Making a difference...together

Saanich Peninsula Stormwater Quality Program

2024 Annual Report

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

Including the jurisdictions of:

District of Central Saanich
District of North Saanich
Town of Sidney
Pauquachin First Nation
Tsartlip First Nation
Tsawout First Nation
Tseycum First Nation

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SAANICH PENINSULA STORMWATER QUALITY PROGRAM
2024 ANNUAL REPORT

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Terms & Abbreviations

CCME	Canadian Council of Ministers of the Environment
CFU	Colony-forming unit
CRD	Capital Regional District
D/S	Downstream
DIS	Dissolved state
DND	Department of National Defence
E. coli	Escherichia coli
ENT	Enterococci
ENV	BC Ministry of Environment and Climate Change Strategy
EPT	Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)
FC	Fecal Coliform
HBI	Hilsenhoff Biotic Index
HMW	High molecular weight
HPAH	High molecular weight polycyclic aromatic hydrocarbon
IHA	Island Health Authority
ISQG	Interim Sediment Quality Guideline
LMW	Low molecular weight
LPAH	Low molecular weight polycyclic aromatic hydrocarbon
LWMP	Liquid Waste Management Program
MMAG	Marine Monitoring Advisory Group
MSQG	Marine Sediment Quality Guidelines
NTU	Nephelometric Turbidity Unit
PAH	Polycyclic aromatic hydrocarbon
PEL	Probable effects level
POD	Point of discharge
PSS	Peninsula Streams Society
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
SPSO	Sewage Pump Station Overflow
SPTP	Saanich Peninsula Treatment Plant
SQG	Sediment quality guidelines
TAC	Technical Advisory Committee
TC	Transport Canada
TEU	Toxic equivalent unit
TOC	Total organic carbon
TOT	Total state
TSS	Total Suspended Solids
U/S	Upstream
WLC	W̱SÁNEĆ Leadership Council
WQG	Water Quality Guidelines

SAANICH PENINSULA STORMWATER QUALITY PROGRAM
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1.0 INTRODUCTION

The Capital Regional District (CRD) Stormwater Monitoring Program works to identify and reduce contamination from the land into stormwater, creeks and the ocean. CRD staff, in cooperation with municipalities and First Nations, accomplish this through environmental monitoring, assessment, collaboration, education and enforcement. This work meets commitments in the Saanich Peninsula Liquid Waste Management Plan (LWMP; CRD, 2009), described below.

CRD staff monitor approximately 300 stormwater discharges and creeks to identify contamination and impacts to stormwater due to land use practices. Data is used to assign priority ratings for mitigative action by the appropriate jurisdiction. When contamination is found, CRD staff conduct investigations and work with municipal staff, First Nations and other jurisdictions to identify the source(s). CRD does not own or operate any stormwater infrastructure but assists owners with source identification and remediation.

CRD environmental monitoring staff work to monitor and assess any existing stormwater contamination, while CRD source control staff work to prevent the release of contamination into the municipal drainage system. This is accomplished through education, guidance and enforcement. Source control staff conduct site visits with every facility on the Saanich Peninsula with a business waste discharge, parking lot or outdoor storage.

This report summarizes the results of the following work which was completed in 2024 (2025 data was considered when available):

- Stormwater Discharge Evaluations for Public and Environmental Health
- Watercourse Monitoring
- Contaminant Source Investigations
- Saanich Peninsula Stormwater Source Control Service

Data, sampling locations and details about the CRD stormwater discharge rating methods for public health and environmental concern are available in appendices A through G.

Regulatory Background

Stormwater Quality Monitoring Service

The CRD created the stormwater quality monitoring service to meet commitments in the Saanich Peninsula LWMP. The CRD commitments regarding stormwater quality and management are to:

1. *plan, promote and co-ordinate a program for management of stormwater quality and surface water resources in cooperation with the participating municipalities, communities and local governments to:*

    a. *limit the impacts of stormwater runoff on the environment and public health and well-being;*
    b. *protect freshwater and near-shore marine ecosystems and resources; and*

2. *promote education about water quality issues and to develop educational material.*

Municipalities and First Nations own the stormwater infrastructure and have authority over stormwater under the *Community Charter*[*]. In the LWMP, participants make the following commitments:

1. *to act on priorities within their jurisdiction to protect stormwater quality, the physical environment and aquatic habitat, and to reduce the levels of contaminants in stormwater discharges to accepted government standards in watercourses and near-shore marine areas;*

[*] https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/03026_00

2. *to use resources available to municipal governments to achieve these reductions; and*

3. *to amend bylaws, as necessary, to ensure that new development takes place in accordance with appropriate best management practices.*

Liquid Waste Management Plan Audit and Review

The current Liquid Waste Management Plan, originally approved by the Minister of Environment in 1996, was last consolidated with Amendment 4 in 2009 and audited in 2019. As identified in the 2019 audit report, most commitments were completed or compliant, with a small number of the goals and commitments that had not been met.

In 2024, at the request of the Saanich Peninsula Wastewater Commission, a Technical Advisory Committee (TAC) was formed to review and make recommendations for addressing the unmet CRD and municipal commitments and to determine the level of effort required to update the Plan. Initial conversations indicate that the remaining commitments have been met, though the commitment for a broader plan review still stands. The next TAC meeting is planed for September 2025.

Saanich Peninsula Stormwater Source Control Service

The CRD created the Saanich Peninsula Stormwater Source Control Service with the goal to prevent contamination into the municipal drainage system through education, maintenance of catch basins, appropriate business practices and proper disposal of waste. Staff created Regulatory Bylaw No. 4168 and amending Bylaw No. 4229 that set out the requirements for discharges to the municipal drainage system. There are two Codes of Practice included in the bylaw, one for Parking Lot Operations and another for Outdoor Storage Operations.

2.0 STORMWATER DISCHARGE EVALUATIONS - PUBLIC HEALTH

Public Health Concern Rating Methods

Staff assess and prioritize stormwater discharges annually to meet LWMP commitments and support local governments in directing funds where they will have the greatest benefit. Discharges are prioritized through public health concern ratings, based on the concentration of bacteria in the discharge and potential for public contact.

Each year, CRD staff sample a selection of stormwater discharges in the wet and dry seasons and analyze them for Escherichia coli *(E.coli)*, an indicator of sewage or animal waste. A summary of the CRD rating system is included in Appendix G. An *E.coli* count greater than 200 colony forming units (CFU)/100 mL indicates a source of sewage or animal waste with the potential to cause adverse effects to members of the public engaging in recreational activities in the vicinity. The CRD assigns discharges a high public health concern rating if:

- the average *E.coli* counts (geomean) are over 200 CFU/100 mL or a single count is over 400 CFU/100 mL on a shoreline used by the public for swimming or diving; or
- the *E.coli* count is greater than 5,000 CFU/100 mL on a shoreline used by the public for small boating (e.g., kayaking or paddle-boarding).

2024 Public Health Concern Ratings

In 2024, staff assessed 95 stormwater discharges, of which 26 discharges had one or more *E. coli* counts greater than 400 CFU/100 mL. However, many of these discharges have low flows or are located where there is little risk of public contact. Considering the likelihood for contact, CRD staff assigned the following public health concern ratings:

- 70 low ratings;
- 18 moderate ratings; and
- 7 high ratings (Table A, Figure A).

These ratings and the associated bacterial data are listed in appendices B and C. Quality assurance and control data are in Appendix D.

Ratings Over Time

Since 2012, the number of high-rated discharges has decreased on the Saanich Peninsula from 13 to 7 (see Table B). The number of high-rated discharges has stabilized in recent years, ranging from 5 to 7 since 2021.

CRD staff removed two discharges from the high-rated list in 2024, however two others were added. Work done in the Town of Sidney to reduce sewage inputs resulted in lower bacterial concentrations in discharge 447, however, a source emerged in discharge 450. Increasing development and aging infrastructure are the main sources of sewage in storm drains in the Town of Sidney.

Four of the high-rated discharges have been of concern for several years. Three of these discharges are along the North Saanich shoreline and drain areas that have on-site sewage treatment systems. In 2024, North Saanich signed onto the CRD Bylaw 3479 which helps ensure regular maintenance of septic systems to prevent environmental degradation. It is anticipated that this action will further reduce the number of high-rated discharges.

After 15 years, CRD staff removed Tseycum Creek from the list of high-rated discharges. Two measurements in 2024 and one in 2025 indicated lower bacterial counts in the creek and the rating has been changed to moderate. CRD investigations indicated that bacteria contamination in Tseycum Creek originated upstream of Tseycum First Nation from agricultural inputs. Ongoing efforts from Peninsula Streams to work with the agricultural community, monitor water quality and conduct riparian restoration has likely contributed to the reduced bacterial contamination.

Table A 2024 Discharges Rated High for Public Health Concern

Jurisdiction	Discharges Rated High
Central Saanich	3150
North Saanich	3077, 3078, 3078A, 3118
Sidney	450, 3016
Pauquachin First Nation	-
Tsartlip First Nation	-
Tsawout First Nation	-
Tseycum First Nation	-

Table B Number of Discharges Rated High for Public Health Concern Over Time

Jurisdiction	Number of Discharges Rated High												
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Central Saanich	2	1	1	1	0	0	1	2	1	0	1	0	1
North Saanich	4	4	3	3	3	4	4	4	3	3	2	3	4
Sidney	4	5	6	3	2	1	2	2	2	2	1	2	2
Pauquachin First Nation	0	0	0	0	0	0	0	0	0	0	0	0	0
Tsartlip First Nation	1	1	0	0	0	0	0	0	0	0	0	0	0
Tsawout First Nation	1	0	0	0	0	0	0	0	0	0	0	0	0
Tseycum First Nation	1	1	1	1	1	1	1	1	1	1	1	1	0
Total	**13**	**12**	**11**	**8**	**6**	**6**	**8**	**9**	**7**	**6**	**5**	**6**	**7**

Bacterial Source Investigations

CRD, municipal, First Nation and Island Health Authority (IHA) staff continue to work together to identify bacterial sources in stormwater discharges of concern so they can be addressed by the appropriate jurisdiction. CRD staff narrow down sources of bacteria using upstream sampling for parameters such as bacteria, caffeine and genetic analysis to determine if the origin of the bacteria is animal or human.

CRD source investigations indicate that malfunctioning on-site sewage treatment systems are the sources of bacteria leading to high ratings in four North Saanich discharges. Sources of bacteria in Sidney discharges are due to sewer cross-connections and aging infrastructure. The recent repair of a sewer to stormwater cross-connection in discharge 447 reduced the number of high-rated discharges in Sidney in 2024. CRD staff are working with municipal staff and (IHA) to mitigate these sources.

In 2024, CRD staff investigated the catchment areas of eight stormwater discharges on the Saanich Peninsula. CRD investigations are complete in five catchments, but staff will continue monitoring for any changes. Investigations are continuing in three catchments to find or further narrow sources. The status of these investigations is summarized in Table C.

Table C Status of 2024 Source Investigations

Stormwater Discharge #	Location/ Jurisdiction	Status	Next Steps
412	Tetayut Creek; Tsawout First Nation and Central Saanich	Ongoing; human bacteria identified in mainstem and Mure Brook	CRD to continue investigations
3007	Roberts Bay; Sidney	Cross-connection identified; source narrowed.	Sidney to investigate.
3080A	North Saanich	Heating oil spill; complete	Complete
3095	Tseycum Creek; Tseycum First Nation and North Saanich	Narrowed source to upstream of Tseycum FN. Bacterial counts lower.	CRD to continue monitoring
3118	Coles Bay; North Saanich	Ongoing; multiple sources of sewage in ditches; human bacteria present	CRD to continue narrowing sources of sewage inputs
3125	Salmon Brook; Central Saanich	Suspended; low flows, contamination not found	CRD to continue monitoring
3133	Hagan Creek; Central Saanich	Ongoing; one source narrowed; other sources exist.	CRD to continue monitoring
3145	Brentwood Bay; Central Saanich	Ongoing; bacteria counts low; ditch often dry	CRD to continue investigations when flow is present

3.0 STORMWATER DISCHARGE AND WATERCOURSE EVALUATIONS – CHEMICAL CONTAMINANTS

The CRD assesses environmental concern in water and sediment from stormwater, pipes, ditches and streams, based on their potential to impact the marine receiving environment. Staff also assess watercourse health in seven freshwater streams through water quality and benthic invertebrate sampling. When contamination is found, the results are passed onto the appropriate jurisdiction and the CRD works in partnership to find and eliminate the source.

Chemical Contaminant Sampling

Stormwater Sediment

The program evaluates sediment from within stormwater discharges (pipes, ditches and streams) for potential environmental impact due to contaminant levels. Sediment data and ratings are in Appendix E.

CRD staff assign contaminant ratings to stormwater discharges from sediment samples taken at the point of discharge into the marine environment. Ratings are determined by comparing the concentration of each contaminant [eight metals and high and low molecular weight polycyclic aromatic hydrocarbons (PAH)] to the CRD marine sediment quality guidelines (MSQG) protective of marine life. Methods are described in Appendix G.

2024 Contaminant Ratings

Staff collected sediment samples from seven stormwater discharges on the Saanich Peninsula and assigned low contaminant ratings to all discharges except for Bennes Creek which was assigned a moderate rating. One discharge (Mermaid Creek) remains on the corrective action list due to previous high ratings and is discussed below.

Discharges Requiring Corrective Action

Remedial work resulted in decreased contamination in two of the three discharges that have been a concern for many years, allowing removal of these from the list of discharges requiring corrective action in 2023. CRD data indicates lower levels of contaminants remain in discharges 441 (Reay Creek) and 3138 (Tsartlip Boat Launch).

Only Mermaid Creek (discharge 3005: Figure A) remains on the list of discharges requiring corrective action based on elevated metals and PAHs. Discharge 3005 has been of concern for several years and CRD staff have conducted numerous investigations, however, finding a source has been challenging due to lack of sediment and multiple sources within the catchment. Due to lack of sediment, staff have been monitoring contaminant levels in water within the stormwater system in recent years.

The highest metals concentrations are measured in a manhole on Malaview Avenue between Fifth Street and Resthaven Drive. The area is residential, and no evident sources of contamination have been found. It is likely that contaminated soil may be present under the surface from historical sources and there is some infiltration into the pipes.

Sidney staff found and repaired a cross-connection in the catchment in early 2024. Staff will continue sampling the catchment and will remove this discharge from the action list if further samples have low contaminant concentrations.

Locations of these discharges are shown in Appendix A.

Watercourse Monitoring

Staff continued to monitor Hagan/Graham, ḰEL,SET (Reay), Tetayut, Tatlow (Chalet), ȾEN̲TEN, Tod and Tseycum creeks in 2024, to provide information about creek and watershed health.

Twice per year staff collect water quality measurements at the discharge of each creek, providing a snapshot of creek health in the wet and dry seasons. Approximately every second year, staff focus on one Saanich Peninsula watershed to conduct more comprehensive monitoring that includes additional locations, additional water quality parameters, higher sampling frequency and benthic invertebrate data collection.

CRD Watercourse Data

Based on the CRD monitoring data, the parameters of most concern in Saanich Peninsula creeks are *E. coli*, phosphorus and turbidity, with some creeks also experiencing low dissolved oxygen and elevated metals. Poor water quality is likely the result of development, business waste (historical and ongoing), agricultural practices and malfunctioning on-site sewage treatment systems.

Significant findings in Saanich Peninsula creeks are as follows:

- Hagan-Graham Creek Watershed is made up of two streams that flow from the north and south of Central Saanich before they join and flow into Saanich Inlet. The land use is mostly agricultural but also includes residential and light industrial areas. Water quality at the mouth of the creek is generally good except for elevated phosphorus and turbidity, likely due to agricultural practices and lack of adequate riparian vegetation in some areas. However, bacteria and metals are elevated upstream at the Kirkpatrick outfall which drains the Keating Industrial Park and flows into Graham Creek. Investigations indicate that the sources are upstream businesses. Central Saanich and CRD staff continue to work with business owners to reduce contaminant input into stormwater infrastructure.

- ȾEN̲TEN Creek drains Victoria Airport Authority land and upstream farmland. The creek continues to display arsenic, cadmium, copper, iron and zinc concentrations which are elevated above BC Water Quality

Guidelines (WQG) for protection of freshwater aquatic life. This is likely due to historical contamination on airport land. Elevated turbidity and phosphorus, as well as low summer dissolved oxygen concentrations are also a concern.

- Tetayut Creek drains SȾÁUTW̱ First Nation Reserve (IR2) and upstream agricultural residential and light industrial areas. In early 2023, a sewage spill into the creek was discovered. SȾÁUTW̱ staff identified the cause, removed the contamination and repaired the infrastructure. It is unknown how long the spill had been occurring, but CRD 2021 data indicated that water quality had decreased in the creek and the presence of more pollution tolerant benthic invertebrate species indicated that there was an increase in organic pollution in the creek over time. Data from 2024 and early 2025 indicate that *E.coli* concentrations have decreased over time. Separately, turbidity and phosphorus continue to be a concern in Tetayut both at the mouth and upstream near East Saanich Road and Cooperidge Park.

- ḰEL,SET (Reay) Creek Watershed originates in Sidney and drains into Bazan Bay. Reay Creek Pond was designated a Class 1 contaminated site by Transport Canada (TC) in 2016, due to elevated metals (cadmium, chromium, lead and zinc). TC dredged and remediated a section of the creek and pond in 2019 and 2020. Sediment samples collected by CRD staff in Reay Creek in 2020 and 2021 had lower concentrations of metals, resulting in a lower contaminant rating (high to moderate) for the creek. 2024 water samples continue to indicate that aqueous metals concentrations are lower and remain below BC WQG.

- Tseycum Creek drains from North Saanich, through W̱SIḴEM First Nation Reserve (IR4) and into Patricia Bay. CRD staff have been measuring elevated bacterial levels for over 15 years at the mouth of the creek. Elevated turbidity, phosphorus and low dissolved oxygen are also a concern. CRD investigations have pointed to agricultural land use in North Saanich as a source. In 2024, CRD staff measured lower bacterial concentrations and will confirm those lower concentrations is 2025. A possible cause of lower bacteria is work done by Peninsula Streams Society to engage residents, measure water quality and conduct restoration.

- Tod Creek Watershed originates in Saanich and flows through agricultural, forested and residential land uses before discharging into Saanich Inlet. In addition, the Hartland Landfill also lies within this watershed. The CRD is funding and supporting Raincoast Conservation Foundation (Raincoast) to assess the watershed as part of Raincoast's Healthy Waters Program. The project will identify the presence of substances of past, present and emerging concern at very low concentrations and compare results to other watersheds in British Columbia. Sampling was initiated in December 2023 and will continue for two years.

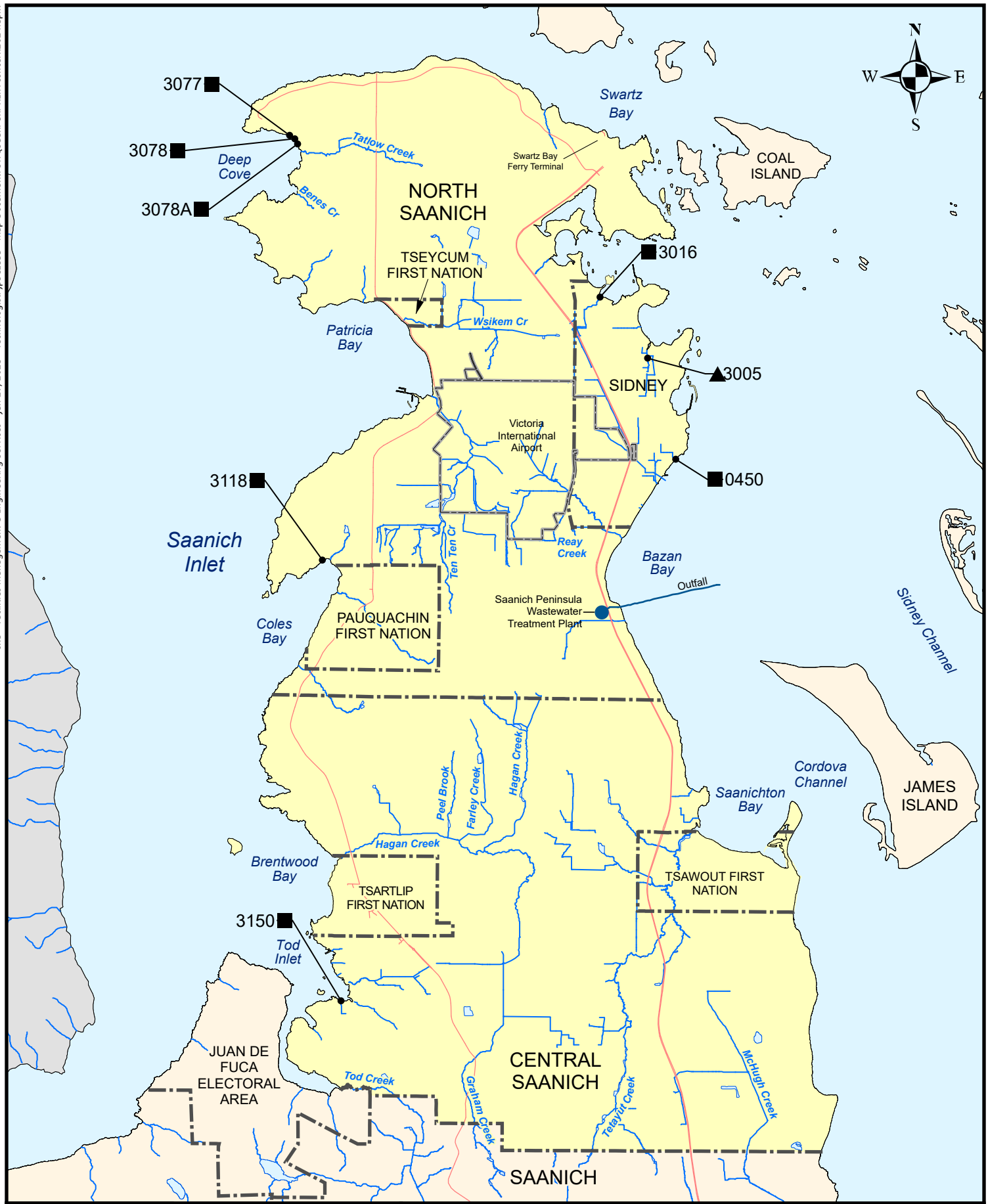
  The project is being carried out in partnership with W̱SÁNEĆ Leadership Council (WLC; comprised of W̱JOŁEŁP'(Tsartlip) and W̱SIḴEM (Tseycum) First Nations. The CRD has provided financial support for training and collection of water samples from the Tod Creek watershed as well as for capacity for internal analysis and communications throughout the project.

In 2025, CRD staff will continue to monitor these creeks and work with First Nations and municipal staff to locate sources of bacterial, physical and chemical contamination.

Quality Assurance

The 2024 data met quality assurance/quality control requirements for the program. For bacterial analysis, quality assurance includes annual establishment of a precision criterion based on a range of Saanich Peninsula stormwater sample triplicates. Staff collect blanks and field-splits for 10% of the discharge and marine surface water samples collected.

Quality assurance for sediment analysis included field duplicates, laboratory triplicates and standard reference materials. Precision and accuracy of the laboratory analysis were estimated from the results of these replicate and standard reference materials samples. A detailed discussion on the quality assurance program is provided in Appendix D.



CRD - Facilities Management & Engineering Services - Jun 27, 2025 - Technologist: jpbezeau - Map Document: SWQSaanPenPHEnvConcern2024.aprx

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Projection: UTM ZONE 10N NAD 83

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 A- Saanich Peninsula - Stormwater Discharges Rated High for Public Health or Environmental Concern

- High Public Health Concern Rating in 2022
- High Environmental Concern Rating in 2022 or previous years (and recommended for corrective action)
- Sewage Treatment and Outfall
- Significant Ditches, Streams, Rivers, and Storm Drains
- Municipal and First Nations Boundary
- Major Roads
- Stormwater Monitoring Area

4.0 SAANICH PENINSULA STORMWATER SOURCE CONTROL SERVICE

The CRD established the Saanich Peninsula Stormwater Source Control Service with the goal to prevent the release of contamination into the municipal drainage system (stormwater system) through education and guidance, maintenance of catch basins, appropriate business practices and proper disposal of waste.

Implementation strategies included site visits with every facility on the Saanich Peninsula identified as having a business waste discharge or operating under one of the Codes of Practice (Parking Lot Operations and Outdoor Storage Operations). Site visits included education on the Stormwater Bylaw and enforcement when major infractions such as direct discharge to the stormwater system, lack of maintenance of stormwater rehabilitation units, or containment issues of hazardous materials were found.

The CRD Saanich Peninsula Stormwater Source Control Bylaw No. 1, 2017 (Bylaw No. 4168 and amending Bylaw 4229) serves as the main regulatory instruments for source control on the Saanich Peninsula. The bylaw specifies the various regulatory conditions under which facilities must operate if they discharge into a municipal drainage system. The regulatory conditions for businesses include operations under sector-specific codes of practice. Under the program enforcement policy, staff make reasonable efforts to resolve issues through cooperative measures. Where education proves ineffective, punitive measures are available, including tickets under the bylaw. Regulatory inspection to ensure compliance with the bylaw requirements commenced in 2024.

The following sections summarize each of the stormwater source control services on the Saanich Peninsula.

Prohibited Discharges

The CRD had identified twenty-two facilities actively discharging business waste to the stormwater system. Staff worked with seventeen of the facilities, including two facilities in 2024, to cease discharge to stormwater. Some businesses changed practices while others were directed to discharge to the sanitary sewer under regulation of the Sewer Use Bylaw 2922. At the end of 2024 there were five facilities operating under a Temporary Approval Letter.

Temporary Approvals

CRD staff have identified five facilities discharging business wastewater to the stormwater system through treatment works that were previously approved by the municipality. These facilities are operating under Temporary Approval Letters with conditions to prove efficacy of the treatment works through self-monitoring and reporting. At the end of 2024, one facility was at Step 1 of a three-step enforcement process for exceeding Prohibited Waste parameters, and one facility was at Step 2 and Under Review for exceeding Prohibited Waste parameters and may have their Temporary Approval revoked if exceedances in Prohibited Waste continue.

Bylaw 4168 Inspections

In 2024, the CRD implemented a two-year cycle of regulatory inspections with all Saanich Peninsula facilities with a business waste discharge and those operating under a Code of Practice. In total, 230 in-person inspections were conducted in 2024 to ensure compliance with bylaw requirements. Staff also provided education on stormwater source control, and solutions for managing business waste on-site to prevent contamination of the stormwater system and the downstream freshwater or marine receiving environment. Inspections took place at 113 parking lot operations, 48 outdoor storage operations, and 13 general inspections. 149 of these facilities were determined to be regulated under the Stormwater Bylaw. The remaining were identified as not regulated under the Bylaw or the Codes of Practice.

Bylaw 4168 Compliance

At the end of 2024, there were 245 facilities regulated under the Stormwater Bylaw. Of the 149 regulated facilities inspected in 2024, the initial compliance rate was 62%. Facilities under Bylaw 4168 such as vehicle wash operations had an initial compliance rate of 100%. Parking lot operations had an initial compliance rate of 58% with infractions consisting of excess sediments in catch basins requiring more frequent clean-outs and record keeping. Outdoor storage operations had an initial compliance rate of 69% with infractions consisting of excess sediments in catch basins requiring more frequent clean-outs, hazardous materials containment, and record

keeping. With follow-up inspections, all but 24 facilities brought their operations into compliance for an overall compliance rate of 84% for 2024.

Significant Incident Response

Staff responded to the following four significant incidents in 2024 and one incident from 2021 that received further investigation and follow-up:

- Deleterious substances in a stream is an ongoing collaboration with municipal and community partners as we work to improve the stream quality impacted by heavy industrial activity.
- A spill or illegal dumping of fats/oils/grease reported by municipal staff. While no point source was identified, the operators of the facility were engaged with education on best practices.
- Construction waste discharge identified by CRD staff. Following catchment investigation and site visit, no violations of the bylaw were found, and the contractors were operating with best practices.
- Deleterious substances reported by municipal staff. Following catchment investigation and site visit, no violation of the bylaw was found, and the facility was engaged with education on best practices.
- Deleterious substances reported by municipal staff. Following a catchment investigation and site visit, it was determined the facility was operating under the Provincial Agricultural Land Reserve and not within the scope of the Stormwater Bylaw.

