

# Core Area

# Liquid Waste Management Plan

## Capital Regional District | 2015 Annual Programs Report



Craigflower Pump Station.

The Capital Regional District (CRD), on behalf of the core area participants - Colwood, Esquimalt, Esquimalt First Nation, Langford, Oak Bay, Saanich, Songhees Nation, Victoria and View Royal - manages wastewater and stormwater according to strategies and activities outlined in the Core Area Liquid Waste Management Plan (LWMP). The LWMP is a 25-year plan, under the *Environmental Management Act*, that was originally approved by the BC Ministry of Environment (MOE) on March 26, 2003 and most recently amended (Amendment #9) in July 2014.

Look for these icons throughout the document for section headings in the 9 program areas:



**Monitoring & Evaluation**



**Outreach & Education**



**Key Initiatives & Accomplishments**



**Looking Ahead**

CRD liquid waste management involves the operation, maintenance, replacement and expansion of wastewater infrastructure, as well as various other activities that have regulatory reporting requirements and commitments to support, inform and educate stakeholders about liquid waste and environmental protection. There are 9 LWMP activities:

- 1. Operations, maintenance and capital planning;**
- 2. Wastewater and marine environment monitoring;**
- 3. Source control;**
- 4. Harbours environmental action;**
- 5. Stormwater quality;**
- 6. Inflow & infiltration management;**
- 7. Trucked liquid waste management;**
- 8. Onsite wastewater management; and**
- 9. Sewage treatment planning**

This overview document provides a summary of 2015 activities, 2016-2017 directions and describes the general scope and integration of the LWMP activities listed above.

# Operations, Maintenance & Capital Planning

The CRD is responsible for the operation and maintenance of the core area wastewater system, including wastewater collection from municipal systems, and conveyance, screening and disposal through CRD trunk systems and ocean outfalls. The core budget for this service is approximately \$4.2 million per year with significant capital project expenditures being funded through supplementary budgets.

The core area conveyance system is comprised of 4 primary trunk sewer systems: the North West Trunk, the North East Trunk (Clover), the North East Trunk (Bowker) and the East Coast Interceptor.

The 2 North East trunks and the East Coast Interceptor collect wastewater from Saanich, Oak Bay and Victoria, while the North West Trunk collects wastewater from Colwood, Esquimalt, Langford, Saanich, Victoria, View Royal, DND and local First Nations. They converge at Clover Point and Macaulay Point pump stations where the wastewater is fine screened and pumped into the Juan de Fuca Strait 1.1 km and 1.7 km off shore, respectively. Screenings are disposed of at Hartland Landfill.

Provincial legislation requires the trunk sewer systems to be classified by the Environmental Operators Certification Program and that appropriate levels of certification are maintained by operations staff. Core area operations staff include Utility Operators that are certified through the program and the B.C. Water and Waste Association, and certified trades staff including millwrights, machinists, electricians, electrical technicians, diesel mechanics and welders.



## Monitoring & Evaluation

Operations staff monitor and respond to conveyance system activities and alarms through a Supervisory Control and Data Acquisition (SCADA) system that continually monitors and controls the equipment within the CRD's wastewater facilities. Staff use the SCADA system to remotely monitor and control system functions as required, including wetwell levels, pump operation, pump temperature, pump vibration, pump efficiency, heating, ventilation and air conditioning systems, odour control systems, standby generators, screening systems and security systems.

The CRD is also responsible for outfall monitoring and evaluating potential effects of wastewater discharges (discussed later).

- Total 2015 discharge volumes (approx):
  - Clover - 16,030,000 m<sup>3</sup>
  - Macaulay - 15,260,000 m<sup>3</sup>
- Total 2015 screening tonnage to Hartland landfill (approx):
  - Clover - 343 tn
  - Macaulay - 322 tn
- Number of 2015 marine (shoreline) system overflows: 63
- Number of 2015 system odour complaints: 1

Electrician disconnecting pumps in Hood pump station.





Operations staff prepare to replace pump guides in Hood pump station wetwell.

## Key Initiatives & Accomplishments

- Implemented the SCADA Master Plan Phase II (Equipment Replacement Strategy).
- Replaced the Currie Minor pump station #3 and #4 pump bases. This was a significant project because the pump station had to be bypassed through the Oak Bay sewer system back into Currie Major pump station.
- Prepared and implemented a new wastewater overflow response plan in cooperation with Environmental Protection staff and Island Health.
- Operations staff worked with Infrastructure Engineering, consultants and contractors to commission the new Craigflower pump station.
- Completed approximately 96% of preventative maintenance work orders planned for the year.
- Changed out the odour control carbon at Macaulay Point pump station. The carbon was spent and outside odours were becoming an issue.
- Repaired a pump and drive shaft in the Macaulay Point pump station after an unexpected failure.

## Looking Ahead

In 2016-2017, staff plan to:

- Continue the ongoing inspection of trunk wastewater pipes (~1.5km).
- Replace odour control carbon at both Trent and Marigold pump stations.
- Inspect Macaulay and Clover Point outfalls.
- Replace SCADA servers and update ClearSCADA software.
- Prepare and update standard operating procedures for mechanical shop equipment.
- Replace mechanical fittings in the Humber and Rutland pump stations.
- Have CRD Information Technology take over responsibly of the Core Area SCADA servers, and start preparing for the implementation of SCADA data historian software.
- Repair a section of corroded pipe on the Macaulay Point pump station outfall and provide additional shoreline protection.
- Replace the Clover Pump Station outfall siphon air break.
- Evaluate and assess the odour control facilities and their effectiveness.
- Work with Infrastructure Engineering to develop and implement SCADA Master Plan Phase III (control panel, HMI and SCADA screen specifications).

# Wastewater & Marine Environment Monitoring

The 2 core area wastewater outfalls (Clover and Macaulay points) are regulated by MOE through permits that specify wastewater quality and flow volume limits, and through marine monitoring commitments made in the LWMP. The outfalls are also subject to wastewater quality monitoring requirements under the federal Wastewater Systems Effluent Regulations.

