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Corporation of the Town of Carleton Place
Water Treatment Plant
Capacity Expansion Assessment

Final Version

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1.0 INTRODUCTION

This Report summarizes the results of a broad based study of the Town of Carleton Place Water Treatment Plant (WTP) which was undertaken to assess future capacity expansion requirements related to the growth of the Town. This assessment included an in-depth review of the historical WTP flows; a projection of future water demands that the plant will need to meet over certain time periods; an estimate of when the expansion project likely needs to be initiated, and; the identification of the required WTP infrastructure upgrades and additional water storage needs and associated capital costs necessary for the expansion. It should be noted that the information presented in this Report is limited to the WTP and the distribution system storage (i.e., the elevated storage tank) and does not include an assessment of any of the linear infrastructure (i.e., the watermain distribution system).

The following are some of the broad assumptions that have been made as part of this assessment:

1. The Town will initiate a Class Environmental Assessment (Class EA) process (and any other required planning steps) for an expansion of the WTP once approximately 90% of the current rated capacity is attained.
2. A period of approximately 5-years will be required from the start of the Class EA process to the time of commissioning of the expanded WTP.
3. Once the upgrades are completed, the WTP will be able to supply the Town's treated water demand for 20 years thereafter.

It should be noted that other assumptions are summarized in Section 6.0 of this Report.

2.0 HISTORICAL FLOW ANALYSIS

Prior to initiation of this study, the Town of Carleton Place (the Town) developed a database consisting of minimum, average and maximum daily flows as measured at the WTP between 1998 and 2017. The flows from this data are identified as treated water (TW) flows and correspond to the daily volumes of water measured at the common discharge header of the WTP's high lift pumps. These flows generally correspond to the daily water demand within the Town of Carleton Place.

Figure 1 at the next page illustrates the treated water flows at the WTP from 1998 to 2017. Figure 1 presents three (3) lines - the minimum day flow recorded for each year, the maximum day flow recorded for each year and the mean daily flow recorded for each year.

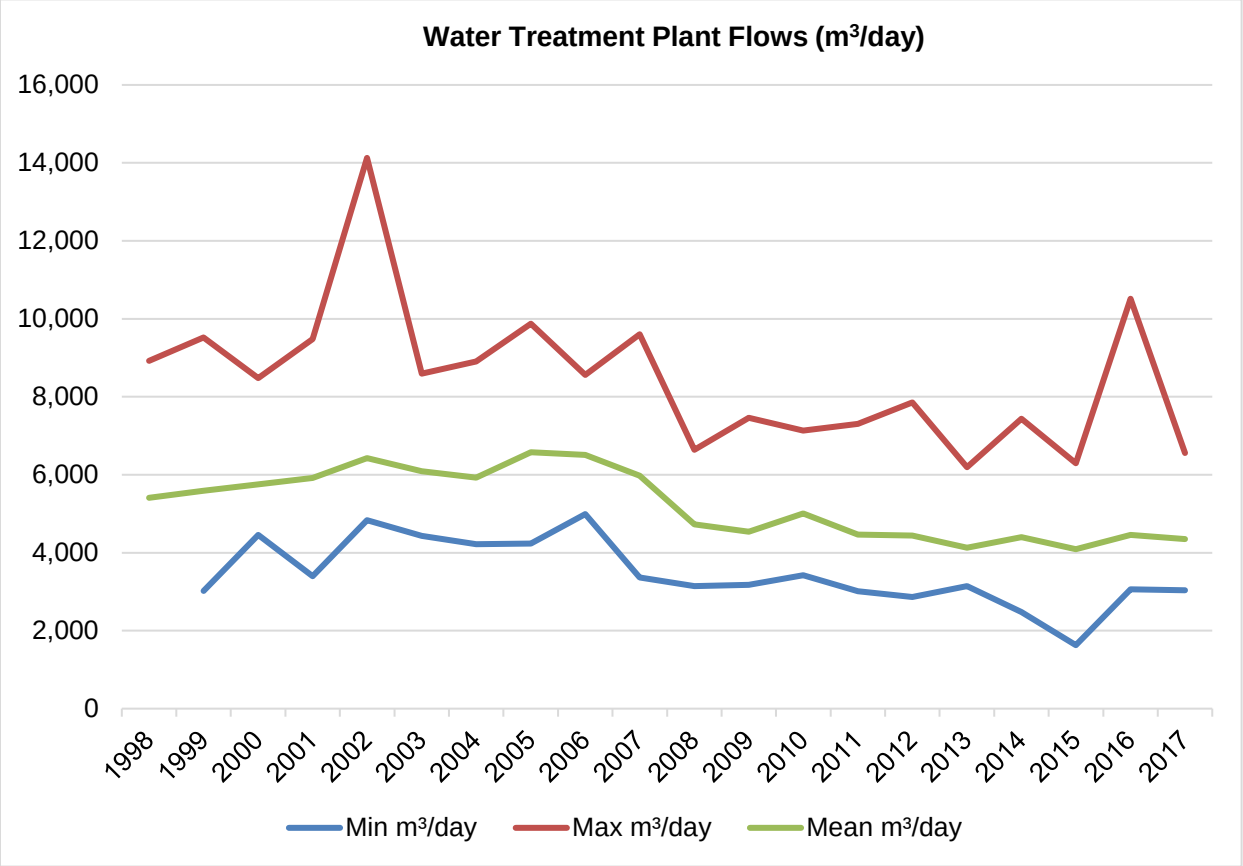


Figure 1: WTP Flows (m³/d) between 1998 and 2017

The minimum daily flow is considered the base flow demand for the system and represents the domestic usage plus the minimum leakage. There would generally not be any lawn watering or other extra usage on the minimum flow day of the year. The minimum daily flow for the years 1999 to 2007 averaged 4,106 m³/d whereas the minimum daily flow for the years 2008 to 2017 averaged 2,896 m³/d. Even though the population of the Town increased significantly between 1999 and 2017, the minimum flow (or the base flow demand) decreased by 1,210 m³/d. Based on discussions with the Town, the reasoning for this decrease is that in 2007, the Town repaired two (2) large watermain leaks in the system which had a significant impact on the base flow demand.

The mean (average) daily flow is the total volume of water produced during the year divided by 365 days of the year to show the flow as a daily flow. The mean flow for the years 1998 to 2007 averaged 6,019 m³/d whereas the mean flow for the years 2008 to 2017 averaged 4,460 m³/d. Even though the population of the Town increased significantly between 1998 and 2017, the average daily flow for the system decreased by 1,559 m³/d. Again, as indicated previously, the watermain leaks repaired in 2007 explain a large part of this decrease in demand.

The most critical flow data for the WTP is the maximum daily flow. Figure 1 shows that the maximum day flows for the years 2008 to 2017 are generally less than the maximum day flows

for the years 1998 to 2007. It is important to note that the maximum day flow shows a peak in 2002 when the maximum day flow was reported to be 14,128 m³/d which exceeds the WTP's rated flow capacity of 12,000 m³/d. However, in 2002, the WTP was subjected to a Post-Construction Stress Test and the WTP was purposely operated at flows above the rated capacity to test effectiveness of the various components of the WTP at higher flows than the rated capacity. The demand flows during the stress test were created by opening hydrants and are not representative of the actual user demand for water supply. Discounting the flows during the stress test, the maximum day flow for 2002 was 9,285 m³/d. Figure 1 also shows a maximum day flow peak in 2016 of 10,512 m³/d. However, the peak of 10,512 m³/d recorded in August 2016 does not follow this pattern suggesting that there was some special event or a problem. It was indeed determined that during the month of August 2016, the water tower was filled and drained for operational reasons causing additional demand at the water treatment plant. Discounting this unusual peak, the maximum day flow for 2016 was 7,946 m³/d. The maximum day flow for the years 1998 to 2007 averaged 9,122 m³/d and the maximum day flow for the years 2008 to 2017 averaged 7,081 m³/d. Even though the population of the Town increased significantly between 1998 and 2017, the maximum day flow for the system decreased by 2,041 m³/d. This again is explained by the two (2) significant watermain leaks that were repaired in 2007.

The decrease in water demand between the 1998-2007 and 2008-2017 periods demonstrates the importance of closely monitoring flows and overall system demand to assess if further leak detection and investigation is required in the future to address potential problems. The base flow is expected to increase with population growth but if the base flow increases more than the demand from the new users, leaks in the system may have developed and should be investigated and repaired. The Town is committed to monitor the base flow in the future.

Figure 2 below illustrates the daily flows at the WTP for year 2016. The figure illustrates how the community's demand for water from the WTP relates to dry weather and rainfall. Generally, the water demand will increase gradually during a period of dry weather and the flows will decline over a few days after a rainfall. The peak of late May 2016 is a good example.

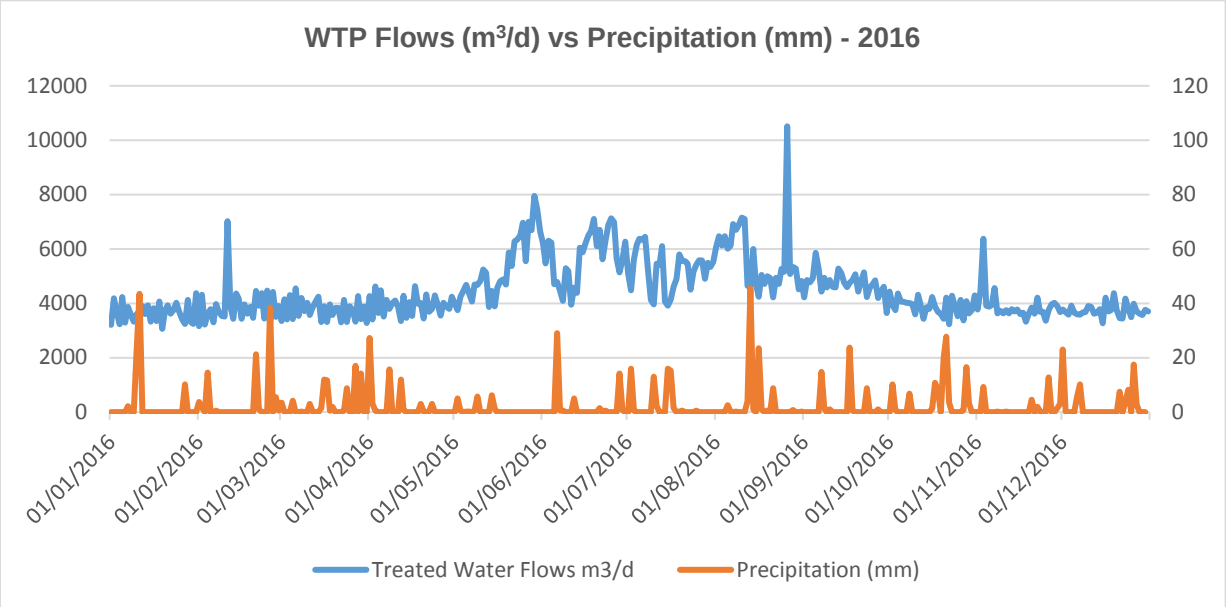


Figure 2: WTP Flows (m^3/d) vs Precipitation for Year 2016

Figure 3 below illustrates the WTP flows between 1998 and 2017 with the year 2002 and 2016 maximum daily flows corrected to take into consideration the unusual situations that had caused the additional water demands.

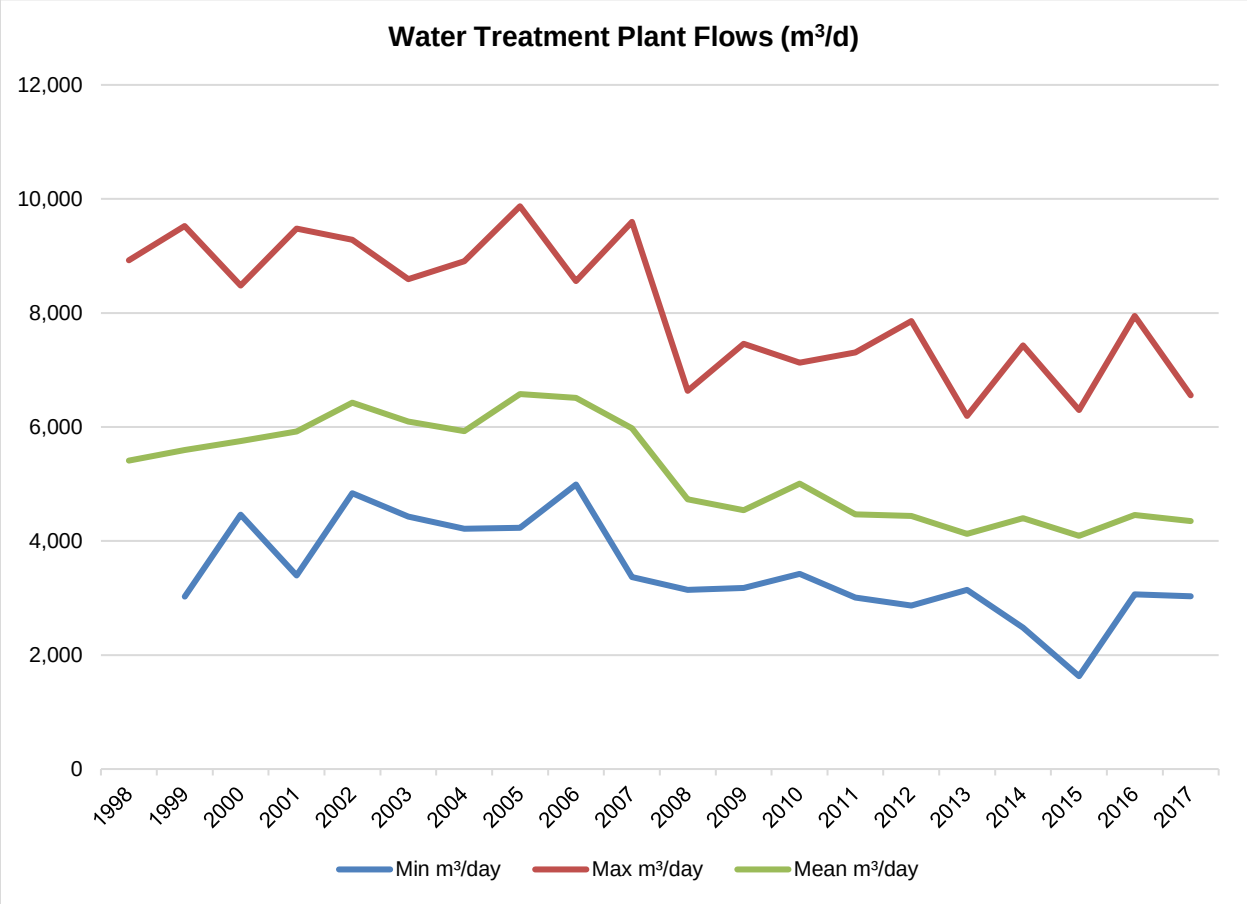


Figure 3: WTP Flows (m^3/d) between 1998 and 2017 (modified)

Table 1 below and Figure 4 at the next page below show the WTP flows divided by the number of households for the years 1998 to 2017.

Table 1: Unit Flows per Day per Household (minimum, maximum and average)1998 and 2017

Year	Minimum Flow (m^3/day/unit)	Maximum Flow (m^3/day/unit)	Average Flow (m^3/day/unit)
1998	Not available	2.51	1.52
1999	0.84	2.66	1.56
2000	1.24	2.35	1.60
2001	0.93	2.59	1.62
2002	1.29	2.53	1.72
2003	1.16	2.25	1.59
2004	1.09	2.30	1.53
2005	1.08	2.51	1.67
2006	1.25	2.15	1.63
2007	0.84	2.40	1.49
2008	0.78	1.64	1.17
2009	0.77	1.81	1.04
2010	0.82	1.70	1.19
2011	0.71	1.72	1.05
2012	0.67	1.84	1.04
2013	0.72	1.43	0.95
2014	0.56	1.68	1.00
2015	0.37	1.41	0.92
2016	0.67	1.78	0.98
2017	0.64	1.38	0.92

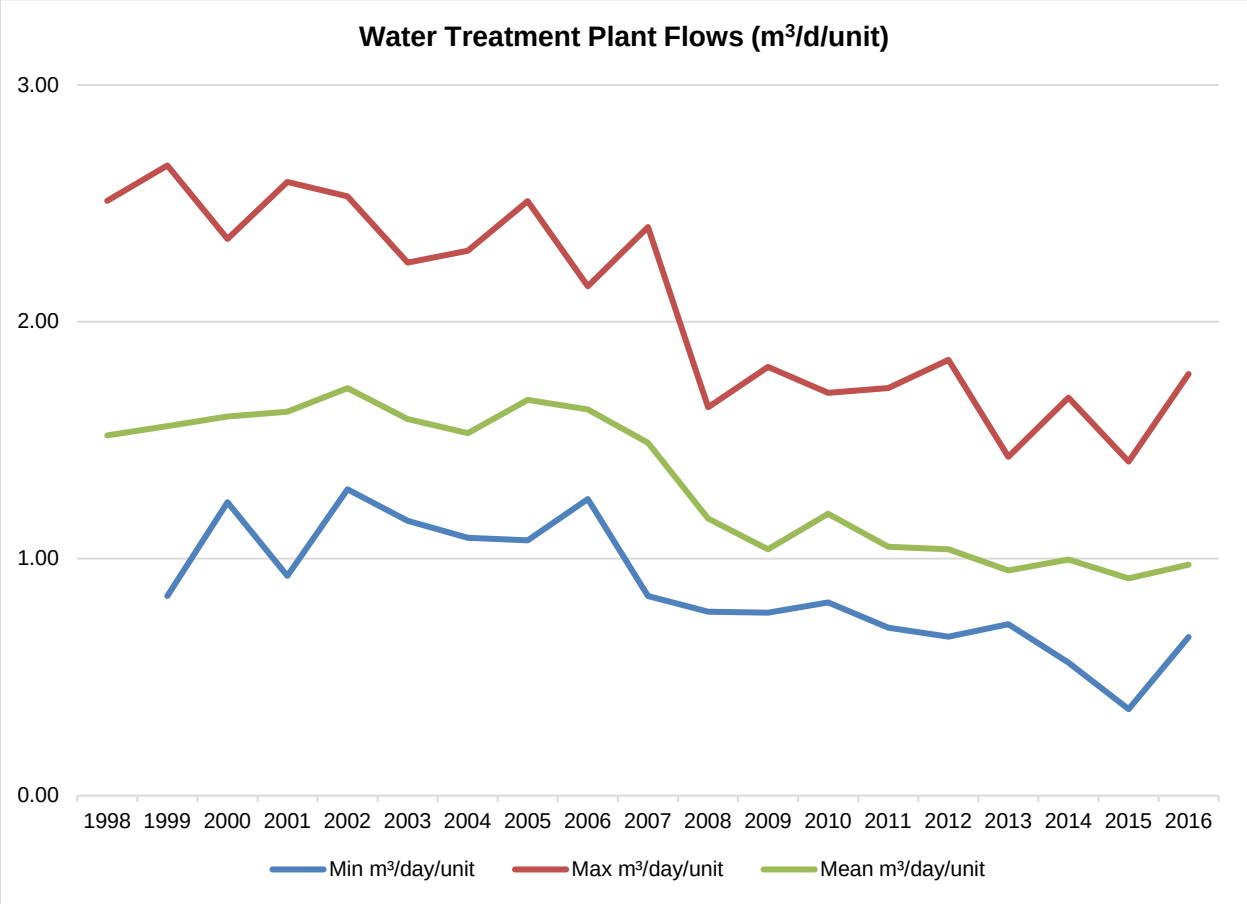


Figure 4: WTP Flows (m³/d/unit) between 1998 and 2016

From Table 1, means of the minimum, average and maximum flows over different periods of time were calculated and the results are summarized in Table 2 below:

Table 2: Average Unit Flows per Day per Household for Different Time Periods

Period	Minimum flow (m³/day/unit)	Maximum flow (m³/day/unit)	Average flow (m³/day/unit)
1998-2017 (20 years)	0.864	2.032	1.309
2008-2017 (10 years)	0.670	1.639	1.024
2013-2017 (5 years)	0.592	1.536	0.951

Figure 4 and Table 1 and 2 clearly illustrate the decrease in flow per household following the watermain repairs in 2007.

Table 2 indicate that from 2008 to 2017, the average unit flow per household was 1.024 m³/d. The analysis also shows that maximum day flow between 2008 and 2017 ranged from 1.38 (recorded in 2017) to 1.84 m³/d/unit (recorded in 2012). Although these unit flows are calculated by dividing the maximum daily flows (including Industrial Commercial Institutional or ICI) by the number of households, it has been assumed that ICI growth will stay at its current proportion relative to residential growth and that the unit flow per household represents total treated water demand throughout the system. To be conservative, when planning for the future, it was assumed that a unit flow of 1.84 m³/d/unit would be used to calculate future maximum day demands (MDDs).

Table 3 below provides a summary of the average and maximum daily flows at the WTP from year 2008 to 2017 and summarizes the percentage of the current rated capacity of the WTP for the maximum flows.

Table 3: Average and Maximum Flows at the WTP from Year 2008 to 2017

Year	Average Flow m³/d	Maximum Flow m³/d	% of the Plant Rated Capacity (maximum flow)
2008	4,728	6,636	55.3%
2009	4,542	7,461	62.2%
2010	5,006	7,129	59.4%
2011	4,469	7,305	60.9%
2012	4,441	7,855	65.5%
2013	4,124	6,194	51.6%
2014	4,397	7,433	61.9%
2015	4,090	6,299	52.5%
2016	4,455	7,946	66.2%
2017	4,351	6,556	54.6%

Table No 4 below presents the 5 year and 10 year averages for the average and maximum flows at the WTP.

Table 4: 5 Year and 10 Year Average for the Average and Maximum Flows at the WTP

Period	Average Flow (m^3/d)	Maximum flow (m^3/d)
Average for period between 2013 and 2017 (5 year-period)	4,283	6,886
Average for period between 2008 and 2017 (10 year-period)	4,460	7,081

The analysis of the available data has shown that the maximum treated water daily demand for the period between 2008 and 2017 was 7,946 m^3/d. This flow corresponds to the daily treated water demand which occurred on May 29, 2016. Large daily treated water flows were also recorded during the summer of 2016 as extreme drought conditions were encountered. It is logical to assume that these conditions will occur again in the future. In determining the distribution system Maximum Day Demand (MDD), the inventory of the treated water in the elevated water tower and in the clearwell at the WTP also needs to be considered. Under some circumstances, the inventory of treated water at these two (2) locations can show a deficit from day to day and

this deficit must be accounted for in calculations of the distribution system MDD. The proposed expansion will include additional equalization storage that will provide additional operational flexibility during maximum day demands. A maximum daily treated water value of 8,000 m^3/d has been used as the starting point for the year 2017 to calculate future maximum daily treated water demands and establish the timing for the plant expansion.

3.0 WTP EXISTING AND PROPOSED CAPACITY

3.1 Existing Capacity of the WTP

The current "rated" treated water capacity of the WTP is 12 MLD as per the original MOECC Certificate of Approval (now Drinking Water Permit). However, based on a review of available guidelines, historical operating information and changes to drinking water legislation since the plant was originally commissioned in the mid-1980s, it is possible that the plant cannot consistently attain 12 MLD treated water production primarily due to constraints with the existing filters as explained further below.

The existing filtration system consists of three (3) identical dual-cell filters (for a total of six separate filtration compartments). Each of the dual-cell filter units has a diameter of 4.57 m and a corresponding filtration surface area of 16.4 m^2 (i.e., for two filtration compartments). Each of the two compartment filter units has a common backwash tank located above. According to some historical documentation, the original filtration rate for the filters was 12 m^3/m^2/hour, however, that was based on a filtered water turbidity requirement at that time of 1 NTU. Plants are now required to achieve filtered water turbidities of ≤0.3 NTU 95% of the time in any given month to achieve appropriate log removal credits for organisms such as giardia and viruses. In order to achieve this it has been shown that lower filtration rates are now required. Under these conditions, a maximum filtration rate of 10 m^3/m^2/hour (for this type of filter) is generally acceptable and this corresponds to a maximum capacity of 164 m^3/hour per dual-cell or 11,808 m^3 over a 24 hour period. Assuming that each filter is backwashed one (1) time per day at a backwash cycle duration of 60 minutes per backwash under predicted worst case scenario conditions (including time for filter-to-waste), each filter would be operational for 23 hours. Therefore, the net filtration capacity at a 10 m^3/m^2/hour filtration rate is equal to 164 m^3/h x 3 filters x 23 hours = 11,316 m^3/d. In addition, each filter cell backwash cycle utilizes an estimated filtered water volume of 15.7 m^3. The total backwash water use per day under predicated worst case conditions is therefore estimated to be 94 m^3 (i.e., 15.7 m^3 x 6 cells x 1 backwash per cell). Therefore, the net capacity of the existing filters is estimated to be 11,316 m^3/d minus 94 m^3 = 11,222 m^3/d. This volume is the estimated net maximum daily volume produced by the filtration system that can be conveyed to the clear well over a 24 hour day based on the above-noted assumptions. This volume should be considered to be a more realistic estimate of what would be available to supply the Town's water demand under current conditions. It should be noted that additional refinement of this capacity assessment can be undertaken at the time of a Class EA, however, for the purposes of this study it is considered to be reasonably conservative.

3.2 Population Growth

Since the 1980s, the Town has experienced strong growth and this growth can be tracked several ways. The Municipal Property Assessment Corporation (MPAC) produces the tax roll for the Town annually which identifies the number of households within the Town. The MPAC data shows that the number of households in 1990 was 2,833 and that this increased an average of 63 households each year to total 4,462 households in 2016. The Town's growth can also be tracked by building permits. The building permit records show that the permits issued for new households each year varied from 23 in 1991 to 142 in 2008 with an average of 76 households per year.

Lanark County has also been studying growth within the County and produced draft population projections for Carleton Place. For the next 25 years, the County's study predicts the Town will grow by 310 people (135 households) per year with a low growth scenario and 414 people (180 households) per year with a high growth scenario.

Based on information provided by the Town, a predicted growth rate of 150 households per year has been assumed. It is important to note that the timing for an "actual" expansion at the WTP will be triggered by flows which are determined by growth rather than a fixed calendar year. If growth occurs faster or slower than the anticipated 150 households per year, then the timing for the expansion can be adjusted accordingly.

3.3 Proposed Future Capacity of the WTP

A WTP expansion to accommodate a 20 year period from the time when the plant's current working capacity has been reached will require an estimated additional 5,520 m^3/day of capacity (i.e., 150 households x 1.84 m^3/d/unit x 20 years = 5,520 m^3/d). Therefore, as a minimum, a plant with a "treated water" rated capacity of 11.222 MLD + 5.52 MLD = 16.742 MLD would be required. For the purposes of this Report it is suggested that the plant would be expanded to provide a treated water capacity of 17 MLD. This will require various upgrades to certain components within the plant in order to accommodate the total required future treated water flow capacity. For example, additional filtration capacity will be needed as demonstrated above.

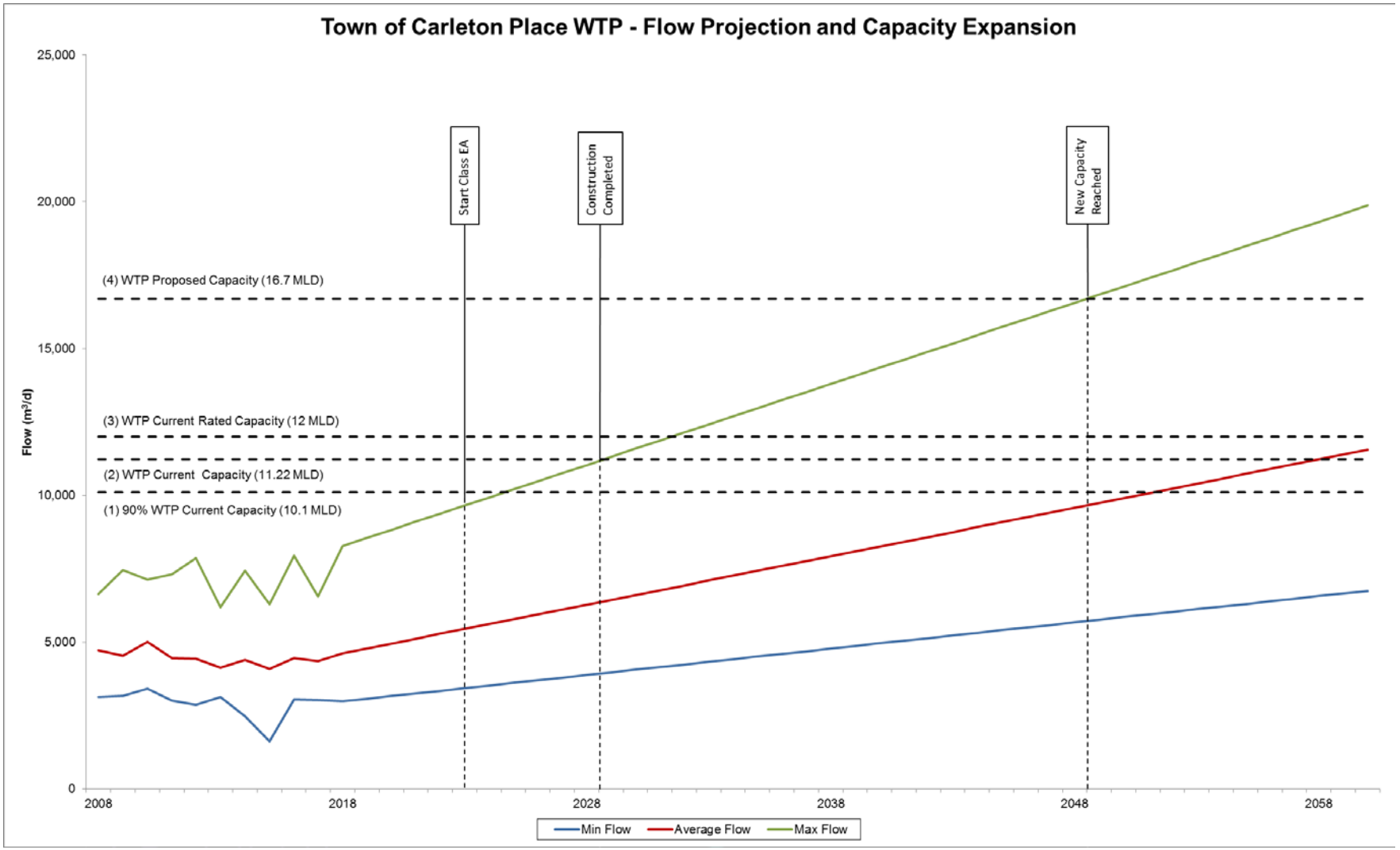
In order to evaluate what filtered water throughput would be needed, additional filtration capacity was analyzed as explained hereafter. An additional filtration surface of 27 m^2 would provide an additional filtration capacity of 6,210 m^3/d at a maximum filtration rate of 10 m/h. This is assuming a maximum operational period of 23 hours (similar to what was assumed for the existing filters) to allow for one (1) backwash per day under worst case scenario conditions. Assuming a period of 20 minutes for backwashing at a rate of 40 m/h, the required backwash water volume is calculated to be 360 m^3. The net capacity of the new filter would therefore be 6,210 m^3/d minus 360 m^3 = 5,850 m^3/d. If this is added to the estimate of what the plant is currently capable of producing the total flow would be approximately 17 MLD (5,850 + 11,222). Therefore, with 27 m^2 of additional filtration area, the net daily filtered water volume that could be produced by the plant would be 17 MLD thereby meeting the required water demand by the Town.

It should be noted that the actual raw water throughput of the plant (including the Permit to Take Water) will need to be for more than 17 MLD since there is a certain percentage of water "wasted" through the treatment processes as part of backwash, filter-to-waste, Actiflo® process and other miscellaneous uses. In order to ensure an appropriate level of conservativeness, it is suggested that the raw water system leading up to the filter be able to accommodate 18 MLD. This would be consistent with adding one additional Actiflo® train as the current two trains are rated for 12 MLD.

3.4 Timing of the Upgrades

As indicated earlier, the maximum daily treated water flow recorded over the period of 2008 to 2017 is 8,000 m^3/d. Based upon the assumption that maximum day demand will increase every year by 276 m^3/d corresponding to 150 households x 1.84 m^3/d/unit, the curve illustrated in Figure 5 at the next page was developed.

Figure 5: Historic WTP Flows and Predicted Growth between 2008 and 2050



Based on Figure 5, it was possible to identify key dates for the Class EA process initiation and plant upgrades completion. These are summarized below.

Table 5: WTP Upgrades and Off-Site Infrastructure Phasing

Category of Works	Recommended Start Date for Class EA Process	Upgrades Completion Date	Next Expansion
Plant expansion	2023	2028	2048
Additional water storage located in the distribution system and additional river crossing	2021	2023	n/a
Completion of the force main between the WTP and the WWTP	2020	2025	n/a

Section 4.0 provides the details of the proposed upgrades at the WTP and the rationale for the additional water storage proposed in the distribution network.

Since population growth rates are not easily predicted and changes in per capita flows may occur, it is recommended that the above assumptions and conclusions be revisited on an annual basis through the completion of a Hydraulic Reserve Capacity calculation.

