APPENDIX A

STORMWATER PROTECTION ACTIVITES BY SAANICH PENINSULA JURISDICTIONS

APPENDIX A

JURISDICTIONAL INVOLVEMENT WITH STORMWATER QUALITY ISSUES

TABLE OF CONTENTS

LIST OF FIGURES

APPENDIX A

JURISDICTIONAL INVOLVEMENT WITH STORMWATER QUALITY ISSUES

1.0 INTRODUCTION

Management of stormwater and its impact on freshwater and marine environments is the responsibility of a number of jurisdictions and is of interest to various organizations and the public. Section 2.0 of this Appendix provides summary of roles and responsibilities of various government levels and First Nations involved with stormwater issues on the Saanich Peninsula. Section 3.0 provides water quality studies and other stormwater related activities completed by various organizations on the Saanich Peninsula and surrounding waters. Most activities have been undertaken within catchment areas of major creeks on the Saanich Peninsula due to fish habitat potential and on the west side of the peninsula, due to the sensitivity of Saanich Inlet. Section 4.0 provides commitments and activities by the municipalities of Central Saanich, North Saanich and Sidney. Section 5.0 provides the activities within the boundaries of the four Saanich Peninsula First Nations.

2.0 ROLES AND RESPONSIBILITIES FOR THE PROTECTION OF STORMWATER QUALITY

2.1 Municipal

Municipalities are responsible for stormwater runoff (i.e. storm drains) and have powers to protect water quality through official community plans (OCPs) and bylaws. OCPs contain community goals and objectives and can state policies regarding protection of stormwater quality. The OCPs can also designate areas requiring special management and guidelines to protect water quality. Bylaws can also be developed to protect stormwater quality and quantity by prohibiting discharge of contaminants, protecting riparian areas, preventing an increase in stormwater flows and requiring treatment of stormwater under certain circumstances.

2.2 First Nations

First Nations are responsible for stormwater on their lands. The First Nations and Health Canada usually address stormwater pollution issues on First Nation's land. Health Canada will carry out sampling investigations if requested by the band.

There are opportunities for First Nations to adopt a bylaw that will allow for protection of stormwater quality similar to the Model Storm Sewer and Watercourse Bylaw discussed in Section 2.3.

2.3 Regional

The CRD Stormwater, Harbours and Watersheds program's role is to work with the jurisdictions involved to control pollution in stormwater runoff from land by investigating, monitoring and reporting on stormwater and sediment quality on the Saanich Peninsula. Authority for these activities comes through the Saanich Peninsula Liquid Waste Management Plan (SPLWMP, CRD, 1996). The CRD does not have authority to directly implement mitigative measures.

SHWP was directed by the Saanich Peninsula Wastewater Commission (SPWWC) to "prepare options for stormwater source control bylaw development, adoption, enforcement and promotion." Staff defined the scope; identified costs associated with such a program and reported this to SPWWC in fall of 2007.

In February 2008 SHWP presented the SPWWC with detailed information on a stormwater source control program and SHWP was then directed to proceed with the option of a CRD-led stormwater source control program on the Saanich Peninsula. In the summer of 2008, the concept was presented to the three municipal councils. The councils each gave approval for the project.

In 2009, the CRD began the process of authority transfer. An amendment to the Saanich Peninsula Liquid Waste Management Plan was written and submitted to the Ministry of Environment. The proposed amendment was approved in late 2010. In 2010, CRD staff began work on updating the model Stormwater Source Control bylaw to harmonize with the newly adopted Central Saanich Surface Water Bylaw. The next steps in 2011 are for CRD staff to finalize the bylaw and seek the required authority through the province, with the goal of initiating the source control program in 2012.

2.3 Vancouver Island Health Authority

The Vancouver Island Health Authority (VIHA) investigates complaints if a sewage treatment system treats less than 5,000 gallons per day and is suspected of polluting stormwater. The *Health Act* and Sewage Disposal Regulation give them the power to complete the investigations. When a problem with a failing septic tank and field is identified the owner is notified and required to complete the repairs. Federal properties and First Nation's land are usually investigated by Health Canada.

2.4 Provincial Government

The following are the most pertinent pieces of provincial legislation related to stormwater quality. Most of this information was taken from *Tackling Non-Point Source Water Pollution in British Columbia* (Ministry of Environment, Lands and Parks, 1998):

- The Community Charter provides local municipalities with power to adopt zoning, subdivision and other bylaws, permit construction, develop solid and liquid waste management plans, provide water and sewer services and address environment concerns. Municipalities can enact bylaws to control surface runoff, prohibit pollution and obstruction of flows in watercourses and allow the development of environmental policies regarding protection and enhancement of the environment in OCPs.
- The Local Government Act provides regional government with the authority to adopt zoning, subdivision and other bylaws, permit construction, develop solid and liquid waste management plans, provide water and sewer services and address environment concerns.
- The Water Act provides for approval of all water use, storage and diversion of water and works in and about streams. This is important for preventing activities that may negatively impact a stream. Efforts to modernize this Act into the new Water Sustainability Act are currently taking place.
- The Water Protection Act confirms Crown ownership of surface and groundwater and prohibits large-scale diversion or removal of water. This allows for the protection of the amount of flows being diverted from a creek or stream, which is vital for survival of aquatic life.
- The Environmental Management Act (formerly the Waste Management Act) requires permits, approvals or operational certificates under a liquid and solid waste management plan for discharges to land, air and water, and handling of solid and toxic wastes; prohibits dumping/discarding litter and sewage. The Ministry of Environment (MOE) (previously Ministry of Water, Land and Air Protection (MWLAP)) regulates sewage treatment facilities with sewage flows greater than 5,000 gallons/day. The Act can also require the development of measures to prevent a spill of a potentially polluting substance by the person in possession of the substance. The Provincial Emergency program (PEP) was initiated to protect people and property during disaster situations and is also the contact for reporting spills that can cause harm to public health and the environment such as oil spills. When an incident is reported to PEP they will contact the agency responsible for investigating the problem. The phone number for PEP is 1-800-663-3465.
- The Environmental Assessment Act requires environmental impact assessment for specific development projects and activities. This will allow MOE to request proposed development projects to consider stormwater quality issues.
- The Fish Protection Act protects fish by ensuring healthy fish-bearing streams and plentiful stocks. Stormwater pollution can impact the health of streams and aquatic species.