Outfall monitoring is undertaken by the Wastewater and Marine Environment Program (WMEP). The current monitoring program is a 5-year monitoring cycle, with 2015 representing the fifth year. The program had a 2015 budget of approximately \$1.2 million (included in the \$4.2 million core area sewer system operating budget) and had the following objectives:

- Monitor and assess wastewater quality and quantity.
- Provide compliance monitoring results to regulatory agencies.
- Monitor and assess the potential effects of wastewater discharges to the marine environment.
- Monitor and assess the potential effects of wastewater discharges to human health.
- Provide information to the CRD Regional Source Control Program.
- Provide information to wastewater managers regarding treatment plant and outfall diffuser performance.
- Provide scientific assessment to the general public regarding the use of the marine environment for the disposal of wastewater.

both outfalls met the regulatory requirements for MOE permits and the Wastewater Systems Effluent Regulations Transitional Authorization limits. Transitional Authorizations are in effect until December 31, 2020 when sewage treatment is expected to be in place.

Wastewater toxicity test results were also similar to previous years; undiluted wastewater, before discharge from both outfalls, was toxic to fish and invertebrates. However, toxicity only occurs in wastewater concentrations well above those expected to occur in the ocean around the outfalls. Studies do not predict toxicity farther than 100 metres away from the outfalls. Installation of further treatment for the core area system will reduce effluent toxicity in the future.

## Surface Water & Water Column Monitoring

The majority of surface water results were within water quality guidelines set to protect human health. Only 1 exceedence, which was slightly higher than the provincial guidelines but within Health Canada guidelines, occurred during the winter sampling period.

The deeper water column sampling results confirmed that the wastewater plumes were trapped at depth. Results from deeper depths routinely exceeded human health guidelines at 100 metres away from the outfalls, indicating a greater human health risk for activities, such as SCUBA diving, near the outfalls. These exceedences were expected due to the intended design of the outfall diffusers and the high concentrations of bacteria in the wastewaters. Cadmium and zinc also occasionally exceeded the guidelines for the protection of aquatic life at depth, but observations were based on infrequent sampling and should be interpreted with caution.

Overall, near the outfalls, human health risk and potential for impacts to aquatic life were low at the surface and slightly higher at depth.



## Monitoring & Evaluation

### Wastewater Monitoring

The 2015 wastewater monitoring consisted of provincial and federal regulatory compliance monitoring, a comprehensive assessment of contaminants and toxicity testing. Results were consistent with previous years. Wastewater from

## Seafloor Monitoring

Seafloor monitoring consisted of sediment chemistry, mussel tissue chemistry, and mussel community structure and health assessments around the Clover Point outfall. Sediment chemistry results were generally consistent with previous years with only a small proportion of the results exceeding applicable sediment quality guidelines. Most exceedences occurred within 100 metres of the outfall and none occurred farther than 400 metres away. The remaining 2015 seafloor biological data is still under assessment.

## Additional Investigations

The CRD continued to collaborate with Ocean Networks Canada to assess oxygen levels in the waters around the Macaulay Point outfall. Results will be used to determine how oxygen levels near the outfall compare to levels elsewhere in the Salish Sea and the north east Pacific Ocean.

The CRD also continued to collaborate with 2 Vancouver Aquarium based programs: PollutionWatch, a program measuring seafloor contaminants over the long-term throughout the entire Salish Sea; and the Salish Sea Ambient Monitoring Exchange, a program to encourage consistency in sampling methodology and collaboration on Salish Sea research.

Staff initiated new collaborations in 2015. Vancouver Island University (VIU) and the Vancouver Aquarium are working to assess microplastics in the ocean waters and sea life of the Salish Sea. The CRD provided Clover Point mussel samples to VIU to help them develop methods that will be used to determine if plastics are accumulating in sea life tissues. In addition, the CRD provided the Vancouver Aquarium with wastewater samples from Clover and Macaulay Point pump stations and, in conjunction with the Regional Source Control program, samples from a residential wastewater catchment area upstream in the sewage system. The Vancouver Aquarium will also be using these samples to develop analytical methodologies that determine both quantity and type of plastics in wastewater and environmental samples. Results are not yet available.

The second new collaboration involved Department of Fisheries and Oceans (DFO). The CRD collected zooplankton samples on their behalf at one of their historic monitoring stations.



Staff sampling seafloor sediment off Clover Point.

In return, DFO will analyze zooplankton samples collected from adjacent to the Clover and Macaulay outfalls. When available, the results will be used to determine if the outfalls are having any impact on zooplankton communities.

## Key Initiatives & Accomplishments

- Met all 2015 sampling and reporting requirements.
- Developed new research collaborations with VIU and DFO.



## Looking Ahead

In 2016-2017, program plans are to:

- Continue routine wastewater and surface water/water column sampling.
- Undertake the fish survey that was supposed to take place in 2015, but was delayed due to logistical issues.
- Initiate an integrated assessment of the 2012 and 2014 Macaulay Point seafloor results.
- Initiate a comprehensive assessment of the full 2011-2015 5-yr monitoring cycle.
- Continue support for the various ongoing collaborative projects.
- Review the need for new additional investigations.



Compliance sampling for the Sewer Use Bylaw.

## Source Control

The Regional Source Control Program (RSCP) protects core area sewage collection and treatment facilities, public health and safety, and the marine receiving environment by reducing the amount of contaminants that industries, businesses, institutions and households discharge into the district's sanitary sewer systems. The 2015 budget for this work in the core area was \$1.3 million.

The CRD adopted a Sewer Use Bylaw in 1994 to regulate sanitary sewer discharges. The CRD meets or exceeds Canadian best practices for source control and is a nationally recognized leader in this field. The program continues to play an important role in achieving significant wastewater contaminant reductions and protecting sewage facilities throughout the region. Source control is widely accepted as a cost-effective, essential first step in sewage treatment.

### Monitoring & Evaluation

Discharges from larger industrial and institutional facilities in the region are regulated through permits or authorizations. Compliance rates for these facilities remained high in 2015.

The program regulates discharges from smaller businesses using 11 Codes of Practice (COP) and each year it targets specific sectors for full reviews based on associated effluent risks, sector size and state of current data.