5.0 CRD ONSITE SEWAGE SYSTEMS SERVICE

Under the Saanich Peninsula Liquid Waste Management Plan, the District of North Saanich commits to the implementation of a program that requires compulsory pumping of septage tanks and compulsory maintenance of small treatment plants. To meet this commitment, North Saanich voted in favour of joining the CRD Onsite Sewage Systems Service at their September 25, 2023 council meeting. The CRD amended the Onsite Sewage System Maintenance Bylaw 3479 to add North Saanich to the regulatory service along with existing participants (City of Colwood, City of Langford, District of Saanich and Town of View Royal). The CRD bylaw came into effect in January 2025 and was introduced to property owners with septic systems through direct mailouts. The CRD and North Saanich also hosted an informational open house in March 2025.

This bylaw will allow North Saanich and the Capital Regional District to work together to protect the environment by ensuring septic systems are well-maintained. Regular maintenance of septic systems will extend system life, save residents' money, safeguard water quality and protect aquatic life and public health. Homeowners can also apply for a rebate to cover part of the cost of a Maintenance Assessment inspection to determine the condition of their septic system and receive a list of recommended repairs.

6.0 OUTREACH & ENGAGEMENT

The CRD provides coordinated residential and business education programs on behalf of the municipalities to provide consistent messaging that reduces and prevents sources of pollution. In 2024 as part of the Inter-Municipal Integrated Watershed Working Group, the CRD hosted a workshop with the municipalities for input into an updated outreach and engagement strategy to be developed in 2025.

Outreach and engagement in 2024 included an update to the stormwater pages on the CRD website which provides resources for both business and residents. We also conducted a multi-media campaign including social media, digital and print components that focused on preventing stormwater pollution and managing rainfall. In addition to print materials, 11 free webinars were provided for the residential audience including rainwater harvesting techniques, building a rain garden, planting native plants and more. Stormwater education was also provided at 26 community events where print materials were distributed, and pollution prevention discussions occurred.

For the business community specifically, two Keyline design workshops were provided that help large property owners manage and optimize rainfall, and a multi-media campaign was conducted on catch basin maintenance. In 2024, the CRD hosted three Harbours Stewardship Speaker Series events which were open to the public, with stormwater management and pollution prevention related topics including Salmon Safe Eco-Certification, Green Shores and Mitigating Inputs of Tire Wear Toxins to Protect Salmon Habitat. The Saanich Peninsula Stormwater Quality Bylaw was supported with new materials to increase awareness of the Bylaw: a new rack card and development of an information sheet for businesses.

7.0 2025 PROGRAM

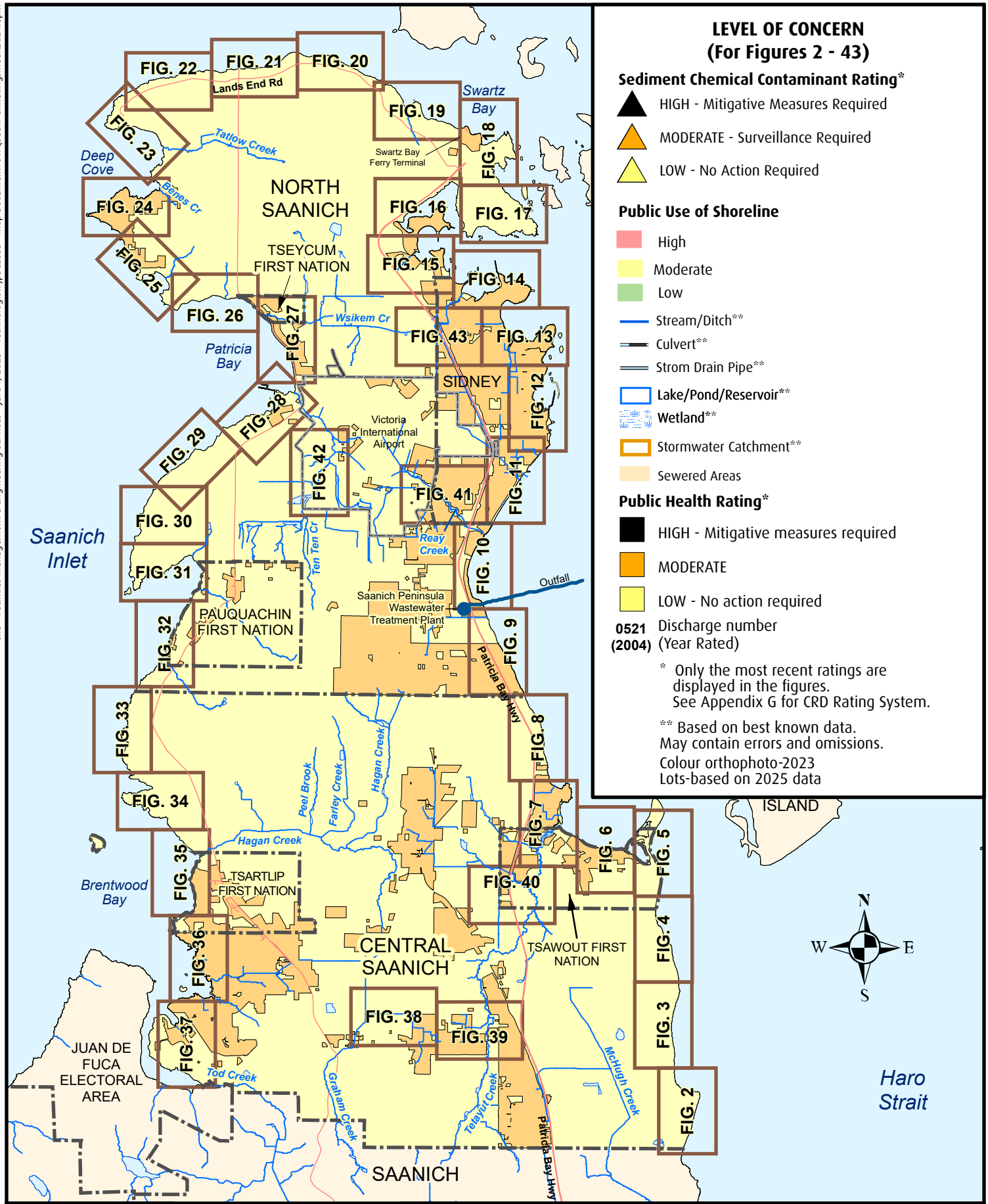
In 2025, CRD staff will continue to work with municipal partners, First Nations, business owners and the community to achieve LWMP goals to identify stormwater discharges of public health and environmental concern. CRD staff will continue to work with its partners to identify and reduce bacterial and contaminant concentrations in stormwater discharges, creeks and the marine receiving environment.

8.0 REFERENCES

CRD, 2011. Saanich Peninsula Liquid Waste Management Plan.

APPENDIX A

LOCATION OF STORMWATER DISCHARGES
2024



LEVEL OF CONCERN
(For Figures 2 - 43)

Sediment Chemical Contaminant Rating*

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

Public Use of Shoreline

- High
- Moderate
- Low
- Stream/Ditch**
- Culvert**
- Strom Drain Pipe**
- Lake/Pond/Reservoir**
- Wetland**
- Stormwater Catchment**
- Sewered Areas

Public Health Rating*

- HIGH - Mitigative measures required
- MODERATE
- LOW - No action required

0521 (2004) Discharge number (Year Rated)

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

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

Colour orthophoto-2023
Lots-based on 2025 data

CRD - Facilities Management & Engineering Services - Jul 31, 2025 - Technologist: jbezeau - Map Document: SWQSaanPenRatingsIndex2024.aprx

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Kilometres
0 0.5 1 2
Projection: UTM ZONE 10N NAD 83

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Figure 1
Key Index for Figures 2 - 43 and Legend

- Sewage Treatment Facility & Outfall
- Significant Ditches, Streams & Storm Drains
- Municipal and First Nations Boundary
- Major Roads
- FIG. 25 Map Tile with Figure Number
- Sewered Areas

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

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W N S E

For Key Index and Legend See Figure 1

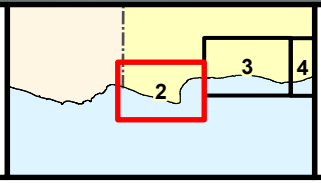
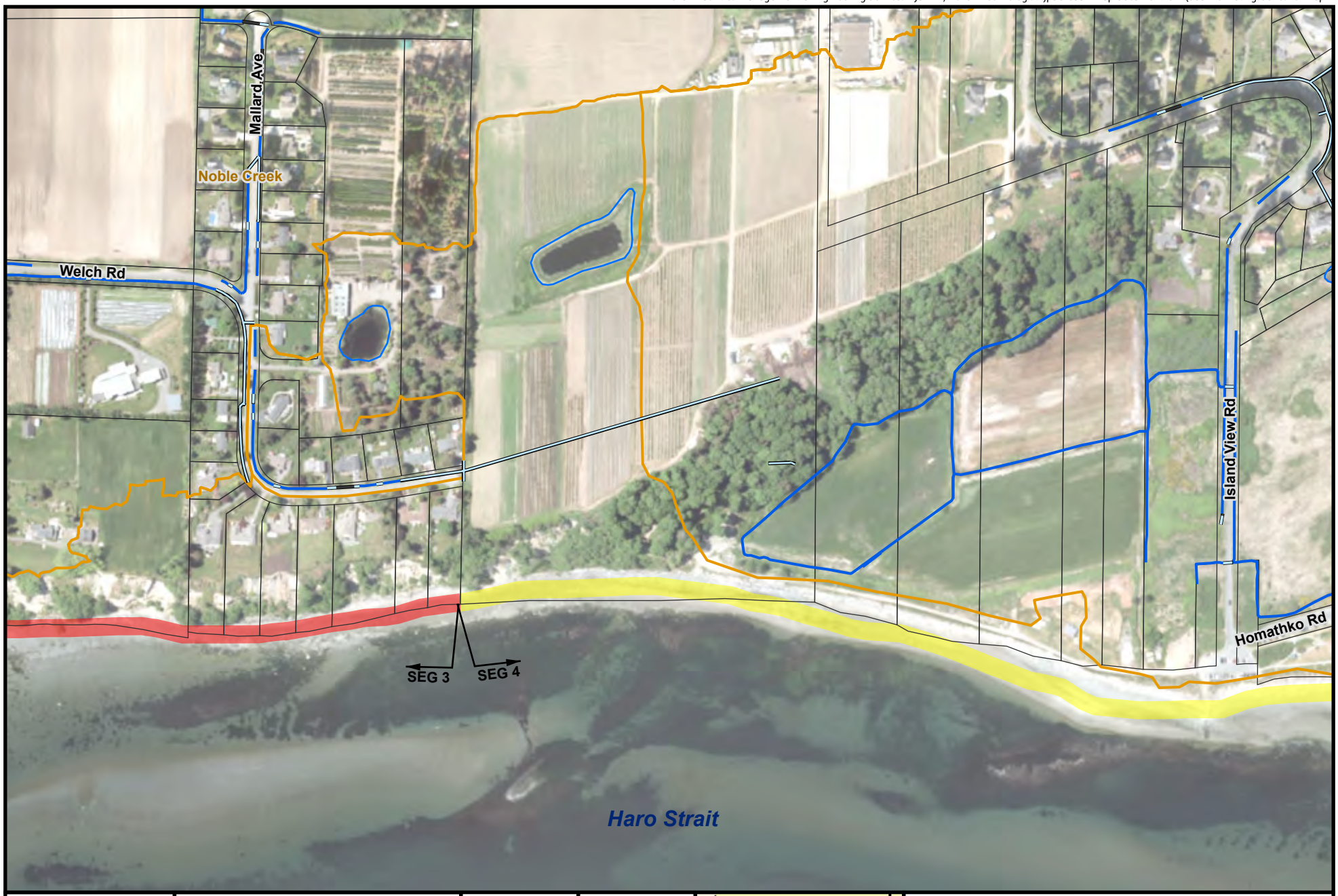


Figure 2
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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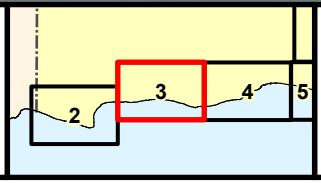
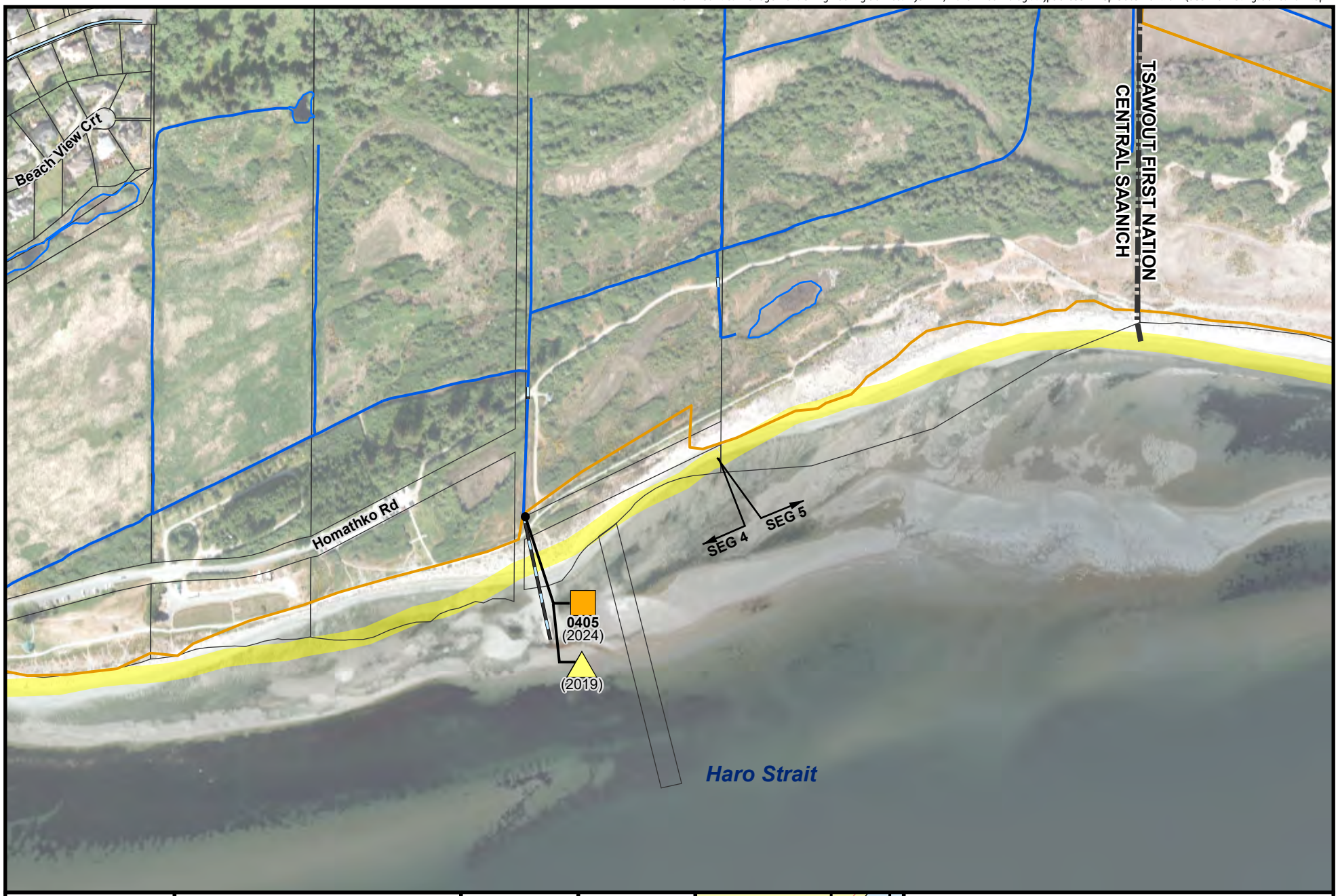


Figure 3

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern



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Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

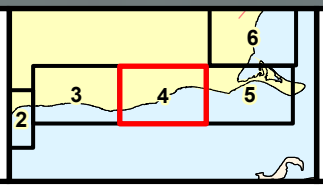

Figure 4

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

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

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W S E N

For Key Index and Legend See Figure 1

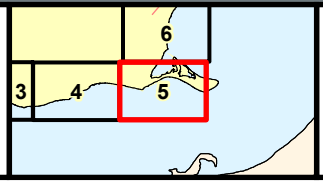
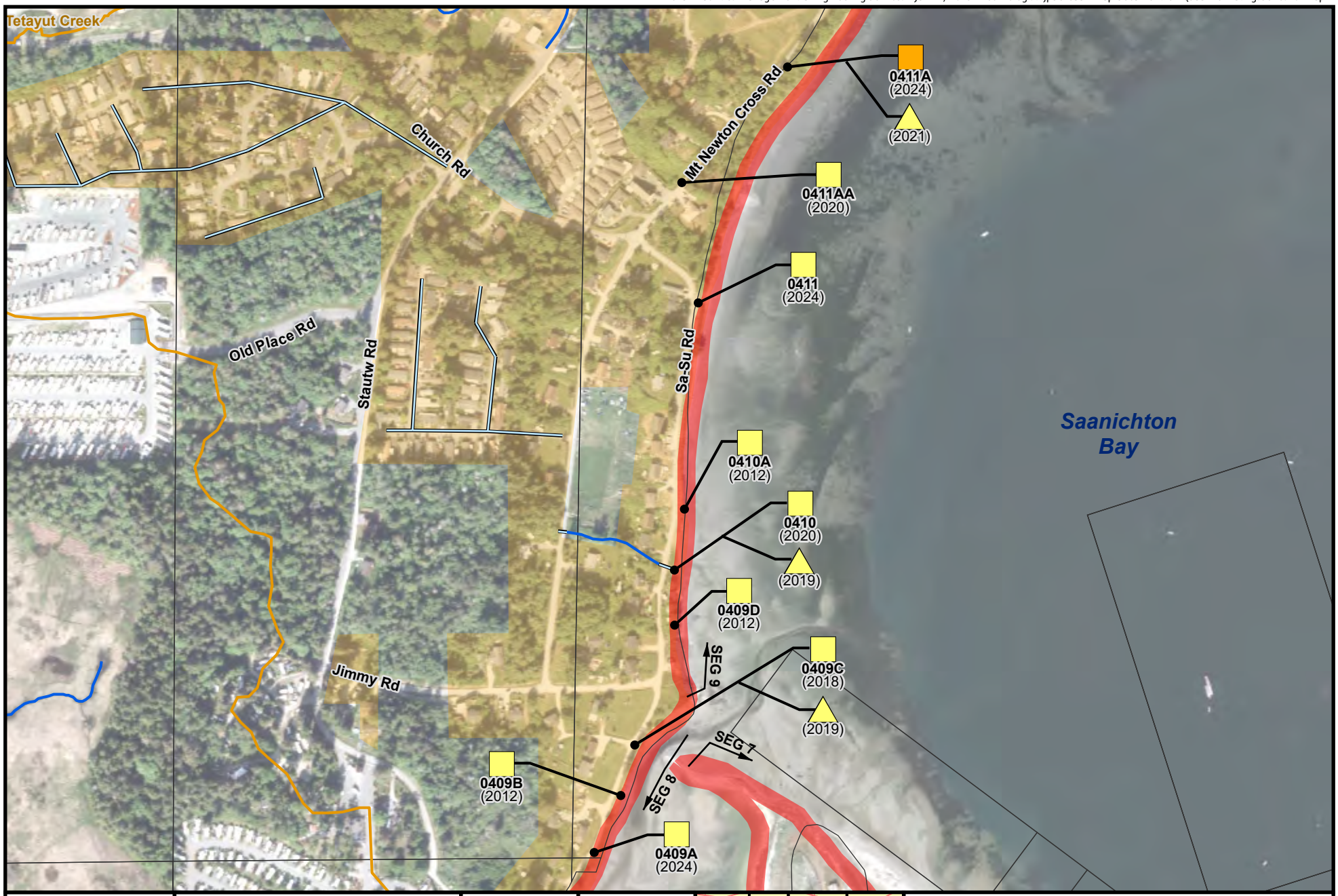


Figure 5
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



CRD Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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W S E N

For Key Index and Legend See Figure 1

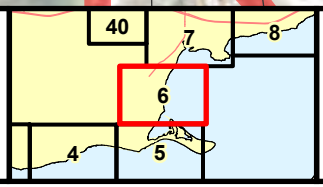
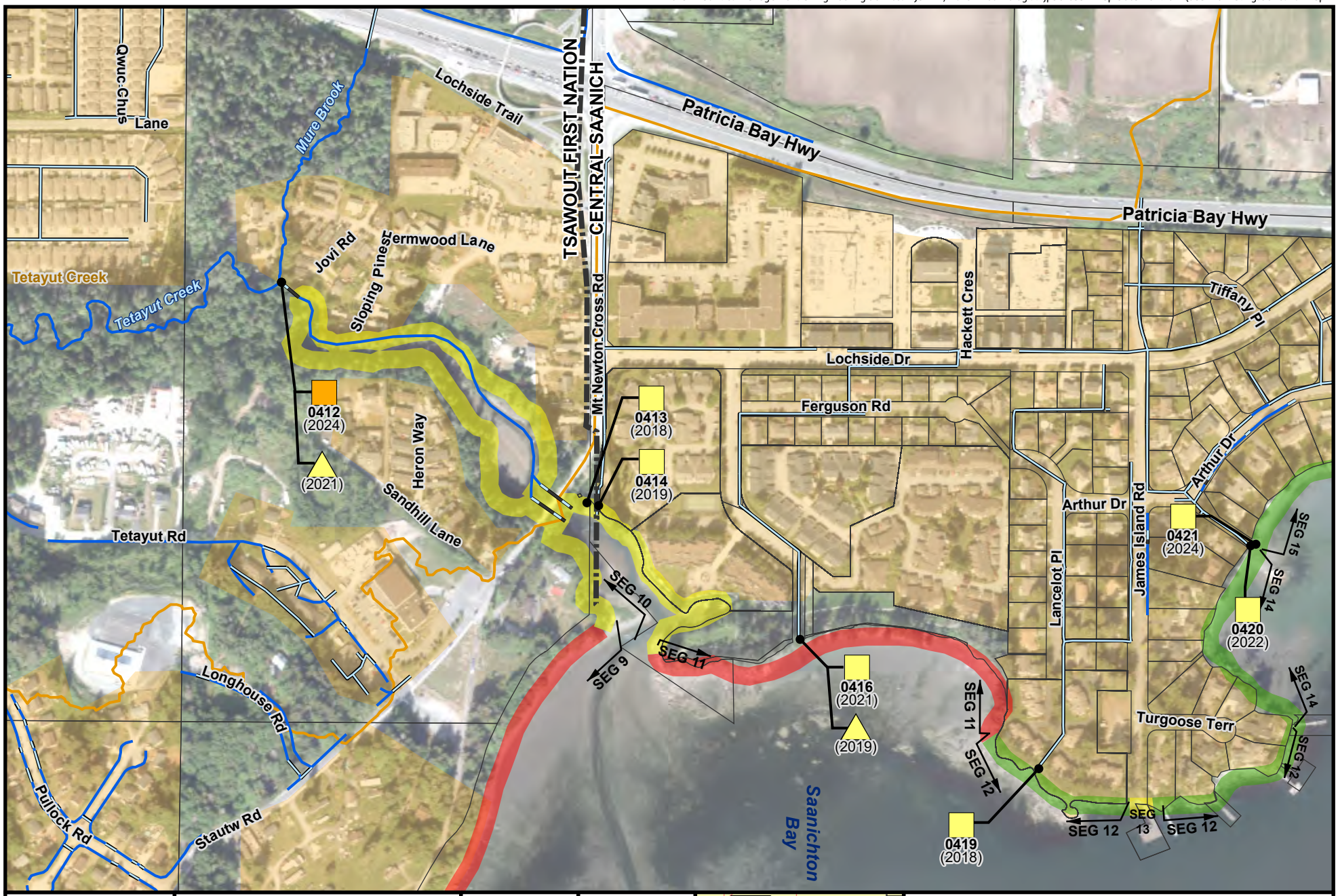


Figure 6
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



CRD Making a difference...together

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

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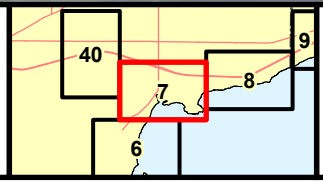

Figure 7
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

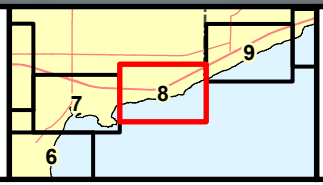

Figure 8

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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

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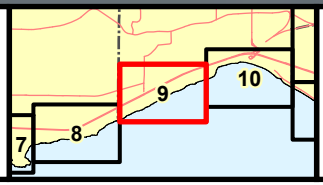
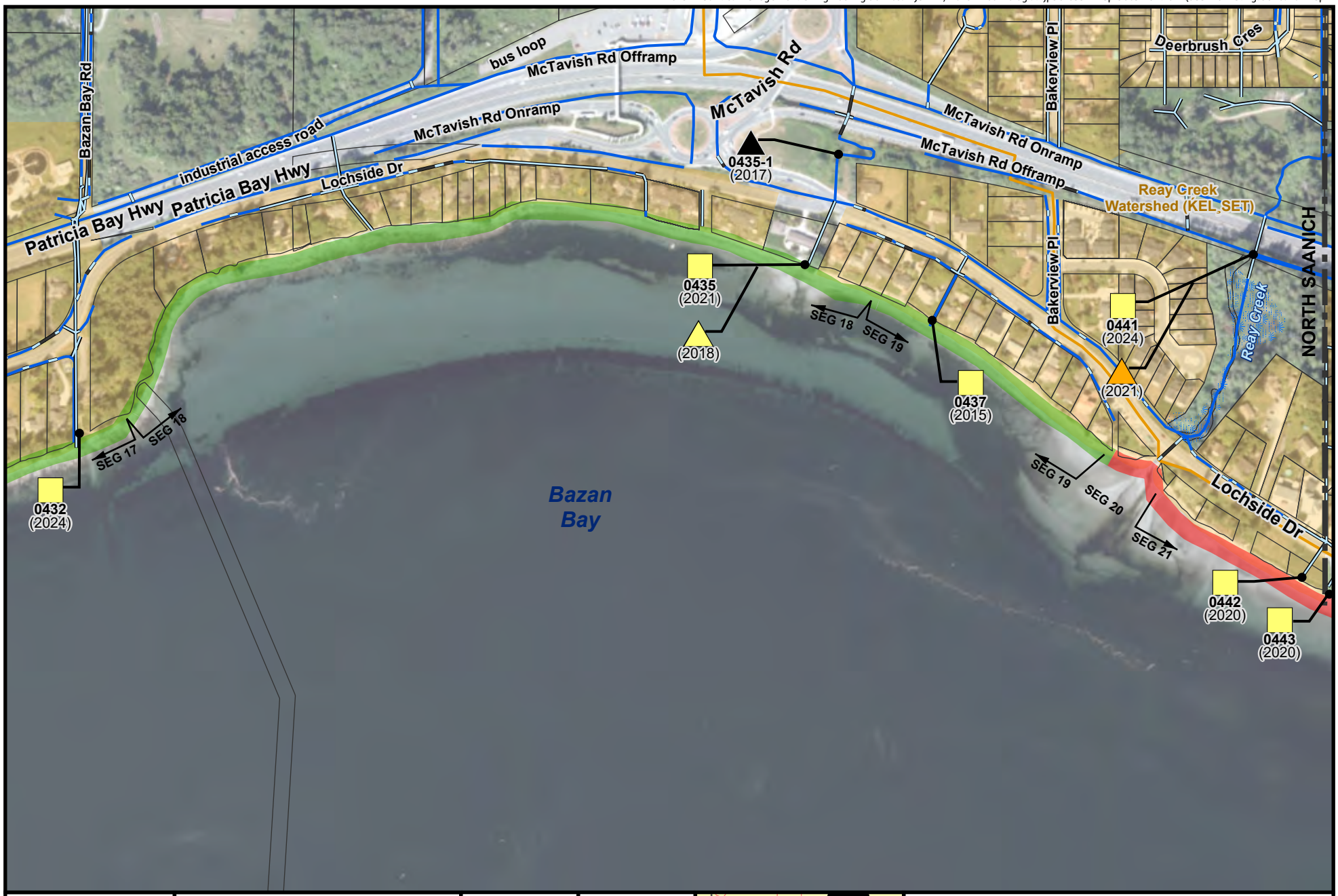


