

**STORMWATER QUALITY REPORT
JUAN DE FUCA ELECTORAL AREA, 2005-2006**

EXECUTIVE SUMMARY

INTRODUCTION

In 2005 and 2006, the Capital Regional District (CRD) Stormwater, Harbours and Watersheds program (SHWP) continued to provide services to the Juan de Fuca (JdF) Electoral Area (EA). The program, in consultation with the EA Director, works to limit the impacts of contaminated stormwater runoff on the environment and to protect public health.

The JdF EA is approximately 151,200 hectares in size and has a population of approximately 4,400. Land use in the area includes residential, agricultural, commercial and institutional activities. The coastline is comprised of pockets of development surrounded by rugged, natural shores.

This bi-annual report covers five main areas of activities:

- **Stormwater Discharge Surveys** – Surveys were carried out along the entire coastline of the District of Sooke to investigate the level of public health and environmental concern associated with stormwater discharges.
- **Upstream Investigations** – Investigations were undertaken to identify sources of observed contamination in stormwater.
- **Marine Surface Water Monitoring** – Measurement of fecal coliform bacteria was undertaken in Sooke Inlet, Harbour and Basin.
- **Monitoring of Significant Watercourses** – Water quality monitoring was undertaken for 14 significant watercourses that flow onto the District of Sooke coastline and into the marine environment.
- **Special Projects** – SHWP staff was involved in a number of special projects to improve stormwater quality in the region. Brief summaries are included in the report.

RESULTS AND DISCUSSION

1) Stormwater Discharge Surveys

The 2005 and 2006 survey areas are shown on Figure A and include the following:

- Willis Point, from the Central Saanich/JdF border to the JdF/District of Highlands border
- Finlayson Arm, from the District of Langford/JdF EA border to the JdF EA/Cowichan Valley Regional District border
- East Sooke, from a point parallel to Whiffin Spit Park to the Sooke/JdF EA border
- foot of Kemp Lake Road and Otter Point
- Sheringham Point
- Jordan River
- Port Renfrew

Public Health Concern

The SHWP evaluates stormwater discharges for public health concerns. Each discharge is assigned a high, moderate or low concern for public health based on the level of fecal coliform contamination (indication of sewage presence) in the stormwater and the potential for human contact (flow and public use of shoreline).

Each year SHWP staff visit the following stormwater discharges during wet weather (January through March) and dry weather (June through September) to represent seasonal differences:

- stormwater flows assigned a high or moderate level of public health concern in the previous years testing
- significant streams
- approximately 20% of the stormwater discharges previously rated low to monitor for change

During the 2005 and 2006 stormwater sampling surveys, 80 stormwater discharges (46 in 2005 and 34 discharges in 2006) were visited and sampled, where flows allowed. Eleven of the discharges rated in 2005 and nine in 2006 were from significant watercourses located throughout the survey areas.

The results of the 2005 public health concern ratings were as follows:

- One discharge was rated high (2407 [near 8177 West Coast Road]).
- Three were rated moderate:
 - 2004B (150m SW of Thornette Place)
 - 2018 (Anderson Cove Park entrance)
 - 2401(8177 West Coast Road)
- 42 were rated low.

The results of the 2006 public health concern ratings were as follows:

- One discharge was rated high (2407 [near 8177 West Coast Rd]).
- Two discharges were rated moderate:
 - 2807 (Defiance Creek)
 - 2010 (below 55 Seagirt Road)
- 31 discharges were rated low.

During our previous survey (2003 and 2004), none of the stormwater discharges were rated high for public health concern and three were rated moderate. Sixty-nine discharges were rated low.

Of the discharges assessed in 2005 and 2006, one was rated high for public health concern (discharge 2407). This discharge, located near 8177 West Coast Rd, was discovered in 2005. Upstream source investigations were carried out in 2005 and 2006 and the source was found and remediated in 2007.

Figure A shows locations of discharges of concern to public health (square symbol).

Environmental Concern

Stormwater flows were evaluated for environmental concern based on a chemical contaminant rating. The rating is determined by the concentration of metals and organic contaminants called polycyclic aromatic hydrocarbons (PAHs) in the sediment associated with the stormwater discharge. Discharges which have a consistently high contaminant rating (two consecutive years) require mitigative action beginning with a detailed investigation to locate the contamination source. Discharges requiring action are prioritized based on habitat sensitivity, discharge flow rate and the flushing characteristics of receiving waters.

In 2005 and 2006, six sediment samples (three each year) were collected from five stormwater discharges along the coastline of the JdF EA to determine contaminant concentrations and assign a contaminant rating. All discharges were chosen at sites which are subject to potential contamination.

Of the six stormwater discharges that were evaluated, one received a moderate rating and five were rated low. Discharge 2004 received a moderate contaminant rating in 2005 due to zinc; however, in 2006, it received a low contaminant rating. This discharge will be sampled again in 2007 to confirm the rating. Figure A shows locations of discharges of environmental concern (triangle symbol).

