

**TOWN OF ARNPRIOR
WALTER E. PRENTICE WATER FILTRATION PLANT
CLASS ENVIRONMENTAL ASSESSMENT**

PHASE 2 REPORT

EXECUTIVE SUMMARY

The Town of Arnprior (Town) has identified that the Arnprior Water Filtration Plant (WFP) is nearing the Certificate of Approval (C of A) compliance criteria for treated water production, and measures must be taken to ensure adequate capacity exists for future demands and growth in the community. The Town has a current population of 7,871 and a 20-year projected population of 10,626.

This Report fulfils the requirements of Phase 2 of the Municipal Engineers Association Class Environmental Assessment (Class EA) planning process. The Report is intended to provide additional information, review additional studies undertaken in Phase 2, identify and evaluate potential solutions to address the Problem Statement defined in Phase 1, and recommend a preferred solution to be carried forward to Phase 3. The Report also summarizes the public consultation undertaken during this Phase of the Class EA process.

Public Consultation Centre No. 1 was scheduled for June 28, 2006. Notices for the Consultation Centre were published in the local newspaper on June 16 and 23, 2006, posted on the Town website, and delivered to property owners within 150 m of the potential project area (the existing WFP site). Review agencies and identified project stakeholders were also notified of the Public Consultation Centre on June 20, 2006.

Additional Studies undertaken in Phase 2 are:

- Water Treatment Alternatives Memorandum: The Memorandum presented and discussed a number of alternatives to address the Problem Statement defined in Phase 1.
- Natural Environmental Assessment: A package of available information (e.g., past Reports and Drawings) was compiled and a desktop review of the areas affected by the alternative solutions was completed.
- Geotechnical Investigation: A package of available information was compiled, including a Geotechnical Investigation Report carried out by Golder Associates Limited (Golder) in July 2004, and a summary of the findings is provided. It is anticipated that the potential work areas will reflect the same geotechnical conditions summarized in the Golder Report.
- Stage 1 Archaeological Assessment: Background research and an in-the-field examination (Stage 1) was undertaken by an Archeological Consultant (Adams Heritage) in February 2006. The Assessment identified locations in and around the potential project area subject to Phase 2 archaeological testing prior to development, in addition to other recommendations.

- Designated Substance and Hazardous Material Survey: A package of available information was compiled, including a Survey completed by Greenough Environmental Consulting Inc. in May 2004. The Survey identified substances located in the main WFP and Raw Water Pumping Station and removals of some of the substances were conducted in the 2005 WFP Upgrades.
- Review of Raw Water Pumping Station: An underwater inspection of the raw water wet well and intake structures was completed on May 8, 2006 by O.D.S. Marine. The Inspection Report confirmed existing conditions.
- Treatment Technology Assessment: XCG Consultants Ltd. (XCG) completed a Treatment Technology Assessment Report dated May 26, 2006. The purpose of the Study was to review the efficacy and suitability of the current direct filtration process to meet future needs. Based on the Assessment, although being classified a 'Direct Filtration' plant in the Certificate of Approval, the plant is currently operating similar to a 'Conventional Filtration' treatment train.

The Phase 2 Report further defined the projected population and WFP production. For the purpose of this Study, a projected 20-year design period population of 11,000 persons will be used. This population allows for potential higher population densities and/or increases in industrial water demand. Consideration is also included for increases in maximum day and peak water demands due to potential climate changes. The projected WFP production is summarized in Table 5.

Table 5: Projected Flow Demands at the Arnprior WFP

Parameter	Value	Comment
Current Plant Rating	7,300 m ³ /day	Current population 7,871 persons. Note: Includes approximately 2,200 m ³ /day ICI flows.
Future Population	11,000 persons	Increase of 3,129 persons.
Average Day User Rate	450 L/cap/day	MOE Guidelines suggest an average user rate of 270 m ³ /day to 450 m ³ /day. Based on past experience, communities similar to the Town of Arnprior typically have average user rates of 450 m ³ /day or more.
Maximum Day Peaking Factor	2	MOE suggests that a peaking factor of 2.0 should be used for communities with a population range of 3,001 - 10,000 persons (MOE, 1985). The Town's projected population of 10,861 is close to the upper limit of the noted population range and, therefore, a peaking factor of 2 was selected.
Calculated Increased Average Day Demand	1,400 m ³ /day	Increased average day demand attributed to a population increase of 3,129 (450 L/cap/day).
Calculated Maximum Day Demand	2,800 m ³ /day	Increased maximum day demand attributed to a population increase of 3,129 (900 L/cap/day).
Process Flow	660 m ³ /day	Anticipated total backwash volume (one backwash a day for three filters)
WFP Re-Rating	10,760 m ³ /day	Total of current plant maximum day flow, calculated maximum day demand and process flow.
Projected WFP Re-rating	11,000 m³/day	Projected WFP flow to be carried forward in Class EA planning process. Note: Includes approximately 2,200 m³/day ICI flows.