4.0 DEFINITION OF PLANT UPGRADES

The WTP consists of several different water treatment processes, pumping systems and chemical storage/feed systems. Based on a filtration capacity of 17 MLD, it is possible to identify the upgrades required throughout the treatment train and for the various auxiliary systems. This has been done based on an assessment of the existing process/system and its current capacity constraints and identifying what additional infrastructure is needed to achieve the expanded capacity. The processes and systems are summarized in the table below along with required capacities and proposed upgrades:

Table 6: Proposed Plant Upgrades for Capacity Expansion

Process/System	Proposed Capacity	Proposed Upgrades
Raw water intake structure	18 MLD	No upgrades required
Raw water pipe	18 MLD	No upgrades required
Screening	18 MLD	Install a new mechanical screen
Low Lift Pumps	18 MLD (with the largest unit out of service)	Replace two (2) pumps with larger units

Process/System	Proposed Capacity	Proposed Upgrades
Raw Water Piping	18 MLD	Some modifications for integration to third Actiflo® unit
Coagulation/ Sedimentation	18 MLD	Add a third Actiflo® unit (identical to the existing units) and build an extension to the existing building
Filtration	17 MLD	Build two (2) new filters in an extension to the existing building. Each filter will have a filtration surface each of 27 m^2. The addition of two (2) new filters will provide an "n+1" configuration, which has become industry standards and is a MOECC Guideline.
Filter backwash wastewater and Actiflo® residuals	Based on continuous discharge from the Actiflo® units and maximum number of filter backwashes per day	Modify the existing configuration to transform the tanks as equalization tanks and modify the existing pump systems. This needs to be synchronized with the installation of the DAF unit at the WWTP.
Treated Water Storage (clearwell)	17 MLD	Construct a third cell with a capacity of 1590 m^3
High Lift Pumps	17 MLD (with the largest unit out of service)	Replace one pump with a larger unit
Coagulant storage and dosing system	For a maximum raw water flow of 18 MLD	Add a third coagulant pump and add a fourth coagulant tank
Polymer preparation and dosing system	For a maximum raw water flow of 18 MLD	Add a second polymer preparation system, a third day tank and a third metering pump
Hydrofluoric acid storage and dosing system	For a maximum treated water flow of 17 MLD	No upgrades required
Chlorine storage and dosing system	For a maximum treated water flow of 17 MLD	Add a third chlorinator to improve redundancy
Lime preparation and dosing system	For a maximum treated water flow of 17 MLD	Replace existing system with a soda ash preparation and dosing system
Electrical system	n/a	Modifications to the existing electrical power supply, MCCs and electrical distribution
Back-up power	n/a	Replace the existing back-up generator with a larger generator designed for outdoor installation
HVAC and plumbing	n/a	New systems for the building extensions

In addition to the WTP, it is important to consider overall system treated water storage. The existing clearwell consists of a two (2) cell underground treated water reservoir with a total capacity of 3,180 m^3. The reservoir provides operational and emergency storage as well as chlorine disinfection contact time. The elevated storage tank within the distribution system provides an additional storage of 3,200 m^3.

The total storage requirement for a community can be estimated based on MOECC Design Guidelines. The total storage required per these guidelines is based on the WTP's design population. MOECC Design Guidelines specifies that treated water storage should be comprised of Fire Storage (A), Equalization Storage (B) and Emergency Storage (C). Fire storage is specifically indicated based on population, equalization storage should correspond to 25% of the maximum day demand and emergency storage should correspond to 25% of the sum of A+B.

Table 7 below summarizes the total water storage requirements for the current and future conditions as per MOECC Guidelines.

Table 7: Water Storage Requirements for Current and Future Conditions as per MOECC Guidelines

Type of Storage	MOECC Guidelines	Volume (m^3)
Current Conditions (Maximum Day Demand of 12 MLD)		
Fire storage (A)	For an equivalent population of 13,000, use 220 L/s during 3 hours	2,376 m^3
Equalization storage (B)	25% of Maximum Day Demand	3,000 m^3
Emergency storage (C)	25% of A+B	1,344 m^3
	Total A+B+C	6,720 m^3
Chlorine contact time dedicated storage – Winter Conditions	CT required of 40.3 mg/L*min for 0.5 log inactivation of Giardia and considering a T/T_{10} of 0.4, a temperature of 0.5 deg. C, a pH of 7.5 and a free chlorine residual of 1.5 mg/L	560 m^3
Chlorine contact time dedicated storage – Summer Conditions	CT required of 12 mg/L*min for 0.5 log inactivation of Giardia and considering a T/T_{10} of 0.4, a temperature of 20 deg. C, a pH of 7.5 and a free chlorine residual of 1.5 mg/L	167 m^3
	Total storage required (winter conditions)	7,280 m^3
	Total storage required (summer conditions)	6,887 m^3
Future Conditions (Maximum Day Demand of 17 MLD)		
Fire storage (A)	For an equivalent population of 13,000, use 220 L/s during 3 hours	2,376 m^3
Equalization storage (B)	25% of Maximum Day Demand	4,250 m^3
Emergency storage (C)	25% of A+B	1,657 m^3
	Total A+B+C	8,283 m^3
Chlorine contact time dedicated storage – Winter Conditions	CT required of 40.3 mg/L*min for 0.5 log inactivation of Giardia and considering a T/T_{10} of 0.4, a temperature of 0.5 deg. C, a pH of 7.5 and a free chlorine residual of 1.5 mg/L	793 m^3

Type of Storage	MOECC Guidelines	Volume (m^3)
Chlorine contact time dedicated storage – Summer Conditions	CT required of 12 mg/L*min for 0.5 log inactivation of Giardia and considering a T/T_{10} of 0.4, a temperature of 20 deg. C, a pH of 7.5 and a free chlorine residual of 1.5 mg/L	236 m^3
Total storage required (winter conditions)		9,076 m^3
Total storage required (summer conditions)		8,519 m^3

As shown in the above table, with a future expansion of the WTP, the overall equalization storage would need to be increased to 4,250 m^3 (or 25% of 17 MLD) and the emergency storage would need to be increased to 25% of (2,376 + 4250 m^3) or 1,657 m^3. Therefore, the new required total storage based on MOECC guidelines would be 8,283 m^3. This includes the fire storage. The increase from current conditions requirements is 1,563 m^3.

Table 8 below summarizes the current and future water storage deficits. For the future conditions, we assumed that a third cell would be constructed at the WTP. The third cell would have the same dimensions as the existing cells for a new water storage volume of 1,590 m^3.

Table 8: Current and Future Conditions Water Storage Deficits

Current Conditions (Maximum Day Demand of 12 MLD)	
Total storage available	
WTP	3,180 m^3
Water tower	3,200 m^3
Total available storage in the system	6,380 m^3
Total storage required including chlorine contact time dedicated storage	
Winter conditions	7,280 m^3
Summer conditions	6,887 m^3
Overall deficit in storage	
Winter conditions	900 m^3
Summer conditions	507 m^3
Future Conditions (Maximum Day Demand of 17 MLD)	
Total storage available	
WTP (existing)	3,180 m^3
WTP (proposed)	1,590 m^3
Water tower	3,200 m^3
Total available storage in the system	7,970 m^3
Total storage required including chlorine contact time dedicated storage	
Winter conditions	9,076 m^3
Summer conditions	8,519 m^3
Overall deficit in storage	
Winter conditions	1,106 m^3
Summer conditions	549 m^3

The table above shows that the water storage deficits under future conditions would remain similar as under current conditions.

If the clearwell is to be considered as “useable” storage, the capacity of the high lift pumps must be greater than the maximum day capacity of the WTP in order to satisfy "peak hour"' demand. This is not the case presently as “peak hour” demand is provided by the elevated water tower.

Typically, for a town the size of Carleton Place, the emergency, equalization and fire storage would be distributed at key locations inside the Town’s limits. The water tower accounts for a theoretical usable volume of 3200 m^3, so typically, the water tower would satisfy the need for fire storage. However, the distribution system might not have the capacity to convey the MOECC Guidelines recommended fire flow of 220 L/s at any point inside the Town’s limits.

Also, the need for additional storage for fire, emergency and equalization as well as potential locations within the distribution system is generally studied through a Class EA process. Often it is not practical and/or optimal to centralize all emergency and equalization storage at the WTP. Hydraulic modelling of the distribution system could be undertaken to more precisely define storage requirements. Also, additional measures could be investigated for providing enhanced fire flow protection, which could eliminate the need for additional physical storage (e.g. using a non-potable water source). For example, it is possible that establishing storage of the north side of the Mississippi River perhaps at ground level with a booster pumping system could offer some advantages. As an additional measure with objective to increase the reliability of the water supply on the north side of the river, the Town is planning to build a third river crossing at McArthur Island.

5.0 OPINION OF PROBABLE COST

For budgetary purposes, costs have been developed in order to allow the Town to appropriately plan and allocate costs for the future WTP expansion and for additional water infrastructures related to the distribution network. The costs do not include life-cycle replacement costs.

It is important to note that these costs are reflective of Class ‘D’ - Order of Magnitude estimates since only conceptual level information has been developed to date for the required works needed for expansion. Costing is intended to represent 2018 and should be adjusted accordingly to determine the future cost at the time of expansion. Table 9 at the next page provides a summary of the costs.

Table 9: Opinion of Probable Cost (in dollars of 2018)

Water Treatment Plant Expansion Project		
Item No	**Description**	**Cost**
1	Modifications to the raw water supply (intake and pipe)	$ -
2	Modifications to the screening system	$ 150,000
3	Modifications to the low lift pumping system	$ 150,000
4	Modifications to the raw water piping between the low lift pumping system and the Actiflo tanks	$ 75,000
5	Modifications to the coagulation/Sedimentation process (addition of one (1) Actiflo)	$ 1,280,000
6	Modifications to the filtration process (addition of two (2) filters)	$ 1,545,000
7	Modifications to the high lift pumping system	$ 130,000
8	Modifications to the backwash water and residuals storage tank	$ 85,000
9	Construction of a new clearwell cell	$ 1,995,000
10	Modifications to the coagulant system	$ 50,000
11	Modifications to the polymer preparation and dosing system	$ 47,000
12	Modifications to the chlorine storage and dosing system	$ 45,000
13	Modifications to the hydrofluorosilicic acid storage and dosing system	$ 20,000
14	Replacement of the lime preparation and dosing system with a soda ash system	$ 100,000
15	Modifications to the main electrical switchgear and backup power system	$ 320,000
16	Additional associated work	$ 300,000
Total - Items Nos 1 to 16		$ 6,292,000
Contingencies (20%)		$ 1,258,400
Engineering costs (15%)		$ 1,132,560
Grand total - Water Treatment Plant Expansion Project		$ 8,682,960
Off-Site Water Storage Project		
Item No	**Description**	**Cost**
1	Construction of a new underground water storage reservoir at a location north of the river	$ 1,000,000
2	Construction of a new building above the reservoir complete with pump system and associated electrical, mechanical (building) and instrumentation and control services	$ 700,000
3	Site civil including yard piping	$ 100,000
Total - Items Nos 1 to 3		$ 1,800,000
Contingencies (20%)		$ 360,000
Engineering costs (15%)		$ 324,000
Grand total - Off-Site Water Storage Project		$ 2,484,000
Completion of the Forcemain from the WTP to the WWTP Project		
Item No	**Description**	**Cost**
1	Completion of the force main from the WTP to the WWTP	$ 260,000
2	Integration of the new force main to the headworks at the WWTP	$ 30,000
Total - Items Nos 1 to 2		$ 290,000
Contingencies (20%)		$ 58,000
Engineering costs (15%)		$ 52,200
Grand total - Completion of the Forcemain from the WTP to the WWTP Project		$ 400,200
Third River Crossing at McArthur Island Project		
Item No	**Description**	**Cost**
1	Construction of a river crossing at McArthur Island	$ 508,000
2	Connection to existing pipes on both side of the river	$ 40,000
Total - Items Nos 1 to 2		$ 548,000
Contingencies (20%)		$ 109,600
Engineering costs (15%)		$ 98,640
Grand total - Third River Crossing at McArthur Island Project		$ 756,240
Summary		
Water Treatment Plant Expansion Project		$ 8,682,960
Off-Site Water Storage Project		$ 2,484,000
Completion of the Forcemain from the WTP to the WWTP Project		$ 400,200
Third River Crossing at McArthur Island Project		$ 756,240
Grand total		**$ 12,323,400**

6.0 SUMMARY OF ASSUMPTIONS

The following assumptions were considered during the development of this Report:

1. Calculations of future flows were based on the population projections/growth rates and flow model information provided by the Town.
2. A maximum daily treated water flow value of 8,000 m^3/d was used as a basis to project when an expansion will be required. This value is representative of the maximum day demand recorded for the period from 2008 to 2017.
3. The WTP will be expanded on the existing site. There will be sufficient available land for the expansion of the treatment processes but there is limited land available for the expansion of the underground storage.
4. It is recommended that the need for additional storage for fire, emergency and equalization as well as the potential strategic locations within the distribution system be investigated through a Class EA process.
5. The Town will initiate a Class Environmental Assessment (Class EA) process (and any other required planning steps) for an expansion of the WTP once approximately 90% of the current rated capacity is attained.
6. A period of approximately 5-years will be required from the start of the Class EA process to the time of commissioning of the expanded WTP (this includes all study, design and construction activities required to expand the plant).
7. A future expanded plant will be able to service the Town for 20 years thereafter consistent with Class EA guidelines for these types of facilities.

This is report has been prepared for the exclusive use of the Town of Carleton Place, for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of the Town of Carleton Place and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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JLR No.: 27871
Revision: 0

July 24, 2018

Addendum to the August 2011 Water Pollution Control Plant Capacity Expansion Master Plan

Final Version

J.L.Richards
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1.0 Introduction

1.1 Background

The Town of Carleton Place originally completed a Master Plan for their Water Pollution Control Plant (WPCP) in 2011. This involved completing Phases 1 and 2 of the Municipal Class EA process. A summary report was prepared at that time entitled, "Town of Carleton Place Water Pollution Control Plant Capacity Expansion Master Plan", (Stantec, 2011).

The Town retained J.L. Richards & Associates Limited (JLR) in January 2018 to update only the capital costing and projected timing for future plant upgrades relative to the 2011 Master Plan. No other deviations from the original Master Plan were deemed necessary and the Town still has the intention to undertake a focused Schedule 'C" Class Environmental Assessment of a plant capacity expansion at the appropriate time. This would include evaluating site-specific issues such as potential impacts to the natural environment; treated effluent requirements based on a receiving water assessment; alternative capacity expansion scenarios as well as other factors.

In order to facilitate the update on capital costing and projected timing for the future plant upgrades, a technical report entitled, "Corporation of the Town of Carleton Place Wastewater Treatment Plant Capacity Expansion Assessment – Final Version (JLR, April 2018)", was prepared and is contained in Appendix 'A".

It should be noted that a similar update to the Water Treatment Plant (WTP) capacity expansion was undertaken concurrently to the WPCP update and results are presented in a separate document.

1.2 Objectives

The objectives of this Report are as follows:

1. To provide relevant background and context for this undertaking;
2. To provide a summary of the methodology that was followed for this undertaking including the technical work and agency and public consultation;
3. To provide a summary of the updated costs and timing associated with an expansion to the Town's Water Pollution Control Plant relative to the original Master Plan information;

2.0 Methodology Followed to Update the Master Plan

2.1 Technical Review

In general, the technical review included meeting with the Town of Carleton Place and the operators of the plant (OCWA) to discuss relevant changes since the original Master Plan was prepared in 2011. This included obtaining all flow data and population projection data for the Town in order to evaluate the timing for a future expansion as well as confirming the required

capacity. The major unit operations (e.g. screening, grit removal, primary settling, etc.) of the plant was evaluated in terms of its available capacity and the future required capacity and conceptual level costs were determined based on a conceptual design layout. All of this information is summarized in the report contained in Appendix 'A'.

2.2 Consultation

A Notice of Public Meeting was issued on May 2, 2018 to stakeholder agencies and organizations that were previously consulted with during the 2011 Water and Wastewater Treatment Plants Master Plans, as well as agencies who may now have an interest in this project. The notice mentioned that JLR was currently working on an update to the 2011 Town of Carleton Place WTP and WWTP Master Plan. The Notice indicated that the Master Plans were being updated to include more up-to-date information about historic flows, future flows, and possible timing for the projects.

The Public Meeting was held on May 15th, 2018 to present the results of the work completed on the Water and Wastewater Plants Master Plans, along with a recently developed Water and Wastewater Treatment Plants Resiliency Plan, and proposed new development charges and policies that would be applied throughout the Town. A period of two weeks was allowed to provide comments and no comments were received. All relevant consultation documentation is presented in Appendix 'B".

3.0 Summary of Conclusions

In general, the technical update presented in Appendix 'A' of this Report is intended to replace Section 3.0 of the original Master Plan as well as Appendix 'D' of the Master Plan which outlines costing (refer to Appendix 'C' for a copy of the original Master Plan completed in 2011).

In summary, it was determined that there was no fundamental changes to the recommendations made in 2011 other than adjustments to the timing for the upgrades and the total costs. The capacity increase proposed in 2018 is similar to the capacity increase proposed in 2011. The Master Plan update maintains the recommendation from the original Master Plan to upgrade/expand the existing WPCP at the existing site. The anticipated date for expansion of the WPCP is 2027 and the Class EA process for this undertaking should be initiated in approximately 2022. A Class 'D" – Order of Magnitude capital cost estimate for expansion of the plant is approximately $15 million including contingencies and engineering.

In summary, this Master Plan update was undertaken for the purposes of updating costs and timing associated with capacity expansions to the Town of Carleton Place WPCP from what was originally established in the 2011 Master Plan in order to provide the Town with additional information for long range planning purposes. There is no intent to do any further detailed work at this time and additional assessment will be completed at the more focused Class EA stage.

This report has been prepared for the exclusive use of the Town of Carleton Place, for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of the Town of Carleton Place and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

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J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:	Reviewed by:
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Appendix A

Corporation of the Town of
Carleton Place Wastewater
Treatment Plant Capacity
Expansion Assessment

JLR No.: 27871
Revision: 0

April 16, 2018

Corporation of the Town of Carleton Place
Wastewater Treatment Plant
Capacity Expansion Assessment

Final Version

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1.0 INTRODUCTION

This Report summarizes the results of a broad based study of the Town of Carleton Place (the Town) Wastewater Treatment Plant (WWTP), which was undertaken to assess future capacity expansion requirements related to the growth of the Town. This assessment has included an in-depth review of the historical WWTP flows; a projection of future flows that the plant will need to accept over certain time periods; an estimate of when an expansion project is likely to be initiated, and; the identification of the required WWTP infrastructure and associated capital costs necessary for the plant expansion. It should be noted that the information presented in this Report is limited to the WWTP and does not include an assessment of any of the linear infrastructure (i.e., the collection system or sub-area lift stations).

The following are some of the broad assumptions that have been made as part of this assessment:

1. The Town will initiate a Class Environmental Assessment (Class EA) process (and any other required planning steps) for an expansion of the WWTP once approximately 90% of the current rated capacity is attained.
2. A period of approximately 5-years will be required from the start of the Class EA process to the time of commissioning of the expanded WWTP.
3. Once the upgrades are completed, the WWTP will be able to service the Town for 20 years thereafter.

It should be noted that other assumptions are summarized in Section 6.0 of this Report.

2.0 HISTORICAL FLOW ANALYSIS

Prior to initiation of this study, the Town developed a data base consisting of flow information measured at the WWTP between 1998 and 2017. This represents a total of 20 years of data.

Figure 1 at the next page illustrates the minimum, average and maximum flows received at the WWTP from 1998 to 2017. For each year, the minimum flow represents the minimum daily flow recorded during the year and the maximum flow represents the maximum daily flow recorded during the year. The annual average daily flow represents the total volume of wastewater treated by the plant during the year divided by 365 days. Flows are recorded at the raw sewage pump station installed at the headworks portion of the WWTP. The flows are measured by a magnetic flowmeter installed on the discharge header of the raw sewage lift pumps. It should be noted that the rated capacity of the WWTP (as per the C of A) is 7.9 MLD (average day flow) and 22 MLD (peak day flow).

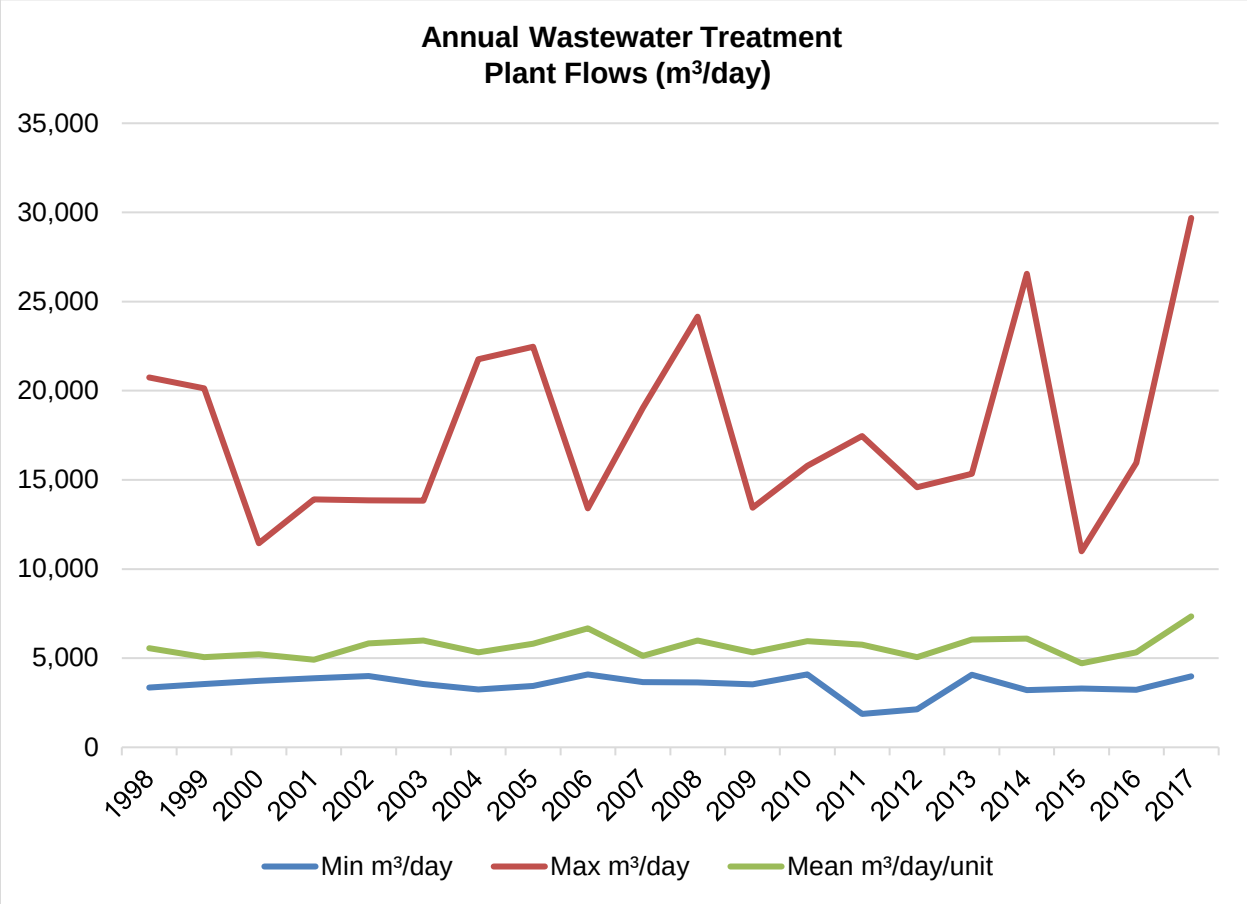


Figure 1: WWTP Flows (m^3/d) 1998 to 2017

The following are some key observations from the analysis of the data:

1. The annual average daily flows for the 20 year period have remained relatively constant at approximately just above 5,000 m^3/d, even though the Town has measurably grown over that period. The population of the Town has increased from 9,150 people in 1998 to 10,985 people in 2017 – an increase of approximately 20%.
2. The annual maximum daily flows throughout the years are typically approximately 15,000 m^3/d but are highly variable. For example, flows of over 27,000 m^3/d were recorded in 2014 and 11,000 m^3/d in 2015. During a recent 5-year period from 2012 to 2016 inclusive (see Figure 2 below), there were three (3) years (2012, 2013 and 2016) with maximum daily flows of approximately 15,000 m^3/d, one year (2014) with a relatively high maximum daily flow of over 25,000 m^3/d and one year (2015) with a relatively low maximum daily flow of only 11,000 m^3/d. As would be expected, all maximum flows were recorded during the spring season;
3. The annual minimum daily flows throughout the years are relatively constant. For year 2011 and 2012, the annual minimum daily flows were slightly lower and this could be explained by the fact that these were drier years.

Daily flows of wastewater for the period between 2012 and 2016 are shown at Figure 2 below.

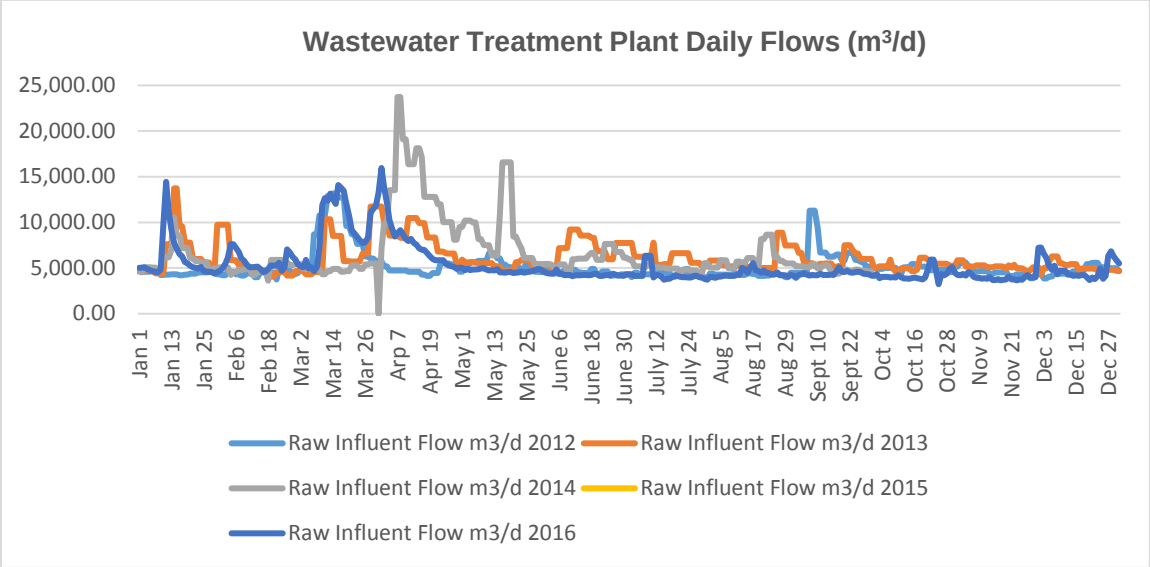


Figure 2: WWTP Daily Flows for Period between 2012 and 2016

Table 1 below provides a summary of the average and maximum flows at the WWTP for years 2008 to 2017 as well as the percentage of current WWTP capacities for dry and wet weather conditions.

Table 1: Average and Maximum Flows at the WWTP from Year 2008 to 2017

Year	Average Flow m³/day	Maximum Flow m³/day	% of Plant Capacity – Dry Weather Conditions	% of Plant Capacity - Wet Weather Conditions
2008	5,987	24,158	75.8%	109.8%
2009	5,330	13,439	67.5%	61.1%
2010	5,960	15,781	75.4%	71.7%
2011	5,748	17,460	72.8%	79.4%
2012	5,055	14,595	64.0%	66.3%
2013	6,052	15,335	76.6%	69.7%
2014	6,098	26,556	77.2%	120.7%
2015	4,711	10,995	59.6%	50.0%
2016	5,319	15,955	67.3%	72.5%
2017	7,340	29,690	92.9%	135.0%

Table 2 presents the most recent 5 year and 10 year averages for the average and maximum flows recorded at the WWTP.

Table 2: 5 and 10 Year Averages for the Aver and Maximum Day Flows

Period	Average Flow (m^3/d)	Maximum Flow (m^3/d)
Average for period between 2013 and 2017 (5 year-period)	5,904	19,705
Average for period between 2008 and 2017 (10 year-period)	5,760	18,396

A conservative value of 5,904 m^3/d will be used as the starting point for the year 2017 to calculate future average daily flows to be treated at the WWTP and establish the timing for the plant expansion

Figure 3 below and Table 3 at the next page show the WWTP flows divided by the number of households (users) for each particular year between 1998 and 2017.

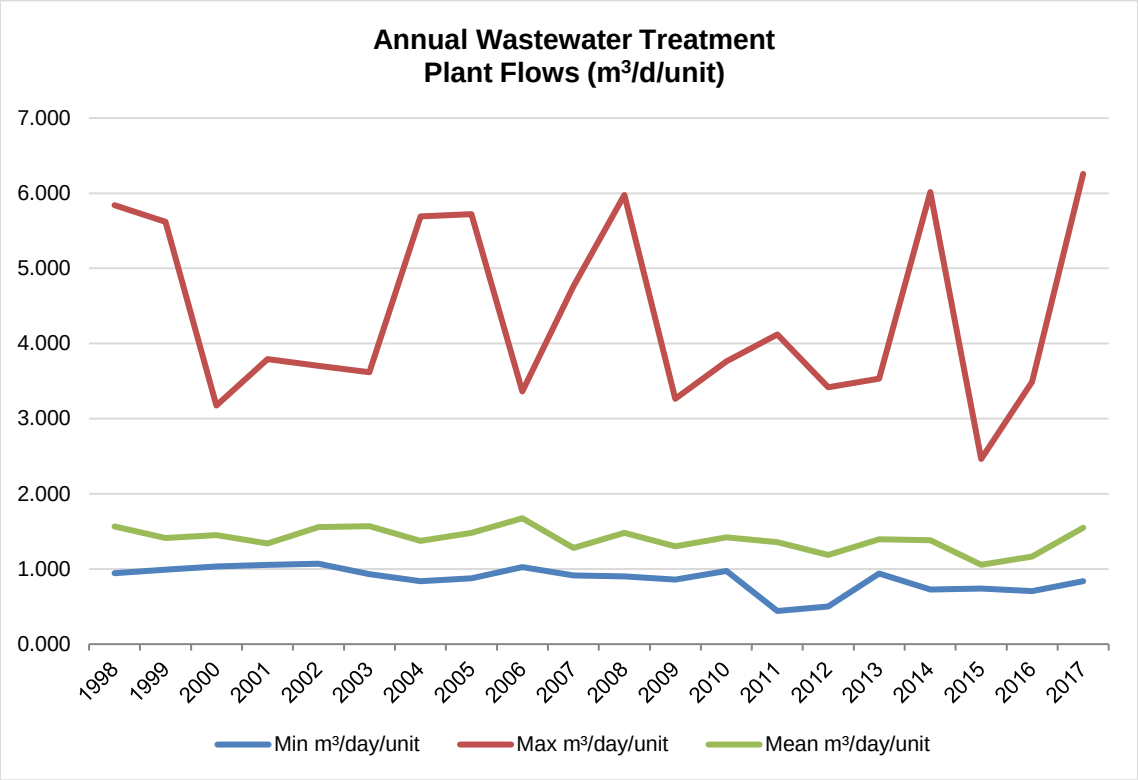


Figure 3: Annual WWTP Flows Divided by Number of Households

Table 3: Unit Flows per Day per Household (minimum, maximum and average) between 1998 and 2017

Year	Min (m^3/d/unit)	Max (m^3/d/unit)	Average (m^3/d/unit)
1998	0.945	5.839	1.565
1999	0.989	5.620	1.413
2000	1.035	3.176	1.450
2001	1.055	3.794	1.340
2002	1.070	3.703	1.558
2003	0.930	3.619	1.568
2004	0.838	5.691	1.375
2005	0.875	5.720	1.482
2006	1.025	3.363	1.675
2007	0.913	4.763	1.282
2008	0.900	5.975	1.481
2009	0.858	3.266	1.300
2010	0.975	3.762	1.421
2011	0.441	4.120	1.355
2012	0.501	3.420	1.185
2013	0.939	3.531	1.394
2014	0.726	6.016	1.382
2015	0.739	2.464	1.056
2016	0.707	3.490	1.164
2017	0.838	6.257	1.547

From the table above, averages were calculated over different periods and are summarized in the table below.

Table 4: Average Unit Flows per Day per Household for Various Periods

Period	Min (m^3/d/unit)	Max (m^3/d/unit)	Average (m^3/d/unit)
1998-2017 (20 years)	0.865	4.379	1.400
2008-2017 (10 years)	0.762	4.230	1.329
2013-2017 (5 years)	0.790	4.352	1.309

Table 4 illustrates that the average flows per household have remained relatively constant or have slightly decreased over the years. From 2013 to 2017 (recent 5 years), the average flow per household is 1.309 m^3/d/unit. This value will be utilized to calculate future average flows at the WWTP.

Table 3 showed that maximum day flows per household vary considerably confirming that growth is not the largest factor impacting maximum day flows. Other factors (weather and spring melt) have the largest impact on maximum day flows. Figure 1 also showed that maximum day flows in 2004, 2005, 2008 and 2016 were 22,000 – 25,000 m^3/d. This indicates that even though

the Town has grown and the collection system has expanded, the highest maximum day flows have remained approximately the same.

3.0 WWTP EXISTING AND PROPOSED CAPACITY

3.1 Existing Capacity of the WWTP

The processes at the existing WWTP and their associated sub-systems and components are generally divided into two (2) categories: those designed for the dry weather flows (DWF) and those designed for wet weather flows (WWF). The dry weather flows are based on an annual average.

Table 5 summarizes the existing capacities of all of the major processes at the WWTP. This information was taken from the current amended Certificate of Approval (C of A) – Municipal and Private Sewage Works – Number 5001-7FZT4A – October 3, 2008.