In 2015, staff conducted 1,491 inspections mostly at

automotive repair, vehicle wash, carpet cleaning, laboratory, photographic imaging and food services operations. This number represented a substantial increase over 2014 and included repeat site visits to facilities found to be non-compliant on the first visit. Almost 1,100 of the inspections carried out were coordinated with other CRD program messaging or other agencies such as municipalities and Island Health.

In 2015, facilities regulated under RSCP codes of practice, permits and authorizations achieved an overall compliance rating of 97%.

Monitoring conducted by staff confirmed compliance at all permitted facilities, provided data for evaluation of carpet cleaning and fermentation treatment works, and assessment of residential and industrial wastewater contaminant loads.

### Outreach & Education

Outreach and education efforts focused on developing and delivering integrated messaging with other CRD programs including:

- Delivery of a new "Green 365" campaign, "In the Bathroom" which included significant source control messaging.
- Continued work with the BC Pharmacy Association

and the Health Products Stewardship Association to host outreach booths in 9 pharmacies throughout the region to provide information and prompts promoting the Medications Return Program. Over 11 tonnes of medications were returned by participating CRD pharmacies in 2015.

- Staff engaged the 3 main post-secondary institutions in the region to look for opportunities to include CRD environmental sustainability messaging as part of their current lesson plans. A new web page was created for post-secondary students and educators to better access CRD environmental education resources.
- Outreach material developed in past years for “Automotive Repair operations” was updated, revised or created to encompass a new, broader, category “Mechanical Repair operations”.
- Established a CRD presence on BizPal, a province-wide web-based tool for new and current businesses to promote awareness of, and access to, information on a range of business licenses and permits. BizPal is one component of the program’s “one-window approach” to business outreach.
- Staff worked with other CRD programs and the non-governmental organization Synergy Sustainability Institute to revitalize the EcoStar business recognition awards.

## Key Initiatives & Accomplishments

- Completion of a 5-year review of the program (2009-2013), a commitment in the Liquid Waste Management Plan.
- Development and Board approval of a new 4-year implementation plan for the program (2016-2019), aligning program activities with the next CRD budget cycle.
- Substantial increase in the number of inspections (including coordinated inspections) carried out in the mechanical repair, vehicle wash and food services sectors.
- Preparation of detailed sewer catchment maps for two major CRD pump stations to assist in significant incident training and response.
- Commencement of a business case to support development of a treatment works maintenance and compliance tracking digital application.
- Completion of a residential survey to gauge attitudes, practices and barriers regarding source control behaviors.
- Continued integration of commercial water audits as an expanded inspection service.



### Looking Ahead

In 2016-2017, program plans are to:

- Review, update and amend the Sewer Use Bylaw, including a review of all codes of practice.
- Conduct Code of Practice inspections, monitoring and sector investigations focusing on the food services, dental, photographic imaging and printing sectors.
- Implement the current BizPal platform and develop integrated webpages and messaging for specific business sectors to access information on all CRD environmental and service programs (the “one-window approach”).
- Develop requirements for a pilot treatment works maintenance tracking application in cooperation with the food services and waste hauling sectors.
- Redesign CRD web pages associated with stormwater, wastewater and septic systems to improve access to source control information and educational material and to support new and refreshed initiatives.
- Develop strategies to emphasize the importance of source control in advance of the implementation of enhanced wastewater treatment in the Core Area: “Source control, the first step in wastewater treatment”.



Victoria Harbour.

## Harbours Environmental Action

The Harbours Environmental Action Program coordinates environmental protection and improvement efforts in Victoria and Esquimalt harbours, Portage Inlet, the Gorge Waterway and Esquimalt Lagoon to achieve the following LWMP goals:

- Advocate environmental protection
- Decrease contaminant inputs
- Protect and enhance habitat quality
- Set environmental quality objectives
- Achieve environmentally protective land uses
- Monitor environmental quality

These commitments are collaboratively implemented with community groups, municipal partners, First Nations and other agencies through environmental projects and multi-stakeholder harbour initiatives. The 2015 budget for this work was approximately \$288,000.



## Monitoring & Evaluation Review of Land & Water Use Applications

The Esquimalt Lagoon Stewardship Initiative (ELSI) and the Gorge Waterway Initiative (GWI) are designated as referral agencies for major harbour developments. In 2015, they reviewed and provided comment on several major land use items, including:

- District of Saanich Management Plan for Cuthbert Holmes Park.
- City of Victoria Burnside Gorge Neighbourhood Plan.
- City of Victoria zoning bylaw for Gorge Waterway Park to create an ecological zone and regulate long-term anchoring.
- Royal Roads University Sustainability Plan 2015-2020.
- District of Colwood pump station protection plan for Coburg Peninsula.
- Development applications for five developments adjacent to Esquimalt Lagoon in Colwood, including Pacific Landing, Ocean Grove and Royal Bay.

## Harbour Water Quality Objectives

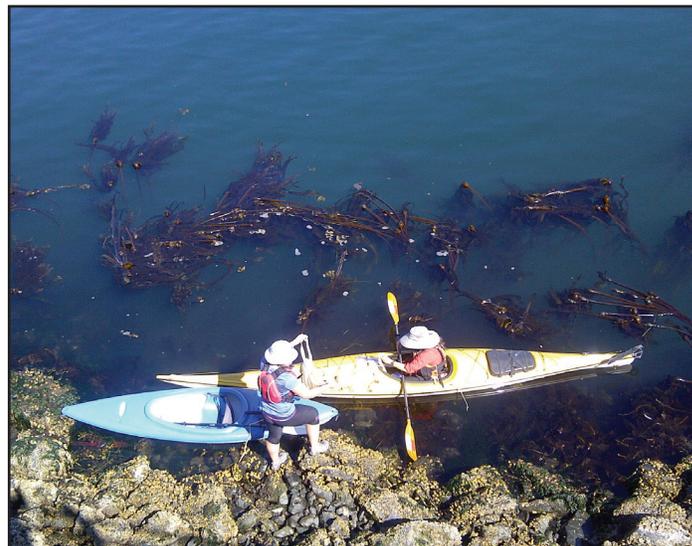
In 2015, CRD staff sampled 86 stormwater discharges entering the harbours. Fifty-six of these discharges had elevated fecal bacterial counts and of these, 15 were assigned a high

public health concern rating. CRD staff are working with appropriate municipal staff to identify sources and repair/remediate these problem areas.