- The Pesticide Control Act regulates the use and application of pesticides. Pesticides have the potential to contribute pollution to stormwater runoff if not applied properly.
- The Health Act regulates approval of construction camps, public water supplies, sewage disposal, sanitation and food supply operations. This Act can be used to prevent pollution of stormwater from the mentioned operations.
- The Fire Services Act provides approval of onsite fuel storage and dispensing. Through this Act proper installation of fuel storage and dispensing facilities can be ensured to protect stormwater quality.
- The Soil Conservation Act established permitting requirements for soil removal from an agricultural land reserve and regulates use of land in agricultural land reserves. Some agricultural activities have the potential to contribute stormwater pollution, especially if soil erosion occurs, causing sedimentation in streams.
- The Farm Practices Protection (Right to Farm) Act ensures that farmers can farm in agricultural land reserves; adds specific powers to local governments; may regulate farm conduct and prohibit specific farm operations.

In 1997, the provincial government passed the *Fish Protection Act* to protect fish from the negative impacts of development. *Section 12 of the act authorizes the Province to establish policy directives regarding the protection and enhancement of riparian areas that the Lieutenant Governor in Council considers may be subject to residential, commercial or industrial development* (Ministry of Environment, 2005).

Effective March 31, 2005 and enabled by the *Fish Protection Act*, the *Riparian Areas Regulation (RAR)* provides local government with the necessary tools to protect fish and fish habitat. The RAR applies to streams, rivers, ditches, ponds, lakes, springs and wetlands and sets out provisions to protect the stream side vegetation and soils during new residential, commercial and industrial development on land under local government jurisdiction. The following key components of the regulation were taken from the Riparian Areas Regulation Implementation Guidebook (MOE, 2006):

- Local government may permit development within 30 m of the high water mark of a stream or top of bank of a ravine provided the prescribed riparian assessment methods have been followed.
- A qualified environmental professional (QEP), using the riparian assessment method, shall provide an opinion -in an assessment report- that the development will not result in a harmful alteration of fish habitat and will provide required measures to protect the riparian area during development.
- The assessment methodology in the Schedule of the Regulation ensures that the assessment has been conducted to a standard level and that the standard reporting format is followed.
- The Regulation is based on current science regarding fish habitat, while recognizing the challenges in achieving science-based standards in an urban environment.

Also, in 2002, the provincial government developed *Stormwater Planning: A Guidebook for British Columbia*. This guidebook is intended to provide a framework for effective stormwater management that is usable in all areas of the province. The guidebook explains how stormwater systems have traditionally been developed and promotes an integrated approach to stormwater management which includes:

- identifying at-risk drainage catchments
- setting preliminary performance targets
- selecting appropriate stormwater management site design solutions

2.5 Federal Government

The following are the most pertinent pieces of federal legislation related to stormwater quality. This information was taken from *Tackling Non-Point Source Water Pollution in British Columbia* (MWLAP, 1998):

- The Fisheries Act prohibits harmful alteration of fish habitat and the deposit of deleterious substances. This Act applies to creeks, streams and storm drains that flow into watercourses and the marine shoreline where fish are present and can be used to prevent pollution and destruction of watercourses with fish.
- The Canadian Environmental Protection Act requires certain facilities such as manufacturing or processing businesses to report when a toxic substance has spilled into a watercourse or storm sewer.
- The Canadian Environmental Assessment Act requires environmental impact assessment of all projects funded or authorized by the federal government or which take place on federal lands. An environment impact assessment usually includes impacts to water quality that will allow the awareness of a potential impact to stormwater quality and allow requirements to prevent the impact from occurring in advance.
- The Canadian Wildlife Act and the Migratory Bird Conventions Act protects wildlife, migratory birds and associated habitats. Associated habitats include wetlands and the marine shoreline, which can be sensitive to stormwater pollution.
- Canada Shipping Act regulates shipping, including ship-sourced pollution and the designation of water bodies under the Pleasure Craft Sewage Pollution Regulations and Non-Pleasure Craft Sewage Pollution Regulations.
- The Transportation of Dangerous Goods Act defines safety requirements for transport of dangerous goods. This can prevent accidental spills of toxic substances from occurring in watercourses and the marine shoreline while being transported.