Table 5: WWTP Processes Current Capacities

System	Design Basis	Current Capacity
Fine screening	DWF and WWF	52 MLD
Sewage pumping	DWF and WWF	26 MLD (n+1 configuration)
Degritting	DWF and WWF	20 MLD
Primary clarifiers	DWF	10.4 MLD
Physical-chemical clarifiers	WWF	11.6 MLD
Aeration tanks	DWF	7.9 MLD
Secondary clarifiers	DWF	10.4 MLD
UV disinfection	DWF and WWF	11.0 MLD
Primary digester	Not applicable	880 m^3
Secondary digester	Not applicable	826 m^3
Storage tank	Not applicable	1,900 m^3
Dewatering	Not applicable	16 m^3/hour

It should be noted that the following conditions are attached to the C of A:

1. Operate the works within the rated capacity of the works (7,900 m^3/d during dry weather conditions) and within the Peak Flow rate of the works (22,000 m^3/d during wet weather conditions).
2. Operate the works such that the physical/chemical clarifiers are brought on line and operated only when raw sewage flow to the works exceeds 10,400 m^3/d (i.e., during wet weather conditions).

3.2 Population Growth

Since the 1980s, the Town has experienced strong growth and this growth can be tracked several ways. The Municipal Property Assessment Corporation (MPAC) produces the tax roll for the Town annually which identifies the number of households within the Town. The MPAC data shows that the number of households in 1990 was 2,833 and that this increased an average of 63 households each year to total 4,462 households in 2016. The Town's growth can also be tracked by building permits. The building permit records show that the permits issued for new

households each year varied from 23 in 1991 to 142 in 2008 with an average of 76 households per year.

Lanark County has also been studying growth within the County and produced draft population projections for Carleton Place. For the next 25 years, the County's study predicts the Town will grow by 310 people (135 households) per year with a low growth scenario and 414 people (180 households) per year with a high growth scenario.

Based on information provided by the Town, a predicted growth rate of 150 households per year has been assumed. It is important to note that the timing for an "actual" expansion at the WWTP will be triggered by flows which are determined by growth rather than a fixed calendar year. If growth occurs faster or slower than the anticipated 150 households per year, then the timing for the expansion can be adjusted accordingly.

3.3 Proposed Future Capacity of the WWTP

A WWTP expansion to accommodate a 20 year period from the time when the plant's current rated capacity has been reached will require an estimated additional 3,927 m^3/day of capacity (i.e., 150 households x 1.309 m^3/d/unit x 20 years = 3,927 m^3/d). Therefore, as a minimum, a plant with a rated capacity of 7.9 MLD + 3.9 MLD = 11.8 MLD would be required. This corresponds to the proposed rated capacity of the secondary treatment.

As indicated earlier, the analysis of the historic data has shown that even though the Town has grown in population and the collection system has expanded in the previous years, the highest maximum day flows have remained approximately the same. This indicates that the continuously expanding collection system does not contribute significantly to the maximum day flows and other factors such as weather have a much larger impact. Also, the Town regularly undertakes sewer lining and other measures to reduce Inflow and Infiltration (I/I) flows in the collection system. The Town has also indicated that new permanent flow monitoring stations will be put in place at key locations along its main trunk sewers. This will provide valuable data to the Town in its ongoing efforts to monitor and reduce I/I flows over the coming years.

As previously noted, the major processes that make up the WWTP and their associated sub-systems and components are generally divided into two (2) categories: those designed for the dry weather flows (DWF) and those designed for wet weather flows (WWF). Table 6 below summarizes the current and new proposed capacities for these major processes.

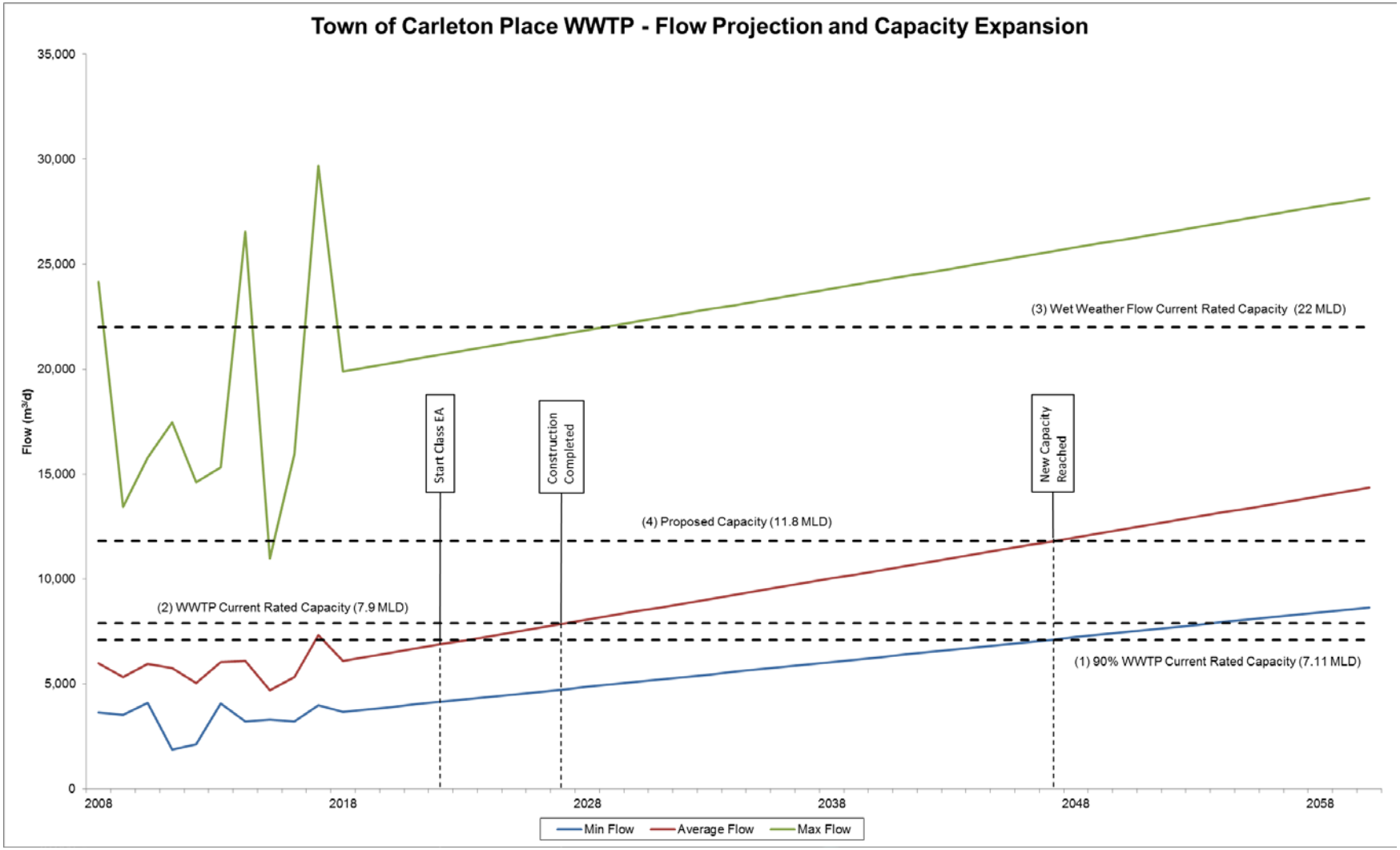
Table 6: Current and Proposed Capacities for All Major Processes

System	Design Basis	Current Capacity (MLD)	Proposed Capacity (MLD)
Fine screening	DWF and WWF	56 MLD	56 MLD
Sewage pumping	DWF and WWF	26 MLD (n+1 configuration)	30 MLD (n+1 configuration)
Degritting	DWF and WWF	20 MLD	30 MLD
Primary clarifiers	DWF	10.4 MLD	15.6 MLD
Physical-chemical clarifiers	WWF	11.6 MLD	11.6 MLD
Aeration tanks	DWF	7.9 MLD	11.8 MLD
Secondary clarifiers	DWF	10.4 MLD	15.6 MLD
Tertiary filtration	DWF and WWF	Not applicable	27.2 MLD
UV disinfection	DWF and WWF	11.0 MLD	27.2 MLD

3.4 Timing of the Upgrades

As indicated earlier, the average dry weather flow for the last five years is 5,904 m^3/d. Based upon the assumption that the average dry weather flow will increase every year by 197 m^3/d (i.e., 150 households x 1.309 m^3/day per household), the curve illustrated at Figure 4 at the next page was developed.

Figure 4: Historic WWTP Flows and Predicted Growth between 2008 and 2050



Based on Figure 4, it was possible to identify key dates for the Class EA process initiation and plant upgrades completion. These are summarized below.

Table 7: Plant Expansion Phasing

Category of Works	Recommended Start Date for Class EA Process	Plant Expansion Completion Year	Next Expansion
Headworks (raw sewage pumping, degritting system and primary clarifiers)	2022	2027	2047
Secondary treatment (aeration tanks and secondary clarifiers)	2022	2027	2047
Tertiary treatment – UV disinfection	2022	2027	2047
Tertiary treatment – Cloth filtration or other technology	2022	2027	2047
Biosolids management	2022	2027	2047

Additional discussion related to the need for tertiary treatment and the timing for upgrades to the Biosolids management system is presented in Section 4.0.

Since population growth rates are not easily predicted and changes in per capita flows may occur, it is recommended that the above assumptions and conclusions be revisited on an annual basis through the completion of a Hydraulic Reserve Capacity calculation.

4.0 DEFINITION OF PLANT UPGRADES

4.1 Quality of Effluent

The current discharge effluent limits identified in the current Certificate of Approval (C of A) are indicated below in Table 8.

Table 8: Treated Effluent Limits

Treated Effluent Parameter	Average Concentration Effluent Limit (mg/L)
CBOD5	25
Total Suspended Solids	25
Total Phosphorus	1
Total Ammonia (Ammonia + Ammonium) Nitrogen	4 (May 15 to September 30)

Based upon information obtained from the Water Pollution Control Plant-Capacity Expansion Master Plan prepared in 2011 (Stantec, 2011), discussions with the MOECC at that time indicated that potential changes to the current effluent limits would be put in place as part of the next WWTP expansion. The changes identified in that document are summarized below:

1. Total Phosphorus: 0.2 mg/l for the months of June, July, and August; 0.3 mg/l for the rest of the year;
2. Total Ammonia: 3.63 mg/l for the months of June, July, and August; 15 mg/L for the rest of the year;
3. Acute Lethality: year-round testing to show effluent is non-acutely lethal.

It had been determined at that time that the more stringent requirement for Total Phosphorous would necessitate the implementation of tertiary treatment.

Based on an analysis of the historic data for Total Ammonia and Total Phosphorous, these two (2) parameters have always met the current effluent limits. The above-mentioned limit for Total Ammonia is not expected to be a problem after the plant expansion. As for the Total Phosphorous, the WWTP currently produces an effluent with a Total Phosphorous concentration which varies between 0.2 and 0.3 mg/L. It should be noted that as per MOECC Guidelines, Policy 2 would apply to the Mississippi River. As per Policy 2: "Water quality which presently does not meet the Provincial Water Quality Objectives shall not be degraded further and all practical measures shall be taken to upgrade the water quality to the Objectives. When new or expanded discharges are proposed, no further degradation will be permitted and all practical measures shall be undertaken to upgrade water quality." As per Policy 2, it might become necessary to incorporate additional treatment measures during the design of the WWTP expansion so as to not increase the Total Phosphorous daily loading discharge to the river.

In general, since the current TP limit is 1 mg/L it is conceivable that this would be changed to 0.67 mg/L in order to maintain the allowable loading as per Policy 2 (i.e., 7,900 m^3/day current flow divided by 11,800 m^3/day future flow x 1 mg/L). The MOECC, however, may actually impose even lower limits simply based on how the plant is currently performing. It would be prudent to assume that, based on the receiving stream and experiences at other similar plants (e.g. Mississippi Mills located downstream) that tertiary treatment will be required as part of a future expansion.

4.2 Discussion on Sludge Management

The treatment process produces a waste sludge (or biosolids) which requires final disposal off-site. The anaerobically treated biosolids are currently spread on agricultural fields (conditions permitting) at an average frequency of four (4) times per year. During year 2017, a total volume of 6,662 m^3 was spread on fields in Mississippi Mills and Beckwith. There was three (3) large haulages from the plant in May, July and August and one (1) in November.

Under extreme conditions, biosolids can be hauled to the Robert O. Pickard Environmental Centre (ROPEC) in Ottawa. Issues, such as the respective costs of the two (2) disposal options, the timeframes for spreading on the fields, and the amount of storage available at the plant, all factor into the current sludge management plan. The option of spreading on the fields remains generally the less costly.

A centrifuge dewatering system was put in place in 2009 in order to assist in the management of the biosolids generated by the WWTP and defers the need to increase on-site storage for the liquid biosolids. This allows for an additional biosolids management option if needed – disposal of the dewatered cake at a landfill (or spread on agricultural fields if possible).

In addition to the above, during the 2003 Stantec investigation of WWTP sludge processing constraints, it was decided that the wastewater generated at the Water Treatment Plant (WTP) from the filter backwash and Actiflo® system should be separated out from the sewage flow since it did not benefit from the biological treatment process and was contributing to solids loading at the WWTP. At that time it was determined that this separation would be achieved by pumping the wastewater in a new dedicated forcemain from the WTP to a new Dissolved Air Flotation unit (DAF) located at the WWTP. A subsequent change in the type of coagulant used at the WTP resulted in a greatly reduced quantity of chemical sludge from the Actiflo® system, and deferred the need for immediate implementation of the wastewater separation. The forcemain has been installed in sections over the past several years to coincide with ongoing planned road reconstruction along the previously planned forcemain route. The trigger for implementation of the DAF at the WWTP would be a transfer rate approaching 50 m^3/day of co-settled sludge from the primary clarifiers to the primary digester. Currently, the transfer rate is below 40 m^3/day, and this rate is not expected to reach the trigger point prior to the need for a plant capacity expansion. The average rate in 2017 was 34 m^3/d.

4.3 Summary of Plant Upgrades

A summary of proposed plant upgrades for a future capacity expansion is presented in Table 9 below:

Table 9: Proposed Plant Upgrades for Capacity Expansion

Process/System	Proposed Capacity	Proposed Upgrades
Inlet sewer	n/a	Integration of the two (2) 350 mm diameter force mains from the Highway 7 Pumping Station
Fine screening	30 MLD	No work proposed.
Sewage lift pumps	30 MLD (n+1 configuration)	Replace all existing pumps with new dry pit submersible pumps, complete with associated mechanical process, electrical, I&C and SCADA.
Degritting	30 MLD	Install a third TeaCup degritter in the headworks building extension identical to the two (2) existing ones complete with associated mechanical process, electrical, I&C and SCADA work.
Primary clarifiers	15.6 MLD	Build a third primary clarifier identical to the two (2) existing ones complete with associated civil, structural, mechanical process, electrical, I&C and SCADA work.
Physical-chemical clarifiers	11.6 MLD	No work proposed.
Aeration tanks	11.8 MLD	Build a fourth aeration tank slightly bigger than tanks Nos. 2 and 3 complete with associated civil, structural, mechanical process, electrical, I&C and SCADA work.
Secondary clarifiers	15.6 MLD	Build a fourth secondary clarifier identical to the three (3) existing ones complete with associated civil, structural, mechanical process, electrical, I&C and SCADA work.
Tertiary treatment (UV disinfection)	27.2 MLD	Build a new building (adjacent to the existing building) which will house a new UV disinfection system complete with associated civil, structural, architectural,

Process/System	Proposed Capacity	Proposed Upgrades
		mechanical process, electrical, HVAC, I&C and SCADA work.
Tertiary treatment (Filtration)	27.2 MLD	Build a new building which will house a new filtration system complete with associated civil, structural, architectural, mechanical process, electrical, HVAC, I&C and SCADA work.
Primary digester	880 m^3	Modify the primary digester piping system so that digested sludge can be transferred to the existing storage tank or to the proposed storage tank.
Secondary digester	826 m^3	Transform the secondary digester into a primary digester complete with associated structural, mechanical process, electrical, I&C and SCADA work.
Storage tank	1,900 m^3	Build a new bio-solids storage tank complete with associated civil, structural, mechanical process, electrical, I&C and SCADA work.
DAF unit	n/a	Install a new DAF in the headworks building extension complete with associated mechanical process, electrical, I&C and SCADA work to manage the WTP residuals.
Headworks building	n/a	Build an extension to the existing building to house the new degritter and the new DAF unit complete with associated civil, structural, architectural, mechanical process, electrical, HVAC, I&C and SCADA work.
Chemical storage building	n/a	Build an extension to the existing building complete with associated civil, structural, architectural, mechanical process, electrical, HVAC, I&C and SCADA work.
Electrical	n/a	Modify main electrical entrance and MCCs and replace the existing backup generator and transfer switch to reflect additional loads.

5.0 OPINION OF PROBABLE COST

For budgetary purposes, costs have been developed in order to allow the Town to appropriately plan and allocate cost for the future WWTP expansion. The costs do not include life-cycle replacement costs.

It is important to note that these costs are reflective of Class ‘D’ - Order of Magnitude estimates since only conceptual level information has been developed to date for the required works needed for expansion. Costing is intended to represent 2018 conditions and should be adjusted accordingly to determine the future cost at the time of expansion. Table 10 at the next page provides a summary of the costs.

Table 10: Opinion of Probable Cost (in dollars of 2018)

Wastewater Treatment Plant Expansion Project		
Item No	**Description of works**	**Cost**
1	Integration of new twin force main from Highway 7 pump station to the plant headworks	$ 60,000
2	Sewage lift station works	$ 300,000
3	Construction of a new TeaCup degritter and headworks building extension	$ 1,110,000
4	Modifications to the flow measurement system upstream of the primary clarifiers	$ 47,000
5	Expansion of the existing chemical storage and feed building	$ 90,000
6	Construction of a new primary clarifier	$ 680,000
7	Construction of a new aeration tank	$ 1,215,000
8	Construction of a new secondary clarifier	$ 1,135,000
9	Construction of a new building and installation of filtration equipment for tertiary treatment	$ 1,505,000
10	Extension of the existing control building and installation of new UV disinfection equipment	$ 1,065,000
11	Modifications to the existing secondary digester	$ 850,000
12	Modifications to the existing primary digester	$ 335,000
13	Construction of a new sludge storage tank and extension to the existing mechanical room	$ 1,160,000
14	Modifications to the chemical storage and feed systems	$ 150,000
15	Modifications to the main electrical switchboard and backup power system	$ 340,000
16	Modifications to the existing boiler system	$ 350,000
17	Additional associated work	$ 300,000
Total - Items Nos 1 to 17		$ 10,692,000
Contingencies (20%)		$ 2,138,400
Engineering costs (15%)		$ 1,924,560
Grand total - Wastewater Treatment Plant Expansion Project		**$ 14,754,960**

6.0 SUMMARY OF ASSUMPTIONS

The following assumptions were considered during the development of this Report:

1. Calculations of future flows were based on the population projections/growth rates and flow model information provided by the Town.
2. The Average Day Flow (ADF) has been used at the basis to project when an expansion will be required versus the maximum day flow which is more subject to weather patterns as opposed to population growth.
3. A plant expansion will likely trigger the need for the implementation of full nitrification and tertiary treatment.
4. The original plan devised by Stantec in the early 2000s for biosolids management, including utilizing the existing centrifuge to dewater digested sludge and installation of a new DAF process for dewatering of WTP residuals will be maintained.
5. The WWTP will be expanded on the existing site and there will be sufficient available land for this expansion.
6. The Town will initiate a Class Environmental Assessment (Class EA) process (and any other required planning steps) for an expansion of the WWTP once approximately 90% of the current rated capacity is attained.
7. A period of approximately 5-years will be required from the start of the Class EA process to the time of commissioning of the expanded WWTP (this includes all study, design and construction activities required to expand the plant).
8. A future expanded plant will be able to service the Town for 20 years thereafter consistent with Class EA guidelines for these types of facilities.

This is report has been prepared for the exclusive use of the Town of Carleton Place, for the stated purpose, for the named facility. Its discussions and conclusions are summary in nature and cannot be properly used, interpreted or extended to other purposes without a detailed understanding and discussions with the client as to its mandated purpose, scope and limitations. This report was prepared for the sole benefit and use of the Town of Carleton Place and may not be used or relied on by any other party without the express written consent of J.L. Richards & Associates Limited.

This report is copyright protected and may not be reproduced or used, other than by the Town of Carleton Place for the stated purpose, without the express written consent of J.L. Richards & Associates Limited.

J.L. RICHARDS & ASSOCIATES LIMITED

Prepared by:

Christian Thibault, P.Eng., ing.
Senior Environmental Engineer

Reviewed by:

Brian Hein, P.Eng.
Chief Environmental Engineer

Appendix B

Consultation Documentation

CARLETON PLACE
Meet me on the Mississippi

Municipal Matters • April 19, 2018

NOTICE OF PUBLIC MEETING

WATER/WASTEWATER MASTER PLAN - RESILIENCY PLAN AND 2018 DEVELOPMENT CHARGES

Take notice that on Tuesday, May 15th, 2018 the Town will hold an Open House and a Public Meeting to review a proposed amendment to the Water/Wastewater Master Plan, review a Resiliency Plan and consider proposed new development charge rates and policies that would be applied throughout the Town.

The Water/Wastewater Master Plan examines growth and climate change impacts on the water and wastewater treatment plants and identifies upgrades that will be required to accommodate growth and improve resiliency of the plants. Development Charges are levied against new development and are a primary source of funding for growth-related capital expenditures.

A Development Charges background report, proposed implementation bylaws and other detailed information is available on the Town's web site.

All interested parties are invited to attend the public meeting on:

Date and Time: Tuesday May 15th 4:00 – 7:00 Open House
7:00 Presentation with Council
Location: Carleton Place Town Hall

Any person may attend the public meeting and make written or verbal representation either in support of or in opposition to the by-law. Written submissions are invited and should be directed to the undersigned. Written comments received prior to the meeting and submissions made at the public meeting will be considered by Council prior to the adoption of the to the new development charge by-law. All submissions received will become part of a public record.

Paul Knowles, Town Engineer
175 Bridge St, Carleton Place K7C2V8

STAKEHOLDER CONSULTATION LIST

Agency	Name	Title	Address1	Address2	Postal Code	Telephone	Email
Algonquins of Pikwakanagan First Nation	Kirby James Whiteduck	Chief	PO BOX 100	Golden Lake, Ontario	K0J1X0	613-625-2800	
Bell Canada	Christopher Lockyer	Implementation Manager Access Network Facilities	450 Princess St. P.O. Box 460	Kingston, ON	K7L 4W5	613-542-4636	
Canadian National Rail	Michael Vallins	Manager Public Works	1 Administration Road	Concord ON	L4K 1B9	905-669-3264	michael.vallins@cn.ca
Carleton Place Municipal Heritage Committee	Bernard Defrancesco	Chairperson	175 Bridge St	Carleton Place, ON	K7C 2V8	613-257-6211	drogers@carletonplace.ca
Carleton Place Ocean Wave Fire Department	Les Reynolds	Director of Protective Services	15 Coleman St	Carleton Place, ON	K7C 4P1	613-257-5526	lreynolds@carletonplace.ca
Carleton Place Urban Forest / River Corridor Committee	Jim McCreedy	Member	176 Bridge St	Carleton Place, ON	K7C 2V9	613-257-5853	
Catholic District School Board of Eastern Ontario	Dan Tackaberry	Planning and maintenance department	2755 County Road 43	Kemptville, ON	K0G 1J0	613 258-7757 x3030	dan.tackaberry@cdsbeo.on.ca
Conseil des Ecoles Publique de l'Est de l'Ontario	Roch Landriault	Director, Technical Services	2445 Blvd. St-Laurent	Ottawa, ON	K1G 6C3	613-747-3802	
Conseil Scolaire de district Catholique de l'Est Ontarian	Luc Poulin	Director of Facilities Services	4000 rue Labelle	Gloucester, ON	K1J 1A1		
Enbridge Pipeline Inc.	Ann Newman	Team Leader, Damage Prevention	1086 Modeland Road, Building 1050	Sarnia, ON	N7S 6L2	519-339-0503	
Environment and Climate Change Canada	Rob Dobos	Manager, Environmental Assessment Section	867 Lakeshore Rd., 5th Floor	Burlington ON	L7S 1A1	905-336-4953	rob.dobos@canada.ca
Fisheries and Oceans Canada		Fisheries Protection Program	867 Lakeshore Road	Burlington ON	L7S 1A2	1-855-852-8320	FisheriesProtection@dfo-mpo.gc.ca
Hydro One Networks Incorporated	Rossella Fazio	Manager, Transmission Lines Sustainment	483 Bay Street, North Tower, 15th Floor	Toronto ON	M5G 2P5	416-345-6411	rossella.fazio@HydroOne.com
Infrastructure Ontario	Tate Kelly	Planning Coordinator	1 Dundas St. W., Suite 2000	Toronto ON	M5G 1Z3	416-327-1925	tate.kelly@infrastructureontario.ca
Leeds, Grenville and Lanark District Health Unit	Paula Stewart	MD, FRCPC, Medical Officer of Health	458 Laurier Blvd.	Brockville, ON	K6V 7A3	613-345-5685	Paula.Stewart@healthunit.org
Mississipi Valley Conservation Authority	Matt Craig	Manager, Planning and Regulations	10970 Hwy 7	Carleton Place, ON	K7C 3P1	613-253-0006 x226	mcraig@mvc.on.ca
Mohawks of Akwesasne, First Nation	Abram Benedict	Grand Chief	PO BOX 90	Akwesasne, Quebec	H0M1A0	613-575-2250	
Mohawks of the Bay of Quinte, First Nation	Rodrick Donald Maracle	Chief	24 Meadow Drive	Tyendinaga Mohawk Territory, Ontario	K0K 1X0	613-396-3424	
ON Ministry of Agriculture, Food and Rural Affairs	John O'Neill	Rural Planner	1st Fl.-59 Ministry Rd., Box 2004, ORC Building	Kemptville, ON	K0G 1J0	613-258-8341	john.oneill@ontario.ca
ON Ministry of Economic Development and Growth	John Bullen	Manager, Policy Coordination Branch, Cabinet Office Liaison Unit	900 Bay St., 7th Fl., Hearst Block	Toronto ON	M7A 2E1	416-325-0186	john.bullen@ontario.ca
ON Ministry of Economic Development and Growth	Michael Helfinger	Senior Policy Advisor, Policy Coordination Branch, Cabinet Office Liaison Unit	900 Bay St., 7th Fl., Hearst Block	Toronto ON	M7A 2E1	416-325-6519	michael.helfinger@ontario.ca
ON Ministry of Energy	Samer Yordi	Liaison and Strategic Policy Branch Coordinator(A), Strategic Policy and Analytics Branch	6th Flr, 77 Grenville St	Toronto ON	M7A 1B3	416-327-7276	samer.yordi@ontario.ca
ON Ministry of the Environment and Climate Change		MOECC Eastern Region EA Notification - Email Only					eanotification.eregion@ontario.ca
ON Ministry of the Environment and Climate Change		Environmental Assessment and Permission's Branch Director - Email Only					MEA.Notices.EAAB@ontario.ca
ON Ministry of Health and Long-Term Care	Tony Amalfa	Manager, Environmental Health Policy & Programs Unit	393 University Avenue, Suite 2100	Toronto ON	M7A 2S1	416-327-7624	tony.amalfa@ontario.ca
ON Ministry of Indigenous Relations and Reconciliation	Jonathan Lebi	Assistant Deputy Minister	4th Floor, 160 Bloor Street East	Toronto ON	M7A 2E6	416-212-2302	jonathan.lebi@ontario.ca
ON Ministry of Municipal Affairs	Michael Elms	Manager, Community Planning and Development, Eastern Municipal Services Office	8 Estate Lane, Rockwood House	Kingston ON	K7M 9A8	613-545-2132	michael.elms@ontario.ca
ON Ministry of Municipal Affairs	Hayley Berlin	Manager, Growth Policy, Ontario Growth Secretariat	777 Bay Street, 4th Floor, Suite 428	Toronto ON	M5G 2E5	416-325-6282	hayley.berlin@ontario.ca
ON Ministry of Natural Resources and Forestry	Mary Dillon	District Planner, Kemptville District	10 Campus Dr, PO Box 2002	Kemptville ON	K0G 1J0	613-258 8470	mary.dillon@ontario.ca
ON Ministry of Northern Development and Mines	Priya Tandon	Director, Corporate Policy Secretariat	99 Wellesley St. W, 5th Floor	Toronto ON	M7A 1W3	416-327-0302	priya.tandon@ontario.ca
ON Ministry of Northern Development and Mines	Stephanie Rocca	Regional Initiatives Coordinator	6th Flr, Willet Green Miller Centre, 933 Ramsey Lake Rd	Sudbury ON	P3E 6B5	705-670-5734	stephanie.rocca@ontario.ca
ON Ministry of Tourism, Culture and Sport: Culture Division	Karla Barboza	Team Lead (A), Heritage Program Unit, Programs and Services Branch	401 Bay Street, Suite 1700	Toronto ON	M7A 0A7	416-314 7120	karla.barboza@ontario.ca
ON Ministry of Tourism, Culture and Sport: Culture Division	Jeff Elkow	Heritage Planner (A), Heritage Program Unit, Programs and Services Branch	402 Bay Street, Suite 1700	Toronto ON	M7A 0A7	416-314-7159	jeff.elkow@ontario.ca
ON Ministry of Tourism, Culture and Sport: Regional Offices	Valerie Andrews	Manager, East Region	347 Preston Street, 4th Floor	Ottawa ON	K1S 3J4	613-742-3366	valerie.andrews@ontario.ca
ON Ministry of Tourism, Culture and Sport: Sport, Recreation and Community Programs Division	Susan Golets	Director(A)	777 Bay Street, 18th Floor	Toronto ON	M7A 1S5	416-314-7696	susan.golets@ontario.ca
ON Ministry of Transportation	Peter Makula	Manager, Engineering Office	Postal Bag 4000, 1355 John Counter Blvd	Kingston ON	K7L 5A3	613-545-4754	peter.makula@ontario.ca
Ontario Power Generation	Tammy Wong	Senior Environment Specialist, Corporate Programs	700 University Ave.	Toronto ON	M5G 1X6	416-592-4548	tammy.wong@opg.com
Ontario Provincial Police	Meaghan Klassen	Manager, Research and Program Evaluation Unit	777 Memorial Avenue, 1st Floor	Orillia, ON	L3V 7V3	705-329-6256	Meaghan.klassen@opp.ca
Upper Canada District School Board	Peter Bosch	Facilities Management	225 central ave. west	Brockville ON	K6V 5X1	800 267 7131 x1297	peter.bosch@ucdsb.on.ca
Downtown Carleton Place Business Improvement Association (BIA)	Kate Murray	BIA Coordinator	136 Bridge Street	Carleton Place, ON	K7C 2V8		k.murray@downtowncarletonplace.com
Lanark County	Kurt Greaves	CAO/ Deputy Clerk / Deputy Treasurer	99 Christie Lake Road	Perth, ON	K7H 3C6	613-267-4200	kgreaves@lanarkcounty.ca
Student Transportation of Eastern Ontario (STEO)			P.O. Box 1179, 104 Commerce Drive	Prescott, Ontario	K0E 1T0	613-925-0022	transportation@steo.ca
Classic Alliance Motorcoach	Steve Cornish	Manager	8467 Highway 17	Rockland, ON	K4K 1K7	613-791-6677	stevecornish@classicalliancemotorcoach.com
Rogers	Trevor Timm	Municipal and Utility Relations, Wireline Access Networks Mun.	475 Richmond Road	Ottawa, ON	K2A 3Y8	613-759-8599 c:613-797-7449	Trevor.Timm@rci.rogers.com
Hydro One	Jason Cordick	Design Technician	3440 Frank Kenny Rd.	Navan, ON	K4B 1H9	613-267-6473, x3228	Jason.Cordick@HydroOne.com
Metis Nation of Ontario	Métis Consultation Unit	Métis Nation of Ontario Head Office	500 Old St. Patrick Street, Unit D	Ottawa, Ontario,	K1N 9G4	613-798-1488	

**** NOTE: Letters were sent to all of the above stakeholders.**

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

May 2, 2018
Our File No.: 27871-000.1

VIA: CANADA POST

Kirby James Whiteduck
Chief
Algonquins of Pikwakanagan First Nation
PO BOX 100
Golden Lake, Ontario K0J 1X0

Dear Kirby James Whiteduck:

Re: Notice of Public Meeting
Town of Carleton Place - Water/Wastewater Master Plan Amendment

On behalf of the Town of Carleton Place, J.L. Richards & Associates Limited (JLR) is currently working on an update to the 2011 Town of Carleton Place Water Treatment Plant and Wastewater Treatment Plant Master Plans. The Master Plans are being updated to include the most up-to-date information about historic flows, future flows, proposed upgrades and projects timing. There are no fundamental changes to the recommendations made in 2011.

A Public Meeting is scheduled for **May 15, 2018** to present work completed to date on the Water and Wastewater Plants Master Plans, along with a recently developed Water and Wastewater Treatment Plants Resiliency Plan, and proposed new development charges and policies that would be applied throughout the Town. This Notice of Public Meeting is being mailed to stakeholder agencies and organizations who were previously consulted with during the 2011 Water and Wastewater Treatment Plants Master Plans, as well as agencies who may now have an interest in this project. A copy of the Notice is attached to this letter for your information.

All parties are welcome to attend the upcoming public meeting and those interested in providing additional input, either prior to or after the meeting, are asked to provide comments in writing to the undersigned or Paul Knowles, P.Eng., at the Town of Carleton Place.