2) Upstream Investigations

In 2005 and 2006, the SHWP continued to work towards identifying sources of fecal coliform contamination in the JdF EA through upstream investigations. As in the past, these efforts were successful in identifying and eliminating sources of elevated fecal coliform concentrations.

In 2005 and 2006, SHWP staff completed upstream investigations within the catchment area of discharge 2407. Discharge 2407 had high fecal coliform counts in 2005 and 2006 (12,000 and 53,000 FC/100 mL, respectively) that resulted in high public health concern ratings both years. This discharge is west of trailer 28 at 8177 West Coast Road (see Figure 2 and Appendix A). In 2005, Bacterial Source Tracking (BST) analysis identified humans as a source of contamination. Upstream investigations carried out in 2006 narrowed down the fecal coliform source. This information was provided to the Vancouver Island Health Authority (VIHA) and a source was found and remediated in 2007. A sample collected after the repairs were completed showed the fecal coliform count was lower (10 FC/100 mL). Additional sampling will be undertaken to confirm all sources have been removed.

SHWP staff continues to work cooperatively with the jurisdictions involved to reduce fecal coliform contamination of stormwater.

3) Monitoring of Major Watercourses

Water quality monitoring was conducted for significant watercourses entering the Sooke Harbour and Basin along the JdF EA coastline. These included Hunden, Barnes, Doerr, Wildwood, and Gillespie creeks and six unnamed watercourses. Wildwood and Gillespie creeks became part of the District of Sooke in 2006 and were only monitored as part of JdF EA in 2005. Monitoring was conducted to assess the following:

- whether adverse effects may be occurring to fish and other aquatic life
- the contribution of contaminants from each jurisdiction
- whether the health of watercourses is changing over time

To complete these objectives, the following water quality parameters were measured during the wet and dry season and compared to water quality guidelines: fecal coliform bacteria, temperature, pH, dissolved oxygen, specific conductance, turbidity, nitrate-nitrogen and phosphorus.

All watercourses were dry during the summer visits with the exception of Hunden Creek; therefore, water quality data for 2005 and 2006 is reflective of winter conditions. In general, the water quality of the JdF EA watercourses was good. Temperature, conductance, turbidity and nitrate were of acceptable levels in all watercourses. Fecal coliform and phosphorous exceedences occurred most frequently and often in the same watercourses, as summarized below:

- Fecal coliform concentrations did not exceed the SHWP guidelines, but were above the provincial guidelines in eight creeks (Barnes, Wildwood, Hunden, Unnamed Creeks #1, #2, #4, #5, and #7). Concentrations ranged from 20 to 60 FC/100mL.
- Phosphorus concentrations exceeded the upper level of the CCME trigger range in five creeks (Barnes, Wildwood, Doerr, Unnamed Creeks #5 and #7). Concentrations range from 0.1 to 0.3 mg/L.

Elevated fecal coliform and phosphorus concentrations are likely due to septic field overflows or domestic animal or wildlife feces entering stormwater flows. Both phosphorous and fecal coliform concentrations in watersheds tend to increase from the upper reaches to the point of discharge to marine waters. Once in the marine environment, adverse effects can occur (e.g. algal blooms and shellfish closures).

Impact on watercourses from development activities is a concern in the JdF EA. As populations increase, there is greater potential for environmental impact. The Monitoring of Significant Watercourses program will be updated as changes in land use and other relevant information occur. Continued monitoring is required to properly assess water quality for these watercourses.

4) Nearshore Marine Investigations

In 2005 and 2006, the marine surface water sampling program continued in Sooke Inlet, Harbour and Basin to provide a general indication of nearshore fecal coliform levels and to track change over time. Samples were collected from all 28 stations in winter and summer of 2005 and 2006 (total of 112 samples (and four duplicates)).

Widespread nearshore marine contamination was not found. All fecal coliform concentrations measured in the winter and summer of 2005 and 2006 were below the SHWPG (200 FC/100 mL). All of these measurements were also below the EC shellfish harvesting standard (14 FC/100 mL) with the exception of one measurement in summer of 2005 (Station 20) and eight measurements during summer of 2006 (Stations 1, 2, 4, 11, 20, 21, 22 and 23). Elevated fecal coliform levels and high flows are likely responsible for the contamination found in the marine environment in the immediate vicinity of these stormwater flows. BST analysis conducted on stations located near the more populated area of Sooke (Stations 20, 21, 22 and 23) identified humans as a source of fecal coliforms.

Less exceedences of the shellfish guideline were identified in 2005 and 2006 than in the data from previous years (2003-2004). Data from 2003 and 2004 identified 11 stations with one or more exceedences of the shellfish harvesting criteria.

Shellfish beds in Sooke Inlet, Harbour and Basin are presently closed to recreational harvesting. Many of these closures are based on elevated fecal coliform levels related to stormwater discharges contaminated with effluent from failing onsite sewage treatment facilities and inappropriate farming practices. It is anticipated that recent sewerage in the District of Sooke's most developed area will eliminate or result in reduced contamination of Sooke Inlet, Harbour and Basin in the future.