3.0 STORMWATER RELATED ACTIVITIES

A number of jurisdictions have been involved in stormwater related activities in the past. Below is a list of those groups and some of the work that was carried out:

3.1 Capital Regional District

- Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program please refer to the CRD Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program 2006 Annual Report (2007). Prepared by the Capital Regional District, Victoria, BC.
- CRD staff investigated the use of de-icing substances at the airport to determine if they pose a risk to the environment (Larose, 1999).
- In consultation with the CRD Regional Source Control program (RSCP), VAA installed a valve, which allows airport staff to send urea and glycol to the sanitary sewer during application.
- The airport is currently under permit with the RSCP for the discharge of ethylene glycol to sanitary sewer. This permit requires VAA to contain the glycol and implement a waste glycol management plan. Presently, specific limits must be met (RSCP Sewer Use Bylaw limits) to discharge the waste to the sanitary sewer from the airport's 27 m3 glycol tank.

3.2 Health Canada

- In 1997, at the request of Tseycum First Nation undertook an investigation to identify the source of elevated fecal coliform bacteria in Tseycum Creek identified a farm in North Saanich as a possible contributor. Tseycum Creek data are indicative of water rich in nutrients with the possibility of human or animal contamination".

3.3 Ministry of Environment -Saanich Inlet Study

- MOE funded a water quality assessment for Saanich Inlet in 1995 (Drinnan et al., 1995). This assessment included sampling stormwater discharges for metals, polycyclic aromatic hydrocarbons (PAH), fecal coliform bacteria and nutrients. The report also included a review of historical data collected in the inlet and from major tributaries on the peninsula.

3.4 Victoria Airport Authority-

The Victoria Airport Authority (VAA) has a comprehensive storm water management plan in place to test stormwater at points of entry and exit from airport lands. The following summarizes activities undertaken by VAA to improve stormwater quality in the area:

- Weekly water quality monitoring (24-hour composite samples) in Reay Creek and Tén Tén Creek at border of airport lands. Parameters include dissolved oxygen, temperature, pH, hardness, TSS, ammonia, phosphates, oil and grease, total glycol, fecal coliform and heavy metals. Monthly grab sample taken at a point of entry onto airport lands for comparison with downstream samples.
- Annual tenant inspections to ensure that tenant's operations and facilities are in compliance with airport environmental lease clauses.

- All capital projects are screened for environmental impacts. When required, construction surveillance is used to ensure that environmental best practices are maintained.

- Airport constructed new Airside Operations Centre which boasts a geo-thermal system to reduce power consumption for heating and bioswale ditches to mitigate runoff.

- Enhanced the glycol control and testing program with the addition of a portable testing station at the point of entry into Reay Creek.

- Airport requires airlines to reposition aircraft on the West side of the main apron during snow events to apply de-icing fluid (Glycol). The spent glycol runs into a 27,000L holding tank which is then discharged into sanitary sewer.

- Airport is under permit with the CRD Regional Source Control program (RSCP), for discharge of ethylene glycol to sanitary sewer. This permit requires VAA to contain glycol and implement a waste glycol management plan. Presently, specific limits must be met (RSCP Sewer Use Bylaw limits) to discharge the waste to the sewer.

- Enhanced the storm water testing program with the addition of a portable station to check for heavy metals and other contaminates at various points on the property.

- VAA has a program in place to deal with spills and provide regular maintenance to oil/water separators and sanitary sewers.

- The VAA has a vacuum truck company on a 24/7 contract to assist with larger spills and related events.

- Planning to install new irrigation controllers which will become active based on weather conditions instead of a conventional timer system.

- Planning use of a more environmentally friendly de-icer, Sodium Formate, to replace the use of Urea on paved airfield surfaces.

3.5 Transport Canada

Transport Canada owns the property on which VIA resides. In recent years, Transport Canada has undertaken several environmental projects relating to VIA and Tén Tén Creek. These projects are as follows:

- Three fuel contaminated sites on the property have been remediated (one of them by Transport Canada).
- Transport Canada completed a detailed environmental assessment of two historical dumpsites in 2000. Contamination in groundwater exceeding freshwater criteria was not identified.
- The environmental condition of Tén Tén Creek was investigated in 1999/2000 in partnership with VAA and DND. The report looked at potential contaminants and their sources.
- A geo-technical assessment of the landfills along Tén Tén Creek was undertaken in 2001.
- In 2002, Transport Canada conducted a debris removal and slope stabilization program along Tén Tén Creek. Nearly 80 tonnes of debris, comprised of building and demolition materials and refuse, were removed by Golder Associates Ltd. and Royal Roads University during this program.
- In October 2002, Transport Canada commissioned Golder Associates Ltd. to conduct a technical review of the stream enhancement along Tén Tén Creek.
- In 2004, the sites were classified as Class 3 by the Canadian Council of Ministers of the Environment (CCME) Classification System for Contaminated Sites indicating the sites are not a high concern.
- In 2008, Golder Associates Ltd inspected the Tén Tén Creek revegetation completed by Transport Canada, and concluded that “Further erosion mitigation and revegetation works are not considered to be required at this time”.

3.6 Institute of Ocean Sciences

There are five stormwater discharges that carry flows from the IOS property into Patricia Bay. The following summarizes previous activities undertaken at the Institute of Ocean Sciences (IOS) to improve stormwater quality in the area:

- DFO with the assistance of Public Works and Government Services Canada have installed a number of stormwater treatment devices over the last few years.
- Program changes have been made to the processes for dealing with boat washing facilities to contain, collect and dispose of hazardous waste materials in an environmentally responsible manner.

