimalt	24	1	2	3	Moderate	Moderate	Low		Confirm rating
0780	Esquimalt	24	2	2	4	High	Moderate	Moderate	Sewer odour	Continue monitoring
0781	Esquimalt	23	2	2	4	High	High	Moderate	Sewer odour	Continue monitoring

Table 1 2021 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Fig. No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2019	2020	2021	Comments	Recommendations
0805	Esquimalt	22	3	3	6	High	High	High	SPSO	Continue monitoring and source investigations
0806	Esquimalt	22	3	3	6	High	High	High		Continue monitoring and source investigations
0807	Esquimalt	21	1	2	3	NA	NA	Low		Resample in 2026
0808	Esquimalt	21	1	2	3	NA	NA	Low		Resample in 2026
0813	Esquimalt	21	1	2	3	Moderate	Low	Low		Resample in 2026
0814	Esquimalt	21	2	2	4	Low	Moderate	Moderate	SPSO	Continue monitoring
0865D	Esquimalt F.N.	17	1	2	3	Moderate	Moderate	Moderate	Iron bacteria present; odour	Continue monitoring
0865F	Esquimalt F.N.	17	1	2	3	Moderate	Moderate	Low		Confirm rating
0854	Esquimalt/DND	19	2	1	3	Moderate	Moderate	Moderate	SPSO; toilet paper present	Continue monitoring and investigate
0726	Esquimalt/Songhees F.N.	29	1	2	3	Moderate	Moderate	Low		Confirm rating
6003	Langford	68	1	2	3	Low	Low	Low	Goldstream River SPSO	Continue monitoring
6006	Langford	68	1	1	2	Low	Low	Low		Resample in 2026
6008	Langford	70	1	3	4	Moderate	Low	Low		Continue monitoring
0231	Oak Bay	41	2	2	4	Moderate	Low	Moderate		Confirm rating
0244	Oak Bay	43	2	2	4	Low	Moderate	Moderate		Continue monitoring
0245	Oak Bay	43	2	3	5	High	High	High		Continue monitoring and source investigations
0249	Oak Bay	43	3	2	5	High	Moderate	High	EC elevated in summer, but low flow	Confirm rating
0250	Oak Bay	43	2	2	4	Moderate	Moderate	Moderate	Outfall, sampled manhole, water pooled	Continue monitoring
0306	Oak Bay	45	2	2	4	High	Moderate	Moderate	Flows in summer; dry in winter; elevated upstream	Continue monitoring
0307	Oak Bay	45	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0308A	Oak Bay	45	1	2	3	Low	Low	Low	Low flow in summer	Resample in 2026
0309	Oak Bay	45	1	2	3	Low	Low	Low		Resample in 2026
0310	Oak Bay	45	1	2	3	High	Moderate	Low		Continue monitoring
0310A	Oak Bay	45	3	2	5	Moderate	Moderate	Moderate		Confirm rating
0316	Oak Bay	46	2	2	4	Moderate	Moderate	Moderate	Bowker Creek High flows, SPSO	Continue monitoring creek
0317	Oak Bay	46	1	2	3	Low	Moderate	Low	SPSO; manhole; low flow	Confirm rating
0318	Oak Bay	46	2	3	5	High	High	High	Counts lower	Continue monitoring
0320	Oak Bay	46	2	3	5	High	High	High	Counts lower	Continue monitoring
0321	Oak Bay	47	1	3	4	Moderate	Moderate	Low	Outfall	Confirm rating

Table 1 2021 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Fig. No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2019	2020	2021	Comments	Recommendations
0321A	Oak Bay	47	2	3	5	Moderate	Moderate	Moderate		Continue monitoring
0322	Oak Bay	47	2	3	5	High	High	High	Outfall; counts lower	Continue monitoring
0323	Oak Bay	47	2	3	5	Moderate	High	High	Stream	Continue monitoring
0323A	Oak Bay	47	1	1	2	NR	NR	Low		Confirm rating
0324	Oak Bay	47	1	2	3	Low	Low	Low	Dry or low flows	Resample in 2026
0325	Oak Bay	48	1	1	2	NA	Low	Low	Dry or low flows	Resample in 2026
0327A	Oak Bay	49	1	3	4	Low	NR	Low	Cadboro Bay; dry in summer	Resample in 2026
0501	Saanich	49	2	3	4	Low	Low	Low	Cadboro Bay; Saanich fixed a cross-connection	Resample in 2026
0503	Saanich	50	2	3	5	High	High	High	Cadboro Bay; duck pond upstream; counts lower	Continue monitoring
0505	Saanich	50	2	3	5	Moderate	Moderate	High		Confirm rating
0506	Saanich	50	1	3	4	Moderate	High	Moderate		Confirm rating
0507	Saanich	50	1	3	4	Low	Moderate	Low	Low flow	Continue monitoring
0508	Saanich	50	2	3	5	Low	Low	Moderate	One source repaired; another source exists	Continue monitoring and source investigations
0515	Saanich	51	1	1	2	NA	NA	Low		Resample in 2026
0518	Saanich	51	3	1	4	NA	NA	Moderate		Confirm rating
0521A	Saanich	51	1	2	3	NA	NA	Low		Confirm rating
0522	Saanich	51	2	2	4	NA	NA	Moderate		Confirm rating
0533	Saanich private	51	1	1	2	NA	NA	Low		Resample in 2026
0534	Saanich private	55	1	1	2	NA	NA	Low		Resample in 2026
0541	Saanich	56	1	2	3	Moderate	Low	Low	Access difficult	Resample in 2026
0541A	Saanich	56	1	3	4	NA	Low	Low	Arbutus Cove	Resample in 2026
0541B	Saanich	56	1	3	4	NA	Low	Low	Arbutus Cove	Resample in 2026
0549	Saanich	57	1	3	4	NA	Low	Low	Arbutus Cove	Resample in 2026
0550	Saanich	58	1	2	3	NA	NA	Low		Confirm rating
0551	Saanich private	58	1	2	3	NA	NA	Low		Confirm rating
0552	Saanich private	58	1	2	3	NA	NA	Low		Confirm rating
0553	Saanich	58	1	2	3	NA	NA	Low		Confirm rating
0554	Saanich private	58	1	2	3	NA	NA	Low		Confirm rating
0557	Saanich	59	1	2	3	NA	NA	Low		Confirm rating
0558	Saanich	59	1	2	3	High	Low	Low	Near Mt. Douglas Park access	Continue monitoring
0559	Saanich	60	1	3	4	Moderate	Low	Low	Mt. Douglas Creek High flows, SPSO	Continue monitoring
0564	Saanich	61	1	3	4	NA	NA	Low		Confirm rating

Table 1 2021 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Fig. No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2019	2020	2021	Comments	Recommendations
0567	Saanich	62	2	2	4	High	Moderate	Moderate	Beach access, waterfall; suds previously	Continue monitoring
0574	Saanich	62	2	2	4	Low	Low	Moderate	Galey Brook; laundry soap	Continue monitoring; Confirm no soap present
0576A	Saanich	63	1	3	4	Moderate	Low	Low	High use beach	Continue monitoring
0578	Saanich	63	1	3	4	Low	Low	Low		Resample in 2026
0580	Saanich	64	2	3	5	Moderate	High	High	Gardom Creek	Confirm rating
0581	Saanich	64	2	3	5	Moderate	High	High		Continue monitoring
0589	Saanich	65	1	3	4	Low	Low	Low		Resample in 2026
0592	Saanich	65	1	1	2	Moderate	Moderate	Low	Noble Creek High flow; sewage odour	Continue monitoring creek
0653	Saanich	27	2	2	4	Moderate	Moderate	Moderate	Counts lower	Confirm rating
0654	Saanich	27	1	2	3	Low	Low	Low	Pool water discharge appears to have stopped	Resample in 2026
0658A	Saanich	28	1	2	3	Moderate	Moderate	Low		Confirm rating
0659	Saanich	28	1	2	3	Low	Moderate	Low		Confirm rating
0671	Saanich	29	2	2	4	Moderate	Moderate	Moderate		Continue monitoring
0676	Saanich	29	1	2	3	Moderate	Low	Low	SPSO; brown foam, sulfur odour	Continue monitoring
0679	Saanich	29	2	2	4	NA	NA	Low		Resample in 2026
0691A	Saanich	32	2	2	4	NA	Moderate	Moderate		Continue monitoring
0692	Saanich	32	1	2	3	Low	Low	Low		Resample in 2026
0690D	Saanich	33	1	2	3	Moderate	Low	Low	Colquitz Creek; high flow	Continue monitoring
0690E	Saanich	33	1	2	3	Moderate	Low	Low		Resample in 2026
0865AB	Songhees F.N	17	1	2	3	Low	Low	Low	No flow; only sampled once	Continue monitoring
0865B	Songhees F.N	17	1	2	3	Low	Low	Low	No flow; only sampled once	Continue monitoring
0865C	Songhees F.N	17	1	2	3	Low	Low	Low	Low flow; only sampled once	Continue monitoring
0209	Victoria	37	2	2	4	High	Moderate	Moderate	208 is an overflow for 209; infrastructure upgrades	Continue monitoring
0210	Victoria	37	1	2	3	Moderate	Moderate	Low		Confirm rating
0211	Victoria	39	1	2	3	NA	Low	Low	Low flow	Continue monitoring
0212	Victoria	39	1	3	4	Moderate	Moderate	Low		Confirm rating
0214	Victoria	39	2	2	4	High	High	High	SPSO; no access in 2020 213 on Victoria maps	Continue monitoring
0216	Victoria	40	3	2	5	High	High	High	SPSO, high flow, sewage odour	Continue monitoring
0217	Victoria	40	2	2	4	Moderate	Moderate	Moderate	Combined flow with 0218; outfall pipe underwater	Continue monitoring

Table 1 2021 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Fig. No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2019	2020	2021	Comments	Recommendations
0222	Victoria	40	3	2	5	High	High	High	Moderate flows	Continue monitoring and source investigations
0227	Victoria	41	2	2	4	Moderate	Moderate	Moderate	Low flow SPSO; SS and SD relining completed	Continue monitoring
0229	Victoria	41	2	3	5	Moderate	High	High	Gonzales Bay; flows low in summer	Continue monitoring and source investigations
0230	Victoria	41	3	2	5	Moderate	Moderate	High	Gonzales Bay; outfall in ocean; sampled manhole	Continue monitoring
0603	Victoria	36	2	2	4	High	High	High	Some relining and infrastructure upgrades	Continue monitoring
0604	Victoria	36	1	1	2	Low	Low	Low	Near boat launch	Resample in 2026
0605	Victoria	36	1	1	2	Moderate	Low	Low		Confirm rating
0607	Victoria	36	3	2	5	High	High	High	SPSO	Continue monitoring; start source investigations
0607A	Victoria	36	1	2	3	Low	Moderate	Low	Eastern pipe; in 607 catchment	Confirm rating
0610	Victoria	35	2	2	4	High	High	Moderate	Cross-connection found	Continue monitoring
0611	Victoria	35	3	2	5	High	High	High	Waiting for legislature to respond	Continue monitoring
0613	Victoria	35	2	2	4	High	Moderate	Moderate	Variable counts	Continue monitoring and source investigations
0614	Victoria	35	2	2	4	High	High	High		Continue monitoring
0618	Victoria	35	1	2	3	Low	Low	Low		Resample in 2026
0619	Victoria	34	3	2	5	High	High	High	Sewer odour	Sewer cross-connection
0620	Victoria	34	3	1	4	Moderate	Moderate	Moderate		Confirm rating
0622	Victoria	34	2	2	4	Moderate	Low	Moderate	Near kayak launch; elevated during rainfall	Confirm rating
0623	Victoria	34	1	1	2	Moderate	Moderate	Low	Low flow	Continue monitoring
0626	Victoria	34	3	1	4	Moderate	Moderate	Moderate	Need permission to access; high flow	Continue monitoring
0627	Victoria	34	3	1	4	Moderate	Moderate	Moderate	Need permission to access; high flow	Continue monitoring
0629	Victoria	26	1	1	2	Moderate	Moderate	Moderate	Dark discharge; foul odours; only one sample	Confirm lower count
0634	Victoria	26	3	1	4	Moderate	Moderate	Moderate	Low flow; hydrocarbon, compost odours	Source narrowed; continue monitoring
0633	Victoria	26	3	1	4	NA	NA	Moderate	Small catchment	Confirm rating
0636	Victoria	26	3	1	4	Moderate	Moderate	Moderate	High flow; high counts; foul odour, murky, grey	Continue monitoring
0639	Victoria	26	3	1	4	NA	NA	Moderate	Selkirk Water development	
0641	Victoria	71	2	2	4	High	Moderate	Moderate	Cecelia Creek; high flow; repaired main; SPSO	Continue monitoring and source investigations
0643	Victoria	27	1	2	3	Moderate	Low	Low	Low flow to dry	Confirm rating
0645	Victoria	27	2	2	4	Moderate	Moderate	Moderate	Dry in summer	Continue monitoring

Table 1 2021 Core Area Public Health Concern Ratings

Discharge	Jurisdiction at Discharge	Fig. No.	Bacterial Rating	Public Shoreline Use Rating	Sum of Ratings	2019	2020	2021	Comments	Recommendations
0645A	Victoria private	27	2	2	4	Moderate	Moderate	Moderate	Difficult access Private discharge	Continue monitoring
0646	Victoria	27	1	2	3	Moderate	Low	Low	Dry in summer	Confirm rating
0649	Victoria private	27	2	2	4	High	High	Moderate	Gorge Road Hospital Private discharge; lower counts	Continue monitoring
0650	Victoria	27	3	2	5	High	High	High	Low flow in summer	Continue monitoring
0756	Victoria	27	1	2	3	NA	NA	NR	Surges	Confirm rating
0759	Victoria	26	1	2	3	Moderate	Moderate	Low		Confirm rating
0768	Victoria	25	2	2	4	Moderate	Moderate	Moderate	SPSO; sewer odour	Continue monitoring
0769	Victoria	25	2	2	4	Moderate	Moderate	Moderate	SPSO?	Continue monitoring
0775	Victoria	24	2	2	4	Moderate	Moderate	Moderate	SPSO	Continue monitoring
0758A	Victoria	27	2	2	4	Moderate	High	Moderate	Low flow in summer	Confirm rating
0777A	Victoria	24	3	2	5	High	High	High		Continue monitoring
0697	View Royal	31	2	2	4	Moderate	Low	Moderate	Hospital Creek: SPSO	Continue monitoring
0703	View Royal	31	2	2	4	Moderate	Low	Moderate		Confirm rating
0705	View Royal	31	1	2	3	NA	NA	Low		Confirm rating
0709B	View Royal	31	2	2	4	Moderate	Moderate	Moderate	Craigflower Creek; SPSO	Continue monitoring creek
0710	View Royal	31	1	2	3	Moderate	Moderate	Low		Continue monitoring
0710W	View Royal	31	1	2	3	Moderate	Low	Low		Resample in 2026
0712	View Royal	30	1	2	3	High	Low	Low	Something got fixed	Continue monitoring
0722	View Royal	30	1	2	3	Moderate	Moderate	Low		Confirm rating
0872	View Royal	16	1	2	3	Moderate	Low	Low	SPSO; low flows	Continue monitoring
0874	View Royal	15	1	2	3	NA	Low	Low		Resample in 2026
0879	View Royal	15	1	2	3	NA	NA	NR	Only sampled once	Confirm rating
0881	View Royal	15	1	2	3	NA	NA	NR	Dry in spring; only sampled once	Confirm rating
0882	View Royal	13	1	2	3	NA	Low	Low		Resample in 2026
0886	View Royal	14	1	2	3	Low	Low	Low	Millstream Creek; SPSO	Continue monitoring creek
0865G	View Royal	17	3	1	4	Moderate	Low	Moderate		Confirm rating

Notes:
Level of Concern determined by sum of the bacterial and shoreline ratings. Low = sums of 2 and 3, moderate = sum of 4 and high = sums of 5 and 6
EC = Escherichia coli (E. coli) counts
NR = Not rated due to insufficient data or sample could not be obtained
NA = Not assessed this year
SPSO = This discharge acts as a sewage pump station overflow
Private discharges are not part of the municipal system

APPENDIX C

CORE AREA STORMWATER DISCHARGE BACTERIAL DATA (2021)

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0209	Foot of San Jose, west of Holland Pt.	2020-07-06	920	5	no odour, clear
		2021-01-15	220	40	no odour, clear, no rain
		2021-06-21	5000	9	no odour, clear, no rain
		2022-01-26	2800	60	no odour, clear, no rain
SW0210	Foot of Lewis, west of Holland Pt.	2020-07-06	150	20	
		2021-01-15	130	85	no odour, clear, no rain
		2021-03-17	2	45	no odour, clear, no rain
		2021-06-21	2	5	no odour, clear, no rain
		2022-01-26	5	13	no odour, clear, no rain
SW0211	~ 270 m E of Finlayson Pt. at stairs	2020-07-06	<1	25	no odour, clear
		2021-02-25	11	11	no odour, clear, overcast with light rain
		2021-06-21	<1	7	no odour, clear, no rain
		2022-01-27	5	11	no odour, clear, no rain
SW0212	Foot of Cook St.	2020-06-01	360	18	sewer odour, murky amber, Clover overflow sampling
		2020-07-21	2000	60	no odour, clear
		2020-11-20	<1	50	no odour, murky brown
		2021-01-15	5	100	no odour, clear, no rain
		2021-02-26	8	65	no odour, clear, no rain
		2021-03-29	80	100	no odour, clear, previous rain
		2021-06-21	4	5	no odour, clear, no rain
		2022-01-26	<1	42	no odour, clear, no rain
SW0214	Clover Point	2022-01-26	3600	>250	no odour, clear, no rain
SW0216	Foot of Eberts St.	2020-06-01	92000	>60	no odour, slight amber, Clover overflow sampling
		2020-07-21	100000	150	no odour, clear
		2021-02-04	1000	>250	no odour, clear, rain/heavy rain previous
		2021-03-29	11000	200	no odour, clear, previous rain
		2021-06-21	110000	65	no odour, clear, no rain
		2022-01-26	1900	>300	no odour, clear, no rain
SW0216-3	MH#D3640 @ Cook St. & May St.	2021-03-30	8000	35	no odour, clear, no rain
SW0216-3B	MH @ 162 Joseph St.	2020-11-20	18000	>200	no odour, murky brown
SW0218	Foot of Memorial Crescent	2020-07-21	100	5	no odour, clear
		2021-02-04	59	60	no odour, clear, rain/heavy rain previous

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-03-30	17	22	no odour, murky, no rain
		2021-06-21	300	2	no odour, clear, no rain
		2022-01-27	56	9	no odour, clear, no rain
SW0222	Middle of Ross Bay Cemetery	2020-06-01	74000	>100	stale/chemical odour, slightly murky, Clover overflow sampling
		2021-02-04	500	>800	no odour, murky, rain/heavy rain previous
		2021-06-21	3000	100	no odour, clear, no rain
		2022-01-27	12000	>250	no odour, clear, no rain
SW0227	Foot of Wildwood Crescent	2020-06-01	270	1	no odour, clear, done with Clover overflow sampling
		2021-02-04	400	9	no odour, clear, rain/heavy rain previous
		2021-06-21	280	<1	no odour, clear, no rain
		2022-01-27	11	4	no odour, clear, no rain
SW0228	Robertson Rd, W side of Gonzales Bay	2022-02-24	<1	<1	no odour, clear, no rain
SW0228A	West side of Gonzales Bay	2022-02-24	1	3	no odour, clear, no rain
SW0229	Foot of Ross St, Gonzales Bay	2020-07-21		<0.01	flow too low to sample
		2020-12-08	570		no odour, brown , potential marine influenced, flow not estimated
		2021-02-04	250	22	no odour, clear, rain/heavy rain previous
		2021-06-21		0	dry, not sampled, no rain
		2022-01-27	140	5	no odour, clear, no rain
SW0230	Foot of Foul Bay Rd, Gonzales Bay	2020-07-21		<0.01	flow too low to sample
		2021-02-04	24000	30	no odour, clear, rain/heavy rain previous
		2021-06-21	26000	6	no odour, clear, no rain
		2022-01-28	34000	12	no odour, clear, no rain
SW0231	Foot of Marne St, Gonzales Bay	2020-07-21		<0.01	flow too low to sample
		2021-02-04	610	24	no odour, murky black, rain/heavy rain previous
		2021-06-21	15	<1	no odour, clear, no rain
		2022-01-28	72	5	no odour, clear, no rain
SW0236	Foot of Crescent Rd, Harling Pt.	2022-01-28	21	6	no odour, clear, no rain
SW0237	Harling Pt.	2021-02-04	370	10	no odour, clear, rain/heavy rain previous
		2021-06-21		<0.01	flow too low to sample, no rain
		2022-01-28	15	3	no odour, clear, no rain
SW0244	Across from 242 Beach Dr., McNeill Bay	2020-07-21	930	2	no odour, clear
		2021-02-04	53	22	no odour, murky, rain/heavy rain previous

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-06-14	730	6	no odour, clear, no rain
		2022-01-24	60	11	no odour, clear, no rain
		2022-02-24	100	11	no odour, clear, no rain
SW0245	Foot of Monterey Ave, McNeill Bay	2020-07-21	1600	15	no odour, clear
		2021-01-06	230	55	no odour, slightly murky, rain in past two days
		2021-03-29	360	250	no odour, clear, previous rain
		2021-06-14	<1	12	no odour, slightly murky, no rain
		2021-08-17	28000	300	no odour, amber with white foam, light rain
		2021-09-16	170	40	no odour, clear, rain two days ago
		2022-01-24	870	65	no odour, clear, no rain
		2022-01-27	120	60	no odour, clear, no rain
SW0249	Foot of Oliver, McNeill Bay	2020-07-21		<0.01	flow too low to sample
		2021-02-10	66	<1	no odour, clear, light snow
		2021-06-14	14000	1	no odour, clear, no rain
		2022-01-27	5	2	no odour, clear, no rain
SW0250	Foot of St. Patrick, McNeill Bay	2020-07-21	900	<0.01	no odour, clear, standing water
		2021-02-10	1200	<0.01	no odour, clear, pooled with unknown flow, light snow
		2021-03-29	330	<0.01	no odour, clear, standing water, previous rain
		2021-06-14	1100	3	no odour, clear, no rain
		2021-09-16	160	0	no odour, clear, standing water, rain two days ago
		2022-01-27	730		no odour, clear, unknown flow, no rain
SW0257A	Foot of Radcliffe Lane	2022-02-24	<1	12	no odour, clear, no rain
SW0304	End of Satellite St.	2022-02-24	860	<1	no odour, clear, no rain
SW0305	Oak Bay Marina, 1270 Beach Dr,	2022-02-24		0	dry, not sampled, no rain
SW0305A	1247 Beach Dr, S of Oak Bay Marina	2022-02-24		<0.01	flow too low to sample, no rain
SW0306	South side of Oak Bay Marina	2020-07-21	140	50	no odour, clear
		2021-02-25	4400	<0.01	no odour, clear, unknown flow, overcast with light rain
		2021-03-29	260	200	no odour, clear, previous rain
		2021-06-22		<0.01	flow too low to sample, no rain
		2021-08-25		40	no odour, clear, some marine influence, no rain
		2022-02-24		<0.01	flow too low to sample, no rain
SW0306-2	MH, 2503 Orchard Ave.	2020-12-01	20000	15	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0306-2A	MH, E corner, Newport & Currie Rd.	2020-12-01	100	<1	no odour, clear
SW0307	Oak Bay Marina	2020-07-21	240	4	sewer odour, sudsy
		2021-02-25	4000	5	no odour, clear, overcast with light rain
		2021-03-29	400	2	slight sewer odour, clear, previous rain
		2021-06-22	110	2	no odour, clear, no rain
		2022-02-01	170	<1	no odour, clear, rain yesterday
SW0308A	Foot of Windsor & Goodwin	2020-07-21		<0.01	flow too low to sample
		2021-01-20	34	<1	no odour, clear, no rain
		2021-06-22		<0.01	flow too low to sample, no rain
SW0309	Upper pipe, end of Windsor Rd.	2020-07-21	90	<1	no odour, clear
		2021-01-20	<1	5	no odour, clear, no rain
		2021-06-22		<0.01	flow too low to sample, no rain
		2022-02-01	<1	10	no odour, clear, surge flow, rain yesterday
SW0310		2020-07-21	18	25	no odour, clear
		2021-01-20	140	25	no odour, very turbid brown, no rain
		2021-06-22	28	5	no odour, clear, no rain
		2022-02-01	540	11	no odour, clear, rain yesterday
SW0310A	Foot of stairs; north of Windsor Rd.	2020-07-21	550	<1	no odour, clear
		2021-01-20	5800	1	no odour, clear, no rain
		2021-06-22	1300	1	no odour, clear, no rain
		2022-02-24	15	1	no odour, clear, no rain
SW0312	1440 beach Drive, end of pipe.	2020-07-21	<1	<1	no odour, clear
SW0314	End of Beresford St., end of pipe.	2020-07-21		<0.01	flow too low to sample
SW0315	Broom Rd. outfall	2020-09-28	6	6	slight sewer odour, slight amber , sampled in relation to sewer overflow sampling
SW0316	South of Somass Drive	2020-07-21	560	500	no odour, clear
		2020-09-28	650	>400	no odour, slight murky , sampled in relation to sewer overflow in creek, no metered parameters
		2021-02-25	260	>2000	no odour, clear, overcast with light rain
		2021-06-22	800	>400	no odour, clear, no rain
		2022-02-24	40	>2000	no odour, slightly murky, no rain
SW0317	End of Bowker Lane	2020-07-20	15	1	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-01-20	2	7	no odour, clear, no rain
		2021-06-22	86	5	no odour, amber, no rain
		2022-01-31	11	32	no odour, clear, suds in MH, rain
SW0318	End of Bowker Ave.	2020-07-20	13000	80	no odour, clear
		2021-01-20	2000	60	no odour, clear, no rain
		2021-06-22	820	22	no odour, clear, no rain
		2022-01-31	36	60	no odour, murky grey, rain
SW0319	End of Cavendish Ave.	2020-07-20		0	dry, not sampled
SW0320	End of Dalhousie St.	2020-07-02	77		no odour, clear
		2020-09-28	350	10	no odour, clear, sampled in relation to sewer overflow sampling
		2020-11-27	700	100	no odour, clear
		2021-01-20	30	14	no odour, green dye in , no rain
		2021-06-22	1100	5	no odour, clear, no rain
		2022-01-31	120	80	no odour, murky grey, rain
SW0321	End of Estevan Ave.	2020-07-20	300	40	no odour, clear
		2021-01-20	70	12	no odour, clear, no rain
		2021-09-16		<0.01	flow too low to sample, no rain
		2022-02-02	110	7	no odour, clear, rain yesterday
SW0321A	Foot of Estevan near stairs	2020-07-20	280	5	no odour, clear
		2021-01-20	280	15	no odour, clear, no rain
		2021-06-22	2400	9	no odour, clear, no rain
		2022-02-02	150	12	no odour, clear, rain yesterday
SW0322	End of Thorpe Place beach access	2020-07-20	210	30	no odour, clear
		2021-01-20	380	20	no odour, clear, no rain
		2021-09-16	130	40	no odour, clear, rain two days ago
		2022-02-02	790	12	no odour, clear, rain yesterday
SW0323	North end of Esplanade	2020-07-20	1000	100	no odour, clear
		2020-08-06	890	40	no odour, slight amber colour
		2021-01-20	50	>160	no odour, slight amber, no rain
		2021-09-16	800	80	no odour, clear, rain two days ago
		2022-02-01	110	200	no odour, clear, rain yesterday
SW0323A	N side of Willows beach; top of stairs	2021-01-20	23	8	no odour, murky brown, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-09-16		0	dry, not sampled, no rain
		2022-02-02	420	5	no odour, murky brown, rain yesterday
SW0324	Cattle Point	2020-07-20		0	dry, not sampled
		2021-02-26	4	18	no odour, clear, no rain
		2021-09-16		0	dry, not sampled, no rain
SW0325	End of Rutland Rd.	2020-07-20		0	no odour, clear
		2021-02-26	2	<0.01	no odour, clear, unknown flow, no rain
SW0327	Center of Cadboro Bay	2020-07-20	200	50	no odour, clear
SW0327A	Foot of Hibbens Close	2021-01-15	22	8	no odour, clear, no rain
		2021-06-14		<0.01	flow too low to sample
SW0501	2730 Hibbens Close, Cadboro Bay	2020-07-20	<1	200	no odour, clear
		2021-01-15	2	75	no odour, clear, no rain
		2021-06-14	1	85	no odour, clear, no rain
SW0503	Hobbs Ck., Cadboro Bay	2020-07-20	230	200	no odour, clear
		2020-08-07	610	200	no odour, clear
		2021-01-07	260	95	no odour, murky, no rain
		2021-01-15	250	>120	no odour, clear, no rain
		2021-02-04	360	>120	no odour, murky amber, rain/heavy rain previous
		2021-06-14	1400	90	no odour, clear, no rain
		2022-02-02	4100	80	no odour, slightly brown, rain yesterday
SW0505	Large diffuser; E of Gyro Park	2020-08-07	140	500	no odour, clear
		2021-02-04	21	>200	no odour, murky amber, rain/heavy rain previous
		2021-05-19	420	200	no odour, clear, no rain
		2021-06-14	710	65	no odour, clear, no rain
		2022-02-25	37	>250	no odour, clear, no rain
SW0505-1	MH S of Penrhyn Pump Station	2020-08-06	7		no odour, clear, not marine water (specific conductance was 522.4 uS/cm), pooled water with unknown flow
SW0505-2	MH SW of 2604 Sinclair Rd.	2020-08-06	20	6	no odour, clear
SW0505-3	MH, pump station, 2620 Penrhyn St.	2020-08-06	92		no odour, clear, not marine water (specific conductance was 237.0 uS/cm), pooled water with unknown flow
SW0505-4	MH 2608/2604 Penrhyn St.	2021-02-26		7	no odour, clear, rain yesterday
SW0505-5	MH, edge of park, 3863 Cadboro Bay Rd.	2020-08-06	76	3	no odour, slight rusty colour, iron oxide bacteria present

