

I. Objectives

The City of Dartmouth (hereinafter referred to as the City) is in need of a municipal water treatment plant with the capacity to produce 16 MIGD on an average day with 20 MIGD on a maximum day. Based on existing pre-design studies, the City is confident that it can deliver such a plant using a traditional call for tenders approach at a cost estimated herein. The City is, however, open to public-private partnerships and is willing to pursue such an approach if the private sector can demonstrate substantial benefits over the traditional approach.

The purpose of this RFQ is to receive statements from parties in the private sector interested in the opportunity to design, construct, finance and operate the proposed municipal water treatment plant, which is more particularly described herein. It is intended that this RFQ will identify qualified and experienced Proponents that have the ability to undertake the water treatment plant project.

Statements of Qualifications received in response to this RFQ will be used by the City and its Review Committee to:

- identify experienced and qualified Proponents that are interested in undertaking this work;
- determine the benefits of pursuing a public-private partnership approach in light of the "City approach" and associated cost estimates set out herein; and
- possibly qualify at least two, but not more than three, firms to submit a proposal provided they meet the selection criteria set out herein.

II. Project Background

The Dartmouth Water Utility ("DWU") serves the City and certain defined areas of Halifax County. Raw water is currently obtained from Lake Major and pumped to Topsail Lake from where it flows through to Lake Lamont. DWU withdraws the system supply from Lake Lamont and conditions and disinfects the water using chlorine, lime, corrosion control chemicals and fluoride on a continuous basis. The conditioned water is then either pumped directly into a portion of the 150 miles of distribution system or flows by gravity to the remainder of the system.

The current raw water source has a safe yield of 27.5 MIGD¹ which includes 23 MIGD from Lake Major and the remaining 4.5 MIGD from the tributary areas of Topsail Lake and Lake Lamont. The yield from Lake Major could be improved to 32 MIGD with the construction of a new dam and a new water intake.

In the 12-month period from April 1993 to March 1994, the DWU delivered a total volume of 18,900 million litres (11.4 MIGD) to the distribution system, 35.2% of which could be considered sold to

¹ Based on information contained in the Pre-design Study - Appendix C.

commercial and industrial customers; 35.4% to residential customers; 13.2% for municipal requirements and 16.2% of the water produced unaccounted for. That volume represents the demand of 25,400 metered water connections estimated to provide water for 101,200 persons in 1994.

The DWU has determined that despite future water conservation programs the proposed water treatment plant should have an initial average day capacity of 16 MIGD with a capability of treating a maximum throughput of at least 20 MIGD for periods not exceeding 72 hours.

The peak balancing requirements from storage are estimated at only 4.2 MIG by 2011 with an emergency storage requirement of 16.1 MIG for a total of 20.3 MIG, slightly in excess of existing storage volumes (see Table 1 below).

Table 1 - Available Storage

Mount Edward Road Reservoir	5.0 MIG
Wright Avenue Reservoir	5.0 MIG
Akerley Reservoir	8.3 MIG
TOTAL STORAGE	18.3 MIG

Raw water quality and proposed finished water quality for the new plant are set out in Appendix B. Raw water quality is dictated by the actual quality of water in Lake Major which is considered to supply 95% of the source water under the current scheme. In Appendix B, the concentration of the various elements in the Lake Major water supply are listed showing their range against Objective Concentrations.

Those conventional quality parameters that currently do not satisfy the Objective Concentrations and approach or exceed Maximum Acceptable Concentrations are stated in Table 2 below.

**Table 2 - Quality Parameters in Excess of Objective Concentrations
as Set Out in the Canadian Drinking Water Guidelines**

Parameter	Maximum Allowable Concentration	Objective Concentration	Raw Water Range	Lake Major Avg.
Colour (TCU)	15	<15	5 - 52	22
Manganese ($\mu\text{g/l}$)	0.05	<0.01	0.02 - 0.27	0.07
Turbidity (NTU)	5	<1	0.05 - 5	0.7
pH	6.5 - 8.5	-	4.3 - 6.5	4.8
Hardness ($\mu\text{g/l}$ as CaCO_3)	--	-	2.6 - 18.5	6.8
Alkalinity ($\mu\text{g/l}$ as CaCO_3)	-	-	<1 - 2.2	<1
Iron ($\mu\text{g/l}$)	0.3	<0.05	0.02 - 0.23	0.06

Bacteriologically there have been significant excesses of coliforms present in DWU's finished water causing the City to order residents to boil water in the summer of 1994. Canadian bacteriological standards for finished water are currently under review by the Committee of Deputy Ministers for Health. Under current Canadian Drinking Water Guidelines, it will be necessary that the new plant be designed to produce a finished water that will meet the key requirements as set out in Table 3.

Table 3 - Finished Water Key Requirements

Parameter	Requirement
Bacteriological	Total coliforms per 100 ml - no more than 1 positive sample per month. Fecal coliforms per 100 ml - 0 at all times
Trihalomethanes	Less than 100 $\mu\text{g/l}$ based on the average of 4 quarterly samples
Lead	Less than 0.01 mg/l at all times

The 1988 pre-design report prepared by UMA Engineering Ltd. (Appendix C) demonstrates a number of treatment alternatives that might be considered to meet the foregoing standards. Each

one has a different capital cost, a facilities replacement cost, as well as an operation and maintenance cost.

The Proponents will be permitted to use imaginative and ingenious approaches to treatment but certain limitations/requirements may be imposed in the context of approvals yet to be received.

At this time, the preferred site for the proposed plant, shown in Plan A, is a tract of land located near Riley Road between the Cherry Brook community and Lake Major. The site is outside the City's limits and is currently under negotiation for purchase. Its development will be controlled by the eventual health and environmental approvals and the results of a future geotechnical study of the site that will be made available by the City at the time that a Request for Proposal ("RFP") is issued.

III. The Preferred Arrangement Under a Public-Private Partnership Approach

The Proponent will be required to design, construct, finance, own and operate over a period of 20 years the new water treatment plant and all works constructed within the designated site limits plus the replacement of the Lake Major intake and pumping station and the construction of approximately 3,300 feet of 42-inch diameter raw water line to transmit raw water from the new pumping station to the new water treatment plant.

The new water treatment plant must provide satisfactorily treated water to DWU's system on a continuous basis at such rates, quantities and pressures as DWU may require, not to exceed a rate of 20 MIGD in any 72-hour period including the booster pumping rate.

The new pumping station will be sized to deliver 20 MIGD through four electrically driven pumping units with any three capable of delivering the station rating. The power requirements at the new pumping station, when pumping 20 MIGD through the existing 24-inch diameter raw water line as well as the new 42 inch diameter raw water line, are estimated at approximately 1,500 horsepower. Pumping quantities and pressures should be sufficient to fill the highest reservoir (Akerley reservoir at elevation 119.3 m).

The new water intake will extend into Lake Major to draw 16 feet of water over the pipe obvert from the normal lake level and will have a maximum capacity of 32 MIGD.

The Proponent will be responsible for:

- (a) Site excavation and development.
- (b) Provision of all structures needed to improve water quality to the standards indicated in Appendix B including:

pre-filtration treatment facilities including chemical storage and feeding systems;