Figure 9
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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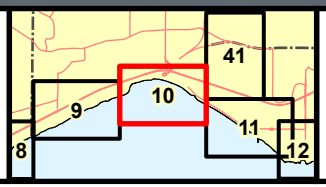

Figure 10

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

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

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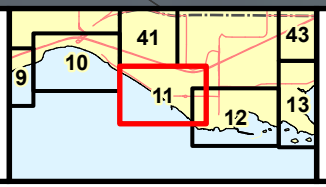

Figure 11
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

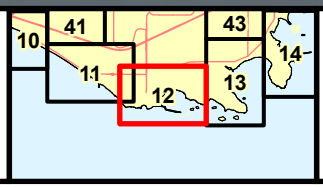
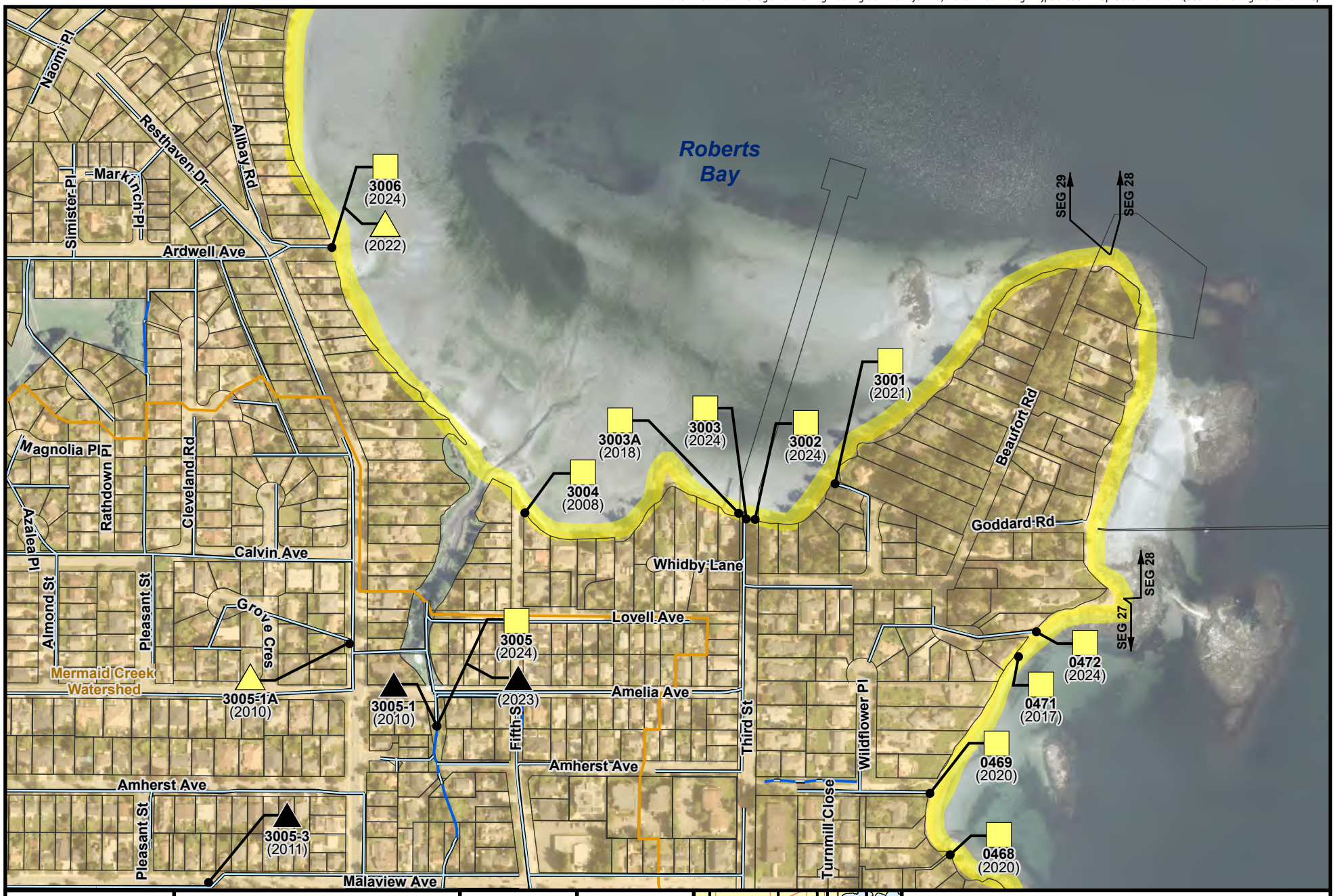


Figure 12

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



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

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For Key Index and Legend See Figure 1

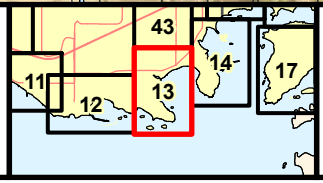

Figure 13
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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

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For Key Index and Legend See Figure 1

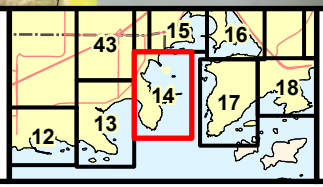
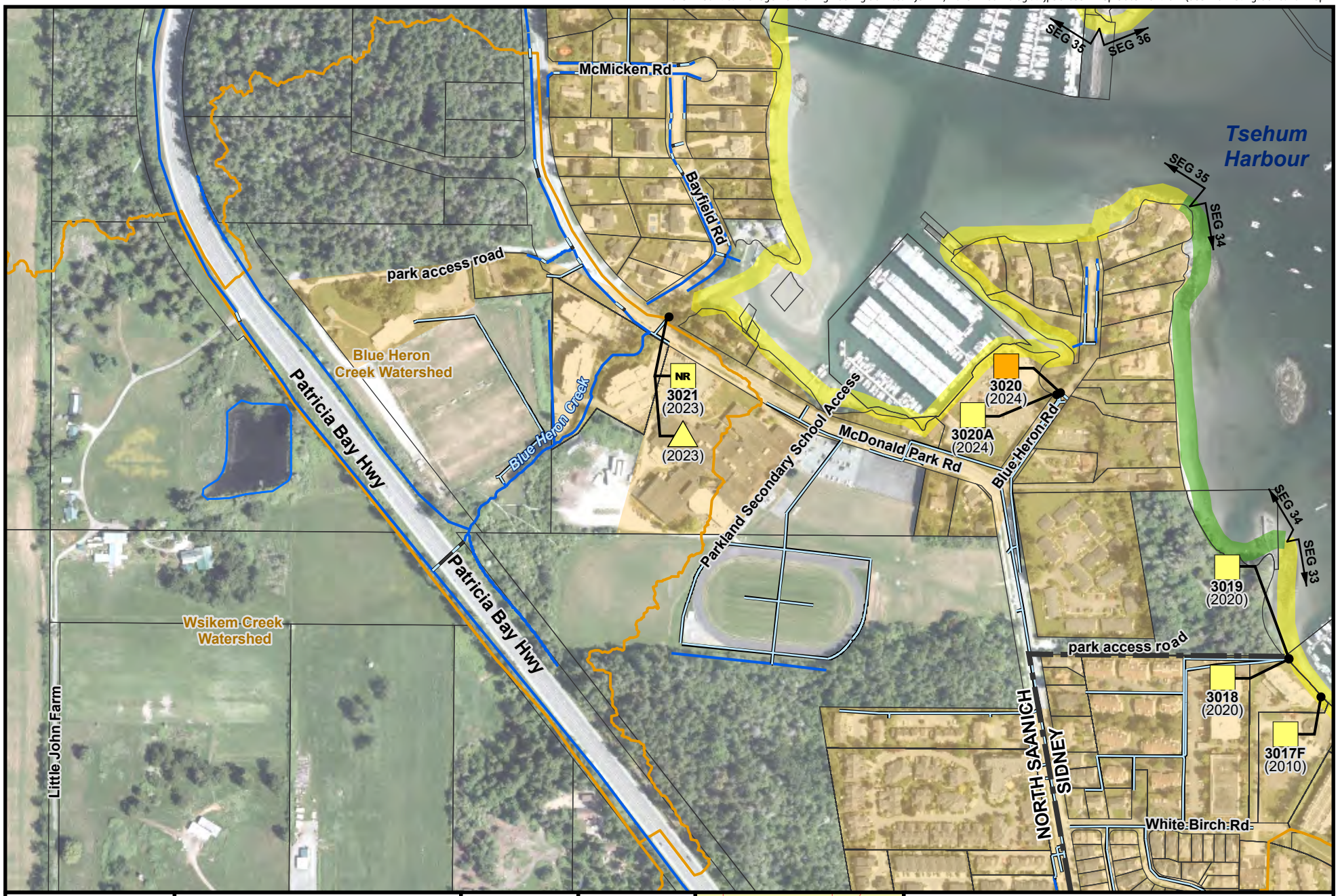


Figure 14
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



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

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For Key Index and Legend See Figure 1

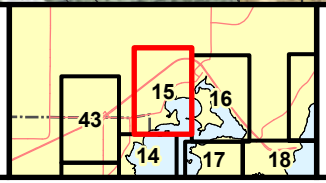

Figure 15
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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

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For Key Index and Legend See Figure 1

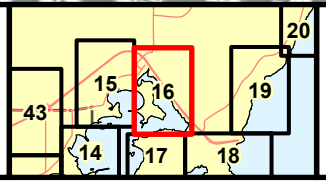

Figure 16
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

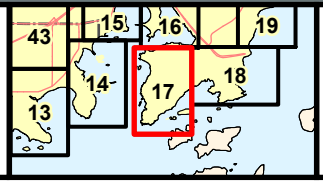

Figure 17

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

Making a difference...together

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

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W N S E

For Key Index and Legend See Figure 1

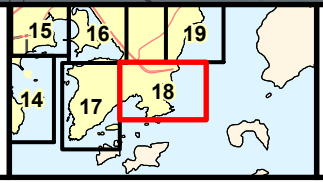

Figure 18
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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N W E S

For Key Index and Legend See Figure 1

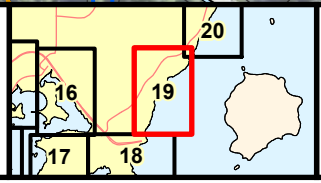

Figure 19

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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N W E S

For Key Index and Legend See Figure 1

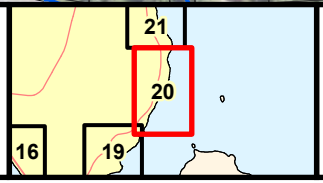

Figure 20

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

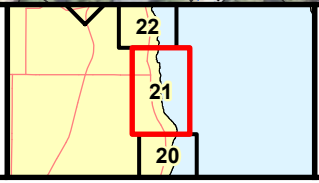
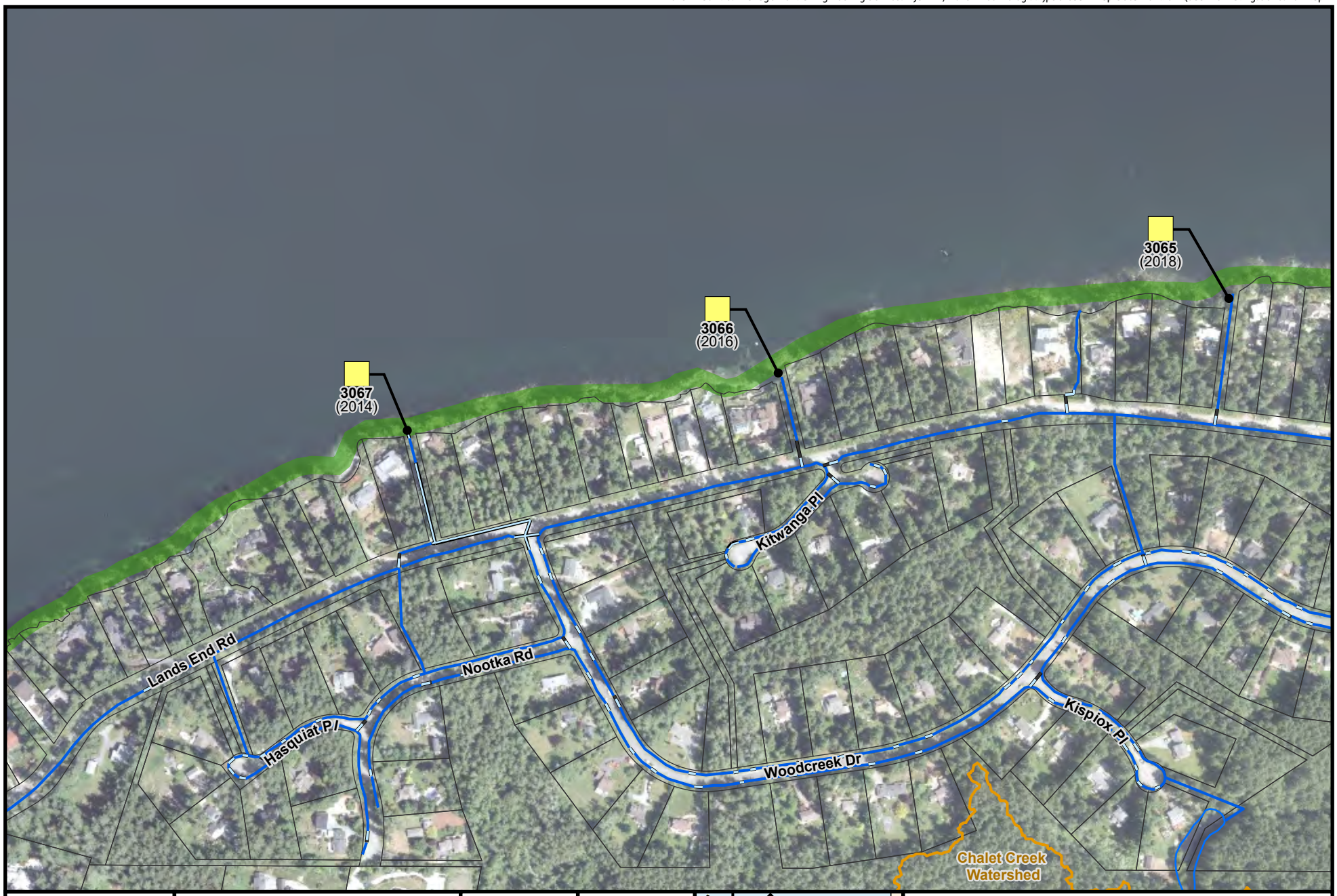


Figure 21

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



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0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

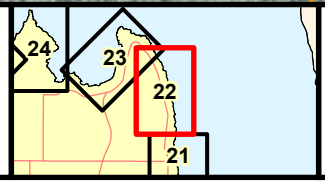

Figure 22

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

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Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

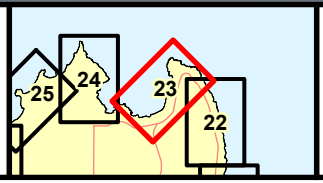

Figure 23

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

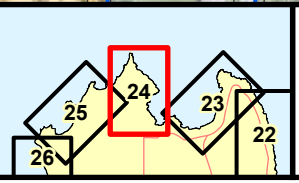

Figure 24

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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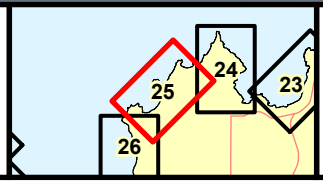
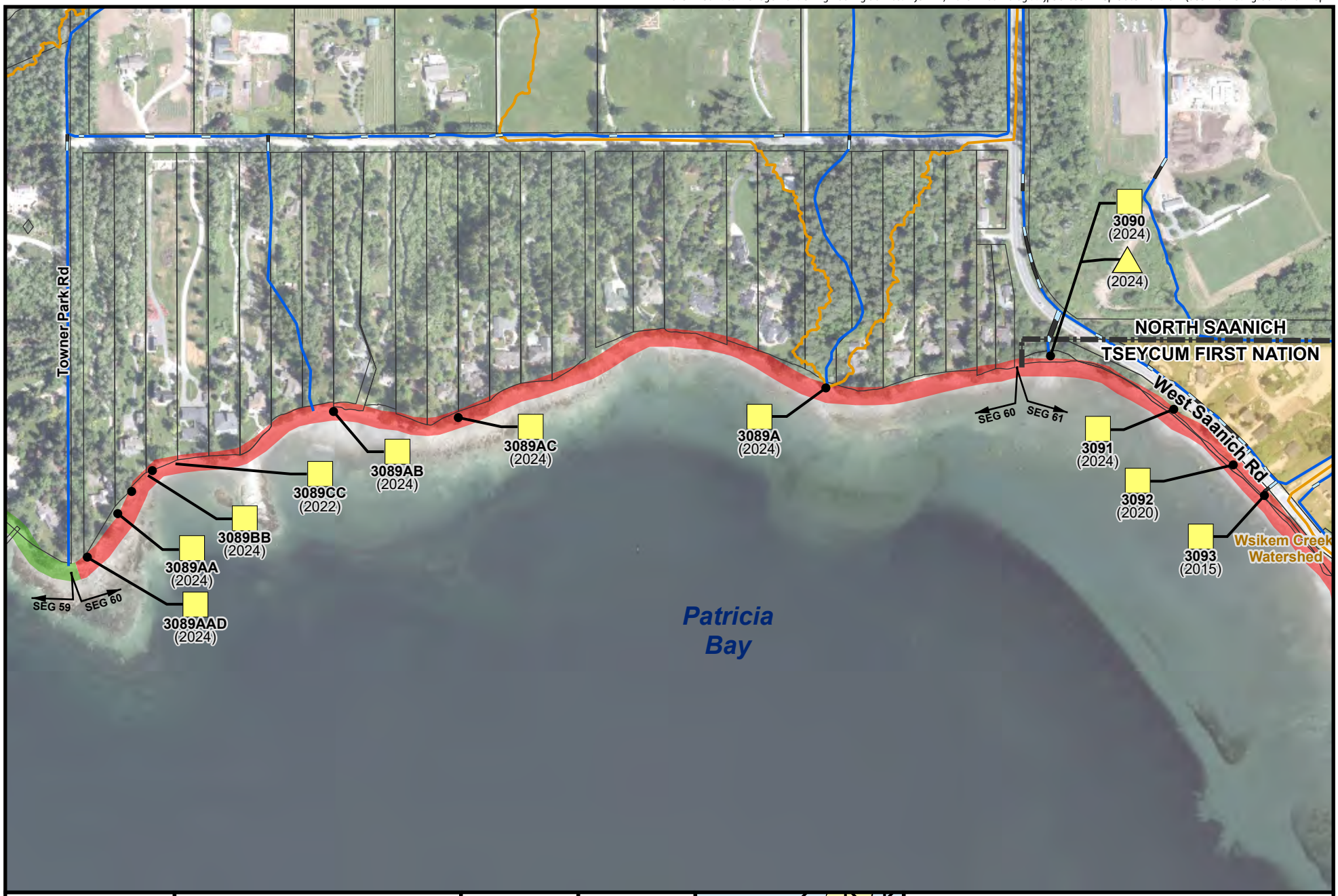


Figure 25

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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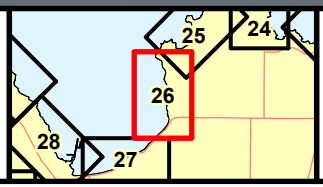
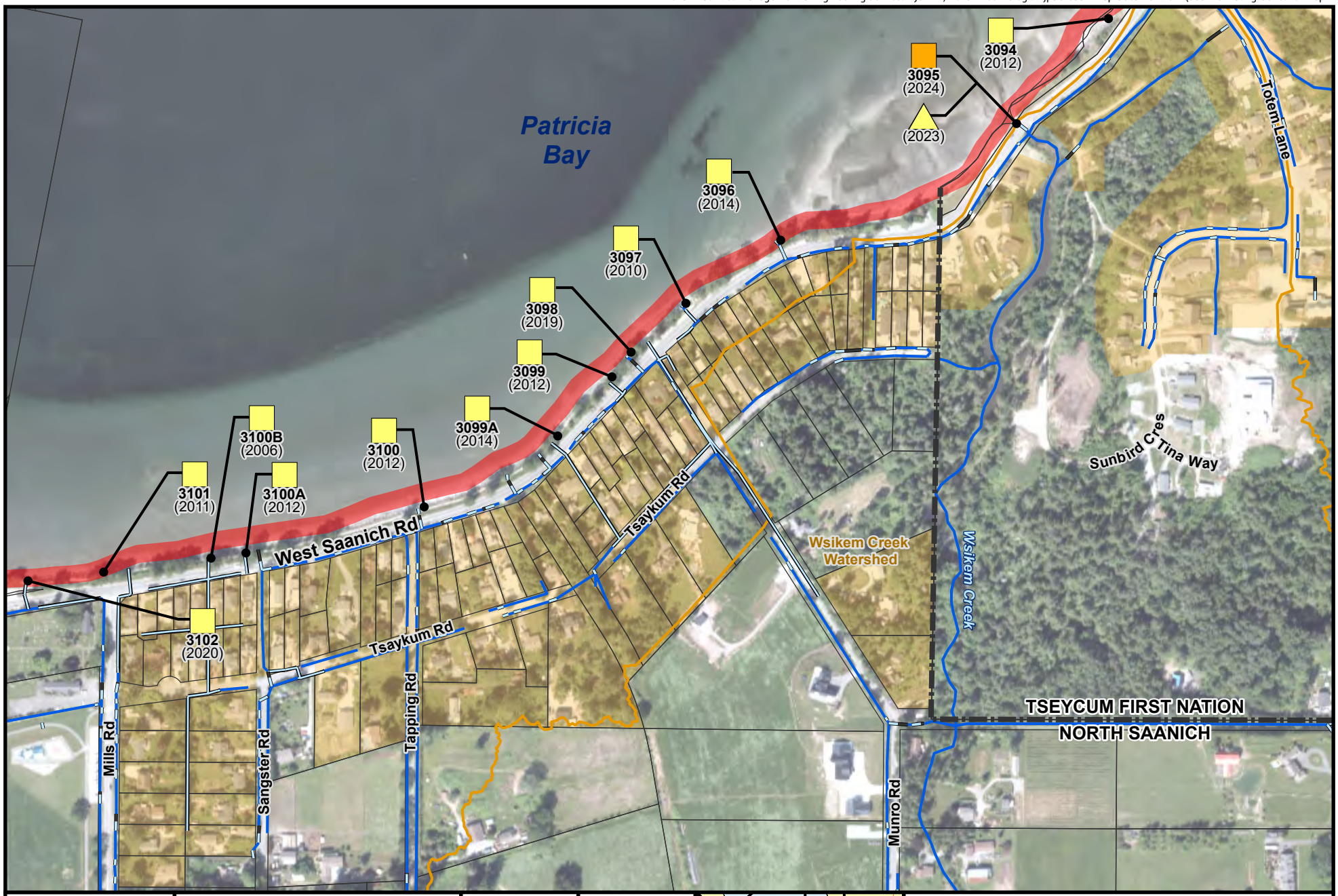


Figure 26

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern



Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

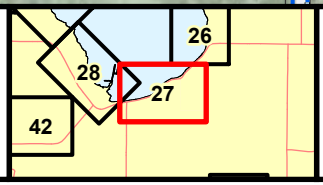
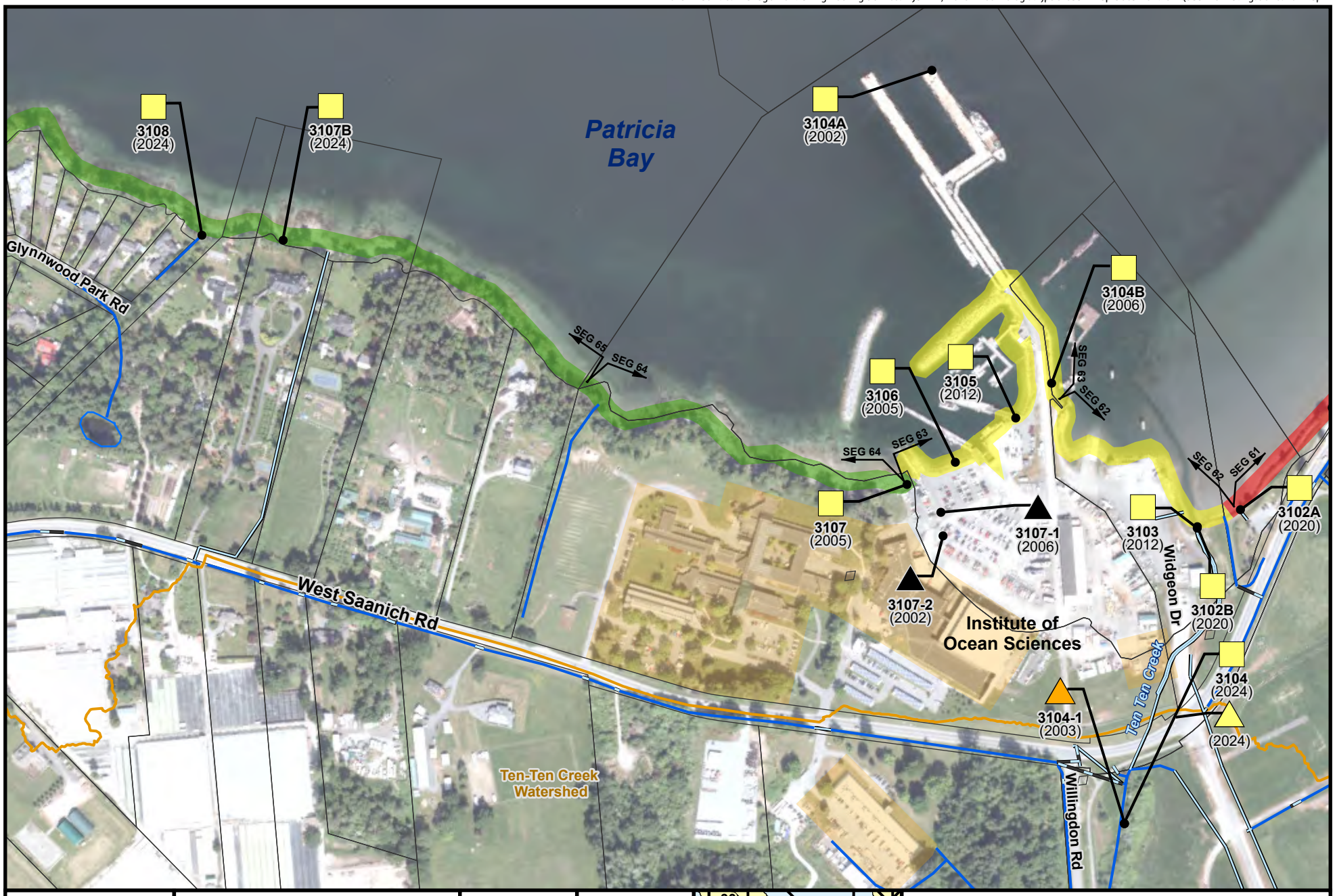


Figure 27

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern



CRD Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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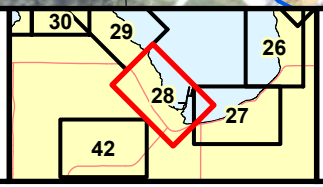

Figure 28

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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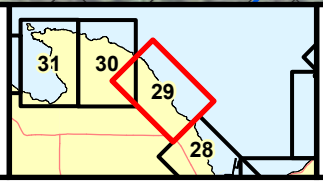