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0505-6	Corner of Cadboro Bay/Penrhyn Rd.	2020-12-11	30		no odour, slightly brown , pooled without flow
		2021-02-26		7	no odour, clear, rain yesterday
SW0505-7	MH at driveway of 3844 Hobbs St.	2021-02-26		7	no odour, clear, rain yesterday
SW0506	Telegraph Bay Rd, Cadboro Bay	2020-08-07	1400	60	no odour, clear
		2021-01-15	8	60	no odour, clear, no rain
		2021-06-14	12	9	no odour, clear, no rain
		2022-02-02	18	35	no odour, clear, rain yesterday
SW0507	S of 508, foot of Telegraph Bay Rd.	2020-08-07		0	dry, not sampled
		2021-01-15	<1	2	no odour, clear, no rain
		2021-06-14		<0.01	flow too low to sample
		2022-02-02	<1	1	no odour, clear, rain yesterday
SW0508	Diffuser, foot of Telegraph Bay Rd.	2020-08-07	140	15	no odour, clear
		2021-01-15	7	100	no odour, clear, no rain
		2021-06-14	1400	12	no odour, clear, no rain
		2022-02-02	8	40	no odour, clear, rain yesterday
SW0512	2825 Sea View Rd.	2020-08-19		<1	no odour, clear
		2020-08-26	21	<1	no odour, clear
SW0513	W side of boat ramp, Ten Mile Point	2022-03-01	2	2	no odour, clear, light rain previous
SW0515	N of beach access, 2929 Sea View Rd.	2021-02-25	13	46	no odour, clear, overcast with light rain
		2021-06-17		<0.01	flow too low to sample, no rain
SW0516	2977 Sea View Rd., Ten Mile Point	2022-02-02	9	18	no odour, clear, rain yesterday
SW0518	Beach access beside 3895 Tudor Ave.	2021-01-07	3	35	no odour, clear, no rain
		2021-06-17	14000	5	no odour, clear, no rain
		2022-02-02	38	9	no odour, clear, rain yesterday
SW0519	South of Tudor Ave beach access	2022-02-25		<0.01	flow too low to sample, no rain
SW0520	3905 Tudor Ave., Ten Mile Point	2022-02-25	<1	3	no odour, clear, no rain
SW0521A	McAnally Rd. & Smugglers Cove Rd.	2021-02-25		0	dry, not sampled
		2021-06-17		0	dry, no rain
		2022-02-03		0	dry, not sampled, rain yesterday
SW0522	Foot of McAnally, Smugglers Cove	2021-02-25	1700	9	no odour, clear, overcast with light rain
		2021-06-17		<0.01	flow too low to sample, no rain
		2022-02-03	6	<1	no odour, clear with iron oxide bacteria, rain yesterday

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0525	3030 Spring Bay Rd., Ten Mile Point	2022-02-25		0	dry, not sampled, no rain
SW0530	End of Phyllis/ Mt Bakerview Rd.	2022-03-01	<1	12	no odour, clear, light rain previous
SW0533	W of Cranford Place beach access	2020-08-19		0	dry, not sampled
		2021-01-07	8	12	no odour, clear, no rain
		2021-06-17		0	dry, no rain
SW0534	E of Cranford Place beach access	2020-08-19		0	dry, not sampled
		2021-01-07	2	18	no odour, clear, no rain
		2021-06-17		<0.01	flow too low to sample, no rain
SW0535	Guinivere Place beach access	2020-08-19		0	dry, not sampled
SW0538	E of Queen Alex. Hospital, Finnerty Cove	2020-08-26	3	2	no odour, clear
SW0539A	4025 Locarno Lane, Arbutus Cove	2020-08-26	4	12	no odour, clear
SW0540	4035 Larcono Lane, Finnerty Cove	2022-03-02	2	7	no odour, clear, no rain in past two days
SW0541	4031 Hollydene Place, Arbutus Cove	2020-08-26	40	16	no odour, clear
		2021-02-25	16	18	no odour, clear, overcast with light rain
		2021-06-17	12	7	no odour, clear, no rain
		2022-01-20	70	32	no odour, clear, light rain previous
SW0541A	Base of hillside, 4039 Hollydene Place	2020-08-19		0	dry, not sampled
		2021-02-25		<0.01	flow too low to sample
		2021-06-17		0	dry, no rain
SW0541B	Base of hillside, 4041 Hollydene Place	2020-08-26	1	4	no odour, clear
		2021-02-25	1700	6	no odour, clear, overcast with light rain
		2021-06-17	5	3	no odour, clear, no rain
		2022-01-20	6	5	no odour, clear, light rain previous
SW0542	2296 Arbutus Cove Lane, Arbutus Cove	2020-08-19		<0.01	flow too low to sample
		2022-01-20	7	3	no odour, clear, light rain previous
SW0542A	NE corner of vacant lot, Arbutus Cove	2020-08-26	2	7	no odour, clear
		2022-01-20	<1	7	no odour, clear, light rain previous
SW0542B	2270 Arbutus Rd., Arbutus Cove	2020-08-26	72	8	no odour, clear
		2022-01-20	8	8	no odour, clear, light rain previous
SW0542C	Between 2254 & 2270 Arbutus Rd.	2020-08-26	4	8	no odour, clear
		2022-01-20	<1	10	no odour, clear, light rain previous
SW0543	Arbutus Cove Lane beach access	2020-08-26	11	7	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2022-01-20	<10	10	no odour, clear, light rain previous
SW0543A	2m S of discharge 544, Arbutus Cove	2020-08-26	26	4	no odour, slight amber
		2022-01-20	57	7	no odour, clear, light rain previous
SW0544	55m S of Arbutus Cove Lane beach access	2020-08-26	7	4	no odour, slight amber
		2022-01-20	49	8	no odour, clear, light rain previous
SW0545	Foot of southern stairs; Arbutus Cove	2020-08-26	60	8	no odour, clear
		2022-01-20	23	24	no odour, clear, light rain previous
SW0545A	End of Arbutus Cove Lane beach access	2020-08-26	2	4	no odour, clear
		2022-01-20	4	12	no odour, clear, light rain previous
SW0549	End of Shore Way, Gordon Head	2021-02-25	1	7	no odour, clear, overcast with light rain
		2021-06-17		<0.01	flow too low to sample, no rain
SW0550	Foot of Balmacarra & Leynes Rd.	2021-02-25		<0.01	flow too low to sample
		2021-06-17	69	5	no odour, clear, no rain
		2022-02-03	6	40	no odour, clear, rain yesterday
SW0551	4659 Vantreight Rd., Gordon Head	2021-02-25		<0.01	flow too low to sample
		2021-06-17		0	dry, no rain
		2022-02-03		0	dry, not sampled, rain yesterday
SW0552	31 m W of Leynes beach access	2021-02-25	24	6	no odour, clear, overcast with light rain
		2021-06-17		0	dry, no rain
		2022-02-03		<0.01	flow too low to sample, rain yesterday
SW0553	110 m W of Leynes beach access	2021-02-25	1	1	no odour, clear, overcast with light rain
		2021-06-17		0	dry, no rain
		2022-02-03		<0.01	flow too low to sample, rain yesterday
SW0554		2021-02-25	4	3	no odour, clear, overcast with light rain
		2021-06-17		0	dry, no rain
		2022-02-03	<10	<1	no odour, clear, rain yesterday
SW0557	480 m E of Mt Douglas Park beach access	2021-03-04	2	9	no odour, clear, no rain
		2021-06-08		<0.01	flow too low to sample
		2022-02-03	28	6	no odour, clear, rain yesterday
SW0558	180 m east of Mt Douglas beach access	2020-06-17	64	3	no odour, clear
		2020-08-26	45	<1	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-03-04	11	12	no odour, clear, no rain
		2021-06-08	61	4	no odour, clear, rain previous
		2022-02-03	40	9	no odour, clear, rain yesterday
SW0559	Mt. Doug Creek, Cordova Bay	2020-08-26	57	55	no odour, clear
		2021-03-04	32	>1200	no odour, clear, no rain
		2021-06-08	60	>200	no odour, clear, rain previous
		2021-08-18	340	200	no odour, clear, no rain
		2021-08-25	34	200	no odour, clear, no rain
		2021-09-01	26	150	no odour, clear, no rain
		2021-09-08	12	150	no odour, clear, mixed rain
		2021-09-15	290	250	no odour, clear, rain previous
		2021-09-17	3200	>3000	no odour, clear, heavy rain (near first flush)
		2021-10-14	410	>700	
		2021-10-20	240	>1200	
		2021-10-28	2800	5000	
		2021-11-03	80	1300	
		2021-11-09	150	1000	
		2022-02-03	470	>2000	no odour, clear, rain yesterday
SW0559-2	Douglas Ck u/s, near Robinwood Dr.	2021-08-18	200	200	no odour, clear, no rain
		2021-08-25	220	200	no odour, clear, no rain
		2021-09-01	70	150	no odour, clear, no rain
		2021-09-08	23	150	no odour, clear, mixed rain
		2021-09-15	190	250	no odour, clear, rain previous
		2021-09-17	3100	>3000	no odour, clear, heavy rain (near first flush)
		2021-10-14	850	>600	
		2021-10-20	5000	1200	
		2021-10-28	14000	5000	
		2021-11-03	70	1300	
		2021-11-09	170	>1000	
SW0560	130 m W of Mt Douglas Park beach access	2022-03-02	2	9	no odour, clear, no rain in past two days
SW0564	4649 Cordova Bay Rd.	2020-08-27	40	28	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-01-20	10	40	no odour, clear, no rain
		2022-02-10	<1	22	no odour, clear, no rain
SW0567	South side of 4771 Timber Place	2020-06-17	790	30	no odour, clear
		2021-01-20	680	80	no odour, clear, no rain
		2021-03-04	20	85	no odour, clear, no rain
		2021-06-08	3800	14	no odour, clear, rain previous
		2022-02-10	470	35	no odour, brown, no rain
SW0574	4915 Cordova Bay Rd.	2020-08-27	25	60	no odour, clear
		2021-01-20	12	>100	no odour, turbid brown, no rain
		2021-03-03	17	85	no odour, clear, no rain
		2021-06-08	280	60	no odour, clear, rain previous
		2021-09-21	2400	65	no odour, slightly murky, moderate rain two days ago
		2022-02-10	11	100	no odour, clear, no rain
		2022-04-07	23	85	no odour, clear, no rain prior
SW0576A	S of beach access; 4989 Cordova Bay Rd.	2020-08-27	43	32	no odour, clear
		2021-01-20	7	70	no odour, clear, no rain
		2021-03-03	5	40	no odour, clear, no rain
		2021-06-08	13	50	no odour, clear, rain previous
		2021-07-20	69	18	no odour, clear, no rain
		2021-09-21	68	46	no odour, clear, moderate rain two days ago
		2022-02-10	2	28	no odour, clear, no rain
		2022-04-07	15	65	no odour, clear, no rain prior
SW0578	S of beach access; 5091 Cordova Bay Rd.	2020-08-27	29	120	no odour, clear
		2021-04-09	28	500	no odour, clear, light rain
		2021-06-08	48	>200	no odour, clear, rain previous
		2022-02-25	8	>300	no odour, clear, no rain
SW0580	20 m south of park on Agate Lane	2020-08-27	900	1	no odour, clear
		2021-03-03	1	9	no odour, clear, no rain
		2021-06-08	230	3	no odour, clear, rain previous
		2022-02-10	19	8	no odour, clear, no rain
SW0581	5179 Agate Lane	2020-08-27	2000	11	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-03-03	<1	30	no odour, clear, no rain
		2021-06-08	520	20	no odour, clear, rain previous
		2022-02-10		<0.01	flow too low to sample, no rain
SW0589	Parker Park beach access, Burnham Brook	2020-08-27	27	100	no odour, clear
		2021-04-09	4	450	no odour, clear, previous rain
		2021-06-08	4	80	no odour, clear, rain previous
SW0592	North side of 5575 Parker Rd.	2020-08-11	82	>250	no odour, slight amber
		2020-08-18	90	>250	no odour, amber
		2020-08-25	51	>200	no odour, slight amber
		2020-09-01	110	200	no odour, slight amber
		2020-09-08	56	180	no odour, slight amber
		2020-09-24	6900	>500	earthy odour, dirty/turbid brown
		2020-10-13	5200	>2000	no odour, turbid brown
		2020-10-20	75	1000	no odour, slight brown
		2020-10-27	60	1000	no odour, slight amber
		2020-11-04	840	900	no odour, amber
		2020-11-12	17	>1000	no odour, slight amber
		2021-03-03	13	>700	no odour, clear, no rain
		2021-08-24		400	no odour, clear, no rain
		2022-02-10	16	>600	no odour, murky brown, no rain
SW0601	Montreal St, behind breakwater	2021-03-31	1	3	no odour, clear, potential marine, no rain
		2021-08-20		<0.01	flow too low to sample, no rain
SW0601A	Ogden Point; center of middle jetty	2020-11-19	27	<0.01	first u/w MH, no odour, clear, fresh water, pooled
		2021-03-31		0	dry, not sampled, no rain
SW0602	Heli jet parking lot	2020-11-19	35	12	tidal water in pipe; sampled MH u/s, no odour, clear
		2021-03-31	<1	12	no odour, clear, no rain
		2021-08-20	300000	8	no odour, turbid, light rain previous
SW0603	20 m south of James Bay Anglers	2020-07-06	2100	15	foul odour, clear
		2021-03-30	2000000	40	strong sewer odour with toilet paper, no rain
		2021-08-20	450000	5	no odour, clear, geese present, light rain previous
SW0604	S corner of Canadian Coast Guard lot	2020-07-06	2	40	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-03-30	2	50	no odour, clear, no rain
		2021-09-21	90	25	no odour, clear, heavy rain two days ago
SW0605	5 m W of fire hydrant at Coast Guard	2020-07-06	190	<1	no odour, clear
		2021-03-30	64	1	no odour, clear, no rain
		2021-09-21		<0.01	flow too low to sample, no rain
SW0607	E of Fisherman's Wharf, NW pipe.	2020-06-19	75000	32	no odour, clear
		2020-06-22	140000	200	no odour, clear
		2021-03-17	7800	32	no odour, clear, no rain
		2021-06-15	940000	17	no odour, slight amber, no rain
SW0607-1A	St. Lawrence St. (MHD3477)	2020-06-19	550000		no odour, clear
SW0607A	E of Fisherman's Wharf, SE pipe.	2020-06-19	9	10	no odour, clear
		2020-06-22	3	100	no odour, clear
		2021-03-17	10	36	no odour, clear, no rain
		2021-06-15	7	24	no odour, clear, rain previous
SW0610	Foot of Oswego St.	2020-06-22	3100	1	strong sewer odour, clear, biofilm on pipe
		2021-03-17	610	9	no odour, clear, no rain
		2021-06-15	90	9	no odour, clear, rain previous
		2022-03-04	4700	9	no odour, clear, no rain
SW0611	At foot of Menzies St.	2020-06-22	200000	25	no odour, clear
		2021-03-17	170000	9	no odour, clear, no rain
		2021-06-15	260000	11	no odour, clear, rain previous
		2022-03-04	16000	12	sewer odour, clear, no rain
SW0613	Government St. & Belleville	2020-06-22	640	45	no odour, clear
		2020-06-23	640	50	no odour, clear
		2021-04-01	120	80	no odour, clear, no rain
		2021-06-15	1100	17	no odour, clear, no rain
		2022-01-31	400	>200	low tide odour, clear, rain
SW0614	Humboldt/Wharf & Government	2020-05-01	3200	40	stale odour, clear
		2021-04-30	300	140	no odour, clear, light rain previous
		2021-06-24	680	26	no odour, clear, no rain
		2022-01-31	9000	>250	low tide odour, murky, rain
SW0614-1A	MH Wharf St. & Government St.	2020-06-23	86	50	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0618	Foot of Fort St.	2020-06-22	1	20	no odour, clear
		2021-03-31	<1	50	no odour, clear, no rain
		2021-06-24	7	3	no odour, clear, no rain
SW0619	South side of Johnson St. bridge	2020-06-22	5300000	30	strong sewer odour, murky
		2021-03-17	280000	7	slight sewer odour, murky, no rain
		2021-06-24	880	2	no odour, clear, no rain
SW0619A	North side of Johnson St. bridge 619A	2020-06-22	<1	5	no odour, clear
SW0620	North side of Johnson St. bridge	2020-06-22	4600	250	no odour, clear
		2020-06-23	4600	250	no odour, clear
		2021-03-17	4700	22	slight sewer odour, murky, no rain
		2021-06-24	7600	11	no odour, clear, no rain
SW0622	End of Swift St.	2020-06-08	10	1	no odour, slight amber
		2020-07-06	190	3	no odour, clear
		2021-03-30		<0.01	flow too low to sample, no rain
		2021-06-24	240	1	no odour, clear, no rain
SW0623	End of Chatham St.	2020-06-03	4400	<1	foul odour, amber colour, low flow after a surge
		2020-06-03	750	8	slight foul odour, murky amber colour, flow during a surge
		2020-06-08	7400	1	no odour, slight amber
		2021-03-30		<0.01	flow too low to sample, no rain
		2021-06-24		0	dry, not sampled, no rain
SW0624	2140 Store St., rubber tidegate	2021-04-01	7	4	no odour, clear, no rain
		2021-06-24	60	1	no odour, clear, no rain
SW0626	Behind 2122 Government St., Rock Bay	2020-06-23	4500	200	no odour, clear
		2021-04-01	49000	500	slight odour, clear, no rain
		2021-06-24	60000	22	no odour, clear, no rain
SW0627	South side of Ocean Cement, Rock Bay	2020-06-23	13000	500	odour not noted, murky with flocculant
		2021-04-01	1200	800	no odour, clear, no rain
		2021-06-24	260000	30	no odour, clear, no rain
SW0627-1	MH, Government St, b/t Queen & Bay St.	2020-12-02	28000	<0.01	no odour, clear, pooled water with flow
SW0627-3	MH @ Princess Ave. & Government St.	2020-12-02	11	<0.01	no odour, clear, pooled water with slight flow
SW0627-3A	MH, 616 Queens Ave.	2020-12-03	18000	>500	no odour, slightly murky
SW0629	East of foot of Bridge St, Rock Bay	2020-06-25	140000	40	odour not noted, dark turbid

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-04-01	12	45	sewer odour, slightly murky, no rain
SW0629-2	MH#D3017 540 John St; Boyd Auto Glass	2020-11-25	30	18	no odour, murky brown
		2021-03-05	<1	8	no odour, slight amber flow, no rain
SW0629-7	MH SE corner of John St/Rock Bay Ave	2020-11-25	<1	18	no odour, murky brown
SW0629-8	MH corner of Hillside Ave/Rock Bay Ave	2021-03-05		2	no odour, clear, no rain
SW0633	Under south side of Bay St. bridge	2021-03-31		<0.01	flow too low to sample
		2021-08-17	1600	30	sewer odour, very turbid, light rain
SW0634	End of David St., below Budget Steel	2020-06-25	900000	30	foul odour, murky with biofilm on outlet pipe
		2021-08-23	3400	5	foul odour, silty, no rain
SW0634-A	MH#D3006 at Hillside & Pleasant	2020-11-25	36000	2	very foul odour, turbid brown
		2021-01-12	15000	32	foul odour, very murky brown, rain/rain
SW0636	Victoria municipal yard, South Bay	2020-06-23	18000	200	odour not noted, grey with oil slick on surface
		2021-04-01	800	>1000	no odour, clear, no rain
		2021-08-23	290000	200	foul odour, light turbid colour, no rain
SW0636-1	MH#D4787 on Bridge St.	2020-12-02	1600	<0.01	no odour, clear, pooled water with flow
SW0636-1A	West side of Bridge St. & David St.	2020-12-02	4600	<0.01	no odour, murky white, pooled with slight flow
SW0639A	Selkirk Water Development	2021-03-30	1200	20	no odour, milky flow, no rain
		2021-08-23	13000	120	no odour, clear, no rain
SW0641	Mouth of Cecelia Creek	2020-08-12	17	600	no odour, clear
		2021-01-21	320	>1000	no odour, slightly murky, no rain
		2021-09-16	480	400	sewer odour, clear, rain two days ago
SW0643	Foot of Washington Ave.	2020-07-17	25	5	no odour, clear
		2021-01-22	<1	2	no odour, clear, no rain
		2021-08-19		<0.01	flow too low to sample, no rain
		2022-03-03	11	1	no odour, clear, no rain in past two days
SW0645	Carrol St. easement	2021-01-22	250	4	no odour, clear, no rain
		2022-03-03	1200	6	no odour, murky, no rain in past two days
SW0645A	Prince Charles Appts/Gorge Rd.	2021-01-22	420	6	no odour, clear, no rain
		2022-03-03	540	5	no odour, clear, no rain in past two days
SW0646	20 m east of large concrete outfall	2020-07-17		0	dry, not sampled
		2021-01-22	<1	3	no odour, clear, no rain
		2021-08-19		<0.01	flow too low to sample, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2022-03-03	15	2	no odour, clear, no rain in past two days
SW0647	Gorge Hospital, across from boat docks	2020-05-25		<0.01	flow too low to sample
		2020-07-17		<0.01	flow too low to sample
SW0649	Scoured channel, Gorge Hospital	2020-05-25	7300	38	no odour, clear
		2020-07-17	200	2	no odour, clear
		2021-01-22	560	7	no odour, clear, no rain
		2021-08-19	1100	1	no odour, clear, light rain previous
		2022-03-03	130	<1	no odour, clear, no rain in past two days
SW0650	End of Harriet Rd.	2020-07-17		<0.01	flow too low to sample
		2021-04-26	28000	15	sewer odour, clear, rain previous
		2021-08-19		<0.01	flow too low to sample, no rain
		2022-03-03	110000	9	no odour, slight brown, no rain in past two days
		2022-03-03	8000	20	no odour, clear, no rain in past two days, sampled surge flow
SW0653	Below tennis courts, Cedar Shore Appts	2020-07-17	2000	20	no odour, clear, biological growth on pipe
		2021-03-30	1800	100	strong sewage odour, solid sewage, no rain
		2021-08-19	2100	30	no odour, clear, light rain previous
SW0654	Tennis courts at Cedar Shore Appts	2020-07-17	<1	1	no odour, clear
		2021-03-30	<1	25	no odour, clear, no rain
		2021-08-19	14	<1	no odour, clear, light rain previous
SW0655	Small cove in Gorge Park, east of bridge	2020-07-07	40	5	no odour, clear, pooled flow
SW0657	West of Gorge Bridge in small cove	2021-05-12		<0.01	flow too low to sample, light rain previous
SW0658	50m u/s of canoe club, SE of Gorge View Dr.	2020-07-17	<1	3	no odour, clear
SW0658A	Directly below 384 Gorge Rd.	2020-07-17	1000	10	no odour, clear
		2021-04-26	95	2	no odour, murky, rain previous
		2021-08-19		<0.01	flow too low to sample, no rain
SW0659	Foot of Gorge View Dr.	2020-07-17	5500	<1	no odour, clear
		2021-04-26	14	8	no odour, clear, rain previous
		2021-08-19		0	dry, not sampled, no rain
SW0669	Foot of Dysart Rd.	2020-07-17		0	dry, not sampled
		2020-10-02		0	dry, not sampled
		2020-12-02	20	24	no odour, clear, combined flow

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-04-26		0	dry, not sampled, rain previous
SW0671	Foot of Austin Ave.	2020-07-17		<0.01	flow too low to sample
		2021-04-26	620	15	no odour, clear, rain previous
		2021-08-19	200	20	no odour, silty, light rain previous
SW0672	Adelaide Ave.	2020-07-22		0	dry, not sampled
		2020-12-02	3	3	no odour, clear
SW0673	Between Wyndeatt & Adelaide	2020-07-22		0	dry, not sampled
SW0675	Foot of Colquitz Ave.	2021-04-26		0	
		2021-09-15		0	dry, not sampled, no rain
SW0676	Across from 820 Gorge Rd.	2020-07-22		<0.01	flow too low to sample
		2021-04-26	3	2	no odour, slight brown foam, rain previous
		2021-09-15		0	dry, not sampled, no rain
SW0679	Gorge Rd. at Admirals Rd.	2020-10-02	53	9	no odour, clear
		2021-04-26	12	25	sulphur odour, clear, rain previous
		2021-09-16	7	20	no odour, clear, rain two days ago
SW0690D	Under 3rd bridge to east, Colquitz River	2020-08-12	40	1000	no odour, clear
		2021-05-06	200	2000	no odour, clear, no rain
		2021-09-01	150	>500	no odour, clear, algae in flow, light rain previous
SW0690D-2	Colquitz River fish ladder, behind mall	2022-04-25	34	>800	no odour, amber, no rain
SW0690D-3	Colquitz River, Swan Lake Creek	2022-04-25	19	>300	no odour, amber, no rain
SW0690D-5A	Colquitz River, Blenkinsop Creek	2022-04-25	230	>500	no odour, amber, no rain, suspected sewer overflow
SW0690E	Garry Rd @ Cuthbert Holmes Park	2020-08-07		0	dry, not sampled
		2020-11-24	12	65	no odour, murky brown
		2021-05-06		0	dry, not sampled, no rain
		2021-09-15		0	dry, not sampled, rain yesterday
SW0691A	Wilkinson Rd 1173 Portage Rd.	2020-05-25	510	36	no odour, clear
		2021-04-26	340	25	no odour, clear, rain previous
		2021-09-15		<0.01	flow too low to sample, rain yesterday
SW0692	End of Portage Rd.	2020-07-22	73	10	no odour, clear
		2021-04-26	5	50	no odour, clear, rain previous
		2021-09-15	27	5	no odour, clear, no rain
SW0695	End of St. Giles St.	2020-07-17	<1	45	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0695-1A	Ditch 115 Camden Ave. @ St. Giles	2020-12-03	4	8	no odour, clear
SW0697	Beside 152 St. Giles St, Hospital Creek	2020-07-17	60	150	no odour, clear
		2021-04-30	340	250	no odour, clear, light rain previous, likely marine influenced
		2021-08-25	50	30	no odour, clear, marine influence, no rain
SW0698	End of Stillwater Rd.	2020-07-17		0	dry, not sampled
SW0703	Tidewater Rd. at Helmcken Park	2020-07-17		<0.01	flow too low to sample
		2021-05-06	<100	2	no odour, murky from sampling, raised detection, no rain
		2021-08-19	4000	5	no odour, clear, light rain previous
SW0705	Foot of Thomas Pk. Rd.	2021-05-06	<1	5	no odour, clear, no rain
		2021-08-19		0	dry, not sampled, no rain
SW0709B	Craigflower Creek, under Helmcken Rd. Bridge	2020-05-01	23	>800	no odour, clear
		2021-05-06	6	1500	no odour, clear, no rain
		2021-09-15	230	200	no odour, clear, no rain
SW0709B-1A	Craigflower Creek, d/s of pond	2020-08-12	200	1000	no odour, clear
SW0709B-2A	Craigflower Creek, under Talcot Rd.	2020-08-12	400	1000	no odour, clear
		2020-08-12		800	no odour, clear
		2020-08-19	200	500	no odour, clear
		2020-08-26	83	500	no odour, clear
		2020-09-02	81	567	no odour, clear
		2020-09-09	63	500	no odour, clear
		2020-09-23	910	>2000	no odour, clear
		2020-10-14	230	>2000	no odour, clear
		2020-10-20	43	>2000	no odour, clear
		2020-10-27	48	>2000	no odour, clear
		2020-11-03	520	>2000	no odour, clear
		2020-11-12	25	>3000	no odour, clear
SW0710	15 m south of Helmcken Rd. Bridge	2020-05-25	260	48	no odour, dirty
		2020-07-22	1800	3	no odour, clear
		2021-03-09	<1	6	no odour, clear, rain previous
		2021-06-24	1	2	no odour, clear, no rain
		2022-02-15	<1	6	no odour, clear, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0710W	5 m d/s of footbridge over Craigflower Ck	2020-07-22	56	25	no odour, clear
		2021-03-09	<1	15	no odour, clear, rain previous
		2021-06-24	4	5	no odour, clear, no rain
SW0712	West of 712A; east of E&N railway	2020-07-10	40	60	no odour, clear
		2021-03-09	<1	45	no odour, clear, rain previous
		2021-03-17	1	46	no odour, clear, no rain
		2021-06-24	14	7	no odour, clear, no rain
		2022-02-15	5	9	no odour, clear, no rain
SW0722	Under center of Craigflower Bridge	2020-07-10	45	10	no odour, clear
		2021-03-09	<1	11	no odour, clear, rain previous
		2021-03-17	7	10	no odour, clear, no rain
		2021-06-25	150	4	no odour, clear, no rain
		2021-09-16	32	10	no odour, murky grey, rain previous
		2022-02-15	7	20	chemical odour, clear with suds, surge flow, no rain
SW0722AA	SW corner of Craigflower Bridge	2020-07-10	<100	10	no odour, clear
		2021-03-09	<1	6	no odour, clear, rain previous
		2021-06-25	28	3	no odour, clear, no rain
		2022-02-15	1	5	no odour, clear, no rain
SW0726	Motel at Craigflower & Admirals	2020-07-10	170	20	no odour, clear
		2021-03-17	49		no odour, clear, no rain, unknown flow
		2021-06-25	60	9	no odour, clear, no rain
		2022-03-04	12	40	no odour, clear, no rain
SW0727	2 m to west of path at foot of Aral Rd.	2020-07-10	810	5	no odour, clear
		2021-03-09	9	9	no odour, clear, rain previous
		2021-08-19	480	5	no odour, clear, light rain previous
		2022-02-15	22	6	no odour, clear, no rain
SW0731	West side of 1376 Treebank Rd.	2020-07-09		<0.01	flow too low to sample
SW0733	East side of 948 Rankin Rd.	2020-07-09		<0.01	flow too low to sample
SW0736A	#14-915 Glenvale, man-made stream	2020-07-09		<0.01	flow too low to sample
		2021-03-09	1	9	no odour, clear, rain previous
		2021-08-19		<0.01	flow too low to sample, no rain
		2022-02-15	13	6	no odour, clear, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0737	Foot of Garthland Rd.	2020-07-09	190	2	strong sewer odour, clear
		2021-03-09	3	5	no odour, clear, rain previous
		2021-03-17	<1	5	no odour, clear, no rain
		2021-08-19	10	1	no odour, turbid, light rain previous
SW0742	Foot of Sioux Pl., u/s edge of pool dam	2020-07-09	5900	15	no odour, clear
		2021-03-17	4	14	no odour, clear with suds, no rain
		2021-08-05	21	2	no odour, clear, no rain
		2022-02-17	3	7	no odour, clear, no rain
SW0742B	SW of parking area, Gorge-Esquamalt Park	2020-07-07		<0.01	flow too low to sample
		2021-03-17	1800		no odour, clear, no rain, unknown flow
		2021-08-05		<0.01	flow too low to sample, no rain
		2022-02-17	<1		no odour, clear, unknown flow, no rain
SW0743A	Gorge-Esquamalt Park, N of Parks Dept.	2020-07-09	280	5	no odour, clear, oil boom inside pipe
		2021-03-17	560	<1	no odour, clear, no rain
		2021-08-05		<0.01	flow too low to sample, no rain
		2022-02-17		<0.01	flow too low to sample, no rain
SW0744	Gorge-Esquamalt Park, main creek flow	2020-07-09	1900	100	no odour, clear
		2021-03-09	870	>300	no odour, clear, rain previous
		2021-03-17	190	180	no odour, clear, no rain
		2021-08-05	480	150	no odour, clear, no rain
		2022-02-17	630	>250	no odour, slightly murky, no rain
SW0744A	E of Esq. Parks Dept., across upper pond	2020-07-09	170	1	no odour, clear
		2021-03-09	650	>100	no odour, clear, rain previous
		2021-08-05		<0.01	flow too low to sample, no rain
		2022-02-17	<1	<1	no odour, clear, no rain
SW0744B	Gorge-Esquamalt Park, 1034 Gosper Cres.	2020-07-09	760000	20	strong sewer odour, organic growth in flow
		2021-01-06	47000	20	sewer odour, murky, rain in past two days
		2021-03-09	2100	9	sewer odour, murky, rain previous
		2022-01-28	300000	5	sewer odour, murky, no rain
		2022-02-17	410000	5	sewer odour, murky grey, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2022-03-09	2200000	7	sewer odour, murky, no rain
		2022-05-04		6	sewer odour, murky, rain previous
SW0749	South side of 306 Ug&a	2020-07-07		<0.01	flow too low to sample
		2021-04-27	240	2	no odour, clear, rain previous
		2021-08-23		<0.01	flow too low to sample, no rain
		2022-03-04	800	9	no odour, clear, no rain
SW0749A	930 Selkirk property line, old spillway	2020-07-07	<10	<1	no odour, clear
		2021-04-27	1	10	no odour, murky, rain previous
		2021-08-23	21	2	no odour, slight silty, no rain
		2022-03-04		<0.01	flow too low to sample
SW0750	Behind 930 Selkirk Ave., under wharf	2021-08-23		0	dry, not sampled, no rain
SW0751	Concrete spill pad behind 928 Selkirk	2020-07-07	2200	7	strong sewer odour, clear
		2021-04-27	870	10	no odour, clear, rain previous
		2021-08-23	1200	5	no odour, clear, no rain
		2022-03-04	400	7	no odour, clear, no rain
SW0754	3 m u/s of rock wall at end of Arm St.	2020-07-07		0	dry, not sampled
		2021-04-27		<0.01	flow too low to sample, rain previous
		2021-08-23		<0.01	flow too low to sample, no rain
SW0756	Between platforms at Arm St.	2021-04-27	28	5	musty odour, clear, rain previous
		2022-03-04	120	4	no odour, clear, no rain
SW0757	W side of bay, Burleith Cres.	2020-07-07		0	dry, not sampled
SW0758A	Below play area in Banfield Park	2020-05-25	8900	80	sewer odour, dirty
		2021-04-27	1000	5	no odour, clear, rain previous
		2021-08-23		<0.01	flow too low to sample, no rain
SW0759	West of Trestle Bridge, Currie Lane	2020-07-10	380	5	no odour, clear
		2020-07-10	340	5	no odour, clear
		2021-04-01	64	10	no odour, clear, no rain
		2021-08-05		<0.01	flow too low to sample, no rain
SW0767	S of Johnson bridge, Ocean Pt Resort	2021-04-01	<1	120	no odour, clear, no rain
		2021-06-25	<1	5	no odour, clear, no rain
SW0768	Below parking area, E of 65 Songhees Rd.	2020-07-07	720	50	no odour, clear

