

NO: R137 COUNCIL DATE: July 27, 2009

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## **REGULAR COUNCIL**

**TO: Mayor & Council**

**DATE: July 22, 2009**

**FROM: General Manager, Engineering**

**FILE: 5600-42**

**SUBJECT: 2008 Water System Annual Report**

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## **RECOMMENDATION**

The Engineering Department recommends that Council:

1. Receive this report as information; and
2. Authorize staff to forward a copy of this report to the Medical Health Officer.

## **INTENT**

This report represents the 2008 Annual Report of the City of Surrey Water System.

## **DISCUSSION**

As a water distribution system operator, the City is required under provincial legislation to monitor the ongoing quality of the water it delivers to its customers. The City supplies water to 112,100 customers. The City, with the Fraser Health Authority (FHA) and Metro Vancouver, has developed a water quality monitoring and reporting plan. A protocol document sets out monitoring parameters, reporting structure, and the response plans to emergency situations such as incidents of high bacteria counts or other types of contamination, should they occur.

A Summary of the 2008 Water System Quality Annual Report is attached (Appendix I). The full report is available at the Engineering Department and will be forwarded to the Medical Health Officer following consideration and receipt of this report by Council. The City of Surrey obtained all of its water in 2008 from Metro Vancouver. Metro Vancouver monitored all of the parameters of the City's source water within their system (from alpine reservoirs through their distribution system to the Surrey delivery points).

Within the City's pipe distribution system, the City monitors the water for such things as bacteria and turbidity (cloudiness) as well as chemical and physical parameters unique to distribution systems. Regular monitoring takes place at 51 water-sampling sites located strategically across the City's water distribution system. Weekly samples are collected by both City and Metro Vancouver staff with temperature, turbidity, chlorine residual, and bacterial analysis carried out at the Metro Vancouver testing laboratory in Burnaby.

No bacterial contamination (e-coli coliforms) was found in any of the 2,518 water samples analyzed in 2008 and none of the samples indicated a higher than acceptable total coliform count as stipulated in the Canadian and B.C. Drinking Water Standards. Audit samples taken by the Fraser Health Authority confirmed Metro Vancouver laboratory test results.

### **Chlorine Levels**

Portions of the City's distribution system continue to occasionally experience lower than optimum residual chlorine levels. The lower than optimum chlorine residuals will be reviewed with Metro Vancouver and the Fraser Health Authority with a view to assessing the impact of the results and to review operational and maintenance procedures as appropriate to increase the residual chlorine levels as necessary.

Where weekly sampling test results revealed (through the use of heterotrophic plate counts, HPC) the potential for bacterial growth beyond acceptable limits, the City's maintenance crews flushed the mains in the affected areas so as to decrease the potential for such growth. Low chlorine residuals, low flow demands, and the absence of circulation at or near dead-ends in the system are characteristics of areas where elevated HPCs may re-occur and result in increased flushing frequency. When practical, City staff is actively trying to eliminate dead-end water mains by completing "loops" in the water main system.

All water samples met Metro Vancouver testing laboratory's detection limits for compliance with the Guidelines for Canadian Drinking Water Quality Standards, and the distribution of water to our customers complied with the British Columbia Drinking Water Protection Regulation.

### **CONCLUSION**

The City of Surrey remains diligent and proactive in monitoring, maintaining and operating the City's water distribution system to ensure that the City's water customers continue to receive safe, clean and palatable drinking water.

Vincent Lalonde, P.Eng.  
General Manager, Engineering

VL/GMc/RNA:ajs/brb

Appendix 1: Summary 2008 Water System Quality Annual Report

## REPORT SUMMARY

In 2008, the City of Surrey, similar to other jurisdictions in the Lower Mainland, purchased all its water from the Greater Vancouver Regional District (Metro Vancouver). The City of Surrey's water distribution system begins at the discharge points of 6 Metro Vancouver reservoirs and 11 Metro Vancouver connection chambers located throughout the City.

The City's piped distribution system is approximately 1,790 km long and includes 10 pump stations.

Surrey's geography and size has required the configuration of eight (8) different water pressure zones to be employed throughout the system.

The City's scheduled maintenance program for its water system components includes a unidirectional water main flushing program. This program results in all pipes being flushed at least once every three (3) years while ensuring that water from non-flushed mains does not flow into recently flushed mains during this maintenance activity. The combination of the City's maintenance program, ongoing pipe replacement program and water supply control by Metro Vancouver has been successful. The City has not had to undertake any abrasive, mechanical cleaning of the City's distribution mains, which is more expensive.

Monitoring of the City's water quality occurs at fifty-one (51) water-sampling sites located strategically across the City. Weekly samples are collected by both City and Metro Vancouver staff, with temperature, turbidity, chlorine residual, and bacterial analysis carried-out at Metro Vancouver testing laboratory in Burnaby.

Approximately 19% of the City's Water Operating & Maintenance Budget was spent on water quality related work in 2008. There were 2,518 water samples analyzed in 2008. None of the samples contained any e-coli coliforms. All samples met Metro Vancouver testing laboratory's detection limit for compliance with the B.C. Drinking Water Protection Regulation (BCDWPR) and the Guidelines for Canadian Drinking Water Quality (GCDWQ) standards for counts of total coliforms. Audit samples taken in 2008 by the Fraser Health Authority throughout the system, confirmed Metro Vancouver lab test results.

The City has established response procedures to deal with water quality issues and for line breaks. The procedures incorporate both agency notification and physical repair steps. Integral to the response procedures are well-defined communication links between the City, Metro Vancouver, and the Fraser Health Authority (FHA). The City has developed a response plan for major water emergencies, which has been successfully tested in concert with other Metro Vancouver member municipalities. Ongoing testing is planned for 2009.

As in previous years, water in portions of the distribution system has experienced lower than optimum chlorine residual values. The lower than desirable chlorine residual values will be reviewed with Metro Vancouver and the Fraser Health Authority to assess the impact of the results and to review operation and maintenance procedures.

Where weekly water sampling test results revealed (through the use of heterotrophic plate counts, HPC) bacterial growth within the mains, in excess of 500 colony forming units per milliliter, the City's maintenance crews flushed the mains in the affected areas and remonitored the chlorine residuals at the sampling station. Low chlorine residuals, low flow demands, and circulation restrictions at or near dead ends in the system, are indicative of site characteristics where elevated HPC's reoccur.

Metro Vancouver laboratory performs quarterly tests on the City's water system for disinfection by-products (Haloacetic Acids and Trihalomethanes), and semi annual tests for pH and select metal concentrations. These were carried out at representative sampling sites in accordance with a monitoring and reporting plan established between the City and Metro Vancouver. The test results did not exceed the minimal acceptable levels recommended in the GCDWQ.

Except for the occasional unauthorized opening of fire hydrants, there were no incidents of vandalism in 2008. System security components incorporating lighting, locks and alarms at the water pump stations, as well as check valves on service connections, help provide protection against vandalism.

The City of Surrey remains diligent in ensuring that the water distribution system is maintained to the high standards expected by its 112,100 customers, and 461,200 residents.