Figure 29

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

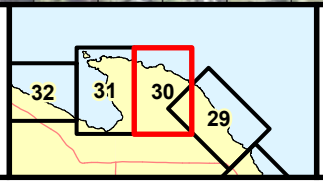
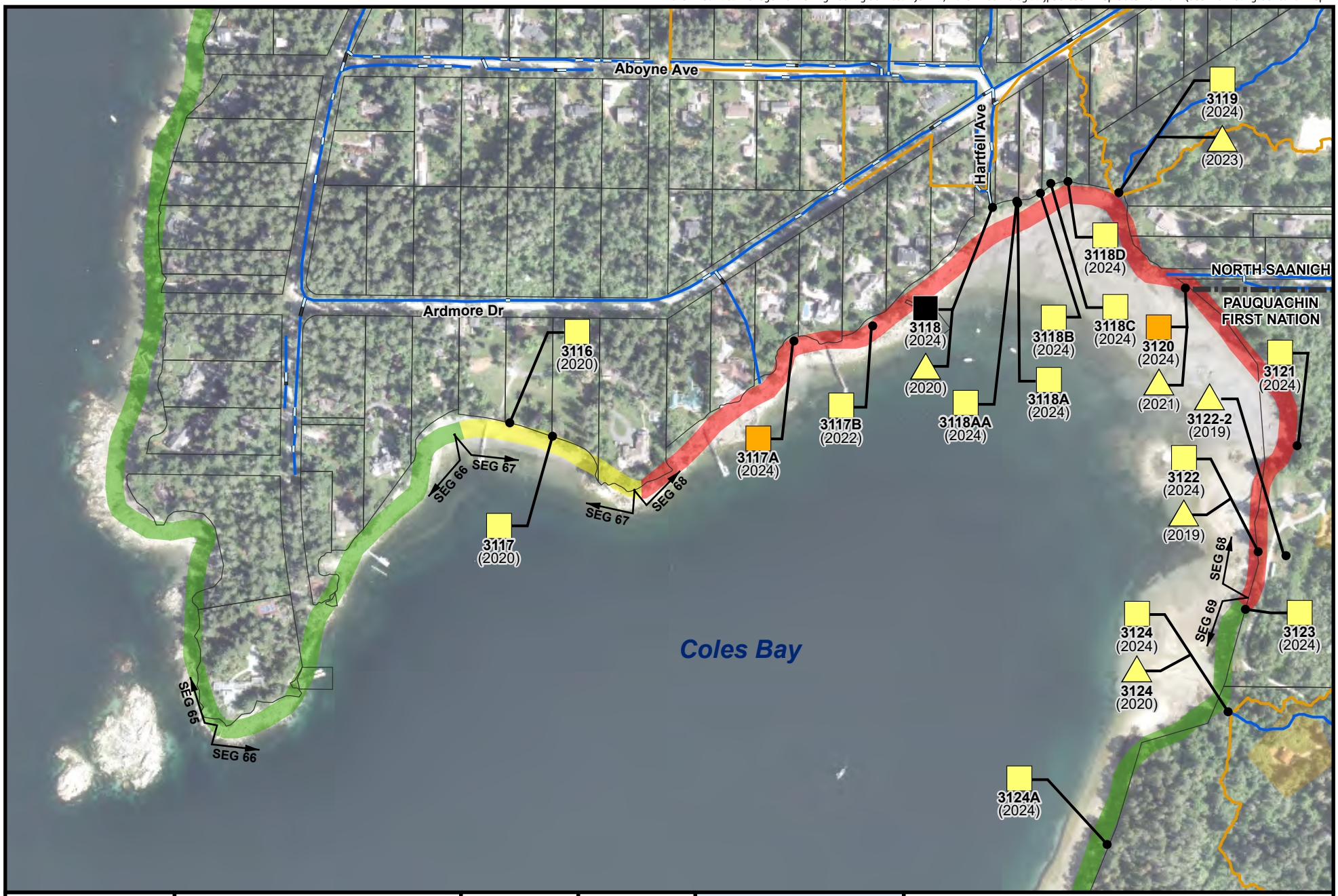


Figure 30

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



Making a difference...together

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

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For Key Index and Legend See Figure 1

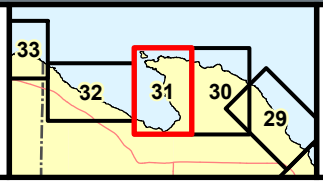

Figure 31
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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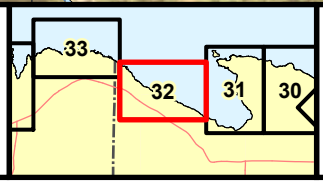

Figure 32

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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W S Z E

For Key Index and Legend See Figure 1

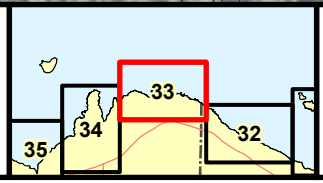
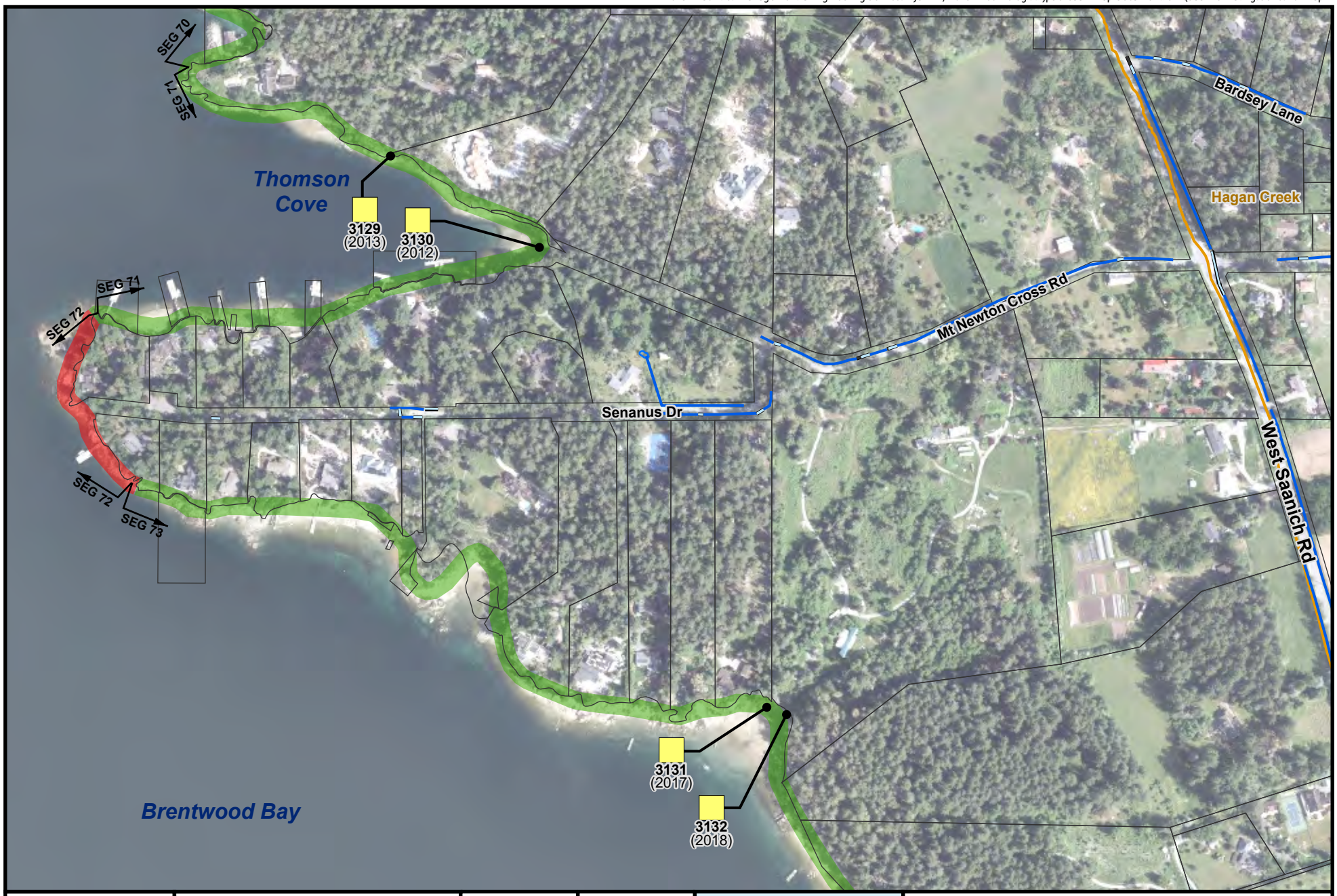


Figure 33

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

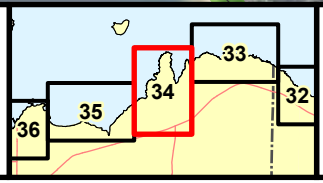

Figure 34

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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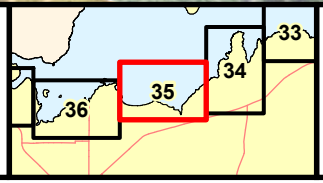

Figure 35

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern

Making a difference...together

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

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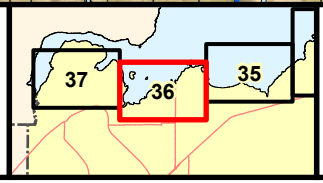

Figure 36
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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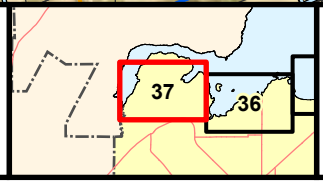
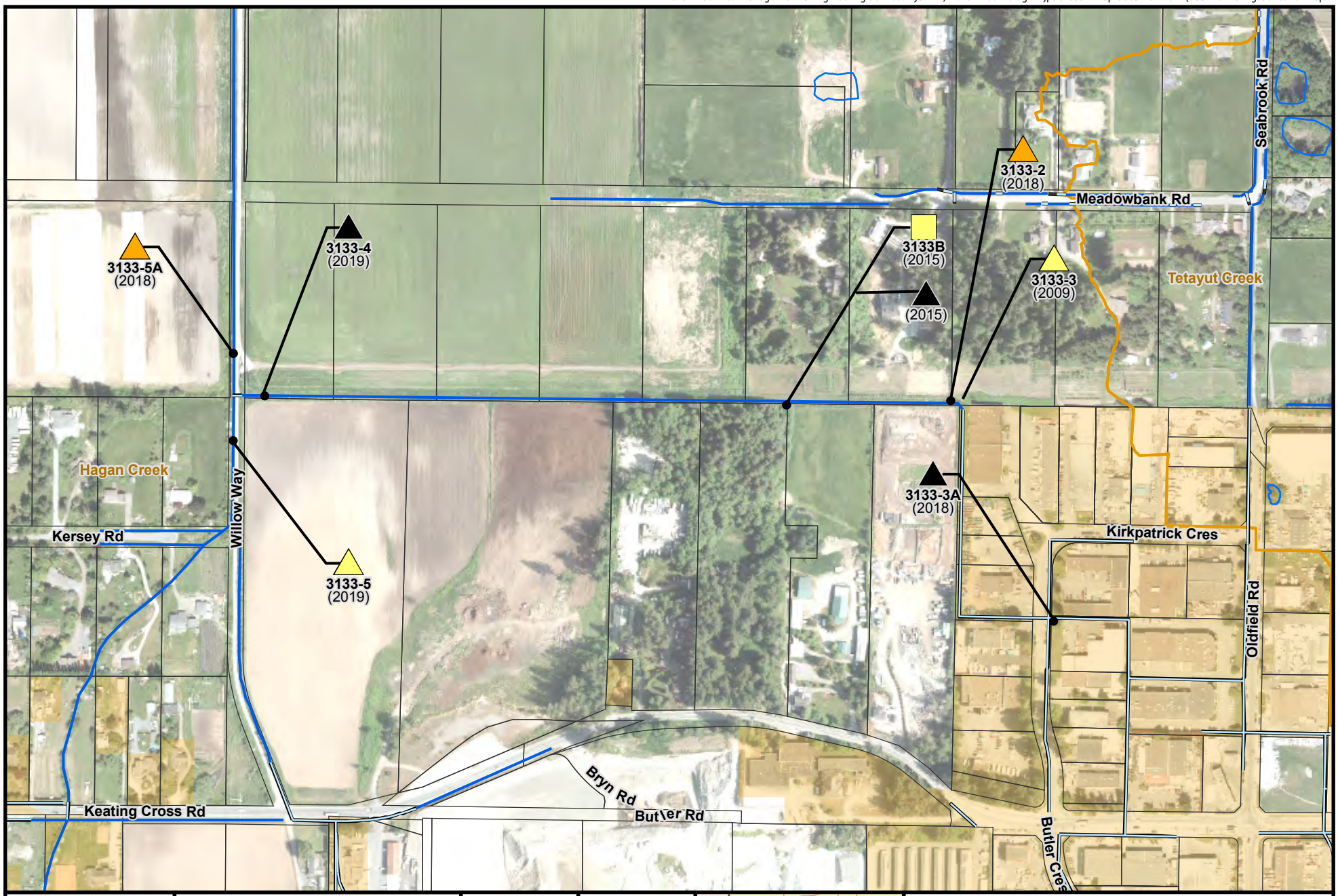


Figure 37

Saanich Peninsula 2024
Stormwater Discharge Location
and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

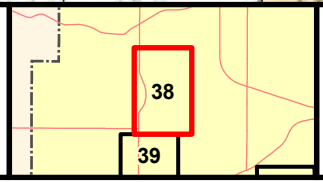
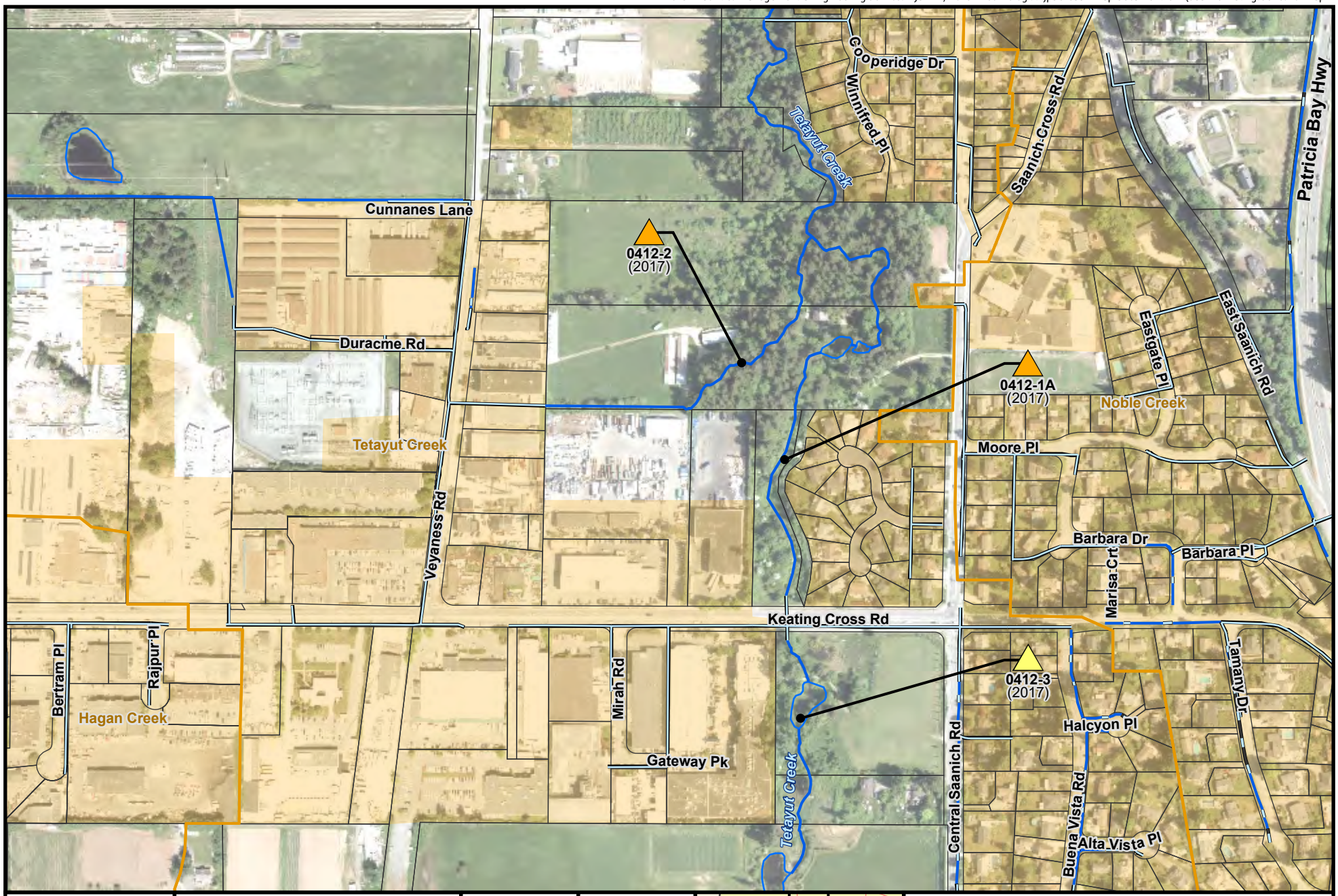


Figure 38

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



CRD Making a difference...together

0 25 50 100 150 Metres

Projection: UTM ZONE 10N NAD 83

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N W E S

For Key Index and Legend See Figure 1

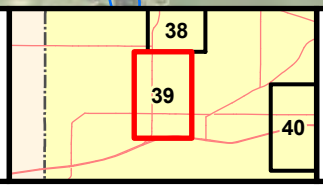
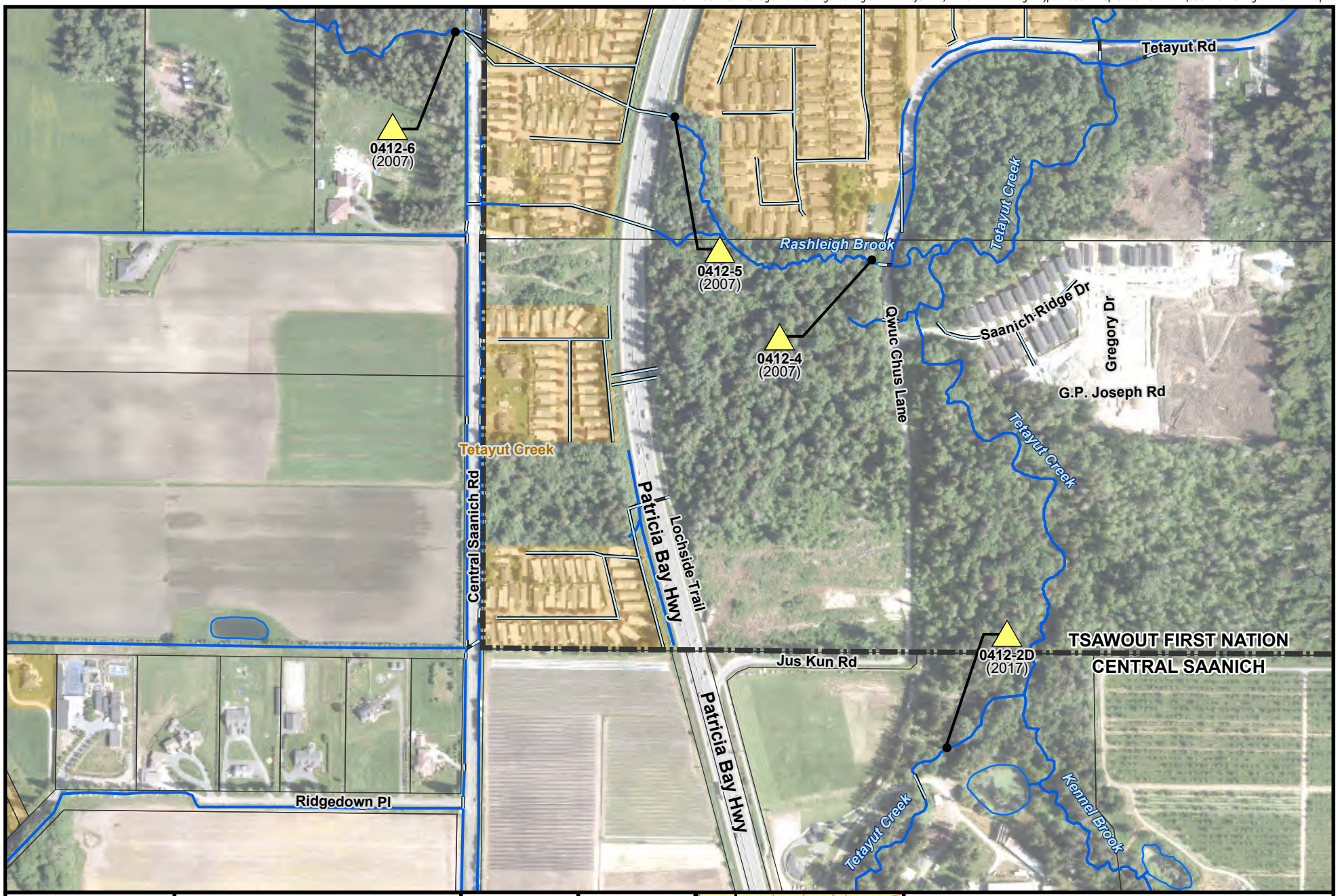


Figure 39

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



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

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For Key Index and Legend See Figure 1

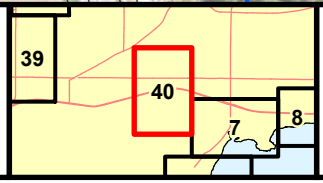
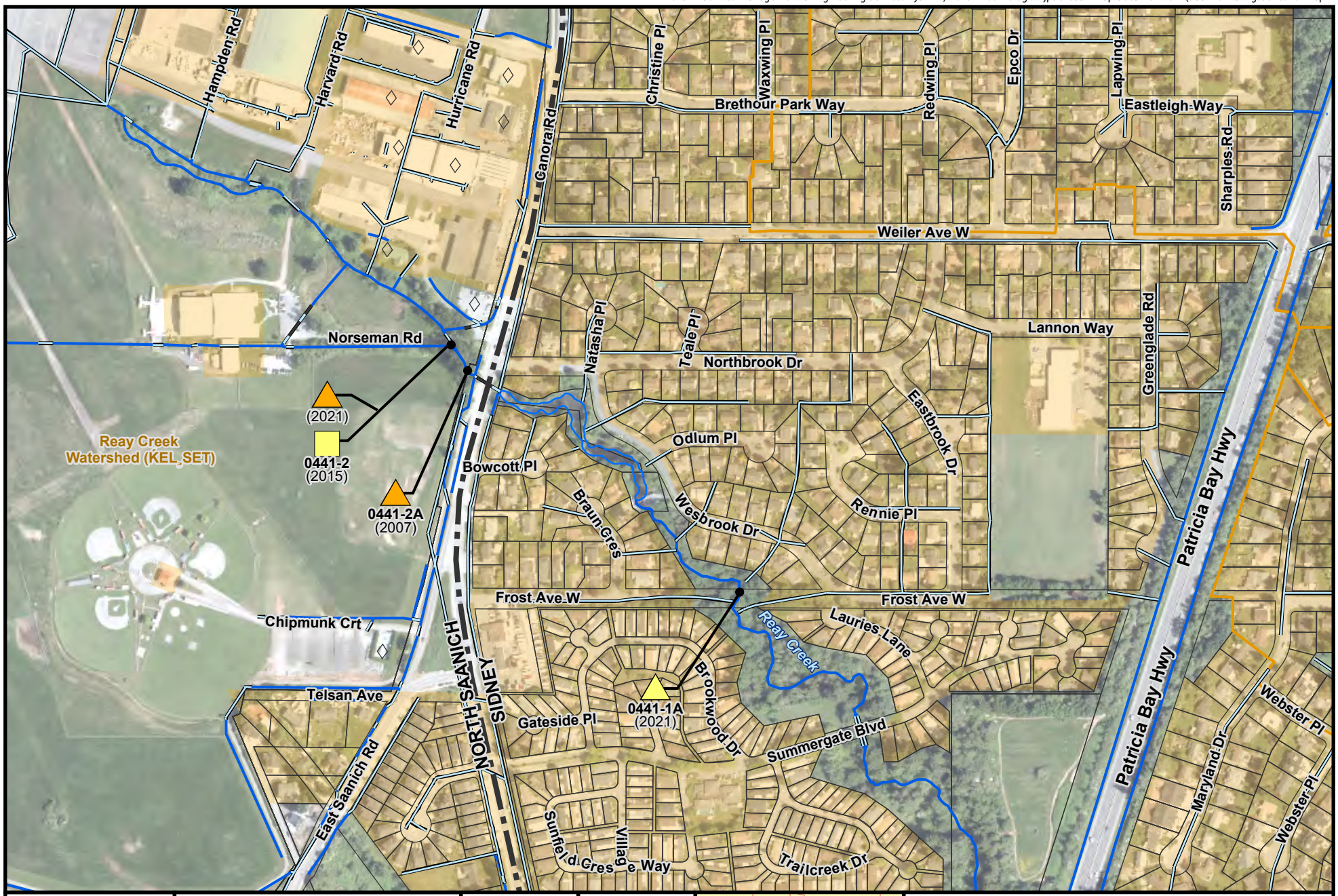


Figure 40
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



CRD — Making a difference...together

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

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For Key Index and Legend See Figure 1

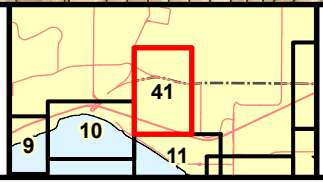
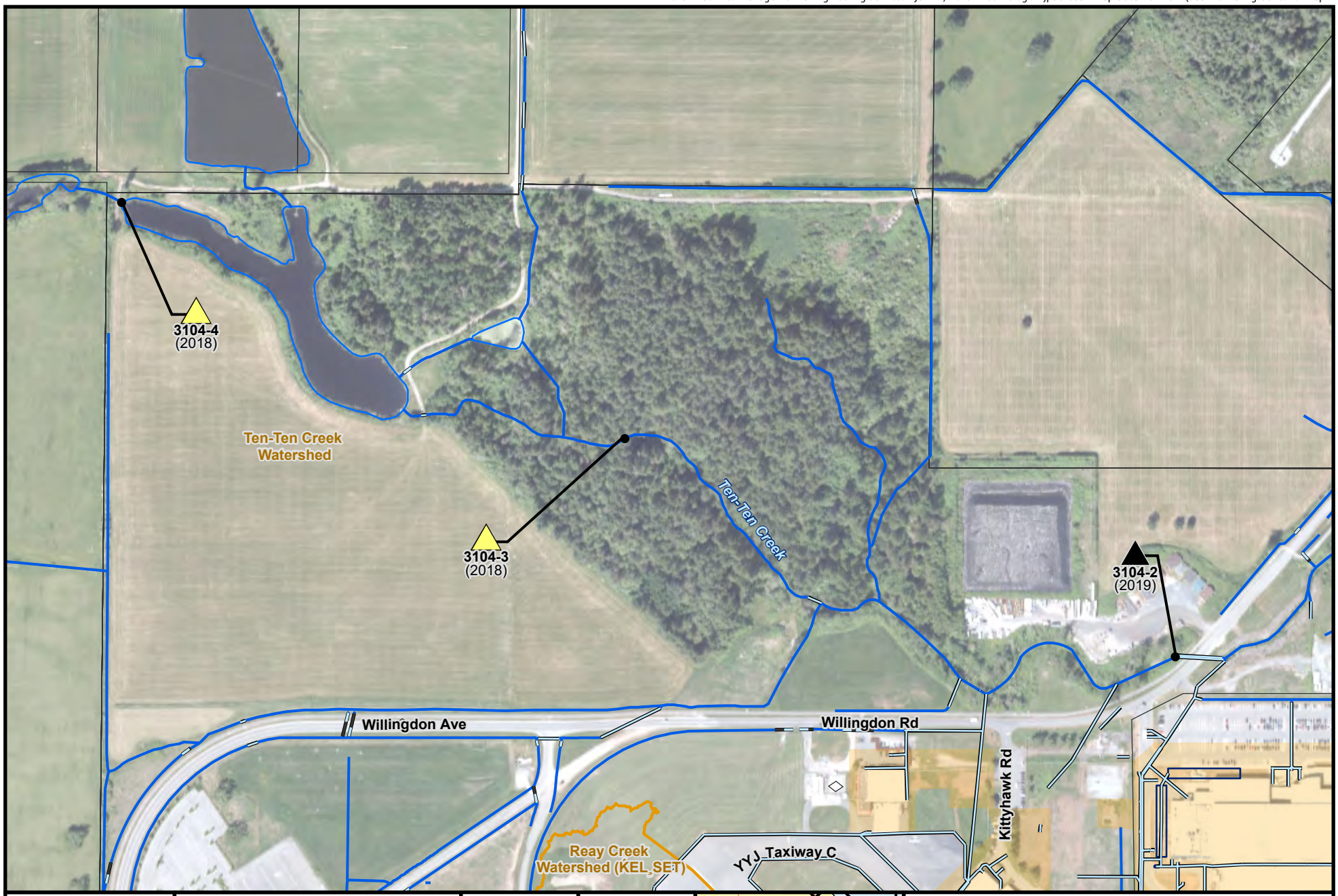