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-03-31	46	45	sewer odour, slightly murky, no rain
		2021-06-25	520	40	no odour, clear, no rain
SW0769	Foot of Cooperidge Place	2020-07-07	940	30	no odour, clear
		2021-03-31	80	60	no odour, clear, no rain
		2021-06-25	520	40	no odour, clear, no rain
SW0775	Foot of Robert St.	2020-07-07	3400	1	
		2021-03-31	1700	10	no odour, clear, no rain
		2021-08-25		<1	no odour, clear, no rain
		2022-03-04	3000	6	no odour, clear, no rain
SW0777A	Curve in rock wall at Barnard Ave	2021-01-06	4900	70	slight sewer odour, murky, rain in past two days
		2021-08-25		10	sewer odour, clear, no rain
		2022-01-24	51000	75	slight sewer odour, murky, no rain
		2022-03-04	25000	65	sewer odour, murky, no rain
SW0779	W side of 531 West Bay Terrace, West Bay	2021-02-24	21	9	no odour, clear, no rain
		2021-06-18		0	dry, not sampled, no rain
		2022-02-07	50000	9	perfume odour, brown, potential surge flow, no rain
		2022-02-16	4000	2	no odour, clear, no rain
SW0780	Below 537 Head St, West Bay	2020-07-07		0	dry, not sampled
		2020-11-20	1700	22	no odour, clear
		2021-02-24	2800	15	no odour, clear, no rain
		2021-04-01	800	35	no odour, clear, no rain
		2021-06-18		<0.01	flow too low to sample, no rain
		2021-08-25		<0.01	flow too low to sample, no rain
		2022-02-07	19000	6	no odour, clear, no rain
SW0781	503 Head St, West Bay	2020-07-09	47	100	foul, acrid odour, brown foamy
		2020-11-20	72000		no odour, clear, potential tide influence, unknown flow
		2021-02-24	320	>60	no odour, clear, no rain
		2021-04-01	280	300	no odour, clear, no rain
		2021-06-18	7	65	sewer odour, clear, no rain
		2021-08-25		500	sewer odour, silty, no rain
		2022-02-07	460	50	creosote odour, clear, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
SW0805	8 m west of Kinver beach access	2020-06-23	8000	20	no odour, clear, sampled during overflow investigation
		2021-02-24	13000	60	no odour, clear, no rain
		2021-06-17	11000	11	no odour, clear, no rain
		2021-06-18	39000	12	no odour, clear, no rain
		2021-07-28	170000	12	sewer odour, murky, no rain
		2021-08-25	140000		slight sewer odour, clear, no recent rain
		2021-09-23	280000	58	sewer odour, murky grey, light rain prior
		2021-11-30	11000	>500	sewer odour murky grey, rain during sample
		2022-01-17	23000	>500	sewer odour, brown, rain previous
		2022-01-28	120000	200	sewer odour, murky, no rain
SW0806	10 m west of Kinver beach access	2020-06-23	50000	8	no odour, clear, sampled during overflow investigation
		2020-07-22		5	no odour, clear
		2021-02-24	530	48	no odour, clear, no rain
		2021-04-01	1300	40	sewer odour, clear, no rain
		2021-06-17	2400	6	no odour, clear, no rain
		2021-06-18	1300	6	no odour, clear, no rain
		2021-07-28	32000	1	slight sewer odour, murky, no rain
		2021-08-25	120000		slight sewer odour, clear, no recent rain
		2021-09-23	6900	1	no odour, clear, light rain prior
		2021-11-30	190	>400	sewer odour murky grey, rain during sample
		2022-01-28	200	35	sewer odour, murky, no rain
SW0807	1173 Munro St, 11 m east of beach access	2021-02-24	4	10	no odour, clear, no rain
		2021-06-18	50	1	no odour, clear, no rain
SW0808	West side of Saxe Pt. Park	2021-02-24	25	5	no odour, clear, no rain
		2021-06-18		0	dry, not sampled, no rain
SW0813	Foot of Foster St., east side of cove	2021-02-24	34	9	no odour, clear, no rain
		2021-06-18	70	2	no odour, clear, no rain
SW0814	Crack in rocks at foot of Grafton St.	2020-05-25	1200	6	no odour, clear
		2020-07-09	250	5	no odour, clear
		2021-02-24	17	3	no odour, clear, no rain
		2021-06-18	2300	3	no odour, clear, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2022-02-16	1000	<1	no odour, clear, no rain
SW0854	Foot of Gate Rd off Admirals Rd.	2020-06-22	6800	50	sewer odour, murky
		2021-03-31	3000	60	sewer odour, turbid, paper in
		2021-06-25	1300	25	sewer odour, murky with toilet paper, no rain
		2022-03-23	800	60	sewer odour, murky grey, light rain previous two days
SW0865AB	North of 200 Maplebank Rd.	2020-10-02		0	dry, not sampled
		2021-03-31		<0.01	flow too low to sample
SW0865B	Baseball field & wood sided house	2020-10-02		0	dry, not sampled
		2021-03-31	40	<1	no odour, clear, no rain
SW0865C	North of Gary Oak, south Plumber Bay	2020-10-02		0	dry, not sampled
		2021-03-31	<1	<1	no odour, clear, no rain
SW0865D	S of red roof house, S Plumper Bay	2020-10-02	650	1	no odour, clear
		2021-03-31	40	11	no odour, clear, no rain
SW0865DA	SE Plumper Bay, 24 Kosapsum Cres.	2021-03-31	20	7	slight sewer odour, turbid brown, no rain
SW0865E	Middle Plumber Bay, S side of playground	2020-10-02	2900	1	no odour, clear
		2021-03-31	<1	7	no odour, clear, no rain
SW0865F	N of Aboriginal Disability Society building	2020-10-02	300	6	no odour, clear
		2021-03-31	1	8	no odour, clear, no rain
SW0865G	Thetis Cove, end of Hallowell Rd.	2020-07-24	890	40	no odour, clear
		2020-10-02		0	dry, not sampled
		2021-03-31	5600	30	no odour, clear, no rain
		2021-09-16		0	dry, not sampled, no rain
SW0866	Portage Park, west of rock outcropping	2020-09-03	5	7	no odour, clear
		2020-11-20	11	40	no odour, clear
		2021-03-31	3	35	no odour, clear, no rain
		2021-09-16		0	dry, not sampled, no rain
SW0872	Below PS at Stewart, 3 m W of walkway	2020-07-24		0	dry, not sampled
	Below PS at foot of Stewart St.	2021-03-31	24	13	no odour, clear, no rain
		2021-09-16		0	dry, not sampled, no rain
SW0874	Foot of Heddle Ave., Tovey Bay	2020-07-24		0	dry, not sampled
		2020-11-20	23	18	no odour, clear
		2021-03-31	100	7	no odour, clear, no rain

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-08-12		0	dry, not sampled, no rain
SW0879	Creek on west side of Price Rd.	2021-06-04	3	40	no odour, clear, no rain
SW0881	Foot of Dukrill, NE of beach access stairs	2021-06-04		0	dry, no sample taken, no rain
SW0882	North bank east side of Parsons Bridge	2020-07-24	6	15	no odour, clear
		2021-05-07	<1	30	no odour, clear, very light rain last night
		2021-08-12	22	20	no odour, clear, no rain
SW0886	Mill Stream below 1700 Wilfert Rd.	2020-09-03	160	>1000	no odour, clear
		2021-05-07	15	2000	no odour, clear, very light rain last night
		2021-08-12	68	800	no odour, clear, no rain
SW0887	Wilfert Rd, flows into Mill Stream	2021-05-07		0	dry, not sampled, very light rain last night
		2021-08-12		0	dry, not sampled, no rain
SW0902A	Joe's Creek, ~45 m SE of 101 Wilfert Rd.	2020-07-24	140	40	no odour, clear
SW0912	East side of Fort Rodd Hill	2020-07-24		0	dry, not sampled
		2021-02-23	920	40	no odour, clear, some rain
		2021-08-12		0	dry, not sampled, no rain
SW0913	120 m W of bridge, east Esquimalt Lagoon	2020-07-24		0	dry, not sampled
SW0915	20 m west of Belmont Park septic tanks	2021-02-10	1	24	no odour, clear, light snow
		2021-08-12	22	20	no odour, clear, no rain
SW0916	Colwood Creek discharge	2020-09-03	130	>500	no odour, clear
		2021-02-10	12	>500	no odour, clear, light snow
		2021-08-06	48	200	no odour, clear, no rain
SW0923	30 m west of 922, creek	2021-04-27	23	300	no odour, clear, light rain previous
SW0924	60 m west of 923	2021-04-27	14	250	no odour. clear, light rain previous
		2021-08-06	8	150	no odour, clear, no rain
SW0925	North side of Ocean Grove	2021-04-27	3	120	no odour, clear, rain previous
		2021-08-06	20	100	no odour, clear, no rain
SW0926	Esquimalt Lagoon, Bee Creek	2020-09-03	130	350	no odour, clear
		2021-02-10	4	>250	no odour, clear, light snow
		2021-08-06	220	800	no odour, clear, no rain
SW0928	Foot of Portsmouth Drive, Selleck Creek	2020-09-03	320	200	no odour, clear
		2021-02-10	37	80	no odour, clear, light snow

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-08-06	150	500	no odour, clear, no rain
SW0930	Below 3279 Anchorage Dr.	2020-09-03	9	8	no odour, clear
		2021-04-27	<1	60	no odour, clear, rain previous
		2021-08-06		0	dry, not sampled, no rain
SW0931	SW of 3279 Anchorage Ave, Lagoon Brook	2020-09-03	13	10	no odour, clear
		2021-04-27	740	50	no odour, clear, rain previous
		2021-08-06	9	70	no odour, clear, no rain
SW0932	Ditch, south end of Esquimalt Lagoon	2020-09-03	<1	24	no odour, clear
		2021-04-27	<1	100	no odour, clear, rain previous
		2021-08-06	9	350	no odour, clear, no rain
SW0933	Pipe at south end of Esquimalt Lagoon	2020-09-03	63	60	no odour, clear
		2021-04-27	49	100	no odour, clear, possibly marine influenced, rain previous
		2021-08-06	48	200	no odour, clear, no rain
SW0934	Across the St. from 3330 Ocean Blvd.	2020-09-03	26		no odour, amber , unknown flow
		2021-02-10	<1	1	no odour, clear, light snow
		2021-04-27	1	10	no odour, clear, light rain
		2021-08-06	130	10	no odour, clear, no rain
SW0935	Top of bank, Ocean Blvd. E of Milburn Dr	2021-02-10	1	28	no odour, clear, light snow
SW0935A	Foot of Milburn below discharge 936	2020-09-03	3	18	no odour, clear
		2021-08-06	13	200	no odour, clear, no rain
SW0940A	N end of stormwater detention pond	2020-09-03		0	dry, not sampled
		2021-02-10	<1	40	no odour, clear, light snow
		2021-08-06		0	dry, not sampled, no rain
SW6003	Goldstream River mouth	2020-09-10	28	>2000	no odour, clear
		2021-03-08	2	>5000	no odour, clear, some rain previous
		2021-08-18	23	>8000	no odour, clear, no rain
		2021-08-25	20	>8000	no odour, clear, no rain
		2021-09-01	4	>8000	no odour, clear, no rain
		2021-09-08	26	8436	no odour, clear, mixed rain
		2021-09-15	6	8500	no odour, clear, rain previous
		2021-10-14	11	>8500	

Table 1 Core Area Stormwater Discharge Bacterial Data (2021)

Station ID	Station Description	Sample Start Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comments
		2021-10-20	2	>17000	
		2021-10-28	130	>17000	
		2021-11-03	7	>17000	
		2021-11-09	10	>17000	
SW6003-3	Langford Ck before Goldstream River	2021-10-28		<0.01	
		2021-11-03	26	>300	
		2021-11-09	87	>800	
SW6003-5	Goldstream River above Golden Gate Rd.	2021-08-18	5	>8000	no odour, clear, no rain
		2021-08-25	1	>8000	no odour, clear, no rain
		2021-09-01	1	>8000	no odour, clear, no rain
		2021-09-08	5	8436	no odour, clear, mixed rain
		2021-09-15	6	8000	no odour, clear, rain previous
		2021-10-14	4	>8500	
		2021-10-20	1	17000	
		2021-10-28	46	>17000	
		2021-11-03	6	>17000	
		2021-11-09	4	>17000	
SW6004	W side of Saanich Inlet, N of cable lines	2021-03-08	2	>400	no odour, clear, some rain previous
		2021-09-15	1	600	no odour, clear, rain yesterday
SW6006	West Saanich Inlet, N of Hall's Boathouse	2020-09-10		0	dry, not sampled
		2020-11-24	92	10	no odour, clear
SW6008	North side of 3680 Trans Canada Hwy	2020-09-10		0	dry, not sampled
		2020-11-24	26	70	no odour, murky brown
		2021-03-08	<1	22	no odour, clear, some rain previous
		2021-09-15		0	dry, not sampled, rain yesterday

Notes:
Flow is visually estimated
CFU/100 mL is colony forming units per 100 millilitres
u/s is upstream
d/s is downstream

APPENDIX D

***ESCHERICHIA COLI* SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2021**

APPENDIX D

***ESCHERICHIA COLI* SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2021 TABLE OF CONTENTS**

1.0 INTRODUCTION	1
2.0 METHODS FOR <i>ESCHERICHIA COLI</i> SAMPLING	1
2.1 Stormwater Discharge Sampling	1
2.2 Quality Assurance	1
2.2.1 Stormwater Sample Replicates (Field Splits)	1
2.2.2 Quality Control Precision Assessment	2
2.2.3 Calculation of Laboratory Precision	2
3.0 RESULTS	3
3.1 Quality Assurance Results	3
3.1.1 Blanks	3
3.1.2 Precision Criterion	3
3.1.3 Field Splits	3
4.0 CONCLUSIONS	3
5.0 REFERENCES	3

LIST OF TABLES

Table 1	Laboratory Quality Assurance Exercise Results for 2021.....	4
Table 2	Laboratory Quality Assurance Results – Wet Period 2021.....	5
Table 3	Laboratory Quality Assurance Results – Dry Period 2021.....	6

APPENDIX D

***ESCHERICHIA COLI* SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2021**

1.0 INTRODUCTION

Quality assurance and quality control (QA/QC) programs are a set of protocols adopted to ensure that the results of a study are valid, internally consistent and comparable with similar projects. These protocols are set out in writing and based on current and relevant research. This appendix discusses:

- field sampling methods
- sample handling procedures
- analytical procedures
- field and laboratory replication (quality control)
- data assessment

The data collected for the QA program are used to ensure consistency in field handling and analytical methods. If the data exceed a specified precision criterion, then the lab is notified of a potential problem in the procedure and steps are taken to resolve the issue.

2.0 METHODS FOR *ESCHERICHIA COLI* SAMPLING

CRD staff collected water samples in 500-mL wide-mouth sterile disposable bottles containing 1.5 mL of sodium thiosulphate (a sample preservative). Bottles were supplied by Bureau Veritas (formerly Maxxam Analytics) in Victoria, BC. Labelled samples were stored in an insulated cooler with ice packs and delivered the same day to the laboratory. Bureau Veritas analyzed samples for *Escherichia coli* (*E. Coli*) bacteria following the procedures in Standard Methods (APHA, 1998) and reported as colony forming units/100 mL (CFU/100 mL).

CRD staff collected samples for QC on days that the weather was representative of the sampling season (wet or dry). Conditions such as "first flush", major storms or any other effect that might tend to prejudice the results were avoided.

2.1 Stormwater Discharge Sampling

Field samplers collected stormwater discharge samples from the point of discharge. Care was taken to avoid contamination of the sample with substances that did not originate in the stormwater (e.g., salt water, other discharges) that may confuse the results.

2.2 Quality Assurance

2.2.1 Stormwater Sample Replicates (Field Splits)

Ten percent of the samples collected were replicated and the field replicate samples identified as "field splits". CRD staff collected a single sample in a 500-mL sample bottle and inverted 30 times to ensure that the sample was well-mixed. The sample was then split evenly into two separate bottles. Staff labelled the bottles submitted them to Bureau Veritas for analysis. These samples were submitted as blind samples (not identified as field splits).

2.2.2 Quality Control Precision Assessment

In 2021, CRD field staff collected 18 field splits at six stormwater discharges in the core area of the CRD. Samples were analyzed for *E. Coli* levels. Field splits were used to establish the precision criterion for the CRD Core Area, District of Sooke and Southern Gulf Island Electoral Area sampling programs. The discharges were chosen based on previous high, moderate, or low levels of *E. Coli* concentrations (two discharges for each category) to represent the varying *E. Coli* counts that would be analyzed. CRD staff collected three individual 500-mL grab samples at each of the six stations and split each into two replicate bottles. CRD staff also submitted three blank samples of potable water in 500-mL sample bottles as part of the assessment. Each sample had a unique identification number and was submitted blindly to the lab (i.e., the lab had no information about the sample).

2.2.3 Calculation of Laboratory Precision

Laboratory precision for *E. Coli* analysis (i.e., a measure of consistency by the lab) is determined by analyzing 18 pairs of field samples (field splits). The following, taken from Standard Methods, 18th Edition (APHA, 1998), explains the procedure for calculating the precision criterion and determining whether the log ranges for the field splits are “acceptable” or “unacceptable”:

- The data are arranged in pairs (D_1 and D_2). The log of each field measurement is determined (L_1 , L_2) and the difference (range) in the log value between each pair of field splits is calculated: $R = (L_2 - L_1)$. An average range (Mean-R) is then determined for all of the pairs.
- The precision criterion is calculated by multiplying the Mean-R by 3.27 and is rounded to one decimal place.
- The log range (R) is calculated for each of the field splits and compared to the precision criterion, to determine whether the sample is acceptable or not, according to the following criterion:

Acceptable (A) If the calculation is less than the precision criterion, then the field data are within normal variability.

Unacceptable (U) If the calculation is greater than the precision criterion, then the field data are outside of the normal variability. All data collected after the last "acceptable" set of data should be discarded and no further analysis should be done until the source of the problem is identified by the lab.

It is important not to put too severe an interpretation on the results from the QA calculation, especially when they are close to the "unacceptable" guideline. Each result represents a value within a 95% confidence interval, which gets proportionately larger as the actual result gets smaller. Therefore, one can expect 5% of the samples to be outside of the precision criterion, through randomness. Also, any *E. Coli* count under 200 FC/100 mL is considered too small an amount to accurately calculate or compare to a precision criterion (APHA, 1998). It is also important to note that discharges with *E. Coli* counts lower than 200 FC/100 mL receive a low public health concern rating.

The results are rounded to one decimal place and compared to the precision criterion (e.g., 0.5). If the calculated value from the duplicate results still exceeds the criterion (e.g., 0.55 or greater) then an informal investigation of the laboratory should be initiated. If only a few duplicates are unacceptable (e.g., one out of every 20 pairs of duplicates) the lab is probably meeting the guideline.

The overall process is intended to act as an "alarm", alerting the study group to potential problems with the sampling and analytical procedures. As part of the review, the following elements are considered:

- the number of pairs exceeding the criterion
- the actual *E. Coli* value of the pairs of data
- field notes on the "field split" procedure
- comments from the laboratory

3.0 RESULTS

3.1 Quality Assurance Results

CRD field staff collected 18 pairs of stormwater samples from six discharges having historically high, moderate or low levels of *E. Coli* bacteria. CRD staff blindly submitted samples to the lab for analysis of the *E. Coli* concentration and used the data to calculate the precision criterion.

3.1.1 Blanks

Field staff submitted three blank samples (CRD tap water) to the lab for analysis for *E. Coli* bacteria. Blanks were reported as having <10 CFU/100 mL. Therefore, the results meet the QA requirements.

3.1.2 Precision Criterion

Table 1 shows the lab results of the 18 pairs of samples used to determine the precision criterion for the 2021 stormwater monitoring program. The calculated criterion for this laboratory, using these 18 sets of duplicates, was 0.4.

3.1.3 Field Splits

Wet Weather Sampling

Table 2 presents the results for the field splits collected in the core area during the wet period of the 2021 stormwater sampling program. Data were compared to the precision criterion (0.4), as described in Section 3.1.2. Three of the field splits exceeded the precision criterion; however, they had counts below 200 CFU/100 mL, which is acceptable. Therefore, the results are acceptable.

Dry Weather Sampling

Table 3 presents the results for the field splits collected in the core area during the dry period of the 2021 stormwater sampling program. One of the field splits exceeded the precision criterion; however, it had counts below 200 CFU/100 mL. Counts below 200 CFU/100 mL are not expected to meet the precision criteria. Therefore, the results are acceptable.

4.0 CONCLUSIONS

Requirements for the Environmental Monitoring Program QA/QC program were carried out in 2021. The QA/QC results were acceptable for rating stormwater discharges for public health concerns.

5.0 REFERENCES

APHA, 1998. American Public Health Association, American Water Works Association, Water Pollution Control Federation, 20th Edition. Standard Methods for the Examination of Water and Wastewater.

Drinnan, R.W. 1995. Memo to R. Miller, CRD Engineering, February 7; 4pp.

Hutcheson, D. 1995. Memo to R. Miller, CRD Engineering, February 7; 2pp.

Table 1 Laboratory Quality Assurance Exercise Results for 2021

CRD Data, Batch Samples: 18 pairs, January 2021						
Discharge No.	Pair No.	1st Duplicate D1	2nd Duplicate D2	Log D1 L1	Log D2 L2	Range of Logs (Rlog) (Log L1 - Log L2)
518	1	3	7	0.4771	0.8451	0.3680
	2	10	10	1.0000	1.0000	0.0000
	3	17	17	1.2304489	1.2304489	0.0000
533	1	8	4	0.9031	0.6021	0.3010
	2	5	6	0.6990	0.7782	0.0792
	3	6	4	0.7781513	0.60206	0.1761
503	1	260	240	2.4150	2.3802	0.0348
	2	280	220	2.4472	2.3424	0.1047
	3	280	260	2.447158	2.4149733	0.0322
245	1	230	140	2.3617	2.1461	0.2156
	2	150	190	2.1761	2.2788	0.1027
	3	250	170	2.39794	2.2304489	0.1675
744B	1	47000	42000	4.6721	4.6232	0.0488
	2	14000	7600	4.1461	3.8808	0.2653
	3	21000	26000	4.3222193	4.4149733	0.0928
634A	1	15000	15000	4.1761	4.1761	0.0000
	2	17000	15000	4.2304	4.1761	0.0544
	3	17000	14000	4.2304	4.1461	0.0843
Mean - Rlog (Sum Rlog/18)						0.1182
Precision Criterion (3.27 x Mean-Rlog)						0.3865

Table 2 Laboratory Quality Assurance Results – Wet Period 2021

Date	Discharge Number	E. Coli Counts CFU/100 mL	Log	Log Range	Acceptable (A) or Unacceptable (U)
15-Jan	212	5	0.6990	0.2218	A
		3	0.4771		
20-Jan	322	380	2.5798	0.0223	A
		400	2.6021		
20-Jan	574	12	1.0792	0.1249	A
		16	1.2041		
4-Feb	222	500	2.6990	0.0492	A
		560	2.7482		
10-Feb	940A	<1	0.0000	0.0000	A
		1	0.0000		
24-Feb	813	34	1.5315	0.0367	A
		37	1.5682		
25-Feb	541	16	1.2041	0.8751	U*
		120	2.0792		
25-Feb	316	260	2.4150	1.0348	U*
		24	1.3802		
4-Mar	567	20	1.3010	0.5441	U*
		70	1.8451		
5-Mar	574	17	1.2304	0.0248	A
		18	1.2553		
8-Mar	6004	2	0.3010	0.0000	A
		2	0.3010		
9-Mar	736A	1	0.0000	0.0000	A
		1	0.0000		
17-Mar	610	610	2.7853	0.0371	A
		560	2.7482		
30-Mar	639A	1200	3.0792	0.3522	A
		2700	3.4314		
31-Mar	854	3000	3.4771	0.1663	A
		4400	3.6435		
31-Mar	865G	5600	3.7482	0.0300	A
		6000	3.7782		
1-Apr	806	1300	3.1139	0.0348	A
		1200	3.0792		
26-Apr	659	14	1.1461	0.3010	A
		7	0.8451		

Notes:

*Counts below 200 CFU/100 mL are not expected to meet the criterion.