Yours very truly,

J.L. RICHARDS & ASSOCIATES LIMITED

Christian Thibault

Christian Thibault, P.Eng., ing.
Senior Environmental Engineer

SJS
Enclosure

CANADA'S BEST MANAGED COMPANIES

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

May 2, 2018
Our File No.: 27871-000.1

VIA: E-MAIL

Environmental Assessment and Permission's Branch Director
ON Ministry of the Environment and Climate Change

To Whom It May Concern:

Re: Notice of Public Meeting
Town of Carleton Place - Water/Wastewater Master Plan Amendment

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Yours very truly,

J.L. RICHARDS & ASSOCIATES LIMITED

Christian Thibault

Christian Thibault, P.Eng., ing.
Senior Environmental Engineer

SJS
Enclosure

J.L. Richards
& Associates Limited
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

May 2, 2018
Our File No.: 27871-000.1

VIA: E-MAIL

MOECC Eastern Region EA
ON Ministry of the Environment and Climate Change

To Whom It May Concern:

Re: Notice of Public Meeting
Town of Carleton Place - Water/Wastewater Master Plan Amendment

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Yours very truly,

J.L. RICHARDS & ASSOCIATES LIMITED

Christian Thibault

Christian Thibault, P.Eng., ing.
Senior Environmental Engineer

SJS
Enclosure

CANADA'S BEST MANAGED COMPANIES

Ministry of Tourism, Culture and Sport

Heritage Program Unit
Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416 314 7182
Fax: 416 212 1802

Ministère du Tourisme, de la Culture et du Sport

Unité des programmes patrimoine
Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416 314 7182
Téléc: 416 212 1802

Ontario

June 5, 2018 (EMAIL ONLY)

Paul Knowles, Town Engineer
175 Bridge Street
Carleton Place, ON K7C 2V8
E: pknowles@carletonplace.ca

RE: MTCS file #: 0008887
Proponent: Town of Carleton Place
Subject: Notice of Public Meeting
Water/Wastewater Master Plan – Resiliency Plan and 2018 Development Charges
Location: Town of Carleton Place, Ontario

Dear Paul Knowles:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Public Meeting for your project. MTCS's interest in this EA project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- Archaeological resources, including land-based and marine;
- Built heritage resources, including bridges and monuments; and,
- Cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Aboriginal communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Aboriginal communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
Your EA project may impact archaeological resources and you should screen the project with the MTCS *Criteria for Evaluating Archaeological Potential* to determine if an archaeological assessment is needed. MTCS archaeological sites data are available at *archaeologicalsites@ontario.ca*. If your EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MTCS for review.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether your EA project may impact cultural heritage resources. The Clerk for Town can provide information on property registered or designated under the

Ontario Heritage Act. Municipal Heritage Planners can also provide information that will assist you in completing the checklist.

If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MTCS for review, and make it available to local organizations or individuals who have expressed interest in heritage.

Environmental Assessment Reporting
All technical heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical heritage studies will be completed for your EA project, and provide them to MTCS before issuing a Notice of Completion. If your screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank-you for consulting MTCS on this project: please continue to do so through the EA process, and contact me for any questions or clarification.

Sincerely,

Jeff Elkow
Heritage Planner
Jeff.Elkow@Ontario.ca

It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MTCS makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MTCS be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Please notify MTCS if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately and the local police as well as the Cemeteries Regulation Unit of the Ministry of Government and Consumer Services must be contacted. In situations where human remains are associated with archaeological resources, MTCS should also be notified to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

Ministry of the Environment and Climate Change

P.O. Box 22032
Kingston, Ontario
K7M 8S5
613/549-4000 or 1-800/267-0974
Fax: 613/548-6908

Ministère de l'Environnement et de l'Action en matière de changement climatique

C.P. 22032
Kingston (Ontario)
K7M 8S5
613/549-4000 ou 1-800/267-0974
Fax: 613/548-6908

Ontario

By email only

May 18, 2018

City of Carleton Place

Attention: Paul Knowles, Town Engineer
pknowles@carletonplace.ca

Dear Mr. Knowles:

Re: Town of Carleton Place Water/Wastewater Master Plan Amendment

Thank you for providing the Notice of Public Meeting on May 3, 2018. The Notice indicates that the current Master Plan is being amended.

Here are MOECC preliminary comments on the project. Please consider these comments as you proceed through the Class EA process. The comments are grouped under these headings:

- Class EA process,
- MOECC technical review issues,
- Aboriginal consultation.

Class Environmental Assessment Process

Notification

As the Regional EA Coordinator for this project, I will be responsible for circulating project notices and information to MOECC reviewers and coordinating the MOECC response during the Class EA process. I am a mandatory contact for all Notices issued for the project. In addition, I request copies of other relevant information such as information updates, technical studies related to MOECC's mandate, interim reports and technical memoranda, and two copies of the final report when it is available.

My preferred methods of correspondence are email for notices, one hard copy of technical reports and final reports (Master Plans), and one copy of the report on a thumb drive. It is helpful to provide scanned copies of the notices as they appear in newspapers, and confirm the dates of publication.

My contact information is:

Vicki Mitchell, Environmental Assessment Coordinator
Ministry of the Environment and Climate Change
1259 Gardiners Road
P.O. Box 22032
Kingston, Ontario
K7M 8S5

telephone: (613) 540-6852
email: vicki.mitchell@ontario.ca

If relevant to this Master Plan amendment, please ensure that the Notice of Completion states that Part II Order requests should be addressed in writing to:

Minister Chris Ballard
Ministry of Environment and Climate Change
Floor 11
77 Wellesley St. W
Toronto ON M7A 2T5
minister.moecc@ontario.ca

and

Director, Environmental Assessment and Permissions Branch
Ministry of Environment and Climate Change
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
MOECCpermissions@ontario.ca

Master Plan Process

The Master Plan process is discussed in section A.2.7 and Appendix 4 of the Class EA. Appendix 4 of the Class EA sets out different approaches that could be followed, and includes sample notices. It is preferable to determine the Master Plan approach at an early stage of the process, so that the public and commenting agencies are aware of future commenting opportunities, appeal mechanisms, and additional work needed for individual projects in the plan.

For example, the proponent will need to decide whether the final notice of study completion for the Master Plan will also serve as a final notice of completion for some or all of the schedule B projects identified in the Master Plan. In this case, the notice should list the specific schedule B projects and include a statement informing the public that they have a right to request a Part II Order for the specified projects (approach # 2).

Alternatively, if the proponent has determined that additional EA work and public consultation is needed before the schedule B and C projects are deemed to be completed, and the Master Plan simply provides the framework for future decisions, then the Master Plan is not subject to Part II Order requests, and the notice would not include a statement about the Part II Order mechanism (approach # 1, sample notice # 3).

Approach # 4 involves integrating the Master Plan with a planning approval such as an Official Plan or a comprehensive Official Plan Amendment. With this approach, the Master Plan must meet the requirements set out in Section A.2.9 of the Municipal Class EA.

The proponent should be aware that copies of notices must be provided to the Director of this ministry's Environmental Approvals Branch, with a brief summary of how the Master Plan followed the Class EA requirements. This information is required to be sent to EAB for tracking purposes, to monitor the effectiveness of the Master Plan approach at MEANoticesEAAB@ontario.ca.

The Master Plan document should clearly define the projects which will be carried out under the Master Plan, the appropriate schedule for each project, future documentation or studies that will be needed, and future public consultation opportunities for each project or class of projects. The Master Plan should also explain the appeal mechanisms for the projects in the plan (for example, opportunities to request a Part II Order at a later date, appeal to OMB if integration with a Planning Act approval is proposed). We recommend that the Master Plan include a chart which summarizes the above information.

As the Master Plan is intended to satisfy Phases 1 and 2 of the Municipal Class EA process, the Master Plan should evaluate alternatives and identify impacts to the environment. The description and evaluation of alternatives should be completed in sufficient detail to allow any reviewer to understand the advantages and disadvantages of each alternative and the rationale for selecting the preferred alternative. The Master Plan may also identify technical studies that will be carried out in future as the individual projects within the Master Plan are further developed.

Consultation with Review Agencies

In addition to public consultation, consultation with review agencies is an important component of the Class EA process. Please ensure that you contact review agencies directly to determine their interest in the project at the Notice of Commencement stage.

The MOECC Regional office is a mandatory contact for all notices. In addition, other ministries and agencies that may have an interest in the project are listed in section A.3.6 and Appendices 3 and 7. The provincial ministries that are most often involved in Class EA project review include the Ministry of Municipal Affairs (for example, expansion of settlement boundaries, consistency with Growth Plan), Ministry of Natural Resources and Forestry (for example, endangered species, significant wetlands), and Ministry of Tourism, Culture and Sport (for example, cultural heritage or archaeological resources).

The Master Plan should consider any impacts to servicing policies for the area. For example, the Province does not support growth on partial services. In addition, expansion of settlement boundaries may have implications for the Official Plan. We recommend that you include the Ministry of Municipal Affairs Municipal Services Office in Kingston on the list of ministries to be consulted on this project.

The final report should include information on correspondence with review agencies, issues raised by reviewers, and how these issues will be addressed. This could include technical studies or other information, and commitments to obtain specific approvals or permits.

MOECC Technical Review

This Ministry's technical review of the project would consider such issues as:

- problems identified during MOECC inspections of the existing facilities,
- impacts to the receiving water body due to increased volumes of sewage treatment plant effluent,
- impacts to source protection areas,
- quality of the drinking water source,
- impacts to groundwater and surface water due to construction (i.e. dewatering of trenches during installation of sewers and watermains, control of erosion and sedimentation, construction and/or dredging at outfall or intake locations),
- potential for encountering landfill sites, contaminated soil, contaminated sediment or groundwater during construction,
- management of excess materials, waste, contaminated soil and groundwater during construction,
- noise and air quality impacts to nearby residents or planned subdivisions,
- information on inflow and infiltration to the sewage collection system and remedial measures under consideration,
- information on the available capacity at sewage or water treatment plants to service design population,
- proposed water and sewage service areas.

These environmental issues, and appropriate mitigation measures, should be addressed during the Class EA process.

We recommend that you contact this office as soon as possible during the environmental assessment process if you become aware of:

- contaminated sites in the study area or influence area of the project,
- a source water protection vulnerable area in the vicinity of the project, or
- issues that are contentious to the general public.

Water Resources

Taking more than 50,000 litres a day from a lake, river, stream or groundwater source for a water supply requires a Permit to Take Water.

Impacts to surface water due to increased volumes or concentrations of sewage effluent should be evaluated as soon in the Municipal Class EA process as possible. A site-specific receiving water assessment must be conducted to determine the effluent requirements based on the waste assimilative capacity of the receiver. The site-specific effluent requirements derived from the receiving water assessment must be compared to provincial guidelines for effluent discharge (MOE procedure F-5-1: *Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works Discharging to Surface Waters*), and the most stringent criteria will apply. The receiving stream assessment, including background water quality and flow data, must be provided to MOECC by the proponent.

We recommend that the proponent consider development of Dewatering and Excess Water Management Plans for collection, assessment, classification, conveyance, treatment and discharge of ground, surface and storm water encountered within the study area during construction.

We recommend that the proponent develop an Excavation and Sediment Control Plan and a Spill Prevention and Contingency Plan for the project. Spills should be reported to the Spills Action Centre at 1-800-268-6060.

If construction involves taking, dewatering, storage or diversion of water in excess of 50,000 litres per day, the activity may be required to be registered on the Environmental Activity and Sector Registry (EASR) or may require a Permit To Take Water. The process to be used depends on the source of the water, the quantity of water taken, and the type of construction activity. EASR requirements for water takings for construction dewatering are prescribed in Ontario Regulation 63/16 under the Environmental Protection Act. The Permit To Take Water requirements are prescribed in Section 34, Ontario Water Resources Act.

Guidance on nearshore construction and dredging may be obtained from the following MOECC guidelines:

- *B-6 Guidelines for Evaluating Construction Activities Impacting on Water Resources,*
- *Evaluating Construction Activities Impacting on Water Resources, Part III A, Part III B, and Part III C* (dredging handbook) and accompanying *Appendix A Provincial Sediment Quality Guidelines,*
- *Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario: An Integrated Approach.*

Source Protection

Proponents undertaking a Municipal Class EA project must identify early in the process whether a project is occurring within a source water protection vulnerable area. This must be clearly documented in a Master Plan, Project File report or Environmental Study Report. If the project is occurring in a vulnerable area, then there may be policies in the local Source Protection Plan (SPP) that need to be addressed (requirements under the Clean Water Act). The proponent should contact and consult with the appropriate Conservation Authority/Source Protection Authority (CA/SPA) to discuss potential considerations and policies in the SPP that apply to the project.

Please include a section in the report on Source Water Protection. Specifically, it should discuss whether or not the project is located in a vulnerable area or changes or creates new vulnerable areas, and provide applicable details about the area. If located in a vulnerable area, proponents should document whether any project activities are a prescribed drinking water threat and thus pose a risk to drinking water (please consult with the appropriate CA/SPA). Where an activity poses a risk to drinking water, the proponent must document and discuss in the report how the project adheres to or has regard to applicable policies in the local SPP. If creating or changing a vulnerable area, proponents should document whether any existing uses or activities may potentially be affected by the implementation of source protection policies. This section should then be used to inform and should be reflected in other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc. Even if the project activities in a vulnerable area are deemed to not to be a drinking water risk, there may be other policies that apply, so consultation with the local CA/SPA is important.

Noise and Odour

The study should discuss the potential for odour or noise impacts, and propose appropriate mitigation measures. Please refer to this Ministry's Guideline *D-2 Compatibility between Sewage Treatment and Sensitive Land Use*.

Contaminated Sites and Waste Management

The proponent should consider the potential that the project may be constructed in an area of contamination. If an area of contamination is present, the EA should determine the appropriate management of contaminated soil, sediment and groundwater as well as consider health and safety measures.

Waste, including contaminated soil, must be managed in accordance with MOECC standards. The *Environmental Protection Act* (EPA) and Regulation 347 require waste to be classified and disposed of appropriately. When determining the waste category, the proponent must ensure compliance with Schedule 4 of Regulation 347.

Where the removal and movement of soils is required for the project, we recommend that you refer to the MOECC document *Management of Excess Soil – A Guide for Best Management Practices* and Ontario Regulation 153/04 and the accompanying *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* for guidance on assessment, management, restoration and soil quality criteria.

We recommend that the proponent consider development of an Excess Materials Management Plan for identification, assessment, excavation, conveyance, treatment, staging, grading and/or off-site disposal/re-use of soils and aggregates generated within the study area during construction.

The Waste Disposal Site Inventory, dated June 1991, may be helpful in identifying the locations of open and closed waste disposal sites in Ontario.

Consultation with First Nation and Métis Communities

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before authorizing this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of this duty to project proponents while retaining oversight of the consultation process.

Your proposed project may have the potential to affect Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. Where the Crown's duty to consult is triggered in relation to your proposed project**, the MOECC is delegating the procedural aspects of rights-based consultation to you through this letter.** The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following Aboriginal communities who have been identified as potentially affected by your proposed project:

- Algonquins of Ontario (this includes Algonquins of Pikwakanagan)
- Metis Nation of Ontario (Mattawa and Ottawa Councils)
- Mohawks of the Bay of Quinte

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's Environmental Assessment Act is available online at: www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Assessment and Permissions Branch under the following circumstances subsequent to initial discussions with the communities identified by MOECC:

- Aboriginal or treaty rights impacts are identified to you by the communities
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right
- Consultation has reached an impasse
- A Part II Order request or elevation request is expected

The Director of the Environmental Assessment and Permissions Branch can be notified either by email with the subject line “Potential Duty to Consult” to or by mail or fax at the address provided below:

Email:	MOECCpermissions@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Assessment and Permissions Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MOECC will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role you will be asked to play in them.

Should you or any members of your project team have any questions regarding the material above, please contact me at (613) 540-6852.

Yours Truly,

Vicki Mitchell
Environmental Assessment Coordinator
Eastern Region

ec: Susan Jingmiao Shi, J.L. Richards and Associates, sshi@jlrichards.ca

Charlie Primeau, MOECC

James Mahoney, MOECC

COPY

J.L. Richards
& Associates Limite
864 Lady Ellen Place
Ottawa, ON Canada
K1Z 5M2
Tel: 613 728 3571
Fax: 613 728 6012

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

July 10, 2018
Our File No.: 27871-000.0

VIA COURIER

Ms. Vicki Mitchell
Environmental Assessment Coordinator - Eastern Region
Ministry of the Environment and Climate Change
1259 Gardiners Road
P.O. Box 22032
Kingston, ON K7M 8S5

Dear Ms. Mitchell:

Re: Town of Carleton Place – Water and Wastewater Treatment Plants Master Plan Update

Thank-you for your letter of May 18, 2018 in regards to the above-noted project. The following provides some clarification on the scope of this project as well as an update on progress to date.

BACKGROUND

The Town of Carleton Place (Town) originally completed a Master Plan for their Water Treatment Plant (WTP) and Water Pollution Control Plant (WPCP) in 2011 (Stantec, 2011). The Town retained J.L. Richards & Associates Limited (JLR) in January 2018 to update only the capital costing and projected timing for future plant upgrades relative to the 2011 Town of Carleton Place Water Treatment Plant and Water Pollution Control Plant Master Plan. No other deviations from the original Master Plan are necessary at this time and the Town still has the intention to undertake focused Schedule 'C' Class Environmental Assessments on each of the treatment plants at the appropriate times in order to evaluate site-specific issues such as potential impacts to the Natural Environment, effluent requirements, alternative capacity expansion scenarios, etc.

In order to facilitate the update on capital costing and projected timing for the future plant upgrades, two separate reports were prepared as follows:

1. Corporation of the Town of Carleton Place Water Treatment Plant Capacity Expansion Assessment – Final Version (JLR, April 2018).
2. Corporation of the Town of Carleton Place Wastewater Treatment Plant Capacity Expansion Assessment – Final Version (JLR, April 2018).

Copies of both reports are enclosed and a brief summary of the results are included below.

PROCESS FOLLOWED TO UPDATE THE MASTER PLAN

A Notice of Public Meeting was issued on May 2, 2018 to stakeholder agencies and organizations that were previously consulted with during the 2011 Water and Wastewater Treatment Plants Master Plan, as well as agencies who may now have an interest in this project. The notice mentioned that JLR was currently working on an update to the 2011 Town of Carleton Place WTP

CANADA'S BEST MANAGED COMPANIES

and WWTP Master Plan. The Notice indicated that the Master Plans were being updated to include more up-to-date information about historic flows, future flows, capital costs, and possible timing for the projects timing. It was determined that there are no fundamental changes to the recommendations made in 2011 other than adjustments to the timing for the upgrades and the total costs. The capacity increase proposed in 2018 is similar to the capacity increase proposed in 2011.

A Public Meeting was held on May 15th, 2018 to present the results of the work completed on the Water and Wastewater Plants Master Plans, along with a recently developed Water and Wastewater Treatment Plants Resiliency Plan, and proposed new development charges and policies that would be applied throughout the Town. A period of two weeks was allowed to provide comments and no comments were received.

WATER TREATMENT PLANT

In summary, the Master Plan update maintains the recommendation from the original Master Plan to upgrade/expand the existing WTP at the existing site. The anticipated date for expansion of the WTP is 2028 and the Class EA process would be initiated in approximately 2023.

WASTEWATER TREATMENT PLANT

In summary, the Master Plan update maintains the recommendation from the original Master Plan to upgrade/expand the existing WTP at the existing site. The anticipated date for expansion of the WWTP is 2027 and the Class EA process for this undertaking would be initiated in 2022.

SUMMARY

In summary, this Master Plan update was undertaken for the purposes of updating costs and timing associated with capacity expansions to the Town of Carleton Place WTP and WWTP from what was originally established in the 2011 Master Plan in order to provide the Town with additional information for long range planning purposes. There is no intent to do any further detailed work at this time and additional assessment will be completed at the more focused Schedule 'C' Class EA stage. We intend to issue the 30 day Notice of Completion for this project within the next few weeks. Please advise if you have any further comments or concerns with this intent.

Please do not hesitate to contact the undersigned should you have any additional questions or require any additional information at this time.

Yours very truly,

J.L. RICHARDS & ASSOCIATES LIMITED

Brian Hein, P.Eng.

Encl.

cc: Mr. Paul Knowles, P.Eng., Town of Carleton Place (via e-mail: letter only)

CANADA'S BEST MANAGED COMPANIES

From:	Mitchell, Vicki (MOECC)
To:	Brian Hein
Cc:	pknowles@carletonplace.ca
Subject:	Carleton Place Master Plan
Date:	July 11, 2018 3:24:23 PM

Hi Brian,

Further to my last email, I have reviewed the Master Plan updates and have no comments or concerns. I have given the reports to the Water Inspector responsible for Carleton Place, for his information.

As discussed below, this office would like an electronic copy of the Notice of Completion when it is available.

Thanks,

Vicki Mitchell
Regional EA Coordinator
MECP Eastern Region
1259 Gardiners Road, Kingston ON
(613) 540-6852

Hi Brian,

Thank you for providing the reports on the Carleton Place Water and Wastewater Master Plan update. I understand you will be issuing the Notice of Completion soon.

I am requesting a pdf copy of the Notice of Completion via email. The email should be sent to our regional email address eanotification.eregion@ontario.ca

As discussed in my May 18 comments, the Notice of Completion would not include the section about the Part II Order request mechanism unless there are schedule B projects which are completed via the Master Plan process and listed on the Notice.

Vicki Mitchell
Regional EA Coordinator
MECP Eastern Region

Appendix C

Original 2011 Master Plan Document (Town of Carleton Place WPCP Capacity Expansion Master Plan – prepared by Stantec Consulting Ltd.)

Town of Carleton Place
Water Pollution Control Plant
Capacity Expansion Master Plan

1634-00725

Prepared by:

Stantec Consulting Ltd.
100 – 1505 Laperriere Avenue
Ottawa, Ontario K1Z 7T1

Prepared for:

The Town of Carleton Place
175 Bridge Street
Carleton Place, Ontario K7C 2V8

August 2011

Executive Summary

The Town of Carleton Place is experiencing a continued growth in population. Growth in the commercial and institutional realms has occurred as well. As the size of the Town grows, the amount of sewage generated is approaching the current capacity of the Water Pollution Control Plant (WPCP) to process that sewage. This report represents a portion of the planning process to increase the capacity of the WPCP in order to sustain continued growth in the Town of Carleton Place.

This Water Pollution Control Plant Capacity Expansion Master Plan was initiated as a Municipal Class Environmental Assessment (EA). As such it has followed the planning process set out in a document published by the Municipal Engineers Association entitled “Municipal Class Environmental Assessment” dated October 2000, as amended in 2007, and is intended to satisfy the legislative requirements of the Environmental Assessment Act (EAA).

As the study has progressed, it has been determined that the Town is not as close to a WPCP capacity expansion as was anticipated at the initiation of the study. For this reason, the decision was made to finalize the study as a Master Plan. A Master Plan is a long range plan which integrates infrastructure requirements for existing and future land use with environmental assessment principles.

Two alternative solutions for addressing the aforementioned problem were advanced to the final evaluation. They were Alternative 1: Single Stage Construction, and Alternative 2: Two Stage Construction. The criteria for evaluation are the net impacts on the environments that could be affected by the work. These environments have been grouped into three categories: Natural Environment, Social Environment, and Economic / Technical Environment.

Based upon the above analysis, the recommended alternative is *Alternative 1: Single Stage Construction*.

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1.0 Introduction

1.1 BACKGROUND

The Town of Carleton Place is situated in Lanark County (west of the City of Ottawa) and accessed by Provincial Highways #7 and #15 (see Figure 1). Carleton Place has a population of 9,453 (Canada Census 2006) with 3,832 private dwellings on 8.83 sq. km of land. The community provides for development on full municipal water and sewer services. The Mississippi River runs through the center of town and serves as both the source of water for municipal use, as well as the receiving stream for ultimate disposal of the treated sewage effluent.

The Town of Carleton Place is experiencing a continued growth in population. Growth in the commercial and institutional realms has occurred as well. As the size of the Town grows, the amount of sewage generated is approaching the current treatment capacity of the Water Pollution Control Plant (WPCP). This report is part of the planning process to increase the capacity of the WPCP in order to sustain continued growth in the Town of Carleton Place.

This Water Pollution Control Plant Capacity Expansion Master Plan was initiated as a Municipal Class Environmental Assessment (EA). As such it has followed the planning process set out in a document published by the Municipal Engineers Association entitled “Municipal Class Environmental Assessment” dated October 2000, as amended in 2007, and is intended to satisfy the legislative requirements of the Environmental Assessment Act (EAA).

As the study has progressed, it has been determined that the Town is not as close to a WPCP capacity expansion as was anticipated at the initiation of the study. For this reason, the decision was made to finalize the study as a Master Plan. The Municipal Class EA process and the purpose of a Master Plan are further explained in Section 1.4 of this report.

1.2 STUDY AREA

The study area for the purposes of this study is defined as the existing WPCP site and any area that could reasonably be expected to be impacted by the work contemplated in this document. The WPCP site is located south of the Mississippi River off Paterson Crescent, west of McNeely Avenue (see Figure 2). The study area is not limited to land area but is inclusive of water bodies and the atmosphere as well as areas defined by social and economic boundaries. Section 2.0 “Description of the Environment” provides a complete catalogue of the environments considered in the course of this study.

1.3 PROJECT ORGANIZATION

The Town of Carleton Place retained Stantec Consulting Ltd. to complete the environmental planning for a study related to the WPCP Capacity Expansion. The primary contacts for the project are:

Mr. Paul Knowles
Chief Administrative Officer, Town of Carleton Place

Mr. Fernand Dicaire
Senior Associate, Stantec Consulting Ltd.

The responsibilities of each of the parties involved in the study are briefly described below.

Ministry of the Environment	• Provides technical input during document review
Town of Carleton Place	• Proponent of the study • Responsibility for overall conduct of the study • Provides background information on existing system and review comments
OCWA (Operator)	• Provides operational input during entire process
Public	• Provides input at meetings and review comments on published reports
Agencies	• Provides input during document review
Stantec Consulting Ltd	• Consultant responsible for completing the study

1.4 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

1.4.1 General

In Ontario, the EAA provides for the protection, conservation and wise management of the environment by providing a responsible and accountable process of decision-making.

There is a cost effective and streamlined process available to municipalities, referred to as the Municipal Class EA or just Class EA, under which projects can be evaluated based on their "Class" while still meeting the requirements of the EAA. For projects to be evaluated under the Class EA process, they must meet the following conditions:

- Be recurring,
- Usually similar in nature,
- Usually limited in scale,
- Have a predictable range of environmental effects, and
- Be responsive to mitigative measures.

The Class EA provides for the implementation of five key principles of successful planning. These are:

1. Early consultation with affected parties (includes public, landowners, etc).
2. Consideration of a reasonable range of alternatives.
3. Identification and consideration of the effects of each alternative on all aspects of the environment.
4. Evaluation of alternatives to determine their net environmental effect.
5. A clear and complete documentation of the planning process to allow "traceability" of the decision-making.

The Class EA process provides for the planning and implementation of municipal projects also referred to as "Undertakings". Since these projects undertaken by municipalities vary in their environmental impact, such projects (or Undertakings) are classified in terms of schedules. In brief these schedules are summarized below.

Schedule A: Projects in this classification are limited in scale, have minimal adverse environmental effects, and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Class EA planning process.

Schedule A+: Projects in this schedule are pre-approved, however, the public is to be advised prior to project implementation. The manner in which the public is advised is determined by the proponent. In this way, the public can provide comment to the municipality about projects that will be undertaken in their local area.

Schedule B: These projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process, involving mandatory contact with the directly affected public and with relevant government agencies, to ensure that they are aware of

the project and that their concerns are addressed. If there are no outstanding concerns, then the proponent may proceed to implementation. Schedule B projects generally include improvements and minor expansions to existing facilities.

Schedule C: Projects in this schedule have the potential for significant environmental effects and must proceed under the full planning and documentation procedures specified in the Class EA document. Such projects may include the construction of expansion of treatment facilities beyond their rated capacity.

Figure 3 illustrates the process followed in the planning and design of projects covered by the Class EA. The steps considered essential for compliance with the requirements of the Act are summarized as follows:

Phase 1 This stage consists of identifying the problems or deficiencies with the current municipal water and/or sewage systems.

Phase 2 This stage consists of identifying alternative solutions to the problems and establishing the preferred solution, taking into account public and review agency input. At this point, identify the approval requirements and determine the appropriate schedule for the Undertaking.

Phase 3 For projects classified as Schedule C activities, this stage consists of examining alternative methods of implementing the preferred solution in accordance with the Class EA requirements.

Phase 4 For projects classified as Schedule C activities, this stage consists of documenting in an environmental study report (ESR) a summary of the rationale, planning, design and consultation process of the project as established through the preceding phases. This document is subject to scrutiny by review agencies and the public.

Phase 5 Once the above phases have been successfully completed, this stage consists of completing the contract documents and proceeding to construction, operation and monitoring of the Undertaking.

The consultation process is a key element of EA planning. The principal aim of the consultation process is to promote public participation and to achieve resolution of differences in points of view, thus reducing or avoiding controversy and, ultimately, avoiding the use of the Part II Order provision. Section 5.0 of this report describes how the proponent has responded to feedback from the public during the initial stages of this study. These steps, accomplished with a well-documented process, will ensure that concerns are met and impacts are well understood.

Master Plans

The Municipal Class EA document explains that Master Plans are a beneficial way to begin the planning process by considering a group of related projects, or an overall system, prior to dealing with project specific issues. It goes on to state:

> By planning in this way, the need and justification for individual projects and the associated broader context, are better defined. Master Plans are long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system(s) or group of related projects in order to outline a framework for planning for subsequent projects and/or developments. At a minimum, Master Plans address Phases 1 and 2 of the Municipal Class EA process.

1.4.2 Determination of Class EA Category / Master Plan

The WPCP Capacity Expansion was initially being planned as a "Schedule C" activity according to the categories defined by the Municipal Class EA (see Section 1.4.1). Schedule C was selected based upon the fact that the contemplated work will expand the existing WPCP beyond the existing rated capacity. A Phases 1 and 2 Municipal Class EA Report was published and circulated for comment. However, during Phase 3 of the process it was determined that a Master Plan would be a more appropriate format for finalization of the study. This decision was made because the planning process was long-range in nature and no specific projects were proposed for implementation in the next five years.

1.4.3 Study Schedule

A Notice of Study Commencement was distributed to review agencies in June of 2007 to inform them of the planning process. Phases 1 & 2 were completed in the fall of 2007. The Master Plan will be finalized in 2011. It is expected that the Master Plan would be re-visited in five years. A Phase 3 EA Report will need to be completed for each individual project proposed by this Master Plan. Phase 4, the Environmental Study Report (ESR), would be completed at the end of the planning process for each project. Phase 5, Design and Construction, would not commence until population growth triggers a requirement for expansion.

1.5 PROBLEM OVERVIEW

The Town administration foresees continued growth in the population of Carleton Place, and desires to plan for capacity expansion at the WPCP to adequately service future capacity needs. In order to properly plan for future needs and proactively evaluate the possible courses

of action and their respective impacts on the environment, the Town has begun the environmental planning process well in advance of the requirement for expansion. It is the intent of the Town to develop an efficient strategy for implementing upgrades to the WPCP for the purpose of expanding capacity in a logically staged approach, thereby matching increasing levels of demand with increasing levels of capacity. This will allow for a gradual implementation of construction upgrades as needed.

2.0 Description of the Environment

The "Description of the Environment" section of this report is divided into three primary groupings: Natural Environment, Social Environment and Economic / Technical Environment. These divisions are intended to group related environments for ease of understanding. The descriptions are intended to provide an overview of the individual environments, highlighting the significant features which could be impacted by the project. Muncaster Environmental Planning Inc. was assigned the task of assessing the Natural Environment at the WPCP site. Excerpts from Muncaster's report have been used in the following sections, while the entire report is included in Appendix A.

2.1 NATURAL ENVIRONMENT

2.1.1 Air Environment and Birds

The study area experiences a cold, continental-type climate. According to Environment Canada meteorological data, as recorded at the Ottawa, Ontario weather station, the average daily temperature ranges from –10.8 degrees Celsius in January to +20.9 degrees Celsius in July. Below freezing temperatures (as defined by the daily minimum) are usually experienced for five months out of the year (November through March). The average annual total precipitation is 943.5 mm. During the average year, measurable precipitation occurs on 163 days.

Documented precipitation extremes are as follows:

- Extreme daily rainfall = 80 mm
- Extreme daily snowfall = 40.6 cm
- Extreme snow depth = 135 cm

The annual average wind speed for this area is 12.9 km/hr. The predominant wind direction is west from November to April and south from May to October. Annual average number of days with wind speed exceeding 52 km/hr is 7.7. The maximum hourly wind speed (80 km/hr) occurred on October 15, 1954. The maximum gust speed (135 km/hr) occurred on May 11, 1959.

The Ontario Ministry of the Environment monitors air quality for this region. The closest monitoring station to the project site is Ottawa. The rating system has five levels: very good, good, moderate, poor, and very poor. The 2006 season history for Ottawa recorded only one day of "poor" air quality. The cause of the poor air quality was ozone. The remainder of the recorded days for 2006 were classified between "very good" and "moderate" air quality rating.

Birds observed among the generally open area north of the WPCP included Baltimore oriole, grey catbird, American crow, ring-billed gull, European starling, yellow warbler, song sparrow and American robin. Birds observed in and adjacent to the deciduous forest, southwest of the WPCP, included American robin, common grackle, yellow warbler, red-winged blackbird, warbling vireo, white-breasted nuthatch and American redstart, the latter likely still in migration on the date of observation (May 17th, 2007).