In order to assess the possible alternatives in the Class EA process, consideration must be given to current trends in drinking water treatment and possible changes to drinking water standards or guidelines. Any upgrade to the WFP should include provision for foreseeable changes in standards. Future anticipated or possible drinking water standards that will be considered during this Class EA include:

- A new standard of 80 µg/L has been applied by the United States Environmental Protection Agency (USEPA) and has been proposed in Ontario.
- Health Canada has recently finalized a Guideline that states "treatment technologies in place should achieve at least a 3-log (99.9%) removal and/or inactivation of cysts and oocysts, unless sources water quality requires a greater log reduction and/or

inactivation" (XCG, 2006). The current guideline adopted by the Ontario Ministry of the Environment requires 2-log (99%) removal/inactivation of *Cryptosporidium* (XCG, 2006).

- A risk-based, multi-barrier approach to assessing the source water and treatment technologies should be undertaken.

The Options considered for initial screening as part of the Class EA process are:

- Option 1: 'Do Nothing'
- Option 2A: Reduce Water Demand - Distribution System Upgrades
- Option 2B: Reduce Water Demand - Water Use Reduction Programs
- Option 3: Obtain Water from Another Source - Connecting to Existing System
- Option 4A: Expand/Upgrade Existing Water Filtration Plant - Direct Filtration Process
- Option 4B: Expand/Upgrade Existing Water Filtration Plant - Additional Treatment Technology
- Option 4C: Expand/Upgrade Existing Water Filtration Plant - Alternative Treatment Technology
- Option 5: Replace Existing Filtration Plant with New Water Treatment Plant
- Option 6: Supplement or Replace Existing Water Filtration Plant with Groundwater Supply/Treatment System

Based on a review the Option feasibility, ability to address the Problem Statement, advantages and disadvantages, Options 4B and 4C were retained for detailed review. Potential environmental impact in several subject areas has been examined for both these remaining Options. Both remaining Options have similar footprints for the expansion and upgrade of the WFP.

Table 17 summarizes the number of environmental impacts at each level for each remaining Option. In general, while neither Option has a major negative impact, the Option that includes an additional treatment technology (i.e., Option 4B) appears to be the most suitable solution, based on the number of benefits and fewest negative impacts. Although Option 4C is a feasible solution, the capital and operating costs are expected to be higher. Construction of a conventional filtration plant per Option 4B does not preclude future long-term conversion of existing filters to membrane filtration.

Table 17: Summary of the Number of Environmental Impacts

Impact	Option 4B Additional Treatment Technology	Option 4C Alternative Treatment Technology
▣ Potential for Small Negative or Small Positive Impacts	1	1
" No Impacts Anticipated	6	6
✗ Small Negative Impact	5	5
✗ Moderate Negative Impact	0	0
✗ Strong Negative Impact	0	0
✓ Small Positive Impact	0	0
✓ Moderate Positive Impact	0	1
✓ Moderate - Strong Positive Impact	1	0
✓ Strong Positive Impact	2	2

Phase 3 of this Class EA planning process will include the following tasks:

- Identify potential alternative design concepts for the treatment system for the preferred solution identified in Phase 2.
- Confirm and expand upon project criteria and constraints (e.g., impacts on Residual Handling at the WFP and WPCP).
- Review the financial implications of the alternative design concepts.
- Investigate impacts on residuals handling of the alternative design concepts at both the WFP and WPCP.
- Evaluate alternative designs and identify recommended design.
- Conduct a public information session.
- Select a preferred design concept.
- Review the environmental significance and confirm choice of Class EA project schedule.
- Preliminary finalization of preferred design concept.