5% of samples will have results outside of the precision criterion, through randomness.

Table 3 Laboratory Quality Assurance Results – Dry Period 2021

Date	Discharge Number	E. Coli Counts CFU/100 mL	Log	Log Range	Acceptable (A) or Unacceptable (U)
8-Jun	574	140000	5.1461	0.0669	A
		120000	5.0792		
14-Jun	245	2	0.3010	0.3010	A
		4	0.6021		
15-Jun	611	170	2.2304	0.0483	A
		190	2.2788		
17-Jun	541	160	2.2041	0.0969	A
		200	2.3010		
18-Jun	781	1600	3.2041	0.0512	A
		1800	3.2553		
21-Jun	222	560	2.7482	0.0714	A
		660	2.8195		
24-Jun	620	5	0.6990	0.0792	A
		6	0.7782		
25-Jun	854	140	2.1461	0.2430	A
		80	1.9031		
6-Aug	928	75	1.8751	0.0388	A
		82	1.9138		
25-Sep	559-1	51	1.7076	0.0084	A
		52	1.7160		
8-Sep	6003-1	40	1.6021	0.1761	A
		60	1.7782		
16-Sep	245	2	0.3010	0.7404	U*
		11	1.0414		
16-Sep	323	25	1.3979	0.0645	A
		29	1.4624		

Notes:

*Discharges with counts below 200 CFU/100 mL are not expected to meet the criterion.

5% of samples will have results outside of the precision criterion, through randomness.

APPENDIX E

2021 CORE AREA STORMWATER CONTAMINANT DATA

Table 1 Stormwater Sediment Contaminant Data (2021)

Station ID		Sample Start Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH	TOC
Marine Sediment Quality Guidelines		CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2	-
		CCME ISQG	7.24	0.7	52.3	18.7	30	0.13	1	124	-	-	-
		CCME PEL	42	4.2	160	108	112	0.7	2.2	271	-	-	-
Vancouver Island Background			4	0.95	65	100	40	0.15	1	150	-	-	-
SW0212	Victoria	2019-11-21	2.31	0.065	16.9	24.9	20.9	<0.05	<0.05	54.3	0.042	0.009	0.76
SW0212	Victoria	2020-11-20	2.26	0.053	20.6	32.6	7.24	<0.05	<0.05	37.1	0.0095	0.0035	<0.05
SW0212	Victoria	2021-03-29	2.29	0.069	15.8	31	14.7	<0.05	<0.05	47.2	0.047	0.015	0.56
SW0216-3A	Victoria	2019-11-22	8.64	0.071	58.6	45.2	7.73	0.069	0.078	91.6	0.04	0.02	0.52
SW0218	Victoria	2021-03-30	3.81	0.099	24.2	36.8	42.8	0.079	<0.05	107	0.18	0.022	0.35
SW0306-2A	Oak Bay	2019-11-21	3.07	0.398	30.9	64	166	0.157	0.164	201	14	2.5	4.8
SW0306-2A	Oak Bay	2020-12-01	2.69	0.301	30.6	50.3	162	0.12	0.138	181	14	1.9	4.3
SW0307-2	Oak Bay	2019-11-21	3.72	0.327	49.5	69	107	0.082	0.097	184	290	210	4.9
SW0307-2A	Oak Bay	2019-11-21	4.85	0.348	47.3	78.6	81.1	0.083	0.107	233	6.4	1.3	16
SW0307-2A	Oak Bay	2021-03-29	2.73	0.31	47.4	70.5	86.2	0.081	<0.05	206	5.5	0.87	12
SW0310-3	Oak Bay	2019-11-22	3.18	0.104	30.3	61.5	23.1	<0.05	<0.05	161	2.7	0.73	0.5
SW0310-5	Oak Bay	2019-11-22	2.3	0.191	23.7	31.5	155	<0.05	<0.05	158	17	2.3	8.5
SW0310-8	Oak Bay	2019-11-22	7.61	0.175	31.8	116	43.9	<0.05	0.239	170	10	1.5	0.52
SW0316	Oak Bay	2019-10-16	3.68	0.102	20.6	26.8	13.2	<0.05	<0.05	122	0.27	0.051	0.26
SW0316	Oak Bay	2019-10-31	2.37	0.092	16.1	18.8	14.3	<0.05	<0.05	94.2	3.1	0.24	0.71
SW0316-1A	Oak Bay	2019-09-05	4.17	0.089	23.9	33	29.4	<0.05	<0.05	141	0.99	0.12	<0.05
SW0316-3B	Oak Bay	2019-10-16	3.95	0.087	31.6	43.4	12.8	<0.05	<0.05	114	0.93	0.27	0.34
SW0316-3B	Oak Bay	2019-10-31	2.45	0.1	20.7	30.5	16.7	<0.05	<0.05	99.3	0.39	0.067	0.34
SW0316-4B	Oak Bay	2019-10-16	2.53	0.137	36.7	31.5	23.6	<0.05	<0.05	115	1.5	0.32	0.63
SW0316-4B	Oak Bay	2019-10-31	3.14	0.132	25.3	38.9	35	<0.05	<0.05	145	0.96	0.35	3.2
SW0316-5	Oak Bay	2019-10-16	5.72	0.094	24	23.9	10.2	<0.05	<0.05	90.7	0.18	0.043	1.1
SW0316-5	Oak Bay	2019-10-31	7.28	0.108	27.4	26.2	13.6	<0.05	<0.05	104	0.18	0.031	0.32
SW0316-5C	Oak Bay	2019-11-29	3.03	0.539	40.6	73.1	66.6	0.102	0.252	247	1.1	0.22	15
SW0316-5D	Oak Bay	2019-11-29	12.9	1.34	42.9	232	106	0.179	0.46	508	1.3	0.33	34
SW0324	Oak Bay	2019-11-25	2.82	0.318	37.4	59.1	57.3	<0.05	0.057	200	21	1.3	28
SW0324	Oak Bay	2021-03-29	3.38	0.115	24.5	24.6	18.3	<0.05	<0.05	71.5	0.25	0.046	7.5
SW0325	Oak Bay	2020-07-20	3.46	0.217	24.8	55.3	30.2	0.15	0.172	151	0.98	0.18	7
SW0505-1	Saanich	2019-11-25	1.84	0.128	28.5	52.5	68.1	0.691	0.096	96.2	2.1	0.51	0.57
SW0505-1	Saanich	2020-08-06	1.91	0.156	24.7	42.4	51.9	0.095	0.167	91.5	0.82	0.14	0.28
SW0505-2	Saanich	2020-08-06	2.39	0.11	36.8	60.9	51.4	<0.05	<0.05	98.4	0.38	0.077	0.81
SW0505-3	Saanich	2019-11-25	2.44	0.16	22.4	25.9	410	0.499	22.1	110	7.7	1.6	4.8
SW0505-3	Saanich	2020-08-06	4.07	0.401	26.5	51.9	74.3	0.215	0.292	179	13	3.9	3.7
SW0505-4	Saanich	2020-08-06	2.33	0.172	63.2	35.9	180	21.6	5.18	118	2.6	0.44	0.56
SW0505-5	Saanich	2020-08-06	4.85	0.064	22.5	14.3	18.4	0.075	0.203	59.9	37	8.9	0.55
SW0505-6	Saanich	2020-12-11	2.29	0.217	36.1	56	96.1	<0.05	<0.05	202	5.6	0.58	1.6
SW0505-6	Saanich	2021-02-26	2.92	0.299	47.3	70.3	134	0.056	0.06	260	4.2	0.77	7.9
SW0559	Saanich	2021-09-08	2.74	0.088	20.9	20.5	5.89	<0.05	<0.05	82.2	0.076	0.013	1.8
SW0574	Saanich	2021-04-09	4.25	0.116	24.4	44.2	8.46	<0.05	0.13	155	0.62	0.39	0.43
SW0578	Saanich	2021-04-09	2.26	0.065	16.4	20	3.36	<0.05	0.093	75.1	0.05	0.0037	0.072
SW0589	Saanich	2021-04-09	5.38	0.137	22.5	25.7	4.79	<0.05	0.18	60.7	0.11	0.031	1.7
SW0672	Saanich	2019-11-29	11.9	0.659	30.6	76.5	93.4	0.103	0.143	267	1.2	0.22	4
SW0689	Saanich	2019-12-03	1.86	0.084	28.1	59.7	4.87	<0.05	<0.05	68.1	0.14	0.03	0.42
SW0690E	Saanich	2019-12-04	4.2	0.079	48.1	46.5	8.03	<0.05	0.169	72.2	0.048	0.0086	1.4
SW0690E	Saanich	2020-11-24	4.68	0.116	53.9	46.3	8.38	<0.05	0.204	76.2	0.028	0.0047	1.6
SW0692	Saanich	2019-12-04	2.31	0.123	23.2	59.2	19.8	<0.05	<0.05	333	0.026	0.0031	1.1
SW0692	Saanich	2020-07-22	27.7	0.304	34.6	56.1	41.3	<0.05	<0.05	422	0.71	0.079	1
SW0692	Saanich	2021-04-26	4.54	0.227	34.5	51.8	43.9	<0.05	<0.05	211	0.16	0.022	2.6
SW0695-1A	View Royal	2019-11-27	5.27	0.236	34.5	53.7	14.9	0.062	0.106	258	0.13	0.019	3.2

Table 1 (continued)

Station ID		Sample Start Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH	TOC
Marine Sediment Quality Guidelines		CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2	-
		CCME ISQG	7.24	0.7	52.3	18.7	30	0.13	1	124	-	-	-
		CCME PEL	42	4.2	160	108	112	0.7	2.2	271	-	-	-
Vancouver Island Background			4	0.95	65	100	40	0.15	1	150	-	-	-
SW0695-1A	View Royal	2020-12-03	3.85	0.148	34.9	42.5	10.7	<0.05	0.119	135	0.11	<0.1	1.7
SW0698	View Royal	2019-11-27	4.3	0.274	29.5	48.7	31.6	<0.05	0.081	145	2.4	1	3
SW0709B-2A	View Royal	2020-09-02	0.86	<0.05	10.6	6.56	4.18	<0.05	<0.05	33.6	0.048	0.0093	1.4
SW0709B-4	View Royal	2020-09-02	2.96	<0.05	43.3	35.9	5.86	<0.05	0.063	57	<0.001	<0.001	1.6
SW0710	View Royal	2019-11-27	3.35	0.11	36.4	58.7	6.82	<0.05	<0.05	202	0.89	0.098	0.69
SW0712	View Royal	2019-11-27	2.75	0.119	44.4	47.1	25.7	<0.05	<0.05	100	58	12	1.3
SW0712	View Royal	2020-07-10	1.71	0.2	36.4	44.8	63.7	0.054	0.089	114	5.6	0.83	11
SW0712	View Royal	2021-03-17	2.22	0.156	29	21.2	4.57	<0.05	<0.05	47.3	8.5	1.9	0.66
SW0737	Esquimalt	2021-03-17	7.44	0.369	50.7	46.6	8.29	0.067	0.085	63.6	18	7.2	1.4
SW0742-2A	Esquimalt	2020-12-01	2.36	0.271	34.3	55.3	8.39	0.07	0.06	143	0.18	0.033	2.5
SW0742-2A	Esquimalt	2021-08-05	3.6	0.437	36.6	81.3	10.8	0.182	0.178	274	0.28	0.16	6.8
SW0742-2B	Esquimalt	2020-12-01	5.18	0.094	27	25.9	8.71	29.8	<0.05	69.6	0.1	0.015	1.9
SW0742-2B	Esquimalt	2021-08-05	26.3	0.291	25.3	38.4	12.3	22.2	0.103	122	0.2	0.04	4.5
SW0744	Esquimalt	2020-07-09	4.84	0.574	48.7	78.7	51.8	0.115	0.881	375	4.5	0.94	1.7
SW0744	Esquimalt	2021-03-31	2.65	0.182	29.1	38.3	26.6	<0.05	0.322	164	0.64	0.12	0.6
SW0866	View Royal	2020-11-20	3.39	0.155	27.2	28.6	16.6	<0.05	<0.05	205	0.046	0.0095	1.6
SW0866	View Royal	2021-03-31	5.24	0.174	24.1	28.7	22.1	<0.05	<0.05	249	0.054	0.008	<0.05
SW0874	View Royal	2021-03-31	6.11	0.381	40.9	69.2	33.9	0.091	0.102	356	0.22	0.03	3.9
SW0874	View Royal	2021-08-12	7.68	0.275	42.7	49.2	68.3	0.066	0.086	300	0.29	0.079	3.2
SW0882	View Royal	2021-05-07	11.5	0.23	34.5	116	32.1	0.051	<0.05	254	2.8	0.42	
SW0887	View Royal	2021-05-07	2.02	0.132	21.4	24.4	13.8	0.078	<0.05	124	0.12	0.026	
SW0921	DND	2019-11-27	1.75	<0.05	9.74	2.26	2.75	<0.05	<0.05	16.8	0.022	0.013	0.64
SW0922	DND	2019-11-27	1.79	<0.05	10.1	3.38	2.06	<0.05	<0.05	15.2	0.053	0.014	0.47
SW0926	Colwood	2019-09-05	1.61	<0.05	17.5	9.44	4.85	<0.05	<0.05	33	0.76	0.25	0.55
SW0926	Colwood	2019-10-17	1.13	0.11	15.1	7	3.85	<0.05	<0.05	24	0.96	0.33	0.85
SW0926	Colwood	2020-09-03	1.9	0.078	16.6	8.71	3.76	<0.05	<0.05	30.7	0.32	0.12	0.88
SW0926-2	Colwood	2019-10-31	42.2	0.319	20.6	29	13.5	<0.05	0.188	71.4	0.42	0.37	0.43
SW0928	Colwood	2019-10-17	2.69	0.096	22	23.5	6.09	<0.05	<0.05	58.5	0.41	0.07	2.6
SW0928	Colwood	2019-10-31	4.91	0.207	25.4	39.2	15.6	0.053	0.062	94.7	3.4	0.46	9.6
SW0931	Colwood	2019-10-21	2.28	0.082	23.6	20.1	8.21	<0.05	<0.05	61.9	0.0063	<0.001	0.4
SW0932	Colwood	2019-10-21	1.72	0.056	32.3	77	6.33	<0.05	<0.05	61	0.12	0.035	0.48
SW0934	Colwood	2021-04-27	2.15	0.123	24.6	40.3	12.5	<0.05	0.054	108	0.17	0.028	3.7
SW0937	Colwood	2019-10-21	2.43	0.064	22.1	24.8	4.97	<0.05	<0.05	52.2	0.2	0.025	1.1

Notes:

Concentrations are in mg/kg dry weight

CRD MSQG =Marine sediment quality guidelines adopted from Washington State's Department of Ecology for protection of aquatic life.

LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively

CCME = Canadian Council of Ministers of the Environment

ISQG = interim sediment quality guideline; concentrations above this level but below the PEL will occasionally result in adverse effects on aquatic life

PEL = probable effects level; concentrations above this level will frequently result in adverse effects to aquatic life

Vancouver Island Background Concentrations are regional estimates (95th percentiles) from BC MOE; https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_4.pdf

Italicized values are those that exceed a guideline but are below the Vancouver Island background concentration

value is greater than or equal to the CCME ISQG

value is greater than or equal to the CCME PEL

value it greater than or equal to CRD MSQG and adverse effects to aquatic life are likely to occur

For mercury only, the CRD MSQG is lower than the CCME PEL

Some samples are not collected at the discharge to marine and therefore marine guidelines are not applicable but are used for screening purposes

Table 2 Calculation of Sediment Contaminant Ratings (2019-2021)

Station ID	Area	Sample Date	Ratios of Concentration / Marine Sediment Quality Guideline										Sum of Ratios	Contaminant Rating
Parameter			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH		
CRD Marine Sediment Quality Guidelines			57	5.1	260	390	450	0.41	6.1	410	12	5.2		
SW0212	Victoria	2019-11-21	0.04	0.01	0.07	0.06	0.05	0.12	0.01	0.13	0.00	0.00	0.50	Low
SW0212	Victoria	2020-11-20	0.04	0.01	0.08	0.08	0.02	0.12	0.01	0.09	0.00	0.00	0.45	Low
SW0212	Victoria	2021-03-29	0.04	0.01	0.06	0.08	0.03	0.12	0.01	0.12	0.00	0.00	0.48	Low
SW0216-3A	Victoria	2019-11-22	0.15	0.01	0.23	0.12	0.02	0.17	0.01	0.22	0.00	0.00	0.94	Low
SW0218	Victoria	2021-03-30	0.07	0.02	0.09	0.09	0.10	0.19	0.01	0.26	0.02	0.00	0.85	Low
SW0306-2A	Oak Bay	2019-11-21	0.05	0.08	0.12	0.16	0.37	0.38	0.03	0.49	1.17	0.48	3.33	High
SW0306-2A	Oak Bay	2020-12-01	0.05	0.06	0.12	0.13	0.36	0.29	0.02	0.44	1.17	0.37	3.00	High
SW0307-2	Oak Bay	2019-11-21	0.07	0.06	0.19	0.18	0.24	0.20	0.02	0.45	24.17	40.38	65.95	High
SW0307-2A	Oak Bay	2019-11-21	0.09	0.07	0.18	0.20	0.18	0.20	0.02	0.57	0.53	0.25	2.29	Moderate
SW0307-2A	Oak Bay	2021-03-29	0.05	0.06	0.18	0.18	0.19	0.20	0.01	0.50	0.46	0.17	2.00	Moderate
SW0310-3	Oak Bay	2019-11-22	0.06	0.02	0.12	0.16	0.05	0.12	0.01	0.39	0.23	0.14	1.29	Moderate
SW0310-5	Oak Bay	2019-11-22	0.04	0.04	0.09	0.08	0.34	0.12	0.01	0.39	1.42	0.44	2.97	High
SW0310-8	Oak Bay	2019-11-22	0.13	0.03	0.12	0.30	0.10	0.12	0.04	0.41	0.83	0.29	2.38	High
SW0316	Oak Bay	2019-10-16	0.06	0.02	0.08	0.07	0.03	0.12	0.01	0.30	0.02	0.01	0.72	Low
SW0316	Oak Bay	2019-10-31	0.04	0.02	0.06	0.05	0.03	0.12	0.01	0.23	0.26	0.05	0.87	Low
SW0316-1A	Oak Bay	2019-09-05	0.07	0.02	0.09	0.08	0.07	0.12	0.01	0.34	0.08	0.02	0.91	Low
SW0316-3B	Oak Bay	2019-10-16	0.07	0.02	0.12	0.11	0.03	0.12	0.01	0.28	0.08	0.05	0.89	Low
SW0316-3B	Oak Bay	2019-10-31	0.04	0.02	0.08	0.08	0.04	0.12	0.01	0.24	0.03	0.01	0.68	Low
SW0316-4B	Oak Bay	2019-10-16	0.04	0.03	0.14	0.08	0.05	0.12	0.01	0.28	0.13	0.06	0.94	Low
SW0316-4B	Oak Bay	2019-10-31	0.06	0.03	0.10	0.10	0.08	0.12	0.01	0.35	0.08	0.07	0.99	Low
SW0316-5	Oak Bay	2019-10-16	0.10	0.02	0.09	0.06	0.02	0.12	0.01	0.22	0.02	0.01	0.67	Low
SW0316-5	Oak Bay	2019-10-31	0.13	0.02	0.11	0.07	0.03	0.12	0.01	0.25	0.02	0.01	0.76	Low
SW0316-5C	Oak Bay	2019-11-29	0.05	0.11	0.16	0.19	0.15	0.25	0.04	0.60	0.09	0.04	1.68	Moderate
SW0316-5D	Oak Bay	2019-11-29	0.23	0.26	0.17	0.59	0.24	0.44	0.08	1.24	0.11	0.06	3.41	High
SW0324	Oak Bay	2019-11-25	0.05	0.06	0.14	0.15	0.13	0.12	0.01	0.49	1.75	0.25	3.15	High
SW0324	Oak Bay	2021-03-29	0.06	0.02	0.09	0.06	0.04	0.12	0.01	0.17	0.02	0.01	0.61	Low
SW0325	Oak Bay	2020-07-20	0.06	0.04	0.10	0.14	0.07	0.37	0.03	0.37	0.08	0.03	1.29	Moderate
SW0505-1	Saanich	2019-11-25	0.03	0.03	0.11	0.13	0.15	1.69	0.02	0.23	0.18	0.10	2.66	High
SW0505-1	Saanich	2020-08-06	0.03	0.03	0.10	0.11	0.12	0.23	0.03	0.22	0.07	0.03	0.96	Low
SW0505-2	Saanich	2020-08-06	0.04	0.02	0.14	0.16	0.11	0.12	0.01	0.24	0.03	0.01	0.89	Low
SW0505-3	Saanich	2019-11-25	0.04	0.03	0.09	0.07	0.91	1.22	3.62	0.27	0.64	0.31	7.20	High
SW0505-3	Saanich	2020-08-06	0.07	0.08	0.10	0.13	0.17	0.52	0.05	0.44	1.08	0.75	3.39	High
SW0505-4	Saanich	2020-08-06	0.04	0.03	0.24	0.09	0.40	52.68	0.85	0.29	0.22	0.08	54.93	High
SW0505-5	Saanich	2020-08-06	0.09	0.01	0.09	0.04	0.04	0.18	0.03	0.15	3.08	1.71	5.42	High
SW0505-6	Saanich	2020-12-11	0.04	0.04	0.14	0.14	0.21	0.12	0.01	0.49	0.47	0.11	1.78	Moderate
SW0505-6	Saanich	2021-02-26	0.05	0.06	0.18	0.18	0.30	0.14	0.01	0.63	0.35	0.15	2.05	Moderate
SW0559	Saanich	2021-09-08	0.05	0.02	0.08	0.05	0.01	0.12	0.01	0.20	0.01	0.00	0.55	Low
SW0574	Saanich	2021-04-09	0.07	0.02	0.09	0.11	0.02	0.12	0.02	0.38	0.05	0.08	0.97	Low
SW0578	Saanich	2021-04-09	0.04	0.01	0.06	0.05	0.01	0.12	0.02	0.18	0.00	0.00	0.50	Low
SW0589	Saanich	2021-04-09	0.09	0.03	0.09	0.07	0.01	0.12	0.03	0.15	0.01	0.01	0.60	Low
SW0672	Saanich	2019-11-29	0.21	0.13	0.12	0.20	0.21	0.25	0.02	0.65	0.10	0.04	1.93	Moderate
SW0689	Saanich	2019-12-03	0.03	0.02	0.11	0.15	0.01	0.12	0.01	0.17	0.01	0.01	0.63	Low
SW0690E	Saanich	2019-12-04	0.07	0.02	0.19	0.12	0.02	0.12	0.03	0.18	0.00	0.00	0.74	Low
SW0690E	Saanich	2020-11-24	0.08	0.02	0.21	0.12	0.02	0.12	0.03	0.19	0.00	0.00	0.79	Low
SW0692	Saanich	2019-12-04	0.04	0.02	0.09	0.15	0.04	0.12	0.01	0.81	0.00	0.00	1.29	High
SW0692	Saanich	2020-07-22	0.49	0.06	0.13	0.14	0.09	0.12	0.01	1.03	0.06	0.02	2.15	High
SW0692	Saanich	2021-04-26	0.08	0.04	0.13	0.13	0.10	0.12	0.01	0.51	0.01	0.00	1.15	Moderate
SW0695-1A	View Royal	2019-11-27	0.09	0.05	0.13	0.14	0.03	0.15	0.02	0.63	0.01	0.00	1.25	Moderate
SW0695-1A	View Royal	2020-12-03	0.07	0.03	0.13	0.11	0.02	0.12	0.02	0.33	0.01	0.02	0.86	Low
SW0698	View Royal	2019-11-27	0.08	0.05	0.11	0.12	0.07	0.12	0.01	0.35	0.20	0.19	1.32	Moderate
SW0709B-2A	View Royal	2020-09-02	0.02	0.01	0.04	0.02	0.01	0.12	0.01	0.08	0.00	0.00	0.31	Low

Table 2 (continued)

Station ID	Area	Sample Date	Ratios of Concentration / Marine Sediment Quality Guideline										Sum of Ratios	Contaminant Rating
Parameter			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH		
CRD Marine Sediment Quality Guidelines			57	5.1	260	390	450	0.41	6.1	410	12	5.2		
SW0709B-4	View Royal	2020-09-02	0.05	0.01	0.17	0.09	0.01	0.12	0.01	0.14	0.00	0.00	0.60	Low
SW0710	View Royal	2019-11-27	0.06	0.02	0.14	0.15	0.02	0.12	0.01	0.49	0.07	0.02	1.10	Moderate
SW0712	View Royal	2019-11-27	0.05	0.02	0.17	0.12	0.06	0.12	0.01	0.24	4.83	2.31	7.94	High
SW0712	View Royal	2020-07-10	0.03	0.04	0.14	0.11	0.14	0.13	0.01	0.28	0.47	0.16	1.52	Moderate
SW0712	View Royal	2021-03-17	0.04	0.03	0.11	0.05	0.01	0.12	0.01	0.12	0.71	0.37	1.56	Moderate
SW0737	Esquimalt	2021-03-17	0.13	0.07	0.20	0.12	0.02	0.16	0.01	0.16	1.50	1.38	3.75	High
SW0742-2A	Esquimalt	2020-12-01	0.04	0.05	0.13	0.14	0.02	0.17	0.01	0.35	0.02	0.01	0.94	Low
SW0742-2A	Esquimalt	2021-08-05	0.06	0.09	0.14	0.21	0.02	0.44	0.03	0.67	0.02	0.03	1.72	Moderate
SW0742-2B	Esquimalt	2020-12-01	0.09	0.02	0.10	0.07	0.02	72.68	0.01	0.17	0.01	0.00	73.17	High
SW0742-2B	Esquimalt	2021-08-05	0.46	0.06	0.10	0.10	0.03	54.15	0.02	0.30	0.02	0.01	55.23	High
SW0744	Esquimalt	2020-07-09	0.08	0.11	0.19	0.20	0.12	0.28	0.14	0.91	0.38	0.18	2.60	High
SW0744	Esquimalt	2021-03-31	0.05	0.04	0.11	0.10	0.06	0.12	0.05	0.40	0.05	0.02	1.00	Moderate
SW0866	View Royal	2020-11-20	0.06	0.03	0.10	0.07	0.04	0.12	0.01	0.50	0.00	0.00	0.94	Low
SW0866	View Royal	2021-03-31	0.09	0.03	0.09	0.07	0.05	0.12	0.01	0.61	0.00	0.00	1.08	Moderate
SW0874	View Royal	2021-03-31	0.11	0.07	0.16	0.18	0.08	0.22	0.02	0.87	0.02	0.01	1.72	High
SW0874	View Royal	2021-08-12	0.13	0.05	0.16	0.13	0.15	0.16	0.01	0.73	0.02	0.02	1.58	Moderate
SW0882	View Royal	2021-05-07	0.20	0.05	0.13	0.30	0.07	0.12	0.01	0.62	0.23	0.08	1.81	Moderate
SW0887	View Royal	2021-05-07	0.04	0.03	0.08	0.06	0.03	0.19	0.01	0.30	0.01	0.01	0.75	Low
SW0921	DND	2019-11-27	0.03	0.01	0.04	0.01	0.01	0.12	0.01	0.04	0.00	0.00	0.27	Low
SW0922	DND	2019-11-27	0.03	0.01	0.04	0.01	0.00	0.12	0.01	0.04	0.00	0.00	0.27	Low
SW0926	Colwood	2019-09-05	0.03	0.01	0.07	0.02	0.01	0.12	0.01	0.08	0.06	0.05	0.46	Low
SW0926	Colwood	2019-10-17	0.02	0.02	0.06	0.02	0.01	0.12	0.01	0.06	0.08	0.06	0.46	Low
SW0926	Colwood	2020-09-03	0.03	0.02	0.06	0.02	0.01	0.12	0.01	0.07	0.03	0.02	0.40	Low
SW0926-2	Colwood	2019-10-31	0.74	0.06	0.08	0.07	0.03	0.12	0.03	0.17	0.04	0.07	1.42	Moderate
SW0928	Colwood	2019-10-17	0.05	0.02	0.08	0.06	0.01	0.12	0.01	0.14	0.03	0.01	0.54	Low
SW0928	Colwood	2019-10-31	0.09	0.04	0.10	0.10	0.03	0.13	0.01	0.23	0.28	0.09	1.10	Moderate
SW0931	Colwood	2019-10-21	0.04	0.02	0.09	0.05	0.02	0.12	0.01	0.15	0.00	0.00	0.50	Low
SW0932	Colwood	2019-10-21	0.03	0.01	0.12	0.20	0.01	0.12	0.01	0.15	0.01	0.01	0.67	Low
SW0934	Colwood	2021-04-27	0.04	0.02	0.09	0.10	0.03	0.12	0.01	0.26	0.01	0.01	0.70	Low
SW0937	Colwood	2019-10-21	0.04	0.01	0.09	0.06	0.01	0.12	0.01	0.13	0.02	0.00	0.49	Low

Notes:
CRD MSQG =Marine sediment quality guidelines adopted from Washington State's Department of Ecology for protection of aquatic life.
These are ratios of the measured value over the MSQG
LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively
values are approaching (i.e.>0.75 the value of) the guideline
values exceed the MSQG
Some samples are not collected at the discharge to marine and therefore marine guidelines are not applicable but are used for screening purposes

Table 3 Summary of Recent Chemical Contaminant Ratings and Recommendations

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time							Notes & Recommendations
			2015	2016	2017	2018	2019	2020	2021	
210 west of Holland Pt	37	Victoria	–	–	–	–	–	Low	–	No sediment at discharge in 2017 and 2018 Small residential catchment, historically low. Copper is elevated in water
212 east of Finlayson Pt	39	Victoria	–	–	–	Moderate	Low	Low	Low	Elevated lead in 2018 Metals elevated in water in fall 2020; in subsequent samples copper elevated only
216 Ross Bay	40	Victoria	–	High u/s	–	no sediment	Low	–	–	Elevated mercury u/s & discharge; 216 is tidal, sampled at 216-3A. Action Required: CRD narrowed down a source of mercury. Copper elevated in water. Resample in 2022. COV did some relining in 2018.
218 Ross Bay	40	Victoria	–	–	–	–	–	NR	Low	No sediment in 2019 or 2020. Summer water sample clean Confirm rating in 2022.
229 Gonzales Bay	41	Victoria	–	–	–	–	–	–	-	Small residential catchment; tidal; no sediment available; contaminants low in water
244 McNeill Bay	43	Oak Bay	–	–	Moderate	–	–	–	–	Lead slightly elevated in 2012, low in 2017 Resample in 2022.
245 McNeill Bay	43	Oak Bay	–	–	–	–	–	–	–	Low in 2001, 2004, 2013. No sediment available in 2018. Water has low contaminants
250 McNeill Bay	43	Oak Bay	Moderate	–	High / Moderate	–	–	–	–	Elevated PAHs. 250-2A is POD but doesn't drain whole catchment. PAHs not detected in water but some elevated metals. Action Required. High in 250-1A & moderate at 250-2A. Continue to delineate the contamination. Confirm metals concentration in water
306 Orchard & Newport Ave	45	Oak Bay	–	–	High	High	High u/s	High u/s	–	Elevated HPAH and lead. Action required. No sediment at 306-1 and 306-2 in 2019; elevated HPAH and lead in sediment at 306-2a (Newport Ave & Currie Rd), low PAH and lead in summer water sample. Sample in 2022.
307 Oak Bay Marina	45	Oak Bay	High	Moderate	–	High	High	-	Moderate at 307-2A	Sampled at 307 and 307-2. Elevated PAH, mercury, lead and zinc. Action Required: Oak Bay cleaned out manholes at Currie & Newport in 2021. Trap placed in 2018. May have narrowed down contamination to intersection of Newport and Currie. Confirm rating at 307-2
310 Windsor Rd	45	Oak Bay	–	Low upstream	High upstream	–	High u/s	-	–	Copper, lead, zinc & PAH elevated (310-1). Other contaminants upstream. Low at 310-5 in 2016 elevated PAH in 2019 Upstream contamination at Windsor & Monterey. Action Required: Oak Bay cleaned out manholes in 2021. Confirm rating.
311 1420 Beach Dr	45	Oak Bay	–	–	–	–	–	–	–	Short line, packed with beach sand in 2017. Intertidal. Cease sampling
316 Bowker Ck.	46	Oak Bay	–	–	–	–	Low	–	–	Discharge rated low. Upstream, 316-5D rated high due to copper & zinc Sample in 2024.
320 Dalhousie St	46	Oak Bay	–	–	–	Low	–	–	–	Resample in 2023.
323 north Esplanade	46	Oak Bay	–	Low	–	–	–	–	–	Resample in 2023.
324 Cattle Point	46	Oak Bay	–	–	–	–	High	–	Low	Sampled for first time in 2019; Elevated HPAH Confirm rating
325 Rutland Rd	48	Oak Bay	–	–	–	–	–	–	–	Sample discharge in 2022.
327 Cadboro Bay	49	Oak Bay	–	–	–	Low	–	–	–	Resample in 2023.
503 Cadboro Bay	50	Saanich	–	High	Low	Moderate	–	–	–	Elevated PAHs in 2016. Resample in 2023.