- In 2001, IOS installed an oil skimming/sediment trapping system to treat stormwater flows and minimize contaminant entry into the marine environment. It is not possible to obtain a sediment sample downstream of treatment that isn't marine-influenced. However, water column samples indicate that contaminant levels are below CCME environmental quality guidelines.
- In 2001, an inline pipe oil filtering device was installed in the catchment area of Area E - boat washing facility. When in use, flows from the boat-washing facilities are redirected so that materials removed from hulls of vessels can be collected in a sump and pumped into storage containers for removal as hazardous waste.
- The following outlines maintenance procedures in place for all installed devices:
  - all catchbasins and interceptor pits are inspected monthly
  - all catchbasins are cleaned semi-annually
  - all catchbasins with oil/sediment filter material have sediment material removed, tested and disposed of as hazardous waste (if required). The removal, testing and disposal are undertaken semi-annually. The filter media is replaced annually.
- Interceptors are pumped out annually. The fluids and sediments are tested prior to disposal to ensure that the material is disposed of in an appropriate manner. The interior of the interceptors are examined for structural defects annually.
- Several spill containment centres are located onsite. Spill containment kits are checked monthly and missing supplies are replenished. Back up supplies are located onsite.
- In 2003, DFO had major repairs completed on the building drainage systems throughout the IOS site. Potential problem areas were identified and a preliminary plan for implementation of further improvements is in place.
- The IOS has a trained spill response team onsite and a spill response plan developed by the Science Branch Health, Safety and Environment Management System Officer.
- In 2007, cuck bill check valves have been attached to the outfalls to prevent high water infiltration into the systems.

For more information regarding IOS activities related to stormwater contact Andrew Sorensen at Andrew.Sorensen@dfo-mpo.gc.ca..

3.7 Swartz Bay Ferry Terminal

Activities or areas that have potential to pollute stormwater at the Swartz Bay ferry terminal include large paved parking areas, oil tanks and various maintenance activities for the property.

There are seven stormwater discharges along the coastline of the ferry terminal property. In 2010, three discharges sampled by CRD did not exhibit fecal coliform contamination. The other discharges have been rated as low public health concern in recent years and will be resampled after five years.

The following actions have been undertaken by the Swartz Bay terminal to limit contaminants associated with the terminal from entering the marine environment:

- Oil/water separators have been installed in all seven stormwater systems at the terminal. These separators are designed to remove contaminants prior to discharge to the marine environment, are inspected once a year and pumped out every two years.
- Catchbasins are inspected twice a year and materials are removed to reduce contaminant migration to the downstream separators.
- There are two above-ground oil tanks on the property, which are double walled and are inspected once a month.
- All sewage from the ferry terminal is treated by secondary treatment. Treated water is dechlorinated before discharge to the marine environment.
- Ferries that visit the terminal have their own sewage treatment and bilge water oil/water separators. Treated oily-water from the ferries is discharged away from Swartz Bay. Onboard sewage treatment systems discharge continuously following requirements under the Canadian Shipping Act.
- Ferries are re-fuelled by tanker truck. Spill contingency plans are in place and Swartz Bay staff undertakes quarterly spill response exercises. Spills to the ocean are reported to Marine Communication and Traffic Services and those over 100 L are also reported to PEP.

4.0 SAANICH PENINSULA MUNICIPAL COMMITMENTS AND ACTIVITIES

The following section discusses commitments made by the municipalities in the SPLWMP. During discussions with each municipality, discharges with a high public health concern were prioritized for upstream investigations. This information is included. Please note, First Nations on the peninsula do not have commitments in the SPLWMP, therefore, their activities are addressed in a different format.

Sewage Collection and Treatment on the Saanich Peninsula

In 2000, the Saanich Peninsula Wastewater Treatment Plant (SPWWTP) and marine outfall at Bazan Bay in North Saanich, replaced two of the three older treatment plants on the peninsula. The outfalls connected to the decommissioned plants are used as emergency sewage overflows. The Central Saanich Pollution Control Centre is owned by the Tsawout First Nation and treats sewage flows from their properties. There is also a sewage treatment plant at the Swartz Bay ferry terminal, which treats sewage from the terminal and discharges through a marine outfall. At Tsehum Harbour (North Saanich), an outfall discharges effluent from a small number of individual sewage treatment plants.

Many areas of North and Central Saanich are serviced by onsite sewage treatment facilities which have been a source of fecal coliform contamination to stormwater. However, District of North Saanich constructed a sanitary sewer collection system in the south east quadrant area and began connecting properties to the system in 2002. Some storm sewer upgrading was also carried out in conjunction with this work. In addition, the District of North Saanich completed the construction of a sanitary sewage collection system in McDonald Park, Deep Cove and Patricia Bay in November 2007.

Figure 1 shows the areas that are serviced by a sewage collection system on the Saanich Peninsula.

4.1 District of Central Saanich

4.1.1 Discharges with a High Public Health Concern Rating

Discharge 416 (at Ferguson Road beach access) was the only discharge rated high for public health concern along the Central Saanich coastline in 2010; this discharge received previous high ratings (2009, 2007, 2005 and 2004). Two bacterial source tracking tests measured ruminants and other animals, but not humans as a source. There is evidence an otter occasionally inhabits this discharge, however SHWP staff have identified multiple sources of contamination upstream of the otter's occurrence.