## Salish Sea Seaweed Contaminant Study

Researchers from Western Washington University (WWU) are working on the largest Pacific Northwest study of contaminants in seaweed conducted in 25 years. Contaminant levels in seaweed (*Fucus* and *Nereocystis*) at traditional First Nations harvesting sites and at known contaminated sites will be compared at 40 locations throughout the Salish Sea. The seaweeds will be screened for potential contaminants including heavy metals, pesticides and other chemicals (e.g., dioxins, furans, PCBs).

In 2015, CRD staff worked with WWU researchers to sample seaweeds at 10 locations within the core area harbours, obtain local First Nation input on historical seaweed harvesting sites, and gain permission to conduct the sampling within their ancestral territories. The results of the study will be shared with First Nation communities and will contribute to understanding of the safety of seaweed consumption and use by Coast Salish People.



CRD staff assist Western Washington University researchers in sampling seaweed for the Salish Sea Seaweed Contaminants Study, the largest study of seaweed contamination in the Pacific Northwest in over 25 years.

program was represented at 15 community events. Staff also led ecological walks around Gorge Waterway, Portage Inlet and the Esquimalt Lagoon

## Key Initiatives & Accomplishments

- Consulted with municipal staff on harbour water quality objectives.
- Worked with CRD Aboriginal Initiatives staff to identify and explore opportunities for better First Nation engagement and input to harbour and watershed initiatives.

### 16 Looking Ahead

In 2016-2017, program plans are to:

- Update the Harbours Atlas functionality.
- Prepare for a 2017 update to the harbours ecological inventory which will include mapping and inventory of shoreline, intertidal and subtidal habitats.
- Complete new table top outreach displays for the initiatives.
- Initiate marine bird surveys.
- Increase awareness of the Migratory Bird Sanctuaries in the capital region and celebrate the 100th Anniversary of the Migratory Birds Convention and the *Migratory Birds Act*.



## Outreach & Education

### Multi-Stakeholder Initiatives

Staff provide support to and coordinate multi-stakeholder initiatives, such as the GWI and the ELSI. These initiatives create opportunities for collaboration on environmental projects and outreach activities, and provide a forum for the sharing of information between partners. Staff also participate on Department of National Defence's multi-stakeholder Esquimalt Harbour Advisory Committee.

### Restoration Activities

In 2015, staff supported volunteer efforts at habitat restoration projects including riparian enhancement at Bee Creek and Pithouse Park, Gorge Waterway Nature House and rebuilding of the Gorge watershed model.

### Community Events

Every year, staff and volunteers attend community events and celebrations, sponsor free public talks and participate in a variety of outreach and education events. In 2015, the

# Stormwater Quality

The Stormwater Quality Program (SQP) plans, promotes and coordinates the management of stormwater quality in consultation with the municipalities and First Nations. The 2015 budget for the program was approximately \$640,000.



## Monitoring & Evaluation

### Stormwater Discharge Evaluations

The core area stormwater discharge survey covers the coastline between the Colwood-Metchosin border in the west and the Saanich-Central Saanich border in the east, including the major harbours.

### Public Health: Fecal Coliforms

There are approximately 550 stormwater discharges along the core area shoreline. Staff visit priority discharges at least twice a year and the program aims to sample all discharges within a 5-year cycle. Data is used to help partners prioritize infrastructure maintenance and evaluate potential human health risks along the shoreline.

In 2015, the CRD analyzed 152 stormwater discharges for fecal bacteria from samples collected once during the winter and once during the summer, to represent seasonal differences. Thirty-five stormwater discharges were rated high for public health concern in 2015.

CRD staff conducted source investigations in 12 high-rated stormwater discharge catchments in 2015. This work directly led to the identification and repair of 4 sewer-to-stormdrain cross-connections.

In 2007, the number of high-rated discharges reached 41, prompting municipalities and the CRD to concentrate efforts on decreasing bacterial concentrations in these discharges. In 2015, only 24 of those discharges were still high-rated, a 42% reduction.

Joint efforts between participants and CRD staff have proven successful. Municipal efforts included relining sewer and stormwater pipes, and separating combined sewer/stormwater manholes. Efforts to identify contamination were successful as fecal bacteria levels in many discharges are now reduced. However, new sources continually appear, highlighting the need for staff to continue monitoring.

## Environment: Chemical Contaminants

The CRD also rates stormwater discharges for environmental concern based on the level of metals and organic contaminants measured in sediment collected within the stormwater collection system (i.e., pipes, manholes, ditches and creeks).

The CRD sampled within 22 stormwater discharge catchment areas and rated 17 based on the discharge sediment sample. Using data from 2015 and previous years, CRD staff have designated 20 stormwater discharges as being of environmental concern based on levels of metals or hydrocarbons that may impact marine aquatic life.

CRD staff conduct source investigations for chemical contaminants, however sources in stormwater sediment can be complex to find and eliminate as sediment is not always available at upstream sites, and levels fluctuate with rainfall and as lines are cleaned out. Many non-point sources are from roadways, parking lots or transient point sources (e.g., spills) and some persist for a long time.

## Major Watercourse Monitoring

Staff monitored the health of 12 creeks and conducted additional water quality sampling and assessment of the health of invertebrate animals living in the creek sediment in 2 of the creeks.

The water quality parameters of most concern in core area creeks were bacteria, phosphorus, turbidity and metals. This is consistent throughout the region wherever there is increased human presence and agriculture. The fecal coliform shellfish harvesting guideline and draft Vancouver Island phosphorus objective were exceeded in all CRD creeks due to human and animal presence in these watersheds.

Overall, creek water quality was similar to previous years in both rural and urban creeks: poor in Bowker and Cecelia, moderate in Bee, Colquitz, Colwood, Craigflower, Hospital, Noble, and Selleck and good in Douglas, Goldstream and Millstream.

