



**PUBLIC WORKS DEPARTMENT
MEMORANDUM #10-41**

DATE: September 23, 2010
TO: Honorable Mayor Joyce Downing and City Council Members
FROM: William A. Simmons, City Manager 
David H. Willett, Director of Public Works
Tamara Moon-Carlson, Lead Laboratory Analyst 
SUBJECT: Laboratory Gas Chromatograph Replacement
Request to Solicit Quotes

Background

The laboratory's gas chromatograph (GC) is an advanced piece of analytical equipment that is used by staff to measure the quantity of organic compounds present in finished drinking water. Specifically, this instrument is used to measure Trihalomethanes (THM) and Haloacetic Acids (HAAs). Both of these groups of compounds are disinfection byproducts (DBP) which form when chlorine from the treatment process interacts with organic carbon present in the raw water. These compounds are known carcinogens and are regulated under the Safe Drinking Water Act and the Colorado Primary Drinking Water Regulations for the protection of human health.

The City purchased the current gas chromatograph in 1995 for approximately \$75,000.00. Agilent Technologies and Varian Instruments, the two suppliers of GCs and Gas Chromatographs with Mass Spectrometer (GC/MS) equipment suggest a useful life for their instruments of 15 years and a recommended replacement rate of 10 years. The current GC is 15 years old and is approaching the end of its useful life. In the last 5 years the GC has required numerous repairs and laboratory staff has noticed a significant decline in sensitivity and performance. Additionally, the EPA has recently published Method 524 (Analysis of Organic Compounds by GC/MS) which will replace the method currently run by the City for analysis of THMs, and will require the use of a GC/MS. The change in methods is expected to occur in 2012, and the process for re-certification through the Colorado Department of Public Health and Environment will take approximately one year.

Budget Implications

The 2010 CIP budget includes the replacement of the GC at the cost of \$120,000.00. Current price estimates for a GC/MS are in the range of \$110,000 to \$130,000 depending on manufacturer and equipment options.

The Laboratory Division currently runs a total of 160 THM and HAA samples for the City and an additional 32 samples per year for other municipalities. The savings that the City achieves by running samples in-house, including savings for shipping and expedited analysis is \$9,680 per year. An additional \$700 per year can be saved since the GC/MS will have the ability to run VOC analysis by EPA method 524, and a portion of the EPA required SOC analyses. The City also generates approximately \$800 per year in revenue by performing contract services for other municipalities. Under the new Stage 2 Disinfection Byproducts Regulation, the City will be required to monitor additional locations in the distribution system on a quarterly basis. This additional sampling and analysis capability is expected to save the City an additional \$360 per year when samples are run in-house using the GC/MS. Other savings that will be achieved through the purchase of a GC/MS and running samples in-house are the intangible costs associated with the use of a contract laboratory, including staff time to complete required paperwork, pack coolers, drive time, and fuel. Given the savings mentioned above including intangible costs, the expected payback rate, without inflation for this piece of equipment is approximately 10 years.

Testing To Be Performed By GC/MS Annually	Savings/Revenue Per Year
Laboratory In-house THM and HAA Testing Savings	\$9,680.00
Additional Testing Required by EPA Method 524 Savings	\$700.00
Additional Revenue Generated from Contract Services with other Municipalities	\$800.00
New Testing Required by EPA Stage Two Byproducts Regulation Savings	\$360.00
Total Savings/Revenue Per Year	\$11,540.00

¹ All dollar figures are based on 2010 prices

Additional benefits, both in cost and treatment, comes from having the capability to run these compounds in-house allowing staff to monitor the levels of THMs, HAAs, VOCs, and SOCs, in the distribution system without waiting for a contract laboratory's turn around time. Having real-time data will allow staff to make changes to plant operation in a timely manner, improving the product that the residents receive and protecting their health by reducing exposure to cancer causing compounds.

Staff Reference

David Willett, P.E., Director of Public Works
 Tamara Moon-Carlson, Lead Laboratory Analyst

dwillett@northglenn.org or 303.450.8783
tmoon@northglenn.org or 303.450.4070