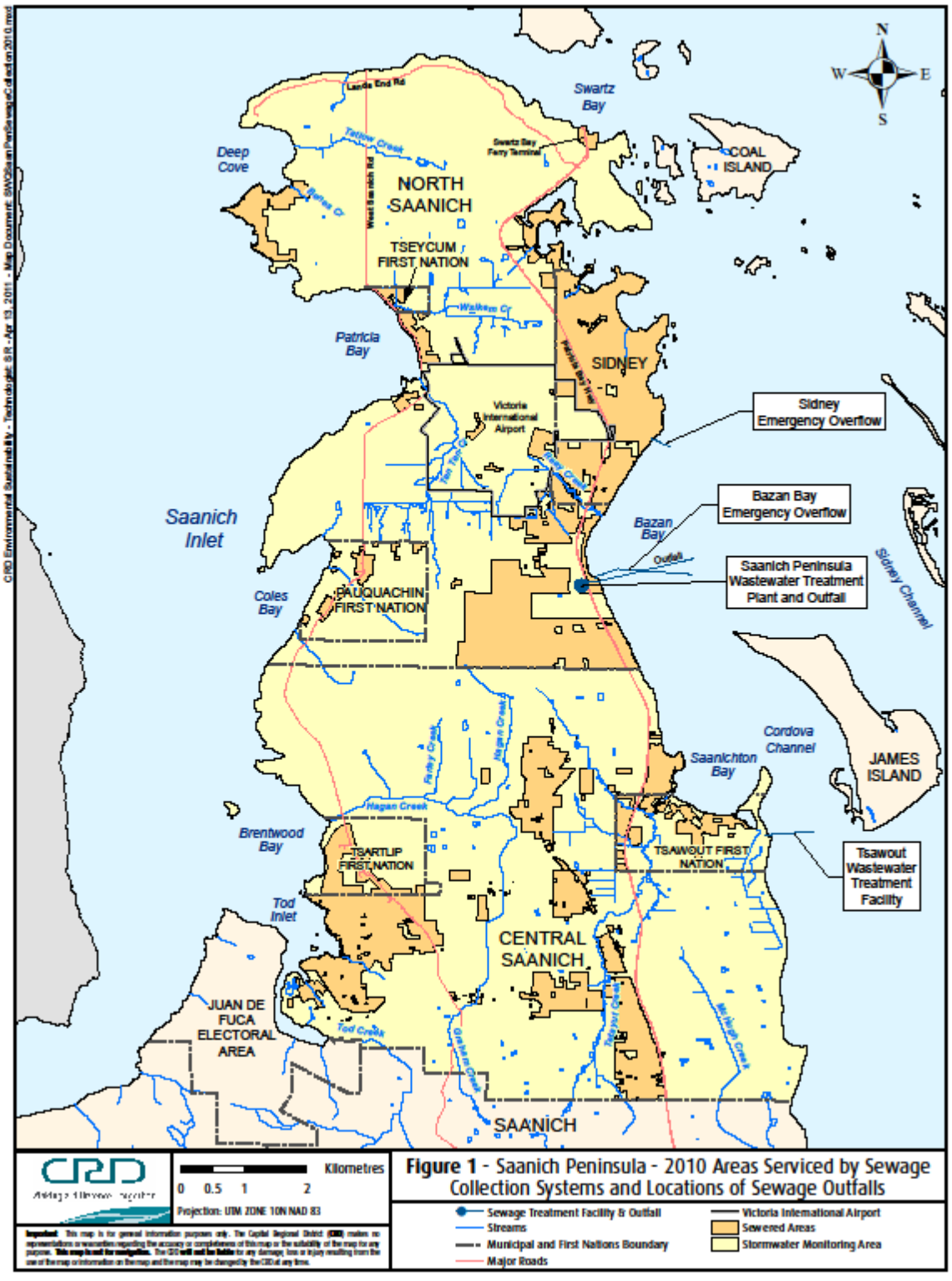
4.1.2 Discharges with a High Chemical Contaminant Rating

No discharges are considered of high environmental concern based on sediment collected in Central Saanich stormwater discharges. Two discharges previously assigned a high contaminant rating (3153 and 3154) are no longer exhibiting contamination, or measures have been taken to ensure proper disposal on contamination to prevent entry into the marine environment.

4.1.3 District of Central Saanich Commitments

In the SPLWMP, related to stormwater quality, the District of Central Saanich has completed or is committed to the following measures:

- Completed development of an integrated stormwater management plan for the Hagan Creek, Sandhill Creek and McHugh Ditch watersheds.
- monitoring of water quality in Hagan and Graham creeks by CRD staff, District of Central Saanich, Peninsula Streams Society and Streamkeepers (ongoing)
- created a surface water management bylaw to implement management of surface water run-off and stormwater flows for construction of impermeable surfaces (e.g. paved areas, roofs) within the District of Central Saanich
- maintenance and monitoring of rainfall recording stations by municipal staff to generate data for coordination of rainfall data with storm flows in sewers and drains (ongoing)
- conducting restorations of Dawson Creek to return it to a natural functioning creek (initiated)
- adoption of a bylaw for the regulation and protection of natural watercourses, ditches and drains (ongoing)
- working with local gravel pit companies to ensure retention and reuse of site water (ongoing)
- adoption of a development cost charge bylaw to generate funds for drainage channel improvements (completed)
- adopting development permit area designations and guidelines for development near riparian areas as part of the OCP (completed)
- implementing a requirement for the provision of oil/water separators for stormwater runoff from paved areas associated with commercial and industrial properties (every commercial/industrial building and plumbing permit requires oil/water separators) (ongoing)
- conducting smoke tests, as required, to identify improper connections and correction of problems (as required)
- regular surveillance and maintenance of storm drain systems, including video inspections (video inspections of the entire system is completed every seven to eight years, depending on budgets, and this work is probably the reason for the relatively low number of stormwater discharges rated high for public health concerns along the Central Saanich coastline)