## Nearshore Marine Monitoring

Staff conducted intensive winter monitoring of 10 high-use beaches to assess marine bacterial levels. Data indicate a number of high-use public beaches in the Core Area (and Saanich Peninsula) have conditions that exceed Health Canada guidelines for recreational use during and after winter rainfall events. The sources of contamination include humans, ruminant animals and dogs. Staff will continue sampling in

fall 2016 to measure how bacterial levels change in relation to rainfall levels. In addition, staff continue to work with Island Health to develop messages around the safety of recreational activities during the winter.

## Outreach & Education

The CRD encourages watershed stewardship through a variety of print, online and educational resources, interactive outreach and special projects. In 2015, 2 new interactive watershed models for outreach and education were a popular addition to community events increasing the number of individuals visiting the CRD outreach booth with engagement that was more meaningful. Local government staff and community groups also borrowed the models for their own outreach events. The Ollie the Otter badge program saw 150 children earning their badge through active watershed stewardship and the strong number of website visits to [www.crd.bc.ca/watersheds](http://www.crd.bc.ca/watersheds) indicate that the resources are utilized.

## Key Initiatives & Accomplishments

### Integrated Watershed Management

Staff undertook several new actions to improve, protect and monitor watersheds in 2015.

- Work started on a project to refine watershed boundaries in the region in order to better assess watersheds.
- The CRD made a new commitment for technical support to groups working on invasive species control and gained approval for the creation an Elk/Beaver Lake Initiative to manage lake water quality.
- Staff contributed to Beyond the Guidebook 2015, a reference document for sustainable watershed systems through asset management produced by the Partnership for Water Sustainability in BC.
- To connect directly with local watershed stewardship groups, Integrated Watershed Management Program established a Community Watersheds Group. The group will meet several times a year to engage, build capacity and create a network of watershed focused non-government groups and volunteer groups.
- The CRD collaborated with the Province to host a forum on Risk Management Options for Residential Heating Oil Tanks for local government staff.



Staff demonstrate watershed function with an interactive model.

### Bowker Creek Initiative

The Bowker Creek Initiative (BCI) is chaired by the CRD and funded by Oak Bay, Saanich and Victoria. A successful collaboration between District of Oak Bay, School District 61, the BCI and the CRD enabled the restoration of Bowker Creek near Oak Bay High School. Restoration objectives were to ensure safe conveyance of flood flows, improve aquatic and riparian habitat, and create an outdoor classroom, viewing platform and greenway.



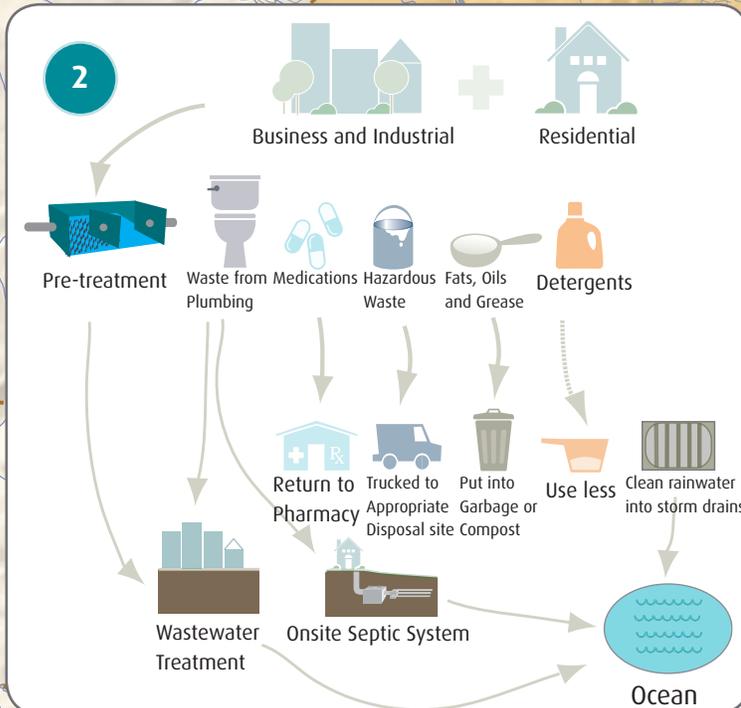
### Looking Ahead

In 2016-2017, program plans are to:

- Collect data to understand how bacterial levels fluctuate with winter rainfall in shoreline areas of high public use.
- Finalize a transition from using fecal coliform to a combination of *E. coli*. (in fresh water) and enterococci (in sea water) which are more representative indicators of risk due to contamination.
- Continue to investigate contaminant sources in the catchment areas of high-rated stormwater discharges.
- Work with the CRD Onsite Wastewater Management Program to determine if onsite septic systems have an impact on watercourses and the near-shore marine environment.
- Continue annual monitoring of priority creeks to assess creek health.
- Continue to produce educational material about watershed protection.

## Program Linkages

- 1 The CRD's Integrated Water Services operations staff work to operate, maintain and replace the core area trunk sewer, pump stations and outfalls.
- 2 The CRD's Regional Source Control, Trucked Liquid Waste and Onsite Wastewater Management programs all work together to ensure potential contaminants are properly disposed of and do not enter into the environment.
- 3 Inflow and infiltration issues occur throughout the core area. The CRD's Inflow & Infiltration Program works with stakeholders to reduce the amount of rain and groundwater entering the sanitary sewer system.
- 4 The CRD's Wastewater and Marine Environment Program monitors and assesses the impacts of wastewater discharged through the two core area outfalls.
- 5 The CRD's Stormwater Quality Program monitors and assesses the impacts of stormwater discharged at approximately 550 locations in the core area.
- 6 The CRD's Harbours Environmental Action Program coordinates environmental protection and improvement efforts in Victoria and Esquimalt harbours, Portage Inlet, the Gorge Waterway and Esquimalt Lagoon.