Table 3 (continued)

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time							Notes & Recommendations
			2015	2016	2017	2018	2019	2020	2021	
505 Cadboro Bay	50	Saanich	–	–	High	High	High	High	Moderate u/s	Overflow for CRD's Penrhyn Station. Elevated Pb, Hg and PAH in 505-3. Sample 505-1 or -3 to avoid tidal influence. Action Required. Saanich cleaned line out 2019. Sediment elevated in Hg upstream to Cadboro Bay Road. Continue source investigations.
558 Mt. Douglas beach	59	Saanich	–	–	Low	–	–	–	–	Sample in 2023.
559 Douglas Ck.	60	Saanich	–	Low	Low	–	–	–	Low	Sample above weir (559-2) after spill June 17 had elevated zinc & PAHs. Resample in 2026.
574 Cordova Bay Rd	63	Saanich	–	Low	–	–	–	–	Low	Resample 2026.
578 Cordova Bay Rd	63	Saanich	Low	–	–	–	–	–	Low	Resample 2026.
586 Parker Ave	64	Saanich	–	–	–	Low	–	–	–	Sample in 2023
589 Burnham Brook	65	Saanich	Low	–	–	–	–	–	Low	Drains golf course. Sample in 2026.
592 Noble Ck.	65	Saanich	–	–	Low	–	–	–	–	Sample in 2023 (Noble Creek)
603 James Bay Anglers	36	Victoria	–	–	Moderate	NA	–	–	–	Elevated zinc & PAH in 2017; no sediment in 2018 or 2020. Contaminants in water low in summer. Action Required. Sediment not available. Confirm lower rating.
613 Govt. St & Belleville	35	Victoria	–	–	–	–	–	–	–	Sampled at 613-2 (MH D2719). Water samples have elevated copper and zinc in summer. Sample sediment in 2023.
613A Govt. St & Belleville	35	Victoria	–	–	–	–	–	–	–	Rated high in 2014 due to mercury & zinc behind Crystal Gardens. Cease sampling, line is intertidal.
614 Wharf & Govt.	35	Victoria	–	–	High u/s	Moderate	–	–	–	Elevated lead, mercury & zinc. Tidal. 614-1a is a short tributary, from a shallow line that drops into the discharge, confirmed by dye. Samples trapped at 614-2 in 2009 & 2014. Sampled 614-1A in 2017. Action Required. CRD narrowed down a source. COV pumped out manhole at tourist sign and catchbasin in front of Empress Hotel.
620 north of Johnson St bridge	34	Victoria	–	–	–	–	–	–	–	Action Required: Consistently rated high for zinc but copper & lead elevated in past. Couldn't access site in 2018. Fire upstream in 2019, elevated metals in water. Resample in 2022.
627 Rock Bay	34	Victoria	–	–	–	–	–	–	–	Tidally influenced at discharge (627) & 627-3 Action Required. Access difficult
629 Rock Bay	26	Victoria	–	–	–	–	–	–	–	Water samples show elevated arsenic, cadmium, chromium, iron, lead, zinc and aqueous PAHs Action Required. Access difficult
630 Rock Bay	26	Victoria	–	–	–	–	–	–	–	Access difficult. Sample in 2022.
633 Bay St. Bridge	26	Victoria	–	–	Moderate	–	–	–	–	Sampled at 633-2. Difficult to sample. Elevated zinc and other metals in sediment. Confirm rating Action Required. Elevated cadmium, chromium, copper, iron, lead and zinc in water.
634 David St	26	Victoria	–	–	–	–	–	–	–	Action Required; Rated high for zinc in 2009. Water samples have high iron, cadmium, chromium, copper, iron, lead and zinc.

Table 3 (continued)

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time							Notes & Recommendations
			2015	2016	2017	2018	2019	2020	2021	
635 Ralmax	26	Victoria	–	–	–	–	–	–	–	This discharge is tidal & can't be sampled upstream; sampling ceased.
636 S. of Victoria works yard	26	Victoria	–	–	–	Metals elevated in water	–	–	–	Elevated zinc and other metals in sediment Action Required. Elevated cadmium, chromium, copper, iron, lead and zinc in water.
641 Cecelia Ck.	26	Victoria	Moderate	–	–	Moderate	–	–	–	Zinc and PAH above freshwater sediment guidelines Resample in 2018
645 Carrol St.	27	Victoria	–	–	–	Moderate	–	–	–	Resample in 2023
649 Gorge Rd. hospital	27	Victoria private	High	–	–	–	–	–	–	Copper, mercury & zinc elevated. Copper elevated in water sample; may be sampling historical sediment. Action Required. Hospital investigating sources;
653 Cedar Shore Appts	27	Saanich	–	–	–	–	–	–	–	Could not access site. Sample in 2023.
654 Cedar Shore Appts	27	Saanich private	–	–	–	–	–	–	–	Rated high in past, but potential tidal influence. No seds in 2016 or 2018. Attempt resample in 2023.
655 E. of Gorge Bridge	28	Saanich	–	Low	Low	–	–	–	–	Resample in 2022.
657 W. of Gorge Bridge	28	Saanich	–	–	–	–	–	–	–	Tidal, sample at 657-1. Resample in 2022.
669 Dysart Rd	29	Saanich	–	–	Moderate	–	–	–	–	Report of oil coming out of pipe in June 2018; no PAHS detected in water in 2020. No sediment in pipe in 2018 or 2019; Could not access in 2020. Resample in 2022.
672 Adelaide Ave	29	Saanich	–	–	–	–	Moderate	Low	–	Resample in 2025.
679 Gorge & Admirals	29	Saanich	–	–	–	Low	–	–	–	Resample in 2023.
687 Westing Rd	30	Saanich	–	Moderate	–	–	–	–	–	Stream. Resample in 2023.
689 Below Admirals Rd	33	Saanich	–	–	–	–	Low	Low	–	Resample in 2024.
690BB foot of Dysart	33	Saanich	–	–	–	–	–	–	–	Tidal at discharge & no upstream sampling location.
690D Colquitz River	33	Saanich	–	Low	Low	–	–	–	–	No elevated metals in water in 2020. Resample in 2024.
690E Colquitz River	33	Saanich		Moderate	–	–	Low	Low	–	Resample in 2025.
692 Portage Rd	32	Saanich	–	–	–	–	Moderate	High	Moderate	Zinc elevated in sediment but low in water.
695 Camden Ave	32	View Royal	–	–	Moderate	–	Moderate	Low	–	Sampled at 695-1A; Resample in 2025.
697 Hospital Ck.	31	View Royal	–	–	–	–	–	–	–	Zinc in ditch near hospital parking lot. Source narrowed down. Can't be sampled at discharge (sampling ceased).
698 Stillwater Rd	31	View Royal	–	–	–	–	Moderate	–	–	Resample in 2025.
709B Craigflower Ck.	31	View Royal	Low	–	–	–	–	Low	–	Continue monitoring

Table 3 (continued)

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time							Notes & Recommendations
			2015	2016	2017	2018	2019	2020	2021	
710 Helmcken Rd bridge	31	View Royal	—	—	—	Moderate	Moderate	—	—	Resample in 2024
712 Old Isl Hwy	30	View Royal	—	—	Moderate	Low	High	Moderate	Moderate	Elevated PAHs in 2019; low in sediment and water. Confirm rating.
722 Craigflower Bridge	30	View Royal	—	—	—	—	—	—	Moderate based on water	No seds in 2016, 2019 or 2020. Elevated copper in water in 2021, lower upon resampling.
726 Craigflower & Admirals	29	Esquimalt	—	—	Low	Low	—	—	—	Moderate rating confirmed. Resample in 2023.
737 Garthland Rd	29	Esquimalt	—	High	Low but High upstream	—	—	—	High	Elevated PAHs Action Required. Source appears to be catchbasin in Garthland PI (737-1). Asked Esquimalt to clean out manhole. Resample when action taken
742 Sioux PI	28	Esquimalt	—	—	High	—	Low u/s	High u/s	High u/s	Sampled at 742-2 as 742 is tidal. Source narrowed. Mercury 5X > guideline. Action Required. Esquimalt has been notified. Low mercury on the golf course.
744 Gorge- Esquimalt Pk	28	Esquimalt	Moderate	—	—	—	—	Moderate	Moderate	Elevated zinc in sediment and slightly elevated in water. Resample in 2024.
749 Uganda St	28	Esquimalt	Moderate	—	High	—	—	—	—	Samples marine-influenced before 2008. Zinc and mercury elevated in 2017. Appears to be food waste present upstream. Oil spill in past. Action Required. Source narrowed down. Esquimalt contacted. Resample after action taken.
758A Bamfield Park	27	Victoria	—	—	—	—	—	—	—	Discharge is intertidal. Rating based on 758A-1. No sediment in 2020. Manhole not accessible.
767 Ocean Pt Resort	25	Victoria	—	—	—	—	—	—	—	Short line, intertidal. Discharge not accessible. Zinc elevated in past Removed from action list. Cease sampling.
780 Head St	24	Esquimalt	Moderate	—	—	—	—	—	—	No sediment available in 2020. Resample in 2021.
781 Head St	23	Esquimalt	High	—	—	—	—	—	—	Elevated lead in 2015. Not enough sediment in 2016. No seds in 2017 or 2018.
806 Kinver St	22	Esquimalt	High upstream	—	—	—	—	—	—	Copper & zinc in discharge; zinc & PAH u/s of Hatfield & Kinver but not farther u/s Action Required; CRD narrowed down to within 2 blocks. Resample discharge in 2022.
847 concrete building	19	DND	—	—	—	—	—	—	—	Rating confirmed. Cannot access site. DND doing own monitoring. Cease sampling.
849 fleet building	19	DND	Moderate	—	—	—	—	—	—	Findings shared with DND.
866 Portage Pk	16	View Royal	—	—	—	High u/s	—	Low	Moderate	Removed from action list. Previously rated high for zinc. Narrowed down; potentially historic source. Elevated copper and zinc in stream. VR cleaned out manhole and catchbasins upstream
873 Helmcken Rd	16	View Royal	Moderate	—	—	—	—	—	—	Resample in 2022.
873A Helmcken Rd	16	View Royal	—	—	—	—	—	—	—	Sampled at 873 to represent discharge of 873, 873A and 873C. Zinc elevated in ditch upstream likely due to corroded pipe. Zinc low at discharge.
873C Helmcken Rd	16	View Royal	Moderate	—	—	—	—	—	—	Sampled at 873 to represent discharge of 873, 873A and 873C. Corroded pipe u/s but zinc low at discharge.
874 Tovey Bay	15	View Royal	—	—	—	—	—	—	Moderate	Zinc elevated in sediment. Rated high then moderate in 2021. Source may be corroded pipe. Zinc and copper elevated in water. Action Required. Resample in 2022.

Table 3 (continued)

Discharge ¹	Figure	Jurisdiction	Contaminant Ratings Over Time							Notes & Recommendations
			2015	2016	2017	2018	2019	2020	2021	
875 View Royal Ave	15	View Royal	Low	–	–	–	–	–	–	Resample in 2022.
879 Price Rd	15	View Royal	Moderate	–	–	–	–	–	–	Resample in 2022.
882 Parsons Bridge	13	View Royal	–	–	Moderate	–	–	–	Moderate	No exceedances in water sample.
886 Millstream Ck.	14	View Royal	–	–	–	Low	–	–	–	Resample in 2023 (Mill Stream Creek).
887 Wilfert Rd	14	View Royal	–	–	–	–	–	–	Low	Low in past. No sediment in 2018 or 2019.
902 Joe's Ck.	13	DND	–	–	–	Low	–	–	–	Resample in 2024 (Joe's Creek).
916 Colwood Ck.	9	Royal Roads	–	–	Low	–	–	–	–	Resample in 2022.
921	8	Royal Roads	–	–	–	–	Low	–	–	Resample in 2024.
922 Hatley Ck	8	Royal Roads	–	–	–	–	Low	–	–	Resample in 2024.
926 Bee Ck.	8	Colwood	–	Low	–	–	Low	Low	–	Elevated arsenic measured upstream. Resample in 2025.
927 Miller Brook	8	Colwood	–	–	–	Low	–	–	–	Resample in 2023.
928 Selleck Ck	8	Colwood	–	–	Low	–	Moderate	–	–	Sampled with 5 in 30s; Resample in 2024.
931 Lagoona Brook	7	Colwood	–	–	–	–	Low	–	–	Resample in 2024.
932 S end Esquimalt Lagoon	7	Colwood	–	–	–	–	Low	–	–	Resample in 2024.
933 S end Esquimalt Lagoon	7	Colwood	–	Low	–	–	–	–	–	Resample in 2022.
934 Ocean Blvd	7	Colwood	Low	–	–	–	–	–	Low	Resample in 2022.
937 Ocean Blvd	7	Colwood	–	–	–	–	Low	–	–	Resample in 2024.
6003 Goldstream River	67	Langford	–	Low	–	–	Low	–	–	Resample in 2026 as part of 5/30s.
6004 Saanich Inlet	67	Langford	–	–	–	–	Low	–	–	Resample in 2024.
6006 Saanich Inlet	68	Langford	–	–	High	–	–	–	–	Action Required. Resample after action is taken. Creosote log pile is likely source.
6008 Trans Canada	68	Langford	–	–	–	Moderate	Moderate	–	–	Slightly elevated zinc. Sample water in 2022.

Notes:
¹ Contaminant rating for a discharge is based on point of discharge.
Ratings from 2012 to 2018 are displayed; refer to previous reports for ratings prior to 2010
Metals: arsenic As, cadmium Cd, chromium Cr, copper Cu, lead Pb, mercury Hg, silver Ag and zinc Zn,
Organic substances: high and low molecular weight polycyclic aromatic hydrocarbons HPAH and LPAH
u/s is upstream

Table 4 Freshwater Stream Sediment Analytical Data (2021)

Guidelines for freshwater aquatic life				Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH	TOC
CCME (ISQG)				5.9	0.6	37.3	35.7	35	0.17	0.5	123	0.1	0.1	
CCME (PEL)				17	3.5	90	197	91	0.486	-	315			
Vancouver Island Background			Date	4	0.95	65	100	40	0.15	1	150	-	-	
Bowker Creek	SW0316	Oak Bay	2019-10-16	3.68	0.102	20.6	26.8	13.2	<0.05	<0.05	122	0.27	0.051	0.26
	SW0316	Oak Bay	2019-10-31	2.37	0.092	16.1	18.8	14.3	<0.05	<0.05	94.2	3.1	0.24	0.71
	SW0316-1A	Oak Bay	2019-09-05	4.17	0.089	23.9	33	29.4	<0.05	<0.05	141	0.99	0.12	<0.05
	SW0316-3B	Oak Bay	2019-10-16	3.95	0.087	31.6	43.4	12.8	<0.05	<0.05	114	0.93	0.27	0.34
	SW0316-3B	Oak Bay	2019-10-31	2.45	0.1	20.7	30.5	16.7	<0.05	<0.05	99.3	0.39	0.067	0.34
	SW0316-4B	Oak Bay	2019-10-16	2.53	0.137	36.7	31.5	23.6	<0.05	<0.05	115	1.5	0.32	0.63
	SW0316-4B	Oak Bay	2019-10-31	3.14	0.132	25.3	38.9	35	<0.05	<0.05	145	0.96	0.35	3.2
	SW0316-5	Oak Bay	2019-10-16	5.72	0.094	24	23.9	10.2	<0.05	<0.05	90.7	0.18	0.043	1.1
	SW0316-5	Oak Bay	2019-10-31	7.28	0.108	27.4	26.2	13.6	<0.05	<0.05	104	0.18	0.031	0.32
	SW0316-5C	Oak Bay	2019-11-29	3.03	0.539	40.6	73.1	66.6	0.102	0.252	247	1.1	0.22	15
	SW0316-5D	Oak Bay	2019-11-29	12.9	1.34	42.9	232	106	0.179	0.46	508	1.3	0.33	34
Douglas Creek	SW0559	Saanich	2021-09-08	2.74	0.088	20.9	20.5	5.89	<0.05	<0.05	82.2	0.076	0.013	1.8
Craigflower Creek	SW0690E	Saanich	2019-12-04	4.2	0.079	48.1	46.5	8.03	<0.05	0.169	72.2	0.048	0.009	1.4
	SW0690E	Saanich	2020-11-24	4.68	0.116	53.9	46.3	8.38	<0.05	0.204	76.2	0.028	0.005	1.6
Mill Stream	SW0709B-2A	View Royal	2020-09-02	0.86	<0.05	10.6	6.56	4.18	<0.05	<0.05	33.6	0.048	0.009	1.4
	SW0709B-4	View Royal	2020-09-02	2.96	<0.05	43.3	35.9	5.86	<0.05	0.063	57	<0.001	<0.001	1.6
Gorge Creek	SW0744	Esquimalt	2020-07-09	4.84	0.574	48.7	78.7	51.8	0.115	0.881	375	4.5	0.94	1.7
	SW0744	Esquimalt	2021-03-31	2.65	0.182	29.1	38.3	26.6	<0.05	0.322	164	0.64	0.12	0.6
Craigflower Creek	SW0866	View Royal	2020-11-20	3.39	0.155	27.2	28.6	16.6	<0.05	<0.05	205	0.046	0.01	1.6
	SW0866	View Royal	2021-03-31	5.24	0.174	24.1	28.7	22.1	<0.05	<0.05	249	0.054	0.008	<0.05
	SW0882	View Royal	2021-05-07	11.5	0.23	34.5	116	32.1	0.051	<0.05	254	2.8	0.42	
Bee Cree	SW0926	Colwood	2019-09-05	1.61	<0.05	17.5	9.44	4.85	<0.05	<0.05	33	0.76	0.25	0.55
	SW0926	Colwood	2019-10-17	1.13	0.11	15.1	7	3.85	<0.05	<0.05	24	0.96	0.33	0.85
	SW0926	Colwood	2020-09-03	1.9	0.078	16.6	8.71	3.76	<0.05	<0.05	30.7	0.32	0.12	0.88
	SW0926-2	Colwood	2019-10-31	42.2	0.319	20.6	29	13.5	<0.05	0.188	71.4	0.42	0.37	0.43
Selleck Creek	SW0928	Colwood	2019-10-17	2.69	0.096	22	23.5	6.09	<0.05	<0.05	58.5	0.41	0.07	2.6
	SW0928	Colwood	2019-10-31	4.91	0.207	25.4	39.2	15.6	0.053	0.062	94.7	3.4	0.46	9.6

Notes

Concentrations are in mg/kg dry weight

LPAH and HPAH are low and high molecular weight polycyclic aromatic hydrocarbons, respectively

CCME = Canadian Council of Ministers of the Environment

ISQG = interim sediment quality guideline; concentrations above this level but below the PEL will occasionally result in adverse effects on aquatic life

PEL = probable effects level; concentrations above this level will frequently result in adverse effects to aquatic life

Vancouver Island Background Concentrations are regional estimates (95th percentiles) from BC MOE; https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_4.pdf

Italicized values are those that exceed a guideline but are below the Vancouver Island background concentration

XX value is greater than or equal to the CCME ISQG

XX value is greater than or equal to the CCME PEL

Some samples are not collected at the discharge to marine and therefore marine guidelines are not applicable but are used for screening purposes

Table 5 2021 Aqueous Metals in Stormwater Discharges Data

Station ID	Sample Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Mercury		Silver		Zinc		Flow Rate
		DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	
Marine Aquatic Life Guidelines	max	-	-	-	12.5		0.12	-	-	-	3	-	-	-	140	-	-	-	3	-	55	NA
	average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	0.002- 0.01 3	-	1.5	-	10	
Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.59	-	-	1/9 ¹	-	11.4	350	1000	-	81.6	-	-	-	0.1	-	40.5	
	average	50	-	-	-	0.21	-	-	-	-	4	-	-	-	6.5	-	0.002- 0.01 3	-	0.05	-	15	
SW0209	2022-01-26		99.4		1.03		0.023		0.63		6.06		141		0.32				<0.005		4.94	60
SW0210	2020-07-06		525		2.32		0.0344		1.02		8.34		427		1.65				<0.01		8.1	20
	2021-03-17		16.1		1.48		0.0332		0.28		2.4		14.7		0.0288				<0.005		2.29	45
	2021-06-21		8.68		1.38		0.0351		0.2		3.54		8.1		0.0297				<0.005		6.46	5
	2022-01-26		16.1		1.31		0.0484		0.27		4.73		10.6		0.0131				<0.005		2.18	13
SW0211	2022-01-27		309		0.701		0.0073		0.75		6.12		168		0.207				<0.005		0.66	11
SW0212	2020-07-21		73.5		0.576		0.0058		0.39		5.97		169		0.609				<0.01		2.3	60
	2020-11-20		9200		6.99		0.164		21.2		54.7		7970		9.05				0.206		263	50
	2021-03-29		232		0.352		0.0052		0.43		2.34		174		0.369				<0.01		2.3	100
	2021-06-21		96		0.675		0.0095		0.36		1.91		144		0.412				<0.01		2.8	5
	2022-01-26		248		0.414		0.0095		0.46		3.34		139		0.172				0.0067		1.26	42
SW0214	2022-01-26		46.8		0.516		0.0075		0.39		3.24		50.1		0.126				<0.005		4.2	>250
SW0216	2020-07-21		96.8		1.43		0.0091		0.57		6.54		228		0.304		<0.0019		<0.005		5.92	150
	2021-03-29		168		1.01		0.0152		0.95		6.27		200		0.356				<0.01		8.1	200
	2021-06-21		125		2		0.0105		0.57		6.66		190		0.366				<0.01		8.2	65
	2022-01-26		480		1.23		0.0312		1.25		9.87		784		3.98				<0.01		12.7	>300
SW0216-3	2021-03-30		4530		1.89		0.0571		8.3		23.1		6070		4.39				0.055		34.7	35
SW0216-3B	2020-11-20		251		1.3		0.0217		1.5		11.7		356		1.45				0.012		15.7	>200
SW0218	2020-07-21		46		0.89		0.12		<2		4.4		189		0.29				<0.1		11.1	5
	2021-03-30		4330		2.2		0.0822		12.3		22.6		7640		31.9				0.11		45.7	22
	2021-06-21		3000		2.22		0.047		3.64		12.3		2860		3.45				0.023		25.2	2
	2022-01-27		1560		1.42		0.0306		4.79		8.51		2330		11.9				0.071		8.6	9
SW0222	2021-06-21		609		1.05		0.0667		1.43		11		984		2.17				0.019		22.4	100
	2022-01-27		93.9		0.93		0.0141		0.56		6.14		119		0.216				<0.01		4.4	>250
SW0227	2022-01-27		163		0.454		0.0104		0.39		4.62		212		0.646				0.0053		3.31	4
SW0229	2022-01-27		76.1		0.703		0.0155		0.64		4.18		77.1		0.337				0.0088		6.78	5
SW0230	2022-01-28		75.2		0.392		0.01		0.3		2.47		77		0.244				0.0116		2.58	12
SW0231	2022-01-28		44.2		0.41		0.0081		0.18		4.12		47.2		0.126				<0.005		3.24	5
SW0236	2022-01-28		51.8		0.44		0.013		0.8		7.29		35.4		0.172				<0.005		9.02	6
SW0237	2022-01-28		134		0.626		0.0176		0.6		4.17		114		0.143				<0.005		10.6	3
SW0245	2020-07-21		145		0.953		0.0093		0.5		6.36		507		0.375				<0.005		4.81	15
	2021-03-29		305		1		0.0132		1.04		5.33		286		0.372				0.0051		5.44	250
	2022-01-27		154		0.813		0.0083		0.61		4.62		413		0.243				<0.005		3.13	60
SW0249	2022-01-27		238		1.32		0.0125		1.21		8.35		203		0.427				0.016		6.5	2
SW0250	2020-07-21		154		1.47		<0.1		<2		5.2		270		0.53				<0.2		<20	<0.01
	2021-03-29		329		1.25		0.0121		1.12		6		369		0.573		0.0039		<0.01		7.6	<0.01
	2021-09-16		152		1.9		<0.25		<5		<2.5		257		0.39				<0.25		18.6	0
	2022-01-27		85		1.68		<0.1		<2		3.9		201		0.32				<0.1		4.6	
SW0306	2020-07-21		188		1.16		1.12		<0.5		5.72		127		0.351				<0.025		7.83	50
	2021-03-29		396		1.22		0.0159		2.6		10.6		261		0.314		0.0113		<0.01		5.6	200
	2021-08-25		99		1.81		0.055		1		13.4		153		0.32				<0.05		10.5	40
SW0306-2	2020-12-01		592		1.25		0.0191		1.73		8.01		548		1.03				<0.01		14.2	15
SW0306-2A	2020-12-01		1070		0.895		0.0605		2.67		13.3		1470		19.2				0.023		30.8	<1
SW0307	2021-03-29		143		0.508		0.0065		0.33		4.6		557		0.52		<0.0019		<0.005		6.01	2
	2021-06-22		394		0.697		0.0302		0.81		7.41		741		3.33				<0.01		11.6	2
	2022-02-01		57.4		0.383		0.0146		0.17		2.26		205		0.291				<0.005		2.97	<1
SW0309	2022-02-01		37.7		1.49		<0.005		<0.1		2.59		71.3		0.116				<0.005		0.66	10
SW0310	2022-02-01		1310		1.18		0.0142		1.92		5.71		802		0.631				<0.01		6.2	11
SW0316	2020-11-20		216		0.808		0.0104		0.67		5.63		331		0.48				<0.01		9.7	>2000
SW0317	2022-01-31		31.4		0.487		0.0095		0.28		11.6		19.5		0.0683				<0.005		2.85	32
SW0318	2022-01-31		133		0.361		0.0096		0.63		2.6		101		0.147				<0.005		6.61	60
SW0320	2022-01-31		1800		5.52		0.118		13.4		24.8		1190		2.34				0.0208		23.7	80
SW0321	2022-02-02		211		0.766		0.013		0.59		4.81		172		0.501				0.0061		14.6	7
SW0321A	2022-02-02		427		1.63		0.0131		1.34		6.41		282		0.672				0.0088		13.1	12