Figure 41
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



Making a difference...together

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

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W N S E

For Key Index and Legend See Figure 1

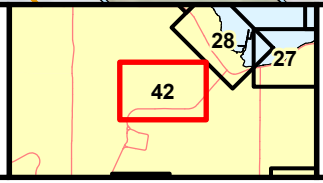
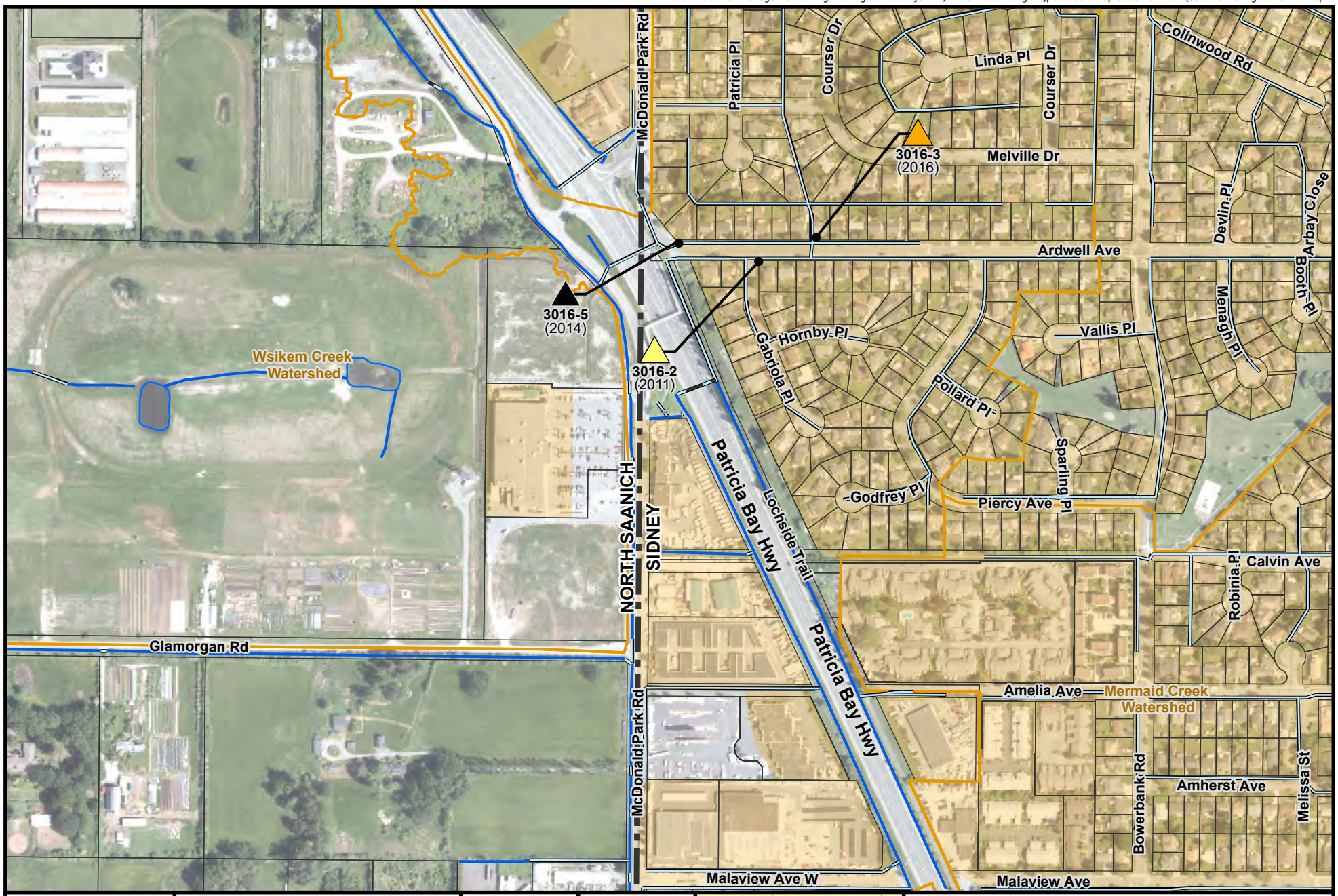


Figure 42
Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern



Making a difference...together

Metres

0 25 50 100 150

Projection: UTM ZONE 10N NAD 83

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For Key Index and Legend See Figure 1

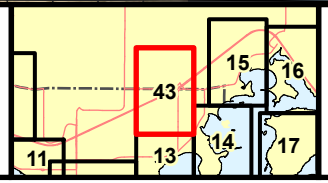

Figure 43

Saanich Peninsula 2024 Stormwater Discharge Location and Level of Concern

APPENDIX B

BACTERIAL AND FLOW DATA (2022-2024)

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW0405	2022-03-22	10	> 500	organic odour, tea colour, rain
	2022-07-07	270		iron-oxidizing bacteria, pooled, no rain
	2023-04-11	92	> 50	earthy odour, amber, no rain
	2023-07-05	3000	> 400	swampy odour, amber, no rain
	2024-04-08	6	85	sewer odour, amber colour, rain
	2024-08-28	380	60	amber, slow flow, recent rain
SW0408	2023-09-25		0	dry, rain prior
	2024-02-29	3500	< 1	heavy rain yesterday
	2024-05-30			dry, recent rain
	2024-08-29		0	dry, recent rain
SW0409	2023-01-31	79	< 1	murky brown, rain recent
	2023-09-25		0	dry, rain prior
	2024-02-29		9	heavier rain yesterday
	2024-08-29		0	dry, recent rain
SW0409A	2023-01-31	< 1	< 1	rain recent
	2023-09-25		0	dry, rain prior
	2024-02-29	250	< 0.01	heavy rain yesterday
	2024-08-29		0	dry, recent rain
SW0411	2022-03-11	< 1	8	no rain
	2022-07-27		0	dry, no rain
	2023-01-31	40	11	murky, rain recent
	2023-09-25		0	dry, rain prior
	2024-02-29	11	8	heavier rain yesterday
	2024-08-29		0	dry, recent rain
SW0411A	2022-03-11	< 1	11	no rain
	2022-07-27	90	1	turbid brown, no rain
	2023-01-31	38	10	sewer odour, murky, recent rain
	2023-09-25		0	dry, rain prior
	2024-02-29	13	12	heavier rain yesterday
	2024-08-29	2100	< 1	amber, recent rain
SW0412	2022-03-11	23	> 2000	no rain
	2022-07-27	280	> 250	no rain
	2023-03-29	160000	> 1200	
	2023-04-11	19000	> 1000	sewer odour, murky, no rain
	2023-09-25	650	> 500	rain prior
	2024-02-29	800	> 5000	turbid, heavier rain yesterday

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-05-10	47	> 500	no rain
	2024-08-29	52	> 400	recent rain
	2024-12-04	14	> 5000	recent rain; human bacteria
SW0412-2D	2024-05-10	34	> 250	no rain
	2024-08-29	29	120	recent rain
SW0412-7	2024-05-10	54	35	no rain
	2024-08-29	65	15	recent rain
SW0416	2024-02-15	11	12	murky, rain/snow
	2024-08-08	33	9	amber, no rain, geese
SW0420	2022-03-11	< 1	20	no rain
	2022-07-07	70	20	no rain prior
SW0421	2023-01-31		0	dry, rain recent
	2023-07-05		0	dry, no rain
	2024-02-15		0	dry, rain/snow
	2024-08-08		0	dry, no rain
SW0422A	2022-03-11		0	dry, no rain
	2022-07-07		0	dry no sample, no rain
SW0424	2022-01-17	3	75	rain previous
	2022-01-17	7	75	rain previous
	2022-01-17	4	75	rain previous
	2022-01-17	7	75	rain previous
	2022-01-17	4	75	rain previous
SW0426	2022-03-11	23	12	no rain
	2022-07-07	470	6	no rain
	2023-01-31	50	24	rain recent
	2023-07-05	37	8	no rain
	2024-02-15	16	14	rain/snow
	2024-08-08	27	4	no rain, geese on beach
SW0430B	2022-03-11	< 1	5	amber, no rain
	2022-07-07	350	3	amber, no rain
	2023-01-31	11	9	rain recent
	2023-07-05	430	< 1	murky brown, no rain
	2024-02-15	3	8	rain/snow
	2024-08-08	420	< 1	no rain
SW0432	2022-03-11	2	45	no rain
	2022-07-07	90	48	no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2023-01-31	260	80	earthy odour, murky, rain recent
	2023-07-05	32	32	no rain
	2023-07-05	14	50	no rain
	2024-02-15	31	80	rain/snow
	2024-08-08	16	70	no rain
SW0435	2024-04-30	5	28	rain earlier in the day
	2024-08-08	340	> 90	no rain, geese
SW0441	2022-03-11	6	> 800	no rain
	2022-05-18	86	> 500	amber, rain within 2 days
	2022-07-07	300	80	no rain
	2022-08-12	5500	> 250	no rain
	2022-08-18	800	> 200	no rain
	2022-08-25	690	> 200	no rain
	2022-09-01	240	> 200	no rain
	2022-09-08	140	> 250	no rain
	2022-10-25	380	> 300	rain, potential first flush
	2022-10-25	470	> 300	rain, potential first flush
	2022-11-03	96	800	rain prior
	2022-11-08	130	> 800	rain prior
	2022-11-17	78	> 600	rain prior
	2022-11-24	330		no rain
	2023-03-29	10	> 300	
	2023-07-05	64	> 250	low tide odour, low tide, no rain
	2024-04-30	23	> 500	murky, rain earlier
	2024-08-08	710	> 200	tidal/sewer odour, murky, no rain, geese
SW0441-1A	2022-08-12	7	120	no rain
	2022-08-18	14	120	no rain
	2022-08-25	30	120	no rain
	2022-09-01	53	120	no rain
	2022-09-08	28	120	no rain
	2022-10-25	200	> 150	rain , potential first flush
	2022-11-03	170	400	rain prior
	2022-11-08	120	> 400	rain prior
	2022-11-17	42	> 300	rain prior
	2022-11-24	93		no rain
SW0444	2022-03-10	< 1	< 1	no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2022-07-07	79	5	no rain
	2023-01-31	5	4	rain recent
	2023-07-06		0	dry, no rain
	2024-02-15	3	6	rain/snow
	2024-08-08	46	< 1	no rain
SW0444A	2022-03-10		< 0.01	flow too low
	2022-07-07		0	dry no sample, no rain
	2023-01-31	9	< 1	rain recent
	2023-07-06		0	dry, no rain
	2024-02-15	1	< 1	rain/snow
	2024-08-08		0	dry, no rain
SW0445	2022-12-08	170	30	murky amber, rain
SW0446	2022-03-10	< 1	1	no rain
	2022-07-07	320	2	no rain
	2023-01-20	< 1	5	rain two days ago
	2023-07-06		0	dry, no rain
	2024-02-15	7	8	rain/snow
	2024-08-08	15	< 1	no rain
SW0447	2022-03-10	34	2	no rain
	2022-06-16	14000	7	rain two days ago
	2023-01-20	4400	9	sewer odour, rain two days ago
	2023-07-06		< 0.01	flow too low, no rain
	2024-01-16	7000	4	amber colour, no rain
	2024-02-15	210	7	rain/snow
	2024-08-08	33	2	no rain
SW0448	2022-03-10	1	3	amber, no rain
	2022-07-07	290	7	amber, no rain
	2023-01-20	10	6	rain two days ago
	2023-07-06		< 0.01	flow too low, no rain
	2024-02-15	3	5	rain/snow
	2024-08-08	59	4	no rain
SW0449	2022-03-10	1	> 350	murky brown, no rain
	2022-05-18	140	90	murky, rain within two days
	2022-07-11	140	20	amber, no rain
	2023-03-29	2	12	
	2023-07-06	250	8	no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-02-15	6	35	murky, rain/snow
	2024-08-08	210	8	amber, no rain
SW0449A	2022-03-10	10	40	no rain
	2022-05-18	600		pooled, recent rain
	2022-07-11	16		amber, pooled, no rain
	2023-03-29	8		
	2023-09-25	1500	10	pooled, rain prior
	2024-02-15	27	20	rain/snow
	2024-08-08	180		no rain, unknown flow
SW0450	2022-03-10	860	35	slightly murky, no rain
	2022-05-18	2000	40	sewer odour, rain within two days
	2022-06-03	2700	70	murky, rain
	2022-07-21	2300	14	sewer odour, murky, no rain
	2022-08-25	1500	5	slightly murky, no rain
	2023-03-29	17	10	
	2023-07-06	2400	7	amber, no rain
	2024-02-15	7300	30	murky, otter scat u/s, rain/snow
	2024-08-08	120000	1	no rain
	2024-08-26	5800	24	recent rain
SW0459	2022-03-14	90	5	no rain
	2022-07-11	590	1	amber, no rain
	2023-04-12	3	7	no rain
	2023-07-06	50	2	amber, no rain
	2024-02-15	2	7	rain/snow
	2024-08-27	350	7	amber, recent rain
SW0462	2022-03-14	1	2	no rain
	2022-07-11		< 0.01	flow too low, no rain
SW0464	2022-03-14	< 1	3	no rain
	2022-07-11		< 0.01	flow too low, no rain
SW0467	2022-03-14	6	2	no rain
	2022-03-22	5	5	amber, rain
	2022-07-11		0	dry, no rain
SW0472	2022-07-11		0	dry, no rain
	2023-07-06		0	dry, no rain
	2024-08-27		< 0.01	flow too low, recent rain
SW3002	2024-03-20		< 0.01	flow too low, no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-08-27		3	dry, recent rain
SW3003	2022-03-14	25	4	no rain
	2022-07-11	52	1	no rain
	2023-01-20	130	6	rain two days ago
	2023-07-06	200	2	amber, no rain
	2024-03-20	2	4	no rain
	2024-08-27	80	0	recent rain
SW3003A	2024-03-20	< 1	1	no rain
	2024-08-27	37	6	recent rain
SW3005	2022-03-15	< 1	> 500	amber, rain
	2022-07-11	60	50	no rain
	2022-12-12	50		pooled, recent rain
	2023-04-12	14	65	no rain
	2023-07-06	98	25	amber, no rain
	2024-05-06	99	> 250	amber, recent rain
	2024-08-27	380	> 100	recent rain
SW3005-1A	2022-03-15	280	60	amber, rain
	2023-04-12	4	20	no rain
	2023-07-06	110	5	no rain
	2024-05-06	27	20	recent rain
	2024-08-27	360	10	recent rain
SW3005-2A	2023-04-12	16	15	no rain
	2024-05-06	9	4	recent rain
	2024-08-27	350	20	recent rain
SW3005-4	2023-04-12	20	40	no rain
	2023-07-06	400	20	amber, no rain
	2024-08-27	160	90	recent rain
SW3006	2023-01-20	7	9	rain two days ago
	2023-07-06	12000	2	amber, no rain
	2024-03-20	3	10	no rain
	2024-08-27	240	4	recent rain
SW3007	2022-03-15	130	7	rain
	2022-07-11	7	1	no rain
	2023-01-27	5	5	soap odour, clear, suds, rain recent
	2023-07-06	420	1	soap odour, blue, sudsy, no rain
	2024-03-20	5	5	soap odour, no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-08-27	130	5	soap odour, recent rain
SW3009	2023-01-27	< 1	1	burnt odour, rain recent
	2023-07-06		0	dry, no rain
SW3011A	2024-03-20		< 0.01	flow too low, no rain
	2024-08-27		0	dry, recent rain
SW3012	2023-01-27	< 1	7	slight odour of diesel, rain recent
	2023-07-06		0	dry, no rain
	2024-03-20		< 0.01	flow too low, no rain
	2024-08-27		0	dry, recent rain
SW3013	2023-01-27		< 0.01	flow too low, rain recent
	2023-07-06		0	dry, no rain
	2024-03-20		< 0.01	flow too low, no rain
	2024-08-27		< 0.01	flow too low, recent rain
SW3014	2022-03-17	36	22	earthy odour, murky, heavy rain
	2022-07-11	15	1	no rain
	2023-01-27	7	3	sewer odour, rain recent
	2023-07-06	3	< 1	amber, no rain
	2024-04-08	58	2	rain
	2024-08-27	17	3	recent rain
SW3015	2022-03-17	42	22	murky amber, heavy rain
	2022-07-11	16000	2	no rain
	2023-01-27	2	4	sewer odour, rain recent
	2023-07-06	2700	< 1	amber, no rain
	2024-04-08	1	3	rain
	2024-08-27	1900	6	recent rain
SW3015A	2022-03-17	70	8	hydrocarbon odour, oily sheen, heavy rain
	2022-07-11		0	dry, no rain
	2023-01-27		0	dry, rain recent
	2023-07-06		0	dry, no rain
SW3016	2022-03-15	3400	> 120	rain
	2022-07-11	1000	9	no rain
	2023-01-27	4000	30	rain recent
	2023-07-12	7700	2	flow too low, no rain
	2024-05-06	290	50	recent rain
	2024-06-05	81000	30	recent rain
	2024-08-27	3500	30	recent rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3017A	2022-03-15	< 1	< 1	rain
	2022-07-11		< 0.01	flow too low, no rain
SW3017B	2022-03-15	< 2	< 1	rain
	2022-07-11		0	dry, no rain
SW3020	2022-03-17	510	60	earthy odour, dirty brown, heavy rain
	2022-07-21	15	4	no rain
	2023-04-11	80	9	no rain
	2023-07-12	290	4	no rain
	2024-04-08	3	8	rain
	2024-08-27	1800	7	recent rain
SW3020A	2022-03-17	40	18	heavy rain
	2022-07-21	2	4	no rain
	2023-04-11	2	4	no rain
	2023-07-12	14	3	no rain
	2024-04-08	< 1	6	rain
	2024-08-27	46	4	recent rain
SW3021	2022-12-08	8	40	murky brown, rain (at times heavy)
	2023-01-20	1	14	rain two days ago
	2023-04-13	1	11	no rain
	2023-07-12		< 0.01	flow too low, no rain
SW3021A	2022-03-17	2700	> 80	sewer odour, amber, heavy rain
	2022-07-21	460	4	garlic odour, no rain
	2023-04-13	2	5	no rain
	2023-07-12	58	3	no rain
	2024-05-06	9	7	amber, recent rain
	2024-08-27	3200	2	recent rain
SW3030	2023-04-13		< 0.01	flow too low, no rain
	2023-07-12		0	dry, no rain
SW3034A	2023-04-13		< 0.01	flow too low, no rain
	2023-07-12		0	dry, no rain
	2024-05-09		< 0.01	flow too low, no rain
	2024-08-27		0	dry, not sampled, recent rain
SW3035A	2023-04-13		0	dry, no rain
	2023-07-12		0	dry, no rain
	2024-04-17		< 0.01	flow too low, no rain
	2024-08-27		< 0.01	flow too low, recent rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3051	2024-04-17	1	9	amber, no rain
	2024-08-27	770	9	exposed historic dump, recent rain
SW3051A	2022-03-17	18	8	amber, heavy rain
	2022-07-21	5	1	no rain
	2023-05-08	< 1	6	recent rain
	2023-05-10	< 1	4	no rain
	2023-07-12	91	1	no rain
	2024-04-17	< 1	7	no odour, no rain
	2024-08-27	54	2	algae in channel, recent rain
SW3077	2022-03-17	94	6	brown, heavy rain
	2022-07-22	10000	3	amber, no rain
	2023-04-13	1300	6	murky brown, rain
	2023-07-07	3000	1	clear, no rain
	2024-05-09	49	2	no rain
	2024-08-29	21	< 1	recent rain
SW3078	2024-02-21	14000	18	sewer odour, murky, misty rain
	2024-05-30	11	2	recent rain
	2024-08-29	3200	< 1	recent rain
SW3078A	2022-03-17	17000	12	sewer odour, brown, heavy rain
	2022-07-22	9800	1	sewer odour, turbid amber, no rain
	2022-12-08	1300	6	murky, rain (at times heavy)
	2023-04-13	3700	5	sewer odour, murky, rain
	2023-07-07		< 0.01	flow too low, no rain
	2024-02-21	8000	10	sewer odour, murky brown, misty rain
	2024-05-30	53	3	recent rain
	2024-08-29	34	< 1	sewer odour, murky brown, recent rain
SW3078B	2023-04-13		0	dry, no rain
	2023-09-27		0	dry, recent rain
SW3079	2022-03-17	740	> 5000	very murky, heavy rain
	2022-07-22	340	45	slight turbid, no rain
	2022-07-28	170	45	amber, no rain
	2023-02-03	21	> 200	rain recent
	2023-04-13	23	> 400	rain during sample collection
	2023-07-07	400	34	clear, no rain
	2024-02-21	400	> 1000	earthy odour, turbid brown, misty rain
	2024-08-30	57	200	recent rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3080	2023-05-08	20	9	recent rain
	2023-07-07		< 0.01	flow too low, no rain
SW3080A	2022-03-22	200	> 100	murky, rain
	2022-07-22	36	8	amber, no rain
	2023-02-03	6	45	rain recent
	2023-07-07	30	8	no rain
	2024-02-21	210	> 80	turbid, misty rain, u/s investigation
	2024-08-26	330	8	recent rain
SW3080B	2024-02-21	21	6	amber, misty rain
	2024-08-26	23	4	recent rain
SW3082	2024-02-21	33	16	amber, misty rain
	2024-08-26	64	6	recent rain
SW3084	2024-03-01	37	8	recent rain
	2024-08-26		< 0.01	flow too low, recent rain
SW3085	2023-05-08	9	4	recent rain
	2024-02-21	38	18	amber, misty rain
	2024-08-26	47	2	recent rain
SW3087	2022-03-22	34	70	amber, rain
	2022-07-22	8	5	no rain
	2023-02-03	35	12	rain recent
	2023-07-07	90	3	no rain
	2024-02-21	330	16	amber, misty rain
	2024-08-26	350	2	recent rain
SW3088	2022-03-22	9600	< 1	rain
	2022-07-22		0	dry, no rain
	2023-02-03		< 0.01	flow too low, rain recent
	2023-07-07		0	dry, no rain
	2024-02-21		0	dry
	2024-08-26		< 0.01	flow too low, recent rain
SW3089A	2022-04-19	210	12	rain yesterday
	2022-07-28		0	dry, no rain
	2023-04-25	6	9	no rain
	2023-09-27		0	dry, rain prior
	2024-03-01	460	32	rain previous
	2024-05-30	110	7	recent rain
	2024-08-26		0	dry, recent rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3089AA	2023-04-25		< 0.01	flow too low, no rain
	2023-09-27		0	dry, rain prior
	2024-03-01		< 0.01	flow too low, recent rain
	2024-08-26		< 0.01	flow too low, rain
SW3089AAD	2022-04-19	2	1	rain yesterday
	2022-07-28		0	dry, no rain
	2023-04-25		0	dry, no rain
	2023-09-27		0	dry, no rain
SW3089AB	2022-04-19	720	12	rain yesterday
	2022-07-28	140	< 1	no rain
	2023-04-25	25	14	no rain
	2023-09-27		0	dry, rain prior
	2024-03-01	87	16	rain previous
	2024-08-26	79	< 1	recent rain
SW3089AC	2022-04-19	2	2	rain yesterday
	2022-07-28		0	dry, no rain
	2023-04-25	1	3	no rain
	2023-09-27		0	dry, rain prior
SW3089BB	2022-04-19	12	1	rain yesterday
	2022-07-28		0	dry, no rain
	2023-04-25	2	1	no rain
	2023-09-27		0	dry, rain prior
	2024-03-01	45	7	rain previous
	2024-08-26		< 0.01	flow too low, rain
SW3089CC	2022-04-19	< 1	3	rain yesterday
	2022-07-28	1	1	no rain
SW3089DD	2023-04-25	< 1		no rain
	2023-09-27	14	1	rain prior
	2024-03-01	11	9	rain previous
	2024-08-26	75	6	recent rain
SW3090	2022-04-08	2	35	no rain
	2022-07-22		0	dry, no rain
	2023-02-03	3	12	rain recent
	2023-09-25		0	dry, rain prior
	2024-03-01	51	65	recent rain
	2024-08-26		0	dry, rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3091	2022-04-08	130	10	no rain
	2022-07-27		0	dry, no rain
	2023-02-03	20	11	rain recent
	2023-09-25		0	dry, rain prior
	2024-04-30	52	9	rain earlier in the day
	2024-08-26		< 0.01	flow too low, rain
SW3095	2022-04-08	53	70	murky amber, no rain
	2022-07-27	5100	12	very amber, no rain
	2023-04-14	200	85	no rain
	2023-09-25	4000	11	murky brown, pooled, rain prior
	2023-11-29	11000	200	amber, no rain
	2024-04-30	69	70	amber, rain earlier in the day
	2024-06-26	130	18	no rain
SW3100	2024-02-29	98	2	heavier rain yesterday
	2024-09-24		0	dry, no rain
SW3104	2022-04-19	7	> 180	amber, rain yesterday
	2022-08-18	400	65	amber, no rain
	2023-05-08	68	> 80	amber, recent rain
	2023-07-05	250	40	amber, very low tide, EOP, no rain
	2024-05-30	34	60	recent rain
	2024-09-24	200	50	no rain
SW3107B	2023-02-01	4	20	rain recent
	2024-05-06	59	20	amber, recent rain
	2024-09-26		< 0.01	flow too low, recent rain
SW3108	2023-05-08		< 0.01	flow too low, recent rain
	2023-09-25		0	dry, rain prior
	2024-05-06	3	4	recent rain
	2024-09-26		< 0.01	flow too low, recent rain
SW3109	2023-02-01	6	9	rain recent
	2023-09-25		0	dry, rain prior
SW3117A	2022-03-25	190	10	rain two days ago
	2022-08-12		0	dry, no rain
	2023-05-11	450	< 1	no rain
	2023-06-22		0	dry, no rain
	2024-04-18	750	1	no rain
	2024-06-05	350	< 1	recent rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3117B	2022-03-25	< 1	2	rain two days ago
	2022-08-12	32	2	no rain
SW3118	2022-03-25	480	55	rain two days ago
	2022-08-12		0	dry, no rain
	2023-05-11	1000	9	no rain
	2023-06-22	320	10	no rain
	2023-07-06		< 0.01	flow too low, no rain
	2024-04-18	64	24	no rain
	2024-06-05	300	6	recent rain
	2024-08-28		0	dry, recent rain
	2024-09-26		< 0.01	flow too low, rain
	2024-10-30	3000	3	amber, previous rain
	2024-11-19	420	20	rain previous; human bacteria
SW3118A	2023-06-01	7	1	no rain
	2023-06-22	< 1	2	no rain
	2024-04-18	< 1	5	no rain
	2024-06-05	4	2	recent rain
	2024-08-28	8	1	recent rain
	2024-09-26		< 0.01	flow too low, rain
SW3118AA	2023-06-01		< 0.01	flow too low, no rain
	2023-06-22		0	dry
	2024-04-18	17	1	no rain
	2024-06-05	3	2	recent rain
	2024-08-28	270	1	recent rain
	2024-09-26	17	3	rain
SW3118B	2022-03-25	< 1	< 1	rain two days ago
	2022-08-12		< 0.01	flow too low, no rain
	2023-05-11		0	dry, no rain
	2023-06-22		0	dry, no rain
	2024-04-18		< 0.01	flow too low, no rain
	2024-08-28		< 0.01	amber, recent rain
	2024-09-26		< 0.01	flow too low, recent rain
SW3118C	2022-03-25	< 2	3	brown from erosion, rain two days ago
	2022-08-12	< 1	1	no rain
	2023-05-11	< 1	< 1	no rain
	2023-06-22	3	2	no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-04-18	< 1	4	no rain
	2024-08-28	5	1	recent rain
	2024-09-26	21	1	amber, recent rain
SW3118D	2022-03-25	< 1	2	rain two days ago
	2022-08-12	11	< 1	no rain
	2023-05-11	< 1	< 1	no rain
	2023-06-22	< 1	1	no rain
	2024-04-18	< 1	3	no rain
	2024-08-28	1	< 1	recent rain
	2024-09-26	< 1	< 1	recent rain
SW3118-M	2024-12-04	340	-	human bacteria detected
SW3119	2022-03-25	19	75	rain two days ago
	2022-08-12		0	dry, no rain
	2023-04-14	7	28	no rain
	2023-06-22	380	< 1	no rain
	2023-07-06		< 0.01	flow too low, no rain
	2024-04-18	110	35	no rain
	2024-08-28		< 0.01	amber, recent rain
	2024-09-26	180	1	amber, recent rain
SW3120	2022-03-25	< 1	50	rain two days ago
	2022-08-12		0	dry, no rain
	2022-11-08	530	6	rain in the past two days
	2023-04-14	25	15	no rain
	2023-06-22	96	1	no rain
	2023-07-06		< 0.01	flow too low, no rain
	2024-04-18	7	32	no rain
	2024-08-28		< 0.01	flow too low, recent rain
	2024-09-26	470	3	amber, recent rain
SW3121	2022-03-25	1	10	rain two days ago
	2022-08-12	230	2	no rain
	2023-05-11	< 1	4	no rain
	2023-06-22	140	2	no rain
	2024-05-23	81	3	recent rain
	2024-09-26	200	2	rain
	2024-12-04	1		unknown flow
SW3122	2022-04-08	12	60	no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2022-08-12		0	dry, no rain
	2022-08-18		0	dry, no rain
	2022-11-08	3200	6	rain in the past two days
	2023-05-11	2	5	no rain
	2023-06-22		0	dry, no rain
	2023-07-06		0	dry, no rain
	2024-05-23	29	1	recent rain
	2024-09-26		0	dry, rain
SW3123	2022-04-08	12	45	no rain
	2022-08-12		0	dry, no rain
	2022-08-18		0	dry, no rain
	2023-05-11		0	dry, no rain
	2023-06-22		0	dry, no rain
	2023-07-06		0	dry, no rain
	2024-05-23		< 0.01	flow too low, recent rain
	2024-09-26		0	dry, rain
SW3124	2022-04-08	< 1	> 500	no rain
	2022-08-18	89	20	no rain
	2022-08-25	140	14	no rain
	2022-09-01	24	12	no rain
	2022-09-08	30	10	no rain
	2022-09-15	1500	8	no rain
	2022-10-25	81	8	rain, potential first flush
	2022-11-03	25	11	rain prior
	2022-11-08	21	20	rain prior
	2022-11-17	13	18	rain prior
	2022-11-24	12		no rain
	2023-05-11	< 1	25	no rain
	2023-06-22	4	32	no rain
	2023-07-06	420	18	no rain
	2024-05-23	14	18	recent rain
	2024-09-26	170	7	amber, rain
SW3124A	2022-04-08	1	50	no rain
	2022-07-29		< 0.01	flow too low, no rain
	2023-04-20	< 1	5	rain
	2023-06-22		< 0.01	flow too low, no rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-05-23		< 0.01	flow too low, recent rain
	2024-09-26		< 0.01	flow too low, rain
SW3124B	2022-04-19	10	11	rain yesterday
	2022-07-29		< 0.01	flow too low, no rain
	2023-04-20	< 1	12	rain
	2023-06-22	37	6	no rain
SW3125	2022-04-19	3	110	rain yesterday
	2022-07-29	29	3	no rain
	2023-04-20	< 1	24	rain
	2023-06-22	92	< 1	no rain
	2024-04-26	1	54	rain earlier
	2024-05-10		0	dry, no rain
	2024-09-26		0	dry, rain
SW3125-1	2024-11-19	9	> 250	amber, rain previous
	2024-12-19	19		
SW3125-3	2024-11-19	25	> 150	amber, livestock u/s, recent rain
	2024-12-19	19		
SW3125A	2022-04-19	1800	4	rain yesterday
	2022-07-29	12	< 1	no rain
	2023-04-20	2	4	rain
	2023-06-22		< 0.01	flow too low, no rain
	2024-04-26	390	54	rain earlier
	2024-09-26		< 0.01	flow too low, rain
SW3125B	2022-04-19	< 1	9	rain yesterday
	2022-07-29	70	5	no rain
	2023-04-20	24	7	rain
	2023-06-22	38	7	otter activity, no rain
	2024-04-26	14	10	turbid brown, rain earlier
	2024-09-26		0	dry, rain
SW3125C	2022-04-19	< 1	7	rain yesterday
	2022-07-29	72	5	no rain
	2023-04-20	6	8	rain
	2023-06-22	1400	1	no rain
	2024-04-26	50	10	amber, rain earlier
	2024-09-26		0	dry, rain
SW3126	2022-04-19	2	3	rain yesterday