The Natural Heritage Information Centre database, maintained by the Ontario Ministry of Natural Resources, identified one rare bird species in the general area of Carleton Place. The red-shouldered hawk (*Buteo lineatus*) is a species of special concern, defined as wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats. The red-shouldered hawk would generally be found in denser forests, with a greater coniferous component, than that in the proximity of the WPCP site.

2.1.2 Water Environment and Aquatic Animals

The Mississippi River is the dominant water environment in proximity to the WPCP. Mississippi Lake is upstream of Carleton Place. The Mississippi River meanders to the east of the WPCP, around Glen Isle and northeast towards Appleton. Wetlands are present in reaches along the Mississippi River, with the closest provincially significant wetland, the Appleton Marsh, well downstream of Carleton Place between Appleton and Almonte. No designated natural areas, Areas of Natural and Scientific Interest or Conservation Areas are reported in proximity to the study area.

The shoreline of the Mississippi River is within about five metres of the existing northwest section of the perimeter fencing. Coppice silver and red maple trees provide good stream cover along the shoreline. The aquatic habitat of the Mississippi River in proximity to the WPCP possesses a diverse sequence of run and riffle habitat. The substrate is a combination of fines, rubble, cobble and exposed bedrock. Aquatic vegetation, both emergent and submergent, and woody debris add to the diversity of in-stream structure. Aquatic and shoreline vegetation include rice-cut grass, pondweeds, hard-stem bulrush, water horehound, boneset, spotted jewelweed and broad-leaved cattail. Side channels add to the diversity of available aquatic habitat.

The warm water aquatic habitat of the Mississippi River in the general area is diverse and productive. Good spawning, nursery, resting and feeding habitst is present along the Mississippi River in the vicinity of Carleton Place. Several species of sportfish and coarse fish have been documented along this reach of the river including northern pike, smallmouth bass, largemouth bass, yellow perch, walleye, white sucker, yellow bullhead, brown bullhead, channel catfish, several redhorse sucker species, American eel, rock bass and pumpkin seed. Forage

fish include bluntnose minnow, longnose dace, logperch, mimic shiner, blackchin shiner and golden shiner. Mississippi Lake upstream provides important northern pike, walleye and bass spawning areas. A public access point to the River and Lake is upstream of the Water Treatment Plant at the west end of Lake Avenue West. Additionally, historical beaver cuttings are common adjacent to the Mississippi River shoreline.

The Natural Heritage Information Centre database, maintained by the Ontario Ministry of Natural Resources, identified two rare aquatic species in the general area of Carleton Place. Blanding's turtle (*Emydoidea blandingii*) is considered threatened, defined as a species likely to become endangered if limiting factors are not reversed. This species would be found along the Mississippi River corridor, as would another identified rare species, the Halloween Pennant (*Celithemis eponina*). This dragonfly species is considered vulnerable in the Province due to relatively few populations or other factors making it vulnerable to extirpation.

2.1.3 Land Environment and Terrestrial Animals

The land environment surveyed generally included the WPCP site and adjacent lands up to 100 meters beyond the existing perimeter fence around the Plant. The Carleton Place Curling Club and associated parking lots are south of the existing WPCP, with a remnant deciduous forest to the southwest, the Mississippi River to the west and north, and a yard and hazardous waste drop off and storage area to the east.

WPCP Site

Natural environment features are limited inside the perimeter fence. Three red pine trees, in generally good condition, are on a grassed area between the Control and Digester Buildings. The largest of these conifers is 28cm diameter at breast height (dbh). A row of white pines, also in good condition, is along the west side of the Control Building and the aeration tanks. The pines are up to 22cm dbh. A dense row of smaller white cedars is adjacent to the northeast perimeter of the existing fencing.

The lands to the south are grassed between the Water Pollution Control Plant and the Carleton Place Curling Club. In addition to bluegrass, white clover, lower hop clover and common dandelion are common. A coppice (multi-stemmed) white elm is to the south of the fencing with several tree plantings along the north side of the Curling Club parking. An 18cm dbh sugar maple is the largest of these plantings, with smaller ash, maple and white spruce stems.

Most of the lands to the north of the existing Water Pollution Control Plant are open, with fields of cypress spurge, common burdock, brome grass, common plantain, wild carrot, common dandelion, bull thistle, alsike clover, yellow rocket, prickly ash and red raspberry. The invasive tartarian honeysuckle is very common among intermittent hedgerows, with Manitoba maple, sugar maple, red maple, white poplar, hawthorn, serviceberry, chokecherry, red ash and white

elm represented. The largest trees in the deciduous hedgerows are sugar maples up to 38cm dbh, with white elms up to 28cm dbh.

A few planted tamaracks are north of the row of white cedar along the perimeter fencing. The largest cedars are in the range of 13cm dbh. Manitoba maple, white elm and tartarian honeysuckle are among the east portion of the white cedar row.

Terrestrial wildlife observed among the generally open area north of the Water Pollution Control Plant was limited to a woodchuck.

Adjacent Deciduous Forest

A remnant deciduous forest is to the southwest of the Water Pollution Control Plant, with a paved recreational pathway spur between the forest and the perimeter fencing. Young deciduous trees are along the pathway including Manitoba maple, white elm, red maple, red ash, white ash and sugar maple. The largest of these trees are up to 26cm dbh. Tartarian honeysuckle and hawthorn shrubs are also present.

The deciduous forest is generally scrubby, with broken limbs off many of the trees, although the canopy cover is generally good. Exposed bedrock is common. The more mature trees are generally further west of the existing Plant, including a 55cm dbh sugar maple approximately 45 metres southwest of the perimeter fence. Mature white poplars, up to 50cm dbh are much closer to the fencing, adjacent to the recreational pathway. These poplars appear to be in poorer condition with reduced leaf-out. A few white cedars, up to 24cm dbh, provide some coniferous component. The ground flora of the forest is dominated by non-native species, a reflection of the disturbed nature of the area. Garlic mustard is abundant in areas, along with ground ivy and common dandelion. Poison ivy, herb robert and bloodroot were also observed. The invasive and non-native common buckthorn is abundant in portions of the understorey. Sugar maple regeneration is good in many areas.

The deciduous forest continues to the west, between the main recreational pathway running along the Mississippi River and the River itself. The influence of non-native ground flora remains high. Garlic mustard, common burdock, rough cinquefoil, wormseed mustard are widely distributed along with Virginia creeper. Common buckthorn, black current and tartarian honeysuckle are common in the understorey. Silver maple, red maple, crack willow, white elm and red ash are the dominant tree species, with 75cm over-mature crack willow and 25cm dbh silver maple representing the largest trees. Many of the willows have major broken limbs, with willows closer to the shoreline of the Mississippi River in generally better condition. Fill material appears present, with exposed bedrock in other areas.

The recreational pathway continues along the shoreline. Vegetation between the pathway and the fencing includes planted hackberry stems, along with red raspberry, cypress spurge, garlic

mustard, brome grass, yellow rocket, spreading dogbane, red-osier dogwood and Manitoba maple.

Terrestrial wildlife observed in and adjacent to the forest was limited to the grey squirrel.

2.2 SOCIAL ENVIRONMENT

2.2.1 Community / Development

According to the "Official Plan of the Town of Carleton Place" (OP), Carleton Place is largely urbanized, with some areas designated to accommodate future development. A sufficient supply of land is available for residential, commercial/industrial, recreational, open space and institutional uses. This will allow for a range of employment opportunities and housing types to accommodate future growth and development. Key employers are the high tech sector, health and social services, and light manufacturing. A significant portion of the workforce commutes into the City of Ottawa on a daily basis for employment.

In the discussion on "Housing", the OP states that the recent historical average has been 80 new homes constructed annually in the Town. It goes on to explain that there is at least a 10-year supply of land to meet future residential needs and that Council will strive to maintain the future supply of residential land at its current level.

The Town of Carleton Place has a population of 9,453 (Canada Census 2006) with 3,832 private dwellings on 8.83 sq. km of land. The community provides for development on full municipal water and sewer services. The Mississippi River runs through the center of town and serves as both the source of water for municipal use, as well as the receiving stream for ultimate disposal of the treated sewage effluent.

The WPCP site is located in close proximity to a residential area of Carleton Place. Residential lots begin approximately 180 feet (54.9 meters) northeast of the entrance to the WPCP site. Lots continue east on both sides of Patterson Street with 49 feet (14.9 meters) of frontage per lot. A public school is located to the east of the site. The Carleton Place Curling Club is located to the southeast.

2.2.2 Heritage / Culture / Historical Significance

In May 2007, McSweeney & Associates issued a report entitled "The Town of Carleton Place Community Strategic Plan". This report documented community thoughts, feelings and ideas about the current state of the Town and where it should be going. One of the greatest strengths of Carleton Place was documented to be the heritage assets and the historic appeal of the built

environment. The local heritage is seen as a key to promoting Carleton Place and the historical and heritage assets are considered to be a cornerstone for revitalizing the downtown.

The Canadian Register of Historic Places (www.historicplaces.ca) is a searchable database containing information about recognized historic places of local, provincial, territorial and national significance. On June 6, 2007, a search of the database was performed for the study area with a result of no registered historic places.

The Ontario Heritage Properties Database (www.culture.gov.on.ca) is a searchable database containing information on over 5,000 heritage properties in Ontario. On June 6, 2007, a search of the database was performed for the study area with a result of no registered heritage properties.

Based upon these database searches, it is assumed that there are no significant historic, cultural or heritage sites in the study area.

2.2.3 Aesthetics / Health / Safety

The aesthetic environment of the study area would include visual impact, sounds, vibrations and odours. There have been odour complaints from local residents due to the operations of the WPCP. These complaints are currently being addressed through a capital works project for handling sludge at the facility.

The walking path through the deciduous forest adjacent to the WPCP is a primary feature contributing the aesthetic environment. Other trees and natural features form a buffer and enhance the aesthetics of the site.

The health and safety aspects of this environment include truck traffic necessary for operating the WPCP as well as the sewage handling and disposal which occurs at the site. The site is considered to be a safe environment with a safety program in place to regulate the day-to-day operation of the facility. A barbed wire perimeter fence is used to limit access to the facility.

2.3 ECONOMIC / TECHNICAL ENVIRONMENT

2.3.1 Economic

According to the OP, Carleton Place has a diversified and relatively strong economic base with occupations primarily in the manufacturing, retailing and health and social services, followed by business services and government. A recent study indicates that there is a large and well educated labour force for professional, and trades and services job needs in the area

(*Economic Promotion Study: Town of Carleton Place*, Market Research Corporation, May 2001).

Current regulations ensure that water and sewer services are provided on a "user pay" basis. The costs of constructing, operating and maintaining the facilities to provide these services are to be entirely subsidized by those who use them. Development charges are assessed when someone applies for a building permit, and can be used to cover the costs of expansion of municipal services. Water and sewer rates are charged at regular intervals for on-going service.

2.3.2 Physical Constraints

The physical constraints environment includes the potential barriers to expansion. This environment is linked to the economic environment (since with enough money most barriers can be overcome), but it warrants its own category because of the time, difficulty and risk that these constraints often represent. The natural feature of the Mississippi River is one physical constraint. Existing development would also be considered as part of the environment of physical constraints.

2.3.3 Land Ownership / Legal

The land ownership and legal environment relates to the availability of land and the requirements of obtaining and using that land for the WPCP expansion. The Town owns the land currently housing the WPCP. The Town also owns the land directly east and south.

3.0 Identification of Design Alternatives

3.1 BACKGROUND

It is the purpose of this report to take the preferred solution from Phases 1 and 2 of this project and look at design alternatives for implementing that solution. Some design alternatives may be touched upon briefly, but not considered as options to be evaluated for one reason or another. The criteria that was used in the determination of the alternatives to be evaluated was based upon generally accepted principles and previous experience. The criteria included the following:

- application of current engineering practices and standards,
- adherence to applicable laws and regulations,
- economic considerations,
- operation and maintenance issues,
- acceptability to concerned stakeholders, and
- feasibility of implementation.

3.1.1 Major Process Changes

The possibility exists to implement treatment processes other than the processes that are already in place at the WPCP. This possibility was considered in the preliminary evaluation and it was determined that wholesale changes to any of the major processes would not meet the criteria listed above, specifically with respect to feasibility of implementation and economic considerations. This does not however, eliminate the possibility of minor process modifications during detailed design. Generally, the major components of the process will be evaluated with respect to capacity, and alternatives for capacity expansion of the WPCP will be presented with respect to these major components.

3.1.2 Current Capacity of Components

Process equipment and components at the WPCP are divided into two categories: those designed for the dry weather flow rate (7,900 m^3/d) and those designed for the wet weather flow rate (22,000 m^3/d). Dry weather flow is an annual average flow rate exclusive of storm events (wet weather flow). The wet weather flow rate is the peak flow rate that the plant is approved to handle. Major components (as shown in Figure 4) are listed below with their current design capacity.

Component	Design Capacity for Dry Weather Flow	Design Capacity for Wet Weather Flow
Headworks		
Mechanical Screen		26,000 m^3/d
2 Vortex Degritters		20,000 m^3/d
3 Low Lift Pumps		13,000 m^3/d (each)
Primary Clarification		
2 Process/Settling Tanks	10,400 m^3/d	
3 Physical/Chemical Tanks		11,600 m^3/d (10,400 + 11,600 = 22,000 wet weather flow)
Aeration		
3 Rectangular Basins	7,900 m^3/d	
Mixing Capability	15,000 m^3/d	
Secondary Clarification		
3 Rectangular Tanks	10,400 m^3/d	
Disinfection		
UV Radiation	11,000 m^3/d	
Phosphorous Removal		
Feed Pumps		22,000 m^3/d
Coagulant Storage Tank	30 days reserve capacity	
Anaerobic Digestion / Storage		
3 Circular Tanks	Approx. 230 days storage	

3.1.3 Long Range Planning

The Town undertook a study in 2010 to determine the long-term potential of the current WPCP site. The scope of the study included a review of the ability of the existing site to meet the needs of a future population of 43,000 people. Also included was a review of two other options: (1) leaving the existing WPCP as is and constructing a second WPCP at another site, and (2) decommissioning the existing WPCP and constructing a new WPCP to accommodate all of the Town demand. The end result of the study was that the existing site of the WPCP can accommodate expansion to a population of 43,000 people, and that this was the preferred option of the three options considered. The study is included in Appendix B.

3.2 DEVELOPMENT OF ALTERNATIVE SOLUTIONS

In developing alternative solutions, there are a range of factors that must be considered. Some of the factors considered in the development of alternatives are listed here:

- Quantity of wastewater,
- Quality of effluent,
- Sludge management, and
- Upgrade timing issues.

These items are addressed in more depth below.

3.2.1 Quantity of Wastewater

The current WPCP rated capacity is 7,900 m^3/d (annual average) for dry weather flow and 22,000 m^3/d (maximum) for wet weather flow. The following table summarizes recent flows and compares the most recent data to the rated capacity.

	Dry Weather Average Flow (m^3/d)	**Percent of Rated Capacity (Rating = 7,900 m^3/d)**	**Maximum Wet Weather Flow (m^3/d)**	**Percent of Allowable Peak Flow Rate (22,000 m^3/d)**
2003	5,994	75.9 %	13,837	62.9 %
2004	5,326	67.4 %	21,757	98.9 %

2005	5,818	73.6 %	22,464	102.1 %
2006	6,678	84.5 %	13,405	60.9 %
2007	5,125	64.9 %	19,046	86.6 %
2008	5,986	75.8 %	24,158	109.8 %
2009	5,330	67.5 %	13,439	61.1 %
2010	5,959	75.4 %	15,780	71.7 %
Average	5,777	73.1 %	17,985	81.7 %

The table shows that the average dry weather flow for the last five years is 5,777 m^3/d. At this flow, the WPCP is operating at 73.1% of its rated capacity. The Town of Carleton Place has provided the consultant with the following assumptions: the population for 2008 was assumed to be 9700 people, and the expected growth rate is 145 people per year. It is also assumed that dry weather flow rates per capita remain constant. Based upon these assumptions, it is estimated that the WPCP will reach its rated capacity in the year 2029. The estimated population at that time would be in the order of 12,746 people. Since population growth rates are not easily predicted and changes in per capita flows may occur, it is recommended that the above assumptions and conclusions be revisited every five years or sooner if deemed necessary by extreme population growth. For the purposes of this report, it is assumed that the ultimate rated capacity of the WPCP will be 10,000 m^3/d.

The above table also shows that several major wet weather flow events have occurred in the last five years. Wet weather flow events (flows greater that 10,400 m^3/d) typically occur once or twice each year. These events correspond with either heavy rains or rainfall combined with snowmelt. The maximum flows for the most recent five years can be averaged to obtain 17,985 m^3/d or 81.7 % of the plant's Peak Flow Rate. For the purposes of this report, it is assumed that the ultimate peak flow of the WPCP will be 27,000 m^3/d.

3.2.2 Quality of Effluent

The current discharge effluent limits imposed by the MOE in the most recent Certificate of Approval (C of A) are tabulated below.

Effluent Parameter	Average Concentration Effluent Limit (milligrams per litre)
CBOD5	25
Total Suspended Solids	25
Total Phosphorous	1
Total Ammonia (Ammonia + Ammonium) Nitrogen	4 (May 15 to September 30)

Based upon discussions with the MOE during this planning process and the Receiving Water Assessment (Stantec, 2009), included as Appendix C, the following changes are expected to be put in place when the WPCP is upgraded to expand its capacity.

- Total Phosphorous: 0.2 mg/l for the months of June, July, and August; 0.3 mg/l for the rest of the year
- Total Ammonia: 3.63 mg/l for the months of June, July, and August; 15 mg/L for the rest of the year
- Acute Lethality: year-round testing to show effluent is non-acutely lethal

The more stringent requirement for phosphorous will necessitate the implementation of tertiary treatment (effluent filtration). This could include sand filtration, cloth media filter disks, or enhanced sedimentation technology. Due to the long lead time prior to implementation, these technologies will not be evaluated as part of this report.

3.2.3 Sludge Management

The treatment process produces a waste sludge which requires final disposal off-site. Currently, the sludge is either spread on farm fields (conditions permitting) or it is hauled to ROPEC (the City of Ottawa sewage treatment facility). Issues, such as the respective costs of the two disposal options, the time frames for spreading on the fields, and the amount of storage available at the plant, all factor into the current sludge management plan. Generally, it is less expensive to spread on the fields than to dump at ROPEC, so this option is used whenever possible. In 2007, the sludge hauled away from the WPCP totaled 6288 m^3. ROPEC was the final destination of 301.1 m^3, while 5,986.9 m^3 was spread on farm fields.

Current capital works, which are in the construction stage, will provide the ability to decant the sludge (separating out some of the water and making a drier waste). This will allow for an additional sludge management option – disposal of the sludge at a landfill. The landfill option is expected to be somewhere between the other two options with respect to cost. This will also address concerns about the future of disposal at ROPEC and delay the need to increase storage capacity.

During the 2003 investigation of WPCP sludge processing problems, it was decided that the chemical sludge from the Water Treatment Plant (WTP) Actiflo system should be separated out from the sewage flow since it did not benefit from the biological treatment process and was overloading the plant. This separation would be achieved by pumping the chemical sludge in a new forcemain from the WTP to a new Dissolved Air Flotation unit (DAF) at the WPCP. A subsequent change in the type of coagulant used at the WTP resulted in a greatly reduced quantity of chemical sludge, and deferred the need for immediate implementation of the chemical sludge separation. The forcemain is being installed piecemeal to coincide with planned road reconstruction along the forcemain route. This is an effective approach to minimizing the installation costs. The trigger for implementation of the DAF would be a transfer rate approaching 50 m^3/day of co-settled sludge from the primary clarifiers to the primary digester. Currently the transfer rate is below 40 m^3/day, and this rate is not expected to reach the trigger point prior to the need for a plant capacity expansion.

3.2.4 Upgrade Timing Issues

Upgrading of the WPCP is expected to take place on an “as needed” basis. There are three different measuring sticks that could be used to communicate when an upgrade would be required. The easiest to understand, but least accurate, would be to give a year in the future when upgrades will be needed. Estimated upgrade years are provided but are based upon the assumptions of population growth rate and per capita (per person) flow. Estimated population at upgrade could also be used as a measuring stick (and will be provided for reference), but it is also limited by the assumption of a stable per capita flow. The most accurate indicator of when the upgrade will be required is at a given flow. The WPCP has been designed to accommodate a given flow (as previously indicated). As a rule of thumb, when the flow to the WPCP is around 90% of capacity (depending on growth rate) it is advisable to begin implementing the upgrades needed to increase the capacity of the plant. Below is a table summarizing timing for the next major upgrade at the WPCP with respect to the factors noted above.

Criteria	90% of Rated Capacity	100% of Rated Capacity
Flow	7,110 m^3/d	7,900 m^3/d

Population	11,472 people	12,746 people
Year	2020	2029

3.3 IDENTIFICATION OF DESIGN ALTERNATIVES FOR EVALUATION

3.3.1 Alternative Design 1: Increase Rated Capacity to 10,000 m3/d in One Stage

This alternative involves upgrades to the WPCP in order to achieve an increase in the average dry weather rated capacity of the works from 7,900 m^3/d to 10,000 m^3/d. Additionally, the wet weather peak flow rate would increase from 22,000 m^3/d to 27,000 m^3/d. Given the assumptions of this report, the upgrade would take place in 2020 and meet capacity demands until 2052. This upgrade would entail work at each of the following major process components: Headworks, Primary Clarification, Aeration, Secondary Clarification, Disinfection and Phosphorous Removal. An opinion of probable cost of the upgrades is presented in Appendix D. The primary upgrades include:

- Headworks: Add a third vortex degritter (10,000 m^3/d)
- Headworks: Replace three low lift pumps (16,000 m^3/d each)
- Primary Clarification: Add a fourth tank (5,200 m^3/d)
- Aeration: Add a fourth tank (2,100 m^3/d)
- Secondary Clarification: Add a fourth tank (3,500 m^3/d)
- Disinfection: Add UV light bank (16,000 m^3/d)
- Phosphorous Removal: Add one pump (5,000 m^3/d), add storage to maintain 30 days storage capacity
- Tertiary Treatment: Add effluent filtration (27,000 m^3/d)

3.3.2 Alternative Design 2: Increase Rated Capacity to 10,000 m3/d in Two Stages

This alternative would break up the construction of the upgrades into two stages of approximately equal magnitude. The same upgrades would be needed at each of the major process components, however the upgrades would be implemented in two small steps instead of one big step. The intermediary plant ratings (after Stage 1) would be approximately 9,000 m^3/d (dry weather) and 24,500 m^3/d (wet weather). Given the assumptions of this report, Stage

1 would occur in 2020, Stage 2 would occur in 2036 and these upgrades would meet capacity demands until 2052. Stage 1 of the upgrades would entail the following:

- Headworks: Add a third vortex degritter (5,000 m^3/d)
- Headworks: Replace one low lift pump (16,000 m^3/d)
- Primary Clarification: Add a fourth tank (2,600 m^3/d)
- Aeration: Add a fourth tank (1,050 m^3/d)
- Secondary Clarification: Add a fourth tank (1,750 m^3/d)
- Disinfection: Add UV light bank (8,000 m^3/d)
- Phosphorous Removal: Add one pump (2,500 m^3/d), add storage to maintain 30 days storage capacity
- Tertiary Treatment: Add effluent filtration (24,500 m^3/d)

The Stage 2 upgrades would be similar to Stage 1, but take place at a later date. The primary upgrades would be:

- Headworks: Add a fourth vortex degritter (5,000 m^3/d)
- Headworks: Replace two low lift pumps (16,000 m^3/d each)
- Primary Clarification: Add a fifth tank (2,600 m^3/d)
- Aeration: Add a fifth tank (1,050 m^3/d)
- Secondary Clarification: Add a fifth tank (1,750 m^3/d)
- Disinfection: Add UV light bank (8,000 m^3/d)
- Phosphorous Removal: Add one pump (2,500 m^3/d), add storage to maintain 30 days storage capacity
- Tertiary Treatment: Add effluent filtration (2,500 m^3/d)

4.0 Evaluation Criteria and Review Process

This section of the report will detail the evaluation criteria and explain the process that was used to review each option in relation to those criteria. Some of the criteria are subjective and, as such, the evaluation process is affected by the opinions of those who participate in the evaluation process. This is generally considered to be a beneficial component of the report since it then compiles many views on the issues presented.

4.1 SCREENING CRITERIA

The criteria for evaluation are the environments that could be affected by the work. These environments have been grouped into three categories: Natural Environment, Social Environment, and Economic / Technical Environment. The individual criteria for each of these environment groups are as follows:

Natural Environment

- Air Environment and Birds
- Water Environment and Aquatic Animals
- Land Environment and Terrestrial Animals

Social Environment

- Community / Development
- Heritage / Culture / Historical Significance
- Aesthetics / Health / Safety

Economic Technical Environment

- Economic
- Physical Constraints
- Land Ownership / Legal

Detailed descriptions of the above criteria as they will be used in the assessment of the alternative solutions are compiled in Table 1.

4.2 ESTABLISHMENT OF RATING SYSTEM

Each alternative solution will be assigned a level of impact for each of the criteria identified in Table 1. The rating system used for evaluation establishes seven levels of impact. The levels of impact are:

- Major Positive Impact (+3)
- Moderate Positive Impact (+2)
- Minor Positive Impact (+1)
- Neutral or Inconsequential Impact (0)
- Minor Negative Impact (-1)
- Moderate Negative Impact (-2)
- Major Negative Impact (-3)

Corresponding explanations of the impact levels and the methodology of the rating system are explained in Table 2.

4.3 EVALUATION OF ALTERNATIVE SOLUTIONS

The summary of the evaluation for the alternative solutions is presented in Table 3. An explanation of the reasoning for the ratings given is provided below.

4.3.1 Alternative Design 1: Increase Rated Capacity to 10,000 m3/d in One Stage

Natural Environment

Air Environment and Birds – *Neutral or Inconsequential Impact (0)* No impacts are expected for this environment once proper mitigating measures are implemented. Mitigating measures will include taking care not to remove trees used for nesting during the breeding season.

Water Environment and Aquatic Animals – *Neutral or Inconsequential Impact (0)* No impacts are expected for this environment once proper mitigating measures are implemented. Potential impacts of construction near waterbodies could include sedimentation, turbidity, and

contamination. Mitigating measures will include erosion control measures, buffers, setbacks, and spill control facilities.

Land Environment and Terrestrial Animals – *Neutral or Inconsequential Impact (0)* The areas where construction is anticipated have been previously disturbed by development.

Social Environment

Community / Development – *Moderate Positive Impact (+2)* This alternative would provide the ability for the Town of Carleton Place to continue growing. Continued development of the residential / commercial / institutional areas could proceed at a pace determined by the Town Council. Construction activities could impact driving/access routes for local residents and institutions.

Heritage / Culture / Historical Significance – *Neutral or Inconsequential Impact (0)* Due to the lack of identifiable heritage, cultural or historical features, no impact is expected on this environment.

Aesthetics / Health / Safety – *Neutral or Inconsequential Impact (0)* There should be few impacts to aesthetics. Construction activities could potentially affect health and safety, but proper implementation of mitigating measures will minimize impacts. Mitigating measures include strict adherence to applicable legislation, proper signage for vehicular traffic approaching the work site, and diligent clean-up and site security (temporary fencing of open trenches and other potential hazards).

Economic / Technical Environment

Economic – *Minor Negative Impact (-1)* There will be a minor economic impact as the Town of Carleton Place will need to determine how to pay for the expansion.

Physical Constraints – *Neutral or Inconsequential Impact (0)* Since construction of the expansion would be on adjacent vacant property, inconsequential impact is expected for this environment.

Land Ownership / Legal – *Neutral or Inconsequential Impact (0)* Since construction of the expansion will be on Town owned land, inconsequential impact is expected for this environment.

4.3.2 Alternative Design 2: Increase Rated Capacity to 10,000 m3/d in Two Stages

Natural Environment

Air Environment and Birds – *Neutral or Inconsequential Impact (0)* No impacts are expected for this environment once proper mitigating measures are implemented. Mitigating measures will include taking care not to remove trees used for nesting during the breeding season.

Water Environment and Aquatic Animals – *Neutral or Inconsequential Impact (0)* No impacts are expected for this environment once proper mitigating measures are implemented. Potential impacts of construction near waterbodies could include sedimentation, turbidity, and contamination. Mitigating measures will include erosion control measures, buffers, setbacks, and spill control facilities.

Land Environment and Terrestrial Animals – *Neutral or Inconsequential Impact (0)* The areas where construction is anticipated have been previously disturbed by development.

Social Environment

Community / Development – *Moderate Positive Impact (+2)* This alternative would provide the ability for the Town of Carleton Place to continue growing. Continued development of the residential / commercial / institutional areas could proceed at a pace determined by the Town Council. Construction activities could impact driving/access routes for local residents and institutions. This would occur during two separate construction periods.

Heritage / Culture / Historical Significance – *Neutral or Inconsequential Impact (0)* Due to the lack of identifiable heritage, cultural or historical features, no impact is expected on this environment.

Aesthetics / Health / Safety – *Neutral or Inconsequential Impact (0)* There should be few impacts to aesthetics. Construction activities could potentially affect health and safety, but proper implementation of mitigating measures will minimize impacts. Mitigating measures include strict adherence to applicable legislation, proper signage for vehicular traffic approaching the work site, and diligent clean-up and site security (temporary fencing of open trenches and other potential hazards).

Economic / Technical Environment

Economic – *Moderate Negative Impact (-2)* There will be a moderate economic impact to the Town of Carleton Place as a result of pursuing a two stage approach to construction.

Physical Constraints – *Neutral or Inconsequential Impact (0)* Since construction of the expansion would be on adjacent vacant property, inconsequential impact is expected for this environment.

Land Ownership / Legal – *Neutral or Inconsequential Impact (0)* Since construction of the expansion will be on Town owned land, inconsequential impact is expected for this environment.

4.4 IDENTIFICATION OF RECOMMENDED ALTERNATIVE

Based upon the above analysis, the recommended alternative is *Alternative Design 1: Increase Rated Capacity to 10,000 m^3/d in One Stage*. This alternative is described in detail earlier in the report (Section 3.3.1). Appendix E presents a breakdown of the planned projects under the recommended alternative, as well as the opinion of probable cost and the approximate timeframe for implementation.

5.0 Consultation

In June 2007, a Notice of Study Commencement was distributed to review agencies and published in the local newspaper. The list of the review agencies used for distribution is included in Table 4.

A public meeting was held on June 21, 2007 to review Phases 1 and 2 of the undertaking. Stantec Consulting Ltd. presented the problem definition, alternative solutions, and recommended solution. Comments were encouraged and comment sheets were made available. Public notices and written comments are included in Appendix F.

A public meeting was held on June 17, 2008 to review Phase 3 of the undertaking. Stantec Consulting Ltd. presented the alternative designs and the recommended design. Public notices and written comments are included in Appendix F.

A public meeting was held on June 24, 2010 to inform the public of changes to Phase 3 of the undertaking and to inform the public of the results of the long-term planning study which had been completed. Public notices and written comments are included in Appendix F.

It was decided by the proponent to finalize the reporting in the form of a Master Plan instead of as an Environmental Study Report. The Master Plan will be placed on the public record and the Town will publish the Master Plan Notice of Completion (included in Appendix F) in 2011.

6.0 References

Market Research Corporation, Economic Promotion Study: Town of Carleton Place, May 2001

McSweeney & Associates, The Town of Carleton Place Community Strategic Plan, May 15, 2007

Muncaster Environmental Planning, Town of Carleton Place Report, June 2007

Municipal Engineers Association, Municipal Class Environmental Assessment, June 2000

Stantec, Carleton Place WTP & WWTP Upgrade Study, January 2007

Town of Carleton Place, Official Plan of the Town of Carleton Place, 2005

Table 1: Description of Screening Criteria

Criteria Groupings	Criteria Descriptions for the Assessment of the Alternative Solutions
Natural Environment	
Air Environment and Birds	Assess the potential for impacts to the natural environment of the air and birds. Potential impacts could be related to dust or other air-born contaminants, odours, noise pollution, heat generation or physical "aerial" structures which could be hazardous to birds (i.e. wind turbines). The scope of impacts would include current usage by individuals or groups.
Water Environment and Aquatic Animals	Assess the potential for impacts to the natural environments primarily associated with water. This would include waterbodies, aquatic flora and fauna and groundwater. The scope of impacts would include both quality and quantity of water and habitat, as well as current usage by individuals or groups.
Land Environment and Terrestrial Animals	Assess the potential for impacts to the natural environment of terrestrial flora and fauna. This would include soils, vegetation and primarily land-dwelling animals. The scope of impacts would include current usage by individuals and groups.
Social Environment	
Community / Development	Assess the potential for impacts to the social environments in which people operate (community) and the development of those environments. These would include government, education, business, housing, man-made recreational facilities, transportation and access to facilities and services.
Heritage / Culture / Historical Significance	Assess the potential for impacts to the social environments related to the preservation of physical locations or objects of historical significance. These would include heritage sites or important cultural aspects of a society, archaeological or paleontological sites, and other sites of natural historic significance.
Aesthetics / Health / Safety	Assess the potential for impacts to the social environments related to aesthetics, health and safety. These will include impacts to the visual aspects of a site and the level of exposure to harmful substances or conditions. The scope of impacts would include night-time illumination, drinking water quality, fire protection, and the potential release of hazardous substances due to accidents.
Economic / Technical Environment	
Economic	Assess the potential for impacts to the economic environments. These would include capital costs of the project, operations and maintenance costs, and any other financial implications of the works. The scope of the impacts would include the level of uncertainty associated with the cost estimate and the risk factors that could affect the costs.
Physical Constraints	Assess the potential for impacts of/to the environments related to technical feasibility and existing physical constraints. These would include operational constraints, bedrock/geological constraints, existing manmade features (utilities), water related constraints and known risk factors of a physical nature (flood, hurricane, ice storm, etc.).
Land Ownership / Legal	Assess the potential for impacts of/to the environments related to land ownership and applicable laws. The scope of impacts would include availability of land, planned uses of land, and legislative/administrative constraints to implementation and operation of the works.