Table 5 (continued)

Station ID	Sample Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Mercury		Silver		Zinc		Flow Rate
		DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	NA
Marine Aquatic Life Guidelines	max	-	-	-	12.5		0.12	-	-	-	3	-	-	-	140	-	-	-	3	-	55	
	average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	0.002- 0.01 3	-	1.5	-	10	
Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.59	-	-	1/9 ¹	-	11.4	350	1000	-	81.6	-	-	-	0.1	-	40.5	
	average	50	-	-	-	0.21	-	-	-	-	4	-	-	-	6.5	-	0.002- 0.01 3	-	0.05	-	15	
SW0322	2022-02-02		379		0.941		0.0136		1.03		4.75		267		0.512				<0.005		23.6	12
SW0323	2022-02-01		179		0.638		0.0083		0.47		3.11		258		0.215				<0.005		6.13	200
SW0323A	2022-02-02		232		0.456		0.0169		0.65		2.78		278		0.205				0.012		27.6	5
SW0503	2022-02-02		1330		1.64		0.0568		3.01		9.81		1830		5.33				0.019		24.8	80
SW0505	2021-06-14		90.8		0.726		0.01		0.59		4.4		191		0.301		<0.0019		<0.005		3.78	65
SW0505-1	2020-08-06		12.6		0.506		0.01		0.36		3.98		137		0.301		<0.0019		0.0051		2.15	
SW0505-2	2020-08-06		36.5		0.659		0.01		0.53		2.73		141		0.282		<0.0019		<0.005		2.55	6
SW0505-3	2020-08-06		58.2		0.836		0.0161		0.82		3.89		514		0.397		0.0026		<0.01		4.4	
SW0505-4	2020-08-06		447		1.99		0.0357		1.11		5.2		1010		3		0.004		0.011		13	
	2021-02-26		124		0.373		0.0095		0.28		2.22		185		0.315		0.0023		<0.01		3.1	7
SW0505-5	2020-08-06		1990		6.64		0.105		6.81		22.4		16100		15.8		0.0031		1.95		31.9	3
SW0505-6	2020-12-11		2150		1.12		0.0786		5.93		38.3		3460		10.6		0.0023		0.023		97.3	
	2021-02-26		688		0.458		0.0164		2.07		12.7		1090		3.83		<0.0019		<0.01		43.4	7
SW0505-7	2021-02-26		107		0.329		0.0083		0.25		1.95		157		0.11		<0.0019		<0.01		2.2	7
SW0506	2022-02-02		171		0.544		0.0143		0.56		4.62		369		0.204				<0.01		8.2	35
SW0507	2022-02-02		269		0.694		0.0166		0.95		4.41		330		1.37				<0.01		7.2	1
SW0508	2022-02-02		67.3		1.52		0.0117		0.46		5.18		52.7		0.105				<0.005		12.7	40
SW0516	2022-02-02		111		0.292		<0.005		0.26		3.8		248		0.0987				<0.005		3.06	18
SW0518	2022-02-02		74.2		0.876		0.0085		0.29		3.53		46.1		0.0703				<0.005		2.87	9
SW0522	2022-02-03		176		0.416		0.0443		0.42		7.55		286		0.487				<0.01		8.6	<1
SW0550	2022-02-03		47.9		0.333		<0.005		0.26		1.61		80.1		0.0636				<0.005		1.7	40
SW0554	2022-02-03		1020		1.1		0.052		1.15		2.51		2180		1.1				<0.01		10.7	<1
SW0557	2022-02-03		121		1.65		0.0197		0.51		5.62		91.8		0.198				<0.005		5.3	6
SW0558	2022-02-03		234		0.442		0.0128		1.03		3.86		162		0.16				0.0155		7.47	9
SW0559	2022-02-03		420		0.6		0.0229		0.94		4.72		450		0.558				<0.01		19	>2000
SW0559-1	2021-08-18	12	47.4	1.2	1.24	0.0099	0.0113	0.4	0.4	16	16.2	58.7	99.5	0.0594	0.119		0.0036	<0.005	<0.01	7.11	9.2	200
	2021-08-25	5.65	28.7	1.09	1.11	0.0162	0.0111	0.21	0.24	3.56	5.19	12.1	42.5	0.0671	0.093			<0.005	<0.01	3.67	4.7	200
	2021-09-01	5.3	29.3	1.01	0.99	0.0078	0.0095	0.19	0.19	3.03	3.09	12.6	32.8	0.0209	0.0666			<0.005	<0.005	3.3	4.35	150
	2021-09-08	8.7	26.5	1.11	1.08	<0.005	0.0233	0.16	0.23	4.33	4.31	17.3	40.3	0.026	0.0838			<0.005	<0.005	4.24	13	150
	2021-09-15	16.7	104	0.898	0.9	0.0056	0.0065	0.34	0.42	8.05	9.4	56.1	135	0.0987	0.222			<0.005	0.006	6.93	9.6	250
	2021-09-17	35.5	950	0.639	0.891	0.0068	0.0247	0.43	2.07	6.05	11.7	52.6	1260	0.276	1.89			<0.005	<0.01	14.6	37	>3000
SW0559-1	2021-10-14	34.4	1010	0.627	0.865	<0.005	0.0232	0.33	2.29	4.87	10.1	66.5	1410	0.245	1.74		<0.0019	<0.005	<0.01	8.33	29.3	>700
	2021-10-20	14.7	134	0.818	0.893	0.0104	0.013	0.2	0.37	3.84	4.78	31.1	212	0.2	0.444			<0.005	<0.01	7.18	12.3	>1200
	2021-10-28	30.3	633	0.633	0.883	0.0096	0.0248	0.55	1.65	5.65	8.77	37.7	767	0.0876	0.907		0.0051	<0.005	<0.01	12.1	23.9	5000
	2021-11-03	17.3	234	0.689	0.792	0.007	0.0082	0.38	0.63	4.98	5.66	53.5	216	0.0684	0.219		0.002	<0.005	<0.005	9.71	12.9	1300
	2021-11-09	14.8	202	0.526	0.605	0.0061	0.0095	0.26	1.12	3.51	4.61	42.8	234	0.0926	0.368		0.004	<0.005	<0.005	13.7	19.9	1000
SW0559-2	2021-08-18	22.2	53.8	1.37	1.54	0.009	0.0112	0.33	0.34	16.3	17.2	98.2	155	0.0435	0.114		0.0048	<0.005	<0.01	21.2	24.9	200
	2021-08-25	14.5	70.6	1.39	1.52	0.0064	0.0117	0.39	0.44	4.32	5.83	38.3	162	0.0469	0.344			<0.005	<0.01	19.1	25.3	200
	2021-09-01	10.1	47.5	1.58	1.64	0.0095	0.0174	0.23	0.28	4.17	7.04	22.7	112	0.022	0.429			<0.005	<0.005	14.7	19.6	150
	2021-09-08	13.3	34.6	1.61	1.58	0.0121	0.0124	0.22	0.27	4.9	5.72	52.7	83.1	0.12	0.148			<0.005	<0.005	20.2	20.6	150
	2021-09-15	14.6	41.7	1.41	1.42	0.0228	0.0258	0.28	0.38	7.51	8.81	60.3	97.5	0.0629	0.14			<0.005	0.01	32.8	35.6	250
	2021-09-17	35.6	471	0.601	0.69	0.0087	0.0302	0.49	1.43	6.41	11.3	45.6	617	0.301	1.66			<0.005	<0.01	23.3	42.2	>3000
SW0559-2	2021-10-14	17.6	369	0.643	0.785	0.0182	0.0313	0.28	1.03	5.22	8.44	39.8	540	0.136	0.946		<0.0019	<0.005	<0.01	22.1	37.6	>600
	2021-10-20	27	569	0.829	0.991	0.0098	0.023	0.85	1.78	8.18	11.5	87	791	0.201	0.906			<0.005	<0.01	23.8	39.2	1200
	2021-10-28	27.8	469	0.617	0.737	0.0131	0.0232	0.58	1.44	5.7	8.35	33.3	571	0.0847	0.8		0.0055	<0.005	<0.01	16	25.9	5000
	2021-11-03	15.2	216	0.771	0.863	0.01	0.014	0.34	0.49	5.36	6.29	63.9	241	0.0514	0.203		0.0026	<0.005	<0.005	16.8	20.2	1300
	2021-11-09	12.8	169	0.67	0.77	0.0096	0.0111	0.3	0.44	4.07	5.4	53.6	204	0.0684	0.3		0.003	<0.005	<0.005	23.2	31.4	>1000
SW0564	2022-02-10		208		0.254		0.0099		0.46		4.79		267		0.157				<0.01		3.8	22
SW0567	2022-02-10		5690		1.64		0.0373		7		27.1		6610		2.95				0.039		22.9	35
SW0574	2022-02-10		24.7		0.333		<0.005		0.12		1.85		245		0.047				<0.005		2.93	100
SW0576A	2022-02-10		115		0.534		0.0092		0.59		1.83		186		0.17				<0.01		6	28
SW0580	2022-02-10		41.7		0.237		0.0071		0.28		1.56		123		0.0827				<0.005		2.75	8
SW0589	2021-04-09		732		1.02		0.0086		1.18		2.11		1280		0.427				<0.01		3.6	450
SW0592	2021-08-24		453		1.28		0.0061		0.8		1.58		592		0.186				<0.01		3.4	400

Table 5 (continued)

Station ID	Sample Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Mercury		Silver		Zinc		Flow Rate
		DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	NA
Marine Aquatic Life Guidelines	max	-	-	-	12.5	-	0.12	-	-	-	3	-	-	-	140	-	-	-	3	-	55	
	average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	0.002- 0.01 3	-	1.5	-	10	
Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.59	-	-	1/9 ¹	-	11.4	350	1000	-	81.6	-	-	-	0.1	-	40.5	
	average	50	-	-	-	0.21	-	-	-	-	4	-	-	-	6.5	-	0.002- 0.01 3	-	0.05	-	15	
	2022-02-10		1090		1.05		0.0372		2.06		4.93		1540		0.686				0.014		10	>600
	2020-08-11	315	246	1.46	1.19	0.01	0.0069	0.63	0.55	1.94	1.42	488	330	0.119	0.138		<0.0019	0.0069	<0.01	1.88	2.1	>250
	2020-08-18	8.98	209	2.64	3.02	0.0088	0.0094	0.17	0.46	1.02	1.49	70	722	0.0054	0.163		<0.0019	<0.005	<0.01	0.8	2.1	>250
	2020-08-25	8.17	181	1.27	1.28	0.0061	0.0058	0.19	0.41	0.698	1.02	92.1	323	0.0209	0.103		<0.0019	<0.005	<0.01	0.63	1.6	>200
	2020-09-01	6.64	236	0.927	1.09	<0.005	0.012	0.16	0.64	0.674	1.56	64.6	409	0.0174	0.153		<0.0019	<0.005	<0.01	0.43	2.7	200
	2020-09-08	7.76	161	1.04	1.04	<0.005	0.01	0.17	0.42	1.05	1.4	45.1	294	0.0144	0.107			<0.005	<0.01	0.49	1.9	180
	2020-09-24	15.3	1810	1.14	1.66	<0.005	0.0396	0.29	3.01	3.81	9.35	78	2350	0.0345	1.18		<0.0019	0.005	0.013	2.73	17.4	>500
	2020-10-13	38.5	1030	0.846	1.1	<0.005	0.0169	0.5	1.98	4.14	6.68	164	1340	0.0641	0.643			0.0118	0.01	3.24	11.7	>2000
	2020-10-20	24.3	135	1.11	1.07	<0.005	0.0139	0.41	0.56	3.52	4.25	116	268	0.0312	0.137			<0.005	<0.01	2.59	6.6	1000
	2020-10-27	15	204	0.733	0.786	<0.005	<0.005	0.31	0.65	2.07	2.55	72.5	302	0.0227	0.131			<0.005	<0.01	1.58	3.1	1000
	2020-11-04	36.9	1160	1.12	1.46	0.0096	0.0353	0.52	2.03	4.87	8.97	139	1320	0.0527	0.779			<0.005	0.013	3.9	13	900
	2020-11-12	18.5	151	0.832	0.895	<0.005	0.0095	0.89	0.55	26.2	2.86	94.4	275	0.0354	0.115			<0.005	<0.01	1.72	2.7	>1000
SW0592-4	2020-08-11	36.2	55.2	2.76	2.33	0.0089	0.0098	0.25	0.29	1.23	1.21	431	420	0.0641	0.068		<0.0019	<0.005	<0.01	2.07	1.3	
	2020-08-18	6.08	97	2.26	2.99	0.0093	0.0069	0.22	0.44	0.883	2.57	144	1850	0.0093	0.119		<0.0019	<0.005	<0.01	0.2	1.6	
	2020-08-25	11.1	63.6	1.32	1.37	<0.005	<0.005	0.2	0.27	0.822	1.25	309	672	0.0275	0.065		<0.0019	<0.005	<0.01	0.56	1.1	
	2020-09-01	11	204	1.33	1.68	<0.005	0.0155	0.2	0.61	1.3	2.16	246	906	0.0511	0.22		0.0021	<0.005	<0.01	0.99	3	
	2020-09-08	17.7	3960	1.72	3.25	<0.005	0.113	0.24	5.99	2.02	12.7	363	5400	0.139	2.52			<0.005	0.02	0.91	26	
	2020-09-24	15.4	534	0.909	1.1	0.0053	0.0184	0.32	1.1	3.32	4.88	87	749	0.0395	0.514		<0.0019	0.0064	<0.01	3.15	8.8	>400
	2020-10-13	45.1	1490	1.16	1.62	0.0089	0.0331	0.58	2.7	6.02	9.51	145	1740	0.0761	1.1			0.0096	0.016	7.64	18.2	>2000
	2020-10-20	25.2	204	1.31	1.44	0.0071	0.0324	0.41	0.69	3.66	4.78	110	462	0.0233	0.227			<0.005	<0.01	3.09	8	800
	2020-10-27	18.5	224	0.85	0.952	<0.005	0.0133	0.33	0.69	2.28	2.9	121	420	0.0272	0.161			<0.005	<0.01	2.44	5	800
	2020-11-04	39.7	1490	1.5	2.11	0.0168	0.0716	0.49	2.54	5.14	8.67	175	1830	0.0607	1.22			<0.005	0.016	4.24	15	800
	2020-11-12	22.3	450	0.986	1.32	0.0078	0.0332	0.35	2.51	2.03	3.95	156	832	0.0423	0.381			<0.005	<0.01	2.18	6.1	800
SW0601A	2020-11-19		116		0.126		0.0059		1.1		3.41		395		0.348				<0.005		21.9	<0.01
SW0602	2020-11-19		44.3		1.53		0.123		0.26		7.17		69		1.23				<0.005		18.4	12
SW0603	2020-07-06		414		4.55		0.0428		1.02		14.8		693		1.41				<0.01		9.2	15
	2021-03-30		103		1.57		0.0214		0.74		10.9		145		0.583				0.021		27.3	40
	2021-08-20		149		2.5		0.0686		0.87		15.9		268		2.18				0.19		21.2	5
SW0607	2020-06-19		153		1.36		0.013		0.56		10.5		487		0.51				0.0183		11.2	32
SW0607-1A	2020-06-19		104		1.27		0.0154		0.48		17.6		225		0.564				0.0214		14.2	
SW0613	2020-04-28		74.8		1.26		0.0079		1.14		9.39		678		0.328				<0.005		11	50
	2020-06-23		99.3		1.22		0.0298		0.92		12.5		714		1.58				<0.01		24.4	50
	2022-01-31		354		0.743		0.0248		1.2		17.2		934		1.73				<0.01		43	>200
SW0614	2020-05-01		3050		3.5		0.453		18.1		116		7300		49.9				0.248		377	40
	2021-04-30		147		1.51		0.0259		1.34		21.5		271		1.82				<0.01		38.1	140
	2021-06-24		74		1.49		<0.025		1.37		26.7		150		2.47				<0.05		30.7	26
	2022-01-31		241		0.993		0.0376		0.97		14.6		275		1.07				0.0074		41.5	>250
SW0614-1A	2020-06-23		2860		5.18		7.17		35.3		229		51100		310				0.183		1830	50
SW0620	2020-04-24		68		1.78		0.02		0.98		14.3		237		0.421				<0.01		28.1	40
	2020-06-23		106		2.05		0.0363		0.8		12.2		339		0.529				0.011		24.3	250
	2021-03-17		424		1.63		0.24		0.55		88.6		473		1.05		0.0077		0.037		39.2	22
	2021-06-24		75.3		2.63		0.0357		0.92		22.4		351		0.669				0.026		48.8	11
SW0626	2020-06-23		205		1.95		0.0189		1.23		9.32		1110		0.779				<0.01		147	200
	2021-06-24		228		2.26		0.0217		1.07		26.8		861		2.36				0.011		22	22
SW0627	2020-04-24		115		0.94		0.029		0.69		7.93		244		1.02				0.026		45.5	>80
	2020-06-23		161		1		0.0202		0.62		27.2		377		0.918				<0.01		97.7	500
	2021-06-24		105		1.02		0.0191		0.49		7.1		515		0.884				0.014		42.6	30
SW0627-1	2020-12-02		6450		3.85		0.328		15.7		69.3		7800		39.7				1.25		156	<0.01
SW0627-3	2020-12-02		209		0.84		0.0591		0.99		8.51		572		2.99				0.023		14.2	<0.01
SW0627-3A	2020-12-03		81.1		0.857		0.0256		0.45		6.66		207		0.292				<0.01		39.4	>500
SW0629	2020-04-24		234		1.06		0.283		1.13		252		1010		19				0.428		345	14
	2020-06-25		4850		7.67		0.976		13.2		521		6850		87.8				0.158		1790	40
SW0629-2	2020-11-25		2130		1.11		0.153		8.28		232		4040		8.32				0.076		514	18
	2021-03-05		1230		0.651		0.0727		4.25		31.1		2890		5.81				0.038		82.8	8

Table 5 (continued)

Station ID	Sample Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Mercury		Silver		Zinc		Flow Rate
		DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	NA
Marine Aquatic Life Guidelines	max	-	-	-	12.5		0.12	-	-	-	3	-	-	-	140	-	-	-	3	-	55	
	average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	0.002- 0.01 3	-	1.5	-	10	
Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.59	-	-	1/9 ¹	-	11.4	350	1000	-	81.6	-	-	-	0.1	-	40.5	
	average	50	-	-	-	0.21	-	-	-	-	4	-	-	-	6.5	-	0.002- 0.01 3	-	0.05	-	15	
SW0629-7	2020-11-25		7680		10.3		66.7		195		63900		136000		41100				19.7		59400	18
SW0629-8	2021-03-05		1200		0.694		0.301		5.14		366		2370		133				0.168		442	2
SW0633	2021-08-17		8560		7.72		0.364		16.3		105		13500		59.5		0.0066		0.117		268	30
SW0634	2020-06-25		1000		1.78		1.34		6.26		32.1		11800		54.2				0.09		432	30
SW0634-A	2020-04-27		410		1.6		0.258		2.75		21		3110		3.27				0.217		378	2
	2020-11-25		397		1.25		0.0935		1.79		14.7		3040		2.93				0.021		232	2
SW0636	2020-04-27		1570		1.93		0.174		2.13		48.1		2120		4.87				0.08		100	60
	2020-06-23		1140		1.91		0.0836		3.11		26.5		2450		3.53				0.049		42.1	200
SW0636-1	2020-12-02		490		1.66		0.129		1.55		12.5		1480		1.79				0.018		31.6	<0.01
SW0636-1A	2020-12-02		431		0.677		0.125		1.45		118		1310		4.3				0.319		112	<0.01
SW0649	2020-04-27		304		0.936		0.0395		0.74		49.4		398		0.917				0.011		14.3	7
	2020-05-25		249		0.597		0.0216		0.73		112		295		1.13		0.0066		0.012		18.3	38
	2020-07-17		216		1.35		0.149		0.61		58.2		626		1.12		0.01		0.012		41.6	2
	2021-01-22		210		0.867		0.0242		0.55		28.2		310		0.667		0.0094		<0.01		8.9	7
	2021-08-19		50.8		1.44		0.0116		0.19		29.6		94.1		0.603				0.0061		7.61	1
SW0653	2020-07-17		75.5		1.24		0.012		0.71		7.3		687		0.276		0.0027		<0.02		5.2	20
	2021-03-30		206		0.78		0.0284		0.54		4.26		262		0.299				<0.005		9.52	100
	2021-08-19		62.5		1.07		0.014		0.64		2.69		713		0.503				<0.01		5.27	30
SW0654	2021-03-30		16.5		0.336		0.0229		7.83		1.97		34.3		0.038				<0.005		4.34	25
SW0669	2020-12-02		479		0.832		0.0255		2.01		7.57		1040		1.06				0.012		12.9	24
SW0672	2020-12-02		186		0.709		0.0177		0.43		2.74		182		0.362				<0.005		9.41	3
SW0690D	2020-04-21		134		0.775		0.0189		0.39		2.37		384		0.232				<0.01		3.3	>400
	2020-08-12		221		1.12		0.0236		0.4		1.88		382		0.35				<0.01		4.6	1000
SW0690E	2020-11-24		190		0.944		0.0131		0.63		5.62		212		0.0933				<0.005		1.77	65
SW0692	2020-04-21		13.9		0.284		0.0057		0.17		1.22		69.3		0.0323				<0.005		5.37	7
	2021-04-26		30.7		0.26		0.0057		0.17		1.84		97.7		0.0716				<0.005		3.95	50
	2021-09-15		124		0.659		0.009		0.47		4.02		304		0.279				<0.005		14.3	5
SW0695-1A	2020-12-03		81.9		0.409		<0.005		0.21		2.6		159		0.096				<0.01		4.7	8
SW0709B-2A	2020-08-12	5.22	84.2	0.385	0.358	<0.005	<0.005	0.11	0.19	0.841	0.85	149	408	0.114	0.077		<0.0019	<0.005	<0.01	0.65	1.1	1000
	2020-08-19	3.83	52.8	0.372	0.465	<0.005	<0.005	<0.1	0.21	0.485	0.66	168	459	0.0116	0.0846		<0.0019	<0.005	0.0106	0.29	0.71	500
	2020-08-26	3.61	45.5	0.29	0.345	<0.005	<0.005	<0.1	<0.1	0.504	0.91	205	419	0.0164	0.068		0.0038	<0.005	<0.01	0.23	1	500
	2020-09-02	3.35	31.3	0.239	0.248	<0.005	<0.005	<0.1	<0.1	0.458	0.529	147	287	0.0152	0.0591		<0.0019	<0.005	<0.005	0.29	0.49	567
	2020-09-09	3.31	31.2	0.269	0.293	<0.005	<0.005	<0.1	<0.1	0.465	0.63	144	315	0.0107	0.044			<0.005	<0.01	0.29	<1	500
	2020-09-23	7.94	246	0.288	0.286	<0.005	<0.005	0.1	0.47	1.18	2.11	98.7	515	0.0228	0.24		<0.0019	<0.005	<0.01	1.38	5.7	>2000
	2020-10-14	551	442	0.317	0.294	<0.005	<0.005	0.68	0.63	2.21	2.18	508	544	0.422	0.221			<0.005	<0.01	2.87	3.1	>2000
	2020-10-20	17.7	221	0.241	0.267	<0.005	<0.005	0.17	0.32	1.12	1.5	155	399	0.0204	0.125			<0.005	<0.01	0.55	1.6	>2000
	2020-10-27	<0.5	107	<0.02	0.15	<0.005	<0.005	<0.1	0.17	<0.05	0.645	1.1	521	<0.005	0.072			<0.005	<0.005	0.28	0.91	>2000
	2020-11-03	14.2	402	0.229	0.291	<0.005	0.0067	0.35	0.9	1.42	2.54	128	617	0.0673	0.472			<0.005	<0.01	2.4	6.1	>2000
	2020-11-12	14.2	90.5	0.179	0.192	<0.005	<0.005	0.12	0.2	0.613	0.78	142	238	0.022	0.054		<0.0019	<0.005	<0.01	0.42		

Table 5 (continued)

Station ID	Sample Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Mercury		Silver		Zinc		Flow Rate
		DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	NA
Marine Aquatic Life Guidelines	max	-	-	-	12.5	-	0.12	-	-	-	3	-	-	-	140	-	-	-	3	-	55	
	average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	0.002- 0.01 3	-	1.5	-	10	
Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.59	-	-	1/9 ¹	-	11.4	350	1000	-	81.6	-	-	-	0.1	-	40.5	
	average	50	-	-	-	0.21	-	-	-	-	4	-	-	-	6.5	-	0.002- 0.01 3	-	0.05	-	15	
	2020-10-14	40.4	36.3	0.186	0.182	<0.005	<0.005	<0.1	<0.1	0.229	0.23	420	337	0.0311	0.032			<0.005	<0.01	0.26	<1	600
	2020-10-20	5.97	44.7	0.179	0.169	<0.005	<0.005	<0.1	<0.1	0.139	0.31	148	356	<0.005	0.041			<0.005	<0.01	<0.1	<1	500
	2020-10-27	<0.5	62.5	<0.02	0.157	<0.005	<0.005	<0.1	0.1	0.367	0.307	<1	749	0.0446	0.0301			<0.005	<0.005	0.28	0.27	>1000
	2020-11-03	9.61	48.9	0.165	0.138	<0.005	<0.005	<0.1	0.11	0.311	0.57	255	418	0.009	0.032			<0.005	<0.01	0.3	<1	>2000
	2020-11-12	15.4	74.6	0.167	0.183	<0.005	<0.005	<0.1	0.17	0.444	0.57	175	326	0.0112	0.04		<0.0019	<0.005	<0.01	0.28	<1	>1000
SW0709B-6	2020-08-12	7.32	34	0.172	0.2	<0.005	<0.005	<0.1	0.18	0.45	0.449	134	229	0.017	0.0274		0.0021	<0.005	<0.005	0.55	0.53	300
	2020-08-19	8.14	99.1	0.181	0.471	<0.005	0.178	<0.1	0.39	0.458	1.31	142	333	0.0152	0.257		<0.0019	<0.005	0.0275	0.45	4.45	300
	2020-08-26	7.19	107	0.157	0.214	<0.005	<0.005	<0.1	0.2	0.443	0.788	148	359	0.0173	0.0895		<0.0019	<0.005	0.006	0.34	1.21	300
	2020-09-02	6.53	102	0.163	0.181	<0.005	<0.005	<0.1	0.27	0.434	0.7	117	327	0.0104	0.097		<0.0019	<0.005	<0.01	0.29	1.2	400
	2020-09-09	7.06	76.6	0.146	0.186	<0.005	<0.005	<0.1	0.15	0.413	0.563	120	293	0.0134	0.0494			<0.005	<0.005	0.35	0.73	100
	2020-09-23	8.96	72.1	0.181	0.151	<0.005	<0.005	<0.1	0.19	0.439	0.65	153	293	0.0145	0.057		<0.0019	<0.005	<0.01	0.65	1.4	200
	2020-10-14	665	444	0.284	0.24	<0.005	<0.005	0.81	0.61	1.79	1.67	697	594	0.185	0.169			<0.005	<0.01	1.81	1.6	600
	2020-10-20	28.9	158	0.193	0.265	<0.005	<0.005	0.14	0.27	0.624	0.9	248	461	0.027	0.084			<0.005	<0.01	0.4	<1	600
	2020-10-27	<0.5	70.7	<0.02	0.158	<0.005	<0.005	<0.1	0.13	<0.05	0.701	<1	261	<0.005	0.041			<0.005	<0.005	0.21	0.85	700
	2020-11-03	34.7	349	0.187	0.208	<0.005	<0.005	0.13	0.45	0.744	1.26	156	427	0.0352	0.154			<0.005	<0.01	0.69	2.4	>1000
	2020-11-12	13.9	45.9	0.153	0.174	<0.005	<0.005	<0.1	0.23	0.44	0.6	114	178	0.0207	0.051		<0.0019	<0.005	<0.01	0.52	<1	>2000
SW0709B-6A	2020-11-03	169	1990	0.239	0.42	<0.005	0.0174	0.32	2.15	1.82	4.26	202	1500	0.0954	0.958			<0.005	<0.01	0.78	5.3	550
SW0710	2022-02-15		591		0.514		0.0141		0.91		6.35		798		0.74				0.014		6.1	6
SW0712	2020-07-10		120		0.375		0.0128		0.43		4.36		204		0.997			<0.005			5.69	60
	2022-02-15		24.2		0.234		0.0108		0.14		2.47		60		0.0498			<0.005			6.03	9
SW0722	2020-07-10		143		1.68		0.0093		0.57		3.06		269		0.272			<0.005			3.63	10
	2021-03-17		32.4		0.695		0.006		0.66		1.78		38.3		0.0426			<0.005			3.58	10
	2021-09-16		3030		3.54		0.0477		4.96		16.4		2870		1.86				0.063		88.5	10
	2022-02-15		42.5		0.459		0.0106		0.39		2.69		78.3		0.192			<0.005			4.72	20
SW0722AA	2022-02-15		413		0.724		0.0175		1.15		5.17		646		1.31			<0.01			14.8	5
SW0727	2022-02-15		27.4		0.268		0.0104		0.16		1.38		26.7		0.0666			<0.005			2.93	6
SW0736A	2022-02-15		62.3		0.265		0.007		0.41		2.53		95.1		0.123			<0.01			5.5	6
SW0737	2021-03-17		23.7		0.521		0.0074		0.33		2.54		60		0.0322			<0.005			3.69	5
	2021-08-19		24.1		0.682		0.0067		0.24		1.33		82.7		0.0705			<0.005			5.16	1
SW0742	2020-07-09		53.5		0.897		0.0167		0.34		3.87		822		0.175		0.0276		<0.01		5.6	15
	2021-03-17		148		0.52		0.0089		0.49		1.76		1200		0.112		0.0133		<0.01		3.6	14
	2021-08-05		67.9		0.616		0.0155		0.33		2.23		1140		0.114		0.0348		<0.01		4.1	2
	2022-02-17		104		0.372		0.0075		0.34		1.49		859		0.107		0.0134		<0.01		2.7	7
SW0742-1	2020-12-01		213		0.507		0.0104		0.57		2.67		872		0.197		0.0077		<0.01		2.7	32
SW0742-2A	2020-12-01		4990		1.64		0.202		8.67		33.5		7140		5.01		0.0044		0.119		76.2	4
	2021-05-12		57.5		0.463		0.0168		0.15		2.37		73		0.0648		0.0025		<0.005		2.5	3
SW0742-2B	2020-12-01		211		0.497		0.0105		0.64		2.51		781		0.196		0.0061		<0.01		2.7	24
	2021-05-12		180		0.606		0.0059		0.54		1.24		2050		0.18		0.121		<0.01		2.4	30
	2021-08-05		8320		8.6		0.199		13.5		26.7		80700		9.36		0.25		0.078		80.8	2
SW0742-2C	2021-08-05		596		1.03		0.0178		1.04		1.62		2540		0.537		<0.0019		<0.01		6.3	
SW0742B	2022-02-17		177		0.347		0.008		0.38		3.61		674		0.158				0.0055		3.44	
SW0744	2021-03-17		131		0.488		0.0111		0.48		2.87		482		0.3		0.0031		0.0072		9.18	180
	2021-08-05		160		1.48		0.0119		0.57		4.57		712		0.683				0.013		9.5	150
	2022-02-17		67		0.493		0.0109		0.3		2.56		398		0.151				<0.005		11.8	>250
SW0744A	2022-02-17		37.3		0.369		0.0231		0.16		2.15		227		0.109				<0.01		19.9	<1
SW0744B	2022-01-28		110		0.788		0.0193		0.39		8.43		350		0.213				0.0061		7.02	5
	2022-02-17		124		0.959		0.0278		0.52		5.56		418		0.237				<0.01		9.9	5
SW0758A	2020-04-16		160		0.459		0.0119		0.37		3.77		258		0.859				0.0054		3.7	8
	2021-04-27		227		0.882		0.0211		1.32		4.25		434		0.591				0.0092		7.5	5
SW0767	2021-04-01		<60		1.43		0.12		<2		<2		193		<0.4		0.0021		<0.2		<20	120
	2021-06-25		187		1.4		<0.25		<5		6		1490		4.4		<0.0019		<0.5		<50	5
SW0769	2021-06-25		156		1.39		0.091		0.58		6.73		401		3.54				<0.05		14.6	40
SW0779	2022-02-07		5930		2.21		0.161		8.68		33.1		7350		11.5				0.087		91.5	9
	2022-02-16		55.6		0.454		0.0128		0.3		1.8		136		0.318				<0.005		2.9	2