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2022-07-29		0	dry, no rain
	2023-04-20	1	2	rain
	2023-06-22		0	dry, no rain
SW3126A	2022-04-19	< 1	14	rain yesterday
	2022-07-29		< 0.01	flow too low, no rain
	2023-04-20	< 1	5	rain
	2023-06-22		< 0.01	flow too low, no rain
SW3127	2022-04-19	< 1	4	rain yesterday
	2022-07-29		< 0.01	flow too low, no rain
SW3127A	2022-04-19	< 1	15	rain yesterday
	2022-07-29		< 0.01	flow too low, no rain
SW3127AA	2022-04-19	< 1	4	rain yesterday
	2022-07-29		< 0.01	flow too low, no rain
SW3128	2023-04-20	13	8	rain
	2023-06-22		< 0.01	flow too low, no rain
	2024-05-30	1	6	recent rain
SW3133	2022-04-08	27	> 2000	amber, no rain
	2022-08-18	20	> 500	no rain
	2023-04-19	50	> 2000	rain yesterday
	2023-06-22	62	> 1000	no rain
	2024-05-06	20	> 500	recent rain
	2024-08-09	10	> 400	no rain, meter not available
	2024-09-24	60	> 2000	amber, no rain
	2024-10-04	190	> 2000	amber, rain
SW3133-2	2022-08-29	150000	12	sewer/chemical odour, black, no rain
	2022-09-13	160000	8	sewer odour, grey, floculant, no rain, PSS gear
	2022-09-13	230000	12	sewer odour, grey, floculant, no rain, surge flow
	2023-10-20	2100	12	chemical odour, rain previous
	2024-08-09	400	13	chemical/creosote odour, no rain
	2024-09-24	8000	12	hydrocarbon/creosote odour, no rain
	2024-10-04	14000	45	chemical/creosote odour, murky brown, rain
SW3133-3A	2024-08-09	4000	10	no rain
	2024-09-24	5000	10	hydrocarbon odour, pink hue, no rain
	2024-10-04	15000	40	hydrocarbon odour, murky brown, rain
SW3133-3B	2024-09-24	20000	8	hydrocarbon odour, no rain
	2024-10-04	20000	8	murky brown, rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
SW3135	2022-04-11	1	5	rain prior
	2022-08-18		0	dry, no rain
	2024-08-28		0	dry, recent rain
SW3136	2022-04-11	35	100	rain prior
	2022-08-18		0	dry, no rain
	2024-05-10	250	7	no rain
	2024-05-30	560	8	recent rain
	2024-08-28		0	dry, recent rain
SW3136A	2022-04-11	52	12	rain prior
	2022-08-18		0	dry, no rain
SW3137	2023-04-19	380	9	murky brown, rain yesterday
	2023-06-28		0	dry, no rain
	2024-05-10	36	5	no rain
	2024-08-28		0	dry, recent rain
SW3138	2022-04-11	23	40	rain prior
	2022-08-18	12000	1	no rain
	2023-04-19	350	24	rain yesterday
	2023-05-10	27	8	no rain
	2023-06-28	100	6	algae, no rain
	2024-05-10	13	10	no rain
	2024-08-28	65	6	recent rain
SW3138-1D	2023-05-10	2	7	no rain
SW3141	2022-03-23	< 1	< 1	rain previous two days
	2022-08-18		0	dry, no rain
	2023-01-26	< 1	11	rain two days ago
	2023-06-28	1	< 1	no rain
	2024-04-08	82	2	earthy odour, grey/black, rain
	2024-08-09		< 0.01	flow too low, no rain
SW3142	2022-03-23	11	> 80	rain previous two days
	2022-06-13	12	8	no rain
	2023-01-26	8	< 1	rain two days ago
	2023-06-28	16	3	no rain
	2024-02-20	43	20	rain recent
	2024-08-09	290	4	no rain
SW3145	2022-03-23	1	45	rain previous two days
	2022-06-03	70	9	rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2022-06-13	12	8	no rain
	2023-01-26	2	10	rain two days ago
	2023-06-28	600	< 1	no rain
	2024-02-20	2	22	rain recent
	2024-06-05	66	10	recent rain
	2024-08-09		0	dry, no rain
	2024-08-26	380	2	rain
	2024-10-30	22	12	
	2024-11-20	2	26	previous rain
SW3145A	2022-03-23	6	9	rain previous two days
	2022-07-22	470	4	amber, no rain
	2023-01-26	< 1	7	rain two days ago
	2023-06-28	6	5	no rain
	2024-08-09	50	2	no rain
SW3146	2022-03-23	240	> 1000	rain previous two days
	2022-07-22	840	50	no rain
	2023-01-26	51	50	rain two days ago
	2023-06-28	360		no rain
	2024-02-20	760	> 300	rain recent
	2024-08-09	320	40	no rain
SW3148	2022-04-07	100	> 500	no rain
	2022-07-22	42	28	no rain
	2023-04-25	3	80	no rain
	2023-09-27	25	12	recent rain
	2024-04-08	4	110	sewer odour, amber, rain
	2024-09-26	560	30	recent rain
SW3150	2022-04-07	57	50	no rain
	2022-06-03	1400	5	foam, rain
	2022-06-13	3200	7	sulphur odour, no rain
	2022-07-22	6000	3	no rain
	2023-04-25	3600	9	otter in pipe, no rain
	2023-09-27		< 0.01	flow too low, recent rain
	2024-04-08	100	7	murky grey colour, rain
	2024-09-26	9100	2	amber, recent rain
SW3150A	2023-04-25		< 0.01	flow too low, no rain
	2023-09-27		0	dry, recent rain

Bacterial and Flow Data (2022-2024)

Station ID	Sample Date	E. Coli CFU/100 mL	Flow Rate L/min	Sample Comment
	2024-04-08		< 0.01	flow too low, rain
	2024-09-26		< 0.01	flow too low, recent rain
SW3151	2022-04-07		0	dry, no rain
	2022-07-28		0	dry, no rain
	2023-04-25		< 0.01	flow too low, no rain
	2023-09-27		0	dry, recent rain
	2024-04-08	1	1	amber colour, rain
	2024-09-26		< 0.01	flow too low, recent rain
SW3153	2023-09-27		0	dry, recent rain
	2024-05-09		< 0.01	flow too low, no rain
	2024-09-26		< 0.01	flow too low, recent rain
SW3154	2022-04-07	18	> 4000	no rain
	2022-07-28	120	> 250	amber, no rain
	2023-02-22	6	> 5000	rain yesterday
	2023-09-27	110	400	recent rain
	2024-05-09	39	> 800	amber, no rain
	2024-09-26	90	> 500	recent rain

Notes
Flow is visually estimated.
Recent rain means rain within previous two days.
No rain means no rain within previous two days.
u/s = upstream; d/s = downstream
PSS = Peninsula Streams Society
Blue shading indicates E.coli concentrations greater than 400 CFU/mL, which may indicate a health risk.

APPENDIX C

PUBLIC HEALTH CONCERN RATINGS 2024

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2022	2023	2024		
405	4	Central Saanich	2	2	4	moderate	moderate	moderate	Amber colour; Island View beach	Continue monitoring
416	7	Central Saanich	1	3	4	NR	NR	low		Confirm rating
421	7	Central Saanich	1	1	2	NR	low	low	Dry	Resample in 2029
3128	33	Central Saanich	1	1	2	NR	low	low	Dry in summer	Confirm rating
3133	35	Central Saanich	1	2	3	moderate	low	low	SPSO, Hagan Creek	Continue monitoring
3141	36	Central Saanich	1	2	3	low	low	low	Dry in summer	Resample in 2029
3142	36	Central Saanich	1	2	3	low	low	low	Elevated intermittently; suds observed in past	Continue monitoring
3145	36	Central Saanich	1	3	4	low	moderate	low	Human bacteria upstream in past	Continue monitoring
3145A	36	Central Saanich	1	2	3	moderate	low	low	Elevated in summer	Confirm rating
3146	36	Central Saanich	2	2	4	moderate	moderate	moderate	SPSO	Continue monitoring
3148	36	Central Saanich	2	2	4	low	low	moderate	Brentwood Bay	Confirm rating
3150	36	Central Saanich	3	2	5	**high**	moderate	**high**	Brentwood Bay	Continue monitoring and investigations
3150A	36	Central Saanich	1	2	3	NR	low	low	Brentwood Bay; low flow	Resample in 2029
3151	36	Central Saanich	1	2	3	low	low	low	Dry	Resample in 2029
3153	37	Central Saanich	1	2	3	NR	low	low	Dry	Resample in 2029
3154	37	Central Saanich	1	2	3	low	low	low	Tod Creek	Continue monitoring
426	9	North Saanich	1	1	2	low	low	low	Bazan Bay; no human bacteria measured	Continue monitoring
430B	9	North Saanich	2	1	3	low	low	low	Dog park	Continue monitoring
432	10	North Saanich	1	1	2	low	low	low	Bazan Bay	Continue monitoring
435	10	North Saanich	1	1	2	NR	NR	low		Confirm rating
441	10	North Saanich	2	2	4	moderate	low	moderate	Reay Creek; birds upstream	Continue monitoring
3020	15	North Saanich	2	2	4	moderate	moderate	moderate		Continue monitoring
3020A	15	North Saanich	1	2	3	low	low	low	Dry in summer	Resample in 2029
3021A	16	North Saanich	2	2	4	moderate	low	moderate	High in summer	Confirm rating
3034A	16	North Saanich	1	2	3	NR	low	low	Dry	Resample in 2029
3035A	16	North Saanich	1	2	3	NR	low	low	Dry	Resample in 2029
3051	19	North Saanich	2	2	4	NR	NR	moderate		Confirm rating
3051A	19	North Saanich	1	2	3	low	low	low	Low counts	Resample in 2029
3077	23	North Saanich	1	3	4	**high**	**high**	**high**	Deep Cove	Confirm rating
3078	23	North Saanich	2	3	5	NR	NR	**high**		Confirm rating
3078A	23	North Saanich	3	3	6	**high**	**high**	**high**	Deep Cove; human bacteria present	Continue monitoring and investigations

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2022	2023	2024		
3079	23	North Saanich	2	3	5	moderate	moderate	moderate	Tatlow/Chalet Creek; human bacteria present	Continue monitoring and investigations
3080A	24	North Saanich	2	1	3	low	low	low	Benes Creek	Continue monitoring
3087	25	North Saanich	2	3	5	low	low	moderate	Low counts	Continue monitoring
3088	25	North Saanich	1	3	4	moderate	low	low	Low flow	Confirm rating
3089A	26	North Saanich	1	3	4	low	low	low	Stream; one count slightly elevated; dry in summer	Continue monitoring
3089AA	26	North Saanich	1	3	4	NR	low	low	Dry	Confirm rating
3089AB	26	North Saanich	1	3	4	moderate	low	low	Stream; low flow and low counts in summer	Confirm rating
3089BB	26	North Saanich	1	3	4	moderate	low	low	Dry in summer	Confirm rating
3104	28	North Saanich	1	2	3	moderate	low	low	SPSO, Ten Ten Creek	Continue monitoring
3107B	28	North Saanich	1	1	2	NR	low	low	Only one sample	Resample in 2029
3108	28	North Saanich	1	1	2	NR	low	low		Resample in 2029
3117A	31	North Saanich	2	2	4	low	moderate	moderate	New; private; no human bacteria present	Continue monitoring
3118	31	North Saanich	2	3	5	moderate	**high**	**high**	Human bacteria present in 2024	Continue monitoring
3118A	31	North Saanich	1	3	4	NR	low	low	Only sampled in June	Continue monitoring
3118AA	31	North Saanich	1	3	4	NR	low	low	Dry; only sampled in June	Continue monitoring
3118B	31	North Saanich	1	3	4	moderate	low	low	Dry; human bacteria present in 2021	Continue monitoring
3118C	31	North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3118D	31	North Saanich	1	3	4	low	low	low	Elevated count in past	Resample in 2026
3119	31	North Saanich	1	3	4	low	low	low	Coles Bay; dry in summer; human bacteria not present	Continue monitoring
3120	31	North Saanich	2	3	5	moderate	low	moderate	Coles Bay; dry in summer; human bacteria not present	Confirm rating
3125	32	North Saanich	1	2	3	low	low	low	Coles Bay	Resample in 2026
3125A	32	North Saanich	1	2	3	moderate	low	low	Occasional high count	Continue sampling
3125B	32	North Saanich	1	2	3	low	low	low	Dry in summer	Continue sampling
3125C	32	North Saanich	1	2	3	low	moderate	low	Dry in summer	Confirm rating
444	11	Sidney	1	3	4	low	low	low	High public use	Continue monitoring
444A	11	Sidney	1	3	4	low	low	low	Dry in summer	Continue monitoring
446	11	Sidney	1	3	4	moderate	low	low	Suds previously in discharge	Continue monitoring
447	11	Sidney	2	3	5	**high**	**high**	moderate	Counts fluctuate	Continue monitoring
448	11	Sidney	1	3	4	moderate	low	low	Low flow in summer, SPSO	Confirm rating

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2022	2023	2024		
449	11	Sidney	1	3	4	moderate	low	low	Counts fluctuate	Continue monitoring
449A	11	Sidney	1	3	4	moderate	moderate	low	Low flows; lower counts; extended outfall	Continue monitoring
450	11	Sidney	3	3	6	moderate	moderate	**high**	Cross-connection fixed; multiple sources upstream	Confirm investigations
459	12	Sidney	2	1	3	low	low	low	Elevated in summer	Resample in 2029
472	13	Sidney	1	2	3	low	low	low	Dry	Resample in 2029
3002	13	Sidney	1	2	3	NR	NR	low	Dry	Resample in 2029
3003	13	Sidney	1	2	3	low	low	low	Low flow	Continue monitoring
3003A	13	Sidney	1	2	3	NR	NR	low		Resample in 2029
3005	13	Sidney	1	2	3	low	low	low	SPSO	Confirm rating
3006	13	Sidney	1	2	3	NR	moderate	low	Roberts Bay	Confirm rating
3007	14	Sidney	1	2	3	low	moderate	moderate	Foot of Bowden	Confirm rating
3011A	14	Sidney	1	2	3	NR	NR	low	Dry	Resample in 2029
3012	14	Sidney	1	2	3	NR	low	low		Resample in 2029
3013	14	Sidney	1	2	3	NR	low	low		Resample in 2029
3014	14	Sidney	1	2	3	low	low	low	Low EC, low flows	Resample in 2029
3015	14	Sidney	3	1	4	moderate	moderate	moderate	High count in summer	Continue monitoring
3016	14	Sidney	3	2	5	moderate	**high**	**high**	Elevated EC, SPSO, one source known but challenging to fix	Continue monitoring
3090	26	Tseycum/North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3091	26	Tseycum/North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3095	27	Tseycum/North Saanich	1	3	4	**high**	**high**	moderate	Tseycum Creek, SPSO	Continue monitoring
3121	31	Pauquachin/ North Saanich	1	3	4	low	low	low	Low flow	Continue monitoring
3122	31	Pauquachin/ North Saanich	1	3	4	moderate	low	low	Dry in summer	Confirm rating
3123	31	Pauquachin/ North Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
3124	31	Pauquachin/ North Saanich	1	3	4	low	moderate	low	Low upstream previously	Continue monitoring
3124A	31	Pauquachin/ North Saanich	1	1	2	low	low	low	Dry in summer	Continue monitoring
3135	35	Tsartlip/Central Saanich	1	3	4	low	NR	low	Dry in summer	Confirm rating
3136	35	Tsartlip/Central Saanich	2	3	5	low	NR	moderate	Not sampled	Confirm rating

Public Health Concern Ratings

CRD Discharge No.	Report Figure No.	Jurisdiction at Discharge	Rating			Level of Concern			Comments	Recommendations
			E.coli Rating	Public Shoreline Use	Overall Rating	2022	2023	2024		
3137	35	Tsartlip/Central Saanich	1	3	4	NR	moderate	low	One elevated count in winter; dry in summer	Confirm rating
3138	36	Tsartlip/Central Saanich	1	3	4	moderate	low	low	Low flow in summer	Confirm rating
408	5	Tsawout/ Central Saanich	2	3	5	NR	NR	moderate	Tsawout	Confirm rating
409	5	Tsawout/ Central Saanich	1	3	4	NR	low	low	Tsawout	Confirm rating
409A	6	Tsawout/ Central Saanich	1	3	4	NR	low	low	Tsawout	Confirm rating
411	6	Tsawout/ Central Saanich	1	3	4	low	low	low	Dry in summer	Continue monitoring
411A	6	Tsawout/ Central Saanich	2	3	5	low	low	moderate	Elevated in summer but low flow	Continue monitoring
412	7	Tsawout/ Central Saanich	1	3	4	moderate	moderate	moderate	Tetayut Creek	Continue monitoring

Notes
Level of Concern determined by sum of the *Escherichia coli* (*E.coli)* and shoreline ratings. Low = sums of 2 and 3, moderate = sum of 4 and high = sums of 5 and 6.
Flow, season, previous *E.coli* measurements and recent changes in the catchment are also considered.
Professional judgement used in determining rating when necessary.
EC = *E.coli* counts
NR = Not rated because there was limited data or it was not one of the discharges assessed this year.
SPSO = This discharge acts as a sewage pump station overflow.

APPENDIX D

E. COLI SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM 2024

APPENDIX D
***E. COLI* SAMPLING QUALITY ASSURANCE**
AND QUALITY CONTROL PROGRAM
2024

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APPENDIX D

E. COLI SAMPLING QUALITY ASSURANCE AND QUALITY CONTROL PROGRAM FOR 2024

1.0 INTRODUCTION

Quality Assurance and Quality Control (QA/QC) programs are protocols adopted to ensure that results of any study are valid, internally consistent and comparable with similar projects. These protocols are set out in writing and based on current and relevant research on related topics.

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

2.0 METHODS FOR BACTERIAL SAMPLING

All water samples were collected in 250 mL wide-mouth polypropylene bottles supplied by the analytical laboratory, Bureau Veritas. 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. Labelled samples were stored in an insulated cooler with ice packs and delivered the same day to the laboratory. *Escherichia coli* bacteria (*E. coli*) were analyzed following the procedures in Standard Methods (APHA, 1998) and reported as colony forming units per 100 mL (CFU/100 mL).

2.1 Stormwater Discharge Sampling

Where possible, stormwater samples were collected from the point of discharge. Where this was not possible, the stormwater system was followed back to the nearest point where samples could be taken.

2.2 Quality Assurance

2.2.1 Stormwater Sample Replicates (Field Splits)

Ten percent of the total number of samples collected were replicated in the field (field replicates) and are identified in this report as field splits. A single sample was collected in a laboratory-prepared one-litre sample bottle and inverted 30 times to ensure that the sample was homogeneous. The sample was split evenly into two sample bottles. The two bottles were labelled and sent to the laboratory for analysis as separate samples but not identified as field splits.

2.2.2 Quality Control Assessment

To establish the precision criteria, 18 replicates (field splits) were analyzed for *E. coli* bacteria. Field splits were collected from six stormwater discharges. Discharges were chosen based on previous results, specifically high, moderate or low levels of *E. coli* concentrations. The QA sampling for the assessment was for all *E. coli* samples analyzed by Bureau Veritas. The three levels of *E. coli* concentrations were selected to represent the variance in the samples analyzed during the sampling program. Three grab samples were taken at each of the six stations and split into two replicate sample bottles. Three blank samples of potable water were also collected as part of the assessment. Samples were supplied to the laboratory with individual numbers.

2.2.3 Calculation of Laboratory Precision

Laboratory precision for *E. coli* analysis is determined by analyzing several pairs of field samples (field splits). The following procedure is the same as that used for fecal coliforms from Standard Methods, 20th edition (APHA, 1998).

Data are arranged in pairs (D1 and D2). The log of each field measurement is determined (L1, L2) and the difference (range) in the log value between each pair of field splits is calculated: R = (L2 - L1). 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 criteria:

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. 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 laboratory.

It is important not to put too severe an interpretation on the results, 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, through randomness, 5% of the samples to be outside of the precision criterion. Also, bacterial counts under 200 CFU/100 mL are considered too small 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 CFU/100 mL receive a low public health concern rating.

The results should be rounded to one decimal place and compared to the precision criterion (e.g., 0.3). If the calculated value from the duplicate results still exceeds the criterion, then an informal investigation of the laboratory should be initiated. If only a few duplicates are unacceptable (i.e., one out of every 20 pairs of duplicates), the laboratory 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.

3.0 RESULTS

CRD staff collected 18 pairs of stormwater samples from six discharges having high, moderate, or low levels of bacteria. Samples were analyzed for *E. coli* concentration used to calculate the precision criterion.

3.1 Blanks

Staff submitted three blank samples (tap water) to the laboratory for *E. coli* analysis. Blanks were reported as having <1 CFU/100 mL. Therefore, the results meet the QA requirements.

3.2 Precision Criteria

Table 1 shows laboratory results of the 18 pairs of samples used to determine the precision criterion. The calculated precision criterion was low this year at 0.4.

3.3 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 2024 Stormwater Sampling Program. Data were compared to the precision criterion (0.4), as described in Section 3.2. None of the field splits exceeded the precision criterion, 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 2024 Stormwater Sampling Program. None of the field splits exceeded the precision criterion, therefore, the results are acceptable.

4.0 CONCLUSIONS

Requirements for the Stormwater Monitoring QA/QC Program were carried out in 2024. 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.

Table 1 2024 Precision Criterion Calculation

CRD Data, Batch Samples: 18 pairs, January 2024						
Discharge No.	**Pair No.**	**1st Duplicate D1**	**2nd Duplicate D2**	**Log D1 L1**	**Log D2 L2**	**Range of Logs (Rlog) (L1 - L2)**
320	1	320	210	2.5051	2.3222	0.1829
	2	200	170	2.3010	2.2304	0.0706
	3	210	170	2.3222	2.2304	0.0918
245	1	220	370	2.3424	2.5682	0.2258
	2	300	290	2.4771	2.4624	0.0147
	3	360	300	2.5563	2.4771	0.0792
447	1	7000	1500	3.8451	3.1761	0.6690
	2	2600	1600	3.4150	3.2041	0.2109
	3	1800	2600	3.2553	3.4150	0.1597
222	1	8900	9000	3.9494	3.9542	0.0049
	2	8100	8300	3.9085	3.9191	0.0106
	3	5700	5600	3.7559	3.7482	0.0077
777A	1	15000	15000	4.1761	4.1761	0.0000
	2	13000	17000	4.1139	4.2304	0.1165
	3	14000	12000	4.1461	4.079	0.0669
744B	1	110000	100000	5.0414	5.000	0.0414
	2	89000	110000	4.9494	5.041	0.0920
	3	88000	100000	4.9445	5.000	0.0555
Mean - R_{log} (Sum R_{log}/18)						0.1167
Precision Criterion (3.27 x Mean-R_{log})						0.3815

Table 2 Comparison of Field Splits to Precision Criterion – 2024 Wet Period

Date	Discharge No.	E. Coli Counts CFU/100 mL	Log	Log Range	Acceptable (A) or Unacceptable (U)
12-Feb	775	3000	3.4771	0.0000	A
		3000	3.4771		
13-Feb	212	20	1.3010	0.1761	A
		30	1.4771		
27-Feb	781	420	2.6232	0.0918	A
		340	2.5315		
4-Mar	237	250	2.3979	0.1192	A
		190	2.2788		
11-Mar	655	1	0.0000	0.0000	A
		1	0.0000		
14-Mar	777A	2400	3.3802	0.0669	A
		2800	3.4472		
14-Mar	620	15000	4.1761	0.0621	A
		13000	4.1139		
21-Mar	879	1	0.0000	0.0000	A
		1	0.0000		
27-Mar	671	15000	4.1761	0.1663	A
		22000	4.3424		
4-Apr	527	6	0.7782	0.1761	A
		4	0.6021		
10-Apr	614	15000	4.1761	0.0544	A
		17000	4.2304		
11-Apr	854	10000	4.0000	0.1139	A
		13000	4.1139		
11-Apr	915	40	1.6021	0.1707	A
		27	1.4314		
19-Apr	690D	50	1.6990	0.1271	A
		67	1.8261		
22-Apr	875	1	0.0000	0.0000	A
		1	0.0000		
24-Apr	697	680	2.8325	0.0401	A
		620	2.7924		
24-Apr	867	310	2.4914	0.1112	A
		240	2.3802		
25-Apr	737	6	0.7782	0.3010	A
		12	1.0792		
14-May	505	14	1.1461	0.3680	A

Notes:
CFU: colony forming units.
A: calculated data is less than the precision criterion and, therefore, falls within normal variability.
U: calculated data is greater than the precision criterion and, therefore, falls outside normal variability.
A*: any *E. coli* count under 200 is considered too small an amount to calculate precision.