N
W
E
S
Swartz Bay
Deep Cove
NORTH SAANICH
COAL ISLAND
TSEYCUM FIRST NATION
Patricia Bay
SIDNEY
Victoria International Airport
Sidney Emergency Overflow
Bazan Bay Emergency Overflow
Bazan Bay
Saanich Inlet
Saanich Peninsula Wastewater Treatment Plant and Outfall
Outfall
Sidney Channel
Coles Bay
PAUQUACHIN FIRST NATION
Cordova Channel
Saanichton Bay
JAMES ISLAND
Brentwood Bay
TSARTLIP FIRST NATION
TSAWOUT FIRST NATION
Tsawout Wastewater Treatment Facility
Tod Inlet
CENTRAL SAANICH
JUAN DE FUCA ELECTORAL AREA
SAANICH
Kilometres
0 0.5 1 2
Projection: UTM ZONE 10N NAD 83
Figure 1 - Saanich Peninsula - 2010 Areas Serviced by Sewage Collection Systems and Locations of Sewage Outfalls
Sewage Treatment Facility & Outfall
Streams
Municipal and First Nations Boundary
Major Roads
Victoria International Airport
Sewered Areas
Stormwater Monitoring Area

- encouraging and permitting systems to promote groundwater recharge on lots with estate, residential and agricultural zoning (ongoing)
- use of stormwater retention systems and bio filtration swales in new rural and semi-rural subdivisions (ongoing)
- establishing design criteria for stormwater retention ponds (criteria developed and considered at the time of development proposal, however, not formally adopted)
- working towards understanding the needs of agriculture and habitat in stormwater management (Central Saanich staff are working with Department of Fisheries and Oceans (DFO) and BC Mnistry of Environment (MOE) regarding ditch maintenance in agricultural zones)
- immediate action on spills (when notified)
- implementing a regular street sweeping program to reduce the introduction of street litter and contaminants into waterways, including a regular catchbasin cleaning program to ensure that catchbasins effectively intercept and retain street litter and contaminants (ongoing)

In addition to the commitments provided in the SPLWMP, Central Saanich upgraded six sewage pump stations for monitoring by the supervisory control and data acquisition (SCADA) in 2004 and seven pump stations in 2005. This telemetric communication network allows for quick response to prevent spills of effluent to watercourses.

Central Saanich is also encouraging all developers to use the Water Balance Model as a guide in designing onsite retention/ground water recharge.

4.2 Town of Sidney

4.2.1 Discharges with a High Public Health Concern Rating

There were four stormwater discharges rated high for public health concern along the Sidney coastline in 2010 (449, 450, 3014, 3016). Some of these discharges have been of concern for a number of years. Many sources of contamination within the Town of Sidney are suspected to be infiltration from the sanitary sewage collection system into the storm drain system as infrastructure ages.

Upstream investigations by SHWP staff narrowed down a source of contamination for discharge 3016. Sidney staff subsequently identified two sources (cracks in sanitary sewer and storm drain lines and a resident disposing of dog feces in the storm system). Sidney is investigating remediation methods for the cracked pipes and repairs will be initiated as budgets allow. Once repairs are complete, investigations will continue to monitor the success of the repairs.

Source investigations in 2010, for 3014 (All Bay) have confirmed that humans are a source of contamination, however, more than one source appears to exist and investigations were inconclusive. SHWP staff will continue work to identify the sources in 2011.

Discharge 449 (Tulista Park) was investigated to assess whether the source may be from a duck pond at Iroquois Park. Humans were not measured as a source of contamination, however upstream investigations were inconclusive due to lower fecal coliform counts. Another BST sample will be completed to confirm human bacteria are not present and more upstream sampling will be completed to narrow the source of fecal coliforms in 2011.

Fecal coliform counts in discharge 450 (Ocean Avenue and Second St) are variable and often low in summer. This discharge has not been investigated recently, but SHWP staff will initiate investigation, if fecal coliform counts remain high.

One discharge (458A) previously on this list was removed (i.e. rated as moderate). After numerous efforts to find the source, a source was found and Sidney made repairs in the catchment of 458A in December 2009. Fecal coliforms appear to have been reduced and the flow rate is low, however another source remains. A marine sample collected below this discharge had a fecal coliform count of 0 FC/100mL. Birds observed in the area are likely contributing to the remaining contamination. This discharge will continue to be monitored to determine the source of remaining contamination.

4.2.2 Discharges with a High Chemical Contaminant Rating

There were two discharges (3016 and 3005) rated high for environmental concern along the Town of Sidney coastline in 2010. These discharges are recommended for action as well as discharges 445 and 449 due to consecutive high ratings from the same contaminants. The area of contamination has been narrowed down for two of these discharges (445, 449) and Sidney has upgraded sewer pipes in one of them (445). SHWP staff will conduct further sampling in 2011 to see if this work has resulted in lower contaminants levels. Investigations for 3016 and 3005 have allowed the dismissal of some areas as the source of contamination, however more effort is required to narrow down the source, and sediment is not always available upstream for collection (even with the recent use of sediment traps). In 2011, SHWP will continue with source investigations.