Table 2: Description of Impact Rating System

The following table explains the seven levels of impact that are used in rating the alternatives with respect to each environment. Each level of impact has a corresponding rationale that describes the reasoning used to assign the level of impact. The rating level is based upon the net impact of all factors related to an environment including mitigation measures. The numbers should not be added cumulatively to produce a single "score" for the alternative unless it is determined that all of the environments should be weighted equally (i.e., all are valued the same in importance).

Level of Impact	Rationale
Major Positive Impact (+3)	The alternative has the potential to produce a major positive impact on the environment. The alternative is able to meet all applicable requirements for the long-term that affect the planning, design, construction, operations, maintenance and decommissioning.
Moderate Positive Impact (+2)	The alternative has the potential to produce a moderate positive impact on the environment. This rating level would typically indicate long-term noticeable impacts. Net impact for this rating level generally fall within the limits of federal, provincial and municipal policies and guidelines over the long-term, but may exceed them in the short-term.
Minor Positive Impact (+1)	The alternative has the potential to produce a minor positive impact on the environment. This rating level would typically indicate limited long-term impacts and/or noticeable short-term impacts.
Neutral or Inconsequential Impact (0)	This rating represents an evaluation where positive impacts balance out negative impacts, or the impacts are so small (e.g., disruptions during construction) as to be of no consequence in the scope of the evaluation.
Minor Negative Impact (-1)	The alternative has the potential to produce a minor negative impact on the environment. This rating level would typically indicate limited long-term impacts and/or noticeable short-term impacts.
Moderate Negative Impact (-2)	The alternative has the potential to produce a moderate negative impact on the environment. This rating level would typically indicate long-term noticeable impacts. Net impact for this rating level generally fall within the limits of federal, provincial and municipal policies and guidelines over the long-term, but may exceed them in the short-term.
Major Negative Impact (-3)	The alternative has the potential to produce a major negative impact on the environment. The alternative is not able to meet all applicable requirements for the long-term that affect the planning, design, construction, operations, maintenance and decommissioning.

WATER POLLUTION CONTROL PLANT CAPACITY EXPANSION
Phase 3 Class Environmental Assessment Report
Table 3: Alternative Evaluation

	Alternative 1	Alternative 2
Natural Environment		
Air Environment and Birds	0	0
Water Environment and Aquatic Animals	0	0
Land Environment and Terrestrial Animals	0	0
Social Environment		
Community / Development	+2	+2
Heritage / Culture / Historical Significance	0	0
Aesthetics / Health / Safety	0	0
Economic / Technical Environment		
Economic	-1	-2
Physical Constraints	0	0
Land Ownership / Legal	0	0

LEGEND FOR EVALUATION CRITERIA

-3 Major Negative Impact

-2 Moderate Negative Impact

-1 Minor Negative Impact

0 Neutral or Inconsequential Impact

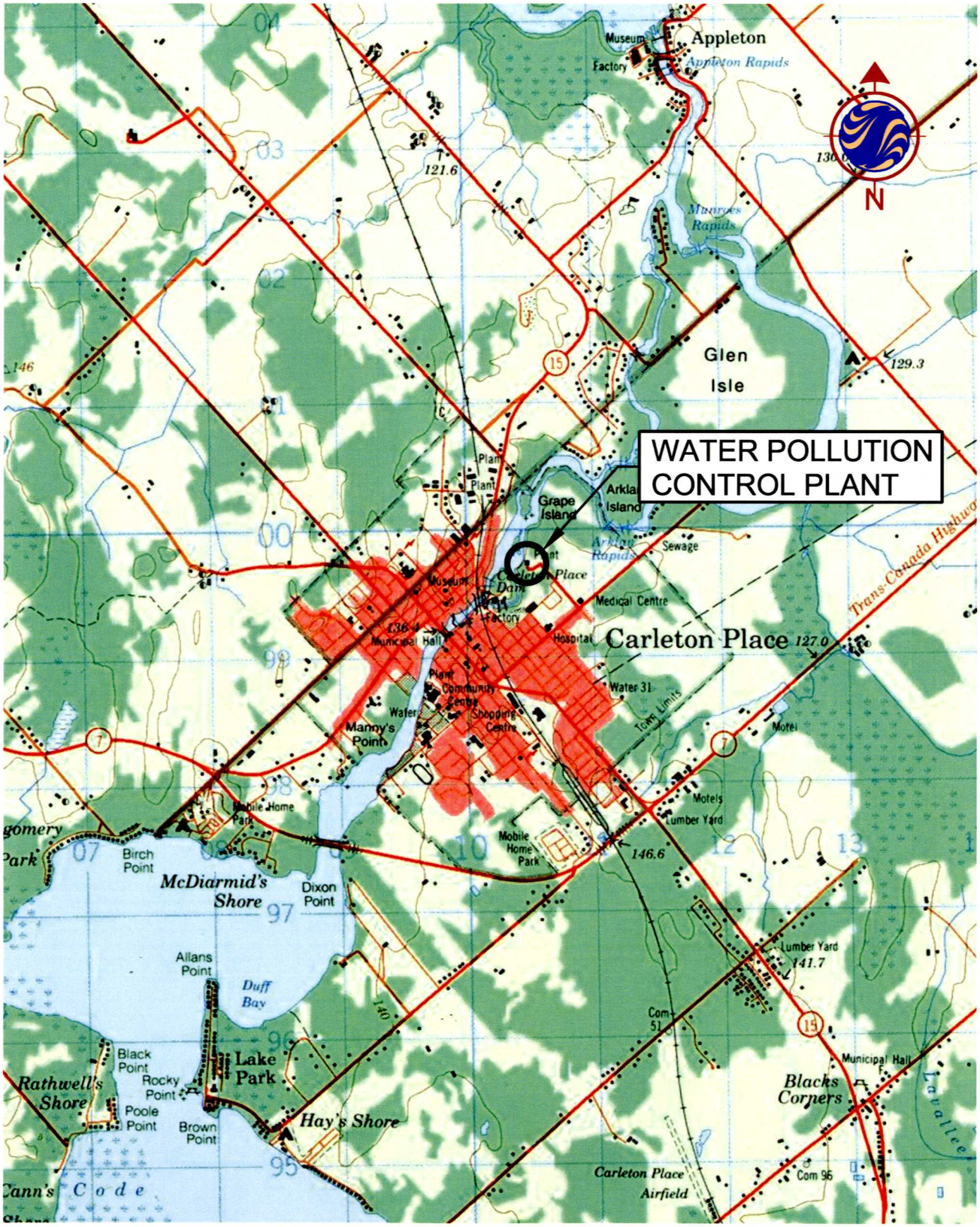
+1 Minor Positive Impact

+2 Moderate Positive Impact

+3 Major Positive Impact

Table 4 - Review Agency List

- Mississippi Valley Conservation Authority
- Leeds, Grenville & Lanark District Health Unit
- Ontario Ministry of the Environment
- Ontario Ministry of Natural Resources
- Ontario Ministry of Public Infrastructure Renewal
- Ontario Ministry of Municipal Affairs and Housing
- Ontario Ministry of Transportation
- Ontario Ministry of Agriculture, Food and Rural Affairs
- Ontario Ministry of Health and Long-Term Care
- Ontario Ministry of Community and Social Services
- Ontario Ministries of Citizenship and Immigration, Culture, Tourism and Recreation
- Ontario Ministry of Education
- Ontario Ministry of Economic Development and Trade
- Catholic District School Board of Eastern Ontario
- Upper Canada District School Board
- Conseil des ecoles publiques de l'Est de l'Ontario
- Conseil scolaire de district catholique de l'Est ontarien
- Enbridge
- Rogers
- Bell
- Hydro One
- Carleton Place Urban Forest / River Corridor Committee
- Carleton Place Heritage Committee



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2008-06-13 12:39PM By: ecalberry

June, 2008
163400725

ORIGINAL SHEET - ISO A4

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Ottawa ON Canada
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Fax. 613.722.2799
www.stantec.com

Client/Project
TOWN OF CARLETON PLACE
WATER POLLUTION CONTROL PLANT
CAPACITY EXPANSION
PHASE 3 CLASS EA REPORT

Figure No.
1

Title
LOCATION PLAN

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2008-06-13 02:04PM By: ecalberry

June, 2008
163400725

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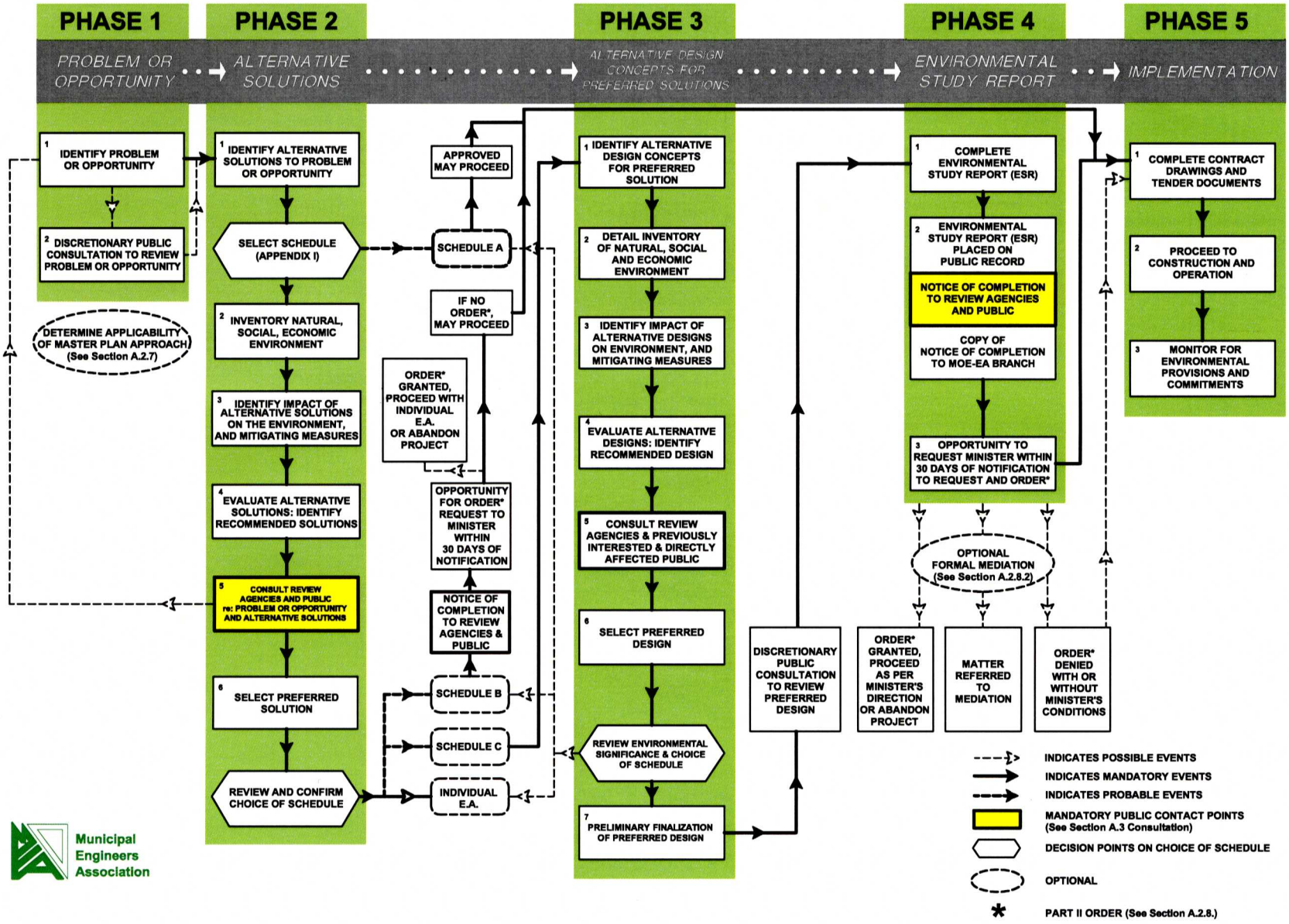
CAPACITY EXPANSION
PHASE 3 CLASS EA REPORT

Figure No.
2

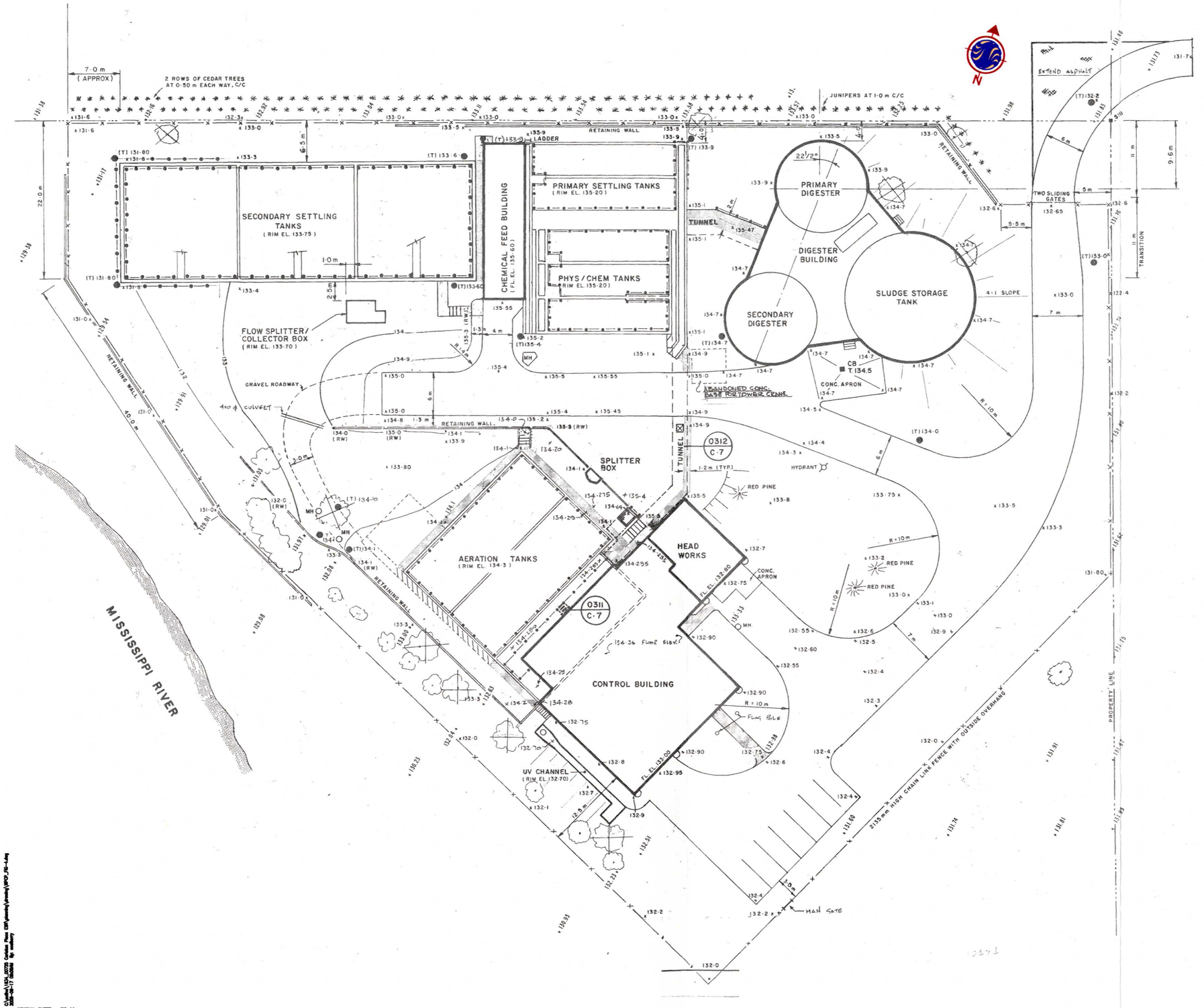
Title
LOCATION PLAN

FIGURE 3 MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

NOTE: This flow chart is to be read in conjunction with Part A of the Municipal EA



Municipal Engineers Association



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Consultants

Legend

Notes

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TOWN OF CARLETON PLACE
WATER POLLUTION CONTROL PLANT
CAPACITY EXPANSION
PHASE 3 CLASS EA REPORT

Carleton Place ON Canada

Title

EXISTING PLANT LAYOUT

Project No. 163400725

Figure No. 4

PHOSPHORUS REMOVAL UPGRADES TO BE CONTAINED WITHIN EXISTING BUILDING

2 ROWS OF CEDAR TREES AT 0·50 m EACH WAY, C/C

JUNIPERS AT 1·0 m C/C

SECONDARY SETTLING TANKS (RIM EL. 133·75)

PRIMARY SETTLING TANKS (RIM EL. 135·20)

CHEMICAL FEED BUILDING (FL. EL. 135·60)

PHYS/CHEM TANKS (RIM EL. 135·20)

FLOW SPLITTER/ COLLECTOR BOX (RIM EL. 133·70)

PRIMARY DIGESTER

DIGESTER BUILDING

SECONDARY DIGESTER

SLUDGE STORAGE TANK

TUNNEL

ABANDONED CONC. BASE FOR TOWER CRANE

CB T. 134.5

CONC. APRON

HYDRANT

RED PINE

TWO SLIDING GATES

EXTEND ASPHALT

RETAINING WALL

GRAVEL ROADWAY

400 ϕ CULVERT

SPLITTER BOX

AERATION TANKS (RIM EL. 134·3)

HEAD WORKS

CONTROL BUILDING

UV CHANNEL (RIM EL. 132·70)

FLAG POLE

MAN GATE

2135 mm HIGH CHAIN LINK FENCE WITH OUTSIDE OVERHANG

PROPERTY LINE

MISSISSIPPI RIVER

0312 C·7

0311 C·7

N

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PROPOSED UPGRADES

Notes

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TOWN OF CARLETON PLACE
WATER POLLUTION CONTROL PLANT
CAPACITY EXPANSION
PHASE 3 CLASS EA REPORT

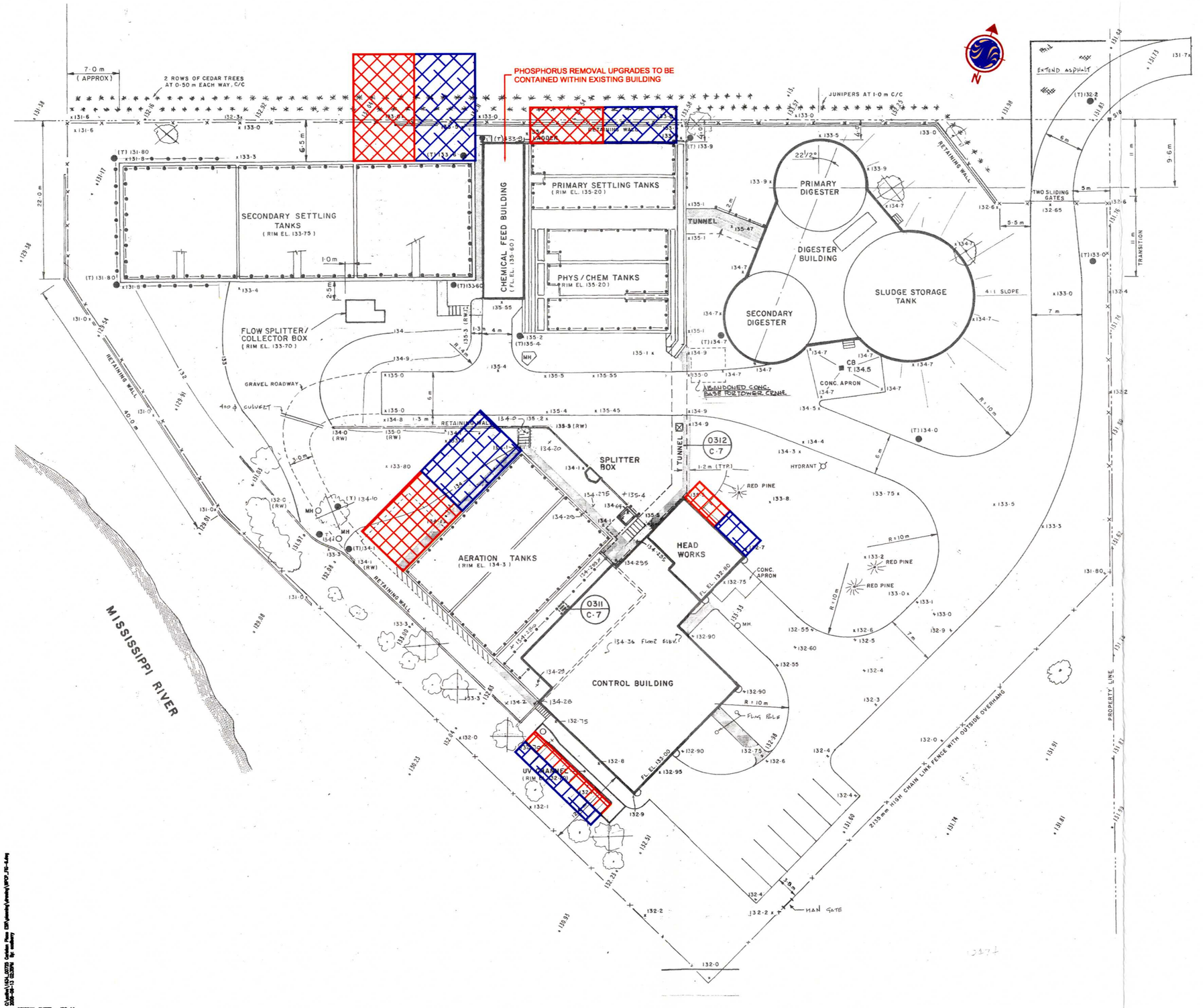
Carleton Place ON Canada

Title

ALTERNATIVE DESIGN 1:
SINGLE STAGE CONSTRUCTION

Project No. 163400725

Figure No. 5



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Legend

PROPOSED STAGE 1 UPGRADES

PROPOSED STAGE 2 UPGRADES

Notes

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TOWN OF CARLETON PLACE
WATER POLLUTION CONTROL PLANT
CAPACITY EXPANSION
PHASE 3 CLASS EA REPORT

Carleton Place ON Canada

Title

ALTERNATIVE DESIGN 2 :
TWO STAGE CONSTRUCTION

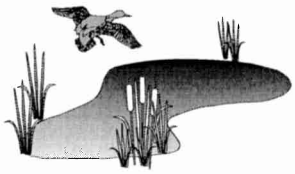
Project No. 163400725

Figure No. 6

ORIGINAL SHEET – ISO A1

APPENDIX A

Muncaster
Environmental
Planning



May 20, 2007

Mr. Marc Bezanson
Project Manager
Stantec Consulting
1505 Laperriere Avenue
Ottawa, Ontario
K1Z 7T1

Dear Mr. Bezanson:

RE: Carleton Place – WTP and WPCP Expansions
Natural Environment Preliminary Input

Following my proposal of April 18th, I reviewed expanded study areas for the Water Treatment Plant and the Water Pollution Control Plant in Carleton Place on May 17th, 2007 and offer the following preliminary input, including summaries of the existing natural environment conditions. Once alternatives for the expansions are prepared I can provide additional natural environment information for the Environmental Study Reports on evaluation of the alternatives, selection of preferred solutions and associated mitigation measures.

Review of General Area

The Mississippi River is the dominant natural environment feature in the general area. Mississippi Lake is upstream of the Water Treatment Plant and Carleton Place. The Mississippi River meanders to the east of the Water Pollution Control Plant and Carleton Place, around Glen Isle and northeast towards Appleton. Wetlands are present in reaches along the Mississippi River, with the closest Provincially significant wetland, the Appleton Marsh, well downstream of Carleton Place between Appleton and Almonte. No designated natural areas, Areas of Natural and Scientific Interest or Conservation Areas are reported in proximity to the study areas.

The warm water aquatic habitat of the Mississippi River in the general area is diverse and productive. Good spawning, nursery, resting and feeding habitat is present along the Mississippi River in the vicinity of Carleton Place. Several species of sportsfish and coarse fish have been documented along this reach of the river including northern pike, smallmouth bass, largemouth bass, yellow perch, walleye, white sucker, yellow bullhead, brown bullhead, channel catfish, several redhorse sucker species, American eel, rock bass and pumpkinseed. Forage fish include

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bluntnose minnow, longnose dace, logperch, mimic shiner, common shiner, blackchin shiner and golden shiner. Mississippi Lake upstream provides important northern pike, walleye and bass spawning areas. A public access point to the River and Lake is upstream of the Water Treatment Plant at the west end of Lake Avenue West.

The Natural Heritage Information Centre database, maintained by the Ontario Ministry of Natural Resources, identified three rare species in the general area of Carleton Place. Blanding's turtle (*Emydoidea blandingii*) is considered threatened, defined as a species likely to become endangered if limiting factors are not reversed. This species would be found along the Mississippi River corridor, as would another identified rare species, the Halloween Pennant (*Celithemis eponina*). This dragonfly species is considered vulnerable in the province due to relatively few populations or other factors making it vulnerable to extirpation. The red-shouldered hawk (*Buteo lineatus*) is a species of special concern, defined as wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats. The red-shouldered hawk would generally be found in denser forests, with a greater coniferous component, than those in proximity to the two study areas. No rare vegetation communities are reported in the general area.

Water Pollution Control Plant

The Water Pollution Control Plant site is located south of the Mississippi River off Patterson Crescent, west of McNeely Avenue. The Carleton Place Curling Club and associated parking lots are south of the existing Water Pollution Control Plant, with a remnant deciduous forest to the southwest, the Mississippi River to the west and north, and a yard and hazardous waste drop off and storage area to the east.

The study area for the survey of the Water Pollution Control Plant and adjacent lands generally included up to 100 metres beyond the existing perimeter fencing of the Plant.

Natural environment features are limited inside the existing fencing. Three red pine trees, in generally good condition, are on a grassed area between the Control and Digester Buildings. The largest of these conifers is 28cm diameter at breast height (dbh). A row of white pines, also in good condition, is along the west side of the Control Building and the aeration tanks. The pines are up to 22cm dbh. A dense row of smaller white cedars is adjacent to the northeast perimeter of the existing fencing.

The lands to the south are grassed between the Water Pollution Control Plant and the Carleton Place Curling Club. In addition to bluegrass, white clover, lower hop clover and common dandelion are common. A coppice (multi-stemmed) white elm is to the south of the fencing with several tree plantings along the north side of the Curling Club parking. An 18cm dbh sugar maple is the largest of these plantings, with smaller ash, maple and white spruce stems.

Most of the lands to the north of the existing Water Pollution Control Plant are open, with fields of cypress spurge, common burdock, brome grass, common plantain, wild carrot, common dandelion, bull thistle, alsike clover, yellow rocket, prickly ash and red raspberry. The invasive tartarian honeysuckle is very common among intermittent hedgerows, with Manitoba maple, sugar maple, red maple, white poplar, hawthorn, serviceberry, chokecherry, red ash and white elm represented. The largest trees in the deciduous hedgerows are sugar maples up to 38cm dbh, with white elms up to 28cm dbh.

A few planted tamaracks are north of the row of white cedar along the perimeter fencing. The largest cedars are in the range of 13cm dbh. Manitoba maple, white elm and tartarian honeysuckle are among the east portion of the white cedar row.

Wildlife observed among the generally open area north of the Water Pollution Control Plant included woodchuck, Baltimore oriole, grey catbird, American crow, ring-billed gull, European starling, yellow warbler, song sparrow and American robin.

Deciduous Forest

A remnant deciduous forest is to the southwest of the Water Pollution Control Plant, with a paved recreational pathway spur between the forest and the perimeter fencing. Young deciduous trees are along the pathway including Manitoba maple, white elm, red maple, red ash, white ash and sugar maple. The largest of these trees are up to 26cm dbh. Tartarian honeysuckle and hawthorn shrubs are also present.

The deciduous forest is generally scrubby, with broken limbs off many of the trees, although the canopy cover is generally good. Exposed bedrock is common. The more mature trees are generally further west of the existing Plant, including a 55cm dbh sugar maple approximately 45 metres southwest of the perimeter fence. Mature white poplars, up to 50cm dbh are much closer to the fencing, adjacent to the recreational pathway. These poplars appear to be in poorer condition with reduced leaf-out. A few white cedars, up to 24cm dbh, provide some coniferous component. The ground flora of the forest is dominated by non-native species, a reflection of the disturbed nature of the area. Garlic mustard is abundant in areas, along with ground ivy and common dandelion. Poison ivy, herb robert and bloodroot were also observed. The invasive and non-native common buckthorn is abundant in portions of the understorey. Sugar maple regeneration is good in many areas.

The deciduous forest continues to the west, between the main recreational pathway running along the Mississippi River and the River itself. The influence of non-native ground flora remains high. Garlic mustard, common burdock, rough cinquefoil, wormseed mustard are widely distributed along with Virginia creeper. Common buckthorn, black current and tartarian honeysuckle are common in the understorey. Silver maple, red maple, crack willow, white elm and red ash are the dominant tree species, with 75cm over-mature crack willow and 25cm dbh silver maple representing the largest trees. Many of the willows have major broken limbs, with

willows closer to the shoreline of the Mississippi River in generally better condition. Fill material appears present, with exposed bedrock in other areas.

The shoreline of the River is within about five metres of the existing northwest section of the perimeter fencing. Coppice silver and red maple trees provide good stream cover along the shoreline. The aquatic habitat of the Mississippi River in proximity to the Water Pollution Control Plant possesses a diverse sequence of run and riffle habitat. The substrate is a combination of fines, rubble, cobble and exposed bedrock. Aquatic vegetation, both emergent and submergent, and woody debris add to the diversity of in-stream structure. Aquatic and shoreline vegetation include rice-cut grass, pondweeds, hard-stem bulrush, water horehound, boneset, spotted jewelweed and broad-leaved cattail. Side channels add to the diversity of available aquatic habitat.

The recreational pathway continues along the shoreline. Vegetation between the pathway and the fencing includes planted hackberry stems, along with red raspberry, cypress spurge, garlic mustard, brome grass, yellow rocket, spreading dogbane, red-osier dogwood and Manitoba maple.

Wildlife observed in and adjacent to the forest included grey squirrel, American robin, common grackle, yellow warbler, red-winged blackbird, warbling vireo, white-breasted nuthatch and American redstart, the latter likely still in migration on May 17th. Historical beaver cuttings are common adjacent to the Mississippi River shoreline.

Water Treatment Plant

The Water Treatment Plant is located among manicured parkland at the west end of John Street in the west portion of Carleton Place. Carleton Place High School is to the south of the Water Treatment Plant, with the Carleton Place Canoe Club, a canteen and parkland to the east. The Mississippi River is to the north and west.

There are several mature deciduous trees among the grassed parkland. The majority of the trees are sugar maples. Many of the maples are in poor condition, with decaying trunks, broken limbs, reduced leaf-out and/or pruned branches. The maples vary in size between 23cm and 70cm dbh. The maples are particularly common between the Water Treatment Plant and the Mississippi River, and to the east of the Plant. The largest tree in the study area is a 130cm dbh eastern cottonwood to the southeast of the Canoe Club. Eighty cm and 100cm eastern cottonwoods are on the west side of the access road west of the Water Treatment Plant. Scot's pine up to 36cm dbh and a 36cm dbh white spruce southeast of the Plant, along with a 28cm dbh white cedar to the north represent the only conifers in this study area.

In addition to many sugar maples, silver maples up to 55cm dbh, a 70cm dbh white ash and an 88cm dbh crack willow are along the south shoreline of the Mississippi River, north of the access road north of the Water Treatment Plant. Some of the branches of the crack willow overhang the

river and provide some aquatic habitat benefit. However the habitat of the Mississippi River along the shoreline north of the Plant is impaired by the hardened shoreline, manicured parkland to the edge of water and general lack of stream cover.

Newer plantings of red oak, red maple and red ash are scattered to the south of the Canoe Club. The trunks of many of the plantings are badly damaged although wood chips are now placed around the trunks of the trees.

Smaller woody vegetation is adjacent to the Water Treatment Plant buildings including three regenerating white elm stems up to 6cm dbh on the northwest side, a coppice red maple to the south and spirea and yew shrubs along the entrance to the building.

Common dandelion, white clover, brome grass and common plantain are found among the manicured bluegrass parkland.

Wildlife observed among the parkland adjacent the Water Treatment Plant included grey squirrel, blue jay, American robin and ring-billed gull.

Summary

There are limited natural environment features and functions to the north, east and south of the Water Pollution Control Plant. These areas are generally open grassed areas, with scattered shrubs and deciduous trees. Any woody vegetation removal can be compensated for with a generous planting of native trees and shrubs. A deciduous forest is to the southwest of the Water Pollution Control Plant. This forest should be considered in the design of the expansion works, although a dominance of non-native vegetation in the understorey and ground flora, and broken limbs on many of the trees reduce the functions of this wooded area. The Mississippi River is to the west of the Water Pollution Control Plant. In areas the distance between the existing perimeter fencing and the shoreline of the River is in the range of five metres. If at all possible Plant expansion should not occur any closer to the shoreline habitat than the existing conditions along the west side of the Plant.

