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**REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION  
MEETING OF THURSDAY, 17 SEPTEMBER 2009**

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**SUBJECT**      **SAANICH PENINSULA TREATMENT PLANT WASTEWATER AND MARINE ENVIRONMENT PROGRAM – 2008 ANNUAL REPORT**

**PURPOSE**

To present the results of the 2008 Wastewater and Marine Environment program (WMEP).

**BACKGROUND**

The Saanich Peninsula Liquid Waste Management Plan contains a commitment to carry out a monitoring program for the Saanich Peninsula wastewater treatment plant (SPWWTP) and to report on this program to the Ministry of Environment. The program was developed in collaboration with the Marine Monitoring Advisory Group and implemented in 2004. This report presents the results of the 2008 WMEP.

The 2008 WMEP consisted of the following components:

- frequent (daily, weekly and monthly) analysis of wastewater for compliance parameters, treatment plant performance and quarterly analysis for priority substances
- monthly analysis of biosolids for fecal coliforms, golden nematodes and metals
- monthly monitoring of receiving waters for fecal coliforms and nutrients
- seafloor biological community structure and sediment chemistry (once in 2008)

The executive summary of the report, Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program - 2008 Annual Report, by the Capital Regional District (CRD) Scientific Programs division, is attached as Appendix A. The complete report is available on request from the CRD Environmental Services department.

**FINANCIAL IMPLICATIONS**

The core of the WMEP is included in the annual budget. The seafloor monitoring component is required every four years and is funded by single supplementary. Seafloor monitoring is required again in 2012.

**SUMMARY**

The 2008 SPWWTP effluent quality met operating certificate compliance requirements on all sampling dates. Effluent quality monitoring indicated no negative effects from the SPWWTP discharge on the marine receiving environment. Biosolids were within Class A limit, a quality that can be beneficially applied to land. Surface water fecal coliform data indicated no potential health effects from recreational activities or shellfish harvesting. Nutrient concentrations showed no effect from the discharge and were within expected ranges.

Some differences were observed upon comparison between seafloor biological communities near the outfall and a reference station further away. These differences are attributed to variations in the composition of sediments in which the organisms live. Future monitoring will be assessed to determine if these differences result from outfall effects or natural variations of biology or sediment. Finally, there

were no apparent effects from the outfall on sediment chemistry and results were similar to previous monitoring events.

**RECOMMENDATIONS**

That the Saanich Peninsula Wastewater Commission:

1. receive the Saanich Peninsula Treatment Plant Wastewater and Marine Environment Program – 2008 Annual Report for information; and
2. forward a copy of this report to the Ministry of Environment.

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Attachment: 1

**SAANICH PENINSULA TREATMENT PLANT  
WASTEWATER AND MARINE ENVIRONMENT PROGRAM  
2008 ANNUAL REPORT**

**EXECUTIVE SUMMARY**

The Capital Regional District has been operating the Saanich Peninsula wastewater treatment plant (SPWWTP) since February 2000. The SPWWTP discharges into the marine receiving environment (Bazan Bay) through an outfall located approximately 1,580 metres from the shoreline at a depth of 30 metres.

As part of the Saanich Peninsula Liquid Waste Management Plan (LWMP), commitments to develop a long-term monitoring program were made. Pre-discharge monitoring data (1999) combined with post-discharge monitoring results (2000 to 2003) were used to develop a long-term monitoring program in consultation with the Marine Monitoring Advisory group. This program has been in place since 2004.

The 2008 Wastewater and Marine Environment Program consisted of the following components:

- daily, weekly and monthly analysis of wastewater for compliance monitoring and treatment plant performance parameters, and quarterly analysis for priority substances
- monthly biosolids monitoring for fecal coliforms, golden nematodes and metals
- monthly surface water monitoring for fecal coliforms and nutrients
- benthic community structure and sediment chemistry (once in 2008)

**WASTEWATER MONITORING**

**Compliance Monitoring and Treatment Plant Performance**

Wastewater monitoring was conducted on a regular basis to profile the chemical and physical constituents of influent and effluent. Parameters monitored for compliance with the operational certificate under the Saanich Peninsula LWMP were below the effluent regulatory limits. Influent and effluent quality was within expected ranges and met treatment plant operating objectives.