4.2.3 Town of Sidney Commitments

In the SPLWMP, relative to stormwater quality, the Town of Sidney has completed or is committed to:

- work cooperatively with Sidney's Advisory Planning Commission on environmental matters (ongoing)
- work cooperatively with the District of North Saanich, DFO and volunteer groups on the Reay Creek Salmon Enhancement project (ongoing)
- immediate action on spills (ongoing)
- a regular street sweeping program to reduce the introduction of street litter and contaminants into waterways (ongoing)
- a regular catch basin cleaning program to ensure that catch basins effectively intercept and retain street litter and contaminants (ongoing)
- provision of traps in catch basins in sensitive areas to reduce the discharge of petroleum oils to surface waters (ongoing)
- completion of a $1.5 million sewer rehabilitation program designed to reduce the amount of inflow and infiltration to sanitary sewers and the related incidence of sewage overflows to surface waters (completed but still continuing with program)
- provision of audible alarms, lights and signage indicating emergency phone numbers and power connections for portable generating capability at all wastewater pump stations (all are inspected once a week)
- future provision of a SCADA system to monitor wastewater pump stations (completed)
- a requirement for the provision of oil/water separators for stormwater runoff from private parking areas (completed)
- adoption of a stormwater management bylaw for the regulation and protection of natural watercourses, ditches and drains (completed)
- undertaking a review of the Town of Sidney OCP in 2006 (completed) and updating information pertaining to stormwater management practices

- regular inspection and maintenance of the storm drain system, including video inspection, smoke testing and dye testing as necessary (manhole inspections annually and flushing of storm drains every three years with de-chlorinated water)

- elimination of sanitary sewer and storm drain cross connections (ongoing, as needed)

- upgrading generators to ensure adequate capacity to power all sewage pump stations in the event of a power failure (completed)

- establishing permanent stand-by power at the largest pump station (Amelia Pump Station) in 2004 to meet provincial criteria (completed)

- education programs, including mail-outs to residents on appropriate use of property, driveway, house and street drains (completed)

- working towards understanding the needs of agriculture and habitat in stormwater management (ongoing)

- working cooperatively with the VAA staff (ongoing)

4.3 District of North Saanich

4.3.1 Discharges Rated High for Public Health Concern

In 2010, there were six stormwater discharges rated high for public health concern along the North Saanich coastline (3038, 3077, 3102, 3118, 3120 and 3118AA). Two of these were rated high in 2009 (3077 and 3118AA). Two of these (3038, 3118AA) appear to be private discharges.

Discharge 3077 (Deep Cove) had a high fecal coliform count in 2009 (10,400 FC/100 mL) for the first time since 2004. Fecal coliform counts were lower in 2010, but contamination is still present (five counts ranged from 55 to 3800 FC/100mL). Ruminants were found to be the source of contamination in 2010; however human bacteria were measured in 2009. Further investigation will be completed in 2011.

Discharge 3038 (Canoe Bay) had a fecal coliform count of 5,400 FC/100mL in 2010. This discharge is often dry and was only revisited in 2009 after not being sampled for 5 years. SHWP will resample this discharge to determine if contamination is still present.

Discharge 3102 (Patricia Bay, near Mills Road, Holy Trinity Cemetery) had a fecal coliform count of 10,400 FC/100mL in 2010. SHWP will resample this discharge to determine if contamination is still present and investigate the source, if contamination remains in 2011.

Discharge 3118 is at the foot of Tatlow Road beside the beach access stairs and had a fecal coliform count of 3,800 FC/100mL in 2010. This discharge has shown contamination in the past, but fecal coliform levels fluctuate. SHWP will investigate the source of contamination in 2011 if counts remain elevated.

Discharge 3118AA (Coles Bay beach access) has been rated high since 2007 and was made the focus of a more detailed investigation. Human bacteria were measured in this discharge using bacterial source tracking analysis. The discharge was identified as draining private property indicating that the probable source of fecal coliforms was a failing septic system. VIHA were contacted in June 2009. The subsequent measurements showed that fecal coliform counts were lower but still remained elevated (427 and 560 FC/100mL) in 2010.

Discharge 3120 (Coles Bay) is a stream at the end of McTavish Road. In 2010, had a fecal coliform count of 2600 FC/100mL and has been elevated in the past. Bacterial source tracking will be used to identify the source of fecal coliform bacteria if counts remain high.

North Saanich has completed the construction of a sanitary sewage collection system in the Deep Cove, McDonald Park and Patricia Bay areas. This work is part of a resolution to commitments in the SPLWMP.

4.3.2 Discharges with a High Chemical Contaminant Rating

In 2010 there was one discharge (441, Reay Creek) assigned a high chemical contaminant rating. Reay Creek was rated high based on elevated concentrations of cadmium and zinc. This discharge has been rated high since 2004. A three-phase remediation project was completed by VAA between 2007 and 2009. The first phase involved removal of contaminated materials upstream of Norseman Road. The second phase involved removal of the contaminated sediment around four stormwater discharges within the creek. The third phase included removal of sediment and soil in a fifty metre area of creek between Canora and Norseman roads. VAA has also taken steps to ensure all tenants on VAA property have adopted appropriate chemical storage, handling and disposal practices as part of their operating practices. SHWP staff will continue to monitor this creek in 2011 on a quarterly basis at the point of discharge and two upstream stations to identify changes in contaminant levels.

