



## STAFF REPORT ACTION REQUIRED

### Filter Underdrain Systems Supplier in Construction Tender Documents for F.J. Horgan Water Treatment Plant Expansion

<b>Date:</b>	April 25, 2008
<b>To:</b>	Public Works and Infrastructure Committee
<b>From:</b>	General Manager, Toronto Water Acting Director, Purchasing and Materials Management
<b>Ward:</b>	Scarborough East (Ward 44)
<b>Reference Number:</b>	P:\2008\Cluster B\TW\pw08008 (AFS#7637)

#### SUMMARY

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The purpose of this report is to seek authority to specify one supplier for the provision of low profile filter underdrain systems, installation supervision and field testing services in the construction tender documents for the F.J. Horgan Water Treatment Plant (WTP) Capacity Expansion to 800 ML/d.

#### RECOMMENDATIONS

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**The General Manager of Toronto Water and Acting Director of Purchasing and Materials Management recommend that:**

1. Anthratech Western Inc. (AWI) be specified as the sole supplier for the provision of thirteen (13) new low profile filter underdrain systems, including all materials, equipment, components, accessories and related services (primary installation supervision and field testing), in the construction tender documents for the F.J. Horgan WTP Capacity Expansion to 800 ML/D.

#### FINANCIAL IMPACT

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There is no direct financial impact as a result of this report. The cost of the filter underdrains will be formally accounted for during the competitive plant expansion construction tendering process.

It is estimated that the filter underdrains will cost \$6,000,000.00 net of GST for thirteen (13) underdrain systems, including installation, supervision and field testing services. The cash flow requirements for this project include \$4,500,000.00 net of GST in 2009 and \$1,500,000.00 net of GST in 2010.

The F.J. Horgan WTP Capacity Expansion project is included in the 2008-2012 Toronto Water Capital Plan under WBS Element CPW002-3. The total budget currently allocated for the project is \$185,950,000.00 net of GST.

The Deputy City Manager and Chief Financial Officer has reviewed this report and agrees with the financial impact information

## **ISSUE BACKGROUND**

The F.J. Horgan WTP was built in the mid 1970s and is one of four water treatment plants providing potable water to the City of Toronto and parts of the Region of York. It is a direct filtration plant having a rated capacity of 570 million litres per day (ML/d) and is currently equipped with eight dual media filters integral to its operation. As part of the Joint Optimization Study conducted in 2004 with the Region of York, it was established that the facility would need to increase its capacity to 800 ML/d by 2011 in order to meet the water demands of the increasing population.

CH2M HILL was engaged through a competitive process to provide the detailed design engineering and construction administration services for the facility expansion. As part of the expansion, five (5) additional dual media filters will be provided, bringing the total number of filters to thirteen. These new filters will be equipped with low profile underdrain systems to integrate with the existing hydraulic profile of the facility and will be operated in biological mode to improve the filtered water quality.

Underdrain systems are extremely critical components of the filtration process and are essential to water treatment filters as they are a permanent structure that supports filter media. They are fundamental and highly engineered structures for ensuring even water flow distribution in the filter and providing high quality filtered water. They also allow for proper water and air flow distribution during a filter backwash in order to ensure that the filters are well cleaned while minimizing filter media loss. Installation of an inadequate or faulty underdrain system would have serious consequences to plant production capability, water quality and result in, at the least, higher operating cost and, in the most severe situation, in contamination of the drinking water supply.

CH2M HILL determined that the filter underdrain systems in the existing filters could also be replaced with low profile underdrain systems to allow for biological filtration and result in improved filtered water quality while maintaining the existing hydraulic profile of the plant.

Recently, the catastrophic failure of a filter underdrain structure and deterioration of two other filters at the Toronto Island WTP resulted in the shutdown of that facility for two

months. This required a Sole Source Emergency Purchase to have the failed filter underdrains replaced with AWI filter underdrain systems. This purchase was processed by the Purchasing and Materials Management Division in accordance with the City's Purchasing By-law.

The existing eight (8) filter underdrain systems at the Horgan WTP are of similar age and type as those that failed at the Toronto Island WTP. This failure event led to the identification of the need to replace the filter underdrain systems in the eight existing filters at the Horgan WTP before a similar potentially catastrophic failure occurs.

## **COMMENTS**

A well engineered filter underdrain system is critical to the proper operation of filters and the production of safe drinking water. Filters are one of the most important physical barriers in removing dangerous microorganisms from the water supply. Significant plant production outages, treatment capacity reduction and compromised water quality could result in the event of faulty or inadequate underdrain system design or installation. For the F.J. Horgan WTP expansion, this could impact the City's ability to supply water to residents and fulfill its contractual obligations to supply water to the Region of York.

Based on the criticality of the filter underdrain systems, the City requested that CH2M HILL assess the recent performance of various suppliers and identify those capable of manufacturing a high quality end product for filters of similar sizes as those at the Horgan WTP. Three manufacturers were identified as having the capability of providing low profile filter underdrain systems. Following their analysis, CH2M HILL recommended that the low profile underdrain system be solely supplied by AWI based on their knowledge and expertise, proven track record, experience with similar sized filters and superior product. Selecting an alternative supplier was identified as a high level risk to the City. In addition to the above, CH2M HILL recommended that the underdrain systems installation supervision and field testing also be conducted by AWI rather than a general contractor due to AWI's hands-on field experience with their product.

The possible consequences associated with awarding a filter underdrain contract to an inferior and inexperienced filter underdrain manufacturer were highlighted recently at a water treatment plant in the Region of Durham. An underdrain system supplier, chosen through a low-bid competitive process, manufactured and installed an inferior system resulting in inefficient filter operation that affected the overall performance of the treatment plant. Modifications were required to the underdrain system after installation resulting in plant outages during peak water demand periods and, to date, the performance of the underdrains remains below specification. As a result of their experience, the Region of Durham has decided to sole source AWI, an alternate supplier, for all future underdrain system installations.

Other municipalities, such as the Region of Peel and the City of Ottawa, have also recognized the criticality of using a superior filter underdrain systems product with a proven track record in the production of safe drinking water. All have chosen to sole source the supply of this equipment to AWI.

The City has gained experience recently with AWI underdrain systems as they were installed at the Toronto Island WTP to replace the filter underdrains that had catastrophically failed. The equipment was delivered within schedule and budget. Furthermore, the underdrain systems that have been installed meet technical requirements, have improved filter performance and ultimately water quality.

The installation of the underdrain systems would be done by a general contractor who would be selected through a competitive tendering process while the installation of the work would be supervised and tested by an AWI manufacturer field representative.

PMMD has been involved in the review of initially prepared sole source documentation for the Horgan WTP underdrain systems and supports the approach.

## **CONTACTS**

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## **SIGNATURE**

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