The natural environment features and functions at the Water Treatment Plant are greatly reduced by the manicured parkland, which extends to the south shoreline of the Mississippi River, and the hardened shoreline along the River. There is a mix of mature deciduous trees and recent plantings, many in poor condition. Although tree removal should be limited as much as possible, the features and functions of any removed trees can be replaced by a diverse planting of native deciduous and coniferous trees, particularly those existing trees that are in poor condition. Other than the Mississippi River itself, there are no natural environment factors that would influence design of the expansion works provided mitigation measures such as plantings for removed trees is undertaken.

Please call if you have any questions on the above preliminary input.

Yours Sincerely,
MUNCASTER ENVIRONMENTAL PLANNING INC.

Bernie Muncaster
Principal

\mbwpcp

491 Buchanan Crescent, Ottawa, ON K1J 7V2
Tel (613) 748-3753; Fax (613) 748-6376

APPENDIX B

Stantec Consulting Ltd.
1505 Laperriere Avenue
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Stantec

March 31, 2010
File: 163400725

Town of Carleton Place
175 Bridge Street
Carleton Place ON
K7C 2V8

Attention: **Mr. Paul Knowles, CAO**

Dear Mr. Knowles:

Reference: **Letter Report on the Water and Wastewater Treatment Plant Requirements of an Ultimate Serviced Population of 43,000 People**

As requested, we have developed this letter report as referenced above contemplating expansion to a maximum population of 43,000 people. A copy of the fee proposal letter is included in Appendix I for reference. No time horizon or rate of growth has been specified, so the evaluation has been based solely upon the requirements of the ultimate population. We have integrated comments from the Town and OCWA submitted on Friday March 26th, 2010.

The following three scenarios have been considered for both the water and the wastewater plants:

- Provide service from the existing treatment plant site, with appropriate capacity expansion
- Provide service from the existing treatment plant site in combination with a new site, and
- Provide service entirely from a new site (decommissioning the existing site).

The requirements with respect to land area and capital cost of construction have been examined for each of these scenarios. The ultimate size of the water and wastewater treatment plants and recommended set back distances are shown on drawings. For comparison purposes, the Consultant developed an aerial view of the proposed plants assuming that they would be located on vacant land within a few kilometers of the existing facilities. It is understood that site selection would be addressed only at the Environmental Assessment stage.

This letter report provides discussion of the costs/benefits of the three scenarios for each system. Only the capital costs (i.e. construction) for each scenario has been assessed. The cost of land acquisition, engineering, project management, contingency, conversion of existing facilities, operation and maintenance, sampling and reporting, asset management program, and infrastructure replacement funding program were excluded. Raw water taking availability, treated water distribution, sewage collection, and receiving stream assimilative capacity considerations are specifically excluded from this evaluation. Although operating and maintenance costs have not been evaluated for each option, the Consultant considered the impact of operating two plants versus operating a single plant in the overall evaluation.

Reference: Letter Report on the Water and Wastewater Treatment Plant Requirements of an Ultimate Serviced Population of 43,000 People

Water Treatment Plant

Technical memo describing the proposed technology and three implementation scenarios is presented in Appendix II. The capacity upgrade considered implementing state of the art surface water technology, i.e. Magnetic Ion Exchange (MIEX™), followed by low pressure membrane filtration system. That process would generate extremely high quality potable water, with much less sludge production than the current Actiflo® process at the Water Treatment Plant. The MIEX™ finished water would require less chlorine reaction time than the current process in order to achieve the disinfection required by provincial standards. Overall water reserve calculations would involve the three basic reserve volumes (i.e. operation reserve, fire reserve and emergency reserve) but would not need additional volume for disinfection purpose.

Option 1 considered the implementation of a MIEX™ plant having a maximum day rated capacity of 26,700 m^3/d, immediately beside the existing plant. Although the new facility would fit in theory within available land, minimum distance restrictions to heritage area, school and parking lot may affect the final setting. Upgrading underwater raw water line and low lift station, while keeping existing plant fully operational, would impose challenging construction and operation transition issues at existing plant. Since the current Actiflo® process and the proposed MIEX™ upgrading would have different low lift pumping requirements, the feasibility and life cycle cost of an independent raw water line and low lift station would be assessed at the EA stage.

Option 2 would consist of implementing a 26,700 m^3/d MIEX™ plant at another site. Drawing W2 shows one potential site, about 1 km south-west of the existing plant. This Option would not experience all the construction and operation transition issues that would occur while modifying an existing plant, such as with Option 1. A separate site would also have much lower visual and social impact than Option 1. There is a substantial premium to pay for developing a new site, because of all non-process related facilities to duplicate (SCADA and laboratory).

Option 3 includes a 38,700 m^3/d maximum day capacity MIEX™ plant at a remote site. Decommissioning of existing plant with Actiflo® process would represent a net loss of valuable assets to the Town; however, existing plant clearwell would be fully usable at peak hour, since there would be no more disinfection contact time minimum requirements at that site. Because of the replacement of current large asset, that Option is the most costly one. For that reason, it should not be retained.

Unaccounted for costs and implementation schedule delays associated with land acquisition, amendment to official plan and other legal considerations would affect Options 2 and 3.

OCWA indicated that having two parallel processes at the same site would cost less for operation, maintenance and management than the same processes located in separate sites. Therefore, Option 1 considering optimization of current site would have lower operations and maintenance (O&M) costs than Option 2.

At this stage, the Consultant recommends retaining Option 1 - 26,700 m^3/d MIEX™ plant at current site, in part because of the benefits of optimizing a site that is already serviced by existing infrastructures, instead of developing a new site. Construction cost would be $20 million.

Water Pollution Control Plant

Appendix III includes the technical memo describing the three implementation scenarios. It was assumed that current technology (activated sludge process with anaerobic digestion) would be implemented. Ultimate

sewage flow calculations considered that the daily sewage flow rate per capita would be lower than the current one, as there would be less infiltration with newer gravity sewers. Average daily sewage flow rate to service 43,000 people has been established to be 23,030 m^3/d.

As per MOE Design Guidelines for Sewage Works, the buffer distance between treatment facilities and nearest residence under all options is recommended to be 150 m. Should the Town plan to implement new infrastructures any closer than 150 m, then tanks would be covered and highly efficient odor control system would have to be constructed.

Option 1 would consist of maximizing the utilization of municipality owned land at current plant site. That would involve implementing new basins on the parcel of land just north of the existing plant, along the Mississippi River. That Option can meet the objectives (i.e. servicing up to 43,000 people) but would need covers and odor control system, as some of the basins would be located less than 150 m from nearest residence.

Option 2 considered implementing a new plant on another site, meeting the 150 m buffer criteria. A capital cost assessment demonstrated that it is more cost efficient to transfer all additional sewage flow (in excess of existing plant rated capacity) to a new plant, than to maximize current plant utilization and reduce the size of the new plant.

Option 3 involves decommissioning of the existing treatment facilities, preserving only the pumping capability at the present site, and implementing a single larger capacity plant. Because of the loss of valuable asset at existing plant site, this Option is by far the most expensive one.

Considering the available information, the Consultant recommends that the Town retain Option 1 - optimizing existing plant and implementing a new plant immediately beside to treat all additional flow. Construction cost would be in the order of $49.8 million, excluding contingency.

Aerial views of the proposed plants are included in Appendix III for reference.

Validity of the existing draft Environmental Study Reports

The award of contract to Stantec for completing the two (Water and Wastewater) Environmental Study Reports (ESRs) occurred in April 2007. Subsequently, over the last three years, the majority of the work to complete the assignment has been performed and the project is nearing its final stage of publishing the formal ESRs. For the purpose of developing alternative solutions, the Town of Carleton Place provided the consultant with the following assumptions: the population for 2008 was assumed to be 9,700 people, and the expected growth rate was assumed to be is 145 people per year. The provision of water and wastewater treatment services from alternate sites was never considered in the ESRs because the projected growth of the Town made it unfeasible

This current letter report indicates that even up to a population of 43,000 people, the expansion of the water and wastewater treatment plants at the existing sites continues to be the preferred option. If accepted by the Town, this conclusion supports the direction of the work done to date on the ESRs and indicates that they should be finalized. The ESRs should mention this letter report and further public consultation would be beneficial to update the public on this new information and to provide an avenue for public comment.

Reference: Letter Report on the Water and Wastewater Treatment Plant Requirements of an Ultimate Serviced Population of 43,000 People

Sincerely,

STANTEC CONSULTING LTD.

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APPENDIX C

Stantec

Receiving Water Assessment Review for Carleton Place Water Pollution Control Plant Discharge to Mississippi River

Project # 1634-00725

Prepared by:

Stantec Consulting Ltd.
100 – 1505 Laperriere Avenue
Ottawa, Ontario K1Z 7T1

Prepared for:

The Town of Carleton Place
175 Bridge Street
Carleton Place, Ontario K7C 2V8

May 20, 2009

Executive Summary

Stantec Consulting Ltd. was retained by the Town of Carleton Place (Town) to prepare an Environmental Study Report (ESR) for the future capacity expansion of the Town's Water Pollution Control Plant (WPCP). The Town, having completed Phases 1 & 2 of the ESR and established that expanding the WPCP at its present location is the preferred solution for expansion, has instructed Stantec to proceed with the Receiving Water Assessment Review. This Receiving Water Assessment Review is in support of the on-going ESR process.

This Receiving Water Assessment Review is intended to be a desktop review of available information related to the Mississippi River and its ability to assimilate effluent discharge for the purpose of establishing reasonable criteria upon which to base the ESR. Ultimately, the MOE will set discharge criteria during the Certificate of Approval application process.

The assimilative capacity of the river was assessed to determine effluent criteria that would provide river quality in compliance with the Provincial Water Quality Objectives. Based upon pre-consultation with the Ministry of Environment, some proposed criteria are more stringent than the assessment would otherwise allow in order to conform to other existing Certificates of Approval and to provide for further enhancement of the Mississippi River. The proposed criteria are as follows:

- BOD5 (year-round): 25 mg/L
- TSS (year-round): 25 mg/L
- Total Phosphorus (September 1 – May 31): 0.3 mg/L
- Total Phosphorus (June 1 – August 31): 0.2 mg/L
- Total Ammonia (June 1 – August 31): 3.63 mg/L
- Total Ammonia (September 1 – March 31): 15 mg/L
- Total Ammonia (April 1 – May 31): 15 mg/L

Table of Contents

1.0 Introduction

Stantec Consulting Ltd. (Stantec) was retained by the Town of Carleton Place (Town) to prepare an Environmental Study Report (ESR) for the future capacity expansion of the Town's Water Pollution Control Plant (WPCP). The Town, having completed Phases 1 & 2 of the ESR and established that expanding the WPCP at its present location is the preferred solution for expansion, has instructed Stantec to proceed with the Receiving Water Assessment Review. This Receiving Water Assessment Review is in support of the on-going ESR process. The Ontario Ministry of the Environment (MOE) regulates municipal sewage treatment facilities and their discharges to the environment. The MOE has established the Receiving Water Assessment as the means for establishing acceptable levels of contaminant discharge into the environment, based upon technical means for evaluating the ability of the receiving water body to assimilate the waste. This Receiving Water Assessment Review is intended to be a desktop review of available information related to the Mississippi River and its ability to assimilate effluent discharge for the purpose of establishing reasonable criteria upon which to base the ESR. Ultimately, the MOE will set discharge criteria during the Certificate of Approval application process.

2.0 Background

2.1 SITE DESCRIPTION

The Mississippi River is a tributary of the Ottawa River in eastern Ontario. The Town of Carleton Place is situated in Lanark County (west of the City of Ottawa) and accessed by Provincial Highways #7 and #15. Carleton Place has a population of 9,453 (Canada Census 2006) with 3,832 private dwellings on 8.83 km^2 of land. The community provides for development on full municipal water and sewer services. The Mississippi River runs through the center of town and serves as both the source of water for municipal use, as well as the receiving stream for ultimate disposal of the treated sewage effluent. The Mississippi River is used for recreational purposes in the area around Carleton Place.

2.2 RIVER QUANTITY DATA

The water quantity monitoring station that is closest to Carleton Place is at Appleton. This station (02KF006) has been measuring flow data since 1918 and, according to the Environment Canada website, has a gross drainage area of 2900 km^2. Flow data available on the aforementioned website was downloaded for analysis.

In accordance with the MOE Procedure B-1-5 (*Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters*, July 1994), the low flow statistic 7Q20 (the minimum 7 day average flow with a recurrence period of 20 years) was used as the basic design flow for the receiving stream. The Log Pearson III Method was applied to the available data to determine the 7Q20 flow for Appleton.

Using topographic maps, the drainage area between the WPCP and the Appleton flow monitoring station was determined to be approximately 65 km^2. Since the two points are in such close proximity with minimal contributing area, the 7Q20 flows were prorated as a linear function of drainage area. The final 7Q20 flow used in this assessment was 4.07 m^3/s. Supporting documentation has been included in Appendix A.

2.3 RIVER QUALITY DATA

The MOE has two publications which address receiving water quality. They are *Procedure B-1-5 Deriving Receiving Water Based Point Source Effluent Requirements For Ontario Waters* (MOEE, 1994) and *Procedure B-1-2 Water Management Policies Guidelines Provincial Water Quality Objectives of the Ministry of Environment and Energy (Includes B-1-1)* (MOEE, 1994). A receiving stream is categorized as Policy 1 or Policy 2 on a parameter by parameter basis with respect to Provincial Water Quality Objectives (PWQO). Policy 1 states "In areas which have water quality better than the Provincial Water Quality Objectives, water quality shall be maintained at or above the Objectives." Policy 2 states "Water quality which presently does not

meet the Provincial Water Quality Objectives shall not be degraded further and all practical measures shall be taken to upgrade the water quality to the Objectives."

A report, *Assimilative Capacity of the Mississippi River* (J.L. Richards and Assoc. Ltd., 1989) was produced for the last major upgrade of the WPCP (1992 construction). At that time the Mississippi River was a Policy 2 watercourse (not meeting Provincial Objectives) for the parameter phosphorous. All other parameters addressed by this report (temperature, pH, dissolved oxygen, ammonia, BOD_5, suspended solids and coliform bacteria) were considered Policy 1 or were within acceptable limits where PWQO were not available. Presently, the level of phosphorous has been reduced, thereby raising the status to Policy 1 (as per MOE email of December 12, 2006 in Appendix B). The MOE attributes this change in part to the low phosphorous loading that has been achieved since the Carleton Place WPCP upgrade. The *Receiving Water Assessment Town of Mississippi Mills Almonte Ward Sewage Treatment System Class Environmental Assessment* (J.L. Richards and Assoc. Ltd., 2005) also confirmed that the Mississippi River was a Policy 1 receiver with respect to Total Phosphorous, Un-ionized Ammonia, and Dissolved Oxygen. Water quality data was collected by the Mississippi Valley Conservation Authority at the Almonte Street bridge in Almonte, the closest sampling site to Carleton Place (Appendix C).

2.4 EXISTING WPCP DISCHARGE CRITERIA

The existing WPCP has a continuous discharge through a series of six diffusers located on an underwater outfall pipe which extends twenty-six metres into the Mississippi River. The current criteria for discharge effluent limits imposed by the MOE in the most recent Certificate of Approval are tabulated below.

Table 1: Current Discharge Effluent Limits

Effluent Parameter	Average Concentration (mg/L)	Average Waste Loading (kg/d)
CBOD5	25	550
Total Suspended Solids	25	550
Total Phosphorus	1	22
Total Ammonia (Ammonia + Ammonium) Nitrogen	4.0 (May 15 to Sept. 30)	88 (May 15 to Sept. 30)

Note: pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times

For the purposes of determining compliance, the following terms are included in the Certificate of Approval in relation to the Table 1 criteria:

- The annual average concentration of the CBOD5 and Total Suspended Solids parameters shall not exceed the maximum concentration set out in column 2.
- The monthly average concentration of the Total Phosphorus and Total Ammonia Nitrogen parameters shall not exceed the maximum concentration set out in column 2.
- The annual average loading of the CBOD5 and Total Suspended Solids parameters shall not exceed the maximum loading set out in column 3.
- The monthly average loading of the Total Phosphorus and Total Ammonia Nitrogen parameters shall not exceed the maximum loading set out in column 3.

3.0 Analysis

3.1 INPUT AND ASSUMPTIONS

The assimilative capacity of the Mississippi River was reviewed based upon discussion with MOE, published works, and available data. Analysis was performed to ensure compliance with the PWQO limits for the receiving stream subsequent to total mixing of the effluent and the river. The following inputs and assumptions were used for the analysis of the assimilative capacity of the receiving stream:

- The proposed rated capacity of the WPCP will be 10,000 m^3/d (annual average dry weather flow).
- The proposed peak flow of the WPCP will be 27,000 m^3/d (wet weather flow).
- The 7Q20 flow of the Mississippi River at Carleton Place is 4.07 m^3/s.
- The quality data from the closest sampling site (Almonte) is a reasonable estimate of the river water quality conditions at Carleton Place.

3.2 DISSOLVED OXYGEN

The impact to dissolved oxygen in the Mississippi River was addressed using an oxygen sag assessment. The Streeter-Phelps equation was the basis for the modeling in this assessment. The 25^{th} percentile value of river dissolved oxygen and the 75^{th} percentile value of river temperature and BOD_5 were used for analysis. With respect to flows, river 7Q20 flow and proposed peak wet weather effluent flow were used in this assessment. The assessment was performed for two separate periods: warm weather (May 1 – Sept 30) and cold weather (Oct 1 – April 30). The notes for this assessment can be found in Appendix D.

3.2.1 Warm Weather Results

The 25^{th} percentile value of river dissolved oxygen during the warm weather months was determined to be 9.31 mg/L. A mass balance assessment reveals that the value of dissolved oxygen in the river after complete mixing of the WPCP effluent and the 7Q20 river flow is 8.93 mg/L. However, the theoretical value of dissolved oxygen at 100% saturation is 8.6 mg/L. The 100% saturation value was used as the starting point for the oxygen sag assessment. The minimum dissolved oxygen was determined to be 8.451 mg/L occurring approximately 0.78

days after effluent release. This corresponds to a point 5,485 m downstream of the discharge point. This result meets the PWQO for dissolved oxygen of 4 mg/L at 23°C.[1]

3.2.2 Cold Weather Results

The 25th percentile value of river dissolved oxygen during the cold weather months was determined to be 12.03 mg/L. A mass balance assessment reveals that the value of dissolved oxygen in the river after complete mixing of the WPCP effluent and the 7Q20 river flow is 11.46 mg/L. However, the theoretical value of dissolved oxygen at 100% saturation is 11.8 mg/L. The 100% saturation value was used as the starting point for the oxygen sag assessment. The minimum dissolved oxygen was determined to be 11.65 mg/L occurring approximately 1.54 days after effluent release. This corresponds to a point 10,830 m downstream of the discharge point. This result meets the PWQO for dissolved oxygen of 6 mg/L at 8°C.

3.3 PHOSPHORUS

Since "current scientific evidence is insufficient to develop a firm Objective at this time", the PWQO for total phosphorus is an interim guideline. [1] The PWQO suggests three levels of surface water objectives:

1. total phosphorus concentration below 0.03 mg/L should eliminate excessive plant growth in rivers and streams,

2. average total phosphorus concentrations during the ice-free period should not exceed 0.02 mg/L to avoid nuisance concentrations of algae in lakes, and

3. a high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 0.01 mg/L or less.

The impact of phosphorus on the Mississippi River was analyzed using a mass balance assessment of the contributing effluent component and the background river component assuming 7Q20 flows. The 75th percentile value of river quality (0.02 mg/L) was used for analysis. The proposed rated capacity of the WPCP was used for the effluent component. Using a completely mixed concentration of 0.03 mg/L (from the interim guideline above), the concentration of the effluent required to meet this guideline would be 0.38 mg/L of phosphorus or less. This analysis can be found in Appendix E.

3.4 AMMONIA

The PWQO for un-ionized ammonia is 0.02 mg/L. The un-ionized fraction of the total ammonia was calculated using the formula prescribed by the MOE. [1] The impact of WPCP effluent ammonia on the Mississippi River was analyzed using a mass balance assessment of the

[1] MOE, *Water Management Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of Environment and Energy*, July 1994, Appendix A, Table 2.

contributing effluent component (proposed rated capacity) and the background river component assuming 7Q20 flows. The 75th percentile values of river quality parameters were used for analysis. Three seasonal periods were analyzed: June 1 through August 31, September 1 through March 31, and April 1 through May 31. Notes on this analysis can be found in Appendix F.

3.4.1 June 1 – August 31 Results

The 75th percentile value of river ammonia, pH and temperature were determined to be 0.04 mg/L, 8.5, and 24°C respectively. The concentration of un-ionized ammonia in the totally mixed effluent and 7Q20 river flow was set at 0.02 mg/L (PWQO). Through a mass balance assessment, the maximum allowable concentration of ammonia in the effluent for this time period was determined to be 3.63 mg/L.

3.4.2 September 1 – March 31 Results

The 75th percentile value of river ammonia, pH and temperature were determined to be 0.05 mg/L, 8.17, and 10°C respectively. The concentration of un-ionized ammonia in the totally mixed effluent and 7Q20 river flow was set at 0.02 mg/L (PWQO). Through a mass balance assessment, the maximum allowable concentration of ammonia in the effluent for this time period was determined to be 25.3 mg/L.

3.4.3 April 1 – May 31 Results

The 75th percentile value of river ammonia, pH and temperature were determined to be 0.04 mg/L, 8.13, and 17°C respectively. The concentration of un-ionized ammonia in the totally mixed effluent and 7Q20 river flow was set at 0.02 mg/L (PWQO). Through a mass balance assessment, the maximum allowable concentration of ammonia in the effluent for this time period was determined to be 16.2 mg/L.

4.0 Results and Conclusions

The assimilative capacity of the river was assessed to determine effluent criteria that would provide river quality in compliance with the PWQO. Based upon pre-consultation with the MOE, it is understood that some of the parameters will be more conservative than the assimilative capacity would otherwise allow in order to conform to other existing Certificates of Approval and to provide for further enhancement of the Mississippi River. Table 2 provides the analysis results and proposed Certificate of Approval criteria.

Table 2: Modeled and Proposed Discharge Effluent Parameters

Parameter / Period	Allowable Concentration, mg/L (from Assimilative Capacity Assessment)	Proposed Criteria for Certificate of Approval, mg/L
BOD_5 / year-round	25	25
TSS / year-round	Not modeled	25
Total Phosphorus / September 1 – May 31	0.38	0.3
Total Phosphorus / June 1 – August 31	0.38	0.2
Total Ammonia / June 1 – August 31	3.63	3.63
Total Ammonia / September 1 – March 31	25.3	15
Total Ammonia / April 1 – May 31	16.2	15

It is expected that the same terms that are currently employed for determining compliance with the criteria would continue to be in force for the proposed criteria.

5.0 References

J.L. Richards & Assoc. Ltd., *Receiving Water Assessment Town of Mississippi Mills Almonte Ward Sewage Treatment System Class Environmental Assessment*, April 2005

J.L. Richards & Assoc. Ltd., *Town of Carleton Place Improvements to Sewage Works Environmental Study Report*, January 1990

J.L. Richards & Assoc. Ltd., *Carleton Place Improvements to Sewage Works Assimilative Capacity Study of Mississippi River*, March 1989

Metcalf & Eddy, Inc., *Wastewater Engineering: Collection, Treatment, Disposal*, McGraw-Hill Book Company, 1972

Ministry of Environment, *Deriving Receiving Water Based, Point-Source Effluent Requirements for Ontario Waters*, July 1994

Ministry of Environment, *Water Management Policies, Guidelines, Provincial Water Quality Objectives of the Ministry of Environment and Energy*, July 1994

Stantec Consulting Ltd., *Carleton Place WTP & WWTP Upgrade Study*, January 2007

Stantec Consulting Ltd., *Town of Carleton Place Water Pollution Control Plant Capacity Expansion Phase 3 Class Environmental Assessment Report*, June 2008

Viessman, Jr., Warren and Hammer, Mark J., *Water Supply and Pollution Control*, 5th Edition, HarperCollins College Publishers, 1993

APPENDIX A

7Q20 River Flow Supporting Documentation

7Q20 RIVER FLOW SUPPORTING DOCUMENTATION

Receiving Water Assessment Review for Carleton Place
Water Pollution Control Plant Discharge to Mississippi River
Stantec Consulting Ltd. Project #163400725

PROCEDURE FOR ARRIVING AT 7Q20 FLOW

ENGSOFT Low Flow Frequency Analysis

Input Values:
Water Quality Monitoring Station 02KF006 data from 1918 through 2002

Using Log Pearson Type 3 Distribution Calculate Low Seven Day Flow with 20 Year Return Period.
Print out of results is attached.
7Q20 = 4.16 m^3/s

Using Topographic Maps Calculate Drainage Area between Monitoring Station and WPCP:
Print out of maps is attached.
Area A = 13.1 km^2
Area B = 27.6 km^2
Area C = 22.75 km^2
Area D = 1.53 km^2
Approximate Total Area = 65 km^2

Calculate Linear Scaling Factor :
WPCP Gross Drainage Area / Monitoring Station Gross Drainage Area = 2,835 km^2 / 2,900 km^2 = 0.978

Calculate Carleton Place WPCP 7Q20:
4.16 m^3/s x 0.978 = 4.07 m^3/s

ENGSOFT Low Flow Frequency Analysis

File Edit Analysis Help

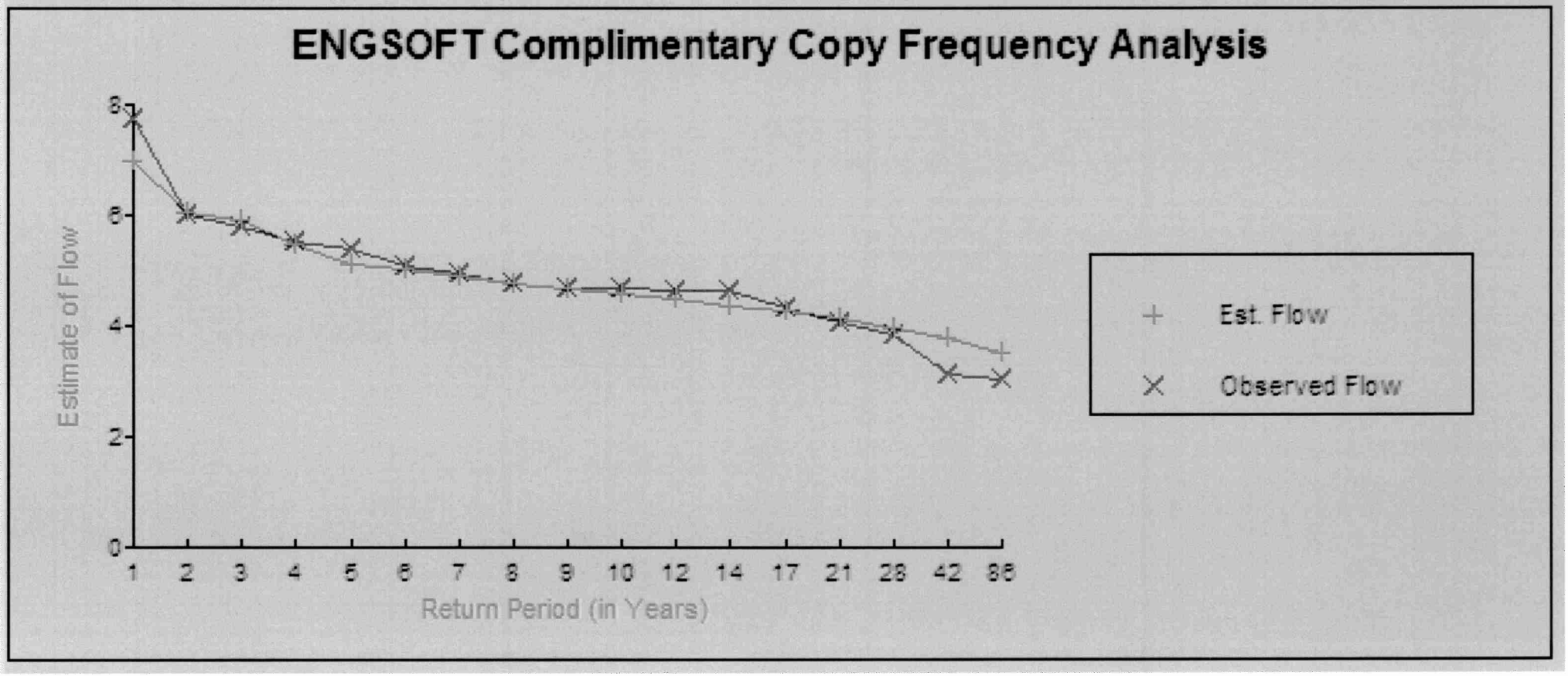
Process | Enter | Open | Exit | Ln2Normal | Ln3Normal | LnPearson | Gumbel | Help

Log Pearson Type 3 Distribution

Statistics	
Mean	.71264E+01
Variance	.52163E+01
Skew	.11178E+01

Parameters	
Alpha	.34640E-01
Beta	.59194E+02
Gamma	.87617E-02

Return Period	Estimate Of Flow
5	.52484E+01
10	.46182E+01
20	.41625E+01



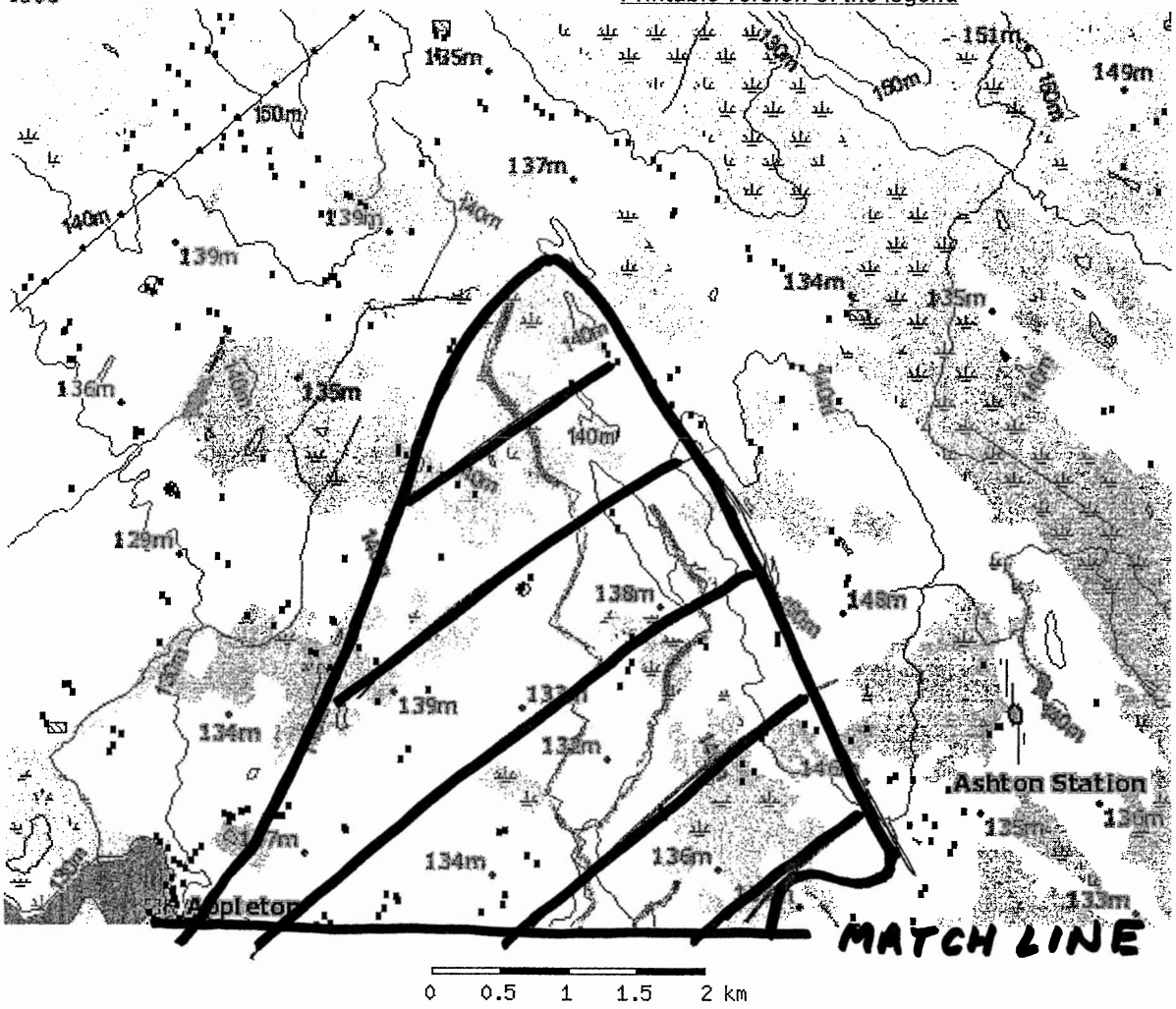
Natural Resources Canada | Ressources naturelles Canada

Canada

Print Map | Return to Map

Toporama – Topographic Maps

Printable version of the legend



Map Scale 1:40 000

4.86 × 2.7 = 13.1 km²

(A)