4.3.3 District of North Saanich Commitments

In the SPLWMP, relative to stormwater quality, the District of North Saanich has completed or is committed to:

- updating the District of North Saanich drainage plans.
- working cooperatively with the Town of Sidney, DFO and volunteer groups on the creek salmon enhancement projects (ongoing)
- working cooperatively with the Tseycum First Nation to resolve stormwater runoff problems associated with Tseycum Creek and its tributaries (ongoing; however, many of the problems concern tributaries in the Agricultural Land Reserve). A retention pond is under consideration at Munro and Wilson.
- immediate action on spills (ongoing)
- a regular catch basin cleaning program (done yearly)
- the provision of oil/water separators for stormwater runoff from paved areas associated with commercial, industrial and institutional properties (ongoing)
- adoption of a stormwater management bylaw for the regulation and protection of natural water courses, ditches and drains (in progress)
- regular inspection and maintenance of the storm drainage system (ongoing)
- working towards understanding the needs of agriculture and habitat in stormwater management (ongoing)
- a North Saanich Agriculture Committee will continue to work with the agricultural community to evaluate present practices and look for ways to improve them

A commitment made in the North Saanich OCP was to complete an analysis of environmentally sensitive areas. To meet this commitment an inventory of some watercourses, wetlands and riparian zones was completed as a pilot project. The project involved mapping the riparian zones of a number of watercourses using a global positioning system. The conditions of the creeks and surrounding riparian area (up to 50 m) were also inventoried.

5.0 SAANICH PENINSULA FIRST NATIONS

There are four First Nation properties along the coastline of the Saanich Peninsula. CRD staff monitors stormwater discharges for public health and environmental concern on all four properties. Some of the First Nations discharges receive flows from other jurisdictions. SHWP staff communicates with First Nations and other jurisdictions involved regarding the protection and improvement of stormwater quality. The following sections provide relevant information regarding stormwater quality for each of the four First Nations.

5.1 Tsawout First Nation

There are 13 stormwater discharges along the coastline of the Tsawout First Nation. Two of the flows are creeks (407 and 412) and both carry flows from Central Saanich.

- No stormwater discharges were rated high for public health concern on Tsawout First Nation land in 2010.
- During an upstream investigation of discharge 412 (Tetayut Creek) in April of 2008, an elevated fecal coliform count of 5,500 FC/100 mL was found. Central Saanich identified a cross connection upstream which may be a source of the elevated fecal coliform counts. The cross connection was repaired in 2009. The 2010 fecal coliform count in this creek was moderate (400 FC/100 mL) at the mouth in summer; however upstream samples were not collected. SHWP staff will continue monitoring this discharge in 2011.
- No stormwater discharges were rated high for environmental concern in 2010.
- All developed properties on Tsawout lands are serviced by a sewage collection system (see Figure 1) except for two properties with septic tanks and fields.
- In 2003 all Tsawout pump stations were upgraded and are monitored by the CRD SCADA system.
- A dewatering system was installed at the Tsawout wastewater treatment facility in 2003. This system removes biosolids from effluent discharged to the marine receiving environment.
- Effluent quality at the Central Saanich treatment plant is being monitored monthly to ensure it is meeting provincial criteria.
- Effort is being made to meet with various levels of government to deal with flooding issues on Tsawout land.

5.2 Tseycum First Nation

There are six stormwater discharges along the coastline of Tseycum First Nation land. One discharge is Tseycum Creek (3095) which carries flow from North Saanich.

- One stormwater discharge (3095; Tseycum Creek) was rated high for public health on Tseycum First Nation land in 2010. Source investigations in 2010 and previous years indicate that there are multiple sources of fecal contamination (mainly from farm animals) as well as elevated nutrient levels (nitrate and phosphorus). Further investigation will be continued in 2011 to narrow down the source and exclude other sources.
- No discharges were rated high for environmental concern on Tseycum First Nation land in 2010.

- Members of the Tseycum First Nation are participating in a marine fecal coliform monitoring program designed to evaluate Saanich Inlet shellfish beds for harvesting.

5.3 Pauquachin First Nation

There are four stormwater discharges along the coastline of Pauquachin First Nation land.

- No discharges were rated high for public health or environmental concern on Pauquachin First Nation land in 2010.
- Most of the developed properties on Pauquachin First Nation land are serviced by a sewage collection system (see Figure 1). Two properties are on septic tank and field.
- The stormwater discharges on Pauquachin land do not carry flows from outside their property line.

5.4 Tsartlip First Nation

There are nine stormwater discharges along the coastline of Tsartlip First Nation land. Some of the discharges carry flow from Central Saanich.

- No stormwater discharges were rated high for public health concern on Tsartlip First Nation land in 2010. However, three discharges assigned a moderate rating (3134, 3135 and 3138) had elevated fecal coliform counts (800 to 1200 FC/100 mL) during one measurement in 2010. The samples were taken after a number of days of dry weather and could indicate first flush conditions. Fecal coliform counts were low in these discharges in subsequent measurements. SHWP staff will continue monitoring these discharges in 2011.
- One stormwater discharge (3138) located along the Tsartlip First Nation coastline was rated high for environmental concern 2004 through 2009 due to elevated zinc concentrations. Zinc was previously elevated in an upstream sample (3138-1; 2004) however concentrations are low in 2010. Stations sampled further upstream (3138-1A and 3138-1B) in 2005, 2006 and 2009 and 3138-1B in 2010 had low levels of contaminants, suggesting that the source of zinc contamination is downstream of 7266 Kristin Place. Investigation will continue in 2011 to confirm results and determine if elevated zinc still remains at the discharge.
- Most Tsartlip developed properties are serviced by a sewage collection system (see Figure 1).
- A master drainage plan is being developed for Tsartlip First Nation land. This plan identifies all major stormwater catchment areas and develops initiatives to attenuate stormwater flows.

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