

EXECUTIVE SUMMARY

The Town of Placentia is presently comprised of the 1994 amalgamated communities of Townside, Jerseyside, Ferndale, Freshwater, Argentia, Southeast, Bond's Path and Dunville with an estimated population of 4,600 people. The 1994 amalgamation has resulted in some 'regional' issues which must be resolved and the most recent issue pertains to the potable water supply. The recent increase in industrial activity at the former Argentia military base and the economic spin-off from the Long Harbour project has increased the concerns regarding the quality and the quantity of potable water available to the Placentia region.

The Town of Placentia has recognized the need to address the potential water quality and quantity issues associated with their 3 existing water supplies for some time now and the economic outlook for the region has made this initiative a priority. In January 2014, the Town of Placentia engaged Progressive Engineering and Consulting Inc (PEC) to investigate the potential for a common water supply to serve all of the amalgamated communities and the potential options for a water treatment plant. The study would have to encompass the distribution system, watershed analysis, existing and future demand, leakage, pressure zones, water storage, water quality, infrastructure upgrades and an overview of the modern day water treatment technologies.

A thorough review of the Clarkes Pond, Larkins Pond and Wyses Pond water supplies was conducted to determine the best candidate to serve as a regional water supply. The Clarkes Pond water supply has the largest watershed and the best water quality. The Clarkes Pond watershed has the reserve from Gull Pond and Barron Pond which makes it a much larger supply than Wyses Pond and Larkins Pond. Larkins Pond can act as an emergency supply to Clarkes Pond by pumping Larkins Pond water back up into Clarkes Pond by means of a simplistic, portable pumping system if an extreme dry weather period should occur. The Clarkes Pond water supply is also centrally located relative to the service region and the existing pumphouse is in very good condition.

The former Argentia military base is presently being rejuvenated with heavy industrial development with such tenants as Vale, Canadian Coast Guard, Marine Atlantic, Husky Energy, Metal World, Research and Development Corporation and so on. The Argentia military base originally had a domestic fresh water system supplied from Argentia Pond as well as a sea water fire system from Argentia Harbour. The fire water system had an independent pipe network and a series of underground concrete storage tanks and pumps to delivery fire flows which is still in place reported to be in good condition. The fire water system should be reactivated by connecting it to Argentia Pond as a critical component of this regional water supply initiative.

For these reasons, the Clarkes Pond water supply was selected as the proposed regional water supply for the amalgamated region of Placentia.

The critical water system infrastructure works required to connect the Clarkes Pond watersheds and all of the existing water distribution systems together so that they function in unison as a single water supply were assessed in detail including the requirement for a separate fire water system for Argentia. Many of the work items proposed as part of the Clarkes Pond Regional Water Supply (CPRWS) benefit the operations of the town's existing water system and can be implemented several years before a treatment plant is constructed. The Town of Placentia has already made some of these projects, such as the replacement of the Freshwater water distribution system and the Castle Hill water storage reservoir, a priority and funding for these initiatives were secured earlier this year.

Whenever a municipality considers implementing a water treatment or wastewater treatment system it is important that they develop a basic understanding of what an initiative of this nature entails. The approach taken in the Regional Water Supply Study is to educate the Town of Placentia on the evolution of water treatment followed by a general overview of the technologies that are available today, the pros and cons of each technology, some commentary on the technologies that may be most suitable to this application and a cost estimate (+/- 25%) for a complete water treatment system.

In order to develop a fully functional regional water supply, several infrastructure upgrades must be implemented and some new infrastructure must be constructed. The total cost of the new infrastructure and upgrades required prior to constructing a water treatment plant is \$15,971,150 which can be implemented in a phased approach. Water treatment requires a significant financial commitment for the town in terms of capital, operating and maintenance costs and the anticipated cost of the water treatment plant is expected to be in the range of \$12,500,000 (+/- 20%) for a total water treatment initiative cost of \$28,471,150. The annual operating and maintenance costs for a water treatment plant of this magnitude could be in the range of \$300,000/year.

With that being said, the attached study indicates that Clarkes Pond is a viable regional water supply provided that the reserves of Gull Pond and Barron Pond are connected to Clarkes Pond and Argentia Pond is reactivated. The reserve of Larkins Pond can also be incorporated into the regional water system as an emergency reserve in the event of an extreme dry weather period.

The review of the modern day water treatment technologies encompassed a total of 9 process treatment technologies and 5 disinfection technologies which were reduced to the three most probable water treatment process streams. All three streams incorporated membrane filtration, ultra-violet disinfection and mixed oxidant oxidation with the two processes of dissolved air flotation and coagulation/flocculation blended into two of the three process streams.