- Stormwater Sampling Station
- Outfall Sampling Station
- ▲ Sewer Overflow Discharge Point
- ▨ Harbour Area

- Trunk Sewer
- Sewer Outfall
- Streams
- Storm Drain
- Lakes

**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.

CRD - Parks & Environmental Services - Env



rain / Ditches

CRD Boundary

Municipal Boundaries

LWMP Boundary

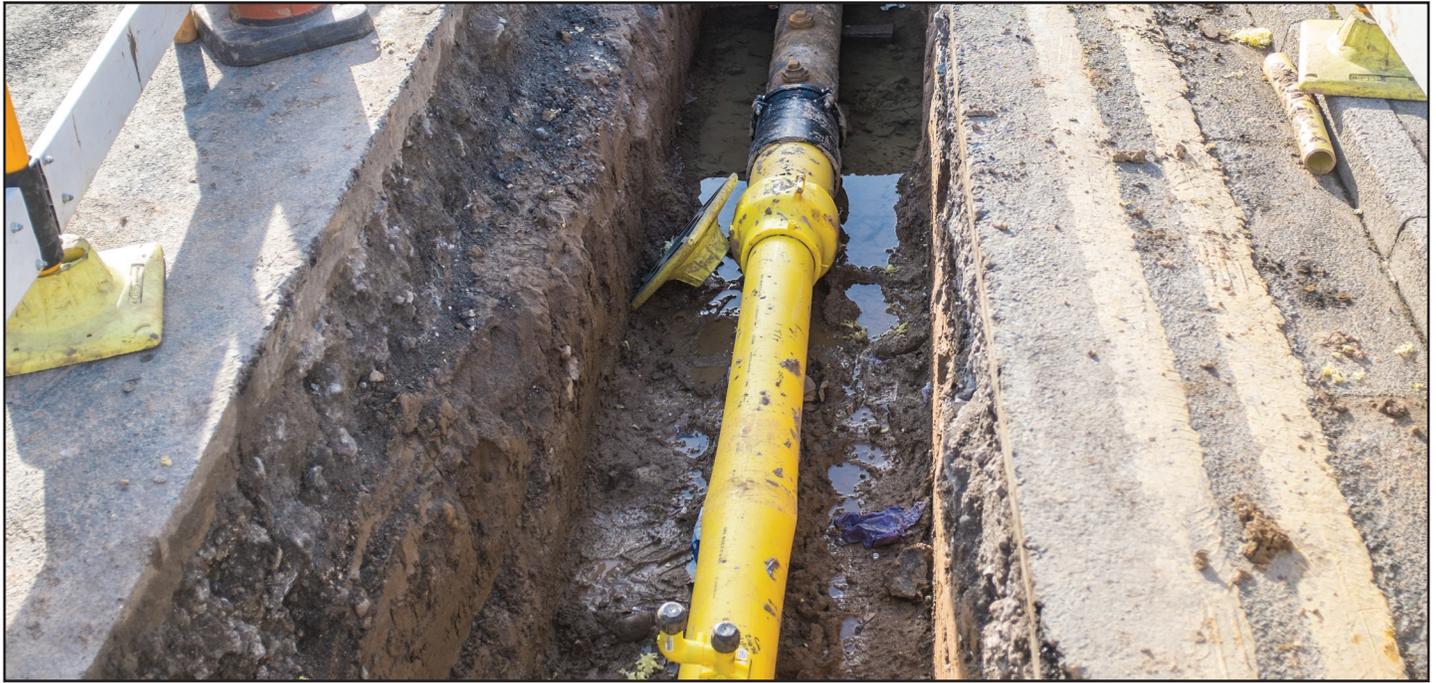
Freeway/Highway

Collector Road

Local Road

Environmental Engineering - Sep 02, 2016 - Technologist: sruljancich - Map Document: EnvProtectionOverviewCore.mxd

# CORE AREA LWMP PROGRAMS TO ASSESS IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT



Infrastructure repair is one way to reduce inflow & infiltration.

## Inflow & Infiltration Management

The Inflow and Infiltration (I&I) Program engages with core area municipalities and First Nations to identify and reduce the amount of rain and ground water that enters the sanitary sewer system. The 2015 budget for this work was \$387,000.

Inflow is rainwater that enters the sanitary sewer system through improper plumbing connections. Infiltration is groundwater that seeps into the sanitary sewer through cracks or loose joints in sewer pipes and manholes. Some I&I is unavoidable and is taken into account during sewer and treatment plant design; however, excessive amounts can result in the following problems:

- Environmental and health issues caused by overflows to creeks, ocean, and beaches.
- Property damage and health issues caused by sewage back-ups into houses and buildings.
- Increased operation and maintenance costs to convey and treat additional sewage flows.
- Reduction in available capacity in sewer systems.

The I&I Management Plan (2012) contains a systematic and comprehensive approach for classifying, identifying and reducing I&I for 108 catchments in the core area. The plan also provides more specific requirements for identification and reduction of I&I originating from private property.



### Monitoring & Evaluation

The CRD analyzed flow monitoring data from 100 locations in the core area. The data was used to update I&I rates and to evaluate I&I performance for the 5-year I&I Management Plan update. The CRD also provided site-specific flow monitoring and data acquisition services to the core area municipalities and First Nations.



### Outreach & Education

The I&I Program was represented at 15 public events as a part of the overall CRD Outreach program coordinated by CRD Environmental Partnerships. Updated education materials were developed to provide private property owners with further information on sewage back-ups.

