Corporate Report

NO: R174

COUNCIL DATE: July 18, 2005

REGULAR COUNCIL

TO:	**Mayor & Council**	DATE:	**July 12, 2005**
FROM:	**General Manager, Engineering**	FILE:	**5600-42**
SUBJECT:	**Water System Quality - 2004 Annual Report**		

RECOMMENDATION

1. That this report be received for information.

2. That a copy of this report be forwarded to the Medical Health Officer.

INTENT

To inform Council of the results of the 2004 Water System Quality Annual Report.

DISCUSSION

As a water distribution system operator, the City must monitor the quality of the water it delivers to its customers. The City, with the Fraser Health Authority (FHA) and the GVRD, has developed a water quality monitoring and reporting plan. A protocol document was developed that sets out monitoring parameters, reporting structure, and the response plans to emergency situations such as incidences of high bacteria counts or other types of contamination.

A Summary of the 2004 Water System Quality Annual Report is attached. The full report is available at the Engineering Department and will be forwarded to the Medical Health Officer following receipt of this report by Council. Since the City obtains most of its water from the GVRD, most of the parameters are monitored by the GVRD at the source. The water supplied by the City's well at Sunnyside was approved by the FHA in 2003 as acceptable for potable use. Further testing in 2004 reconfirmed its potability. When the well is used, the City chlorinates the well water prior to blending it in with the GVRD supplied water.

Within the City's pipe distribution system, the city monitors for such things as bacteria and turbidity (cloudiness) as well as for chemical and physical parameters unique to distribution systems.

Only one of the over 2,200 water samples analyzed in 2004 detected the presence of bacterial contamination (fecal coliforms), and none of the samples indicated a higher than acceptable total coliform count. Resampling and testing could not replicate the presence of fecal coliform, and in accordance with established health protocols further precautionary action was not necessary.

Portions of the City's distribution system continue to occasionally experience lower than desirable residual chlorine levels. However, the extent of this condition has improved over the past years. The impact of this situation is reviewed with the GVRD and the Fraser Health Authority on an ongoing basis.

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. 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 HPC's may reoccur.

Other than the above noted exceptions, the water samples met the Guidelines for Canadian Drinking Water Quality Standards, and complied with the British Columbia Drinking Water Protection Regulation.

An ongoing aesthetic water quality issue exists in the 139 Street cul-de-sac, north of 20A Avenue. Council was apprised of the current status of this in a June 13, 2005, memo from the General Manager, Engineering. The Engineering Department is continuing to work with the GVRD to resolve this issue.

CONCLUSION

The City of Surrey remains diligent and proactive to maintain and operate the water distribution system to a high standard to ensure we deliver the safe and clean drinking water our 110,000 customers expect.

Paul Ham, P.Eng.
General Manager, Engineering

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Attachment

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REPORT SUMMARY

The City of Surrey, similar to other jurisdictions in the Lower Mainland, purchases most of the water from the GVRD. The City, however, has also drawn a minimal amount from the Sunnyside Well No. 2 (SSW2) located in South Surrey. The City of Surrey's water distribution system begins at the discharge points of 6 GVRD reservoirs and 11 GVRD connection chambers located throughout the City, and from SSW2.

The SSW2 was put into service in April 2003, and was used at various times in 2004. The well water was chlorinated prior to blending with the GVRD water, and then distributed to the City's customers. In addition to augmenting the GVRD supply, SSW2 can provide South Surrey with a limited emergency source of water. The well provides an approximate flow of 46 litres / second.

The City's piped distribution system is approximately 1820 km long and includes 11 pump stations and 137 pressure reducing stations.

Surrey's geography and size has required eight (8) different water pressure zones spanning forty-four (44) separate management areas.

An average annual water system expansion rate of 3% has occurred since 1997 and a 2% increase is forecasted to continue in 2005 and 2006.

The City's scheduled maintenance program for its water system components includes a unidirectional water main flushing program. This program ensures all pipes are flushed at least once every three (3) years, ensuring that water from non-flushed mains does not flow into recently flushed mains. The combination of the City's maintenance program, ongoing pipe size upgrades, and water supply control by the GVRD, has so far eliminated the need for any abrasive, mechanical cleaning of

the City's distribution mains.

Key to monitoring the City's water quality are forty-nine (49) water-sampling sites located strategically across the City. Weekly samples are collected by both City and GVRD staff, with temperature, turbidity, chlorine residual, and bacterial analysis carried-out at the GVRD Testing Laboratory in Burnaby. A fiftieth sampling site located at SSW2 permits sampling of the raw well water prior to chlorination and blending with the GVRD water.

Approximately one-third of the City's Water Operating & Maintenance Budget is spent on water quality related work. Over 2,200 water samples were analyzed in 2004. One of the samples detected the presence of fecal coliforms. Subsequent resampling and testing however indicated that zero fecal coliforms were present and further precautionary action was not necessary. All samples tested met the B.C. Drinking Water Protection Regulation (BCDWPR) and the Guidelines for Canadian Drinking Water Quality (GCDWQ) Standards for total coliform counts. The potability characteristics of the raw well water at SSW2 were positive and similar to those present when the well was recommissioned in 2003.

During July and August 2004, a black particulate deposition (“high solids”) condition occurred in a City watermain. This caused an inconvenience to residents in a South Surrey neighbourhood. The cause of this condition is still being assessed. A frequent flushing program was initiated and the problem abated by the end of August. Bacteriological testing of the “high solids” water confirmed that the problem was an aesthetic one and that there was no bacteriological contamination present.

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, the GVRD, and the Fraser Health Authority (FHA). Development of a response plan for major water emergencies is underway.

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. The City is continuing to monitor the chlorine residual value's relationship with bacteriological regrowth potential, and will be reviewing our findings with the FHA.

Where weekly water sampling test results revealed (through the use of heterotrophic plate counts, HPC) bacterial growth within the mains, in excess of 500 HPC's per millilitre, 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.

The GVRD Laboratory performs quarterly tests on the City's water system 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 lower than the minimal acceptable levels recommended in the Guideline for Canadian Drinking Water Quality (GCDWQ).

Except for the occasional unauthorized opening of fire hydrants, there were no incidents of vandalism in 2004. System security components incorporating lighting, locks and alarms at the water pump stations, as well as check valves on all new 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 110,000 customers, and 392,000 residents.