



**City of Richmond**

**Report to Committee**

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**To:** Public Works and Transportation Committee      **Date:** March 8, 2005  
**From:** Greg Scott, P. Eng., LEED A.P.  
Director of Operations      **File:** 10-6000-01/2005-Vol 01  
**Re:** **Annual Water Quality Report**

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**Staff Recommendation**

That the report entitled Annual Water Quality Report be received for information.

Greg Scott, P. Eng., LEED™ A.P.  
Director of Operations  
(1206)

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|--|--|--------------------------------|
| <b>FOR ORIGINATING DIVISION USE ONLY</b> |  |                                |
| <b>CONCURRENCE OF GENERAL MANAGER</b>    |  |                                |
|  |  |                                |
| <b>REVIEWED BY TAG</b>                   | YES<br><input checked="" type="checkbox"/> | NO<br><input type="checkbox"/> |
| <b>REVIEWED BY CAO</b>                   | YES<br><input type="checkbox"/>            | NO<br><input type="checkbox"/> |

## **Staff Report**

### **Origin**

The purpose of this report is to meet the British Columbia Drinking Water Protection Regulations (BCDWPR) that were adopted by the Province in May of 2003. The Regulations instructs all water purveyors to prepare and make public an annual report of the water quality monitoring results as required by the regulation and our operating permit.

### **Water Distribution System**

The City of Richmond purchases annually 42 million cubic metres of the drinking water from the Greater Vancouver Regional District (GVRD), similar to other jurisdictions in the Lower Mainland. The City of Richmond's water distribution system begins at 13 separate connections points along the GVRD's transmission mains locate through out Richmond. At each connection point is a City owned and operated pressure reducing valve chamber. The City's responsibility ends at the point where the individual water service connections cross property lines of residential homes and businesses.

The City's distribution system is approximately 634 km long and includes (13) pressure-reducing stations, which decreases the GVRD transmission pressure (250 psi.) to Richmond's operating pressure (95 psi.).

The City's 2005 Water Utility operating budget is \$24,183,300, of which we allocate \$409,000 for water quality programs.

### **City's Water Main Flushing Program**

As part of the City's scheduled maintenance programs for its water system components is an annual water main flushing program. This program is important as it allows accumulated silts and organic matter to be flushed out of the water distribution system.

The City uses a 'unidirectional flushing" method for added control to ensure that water from non-flushed mains does not flow into recently flushed mains. Sediments reduce the effectiveness of disinfectants (chlorine) used to fight the growth of bacteria in the water system. By removing sediments, we can reduce the level of chlorine used to disinfect the water.

This year's water main flushing program began on March 6, 2005 and is perform by a dedicated crew, on a special shift designed to minimise impact to our customers (10pm. - 6:00am. Sunday through Thursday).

In previous years, portions of the distribution system have experienced lower than desirable chlorine residual values. However, the extent of this condition has improved over the past year with the implementation weekly and monthly flushing programs for dead end and other low flow water mains.

The City is continuing to explore ways to improve the chlorine residual values throughout water distribution system by simulation modeling, water main replacement programs, installation of flushing points and joint review by the City and the Vancouver/Richmond Health Authority.

### **Water Quality Monitoring Program**

The City monitors water quality at thirty-one (31) water-sampling sites strategically located across the City. Weekly samples are collected by City staff, with temperature, turbidity, chlorine

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residual, and bacterial analysis carried-out at the GVRD testing laboratory in Burnaby. Last year the water-sampling locations were reviewed by the Vancouver/Richmond Health Authority (VRHA) resulting with the addition of three (3) sites.

In 2004 over 1,400 water samples were taken by City staff and analyzed by the GVRD. Of those samples taken, one sample detected the presence of fecal coliforms, and one other detected total coliform. Subsequent re-sampling and testing did not confirm either presence, further precautionary action was not necessary. This indicates possible contamination of the test sample itself during the collection or laboratory processes and not the water main. As a precaution, when a coliform event occurs our staff re-sample, then flush the water main and re-sample again.

### **Water Quality Monitoring Results For 2004**

The GVRD is responsible for the quality of our source water. Turbidity, a measure of the clarity of water, remains in non-compliance for periods of 2004. Approximately 58 days in 2004 the source water did not meet BCDWPR due to rain events. However, with the completion of the GVRD's \$600 million water treatment plant scheduled in 2007 this problem will be reduced significantly.

Weekly water sampling program test results for 2004 revealed (through the use of heterotrophic plate counts, HPC) the onset of bacterial growth within the mains. When the growth of bacteria is encountered, the City's maintenance crews flush the mains in the affected areas and re-monitor 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 site characteristics where elevated HPC's reoccur. Of the 1400 test samples taken in 2004, 28 did not meet acceptable criteria. Flushing was initiated to improve water quality.

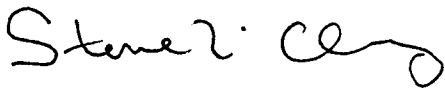
The City also utilizes the GVRD laboratory to perform quarterly tests for pH and disinfection bi-products (HAA's and THM's), and semi annual tests for metal concentrations. These were carried out at representative sampling sites in accordance with a monitoring and reporting plan established between the City and the GVRD. The test results were within acceptable levels recommended in the Federal Drinking Water Quality standards.

### **Financial Impact**

None at this time.

### **Conclusion**

The City of Richmond remains diligent in ensuring that the water distribution system is maintained to the high standards expected by its 177,300 residents.



Steve McClurg  
Manager, Water Services  
(1209)