## Key Initiatives & Accomplishments

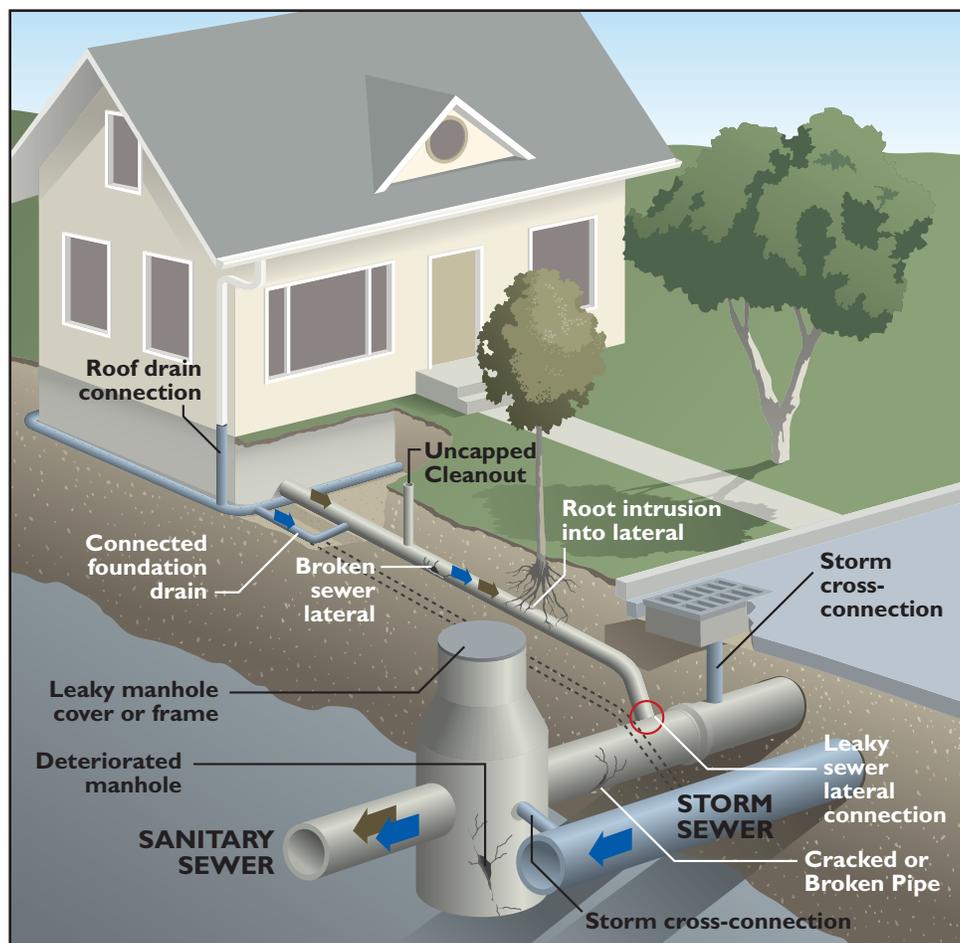
- Based on identified elevated I&I rates, significant municipal I&I reduction capital programs, including separation of combined sewer manholes and comprehensive smoke testing and video inspection programs, were conducted in Esquimalt and Victoria respectively.
- Preparation of the 5-year update of the I&I Management Plan for submission to the Province in late 2016 or early 2017.
- Updated I&I rates for 108 catchments.
- Distributed a sample model bylaw for private property sewer laterals to the core area municipalities and First Nations.
- Evaluated respective municipalities' existing sewer bylaws in comparison to the sample model bylaw. Municipalities can use the recommendations from the evaluation to either strengthen their existing bylaws or to adopt a stand-alone private property I&I bylaw.
- Initiated an education program aimed at stakeholder groups which can influence home owners / homebuyers to inspect, maintain and repair their private sewer laterals.

## 16 Looking Ahead

In 2016-2017, program plans are to:

- Continue to support core area municipalities and First Nations by providing monitoring information and regional I&I rates.
- Completion and submission of the 5-year update to the I&I Management Plan.
- Implement an education program aimed at stakeholder groups which can influence home owners / homebuyers to inspect, maintain and repair their private sewer laterals.
- Continue assisting core area municipalities and First Nations with the development of regional and municipal private property I&I programs.
- Provide leadership for establishing a regional I&I benchmarking framework.

Below: Cross-section of a sanitary and storm sewer system.





Parking lot catchbasin grate.

## Trucked Liquid Waste Management

Trucked liquid wastes (TLW) are non-domestic liquid wastes that are prohibited from discharge to sanitary sewer or stormwater systems and must be transported by truck to a disposal facility. Examples of TLW include catch basin, grease interceptor and oil/water separator wastes.

The CRD TLW Program (the Program) addresses the LWMP requirements related to management of TLW. The objective of the Program is to ensure that TLW is handled and disposed of in an appropriate and responsible manner to protect the environment and public health. The 2015 program budget was \$55,650 and the goals were:

- Promote pollution prevention.
- Promote informed decisions by the industrial, commercial and institutional sectors on liquid waste disposal.
- Encourage the development of appropriate and cost effective facilities.
- Encourage and increase compliance with regulations.

A key component of the Program is industry partnership and outreach that promotes education of TLW generators and haulers. The Program provides information regarding disposal options, waste pre-treatment, and maintenance requirements that improves compliance with the Sewer Use Bylaw and Municipal Stormwater Bylaws. The Program routinely prepares outreach materials regarding TLW issues and presents relevant topics at annual stakeholder meetings.



### Monitoring & Evaluation

Staff annually review catch basin quantities disposed of at local disposal facilities and the 2015 assessment determined that overall quantities have increased by 20% over the last 2 years. However, trend analysis of this data is complicated due to the existence of out-of-region disposal facilities, inconsistent catch basin maintenance intervals and variable catch basin sediment accumulation.

Staff maintain relevant information on the CRD website, including direction on proper management and disposal of wastes, catch basin facts, technical reports and tools for waste haulers, as well as a service provider directory. The majority of web visitors sought information about catch basin maintenance and servicing, which was the focus of the 2015 fall ad campaign, confirming that the campaign successfully directed traffic to the website and delivered consistent messaging.



## Outreach & Education

Staff coordinated a number of outreach initiatives specifically targeting waste generators and haulers. Outreach initiatives included:

- The fall catch basin ad campaign, including advertisements and news articles in various forms of media.
- Promotion of a short video regarding catch basin maintenance as part of a series of stormwater protection videos.
- Updating and reviewing the TLW Service Provider Directory.
- Tours of private facilities to increase knowledge of waste processing/disposal in the region and to foster positive working relationships with industry.



## Key Initiatives & Accomplishments

- Hosted annual stakeholder meeting in partnership with the Onsite Wastewater Management Program to promote CRD outreach programs, and to provide opportunity for stakeholders to raise current and emerging issues.
- Promoted both print and video outreach materials on catch basin maintenance.
- Online outreach initiatives indicated that close to 10,000 individuals were reached throughout the duration of the catch basin campaign.