5) Special Projects

During the past several years, the SHWP has undertaken a number of special projects related to reducing or eliminating contaminants in watercourses and improving stormwater quality in the region. This section discusses some of the main projects undertaken that could be used by the JdF EA to protect stormwater quality.

Natural Areas Atlas

A web based atlas of all natural areas in the CRD continues to be enhanced. The atlas is a comprehensive information tool of natural areas (i.e., significant watercourses) for anyone interested or involved in land use planning and stewardship, including JdF EA staff. The atlas can be used to promote well informed and responsible land use decisions. This will, in turn, have a positive effect on the protection and restoration of natural areas in the JdF EA. The Natural Areas Atlas covers the entire JdF EA and can be viewed at www.naturalareasatlas.ca. For more information contact the coordinator at atlas@crd.bc.ca.

Stormwater Source Control

Stormwater source control is the reduction or elimination of contaminants prior to leaving a site and entering the municipal stormwater collection system and is one of the major initiatives being undertaken by SHWP staff.

In an effort to ensure a consistent approach to stormwater contaminant reduction in the CRD and to avoid duplication of effort, SHWP staff has been working with member municipalities to develop a Model Storm Sewer and Watercourse Bylaw and codes of practice (COP). These regulatory tools have been made available to member municipalities for adoption under their own regulatory framework. SHWP staff is working with electoral areas staff to determine appropriate implementation options within their areas. Model regulatory tools currently available to municipalities include the Model Storm Sewer and Watercourse Protection Bylaw (Version 12A) and six model stormwater COP. Region-wide adoption of these regulatory tools is a key

component to ensuring a level playing field throughout the CRD with respect to the protection of stormwater. As such, the JdF EA is being encouraged to adopt the bylaw and regulatory COP described below.

Two sector-specific non-regulatory best management practices (BMP) have also been developed and are available for region-wide use. More information regarding the model bylaw, COP and BMP is outlined below:

Street Materials Project

Municipalities in the core area collect street material from sidewalks, roads and catchbasins as part of routine maintenance. In the JdF EA, most of this work is undertaken by the Ministry of Transportation. These street materials, solids and liquids, frequently contain heavy metals, PAH and other substances that can contaminate land and pollute stormwater if disposed of improperly.

SHWP staff will continue to work with the JdF EA Director to develop appropriate handling and disposal for street material and to look for opportunities to apply the Model Storm Sewer and Watercourse Protection Bylaw and COP for the protection of storm drains and watercourses.

Education

Program activities in 2005-2006 included promotion of stormwater contaminant reduction through displays and information handouts at community events. Also, a news article was run in the News Review. Other educational efforts included the collection and promotion of best management practices (strategies for preventing pollution) to the community. The SHWP also worked to promote the importance of reporting to the Provincial Emergency Program spills that can cause harm to public health and the environment.

Shellfish Closures

Stormwater flows are the major pathway for contaminants from the land to the marine environment. Fecal coliform sampling has focused on human health issues; however, most of the shellfish beds in the Sooke Inlet, Harbour and Basin and Saanich Inlet are currently closed for recreational harvesting. The SHWP works toward reducing pollution, through discharge and nearshore marine sampling and upstream source investigations. This work may eventually lead to the opening of shellfish beds in these water bodies.

RECOMMENDATIONS

The following recommendations are based on the results of the fecal coliform sampling:

1. that the Stormwater, Harbours and Watersheds program continues sampling stormwater discharges and creeks along the Juan de Fuca Electoral Area coastline to monitor for fecal coliform levels.
2. that the Stormwater, Harbours and Watersheds program continues working with the Juan de Fuca Electoral Area director and Vancouver Island Health Authority staff to identify the sources of elevated fecal coliform concentrations in stormwater.
3. that the Stormwater, Harbours and Watersheds program continues monitoring surface fecal coliform levels in Sooke Inlet, Harbour and Basin to track changes in these water bodies over time.
4. that Bacteria Source Tracking be used during upstream investigations to assist with the identification of sources of contamination.

Environmental Concerns

The following recommendations are based on the results of the chemical contaminants survey:

1. that the Stormwater, Harbours and Watersheds program staff continue to monitor discharges rated high or moderate in 2005 or 2006.
2. that the Stormwater, Harbours and Watersheds program staff discontinue sampling and analysis at discharges where low contaminant levels have been confirmed.
3. that the Stormwater, Harbours and Watersheds program evaluate the effectiveness of the current sediment sampling program and make changes as required to protect watercourses and the nearshore marine environment.

Stormwater Source Control

1. that the Juan de Fuca Electoral Area considers adopting the Model Storm Sewer and Watercourse Protection Bylaw and related codes of practice.
2. that the Stormwater, Harbours and Watersheds program staff continue to develop (as required) the regulatory framework of bylaws, codes of practice and best management practices for the protection of stormwater quality.

General

1. that the Stormwater, Harbours and Watersheds program continues working with community groups and others to promote the protection of stormwater quality.