Table 5 (continued)

Station ID	Sample Date	Aluminum		Arsenic		Cadmium		Chromium		Copper		Iron		Lead		Mercury		Silver		Zinc		Flow Rate
		DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	DIS	TOT	NA
Marine Aquatic Life Guidelines	max	-	-	-	12.5	-	0.12	-	-	-	3	-	-	-	140	-	-	-	3	-	55	
	average	-	-	-	-	-	-	-	-	-	2	-	-	-	2	-	0.002- 0.01 3	-	1.5	-	10	
Freshwater Aquatic Life Guidelines	max	100	-	-	5	0.59	-	-	1/9 ¹	-	11.4	350	1000	-	81.6	-	-	-	0.1	-	40.5	
	average	50	-	-	-	0.21	-	-	-	-	4	-	-	-	6.5	-	0.002- 0.01 3	-	0.05	-	15	
SW0780	2020-11-20		218		0.953		0.0168		0.69		8.02		462		0.391				0.018		14.4	22
	2021-04-01		67.9		0.537		0.0108		0.59		3.49		110		0.309				<0.01		8.2	35
	2022-02-07		28.6		0.76		0.0123		0.49		3.3		43.7		0.191				<0.005		8.2	6
SW0781	2020-07-09		49.6		0.374		0.0073		0.26		4.11		225		0.282				<0.005		7.97	100
	2020-11-20		216		1.24		0.0268		1.29		15.6		253		1.41				<0.01		21.4	
	2021-04-01		103		0.416		0.01		0.72		2.7		361		0.488				<0.01		11.2	300
	2021-08-25		108		0.307		0.0145		0.5		4.7		442		0.526				<0.01		13.5	500
	2022-02-07		57.7		0.423		0.0118		0.32		3.39		419		0.143				<0.005		6.28	50
SW0805	2021-08-25		235		0.534		0.0222		0.47		15		309		0.518				0.019		15	
	2022-01-28		130		0.474		0.0171		0.99		9.71		221		0.505				0.015		12	200
SW0806	2020-07-22		285		1.75		0.0443		0.85		5.76		317		0.381				<0.01		5.2	5
	2021-04-01		194		0.723		0.0174		0.47		3.55		456		0.245				<0.01		9.3	40
	2021-08-25		757		1.7		0.0615		1.43		15.3		903		0.864				0.012		29.5	
	2022-01-28		126		0.604		0.0188		0.33		3.51		321		0.145				<0.005		6.43	35
SW0814	2022-02-16		411		0.785		0.017		0.85		5.25		346		0.881				0.0109		9.36	<1
SW0854	2020-04-27		1260		1.5		0.0224		2.39		10.9		1420		0.868				<0.01		12.1	20
	2020-06-22		1630		2.61		0.0211		3.86		10		2080		1.53				0.011		14.7	50
	2021-03-31		213		0.634		0.0188		0.84		8.24		334		0.6				0.031		17.9	60
	2021-06-25		65.4		3.33		0.03		2.1		8.73		973		0.368				<0.01		16.1	25
SW0866	2020-09-03		24.4		0.295		0.0113		0.24		7.15		33.3		0.0279				<0.005		10.3	7
	2020-11-20		115		0.336		0.0105		0.25		2.96		190		0.126				<0.005		28.2	40
	2021-03-31		97.8		0.205		0.0075		0.2		1.77		226		0.127				<0.01		14.8	35
SW0874	2020-11-20		228		0.364		0.0167		0.46		4.71		248		0.355				<0.01		16.8	18
	2021-03-31		555		0.427		0.0228		0.93		5.22		695		0.899				0.043		23.2	7
SW0879	2021-06-04		35.1		0.414		<0.005		0.14		1.28		192		0.044				<0.005		3.28	40
SW0882	2020-07-24		114		0.258		0.0114		0.33		2.15		150		0.303				<0.01		10.7	15
	2021-05-07		42		0.225		0.0146		0.53		2.68		93.3		0.131				<0.01		15.4	30
	2021-08-12		19.4		0.259		0.007		0.17		1.75		34.5		0.0935				<0.005		6.84	20
SW0934	2021-04-27		1930		0.672		0.0233		3.64		8.91		2450		2.09				0.012		17.4	10
	2021-08-06		57.5		0.213		0.0141		0.56		1.72		79.2		0.153				<0.01		7	10

Notes:
All concentrations in µg/L; except flow rate which is in min/L
British Columbia water quality guidelines for protection of freshwater or marine aquatic life were used for comparison
Although aquatic life guidelines would not apply to stormdrains, as they are not viable habitat for aquatic life, these comparisons indicate potential contamination
A hardness of 100 mg/L CaCO3 was used to calculate hardness dependant water quality parameters
TOT = total state, DIS - dissolved
Cr (IV) / Cr (III)
Guideline If methyl mercury is 5% of the total mercury; methyl mercury was not measured in these samples

xx	Value exceeds the provincial guideline for protection of freshwater aquatic life
xx	Value exceeds the provincial guideline for protection of marine aquatic life
xx	Value exceeds the provincial guidelines for the marine and freshwater aquatic life
xx	Italicized value exceeds a guideline which is only partially applicable. Further investigation is needed.

APPENDIX F
2021 WATERCOURSE MONITORING DATA

Table 1 Summary Table for 5 in 30 Water Quality Data Collected for Douglas Creek and Goldstream River in 2021

		parameter	Alkalinity	Aluminum	Aluminum	Antimony	Antimony	Arsenic	Arsenic	Barium	Barium	Beryllium	Beryllium	Bismuth	Bismuth	Boron	Boron	Cadmium	Cadmium
		state	TOT	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DIS	TOT	DISS
		unit	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BC ENV FW Aquatic Life Guidelines		max			100	20 ¹		5		5,000 ¹		0.13 ¹				1,200			0.09 - 0.83 ²
		mean			50					1,000 ¹									0.06 - 0.27 ²
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	0%	0%	0%	20%
SW0559-1		min	55	26.5	5.3	0.325	0.311	0.9	0.898	8.36	7.6	0.01	0.01	0.005	0.005	26	26	0.0065	0.005
		max	130	104	16.7	0.605	0.602	1.24	1.2	13.5	13.2	0.01	0.01	0.01	0.005	177	173	0.0233	0.0162
		mean	107	47.2	10	0.43	0.417	1.1	1.1	11.8	11.6	0.01	0.01	0.01	0.01	69	69	0.012	0.009
		sd	27	29.4	4	0.11	0.114	0.1	0.1	1.8	2.1	0.00	0.00	0.00	0.00	55	54	0.006	0.004
	first flush	2021-09-17	13	950	35.5	0.513	0.371	0.891	0.639	9.88	3.8	0.016	<0.01	0.038	<0.005	15	12	0.0247	0.0068
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.6	100%	40%	80%	0%	0%	0%	20%
		min	37	134	14.7	0.405	0.326	0.605	0.526	9.92	5.08	0.01	0.01	0.005	0.005	13	12	0.0082	0.005
		max	100	1010	34.4	0.664	0.444	0.893	0.818	14.1	12.4	0.016	0.01	0.136	0.0075	32	32	0.0248	0.0104
		mean	62.4	443	22.3	0.474	0.381	0.808	0.659	12.4	9.4	0.01	0.01	0.04	0.006	23	22	0.02	0.01
		sd	24	333	8.4	0.097	0.039	0.107	0.095	1.5	2.6	0.00	0.00	0.05	0.001	7	7	0.01	0.00
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	0%	0%	0%	0%
SW0559-2		min	100	34.6	10.1	0.34	0.332	1.42	1.37	12.4	11.9	0.01	0.01	0.005	0.005	27	28	0.0112	0.0064
		max	130	70.6	22.2	0.416	0.417	1.64	1.61	15	14.7	0.01	0.01	0.01	0.005	170	165	0.0258	0.0228
		mean	116	50	15	0.37	0.36	1.54	1.47	13.28	13.1	0.0	0.01	0.01	0.01	66	66	0.02	0.01
		sd	10	12	4	0.03	0.03	0.07	0.10	0.92	1.0	0.00	0.00	0.00	0.00	53	50	0.01	0.01
	first flush	2021-09-17	13	471	35.6	0.531	0.375	0.69	0.601	7.25	4.36	<0.01	<0.01	0.046	<0.005	14	11	0.0302	0.0087
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	100%	40%	100%	0%	0%	0%	0%
		min	38	169	12.8	0.375	0.353	0.737	0.617	10.8	7.64	0.01	0.01	0.005	0.005	16	15	0.0111	0.0096
		max	94	569	27.8	0.691	0.592	0.991	0.829	15.2	14.6	0.011	0.01	0.04	0.005	33	32	0.0313	0.0182
		mean	66	358	20	0.49	0.42	0.83	0.71	12.98	10.6	0.0104	0.01	0.02	0.01	24	22	0.02	0.01
		sd	21	150	6	0.11	0.09	0.09	0.08	1.64	2.6	0.0	0.00	0.01	0.00	7	7	0.01	0.00
Goldstream	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	0%	0%	100%	100%	0%	0%	0%	0%	100%	100%	100%	100%	100%	60%	100%	100%
6003-1		min	29	5.99	2.65	0.02	0.02	0.084	0.144	3.05	2.97	0.01	0.01	0.005	0.005	10	10	0.005	0.005
		max	33	7.53	4	0.02	0.02	0.184	0.201	3.34	3.45	0.01	0.01	0.005	0.005	10	12	0.005	0.005
		mean	31.2	7	3	0.02	0.02	0.16	0.18	3.25	3.2	0.0	0.01	0.01	0.01	10	10	0.005	0.01
		sd	1	1	1	0.00	0.00	0.04	0.02	0.11	0.2	0.00	0.00	0.00	0.00	0	1	0.000	0.00
	first flush	2021-09-15	31	6.81	2.77	<0.02	<0.02	0.172	0.171	3.21	3.18	<0.01	<0.01	<0.005	<0.005	<10	<10	0.0051	<0.005
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	20%	80%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	80%	100%
		min	12	9.81	5.06	0.02	0.02	0.147	0.116	2.98	3.01	0.01	0.01	0.005	0.005	10	10	0.005	0.005
		max	28	265	55.5	0.027	0.021	0.307	0.141	4.87	3.17	0.01	0.01	0.01	0.005	10	10	0.0102	0.005
		mean	20	98	31	0.02	0.02	0.19	0.13	3.71	3.1	0.01	0.01	0.01	0.01	10	10	0.01	0.01
		sd	5	89	19	0.00	0.00	0.06	0.01	0.75	0.1	0.00	0.00	0.00	0.00	0	0	0.00	0.00

Table 1, continued

		parameter	Alkalinity	Aluminum	Aluminum	Antimony	Antimony	Arsenic	Arsenic	Barium	Barium	Beryllium	Beryllium	Bismuth	Bismuth	Boron	Boron	Cadmium	Cadmium
		state	TOT	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DIS	TOT	DISS
		unit	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BC ENV FW Aquatic Life Guidelines		max			100	20 ¹		5		5,000 ¹		0.13 ¹				1,200			0.09 - 0.83 ²
		mean			50					1,000 ¹									0.06 - 0.27 ²
Goldstream River	fall	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Upstream		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	0%	0%	100%	100%
SW6003-3		min	78	16	4.45	0.076	0.074	0.545	0.53	7.25	6.99	0.01	0.01	0.005	0.005	19	18	0.005	0.005
		max	85	41.5	7.43	0.108	0.102	0.556	0.555	8.77	7.44	0.01	0.01	0.01	0.005	19	18	0.005	0.005
		mean	82	29	5.94	0.092	0.088	0.551	0.54	8.01	7.22	0.01	0.01	0.0075	0.005	19	18	0.005	0.005
		sd	35	34	10.42	0.042	0.041	0.218	0.24	3.12	3.02	0.00	0.00	0.00	0.002	8	7.40	0.001	0.002
Goldstream River	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	0%	0%	80%	80%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%
SW6003-5		min	15	7.14	4.17	0.02	0.02	0.11	0.2	2.87	2.8	0.01	0.01	0.005	0.005	10	10	0.005	0.005
		max	16	15.6	9.98	0.029	0.021	0.232	0.265	3.2	3.21	0.01	0.01	0.01	0.005	10	10	0.005	0.005
		mean	15	10.4	5.76	0.02	0.02	0.189	0.2	3.1	3.0	0.01	0.01	0.01	0.005	10	10	0.005	0.01
		sd	0	3.0	2.15	0.00	0.00	0.042	0.0	0.1	0.2	0.00	0.00	0.00	0.000	0	0	0.000	0.00
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	60%	60%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%
		min	10	10.7	7.42	0.02	0.02	0.126	0.132	3.06	2.83	0.01	0.01	0.005	0.005	10	10	0.005	0.005
		max	15	213	57.7	0.028	0.025	0.244	0.14	4.43	3.64	0.01	0.01	0.01	0.005	10	10	0.005	0.005
		mean	13	72	35.9	0.02	0.02	0.162	0.14	3.40	3.20	0.01	0.01	0.01	0.005	10	10	0.005	0.005
		sd	2	73	19.1	0.00	0.00	0.042	0.00	0.52	0.28	0.00	0.00	0.00	0.000	0	0	0.000	0.000

Table 1, continued

		parameter	Calcium	Calcium	Chloride	Chromium	Chromium	Cobalt	Cobalt	Sp. Conductivity 25°C.	Copper	Copper	Oxygen	O. Carbon	E.Coli	Flow Rate	Hardness	Iron	Iron
		state	TOT	DISS	DISS	TOT	DISS	TOT	DISS	NA	TOT	DISS	DISS	DISS	NA	NA	TOT	TOT	DISS
		unit	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µS/cm	µg/L	µg/L	mg/L	mg/L	CFU/100 mL	L/min	mg/L as CaCO ₃	µg/L	µg/L
BC ENV FW Aquatic Life Guidelines		max				1 / 9 ^{1,3}		110				0.4 - 22.5 ⁴	5 ⁵		400 ⁶			1,000	350
		mean						4				0.2 - 3.8 ⁴	8 ⁵		200 ⁶				
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SW0559-1		min	18.4	19.3	10	0.19	0.16	0.0673	0.048	169.2	3.09	3.03	8.51	3.1	12	150	63.4	32.8	12.1
		max	42.9	42.1	28	0.42	0.4	0.114	0.0885	386.1	16.2	16	10.01	19	340	250	152	135	58.7
		mean	35.8	36.5	23	0.30	0.3	0.093	0.065	329.5	7.6	7	9.38	7.5	140	190	126	70.0	31.4
		sd	8.9	8.7	7	0.09	0.1	0.017	0.013	81.0	4.78	5	0.60	5.9	144	37	32	40.3	21.4
	first flush	2021-09-17	5.69	5.7	4.1	2.07	0.43	0.659	0.0246		11.7	6.05	9.73	6.8	3200	>3000	19.5	1260	52.6
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%
		min	10.3	9.85	5.8	0.37	0.2	0.12	0.0286	94.7	4.61	3.51	10.19	3.5	80	700	36.9	212	31.1
		max	35.6	35.7	20	2.29	0.55	0.69	0.0918	320.2	10.1	5.65	10.67	6.3	2800	5000	125	1410	66.5
		mean	23	23	14	1.21	0.34	0.305	0.063	204.1	6.78	4.57	10.37	4.7	319	1840	81	568	46.3
		sd	9	9	5	0.69	0.12	0.225	0.022	85.1	2.23	0.78	0.18	0.9	1038	1593	32	471	12.5
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
SW0559-2		min	38.7	38.9	19	0.27	0.22	0.074	0.0553	345.9	5.72	4.17	6.59	3.5	23	150	133	83.1	22.7
		max	42	43.6	27	0.44	0.39	0.206	0.146	375.2	17.2	16.3	8.59	9.9	220	250	149	162	98.2
		mean	40	41	24	0.34	0.29	0.127	0.078	365.7	8.92	7.4	7.76	5	106	190	140	122	54.4
		sd	1	2	3	0.06	0.06	0.052	0.034	10.7	4.29	4.6	0.85	2	79	37	6	31	25.4
	first flush	2021-09-17	5.52	5.66	5	1.43	0.49	0.409	0.0234		11.3	6.41	9.33	6.7	3100	>3000	18.1	617	45.6
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%
		min	17.2	18	9.8	0.44	0.28	0.146	0.03	157.1	5.4	4.07	9.02	3.9	70	600	58	204	33.3
		max	36.7	36.2	21	1.78	0.85	0.396	0.103	336.7	11.5	8.18	9.91	6.9	14000	5000	129	791	87
		mean	25	25	15	1.04	0.5	0.264	0.078	217.3	8.0	5.7	9.41	5	933	1820	87	469	56
		sd	8	8	5	0.52	0.2	0.104	0.026	70.0	2.1	1.4	0.31	1	5311	1608	30	220	19
Goldstream	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	0%	0%	80%	80%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	0%	0%
6003-1		min	10.3	10.6	5.9	0.1	0.1	0.0171	0.0145	73.5	0.411	0.324	9.44	0.57	4	8000	33.3	9.1	3
		max	11.3	11.1	6.5	0.1	0.11	0.0229	0.0167	96.2	0.546	0.454	10.93	0.99	27	8436	36.5	14	8.8
		mean	11	11	6	0.1	0.10	0.020	0.016	91.0	0.449	0.39	9.94	0.77	17	8174	35	11	5.6
		sd	0	0	0	0.0	0.00	0.002	0.001	8.8	0.050	0.044	0.61	0.15	8	214	1	2	2.2
	first flush	2021-09-15	11.1	11.6	6.2	<0.1	<0.1	0.0228	0.0148	97.3	0.437	0.338	10.07	0.98	6	8500	36.1	8.4	3.9
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	20%	60%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
		min	5.1	5.14	5	0.1	0.1	0.015	0.0121	49.5	0.449	0.365	11.27	1.6	2	8500	17.8	9.6	4.1
		max	9.45	9.31	5.8	0.54	0.11	0.314	0.0332	83.5	1.93	1	11.96	4.1	130	17000	30.9	378	38.6
		mean	7	7	5	0.2	0.1	0.105	0.025	65.3	1.0	0.7	11.68	3	11	15300	24	130	22.7
		sd	2	1	0	0.2	0.0	0.107	0.008	11.7	0.5	0.2	0.24	1	49	3400	5	133	12.9

Table 1, continued

		parameter	Calcium	Calcium	Chloride	Chromium	Chromium	Cobalt	Cobalt	Sp. Conductivity 25°C.	Copper	Copper	Oxygen	O. Carbon	E.Coli	Flow Rate	Hardness	Iron	Iron
		state	TOT	DISS	DISS	TOT	DISS	TOT	DISS	NA	TOT	DISS	DISS	DISS	NA	NA	TOT	TOT	DISS
		unit	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µS/cm	µg/L	µg/L	mg/L	mg/L	CFU/100 mL	L/min	mg/L as CaCO ₃	µg/L	µg/L
BC ENV FW Aquatic Life Guidelines		max				1 / 9 ^{1,3}		110				0.4 - 22.5 ⁴	5 ⁵		400 ⁶			1,000	350
		mean						4				0.2 - 3.8 ⁴	8 ⁵		200 ⁶				
Goldstream River	fall	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Upstream		%nd	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%
SW6003-3		min	30.9	30.9	26	0.11	0.1	0.0443	0.0341	250.3	0.76	0.629	10.51	3.3	26	300	101	35.5	15.2
		max	31.7	33.1	27	0.12	0.11	0.064	0.0408	282.3	0.804	0.698	11.01	3.9	87	800	104	92.9	30.4
		mean	31.3	32.0	27	0.12	0.11	0.054	0.03745	266.3	0.78	0.7	10.76	3.6	34	550	103	64.2	22.8
		sd	13.6	14.0	12	0.04	0.04	0.03	0.012	116.0	0.18	0.20	4.71	1	29	6090	45	39.2	6.9
Goldstream River	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	0%	0%	100%	80%	0%	0%	0%	0%	0%	0%	0%	0%	60%	0%	0%	0%
SW6003-5		min	4.81	4.86	3.3	0.1	0.1	0.016	0.0105	25.1	0.464	0.369	8.64	0.8	1	8000	16	19.6	9.9
		max	5.19	5.25	3.7	0.1	0.16	0.025	0.0212	48.8	0.59	0.4	10.37	1.2	6	8436	17.2	39.4	26.5
		mean	5	5	3	0.1	0.1	0.021	0.015	43.04	0.49	0.4	9.68	1.0	3	8087	17	28	20.3
		sd	0	0	0	0.0	0.0	0.003	0.004	9.00	0.05	0.0	0.59	0.2	2	174	0.4	8	6.1
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	40%	40%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%	0%	0%
		min	4.51	4.44	3.3	0.1	0.1	0.0207	0.0102	40.7	0.491	0.462	11.31	1.6	1	8500	15.8	17.6	7.3
		max	5.09	5.06	4.9	0.39	0.12	0.238	0.037	49.6	1.43	0.848	12.08	5	46	17000	17.4	288	42
		mean	4.74	4.7	4.1	0.2	0.1	0.076	0.026	45.8	0.82	0.72	11.7	3	5	15300	16	87	27
		sd	0.24	0.2	0.6	0.1	0.0	0.082	0.010	2.9	0.32	0.14	0.3	1	17	3400	0.6	102	13

Table 1, continued

		parameter	Lead	Lead	Lithium	Lithium	Magnesium	Magnesium	Manganese	Manganese	Mercury	Molybdenu m	Molybdenu m	N - Nh3 (As N)	Nitrite as N	Nitrate as N	Nickel	Nickel	Phosphorus
		state	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	TOT	DISS	TOT	DISS	DISS	TOT	DISS	TOT
		unit	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/l	mg/L	µg/L	µg/L	mg/L
BC ENV FW Aquatic Life Guidelines		max	8.17-125 ⁷			870 ¹				720-2083 ⁸			2,000		0.06	32.8		25 -110 ^{1,9}	0.01 ¹⁰
		mean	3.6-8.2 ⁷							677-1221 ⁸			1,000		0.02	3			0.005 ¹⁰
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	1	5	5		5	5	5	5	5
Mouth		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		100%	0%	0%	0%	0%
SW0559-1		min	0.0666	0.0209	0.94	0.97	4.2	4.15	5.67	2.69	0.0036	0.774	0.81		0.005	0.296	0.765	0.825	0.015
		max	0.222	0.0987	2.12	2.19	11	10.7	14.2	7.09	0.0036	1.35	1.3		0.05	0.71	1.82	1.76	0.039
		mean	0.12	0.05	1.59	1.64	9	8.9	8.5	5	0.0	1.14	1.12		0.01	0.52	1.15	1.08	0.025
		sd	0.06	0.03	0.38	0.39	2	2.4	3.0	1	0.0	0.20	0.17		0.02	0.13	0.36	0.35	0.009
	first flush	2021-09-17	1.89	0.276	0.91	<0.5	1.29	0.86	72.6	0.839		0.35	0.33		0.0093	0.284	2.27	0.582	0.1
	fall	n	5	5	5	5	5	5	5	5	4	5	5		5	5	5	5	4
		%nd	0%	0%	0%	20%	0%	0%	0%	0%	25%	0%	0%		20%	0%	0%	0%	0%
		min	0.219	0.0684	0.78	0.5	2.71	2.17	4.77	0.468	0.0019	0.496	0.435		0.005	0.198	0.87	0.56	0.06
		max	1.74	0.245	1.4	1.36	8.79	8.83	35.6	3.32	0.0051	0.972	0.968		0.0117	2.39	2.14	1.03	0.12
		mean	0.74	0.1	1.0	0.8	5.58	5.34	17	1.71	0.003	0.690	0.644		0.007	1.39	1.420	0.80	0.1
		sd	0.55	0.1	0.2	0.3	2.25	2.43	12	1.10	0.001	0.167	0.197		0.002	0.85	0.565	0.20	0.03
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	1	5	5		5	5	5	5	5
Upstream		%nd	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		80%	0%	0%	0%	0%
SW0559-2		min	0.114	0.022	1.41	1.32	8.75	8.74	8.8	3.09	0.0048	0.952	0.82		0.005	0.464	0.925	0.80	0.01
		max	0.429	0.12	2.33	2.27	10.7	10.4	25.2	18.6	0.0048	1.49	1.49		0.05	2.09	1.93	1.95	0.03
		mean	0.235	0.06	1.73	1.8	9.6	9.6	16.02	9.0	0.0	1.198	1.2		0.015	0.83	1.235	1.12	0.02
		sd	0.127	0.03	0.33	0.3	0.7	0.6	6.73	5.2	0.0	0.174	0.2		0.018	0.63	0.365	0.43	0.01
	first flush	2021-09-17	1.66	0.301	<0.5	<0.5	1.04	0.787	45.1	1.27		0.482	0.44		0.0095	0.269	1.44	0.613	0.082
	fall	n	5	5	5	5	5	5	5	5	4	5	5		5	5	5	5	4
		%nd	0%	0%	0%	20%	0%	0%	0%	0%	25%	0%	0%		40%	0%	0%	0%	0%
		min	0.203	0.0514	0.59	0.5	3.65	3.48	14.8	0.438	0.0019	0.621	0.592		0.005	0.352	1.14	0.64	0.05
		max	0.946	0.201	1.28	1.13	8.99	9.03	40.2	13.4	0.0055	4.34	4.67		0.0427	2.97	1.73	1.20	0.127
		mean	0.631	0.11	0.99	0.8	5.9	5.7	25.68	7.6	0.0033	1.514	1.58		0.015	1.65	1.414	0.89	0.08
		sd	0.315	0.05	0.24	0.2	2.3	2.3	8.68	5.8	0.0014	1.426	1.56		0.014	1.03	0.229	0.19	0.03
Goldstream	summer	n	5	5	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5
Mouth		%nd	0%	40%	100%	100%	0%	0%	0%	0%	100%	0%	0%	100%	100%	0%	0%	0%	80%
6003-1		min	0.011	0.005	0.5	0.5	1.82	1.85	0.786	0.311	0.0019	0.062	0.068	0.015	0.005	0.89	0.091	0.07	0.001
		max	0.0219	0.018	0.5	0.5	2.01	2.01	1.06	0.518	0.0019	0.095	0.102	0.015	0.005	0.949	0.118	0.12	0.003
		mean	0.015	0.009	0.5	0.5	1.95	1.93	0.93	0.41	0.00	0.078	0.083	0.015	0.005	0.92	0.108	0.10	0.001
		sd	0.005	0.005	0.0	0.0	0.07	0.06	0.12	0.09	0.00	0.011	0.011	0.000	0.000	0.02	0.010	0.02	0.001
	first flush	2021-09-15	0.0141	<0.005	<0.5	<0.5	2.03	1.99	0.848	0.277		0.07	0.071	0.017	<0.005	1	0.102	0.092	<0.001
	fall	n	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	4
		%nd	0%	40%	100%	100%	0%	0%	0%	0%	50%	20%	60%	40%	100%	0%	0%	0%	0%
		min	0.0093	0.005	0.5	0.5	1.24	1.18	0.835	0.08	0.0019	0.05	0.05	0.015	0.005	0.209	0.122	0.10	0.003
		max	0.252	0.0123	0.5	0.5	1.77	1.7	36.5	1.37	0.0029	0.061	0.06	0.029	0.005	0.668	0.74	0.30	0.03
		mean	0.083	0.008	0.50	0.5	1.5	1.4	9.46	0.68	0.0023	0.05	0.052	0.020	0.005	0.407	0.343	0.21	0.01
		sd	0.089	0.003	0.00	0.0	0.2	0.2	13.56	0.46	0.0004	0.00	0.004	0.005	0.000	0.177	0.216	0.07	0.01
Goldstream River	fall	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Upstream		%nd	0%	0%	100%	100%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%