Catchbasin cleanout with a vacuum truck.



## Looking Ahead

In 2016-2017, program plans are to:

- Promote catch basin clean out and continue to expand the outreach network.
- Expand TLW outreach to additional waste sectors and collaborate with other divisions, such as the RSCP and IWM to streamline outreach strategies and information sharing.
- Consult and collaborate with stakeholders through site visits, the annual fall meeting and the stakeholders group.
- Maintain TLW website content and the Service Provider Directory.



Access to shutoff valves is important for maintenance of a pressurized septic field.

## Onsite Wastewater Management

The Onsite Wastewater Management Program (OWMP) is a pollution prevention program for septic systems that aims to protect public health and safety, local surface and groundwater resources, and the environment. The program strives to reduce the number of malfunctioning onsite wastewater systems by promoting proper care and maintenance, and regulating maintenance frequency.

### Monitoring

The OWMP administers the Onsite Sewage System Maintenance Bylaw (Bylaw No. 3479) in the municipalities that have onsite treatment systems within the Core Area: Colwood, Langford, Saanich and View Royal. The Bylaw regulates the pump-out frequency of Type 1 systems and maintenance frequency for Type 2 and 3 systems. In 2015, a compliance rate of 82% for Type 1 systems was maintained. For the approximately 500 more advanced Type 2 and Type 3 systems, the compliance rate dropped from over 80% to below 30%.

### Outreach & Education

A key component of the OWMP is education. The Septic Savvy Education program provides educational materials including a Household Information Kit and Information Sheets on Septic Issues. Approximately 8,500 people have attended a Septic Savvy Workshop or engaged in-depth with CRD staff about septic systems at a community event. Access to educational materials on the CRD website is a valuable resource for system owners. In addition, septic system information was included in shared messaging that reached over 4,500 residents, through the Environmental Partnerships Division's themed community outreach, where best practices for environmental stewardship are promoted: *In the Kitchen, In the Laundry Room, and In the Bathroom.*



## Key Initiatives & Accomplishments

- In 2015, staff commissioned an independent 5-year program review (2009-2013). It evaluated effectiveness and efficiency of program delivery, best practices in other jurisdictions and progress towards the ultimate goal of preventing the environmental degradation associated with poorly maintained systems. Staff had a consultant review the mandated onsite wastewater management commitments from the LWMP to determine the degree to which these have been met during the review period. The review indicated that all mandated and measurable LWMP commitments were achieved through the review period, contributing significantly to the program's overall goal. Staff incorporated specific recommendations into a new 4-year implementation plan.
- The CRD conducted a pilot study in 2015 to evaluate and improve the option for system owners to conduct a Maintenance Assessment of their system in order to establish a site-specific pump-out frequency, rather than a generic pump-out of their septic tank every 5 years. The pilot study evaluated the use of a Maintenance Assessment (Inspection) to ensure systems are in good working order and recommend a pump-out frequency based on current conditions in the home and system capacity.
- A key finding was that although pilot study participants were in compliance with CRD Bylaw requirements for regular pumping, 92% of the systems needed corrective action beyond pumping out the tank and 62% were experiencing a performance malfunction whereby untreated effluent was being passed into the environment. A positive finding was that residents are willing to do necessary repairs; 68% of participants proceeded with the corrective action recommended from the maintenance assessment report. Of the residents who did not proceed with repairs, many indicated they plan to do the corrective action at some point in the near future. Compared to the \$14,000 the CRD invested in piloting maintenance assessments, residents spent over \$70,000 in upgrades and repairs; a 5:1 result in investment into septic system maintenance and repair.



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## Looking Ahead

In 2016-2017, program plans are to:

- Update the Septic Savvy Program and materials with new knowledge and alignment with watershed protection education.
- Collaborate with partners to continue development of a regional program that meets best practices.
- Continue the pilot study to evaluate interest in the Maintenance Assessment option for residents, and consider a revision to the Bylaw to allow for pump out frequencies longer than 5 years.
- Continue to encourage bylaw compliance through education.



Photo: Alan Johnston.

## Sewage Treatment Planning

Between 2009 and 2015, the Core Area Liquid Waste Management Committee, CRD staff, consultants and the Core Area Wastewater Program Commission worked to create and implement a sewage treatment and resource recovery system for the core area. This was initiated based on a July 2006 order from the Ministry of Environment to develop a fixed schedule for implementing secondary wastewater treatment for the core area.

### Key Initiatives & Accomplishments

- An Eastside Select Committee was formed by Saanich, Victoria and Oak Bay to develop a wastewater treatment and resource recovery conceptual plan to serve those communities in January 2015.
- A public survey was completed and open houses were held by the Westside Select Committee, comprised of Langford, Colwood, View Royal, Esquimalt and Songhees Nation, to identify the sewage treatment priorities of residents in those communities.
- Funding was confirmed and 1-year timeline extension was granted by PPP Canada in April 2015.
- Potential wastewater treatment sites were identified by the Eastside Select Committee in May and the Westside Select Committee in June 2015.
- Public input was sought on Eastside and Westside treatment options starting in June 2015.
- A Technical Oversight Panel and Fairness and Transparency Advisor were implemented in August 2015.

- Construction of the new Craigflower pump station was completed in August 2015.
- A new Core Area Sewage and Resource Recovery System 2.0 Project Charter was approved in October 2015.
- Solution sets for both distributed and centralized treatment scenarios were developed by a consultant and refined based on the potential sites identified by the Eastside and Westside Select committees in December 2015.

### 2016 Activities

- The CRD received extensions to the planning and funding timeline by the Province and PPP Canada in March 2016.
- The CRD Board approved the terms of reference for a new project board with delegated authority for all planning, siting and implementation of the sewage project in May 2016.
- The CRD Board approved a final solution set and business case, including liquid treatment at McLoughlin Point and solids treatment at Hartland Landfill in September 2016.
- The CRD is currently seeking federal and provincial approval of the proposed system and confirmation of funding contributions.

#### Contact

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