Table 3 Comparison of Field Splits to Precision Criterion – 2024 Dry Period

Date	Discharge No.	Field Split Fecal Coliform Counts	Log	Log Range	Acceptable (A), Unacceptable (U) or Conditionally Acceptable (U*)
8-Jul	214	14	1.1461	0.1461	A
		10	1.0000		
8-Jul	222	62000	4.7924	0.0465	A
		69000	4.8388		
19-Jul	607A	200	2.3010	0.0607	A
		230	2.3617		
19-Jul	620	8000	3.9031	0.0000	A
		8000	3.9031		
22-Jul	614	250	2.3979	0.0334	A
		270	2.4314		
24-Jul	805	390000	5.5911	0.0621	A
		450000	5.6532		
29-Jul	317	13	1.1139	0.2083	A
		21	1.3222		
30-Jul	322	2200	3.3424	0.0378	A
		2400	3.3802		
7-Aug	316	6700	3.8261	0.0190	A
		7000	3.8451		
9-Aug	3142	290	2.4624	0.2863	A
		150	2.1761		
13-Aug	508	27	1.4314	0.1001	A
		34	1.5315		
22-Aug	760	32	1.5051	0.1072	A
		25	1.3979		
5-Sep	653	430	2.6335	0.0207	A
		410	2.6128		
10-Sep	574	2400	3.3802	0.0378	A
		2200	3.3424		
11-Sep	538A	86	1.9345	0.0772	A
		72	1.8573		
18-Sep	310	500	2.6990	0.1523	A
		710	2.8513		
18-Sep	806	7900	3.8976	0.0525	A
		7000	3.8451		
20-Sep	709B	690	2.8388	0.0259	A

Notes:
CFU: colony forming units.
A: calculated data is less than the precision criterion and, therefore, falls within normal variability.
U: calculated data is greater than the precision criterion and, therefore, falls outside normal variability.
A*: any *E. coli* count under 200 is considered too small an amount to calculate precision.

APPENDIX E

CONTAMINANT DATA AND RATINGS FOR ENVIRONMENTAL CONCERN

Table 1 **2024 Stormwater Sediment Contaminant Concentrations**

	Station	Sample Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	LPAH	HPAH	O. Carbon %	Carbon normalized LPAH	Carbon normalized HPAH	Sample Comment
		CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	5.2	12	-	370	960	
		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	-	-	-	-	-	
SW3005-2A	Mermaid Creek upstream	2023-04-12	1.67	0.083	14.1	15.8	3.5	0.118	<0.05	82.6	0.014	0.11	0.28	0.050	0.393	grey sand, clear
SW3016	Tsehum Harbour	2024-05-06	4.31	0.211	23.7	*28.4*	11.3	<0.05	0.09	*133*	0.012	0.083	1.1	0.011	0.075	brown sand and fines,
SW3021	Blue Heron Creek	2023-04-13	2.9	0.117	17.2	17.4	16.8	*0.146*	0.101	69.4	0.032	0.14	2.2	0.015	0.064	brown sand, fines and organic material
SW3051	Queen Mary Bay	2024-04-17	3.06	0.379	21.1	18.1	17	0.063	0.1	117	0.02	0.067	1.7	0.012	0.039	brown fines and gravel
SW3051A	Queen Mary Bay	2024-04-17	2	0.075	12.7	*25.9*	4.96	<0.05	<0.05	47.3	0.013	0.027	1.2	0.011	0.023	sand, gravel, iron oxide bacteria, construction
SW3079	Tatlow Creek	2023-07-07	2.53	0.099	21.5	*22.5*	3.71	<0.05	<0.05	65.8	0.0035	0.034	2.6	0.001	0.013	grey sand and fines
SW3080A	Bennes Creek	2024-02-21	5.82	0.24	28	*38.7*	**74.4**	0.119	<0.05	**183**	0.0014	0.012	0.37	0.004	0.032	grey sand and gravel, investigation
SW3090	Patricia Bay	2024-08-26	4	0.067	30.3	*49*	7.85	<0.05	<0.05	115	0.0055	0.02	0.36	0.015	0.056	brown sand and gravel
SW3095	Tseycum Creek	2023-04-14	**8.6**	0.078	42	*41.7*	8.49	0.094	0.053	88.6	0.0071	0.012	0.84	0.008	0.014	brown fines and gravel
SW3104	TENTEN Creek	2024-05-30	7.1	0.144	30.1	*40*	7.11	<0.05	0.078	*142*	0.0061	0.017	2.2	0.003	0.008	brown sand, fines and gravel
SW3119	Coles Bay	2023-04-14	5.39	0.099	26.8	*22.5*	5.54	<0.05	0.057	62	0.026	0.016	1.7	0.015	0.009	brown fines, sand and gravel
SW3146	Brentwood Bay	2024-08-09	**14.4**	0.114	22.2	*34.9*	14.2	<0.05	0.057	**159**	0.0027	0.0071	0.39	0.007	0.018	grey sand and fines (some gravel)
SW3148	Brentwood Bay; Port Royale	2023-04-25	4.4	0.116	25.4	*29.3*	7.73	*0.133*	0.071	87.4	0.0045	0.026	1.2	0.004	0.022	brown sand, fines and gravel
SW3154	Tod Creek	2023-02-22	6.9	0.291	28.8	*35.3*	**40.2**	<0.05	0.063	**170**	0.026	0.056	0.64	0.041	0.088	sand, gravel, fines ~100 m above discharge
SW3154	Tod Creek	2023-02-22	**8.51**	0.287	28.5	*35.2*	*33.1*	0.08	0.059	**181**	-	-	-	-	-	coarse sand and gravel, discharge
SW3154	Tod Creek	2023-02-22	**7.85**	0.196	26.7	*34.2*	*34*	<0.05	<0.05	*143*	-	-	-	-	-	coarse sand and gravel, 10 m above discharge

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.

XX 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.

XX 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 discharge to marine, therefore marine guidelines are not applicable but used for screening purposes, see Table 4 for freshwater comparisons.

Table 2 2024 Sediment Contaminant Ratings

Station		Sample Date	Ratios of Contaminant Concentration to CRD Sediment Quality Guideline										TEQ	Rating
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	HPAH	LPAH		
		CRD MSQG	57	5.1	260	390	450	0.41	6.1	410	12	5.2		
SW3005-2A	MH; 2356/2362 Malaview Avenue	2023-04-12	0.029	0.016	0.054	0.041	0.008	0.288	0.008	0.201	0.001	0.021	0.67	Low
SW3016	Tsehum Harbour	2024-05-06	0.076	0.041	0.091	0.073	0.025	0.122	0.015	0.324	0.001	0.016	0.78	Low
SW3021	McDonald Park /Bayfield Road	2023-04-13	0.051	0.023	0.066	0.045	0.037	0.356	0.017	0.169	0.003	0.027	0.79	Low
SW3051	Queen Mary Bay	2024-04-17	0.054	0.074	0.081	0.046	0.038	0.154	0.016	0.285	0.002	0.013	0.76	Low
SW3051A	Queen Mary Bay	2024-04-17	0.035	0.015	0.049	0.066	0.011	0.122	0.008	0.115	0.001	0.005	0.43	Low
SW3079	Tatlow Creek	2023-07-07	0.044	0.019	0.083	0.058	0.008	0.122	0.008	0.160	0.000	0.007	0.51	Low
SW3080A	Bennes Creek	2024-02-21	0.102	0.047	0.108	0.099	0.165	0.290	0.008	0.446	0.000	0.002	1.27	Moderate
SW3090	Patricia Bay	2024-08-26	0.070	0.013	0.117	0.126	0.017	0.122	0.008	0.280	0.000	0.004	0.76	Low
SW3095	Tseycum Creek	2023-04-14	0.151	0.015	0.162	0.107	0.019	0.229	0.009	0.216	0.001	0.002	0.91	Low
SW3104	TEN TEN Creek	2024-05-30	0.125	0.028	0.116	0.103	0.016	0.122	0.013	0.346	0.001	0.003	0.87	Low
SW3119	Coles Bay	2023-04-14	0.095	0.019	0.103	0.058	0.012	0.122	0.009	0.151	0.002	0.003	0.57	Low
SW3146	Brentwood Bay	2024-08-09	0.253	0.022	0.085	0.089	0.032	0.122	0.009	0.388	0.000	0.001	1.00	Low
SW3148	Brentwood Bay; Port Royale	2023-04-25	0.077	0.023	0.098	0.075	0.017	0.324	0.012	0.213	0.000	0.005	0.84	Low
SW3154	Tod Creek	2023-02-22	0.121	0.057	0.111	0.091	0.089	0.122	0.010	0.415	0.002	0.011	1.03	Moderate
SW3154	Tod Creek	2023-02-22	0.149	0.056	0.110	0.090	0.074	0.195	0.010	0.441	-	-	1.13	Moderate
SW3154	Tod Creek	2023-02-22	0.138	0.038	0.103	0.088	0.076	0.122	0.008	0.349	-	-	0.92	Low

Notes

This table shows the ratio of contaminant concentration to CRD Marine Sediment Quality Guideline (MSQG).
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.
XX Value is approaching (ratio >0.75) or greater than (ratio is >1) the CRD MSQG and adverse effects to aquatic life probable.
TEQ is toxicity equivalency quotient which is a sum of all the ratios as an indicator of overall probable adverse effect from all contaminants.
Ratings are calculated as follows: low if the ratio sum (TEQ) is < 1; moderate if it is > 1 with no individual ratios greater than 0.75 and high if an individual ratio is > 0.75.
Some samples are not collected at discharge to marine, therefore marine guidelines are not applicable but used for screening purposes, see Table 4 for freshwater comparisons.
MH = manhole

Table 3 Summary of Contaminant Ratings for Environmental Concern

Discharge # (Location)	Figure #	Jurisdiction	Contaminant Ratings							Comments & Recommendations
			2018	2019	2020	2021	2022	2023	2024	
405 (Island View Beach)	4	Central Saanich	Low	Low	-	-	-	-	-	Resample in 2025 to monitor for change.
407 (Saanichton Bay)	5	Tsawout First Nation	-	-	-	-	Low	-	-	Rated low in 2005, 2011 and 2017. Resample in 2027 to monitor for change.
409C (Saanichton Bay)	6	Tsawout First Nation	Low	Low	-	-	-	-	-	Resample in 2025 to monitor for change.
410 (Saanichton Bay)	6	Tsawout First Nation	-	Low	-	-	-	-	-	Elevated lead in 2012. Resample in 2025.
411A (Saanichton Bay)	6	Tsawout First Nation	-	-	-	Low	-	-	-	Rated low in 2011 and 2016. Rated moderate in 2008. Resample in 2026 to confirm rating.
412 (Tetayut Creek)	7	Tsawout First Nation	-	Low	-	Low	-	-	-	Low at discharge but elevated levels upstream. Resample discharge in 2025 to monitor for change.
416 (Foot of Ferguson Road)	7	Central Saanich	Low	Low	-	-	-	-	-	Rated low in 1999, 2000 & 2011. Resample in 2026 to monitor for change.
435 (Bazan Bay)	10	North Saanich	Low	-	-	-	-	-	-	High upstream near highway but low at discharge and in marine. Resample in 2025 to monitor for change.
441 (Reay Creek)	10	North Saanich	-	-	Moderate	Moderate	-	-	-	Remedial action undertaken, continue monitoring.
445 (Foot of Frost Avenue)	11	Sidney	-	-	NR	-	-	-	-	Rated high yearly (2002 to 2007) due to zinc. U/S: 445-2 high in 2007 due to mercury & PAHs. No sediment available since 2009. Elevated copper and zinc in water.
449 (Tulista Park)	11	Sidney	Low	Moderate	Low *	-	-	-	-	Tidally influenced at discharge. Sample 449-2D for rating. *Zn low in sediment, but copper and zinc elevated in one water sample. Resample in 2025.
450 (Foot of Ocean Avenue)	11	Sidney	-	-	-	-	-	-	-	Rated moderate in 2005 and 2007 due to cumulative contaminants. Rated low in 2011, 2012 and 2017. Resample in 2025 to monitor for change.
467 (Foot of Shoreacres)	12	Sidney	-	-	-	-	Low	-	-	Resample in 2027 to monitor for change.

Table 3, continued

Discharge # (Location)	Figure #	Jurisdiction	Contaminant Ratings							Comments & Recommendations
			2018	2019	2020	2021	2022	2023	2024	
3005 (Mermaid Canal)	13	Sidney	-	-	NR	-	-	Low	-	Rated high due to Zn & PAH in past. Low in 2023. Sediment is challenging to find. Elevated metals in water but multiple sources. **Action Required** (higher priority). Continue source investigations with water.
3006 (Roberts Bay)	13	Sidney	-	-	-	-	Low	-	-	Resample in 2027 to monitor for change.
3016 (All Bay)	14	Sidney	Moderate	-	-	Moderate	-	-	Low	Rated moderate due to Cu and Zn in past. Upstream arsenic concentrations lower. Sidney flushed line in fall 2015. Confirm in 2025.
3021 (Tsehum Harbour)	15	North Saanich	**High**	Moderate	**High**	Moderate	Low	Low	-	2020: elevated Hg and Pb in sediment; no exceedances in water. Confirm rating.
3077 (Deep Cove)	23	North Saanich	-	-	NR	High in water	-	High in water	-	In 2020, Cu and Zn 10X above BC ENV marine guidelines. Pipe buried; elevated aqueous Al, Cr, Cu, Zn in 2023. Start investigations.
3079 (Tatlow Creek)	23	North Saanich	Low	-	-	-	-	Low	-	Rated low in 2018 and 2079. Resample in 2028 to monitor for change.
3080A (Benes Creek)	24	North Saanich	Low	-	-	-	-	-	Moderate	Rated high in 2015 due to mercury, then low. Elevated lead and zinc in 2024. Confirm rating in 2025.
3090 (Patricia Bay)	26	Tseycum First Nation	Low	Low	-	-	-	-	Low	Rated low in 2001, 2005 & 2010. Resample in 2027 to monitor for change.
3095 (Tseycum Creek)	27	Tseycum First Nation	Low	-	-	-	-	Low	-	Rated low in previous years. Resample in 2028 to monitor for change.
3104 (Tén Tén Creek)	28	North Saanich	Moderate High u/s	Low High u/s	-	Low	-	-	Low	Zn and Cu above the PEL at Willingdon Road but low at discharge. Transport Canada remediated gross contaminants. Resample in 2027 to monitor for change.
3118 (Coles Bay)	31	North Saanich	-	-	Low	-	-	-	-	Rated low in 2001, 2005 & 2011. Rated moderate in 2006 and 2008 & 2012. Resample in 2025.
3119 (Coles Bay)	31	North Saanich	Low	-	-	-	-	Low	-	Rated low in 1998, 2004 & 2011. Rated high in 2015 due to mercury; possible lab error. Resample in 2028 to monitor for change.
3120 (Coles Bay)	31	North Saanich	-	-	-	Low	-	-	-	Rated low in 1999, 2006, 2011 and 2016. Resample in 2026 to monitor for change.
3122 (Coles Bay)	31	Pauquachin First Nation	Low	Low	-	-	-	-	-	Rated low in past. Rated high in 2015 due to Hg and in 2017 due to Ca. Resample in 2025.

Table 3, continued

Discharge # (Location)	Figure #	Jurisdiction	Contaminant Ratings							Comments & Recommendations
			2018	2019	2020	2021	2022	2023	2024	
3124 (Coles Bay)	31	Pauquachin First Nation	Low	-	-	-	-	-	-	Rated low in 2001 & 2005. Resample in 2025 to monitor for change.
3133 (Hagan Creek)	35	Tsartlip First Nation	Low to High U/S	Low but High U/S	Low	-	-	High in water u/s	-	Rated low at point of discharge. Elevated As, Ca, Cr, Cu, Pb and Zn upstream. Resample discharge in 2025. Continue investigations around Keating Industrial Park.
3135 (South of Hagan Bight)	35	Tsartlip First Nation	-	-	Moderate	Moderate	-	-	-	Copper and zinc elevated above CCME PEL. U/S: stations were rated low. Resample in 2026.
3136A (Stream, south of Hagan Bight)	35	Tsartlip First Nation	-	Low	Low	-	-	-	-	No exceedances of guidelines in 2015. Rated high in 2014 due to zinc. Resample in 2025.
3136B (North of Tsartlip boat launch)	35	Tsartlip First Nation	-	-	Low	-	-	-	-	Rated low in 2002 & 2008. Resample in 2025.
3138 (Brentwood Bay, north of boat ramp)	36	Tsartlip First Nation	**High**	Low	Low	-	-	-	-	Rated high between 2004-2013 due to zinc. Tsartlip replaced pipes. Resample in 2025.
3146 (Brentwood Drive)	36	Central Saanich	-	Low	-	-	-	-	Low	Rated low in 2006, 2007. Resample in 2029.
3148 (Brentwood Bay)	36	Central Saanich	Low	-	-	-	-	Low	-	Rated low in 2005, 2010, 2011 and 2018. Resample in 2029 to monitor for change.
3153 (Brentwood Bay)	37	Central Saanich	-	-	-	-	-	-	-	Elevated levels of Zn but rated moderate because the sediment is pumped out. U/S: in 2008 & 2009, station 3153-1 rated low. Remedial action undertaken, confirm sediment is still being removed.
3154 (Tod Creek)	43	Central Saanich	-	-	Low	-	**High**	Moderate	-	Elevated mercury in 2022. Sampled three times in 2023 and mercury not elevated. As, Pb, Zn elevated above CCME ISQG at mouth. Confirm rating.

Notes:
POD = Point of discharge; U/S = upstream
CCME = Canadian Council of Ministers of the Environment
ISQG = Interim sediment quality guidelines

Table 4 2024 – Freshwater Sediment Contaminant Concentrations

Station		Sample Date	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc	LPAH	HPAH	O. Carbon %	Carbon normalized LPAH	Carbon normalized HPAH	Sample Comment
		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	90	91	0.486		315	-	-	-	-	-	
		Vancouver Island Background*	4	0.95	65	100	40	0.15	1	150	-	-	-	-	-	
SW3005-2A	Mermaid Creek	2023-04-12	1.67	0.083	14.1	15.8	3.5	0.118	<0.05	82.6	0.014	0.11	0.28	0.050	0.393	grey sand, clear
SW3016	Tsehum Harbour	2024-05-06	4.31	0.211	23.7	28.4	11.3	<0.05	0.09	*133*	0.012	0.083	1.1	0.011	0.075	brown sand and fines
SW3021	Blue Heron Creek	2023-04-13	2.9	0.117	17.2	17.4	16.8	0.146	0.101	69.4	0.032	0.14	2.2	0.015	0.064	brown sand, fines and organic material
SW3051	Queen Mary Bay	2024-04-17	3.06	0.379	21.1	18.1	17	0.063	0.1	117	0.02	0.067	1.7	0.012	0.039	brown fines and gravel
SW3051A	Queen Mary Bay	2024-04-17	2	0.075	12.7	25.9	4.96	<0.05	<0.05	47.3	0.013	0.027	1.2	0.011	0.023	sand, gravel, iron oxide bacteria, construction
SW3079	Tatlow Creek	2023-07-07	2.53	0.099	21.5	22.5	3.71	<0.05	<0.05	65.8	0.0035	0.034	2.6	0.001	0.013	grey sand and fines
SW3080A	Bennes Creek	2024-02-21	5.82	0.24	28	*38.7*	**74.4**	0.119	<0.05	**183**	0.0014	0.012	0.37	0.004	0.032	grey sand and gravel, investigation
SW3090	Patricia Bay	2024-08-26	4	0.067	30.3	*49*	7.85	<0.05	<0.05	115	0.0055	0.02	0.36	0.015	0.056	brown sand and gravel
SW3095	Tseycum Creek	2023-04-14	**8.6**	0.078	**42**	*41.7*	8.49	0.094	0.053	88.6	0.0071	0.012	0.84	0.008	0.014	brown fines and gravel
SW3104	TEN TEN Creek	2024-05-30	**7.1**	0.144	30.1	*40*	7.11	<0.05	0.078	*142*	0.0061	0.017	2.2	0.003	0.008	brown sand, fines and gravel
SW3119	Coles Bay	2023-04-14	5.39	0.099	26.8	22.5	5.54	<0.05	0.057	62	0.026	0.016	1.7	0.015	0.009	brown fines, sand and gravel
SW3146	Brentwood Bay	2024-08-09	**14.4**	0.114	22.2	34.9	14.2	<0.05	0.057	**159**	0.0027	0.0071	0.39	0.007	0.018	grey sand and fines (some gravel)
SW3148	Ravine Park Creek	2023-04-25	4.4	0.116	25.4	29.3	7.73	0.133	0.071	87.4	0.0045	0.026	1.2	0.004	0.022	brown sand, fines and gravel
SW3154	Tod Creek	2023-02-22	**6.9**	0.291	28.8	35.3	**40.2**	<0.05	0.063	**170**	0.026	0.056	0.64	0.041	0.088	sand, gravel, fines ~100 m above discharge
SW3154	Tod Creek	2023-02-22	**8.51**	0.287	28.5	35.2	33.1	0.08	0.059	**181**	-	-	-	-	-	coarse sand and gravel, discharge
SW3154	Tod Creek	2023-02-22	**7.85**	0.196	26.7	34.2	34	<0.05	<0.05	*143*	-	-	-	-	-	coarse sand and gravel, 10 m above discharge

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 soil concentration 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

XX 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 for freshwater aquatic life.

XX Value is greater than or equal to the CCME PEL for freshwater quality life.

Table 5 Aqueous Stormwater Data

		Average Concentration of Parameter													
		Aluminum	Antimony	Arsenic	Cadmium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Manganese	Nickel	Selenium	Silver	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L $CaCO_3$	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BC Marine Guidelines (acute/chronic)		-	-	12.5	0.12	9	-	3 / 2	-	-	140 /2	-	-	2 / 1	3 / 1.5	55 / 10
Station	**n**															
SW3003	5	143	0.19	0.54	0.011	0.3	0.129	**3.7**	116	121	0.13	8	0.9	0.06	0.007	5.9
SW3003A	2	103	0.11	0.51	0.006	0.3	0.084	**8.2**	162	87	0.10	2	0.9	0.09	0.010	1.7
SW3005	8	301	0.36	0.77	0.048	2.2	0.206	**23.5**	525	302	0.47	22	6.9	0.23	0.022	12.2
SW3005-1A	6	343	0.26	0.73	0.017	1.5	0.223	**3.4**	256	456	0.43	17	4.4	0.14	0.010	5.4
SW3005-2A	4	777	0.39	1.00	0.051	1.9	0.912	**10.5**	205	1061	2.16	93	3.8	0.14	0.032	**56.1**
SW3005-4	5	496	0.35	0.83	0.020	1.4	0.354	**7.1**	192	587	0.34	13	3.7	0.21	0.011	13.8
SW3006	4	225	0.20	0.44	0.013	0.4	0.139	**5.9**	164	187	0.20	18	1.3	0.17	0.008	4.7
SW3007	5	169	0.38	0.32	0.019	0.6	0.128	**9.7**	200	122	0.19	7	1.6	0.22	0.168	19.5
SW3014	5	210	0.28	0.78	0.015	0.6	0.161	**20.8**	155	273	0.65	29	1.0	0.17	0.010	18.3
SW3015	5	185	0.23	0.46	0.015	0.5	0.151	**11.2**	102	350	0.28	41	1.1	0.09	0.013	7.1
SW3016	11	380	0.28	1.03	0.047	1.1	0.345	**9.52**	664	650	0.67	53	2.2	0.26	0.041	16.59
SW3020	5	718	0.28	1.00	0.031	1.5	0.470	**6.64**	385	1225	0.88	69	1.7	0.18	0.034	21.22
SW3020A	4	48	0.26	0.54	0.005	0.3	0.078	**4.20**	208	63	0.10	5	0.6	0.20	0.009	3.31
SW3021	6	267	0.11	0.44	0.007	1.6	0.226	**3.74**	156	600	0.21	200	6.3	0.08	0.008	2.90
SW3021A	5	593	0.21	0.86	0.012	3.7	0.401	**7.62**	130	1091	0.36	203	12.7	0.17	0.012	6.36
SW3051	3	360	0.04	0.24	0.012	0.5	0.192	1.34	68	558	0.25	27	1.0	0.06	0.011	1.87
SW3051A	5	1077	0	0.46	0.023	3.5	0.685	**3.22**	79	1239	1.71	43	11.8	0.06	0.011	8.37
SW3077	7	3024	0	1.24	0.064	5.1	1.758	**15.36**	150	4076	1.80	112	5.6	0.11	0.030	27.29
SW3078	4	1150	0.11	0.49	0.024	1.9	0.826	**4.93**	110	1939	0.64	118	2.5	0.07	0.015	32.73
SW3078A	6	1459	0.10	1.55	0.031	2.5	1.638	**8.86**	111	2360	0.68	333	4.9	0.13	0.099	7.70
SW3079	7	1065	0.07	0.81	0.018	1.5	0.500	**3.22**	117	1165	0.48	74	2.1	0.08	0.014	7.99
SW3080A	6	527	0.13	0.56	0.016	0.8	0.367	**5.48**	125	579	0.29	47	1.6	0.11	0.010	22.25
SW3080B	2	113	0.20	0.79	0.016	0.2	0.108	**6.11**	183	103	0.10	12	0.8	0.13	0.010	9.95
SW3082	2	216	0.14	0.38	0.018	0.4	0.177	**10.58**	134	199	0.16	19	1.2	0.09	0.010	3.95
SW3085	3	174	0.08	0.22	0.012	0.5	0.148	**5.47**	157	195	0.13	15	1.0	0.07	0.010	3.24
SW3087	5	958	0.09	0.54	0.013	1.4	0.398	**9.03**	119	1000	0.31	35	1.6	0.09	0.010	7.88
SW3088	2	114	0.24	0.66	0.037	0.3	0.111	**4.32**	146	131	0.65	2	1.0	0.14	0.015	**103.00**
SW3089A	3	374	0.10	0.62	0.010	0.7	0.198	**3.86**	98	363	0.14	9	1.6	0.08	0.010	3.83
SW3089AB	3	1177	0.08	1.00	0.042	2.0	0.858	**5.74**	142	1947	0.63	240	2.4	0.07	0.015	20.00
SW3089BB	2	313	0.16	0.26	0.027	0.6	0.356	**3.03**	53	288	0.13	44	1.3	0.06	0.013	2.65
SW3089DD	3	133	0.11	0.40	0.019	0.3	0.203	**52.40**	154	154	0.19	9	0.9	0.11	0.010	2.77
SW3090	2	251	0.10	0.44	0.009	0.5	0.158	**3.79**	77	230	0.15	7	1.1	0.07	0.008	4.79
SW3091	2	659	4.50	0.59	0.089	1.3	0.375	**3.07**	93	759	0.31	29	1.5	0.07	0.009	13.05
SW3095	4	289	0.08	0.98	0.007	0.6	0.4	1.84	213	603	0.14	215	1.6	0.11	0.010	5.35
SW3104	7	130	0.11	4.42	0.074	0.7	0.8	**43.14**	187	942	0.22	64	3.5	0.11	0.007	**71.65**
SW3107B	2	947	0.14	16.96	0.107	2.3	2.0	**126.95**	134	1435	0.69	244	5.5	0.05	0.012	**270.95**
SW3117A	3	346	0.06	0.52	0.026	0.7	0.3	**4.91**	158	475	0.29	48	1.2	0.07	0.012	8.40
SW3118	5	909	0.07	0.55	0.042	1.5	0.4	**4.16**	93	940	0.30	21	1.5	0.06	0.013	7.96
SW3118A	4	51	0.09	0.23	0.009	3.4	0.0	**3.01**	115	43	0.05	2	14.2	0.06	0.009	1.18
SW3118AA	5	261	0.15	0.31	0.012	0.5	0.1	2.43	116	214	0.13	4	0.6	0.12	0.010	2.70
SW3118C	5	133	0.04	0.15	0.008	0.3	0.1	**3.04**	111	117	0.08	4	1.1	0.04	0.010	1.56
SW3118D	5	5	0.04	0.18	0.005	0.7	0.0	2.80	139	5	0.02	3	3.4	0.04	0.010	2.58
SW3119	4	457	0.05	0.42	0.008	0.7	0.3	2.05	100	534	0.17	32	1.1	0.07	0.010	2.95
SW3120	4	193	0.06	0.39	0.005	0.4	0.1	1.65	97	230	0.08	9	0.6	0.05	0.010	2.25
SW3121	4	1177	0.05	0.53	0.017	2.0	1.3	**4.33**	75	1706	3.52	88	2.2	0.04	0.013	6.23
SW3122	2	113	0.05	0.18	0.009	0.2	0.1	0.92	97	118	0.15	3	0.4	0.04	0.010	1.70
SW3124	24	59	0.02	0.20	0.006	0.2	0.0	0.68	99	75	0.07	7	0.2	0.04	0.006	1.33
SW3125	3	46	0.03	0.07	0.112	0.1	0.0	1.47	41	54	0.05	3	0.1	0.04	0.010	1.13