Table 1, continued

		parameter	Lead	Lead	Lithium	Lithium	Magnesium	Magnesium	Manganese	Manganese	Mercury	Molybdenum	Molybdenum	N - Nh3 (As N)	Nitrite as N	Nitrate as N	Nickel	Nickel	Phosphorus
		state	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	TOT	DISS	TOT	DISS	DISS	TOT	DISS	TOT
		unit	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/l	mg/L	µg/L	µg/L	mg/L
BC ENV FW Aquatic Life Guidelines		max	8.17-125 ⁷			870 ¹				720-2083 ⁸			2,000		0.06	32.8		25 -110 ^{1,9}	0.01 ¹⁰
		mean	3.6-8.2 ⁷							677-1221 ⁸			1,000		0.02	3			0.005 ¹⁰
SW6003-3		min	0.0656	0.0114	0.5	0.5	5.87	5.82	3.58	0.766	0.0019	0.239	0.225	0.016	0.0057	0.26	0.27	0.228	0.0373
		max	0.095	0.018	0.5	0.5	6.1	6.13	8.79	3.06	0.0019	0.248	0.246	0.072	0.0154	0.474	0.276	0.245	0.0488
		mean	0.080	0.015	0.5	0.5	6.0	5.98	6.19	1.91	0.0019	0.244	0.236	0.044	0.01055	0.37	0.27	0.237	0.04
		sd	0.011	0.006	0.2	0.2	2.6	2.62	3.55	1.06	0.0007	0.109	0.105	0.026	0.01	0.12	0.05	0.1	0.02
Goldstream River	summer	n	5	5	5	5	5	5	5	5	1	5	5	5	5	5	5	5	5
Upstream		%nd	0%	80%	100%	100%	0%	0%	0%	0%	100%	80%	40%	100%	100%	0%	0%	0%	20%
SW6003-5		min	0.0121	0.005	0.5	0.5	0.959	0.99	1.23	0.432	0.0019	0.05	0.05	0.015	0.005	0.241	0.124	0.11	0.002
		max	0.05	0.0115	0.5	0.5	1.12	1.12	3.6	1.66	0.0019	0.055	0.068	0.015	0.005	0.282	0.17	0.21	0.003
		mean	0.024	0.006	0.5	0.5	1.04	1.1	1.9	0.71		0.05	0.05	0.015	0.005	0.26	0.142	0.15	0.003
		sd	0.014	0.003	0.0	0.0	0.05	0.1	0.9	0.47		0.00	0.01	0.000	0.000	0.01	0.017	0.03	0.001
	fall	n	5	5	5	5	5	5	5	5	4	5	5	5	5	5	5	5	4
		%nd	0%	60%	100%	100%	0%	0%	0%	0%	50%	100%	100%	60%	100%	0%	0%	0%	0%
		min	0.0108	0.005	0.5	0.5	1.08	1.02	1.76	0.107	0.0019	0.05	0.05	0.015	0.005	0.122	0.151	0.13	0.003
		max	0.099	0.015	0.5	0.5	1.17	1.21	28.7	2.8	0.0039	0.05	0.05	0.027	0.005	0.351	0.55	0.27	0.023
		mean	0.031	0.008	0.5	0.5	1.12	1.11	8.1	1.2	0.0027	0.05	0.05	0.019	0.005	0.213	0.274	0.21	0.010
		sd	0.034	0.004	0.0	0.0	0.03	0.07	10.4	1.1	0.0008	0.00	0.00	0.005	0.000	0.084	0.141	0.05	0.01

Table 1, continued

		parameter	pH	Potassium	Potassium	Selenium	Selenium	Silicon	Silicon	Silver	Silver	Sodium	Sodium	Strontium	Strontium	Sulphur	Sulphur	Sulphate	Sus. Solids
		state	NA	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	DISS	TOT	DISS	TOT
		unit	pH	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
BC ENV FW Aquatic Life Guidelines		max	6.5-9 ¹¹	373 - 432		2				0.1-3.0 ¹²									26 ¹⁴
		mean								0.05-1.5 ¹²									6 ¹⁴
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	0%	0%	0%	0%	0%	0%	80%	100%	0%	0%	0%	0%	0%	0%	0%	40%
SW0559-1		min	7.19	1.78	1.8	0.07	0.063	3990	3910	0.005	0.005	8.16	8.33	71.8	72.7	4.3	5	14	1
		max	8.07	2.58	2.61	0.196	0.159	7430	7500	0.006	0.01	18.2	18.3	190	182	10.2	10.4	37	2
		mean	7.8	2.08	2.1	0.11	0.096	6392	6392	0.005	0.01	15.6	15.8	157	155	9	9	30	1
		sd	0.3	0.29	0.3	0.05	0.033	1238	1286	0.000	0.00	3.8	3.8	43	42	2	2	8	0
	first flush	2021-09-17	6.97	1.51	1.39	0.072	0.049	2300	733	<0.005	<0.01	2.51	2.29	21.5	20.3	<3	<3	1.8	36
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	0%	20%	0%	0%	100%	100%	0%	0%	0%	0%	20%	20%	0%	20%
		min	6.83	1.210	1.060	0	0	3540	1960	0.01	0.01	4.9	5	44	37	3	3	7	1
		max	8.02	2.010	2.040	0	0	6880	6300	0.01	0.01	14.8	16	147	141	10	10	33	21
		mean	7.55	1.674	1.656	0	0	5038	4290	0.01	0.01	9.7	10	97	93.0	5.8	6.0	19.5	9
		sd	0.43	0.272	0.347	0	0	1399	1690	0.00	0.00	3.6	4	36	38.0	2.4	2.4	9.2	8
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	0%	0%	0%	0%	0%	0%	80%	100%	0%	0%	0%	0%	0%	0%	0%	0%
SW0559-2		min	7.67	1.680	1.730	0	0	7300	7220	0.01	0.01	12.6	13	152	156	9	9	31	2
		max	7.95	4.320	4.240	0	0	9510	8610	0.01	0.01	17.9	17	192	183	11	11	41	4.4
		mean	7.82	2.248	2.274	0	0	8062	7956	0.01	0.01	15.9	16	174	173.6	10.1	10.1	35.8	3
		sd	0.10	1.037	0.984	0	0	765	533	0.00	0.00	1.8	1	13	9.4	0.7	0.8	3.9	1
	first flush	2021-09-17	6.69	1.41	1.36	0.056	<0.04	1220	645	<0.005	<0.01	2.66	2.53	19.7	19.4	<3	<3	1.7	18
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	20%
		min	7.28	1.470	1.410	0	0	3290	2920	0.01	0.01	6.0	6	75	68	5	4	13	1
		max	7.68	2.000	2.050	0	0	7320	6930	0.01	0.01	14.3	14	152	158	10	10	35	12
		mean	7.52	1.728	1.744	0	0	5100	4446	0.01	0.01	10.1	10	107	102.3	6.2	6.5	22.0	6
		sd	0.14	0.219	0.260	0	0	1748	1729	0.00	0.00	3.5	3	36	38.0	2.0	2.4	7.7	4
Goldstream	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	100%	100%	0%	100%
6003-1		min	6.65	0.179	0.187	0	0	2890	2920	0.01	0.01	3.7	4	36	36	3	3	6	1
		max	8.07	0.209	0.216	0	0	3320	3300	0.01	0.01	4.1	4	42	40	3	3	7	1
		mean	7.22	0.198	0.203	0	0	3120	3116	0.01	0.01	4.0	4	39	38.3	3.0	3.0	6.7	1
		sd	0.59	0.010	0.012	0	0	138	155	0.00	0.00	0.1	0	2	1.2	0.0	0.0	0.2	0
	first flush	2021-09-15	7.71	0.207	0.2	0.059	0.061	3290	3280	<0.005	<0.005	4.02	4.06	38.7	37.2	<3	<3	6.6	<1
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	40%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	100%	100%	0%	80%
		min	6.70	0.180	0.190	0	0	2710	2740	0.01	0.01	2.8	3	19	18	3	3	1	1
		max	7.67	0.280	0.282	0	0	3600	3430	0.01	0.01	3.5	4	33	32	3	3	7	17
		mean	7.15	0.236	0.218	0	0	3104	2998	0.01	0.01	3.2	3	26	25.3	3.0	3.0	4.2	4
		sd	0.40	0.034	0.033	0	0	306	245	0.00	0.00	0.3	0	5	4.7	0.0	0.0	1.8	6
Goldstream River	fall	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Upstream		%nd	0%	0%	0%	0%	0%	0%	0%	100%	100%	0%	0%	0%	0%	0%	0%	0%	50%

Table 1, continued

		parameter	pH	Potassium	Potassium	Selenium	Selenium	Silicon	Silicon	Silver	Silver	Sodium	Sodium	Strontium	Strontium	Sulphur	Sulphur	Sulphate	Sus. Solids
		state	NA	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS	DISS	TOT	DISS	TOT
		unit	pH	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L
BC ENV FW Aquatic Life Guidelines		max	6.5-9 ¹¹	373 - 432		2				0.1-3.0 ¹²									26 ¹⁴
		mean								0.05-1.5 ¹²									6 ¹⁴
SW6003-3		min	7.42	0.74	0.76	0.062	0.066	3760	3700	0.005	0.005	14.5	14.4	98.4	101	5.4	6.1	20	1
		max	7.81	0.766	0.781	0.09	0.083	3930	3750	0.01	0.005	15.1	14.8	99.3	104	6.2	6.5	20	1.6
		mean	7.615	0.753	0.7705	0.076	0.0745	3845	3725	0.0075	0.005	14.8	14.6	98.85	102.5	5.8	6.3	20	1.3
		sd	3.1	0.3	0.3	0	0	1459	1433	0	0	7	7	42	44	2	3	9	2
Goldstream River	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	20%	0%	100%	100%	0%	0%	100%	100%	0%	0%	0%	0%	100%	100%	0%	80%
SW6003-5		min	6.49	0.140	0.144	0	0	1460	1470	0.01	0.01	2.3	2	17	18	3	3	3	1
		max	7.12	0.250	0.168	0	0	1720	1700	0.01	0.01	2.5	3	20	19	3	3	3	2
		mean	6.76	0.174	0.155	0	0	1552	1568	0.01	0.01	2.4	2	19	18.4	3.0	3.0	2.7	1
		sd	0.27	0.039	0.008	0	0	93	82	0.00	0.00	0.1	0	1	0.5	0.0	0.0	0.2	0
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	20%	0%	40%	40%	0%	0%	100%	100%	0%	0%	0%	0%	100%	100%	0%	80%
		min	6.35	0.148	0.143	0.04	0.04	1760	1700	0.005	0.005	2.4	2.46	15.9	15.5	3	3	1	1
		max	7.28	0.250	0.228	0.05	0.04	3510	3310	0.010	0.005	2.8	2.73	18.5	17.8	3	3	3	7
		mean	6.94	0.179	0.179	0.05	0.04	2594	2552	0.006	0.005	2.6	2.58	17.1	16.6	3	3	2	2
		sd	0.34	0.036	0.027	0.01	0.00	595	550	0.002	0.000	0.2	0.10	0.9	0.8	0	0	1	2

Table 1, continued

		parameter	Temperature	Thallium	Thallium	Tin	Tin	Titanium	Titanium	Turbidity	Uranium	Uranium	Vanadium	Vanadium	Zinc	Zinc	Zirconium	Zirconium
		state	NA	TOT	DISS	TOT	DISS	TOT	DISS	NA	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS
		unit	°C	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	NTU	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BC ENV FW Aquatic Life Guidelines		max	17 ¹³		0.3				2,000 ¹	9 ¹⁵		8.5 ¹			33-71 ¹⁶			
		mean			0.8				4,600	3 ¹⁵					7.5-45 ¹⁶			
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	40%	60%	100%	100%	20%	60%	0%	0%	0%	0%	0%	0%	0%	40%	80%
SW0559-1		min	12.1	0.002	0.002	0.2	0.2	0.8	0.5	0.85	0.0268	0.0205	1.1	1.1	4.35	3.3	0.1	0.1
		max	14.8	0.0031	0.0028	0.2	0.2	6.13	0.9	5.39	0.237	0.235	1.63	1.33	13	7.11	0.24	0.11
		mean	13.7	0.002	0.002	0.2	0.2	3	0.6	2.06	0.164	0.163	1.2	1.2	8	5.1	0.2	0.1
		sd	0.9	0.000	0.000	0.0	0.0	2	0.2	1.73	0.076	0.079	0.2	0.1	3	1.6	0.1	0.0
	first flush	2021-09-17	14.2	0.0057	<0.002	0.24	<0.2	37.1	1.11	30.3	0.0315	0.0104	3.85	1.55	37	14.6	0.26	<0.1
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	60%	80%	100%	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	100%
		min	10.6	0.002	0.002	0.2	0.2	6	0.5	4.4	0.041	0.02	1.28	0.9	12.3	7.2	0.2	0.1
		max	12.6	0.006	0.002	0.3	0.2	39.0	1.5	42	0.224	0.23	3.95	1.2	29.3	13.7	0.74	0.10
		mean	12.0	0.004	0.002	0.2	0.2	18	1.0	16	0.098	0.08	2.08	1.1	19.7	10.2	0.3	0.1
		sd	0.8	0.002	0.000	0.0	0.0	12	0.4	14	0.068	0.08	1.04	0.1	6.5	2.4	0.2	0.0
Douglas Ck	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	20%	0%	100%	100%	20%	60%	0%	0%	0%	0%	0%	0%	0%	40%	60%
SW0559-2		min	16	0.002	0.002	0.2	0.2	2	0.5	1.09	0.206	0.21	1.35	1.3	19.6	14.7	0.1	0.1
		max	18.2	0.003	0.003	0.2	0.2	2.8	0.6	3.8	0.275	0.29	1.69	1.7	35.6	32.8	0.23	0.20
		mean	17	0.002	0.002	0.2	0.2	2	0.5	2.5	0.241	0.24	1.47	1.5	25.2	21.6	0.2	0.1
		sd	1	0.000	0.000	0.0	0.0	0	0.1	1.1	0.026	0.03	0.12	0.1	5.7	6.0	0.1	0.0
	first flush	2021-09-17	14.4	0.0033	<0.002	0.24	<0.2	18.5	1.01	18.4	0.0251	0.0081	2.71	1.4	42.2	23.3	0.19	<0.1
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	0%	80%	100%	100%	0%	40%	0%	0%	0%	0%	0%	0%	0%	0%	100%
		min	12	0.002	0.002	0.2	0.2	8	0.5	3.62	0.062	0.03	1.36	0.9	20.2	16	0.1	0.1
		max	15	0.005	0.003	0.2	0.2	28.5	1.0	21.6	0.161	0.16	2.64	1.3	39.2	23.8	1.01	0.10
		mean	14	0.004	0.002	0.2	0.2	16	0.7	12.0	0.10	0.09	1.90	1.1	30.9	20	0.4	0.1
		sd	1	0.001	0.000	0.0	0.0	8	0.2	6.9	0.04	0.05	0.47	0.1	7.1	3	0.3	0.0
Goldstream	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Mouth		%nd	0%	100%	100%	100%	100%	100%	100%	0%	40%	40%	20%	0%	0%	0%	100%	100%
6003-1		min	12.8	0.002	0.002	0.2	0.2	1	0.5	0.29	0.002	0.00	0.20	0.2	0.22	0.1	0.1	0.1
		max	15.3	0.002	0.002	0.2	0.2	0.5	0.5	0.67	0.003	0.00	0.26	0.3	1.28	0.61	0.10	0.10
		mean	14.6	0.002	0.002	0.2	0.2	1	0.5	0.55	0.002	0.00	0.22	0.3	0.73	0.28	0.1	0.1
		sd	0.9	0.000	0.000	0.0	0.0	0	0.0	0.14	0.000	0.00	0.02	0.0	0.37	0.19	0.0	0.0
	first flush	2021-09-15	12.8	<0.002	<0.002	<0.2	<0.2	<0.5	<0.5	0.38	0.0076	<0.002	<0.2	0.22	0.61	<0.1	<0.1	<0.1
	fall	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	80%	100%	100%	100%	80%	80%	0%	60%	40%	60%	40%	0%	0%	100%	100%
		min	7.8	0.002	0.002	0.2	0.2	1	0.5	0.91	0.002	0.00	0.20	0.2	0.23	0.1	0.1	0.1
		max	9.8	0.003	0.002	0.2	0.2	9.1	0.6	7.15	0.01	0.00	0.74	0.3	2.00	0.34	0.10	0.10
		mean	9.2	0.002	0.002	0.2	0.2	3	0.5	2.29	0.005	0.00	0.31	0.2	1.04	0.3	0.1	0.1
		sd	0.8	0.000	0.000	0.0	0.0	3	0.0	2.43	0.003	0.00	0.21	0.0	0.61	0.1	0.0	0.0
Goldstream River	fall	n	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Upstream		%nd	0%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	100%	100%

Table 1, continued

		parameter	Temperature	Thallium	Thallium	Tin	Tin	Titanium	Titanium	Turbidity	Uranium	Uranium	Vanadium	Vanadium	Zinc	Zinc	Zirconium	Zirconium
		state	NA	TOT	DISS	TOT	DISS	TOT	DISS	NA	TOT	DISS	TOT	DISS	TOT	DISS	TOT	DISS
		unit	°C	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	NTU	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BC ENV FW Aquatic Life Guidelines		max	17 ¹³		0.3				2,000 ¹	9 ¹⁵		8.5 ¹			33-71 ¹⁶			
		mean			0.8				4,600	3 ¹⁵					7.5-45 ¹⁶			
SW6003-3		min	9.5	0.002	0.002	0.2	0.2	0.5	0.5	1.02	0.017	0.0157	0.33	0.38	2.85	1.83	0.1	0.1
		max	10.7	0.002	0.002	0.2	0.2	2	0.5	7.73	0.0182	0.017	0.4	0.4	4.1	2.52	0.1	0.1
		mean	10.1	0.002	0.002	0.2	0.2	1.25	0.5	4.38	0.0176	0.01635	0.365	0.39	3.475	2.18	0.1	0.1
		sd	4.0	0.001	0.001	0.1	0.1	1.0	0.2	2.58	0.007	0.007	0	0	1	1.04	0	0
Goldstream River	summer	n	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Upstream		%nd	0%	100%	100%	100%	100%	100%	100%	0%	80%	80%	100%	100%	0%	40%	100%	100%
SW6003-5		min	14.0	0.002	0.002	0.2	0.2	1	0.5	0.45	0.002	0.00	0.20	0.2	0.27	0.1	0.1	0.1
		max	17.2	0.002	0.002	0.2	0.2	2.0	0.5	0.72	0.005	0.00	0.20	0.2	1.30	0.16	0.10	0.10
		mean	15.4	0.002	0.002	0.2	0.2	1	0.5	0.57	0.003	0.00	0.20	0.2	0.76	0.1	0.1	0.1
		sd	1.2	0.000	0.000	0.0	0.0	1	0.0	0.09	0.001	0.00	0.00	0.0	0.39	0.0	0.0	0.0
	fall	n	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
		%nd	0%	80%	100%	100%	100%	40%	80%	0%	20%	40%	80%	60%	0%	0%	100%	100%
		min	7.5	0.002	0.002	0.2	0.2	1	0.5	0.56	0.002	0.002	0.20	0.2	0.3	0.16	0.1	0.1
		max	9.7	0.002	0.002	0.2	0.2	8.1	0.6	5.03	0.007	0.003	0.58	0.3	1.6	0.67	0.1	0.1
		mean	8.9	0.002	0.002	0.2	0.2	2.1	0.5	1.58	0.003	0.002	0.28	0.2	0.8	0.28	0.1	0.1
		sd	0.9	0.000	0.000	0.0	0.0	3.0	0.0	1.73	0.002	0.000	0.15	0.0	0.6	0.19	0.0	0.0

Table 1, continued

Stations	
SW0559-1	Douglas Creek upstream of mouth; first big bend
SW0559-2	Douglas Creek upstream, near Robinwood Drive path into park. Confluent flow from two daylighted pipes
SW6003-1	Point of discharge into Finlayson Arm
SW6003-3	Langford Creek just before discharge into Goldstream River; site was dry until November 03, 2021
SW6003-5	Goldstream River above Golden Gate Rd bridge at campground
Notes:	
Statistics calculated with the detection limit where values were not detected	
BC ENV approved water quality guidelines for protection of freshwater aquatic life applied unless otherwise stated	
Minimum upstream hardness average (15.8 mg/L) was used to calculate lowest level of hardness-dependant water quality guidelines for screening purposes	
Samples that exceeded the minimum guideline were highlighted to be assessed based on the guideline associated with their sample hardness	
DISS = dissolved state, TOT = total state	
¹	BC ENV working water quality guideline
²	Hardness-dependant; max (e[1.03 * ln(Hss) - 5.274]) ranges from 0.19 to 0.65 µg/L Cd; average (e[0.736 * ln(Hss) - 4.943]) ranges from 0.11 to 0.30 µg/L Cd
³	Cr(IV) / Cr (III)
⁴	Site specific BC Biotic Ligand Model guidelines for dissolved copper. Douglas Creek guidelines ranged from 10.3 to 22.3 µg/L for acute and 1.7 to 3.8 µg/L for chronic Goldstream River guidelines ranged from 0.4 to 2.3 ug/L for acute and 0.2 to 0.4 µg/L for chronic If 1 of 5 samples or average of the 5 samples exceed chronic guideline, station has exceeded
⁵	Minimum values for dissolved oxygen
⁶	Average guideline is a geomean of 400 CFU/100 mL for E.coli; E.coli values in the average row are geomeans
⁷	If hardness > 8 mg/L : e(1.273 ln (hardness) - 1.460; if hardness < 8 mg/L : 3 ug/L total lead; if mean hardness > 8 mg/L CaCO3 then, 3.31 + e(1.273 ln (mean hardness) - 4.704) ug/L total lead
⁸	0.01102 hardness + 0.54 maximum mg/L total Mn; 0.0044 hardness + 0.605 average mg/L total Mn
⁹	25 ug/L total Ni if hardness is < or = 60 mg/L CaCO ₃ , 110 ug/L Ni at hardness > 60 to 180 mg/L as CaCO ₃ , 150 ug/L Ni at hardness of 120 to 180 mg/L as CaCO ₃
¹⁰	Draft Vancouver Island Objective, applies to monthly samples collected June to September; our data was collected 5 times in 30 days
¹¹	Optimum pH range
¹²	0.1 ug/L Ag max, 0.05 ug/L Ag average if hardness is <=100 mg/L; otherwise 3 mg/L Ag max, 1.5 mg/L Ag average
¹³	Draft objective proposed to protect juvenile Coho (the most sensitive species); average weekly temperature at any location in the creeks
¹⁴	25 and 5 mg/L over ambient levels of 2 mg/L in the upper Sooke River watersheds
¹⁵	Max: 9 NTU (8NTU above ambient levels in the upper Sooke River watershed) at any time during clear flow periods, and average 3 NTU (2NTU above ambient levels during clear flow periods
¹⁶	If H is >90 mg/L then 33 +0.75 (hardness-90); if H is less < or = 90 mg/L then 33 ug/L or 0.033 mg/L; if H is >90 then 75+0.75 (hardness-90); if less < or = 90 then 7.5 ug/L or 0.0075 mg/L
xx	Value exceeds the provincial guideline protective for aquatic life
xx	Italicized value exceeds a guideline/objective which is only partially applicable. Further investigation is needed

APPENDIX G

CRD PUBLIC HEALTH AND ENVIRONMENTAL CONCERN RATING SYSTEM

STORMWATER DISCHARGE RATING SYSTEM

The CRD evaluates stormwater discharges for public health and environmental concerns using a rating system for stormwater discharges developed by the CRD titled *Stormwater Discharge Rating System for the Capital Regional District* (Drinnan, 1997). As part of the rating system, the following study was used to determine levels of public use, coastline habitat sensitivity and flushing characteristics of the marine receiving waters:

- *An Evaluation of the Coastline Sensitivity Associated with Stormwater Discharges on the Saanich Peninsula* (Drinnan, 1997)

Public shoreline use ratings indicate the potential for public contact with stormwater. These ratings were updated in 2010.

The rating of discharges allows the jurisdictions involved to better manage limited funds and undertake remedial measures where necessary. A copy of the rating system and the coastline sensitivity evaluations are available upon request from the CRD. A brief explanation of the stormwater discharge rating system follows.

1.1 Public Health Concern

CRD staff rate each discharge as a high, moderate or low level of concern for public health based on the level of bacterial contamination in the stormwater and the potential for human contact. The parameters used to assess the level of concern for public health are:

- *Escherichia coli* (*E.coli*) concentrations in the stormwater discharge
- discharge flow rate
- location of the discharge (e.g., below high-water line)
- public use of the shoreline (uses such as swimming, fishing, or kayaking)

The level of contamination is used to assign a bacterial rating. Public shoreline use ratings are used to indicate the potential for public contact with stormwater and depends on the type of activities carried out on the shoreline. Table 1 shows criteria for the bacterial and public shoreline use ratings.

Table 1 Fecal Coliform and Public Shoreline Use Rating Criteria

Rating	Bacterial Rating Criteria	Rating	Public Shoreline Use Rating Criteria
1	No flow measured or <i>E.coli</i> count consistently under 200 CFU/100 mL	1	Low contact (e.g., inaccessible, beach walking)
2	<i>E.coli</i> count between 200 and 5,000 CFU/100 mL	2	Secondary contact (e.g., kayaking)
3	<i>E.coli</i> count greater than 5,000 CFU/100 mL	3	Primary contact (e.g., swimming, scuba diving)

Note: *E.coli* counts above 200 CFU/100 mL (on average) indicate the potential to cause adverse public health effects from primary recreational activities such as swimming or diving.

1.2 Environmental Concern

Environmental concerns are based on a contaminant rating of discharge sediments. The contaminant rating is determined by comparing the sediment concentration of each of 8 metals and 2 groups of organic contaminants (Cn) with the CRD MSQG to obtain a ratio (Cn/MSQG). To account for potential additive effects, these ratios are summed to calculate the toxic equivalent unit (TEU). Table 2 provides the criteria for determining the contaminant rating.

Table 2 Criteria for Determining the Contaminant Rating

Contaminant Rating	Criteria for Determining the Contaminant Rating
Low	Sum of the individual ratios of Cn/MSQG (TEU) is less than 1.0
Moderate	Sum of the individual ratios of Cn/MSQG (TEU) is greater than or equal to 1.0, but no individual parameter exceeds, or is equal to, a value of 0.75
High	The ratio Cn/MSQG is greater than, or equal to, 0.75 for any single parameter

Discharges evaluated are located near environmentally sensitive areas, in creeks or near heavily settled areas where there is an increased probability of pollution. All discharges sampled for environmental concern are sampled for at least 2 years to confirm the contaminant concentrations and contaminant(s) of concern. Only a small number of discharges can be sampled each year due to budgetary constraints; therefore, each discharge selected for sampling can only be sampled once per year.

Discharges with a confirmed high contaminant rating are investigated to determine the source(s) of contamination. The priority in which high-rated discharges are investigated and problems mitigated is determined by calculating a habitat rating (high, moderate or low). The habitat rating is based on the habitat sensitivity, discharge flow and marine flushing characteristics. The following briefly describes the rating criteria for the habitat rating.

Table 3 Criteria for Determining Ratings for Habitat Sensitivity, Discharge Flow and Marine Flushing

Habitat Sensitivity Rating		Discharge Flow Rating		Marine Flushing Ratings	
Rating	Criteria	Rating	Criteria	Rating	Criteria
1	Low productivity; less diverse habitats	0.5	Less than 50 L/minute	0.5	Open shoreline; high flushing
2	Moderate productivity; diverse habitats	1	Between 50 to 500 L/minute	1	Partially enclosed area; moderate flushing
3	High productivity or endangered or protected habitats	1.5	Greater than 500 L/minute	1.5	Enclosed area; poor flushing

These 3 ratings (habitat sensitivity, discharge flow and marine flushing) are summed to determine a habitat rating as shown in Table 4. The habitat rating assigned to each discharge will allow limited resources to be spent in a prioritized manner.

Table 4 Criteria for Establishing the Habitat Rating

Habitat Rating and Mitigative Priority	Sum of Criteria (Habitat + Flow + Flushing)
Low	2.0-3.0
Moderate	3.5-4.5
High	5.0-6.0

OTHER CONCERNS

There are a number of other concerns that have been jointly reviewed and discussed by staff from the CRD and the other jurisdictions involved. This review and discussion assists in setting priorities for remediation of discharges with a high level of concern for public health and the environment. These include:

- the cost of remediation
- the likelihood that remediation will be successful
- compatibility with the priorities of the jurisdictions
- public interest