

- DRAFT -

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

PHASE 3 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 3 of the Municipal Engineers Association Class Environmental Assessment (Class EA) planning process. Phase 3 of the Class EA process is intended to evaluate possible design concepts that could be implemented to achieve the preferred solution recommended in Phase 2 of the Class EA. This Phase includes the preparation of a more detailed and specific inventory of natural, social and economic environments that could be affected positively or negatively by the design alternatives. Each design alternative is then evaluated with respect to the proposed inventory. The Report also summarizes the public consultation undertaken during Phase 2 of the Class EA process.

Public Consultation Centre No. 2 was scheduled for October 17, 2006. Notices for the Consultation Centre were published in the local newspaper on October 6 and 13, 2006, posted on the Town website, and delivered to property owners within 120 m of the potential project area (the existing WFP site). Review agencies and identified project stakeholders were also notified of the Public Consultation Centre.

An initial evaluation was undertaken for three pretreatment (enhanced coagulation / sedimentation) options, including (numbering is carried forward from Phase 2):

1. Option 4B-1: Conventional Clarification consisting of flash mixing, flocculation, and settling in a conventional clarifier with mechanical sludge collection to remove residuals. Variations of the conventional treatment include high rate clarification, as provided by tube or plate settlers, or proprietary processes such as the Degremont Ultrapulsator, or Infilco-Degremont Accelator.
2. Option 4B-2: Dissolved Air Flotation (DAF) consisting of flash mixing, flocculation, and clarification. Clarification is achieved by injecting high pressure air into a pressurized clarified water recirculation stream (approximately 10 percent of the production rate). The micro-bubbles formed by the supersaturated high pressure stream rise to the surface of the clarifier and "attach" to suspended floc. Residuals are removed from the surface of the clarifier.

3. Option 4B-3: Ballasted Flocculation (BF) consisting of flash mixing, flocculation, and clarification. "Microsand" is added in parallel with polymer at the flocculation stage. Floc attaches to the polymer coated Microsand, which acts as a ballast to enhance settling in the clarifier. Residuals are recirculated and separated from the Microsand in a hydrocyclone.

Phase 3 also included a review of the following additional upgrades that would be required at the WFP due to the increased treatment capacity:

- Filtration Expansion and Upgrades: It is recommended that a third filter be constructed to address reduced capacity due to backwashing and no backup if the in-service filter failed.
- Raw Water Pumping Station: The condition of the Raw Water Pumping Station presents some risk to the operators and the reliability of the supply of water to the WFP. The upgrades include retention of the existing wet well and intake and construction of a new slab on grade building to increase serviceability, security and reliability.
- Other Upgrades (Opportunities): During the Design Phase for the 2005 Upgrades Project, a Condition Assessment of the existing WFP systems and infrastructure was conducted. Many of the proposed upgrades and modifications were driven by the age and obsolescence of the original 1967 equipment. Some of the recommendations were implemented in the 2005 project, however, due to budget constraints, many were not and are addressed within this Class EA.

Table 3 provides a summary of the capital costs associated with the design alternatives considered in Phase 3 of the Class EA.

Table 3: Summary of Costs

ITEM	OPTION 4B-1 Conventional Clarification	OPTION 4B-2 Dissolved Air Flotation	OPTION 4B-3 Ballasted Flocculation
Pretreatment	\$2,360,000	\$2,460,000	\$2,190,000
Filter Expansion and Upgrades	\$1,450,000	\$1,450,000	\$1,450,000
Raw Water Pumping Station	\$440,000	\$440,000	\$440,000
Other Upgrades (Opportunities)	\$510,000	\$510,000	\$510,000
Sub Total	\$4,760,000	\$4,860,000	\$4,590,000
Allowances ¹	\$2,210,000	\$2,260,000	\$2,130,000
Construction Start 2008 (3%)	\$209,000	\$214,000	\$202,000
TOTAL	\$7,197,000	\$7,334,000	\$6,922,000

¹Includes Construction Phasing (1.5%), Commissioning (1.5%), Permits (1%), General Contractor Fees (12.5%), Engineering and Contingency (30%)

The potential effects on the environment for each of the alternative design concepts and additional upgrades were reviewed. The review of potential effects illustrated that the relative differences between the three design concept alternatives with respect to the environment are not significant. The greatest difference may be with respect to the economic impact to the residents of the Town.

A detailed evaluation of each design alternative was undertaken. Parameters considered in the Phase 3 evaluation included:

- Proprietary equipment costs
- Construction costs
- Operating costs
- Operating complexity
- Expected performance
- Reference installations and proven performance
- Reliability/Redundancy
- Water quality risk reduction
- Residuals treatment requirements
- Relative impact with respect to applicable Environmental Inventory
- Use/Reuse of existing infrastructure
- Provision for future expansion / Ability to meet potential future water quality standards
- LEED Principles (Sustainability, Water Efficiency, Energy Efficiency, Conservation of Resources, Indoor Environment).

Based on the outcome of the evaluation, it was recommended that Option 4B-1 (Conventional Clarification) not be carried forward for further consideration. Although comparable to the capital costs of the other two design alternatives, this alternative is more sensitive to changing raw water quality, sensitive to changing market conditions, and raw material costs, a poor use of available space, and uses significantly more resources to construct. Conventional Clarification is not common in new treatment plants of this capacity. For example, existing Conventional Clarification was removed in upgrade projects for Renfrew and Deep River.

Based on the results of Phase 3, the following actions are recommended:

- Options 4B-2 and 4B-3 be carried forward to Phases 4 and 5 and be evaluated further through a formal preselection process and potential pilot plant operation
- Obtain and evaluate Public and Agency comments on Phase 3
- Proceed to Phase 4 (Prepare Environmental Study Report).

Phase 4 of this Class EA planning process will include finalizing the preferred design alternative(s) (based on comments received during Phase 3) and documenting Phases 1 through 3 within an Environmental Study Report (ESR). The ESR will be filed for review by Public, Review Agencies and Project Stakeholders. It is noted that Phase 5 includes the design and construction of the final design alternative and obtaining the required approvals and permits.