**Priority Substances**

In addition to the compliance and treatment plant performance monitoring, over 200 substances were analyzed in the SPWWTP influent and effluent. More than half of these were below analytical detection limits in 2008. Substances that were detected above analytical detection limits on a regular basis (greater than 50% of the time) in the effluent included most of the conventional variables, metals (both total and dissolved) and five organic substances. Most substances in the effluent were below BC Water Quality Guidelines (BC WQG). For substances that were above BC WQG (i.e., total cadmium, copper, iron and zinc), the predicted levels of these substances in the environment were all below BC WQGs after the estimated minimum initial dilution was factored in.

**BIOSOLIDS MONITORING**

Biosolids were analyzed for fecal coliforms, golden nematode and metals in 2008. All biosolids results were below the BC Ministry of Environment Organic Matter Recycling Regulations (OMRR) Class A limits, indicating they could be applied to land with an approved land application plan.

**SURFACE WATER MONITORING**

**Fecal Coliforms**

Similar to previous years, fecal coliform results were low, with station geometric means of 1 CFU/100 mL for each station in 2008. There were no elevated fecal coliform concentrations observed at any station or sampling date in 2008.

Overall, results indicate that health effects from recreational primary contact activities and shellfish harvesting are not expected. However, an area of approximately 3.75 km<sup>2</sup> around the outfall is closed for shellfish harvesting as standard Fisheries and Oceans Canada (F&OC) procedure near industrial and sanitary wastewater outfalls. Shellfish closures have a minimum radius around an outfall of 300m. Closure areas are usually larger near bigger urban centres, like around the SPWWTP outfall, where there are other potential sources of bacterial contamination (e.g., stormwater outfalls).

### **Nutrients**

There were no distinguishable differences in nutrient concentrations between the station immediately above the outfall terminus and the reference station in 2008. Results were within the ranges measured in previous years and those of the pre- and post-discharge assessment programs. As was observed in previous monitoring years, high variability, both spatially and temporally, was evident in the data. Fluctuations in nutrient concentrations are attributed to natural variation in the study area. Overall, there is no evidence of an effect on nutrient concentrations in the receiving environment from the SPWWTP discharge.

### **SEAFLOOR MONITORING**

#### **Benthic Invertebrate Community**

The 2008 monitoring results, as compared with the 2004 results and pre-discharge assessment program, indicate no detectable or observable effect on benthic community health. Benthic invertebrate community structure did differ between the outfall and the reference station when comparing indices and examining the dominant groups within the community, but these differences could be attributed to substrate type.

#### **Sediment Chemistry**

Sediment quality was similar between the outfall and reference stations, and to 2004 and pre-discharge (1999) concentrations. All data were well below the lowest available Canadian council of the minister of the Environment, British Columbia Minister of the Environment Sediment Quality Guideline or US Environmental Protection Agency sediment quality guidelines.

### **OVERALL ASSESSMENT**

Based on tests used to monitor effluent quality, surface water, sediment and benthic communities in 2008, no significant effects from the SPWWTP discharge on the receiving environment were detected. Influent and effluent quality was within expected ranges and met operating certificate compliance requirements on all sampling dates. All substances for which there are applicable BC WQG met these guidelines when the estimated minimum initial dilution of the effluent was factored in, indicating that the predicted levels of substances in the environment were not likely at concentrations of concern. All biosolids complied with the appropriate standards in the BC OMRR and could be applied to land with an approved plan. Surface water fecal coliform data indicated that health effects on recreational activities or shellfish harvesting are not expected, and that surface water nutrient concentrations were within ranges measured in previous monitoring programs and showed no detectable effect from the discharge. Benthic invertebrate community structure did differ between the outfall and the reference station when comparing indices and examining the dominant groups within the community, but these differences could be attributed to substrate type. There were no differences observed in sediment chemistry between the outfall and reference stations; results were similar to the 2004 and pre-discharge (1999) results and all data were well below lowest available sediment quality guidelines, indicating that sediment quality has not likely been significantly affected by the SPWWTP discharge.