Table 5, continued

		Average Concentration of Parameter														
		Aluminum	Antimony	Arsenic	Cadmium	Chromium	Cobalt	Copper	Hardness	Iron	Lead	Manganese	Nickel	Selenium	Silver	Zinc
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L $CaCO_3$	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
BC Marine Guidelines (acute/chronic)		-	-	12.5	0.12	9	-	3 / 2	-	-	140 /2	-	-	2 / 1	3 / 1.5	55 / 10
Station	**n**															
SW3125-1	3	112	0.02	0.09	0.006	0.3	0.1	0.84	46	99	0.07	4	0.2	0.04	0.010	1.47
SW3125-3	3	195	0.04	0.15	0.007	0.3	0.1	1.23	46	186	0.08	8	0.3	0.04	0.008	2.14
SW3125A	3	69	0.11	0.20	0.007	0.3	0.1	1.61	75	70	0.04	24	0.7	0.04	0.010	5.10
SW3125B	2	557	0.05	0.23	0.020	0.7	0.5	2.64	66	647	0.69	33	0.9	0.04	0.010	7.50
SW3125C	2	196	0.03	0.11	0.012	0.4	0.1	0.84	69	252	0.23	15	0.5	0.04	0.010	3.40
SW3128	2	128	0.09	0.25	0.012	0.3	0.1	**12.32**	161	123	0.06	6	0.5	0.09	0.010	2.50
SW3133	31	103	0.10	0.53	0.016	0.3	0.1	1.88	102	202	0.08	34	0.6	0.06	0.007	1.64
SW3133-1B	22	146	0.12	0.46	0.007	0.5	0.1	2.49	115	234	0.12	16	0.7	0.08	0.007	3.77
SW3133-2	11	1076	0.37	1.12	0.091	3.3	0.9	**22.37**	107	1429	1.51	102	3.2	0.08	0.014	**71.66**
SW3133-3A	3	443	0.46	0.87	0.115	3.2	0.6	**60.17**	63	744	1.17	30	3.7	0.09	0.010	**105.37**
SW3133-3B	3	2235	1.04	2.05	0.307	5.8	1.7	**94.23**	66	3515	6.03	94	5.1	0.07	0.037	**225.67**
SW3133-4	22	192	0.23	0.68	0.020	0.7	0.5	**5.76**	139	472	0.33	69	1.6	0.09	0.007	21.06
SW3133-5	23	171	0.14	0.63	0.006	0.5	0.145	2.93	78	321	0.15	31	0.6	0.10	0.007	3.50
SW3136	4	248	0.09	0.41	0.012	0.4	0.264	1.70	150	317	0.24	17	1.1	0.05	0.014	2.70
SW3137	2	1368	0.06	0.59	0.013	2.7	1.023	**3.05**	128	1841	0.55	290	2.3	0.05	0.010	10.10
SW3138	9	217	0.17	0.56	0.016	1.7	0.161	2.81	208	249	0.17	6	5.5	0.24	0.008	4.28
SW3141	4	980	0.49	0.69	0.038	2.7	0.906	**24.60**	19	1393	1.84	34	4.5	0.08	0.017	**55.35**
SW3142	5	162	0.24	0.37	0.011	0.7	0.095	2.68	124	144	0.16	8	1.9	0.07	0.007	10.73
SW3145	9	118	0.12	0.24	0.008	0.3	0.090	2.12	118	109	0.14	4	0.6	0.07	0.007	12.75
SW3145A	4	104	0.12	0.45	0.011	0.3	0.110	2.34	141	90	0.07	29	0.8	0.10	0.006	3.39
SW3146	6	308	0.11	0.52	0.012	0.7	0.380	**4.07**	140	360	0.21	13	2.1	0.07	0.008	11.12
SW3148	5	192	0.08	0.24	0.007	0.4	0.105	1.92	112	215	0.14	13	0.4	0.08	0.010	2.69
SW3150	5	154	0.19	0.38	0.212	0.5	0.124	**16.45**	408	144	0.43	11	0.8	0.18	0.027	28.65

Notes:
All metals are in total state.
Units are in µg/L
British Columbia Approved and Working Water Quality Guidelines for protection of marine aquatic life were used for comparison.
Guidelines are maximum values; where two guidelines are shown they are acute (or maximum) and chronic (or average) guidelines.
Although marine aquatic life guidelines would not apply to stormdrains, these comparisons indicate potential impacts to the marine environment.

XX	Value exceeds the provincial acute guideline for protection of marine aquatic life.
XX	Bolded value exceeds the provincial chronic guideline for protection of marine aquatic life.

APPENDIX F

2024 WATERCOURSE MONITORING DATA

Table 1. Saanich Peninsula Streams Data

Station		Sample Date	Conductivity	Dissolved Oxygen	E. Coli	Flow Rate	No2 (As N)	No3 (As N)	PO4 - Ortho	Phosphorus	pH	Temperature	TSS	Turbidity	Sample Comment
	state		NA	DIS	TOT	NA	DIS	DIS	DIS	TOT	NA	NA	TOT	NA	
	unit		µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	pH	°C	mg/L	NTU	
BC Freshwater	acute / instantaneous		-	5	400	-	0.24	23.8		10	6.5-9	-	-	9	
AL Guidelines	chronic / average		-	8	200	-	0.08	3		5	-	17	-	6	
Hagan Creek (SW3133)	Mouth of creek; upstream of waterfall	2021-02-19	208	12.49	250	>3000		0.8	0.03586		7.62	4.2		28.3	no odour, murky, rain and snow previous
		2021-07-16	318	6.73	24	>250		0.7	0.04238		7.26	15.8		3.27	no odour, clear, no rain
		2021-11-18			490	>3000									earthy, turbid brown, heavy rain, sewer spill investigation
		2022-04-08	210	11.34	27	>2000		0.8	0.03586		7.25	11.1		11.5	no odour, amber, no rain prior
		2022-08-18	293	6.02	20	>500		1.3	0.05868		6.7	16.9		2.44	no odour, clear, no rain prior
		2023-04-19	215	11.57	50	>2000		0.9	0.0326		7.64	8.6		6.33	no odour, clear, light rain yesterday
		2023-06-22	265	8.26	62	>1000		1.2	0.04564		7.54	15		3.56	no odour, clear, no rain prior
		2024-05-06	291	9.78	20	>500		0.8	0.04238		7.42	11.4			no odour, clear, recent rain
		2024-08-09			10	>400									no odour, clear, no recent rain, meter not available
		2024-09-24	262	7.35	60	>2000		0.9	0.03912		7.35	13.6		3.51	no odour, slight amber, no rain
		2024-10-04	259	6.75	190	>2000		0.8	0.05216		7.42	10.7		4.02	no odour, amber, rain
		2025-05-21	271	7.16	25	>1000		0.8	0.04238	55.3	7.25	11.2		6.16	no odour, murky, no rain
Graham Creek (SW3133-1B)	Above Hagan Creek confluence; d/s of Centennial Park	2021-07-16			100	>150									no odour, clear, no rain
		2021-11-18			5000	>1500									earthy, turbid brown, heavy rain, sewer spill investigation
Hagan Creek (SW3133-2)	Ditch, d/s of Keating Industrial Park	2021-07-16		3.08	1200	20									slight organic odour, murky, no rain
		2022-08-29		5.18	150000	12									strong sewer/chemical odour, black, no rain prior
		2022-09-13		5.20	160000	8									sewer odour, grey, black floculant, no rain, PS equipment
		2022-09-13			230000	12									sewer odour, grey, black floculant, no rain, slight surge
		2023-10-20		3.32	2100	12									slight chemical odour, clear, rain previous
		2024-08-09		2.60	400	13				98					chemical/creosote odour, clear, no recent rain
		2024-09-24		3.90	8000	12									slight hydrocarbon/creosote odour, clear, no rain
		2024-10-04		4.15	14000	45									chemical/creosote odour, murky brown, rain
		2024-12-04		0.90	8	30									no odour, clear, no rain
		2025-05-21		3.81	6400	40				45.3					slight chemical odour, slight murky, no rain
Tseycum Creek (3095)	10 m north of 1036 West Saanich Road	2019-03-19	594	10.64	860	80		1	0.10758		7.68	7.7		7.95	no odour, discharge clear
		2019-06-26	661	5.4	3000	12		0.9	0.31622		7.8	16.1		6.09	no odour, discharge clear
		2019-10-28	601	5.21	3600	40		1	0.38468		7.65	6.5		2.24	no odour, discharge clear
		2020-03-19	620	10.16	34000	>80		0.9	0.1304		7.6	5.2		10.6	sewer odour, murky discharge
		2020-07-16	587	3.52	2800	24		1	0.68134		7.49	15.7		4.57	no odour, discharge clear
		2021-02-23	402	11.41	250	>500		0.8	0.12714		7.62	6.2		20.7	no odour, clear, drizzle
		2021-07-21	624	5.52	440	26		0.9	0.3097		7.57	16.1		15.1	no odour, amber, no rain
		2022-04-08	459	10.91	53	70		0.9	0.12388		7.23	9.7		15.2	no odour, murky amber, no rain prior
		2022-07-27	716	2.2	5100	12		0.3	>0.815		7.2	18.5		19.1	no odour, very amber, no rain prior
		2023-04-14	310	11.1	200	85		0.9	0.0978		7.65	9.6		9.2	no odour, clear, no rain prior
		2023-09-25	746	4.3	4000	11		0.8	0.32926		7.37	13.1		59.4	no odour, murky brown, pooled flow, light rain prior

Table 1, continued

Station		Sample Date	Conductivity	Dissolved Oxygen	E. Coli	Flow Rate	No2 (As N)	No3 (As N)	PO4 - Ortho	Phosphorus	pH	Temperature	TSS	Turbidity	Sample Comment
	state		NA	DIS	TOT	NA	DIS	DIS	DIS	TOT	NA	NA	TOT	NA	
	unit		µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	pH	°C	mg/L	NTU	
BC Freshwater	acute / instantaneous		-	5	400	-	0.24	23.8		10	6.5-9	-	-	9	
AL Guidelines	chronic / average		-	8	200	-	0.08	3		5	-	17	-	6	
		2023-11-29			11000	200									no odour, slight amber, no recent rain
		2024-04-30	582	9.31	69	70		0.9	0.15977		7.72	9.8		4.67	no odour, slight amber, rain earlier in the day
		2024-06-26	622	5.35	130	18		0.191		0.57	7.69	14.6		8.81	no odour, clear, no recent rain
		2025-05-21	595	5.08	70	50		0.8	0.16952		7.56	11.9		15.7	no odour, slightly brown, construction upstream, no rain
TENTEN (3104)	Mouth of creek, north end of seaplane base	2018-03-26	284.3	11.05	10	<250		1	0.09128		7.58	7.5		3.29	no odour, clear
		2018-09-27	605.4	7.79	240	40		1.2	0.1467		7.24	14.4		2.38	no odour, clear
		2018-11-01	221.6	8.95	120	50	0.0283	0.763		187	7.37	12.2	6	14.8	no odour, clear
		2018-11-08	621.5	6.77	80	50	0.0154	0.82		273	7.54	8.8	<2	5.38	no odour, clear
		2018-11-15	465.7	8.75	290	100	0.0746	5.5		198	7.34	9.8	<4	14.5	no odour, clear
		2018-11-20	523	7.62	140	80	0.0498	3.02		175	7.46	5.5	<2	2.82	no odour, clear
		2019-04-17	290.1	10.47	70	180		1	0.03912		7.77	12		2.91	no odour, clear
		2019-07-11	513.6	9.39	160	>80		1.3	0.27058		7.69	18.8		11	no odour, amber discharge
		2019-12-03	629.5	9.22	9	>300					7.72	6.7			no odour, clear
		2020-03-23	384.2	10.89	24	>1000		0.9	0.07172		7.68	8.5		5.24	no odour, clear
		2020-09-29	357.6	6.79	25	50		0.8	0.14018		7.31	13.7		2.44	no odour, clear
		2021-03-02	308.9	12.32	<1	>500		1	0.07824		7.82	6.1		15.1	no odour, amber, no rain
		2021-08-24	655.2	7.78	700	50		0.9	0.15322		7.56	13.1		5.71	no odour, murky, no recent rain
		2022-04-19	262.5	10.39	7	>180		1	0.07172		7.19	8.2		9.83	no odour, amber, rain yesterday
		2022-08-18	307.5	6.12	400	65		3.8	0.81826		7.2	15.9		6.56	no odour, amber, no rain prior
		2023-05-08	425.5	10.25	68	>80		2.2	0.21516		7.76	12.8		4.09	no odour, amber, rain in past two days
		2023-07-05	2195	9.01	250	40		3.9	>0.815		7.8	15.4		11.6	no odour, amber, very low tide, EOP, no rain
		2024-05-30	257.3	8.79	34	60		1.6	0.38468		7.48	12		5.09	no odour, clear, recent rain
		2024-09-24	426.5	6.32	200	50		1.1	0.59658		7.09	15.8		3.36	no odour, clear, no rain
Reay Creek (SW0441)	Mouth of Reay Creek	2021-02-02	186.8		450	>2000			0.02608		7.54	6.8			no odour, brown, heavy rain
		2021-04-29			7	>500									no odour, clear, light rain previous
		2021-07-19			600	85									no odour, clear, no rain
		2022-03-11	706.1	11.56	6	>800		0.9	0.03912		7.48	7.3		4.69	no odour, clear, no rain
		2022-05-18	557.3	10.05	86	>500		0.8	0.04238		7.25	12.5		11.1	no odour, slight amber, rain within two days
		2022-07-07	552.7	8.46	300	80		0.7	0.04238		7.23	16.4		6.68	no odour, clear, no rain prior
		2022-08-12	184.7	9.9	5500	>250	0.0096	0.632		88	7.4	15.9	6	5.51	no odour, clear, no rain prior
		2022-08-18	2995	8.06	800	>200	0.0109	0.755		87	7	17.8	2.8	6.15	no odour, clear, no rain prior
		2022-08-25	4631	8.61	690	>200	0.0138	0.609		120	7.1	17.3	11	13.2	no odour, clear, no rain prior
		2022-09-01	2022	7.97	240	>200	0.0109	0.761		109	7.1	18.7	2.8	5.63	no odour, clear, no rain prior
		2022-09-08	278.4	9.02	140	>250	0.0107	0.719		80	7.2	16.6	4	4.74	no odour, clear, no rain prior
		2022-10-25	3532	10.31	380	>300	0.011	0.993			7.2	10.5	8.4	6.95	no odour, clear, potential first flush
		2022-10-25	3532	10.31	470	>300	0.0112	1			7.2	10.5	9.6	6.95	no odour, clear, potential first flush
		2022-11-03	309.7	9.15	96	800	0.005	0.969		63.6	7.2	8.8	<1	4.12	no odour, clear, rain prior
		2022-11-08	1994	8.31	130	>800	0.0066	0.82		62.3	7.2	7.5	2.4	4.69	no odour, clear, rain prior
		2022-11-17	2238	11.4	78	>600	0.0082	0.978		70.7	7.3	5.2	12	8.11	no odour, clear, rain prior
		2022-11-24			330		<0.002	0.8		55.2			<1		no odour, clear, no recent rain
		2023-03-29	3221	11.4	10	>300		0.8	0.01956		7.68	9.8		5.74	
		2023-07-05	6900	3.24	64	>250		0.9	0.11084		7.81	20.5		5.46	low tide odour, very low tide, no rain prior
		2024-04-30	751.6	9.88	23	>500		0.8	0.03912		7.61	10.1		7.26	no odour, murky, rain earlier
		2024-08-08	2791	4.04	710	>200		1	0.13366	112	7.3	16.7		9.57	tidal/sewer odour, murky, no prior rain, geese

Table 1, continued

Station		Sample Date	Conductivity	Dissolved Oxygen	E. Coli	Flow Rate	No2 (As N)	No3 (As N)	PO4 - Ortho	Phosphorus	pH	Temperature	TSS	Turbidity	Sample Comment
	state		NA	DIS	TOT	NA	DIS	DIS	DIS	TOT	NA	NA	TOT	NA	
	unit		µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	pH	°C	mg/L	NTU	
BC Freshwater	acute / instantaneous		-	5	400	-	0.24	23.8		10	6.5-9	-	-	9	
AL Guidelines	chronic / average		-	8	200	-	0.08	3		5	-	17	-	6	
SW0441-1A	Foot of Frost Avenue	2021-04-29			30	>200									no odour, clear, light rain previous
		2022-08-12	305.7	9.02	7	120	0.0034	0.965		33	7.2	17	4	3.43	no odour, clear, no rain prior
		2022-08-18	340.5	8.99	14	120	0.0048	0.965		30	6.8	18.1	1.6	3.06	no odour, clear, no rain prior
		2022-08-25	328.7	8.95	30	120	0.0062	0.861		39	6.9	17.1	3.2	2.99	no odour, clear, no rain prior
		2022-09-01	341.3	8.46	53	120	0.0056	0.944		37.6	7.3	16.8	1.6	4.14	no odour, clear, no rain prior
		2022-09-08	341.4	8.17	28	120	0.0071	1.02		37	7.1	15.3	3.2	2.32	no odour, clear, no rain prior
		2022-10-25	281.4	9.05	200	>150	0.0079	1.22			7.1	10.8	2	3.55	no odour, clear, potential first flush
		2022-11-03	243.7	8.61	170	400	0.0074	0.813		54.5	7.2	9.5	2.4	3.64	no odour, clear, rain prior
		2022-11-08	258.7	8.54	120	>400	0.0061	0.789		30.5	7.4	8.1	<1	3.74	no odour, clear, rain prior
		2022-11-17	374.6	11.07	42	>300	0.0053	1.11		28.2	7.2	6	<1	1.4	no odour, clear, rain prior
		2022-11-24			93		0.0029	0.83		46.3			<1		no odour, clear, no recent rain
SW0441-2	Canora at Norseman	2021-04-29			4	>120									no odour, clear, light rain previous
Tetayut Creek (SW0412)	Tetayut d/s of Mure Brook input	2021-01-26	165.7	11.6	100000	>1000		1	0.15648		7.69	5		14.5	clear, light rain previous
		2021-02-01	192	11.51	400	>2000		1	0.10432		7.64	6.4		73.9	brown, heavy rain
		2021-07-16	279	9.22	890	>500		0.7	0.05868		7.81	14.8		8.77	clear, no rain
		2021-08-10	346	8.54	96	>250	<0.005	1.02			7.77	16	4.8	6.75	clear, no recent rain
		2021-08-17	429	7.82	210	>250	<0.005	0.954		50	7.68	15.1	6	7.91	clear, no recent rain
		2021-08-24	342	9.09	230	>300	<0.005	1.28		38	7.97	13.5	4	6.23	clear, no recent rain
		2021-08-31	341	8.33	550	>300	<0.005	1.27		39	7.92	13.4	4	6.28	clear, no recent rain
		2021-09-07	330	7.94	64	>300	<0.005	1.3		52	7.58	13.3	2.4	6.63	clear, no recent rain
		2021-10-12	341	9.69	170	>600	<0.005	1.28		65.4	7.43	7.9	1.6	6.56	clear, rain within past two days
		2021-10-20	346	10.14	270	>2000	0.005	1.41		97	7.68	10	9.6	14.6	turbid, light rain at time and previous two days
		2021-10-26	685	8.68	380	>3200	0.0145	3.6		104	7.66	10.6	6.8	18.9	turbid brown, rain at time and previous two days
		2021-11-03	294	10.71	150	>3500	0.0289	5.88		127	7.49	10	4.8	23.5	turbid brown, rain in previous two days
		2021-11-09	812	10.64	900	>3600	0.0221	4.31		142	7.08	8.4	24	56.7	turbid brown, heavy rain previous
		2022-03-11	291	12.54	23	>2000		1	0.0652		7.35	5.8		7.67	clear, no rain
		2022-07-27	352	8.65	280	>250		2.2	0.0978		7.21	17		8.56	clear, no rain
		2023-03-29	300	11.52	160000	>1200		1.1	0.22494		7.63	7.1		7.26	
		2023-04-11	274	11.11	19000	>1000		1	0.23472		7.63	8.9		8.31	sewer odour, slightly murky, no rain prior
		2023-09-25	320	9.7	650	>500		0.9	0.08476		7.77	12.7		4.39	clear, light rain prior
		2024-02-29	193	12.44	800	>5000		1.7	0.0326		7.37	6.9		37.1	turbid, heavier rain yesterday
		2024-05-10	364	9.03	47	>500		0.8	0.05868		7.7	12		4.21	clear, no rain
		2024-08-29	316	10.89	52	>400		1.1	0.0815		7.55	13.2		4.46	clear, recent rain
		2025-05-21	351	9.8	90	>1000		0.8	0.094		7.63	10.7		6.17	clear, no rain
Tetayut Creek (SW0412-2B)	At Cooperidge Park	2021-07-16			80	30									clear, no rain
		2021-08-10				<0.01									wet only, no previous rain
		2021-08-17				<0.01									wet only, no recent rain
		2021-08-24				<0.01									wet only, no recent rain
		2021-08-31				<0.01									wet only, no recent rain
		2021-09-07				<0.01									wet only, no recent rain
		2021-10-12	273	9.73	33	40	<0.005	0.391		79.2	7.36	7.7	1.6	3.65	clear, rain within past two days
		2021-10-20	134	9.46	1600	>250	0.0099	0.372		170	6.82	10.7	50	108	very turbid, light rain at time and previous two days
		2021-10-26	247	8.01	270	>300	<0.005	0.857		123	7.12	10.8	4.8	17.2	turbid brown, rain at time and previous two days
		2021-11-03	170	10.16	150	>450	0.051	1.73		94.7	7.47	9.2	2	11.6	turbid brown, rain in previous two days

Table 1, continued

Station		Sample Date	Conductivity	Dissolved Oxygen	E. Coli	Flow Rate	No2 (As N)	No3 (As N)	PO4 - Ortho	Phosphorus	pH	Temperature	TSS	Turbidity	Sample Comment
	state		NA	DIS	TOT	NA	DIS	DIS	DIS	TOT	NA	NA	TOT	NA	
	unit		µS/cm	mg/L	CFU/100 mL	L/min	mg/L	mg/L	mg/L	µg/L	pH	°C	mg/L	NTU	
BC Freshwater	acute / instantaneous		-	5	400	-	0.24	23.8		10	6.5-9	-	-	9	
AL Guidelines	chronic / average		-	8	200	-	0.08	3		5	-	17	-	6	
		2021-11-09	194	10.89	25	>450	0.0452	2.31		85.9	7.43	8.3	9.2	18.7	turbid brown, heavy rain previous
Tetayut Creek (SW0412-2C)	D/S of East Saanich Road near fish ladder	2021-08-17	327	9.54	72	200	<0.005	2.87		11	7.34	12.4	2.8	1.88	clear, no recent rain
		2021-08-24	334	10.09	40	200	<0.005	2.87		18	7.94	12.4	2	1.86	clear, no recent rain
		2021-08-31	335	9.07	130	250	<0.005	2.92		14	7.54	11.7	2	1.81	clear, no recent rain
		2021-09-07	329	8.83	22	220	<0.005	2.27		22	7.56	12.7	3.2	1.73	clear, no recent rain
		2021-10-12	317	9.33	20	>350	<0.005	2.39		44.2	7.4	9.2	1.6	3.93	clear, rain within past two days
		2021-10-20	294	10.51	72	>1000	0.0131	1.38		138	7.32	10.3	15	41.5	turbid, light rain at time and previous two days
		2021-10-26	261	9	320	>1200	0.0082	1.69		79.1	7.27	10.7	3.2	14.2	turbid brown, rain at time and previous two days
		2021-11-03	215	11.18	90	>1500	0.0294	2.33		83.8	7.44	9.8	3.6	13.1	turbid brown, rain in previous two days
		2021-11-09	200	11.27	38	>2000	0.0278	2.34		86.3	7.29	8.6	6.8	21.7	turbid brown, heavy rain previous
Tetayut Creek (SW0412-2D)	Above confluence with Kennel Brook	2024-05-10	327	9.62	34	>250		0.8	0.04238		7.82	11.6		3.82	clear, no rain
		2024-08-29	288	10.8	29	120		1.1	0.08476		7.81	12.5		3.01	clear, recent rain
Tetyut Creek (SW0412-2F)	Tetayut Creek, u/s of Mure Brook input	2024-12-04			14	>1000									clear, no rain
		2025-05-21	341	9.71	110			0.9	0.12062		7.62	10.8		6.08	clear, no rain
Tetayut Creek (SW0412-3)	Slough in park SW of Keating X Road & Central Saanich Road	2021-07-16			12	18									clear, no rain
Kennel Brook (SW0412-7)	Kennel Brook (Tetayut Creek Watershed)	2024-05-10	489	7.78	54	35		0.9	0.12062	123	7.77	12.8		3.06	clear, no rain
		2024-08-29	358	11.36	65	15		0.3	0.18582		7.85	12.3		2.71	clear, recent rain
Mure Brook (SW0412-8)	Mure Brook (Tetayut Creek Watershed)	2024-12-04			22	200									clear, no rain
		2025-05-21	433	10.23	35			0.7	0.042		7.61	10.9		22	murky, no rain
Tod Creek (SW3154)	South of Butchart Gardens in Tod inlet, Tod Creek	2021-03-02	141	12.6	8	>2000		0.7	0.02608		7.44	6.1		5.9	no odour, clear, no rain
		2021-04-15			11	>2000									slight sewer odour, amber discharge, no meter readings, no rain
		2021-09-22	359	8.56	26	80		0.7	0.0652		7.74	12.9		3.01	no odour, clear, light rain prior
		2022-04-07	154	11.52	18	>4000		0.8	0.04238		7.15	9.4		6.67	no odour, clear, no rain prior
		2022-07-28			120	>250									no odour, slight amber, no rain prior
		2023-02-22	169	12.01	6	>5000		0.7	0.02934		7.87	4		2.64	no odour, clear, rain yesterday
		2023-09-27	346	10.35	110	400		1.1	0.0815		7.91	12.5		3.24	no odour, clear, recent rain
		2024-05-09	258	9.16	39	>800		1.7	0.20212		7.27	11.5		9.38	no odour, dark amber, no rain
		2024-09-26	307	9.54	90	>500		0.8	0.02608		7.66	12.7		3.66	no odour, clear, recent rain

Notes
Flow rate is visually estimated.
Guidelines are BC's guidelines for protection of aquatic life.
u/s = upstream; d/s = downstream
DIS = dissolved; TOT = total

APPENDIX G

CRD PUBLIC HEALTH AND ENVIRONMENTAL CONCERN RATING SYSTEM

1.0 STORMWATER DISCHARGE RATING SYSTEM

The Capital Regional District (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 officially updated in 2010, however, shoreline use is updated for individual discharges as they are assessed each year.

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. 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. While the shoreline ratings represent a rating for a section of shoreline, each discharge with a bacterial rating of 2 or more is evaluated individually using site-specific information and professional judgment. 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 *E. coli* count consistently under 200 CFU/100 mL	1	Low contact (e.g., inaccessible, beach walking)
2	*E. coli* count between 200 and 5,000 CFU/100 mL	2	Secondary contact (e.g., kayaking)
3	*E. coli* 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 eight metals and two groups of organic contaminants (Cn) with the CRD Marine Sediment Quality Guidelines (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 two 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 three 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