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MATCH LINE B-D

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Canada

Print Map

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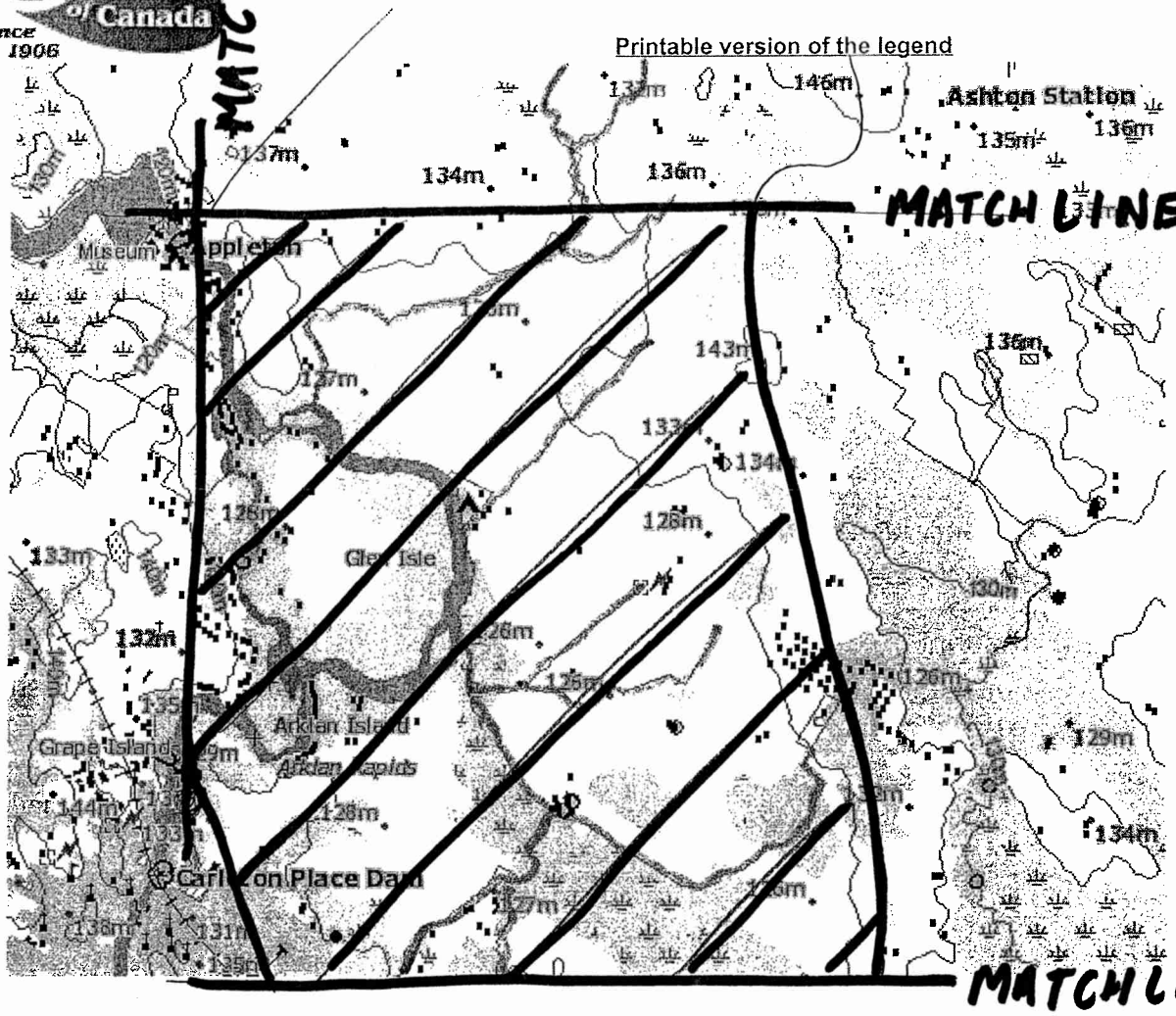
The Atlas of Canada Since 1906

Toporama – Topographic Maps

Printable version of the legend



0 0.5 1 1.5 2 km

Map Scale 1:40 000

4.86 km x 5.68 km = 27.6 km²

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Canada

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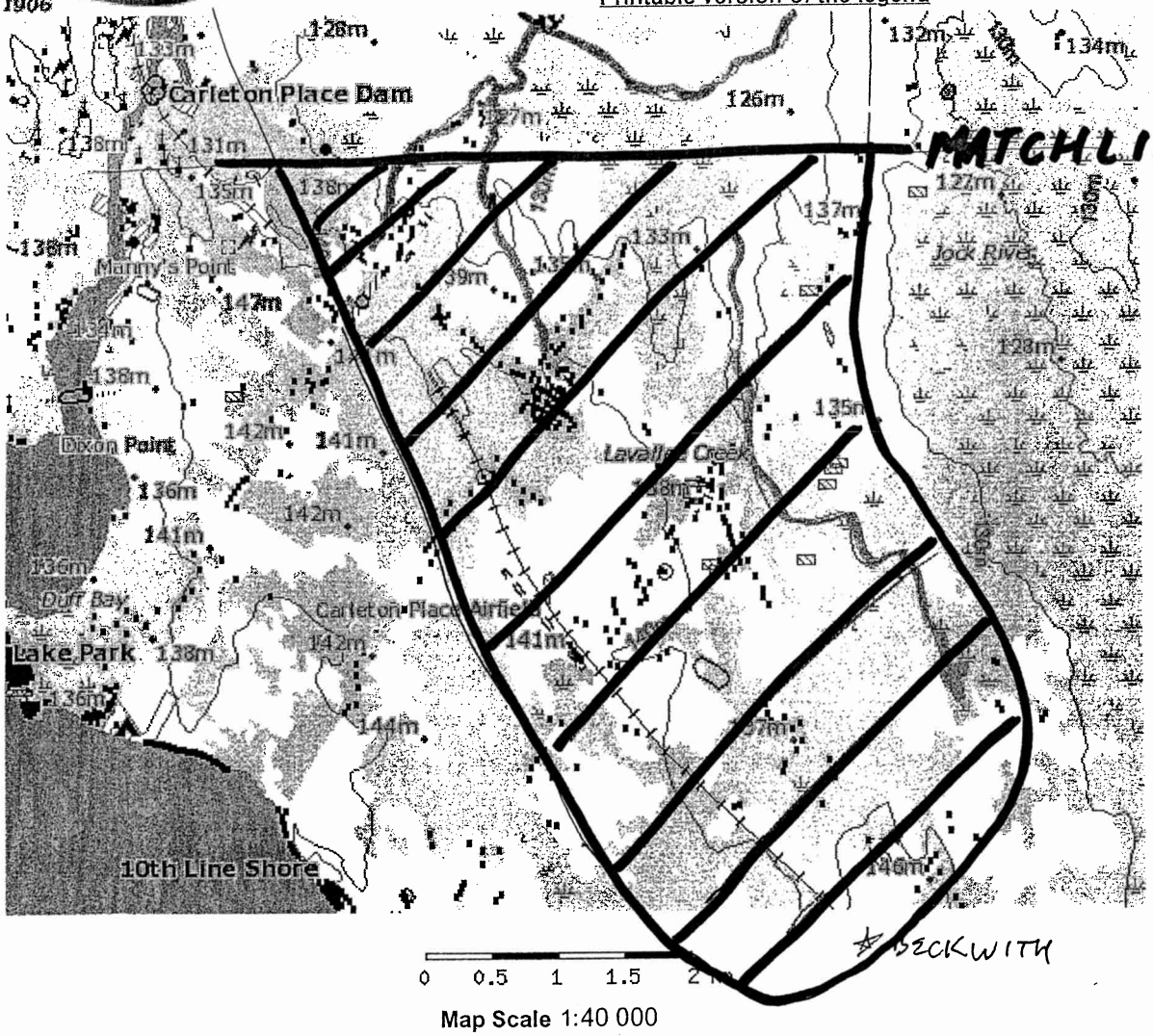
Toporama – Topographic Maps

Printable version of the legend



Map Scale 1:40 000

3.50 km x 6.50 km = 22.75 km²

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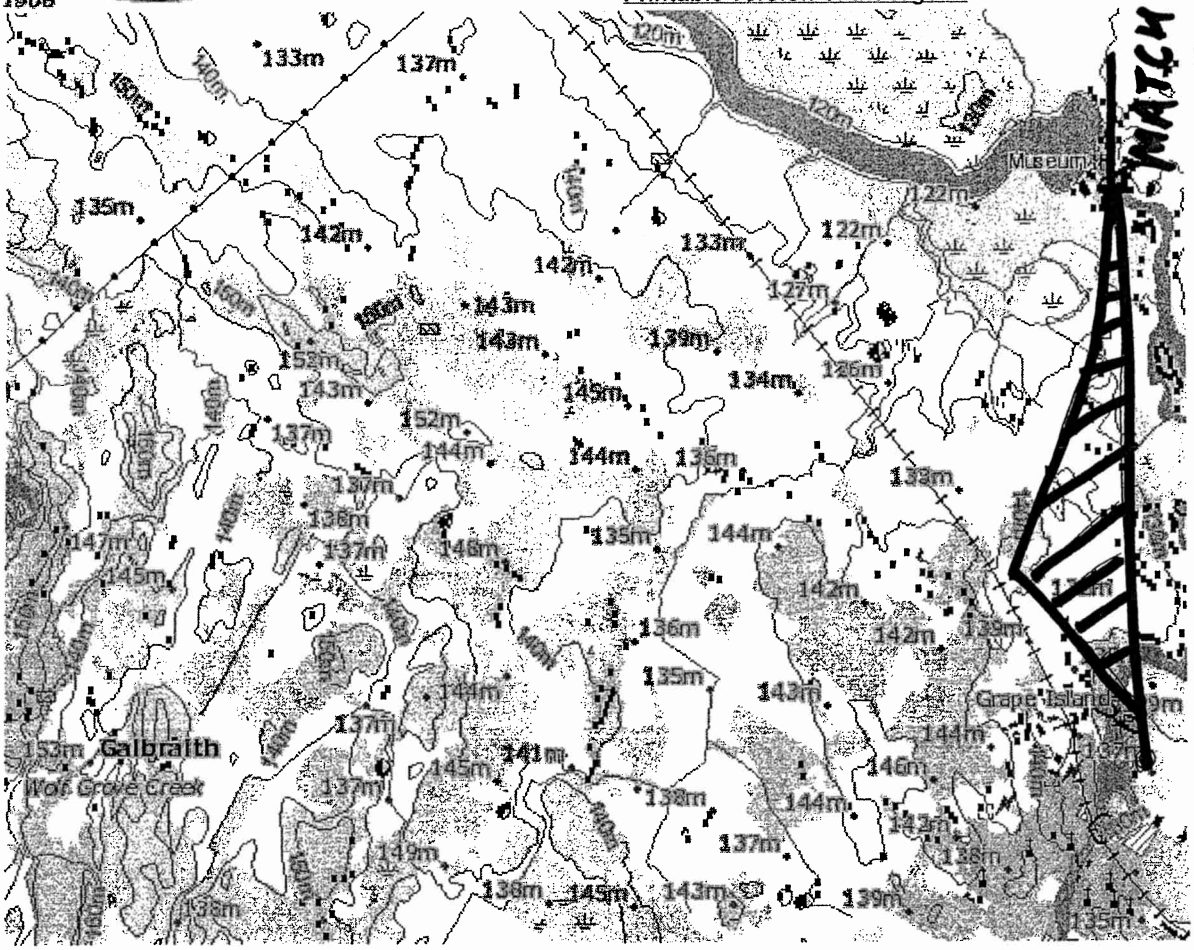
MATCH LINE B-D



0 0.5 1 1.5 2 km

Map Scale 1:40 000

$\frac{0.81 \times 3.78}{2} = 1.53 \text{ km}^2$ (D)

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(A) 13.1

(B) 27.6

(C) 22.75

(D) 1.53

TOTAL 65 km^2

APPENDIX B
MOE Correspondence

Hebert, Jean

From: Burns, Barry (ENE) [Barry.Burns@ontario.ca] (613) 540-6873

Sent: Tuesday, December 12, 2006 12:57 PM

To: Hebert, Jean

Cc: Castro, Victor (ENE); Leavoy, Jena (ENE); Mitchell, Vicki (ENE)

Subject: RE: 634_00426_moe_061102_Carleton_Place_WWTP_effluent_criteria

Hi Jean,

As a follow up to your e-mail of November 2, 2006 regarding effluent criteria for a potential expansion at the Carleton Place WWTP, I would like to provide the following.

As you know, effluent criteria are normally developed as part of the Municipal Class EA process through site specific receiving water assessments, the results of which are compared to the appropriate standard. The most stringent of those criteria are then applied. Usually, larger receiving streams will be subject to the standard secondary treatment requirements of 25 mg/l for CBOD5 and Suspended Solids, 1.0 mg/l for Total Phosphorus (TP) as well as meeting whole effluent non-toxicity.

In the case of the Mississippi River downstream from Mississippi Lake, significant reductions in TP concentrations and a corresponding increase in water quality have been realized over the last 10 – 15 years, raising the river's status from policy 2 to Policy 1 for TP. The overall reductions in TP are attributable to a number of factors, and would certainly include the substantially lower (in comparison to that allowed) phosphorus loading from the Carleton Place WWTP. A review of plant operating data for the years 2002 through 2006 has shown that this plant is very well operated, and despite a current TP compliance level of 1.0 mg/l, there have in fact been very few occasions where the plant effluent has exceeded 0.3 mg/l TP as a monthly average.

Maintaining these improvements to water quality in the Mississippi River needs to be a key component of any proposed upgrade to the Carleton Place WWTP, and to that end the ministry will require compliance criteria of 0.3 mg/l TP for any expansion of the Carleton Place WWTP. This requirement however, does not preclude the imposition of lower compliance value for TP that may be identified through a receiving water assessment.

Compliance criteria of 0.3 mg/l TP for an expansion of the Carleton Place sewage works is consistent with that required for the recently proposed expansion of the sewage works at Almonte, where effluent compliance criteria of 0.3 mg/l TP will apply for 9 months of the year from September through May, and is reduced to 0.2 mg/l for the months of June, July and August.

Additionally, in order to verify the acute non-lethality of sewage effluents, there will be a condition on the Certificates of Approval requiring the operator to perform lethality testing for rainbow trout and Daphnia magna, in accordance with the most current procedures published by Environment Canada. For plants with design flows in excess of 5000 m^3/day, the testing is carried out on a monthly basis, and can be reduced to quarterly testing following 12 consecutive months of successfully demonstrating non-lethality. For plants less than 5000 m^3/day, testing is carried out on a quarterly basis. In the event of failure of any test, the owner would be required to investigate possible causes of the toxicity based on sampling data and monitoring, and upon determination of the cause or source of the lethality determine appropriate control measures.

I would also like to clarify what appears to be a minor misunderstanding concerning the current Certificate of Approval. The Table attached to your e-mail indicates that there are no compliance limits applied to any parameters for plant flows between 11,900 m^3/day and 22,000 m^3/day. The compliance limits for the effluent listed in the Certificate of Approval apply to all discharges from the STP, regardless of flows. Compliance loadings are in fact based on the maximum flow rate of 22,000 m^3/day.

Please let me know if you have any questions or comments.

Regards

Barry

B.D. Burns, P.Eng.
Surface Water Scientist
Eastern Region

From: Hebert, Jean [mailto:jean.hebert@stantec.com]
Sent: November 2, 2006 3:13 PM
To: Burns, Barry (ENE)
Cc: Dicaire, Fern
Subject: 634_00426_moe_061102_Carleton_Place_WWTP_effluent_criteria

Hi, Barry.

Stantec is preparing on behalf of the Town of Carleton Place an assessment report for the Carleton Place Wastewater Treatment Plant, for planning purpose only. This activated sludge process plant is discharging treated effluent to Misssissippi River on a continuous basis. Effluent is disinfected with UV ligths. This is a desktop exercise only, since the plant is operated at a current flow rate representing about 76% of the average (dry weather) capacity.

We would need to confirm what would be the plant effluent criteria, would the plant be upgraded this year.

For reference, we provide into the attached table the current plant effluent criteria.

<<WWTP_effluent_criteria.doc>>

Thank you for your collaboration.

Jean Hébert, M.A.Sc., P.Eng.
Environmental Engineer, Project Manager
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Fx: (613) 722-2799
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APPENDIX C

Summary of Mississippi River Sampling Data

SUMMARY OF MISSISSIPPI RIVER SAMPLING DATA

Almonte Street Bridge Station Number 18343004002

Sampled by Mississippi Valley Conservation Authority (1999-2004)

DATA FOR DISSOLVED OXYGEN ANALYSIS

River BOD_5 (mg/L)

October 1 – April 30

Number of samples	27
Minimum	0.20
Maximum	1.80
Average	0.76
75%-ile	0.90

May 1 – September 30

Number of samples	28
Minimum	0.20
Maximum	1.30
Average	0.70
75%-ile	0.85

River Dissolved Oxygen (mg/L)

October 1 – April 30

Number of samples	6
Minimum	10.43
Maximum	14.75
Average	12.63
25%-ile	12.03

May 1 – September 30

Number of samples	10
Minimum	8.98
Maximum	11.23
Average	9.98
25%-ile	9.31

River Temperature (degrees Celsius)

October 1 – April 30

Number of samples	21
Minimum	0.5

Maximum	10.5
Average	5.6
75%-ile	8.3

May 1 – September 30

Number of samples	27
Minimum	14.0
Maximum	26.6
Average	21.0
75%-ile	23.0

DATA FOR PHOSPHORUS ANALYSIS

River Total Phosphorus (mg/L)

June 1 – August 31

Number of samples	17
Minimum	0.012
Maximum	0.022
Average	0.018
75%-ile	0.020

September 1 – March 31

Number of samples	22
Minimum	0.002
Maximum	0.032
Average	0.017
75%-ile	0.020

April 1 – May 31

Number of samples	11
Minimum	0.012
Maximum	0.020
Average	0.016
75%-ile	0.020

DATA FOR AMMONIA ANALYSIS

River pH

June 1 – August 31

Number of samples	17
Minimum	8.10

Maximum	8.67
Average	8.38
75%-ile	8.50

September 1 – March 31

Number of samples	22
Minimum	7.84
Maximum	8.44
Average	8.10
75%-ile	8.17

April 1 – May 31

Number of samples	11
Minimum	7.87
Maximum	8.14
Average	8.03
75%-ile	8.13

River Temperature (degrees Celsius)

June 1 – August 31

Number of samples	17
Minimum	19.6
Maximum	26.6
Average	23.2
75%-ile	24.0

September 1 – March 31

Number of samples	21
Minimum	0.5
Maximum	20.0
Average	8.0
75%-ile	10.0

April 1 – May 31

Number of samples	10
Minimum	6.4
Maximum	17.4
Average	12.2
75%-ile	17.0

River Total Ammonia (mg/L)

June 1 – August 31

Number of samples	17
Minimum	0.002
Maximum	0.076
Average	0.036
75%-ile	0.040

September 1 – March 31

Number of samples	23
Minimum	0.002
Maximum	0.064
Average	0.031
75%-ile	0.050

April 1 – May 31

Number of samples	11
Minimum	0.018
Maximum	0.040
Average	0.030
75%-ile	0.040

APPENDIX D

Dissolved Oxygen – Oxygen Sag Assessment

DISSOLVED OXYGEN – OXYGEN SAG ASSESSMENT

Receiving Water Assessment Review for Carleton Place
Water Pollution Control Plant Discharge to Mississippi River
Stantec Consulting Ltd. Project #163400725

ANALYSIS FOR MAY 1 – SEPTEMBER 30 PERIOD

Dissolved Oxygen in Mix of River and Effluent - Mass Balance Assessment

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s (from Appendix A)
Sewage Effluent Wet Weather Flow (Q_S) = 27,000 m^3/d = 0.3125 m^3/s (from main report Section 3.1)
25%-ile Summer Dissolved Oxygen of the River (DO_R) = 9.31 mg/L (from Appendix C)
Dissolved Oxygen of the Sewage (DO_S) = 4.0 mg/L (assumed)

Calculation:
$DO_{MIX} = [(Q_R \times DO_R) + (Q_S \times DO_S)] / (Q_R + Q_S)$
$DO_{MIX} = [(4.07\ m^3/s \times 9.31\ mg/L) + (0.3125\ m^3/s \times 4.0\ mg/L)] / (4.07\ m^3/s + 0.3125\ m^3/s)$
$DO_{MIX} = 8.93$ mg/L

However, Theoretical Value of Dissolved Oxygen at 100% Saturation = 8.6 mg/L (assuming atmospheric pressure = 760 mm mercury; temperature of water = 23.0 degrees C), which is less than DO_{MIX}. *Therefore, use 0 mg/L as Initial Dissolved Oxygen Deficit (D_0).*

BOD and Reaeration Constants at 20 degrees C

Input Values:
Diffusivity of Oxygen in Water (D_L) = 7.5×10^{-6} m^2/hr (Viessman, 1993)
Velocity of Flow (U) = 0.0814 m/s (as shown below)
U = River 7Q20 flow / river depth x river width (from river survey at WPCP outfall, JLR)
U = 4.07 m^3/s / 0.5 m x 100 m
U = 0.0814 m/s
Depth of flow (H) = 0.5 m

Calculate Reaeration Constant (base *e*) per hour (k'_2):
$k'_{2@20} = (D_L \times U)^{1/2} / H^{3/2}$
$k'_{2@20} = (7.5 \times 10^{-6}\ m^2/hr \times 0.0814\ m/s \times 3600\ s/hr)^{1/2} \times 24\ hr/day / (0.5\ m)^{3/2}$
$k'_{2@20} = 3.18$ per day

$k'_{1@20} = 0.23$ per day (Metcalf & Eddy, 1972)

BOD and Reaeration Constants adjusted for temperature

Input Values:
75%-ile River Temperature (T) = 23 degrees C

Calculations:
$k'_{2@T} = k'_{2@20} \times 1.047^{T-20}$

$k'_{2@23} = 3.18 \times 1.047^{23-20}$
$k'_{2@23} = 3.65$ per day

$k'_{1@T} = k'_{1@20} \times 1.047^{T-20}$
$k'_{1@23} = 0.23 \times 1.047^{23-20}$
$k'_{1@23} = 0.26$ per day

Initial BOD of Mixture of River Water and Sewage Effluent (L_0)

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s (from Appendix A)
Sewage Effluent Wet Weather Flow (Q_S) = 27,000 m^3/d = 0.3125 m^3/s (from main report Section 3.1)
75%-ile BOD of the River (BOD_R) = 0.85 mg/L (from Appendix C)
BOD of the Sewage (BOD_S) = 25 mg/L (proposed maximum allowable)

Calculation:
$L_0 = [(Q_R \times BOD_R) + (Q_S \times BOD_S)] / (Q_R + Q_S)$
$L_0 = [(4.07\ m^3/s \times 0.85\ mg/L) + (0.3125\ m^3/s \times 25\ mg/L)] / (4.07\ m^3/s + 0.3125\ m^3/s)$
$L_0 = 2.57$ mg/L

Time (t_C) to Point of Minimum Dissolved Oxygen

Input Values:
$D_0 = 0$ mg/L (from above)

Calculation:
$t_C = [1 / (k'_2 - k'_1)] \ln \{(k'_2 / k'_1) \times [1 - D_0(k'_2 - k'_1)/ k'_1 L_0]\}$
$t_C = [1 / (3.65 - 0.26)] \ln \{(3.65 / 0.26) \times [1 - 0]\}$
$t_C = 0.78$ days

Minimum Dissolved Oxygen

Input Values:
As determined above

Calculate Maximum Sag (D_C) from Saturation Value:
$D_C = [(k'_1 L_0) / (k'_2 - k'_1)] \times [e^{-k'_1 t_C} - e^{-k'_2 t_C}] + [D_0 e^{-k'_2 t_C}]$
$D_C = [(0.26)(2.57) / (3.65 - 0.26)] \times [2.718^{-(0.26)(0.78)} - 2.718^{-(3.65)(0.78)}] + 0$
$D_C = 0.149$ mg/L

Minimum Dissolved Oxygen = Saturation Value (8.6 mg/L) – Maximum Sag (0.149 mg/L)
= 8.451 mg/L

Distance to Minimum Dissolved Oxygen = Velocity x Time
= 0.0814 m/s x 3600 s/hr x 24 hr/day x 0.78 days
= 5,485 m

ANALYSIS FOR OCTOBER 1 – APRIL 30 PERIOD

Dissolved Oxygen in Mix of River and Effluent - Mass Balance Assessment

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s (from Appendix A)
Sewage Effluent Wet Weather Flow (Q_S) = 27,000 m^3/d = 0.3125 m^3/s (from main report Section 3.1)
25%-ile Winter Dissolved Oxygen of the River (DO_R) = 12.03 mg/L (from Appendix C)
Dissolved Oxygen of the Sewage (DO_S) = 4.0 mg/L (assumed)

Calculation:
$DO_{MIX} = [(Q_R \times DO_R) + (Q_S \times DO_S)] / (Q_R + Q_S)$
$DO_{MIX} = [(4.07\ m^3/s \times 12.03\ mg/L) + (0.3125\ m^3/s \times 4.0\ mg/L)] / (4.07\ m^3/s + 0.3125\ m^3/s)$
$DO_{MIX} = 11.46$ mg/L

However, Theoretical Value of Dissolved Oxygen at 100% Saturation = 11.8 mg/L (assuming atmospheric pressure = 760 mm mercury; temperature of water = 8.0 degrees C), which is less than DO_{MIX}.
Therefore, use 0 mg/L as Initial Dissolved Oxygen Deficit (D_0).

BOD and Reaeration Constants at 20 degrees C

Input Values:
Diffusivity of Oxygen in Water (D_L) = 7.5×10^{-6} m^2/hr (Viessman, 1993)
Velocity of Flow (U) = 0.0814 m/s (as shown below)
U = River 7Q20 flow / river depth x river width (from river survey at WPCP outfall, JLR)
U = 4.07 m^3/s / 0.5 m x 100 m
U = 0.0814 m/s
Depth of flow (H) = 0.5 m

Calculate Reaeration Constant (base *e*) per hour (k'_2):
$k'_{2@20} = (D_L \times U)^{1/2} / H^{3/2}$
$k'_{2@20} = (7.5 \times 10^{-6}\ m^2/hr \times 0.0814\ m/s \times 3600\ s/hr)^{1/2} \times 24\ hr/day / (0.5\ m)^{3/2}$
$k'_{2@20} = 3.18$ per day

$k'_{1@20} = 0.23$ per day (Metcalf & Eddy, 1972)

BOD and Reaeration Constants adjusted for temperature

Input Values:
75%-ile River Temperature (T) = 8 degrees C

Calculations:
$k'_{2@T} = k'_{2@20} \times 1.047^{T-20}$
$k'_{2@8} = 3.18 \times 1.047^{8-20}$
$k'_{2@8} = 1.83$ per day

$k'_{1@T} = k'_{1@20} \times 1.047^{T-20}$
$k'_{1@8} = 0.23 \times 1.047^{8-20}$
$k'_{1@8} = 0.132$ per day

Initial BOD of Mixture of River Water and Sewage Effluent (L_0)

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s (from Appendix A)
Sewage Effluent Wet Weather Flow (Q_S) = 27,000 m^3/d = 0.3125 m^3/s (from main report Section 3.1)
75%-ile BOD of the River (BOD_R) = 0.90 mg/L (from Appendix C)
BOD of the Sewage (BOD_S) = 25 mg/L (proposed maximum allowable)

Calculation:
$L_0 = [(Q_R \times BOD_R) + (Q_S \times BOD_S)] / (Q_R + Q_S)$
$L_0 = [(4.07\ m^3/s \times 0.9\ mg/L) + (0.3125\ m^3/s \times 25\ mg/L)] / (4.07\ m^3/s + 0.3125\ m^3/s)$
$L_0 = 2.618$ mg/L

Time (t_C) to Point of Minimum Dissolved Oxygen

Input Values:
$D_0 = 0$ mg/L (from above)

Calculation:
$t_C = [1 / (k'_2 - k'_1)] \ln \{(k'_2 / k'_1) \times [1 - D_0(k'_2 - k'_1)/ k'_1 L_0]\}$
$t_C = [1 / (1.83 - 0.132)] \ln \{(1.83 / 0.132) \times [1 - 0]\}$
$t_C = 1.54$ days

Minimum Dissolved Oxygen

Input Values:
As determined above

Calculate Maximum Sag (D_C) from Saturation Value:
$D_C = [(k'_1 L_0) / (k'_2 - k'_1)] \times [e^{- k'_1 t_C} - e^{- k'_2 t_C}] + [D_0 e^{- k'_2 t_C}]$
$D_C = [(0.132)(2.618) / (1.83 - 0.132)] \times [2.718^{-(0.132)(1.54)} - 2.718^{-(1.83)(1.54)}] + 0$
$D_C = 0.151$ mg/L

Minimum Dissolved Oxygen = Saturation Value (11.8 mg/L) – Maximum Sag (0.151 mg/L)
= 11.65 mg/L

Distance to Minimum Dissolved Oxygen = Velocity x Time
= 0.0814 m/s x 3600 s/hr x 24 hr/day x 1.54 days
= 10,830 m

APPENDIX E
Phosphorus Assessment

PHOSPHORUS ASSESSMENT

Receiving Water Assessment Review for Carleton Place
Water Pollution Control Plant Discharge to Mississippi River
Stantec Consulting Ltd. Project #163400725

ANALYSIS FOR ALL PERIODS

75%-ile for Total Phosphorus was 0.02 mg/L for each of the three calendar periods (June 1-August 31, September 1 – March 31, April 1 – May 31)

Mass Balance Assessment

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s = 4070 L/s (from Appendix A)
WPCP Rated Capacity of Sewage (Q_S) = 10,000 m^3/d = 116 L/s (from main report Section 3.1)
75%-ile Total Phosphorus of the River (P_R) = 0.02 mg/L (from Appendix C)
PWQO Interim Guideline for Allowable Phosphorus Concentration (P_{MIX}) = 0.03 mg/L

Calculate Maximum Phosphorus Concentration in Sewage Effluent (P_S) to Meet Guidelines:
$P_{MIX} = [(Q_R \times P_R) + (Q_S \times P_S)] / (Q_R + Q_S)$
$P_S = [(P_{MIX}) \times (Q_R + Q_S) - (Q_R \times P_R)] / (Q_S)$
$P_S = [(0.03\ mg/L) \times (4070\ L/s + 116\ L/s) - (4070\ L/s \times 0.02\ mg/L)] / (116\ L/s)$
$P_S = 0.38\ mg/L$

APPENDIX F
Ammonia Assessment

AMMONIA ASSESSMENT

Receiving Water Assessment Review for Carleton Place
Water Pollution Control Plant Discharge to Mississippi River
Stantec Consulting Ltd. Project #163400725

ANALYSIS FOR JUNE 1 – AUGUST 31 PERIOD

Mass Balance Assessment

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s = 4070 L/s (from Appendix A)
WPCP Rated Capacity of Sewage (Q_S) = 10,000 m^3/d = 116 L/s (from main report Section 3.1)
75%-ile Total Ammonia of the River (A_R) = 0.04 mg/L (from Appendix C)
75%-ile Temperature of the River (T) = 24.0 degrees C = 297.15 K (from Appendix C)
Assume Temperature of the River/Effluent Mix is equal to 75%-ile Temperature of the River
75%-ile pH of the River (pH) = 8.5 (from Appendix C)
Assume pH of the River/Effluent Mix is equal to 75%-ile pH of the River
PWQO for un-ionized ammonia = 0.02 mg/L

Calculate Fraction (f) of Total Ammonia which is Un-ionized:
pKa = 0.09018 + 2729.92 / T(in K)
pKa = 9.277
$f = 1 / (10^{pKa - pH} + 1)$
$f = 1 / (10^{9.277 - 8.5} + 1)$
f = 0.1433

Calculate Maximum Total Ammonia Concentration of the Mix (A_{MIX}):
A_{MIX} = PWQO for un-ionized ammonia / f
A_{MIX} = 0.02 mg/L / 0.1433
A_{MIX} = 0.1396 mg/L

Calculate Maximum Total Ammonia Concentration of the Sewage (A_S):
$A_{MIX} = [(Q_R \times A_R) + (Q_S \times A_S)] / (Q_R + Q_S)$
$A_S = [A_{MIX} \times (Q_R + Q_S) - (Q_R \times A_R)] / (Q_S)$
A_S = [0.1396 mg/L x (4070 L/s + 116 L/s) - (4070 L/s x 0.04 mg/L)] / (116 L/s)
A_S = 3.63 mg/L

ANALYSIS FOR SEPTEMBER 1 – MARCH 31 PERIOD

Mass Balance Assessment

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s = 4070 L/s (from Appendix A)
WPCP Rated Capacity of Sewage (Q_S) = 10,000 m^3/d = 116 L/s (from main report Section 3.1)
75%-ile Total Ammonia of the River (A_R) = 0.05 mg/L (from Appendix C)
75%-ile Temperature of the River (T) = 10.0 degrees C = 283.15 K (from Appendix C)
Assume Temperature of the River/Effluent Mix is equal to 75%-ile Temperature of the River

75%-ile pH of the River (pH) = 8.17 (from Appendix C)
Assume pH of the River/Effluent Mix is equal to 75%-ile pH of the River
PWQO for un-ionized ammonia = 0.02 mg/L

Calculate Fraction (f) of Total Ammonia which is Un-ionized:
pKa = 0.09018 + 2729.92 / T(in K)
pKa = 9.7314
$f = 1 / (10^{pKa - pH} + 1)$
$f = 1 / (10^{9.7314 - 8.5} + 1)$
f = 0.0267

Calculate Maximum Total Ammonia Concentration of the Mix (A_{MIX}):
A_{MIX} = PWQO for un-ionized ammonia / f
A_{MIX} = 0.02 mg/L / 0.0267
A_{MIX} = 0.749 mg/L

Calculate Maximum Total Ammonia Concentration of the Sewage (A_S):
$A_{MIX} = [(Q_R \times A_R) + (Q_S \times A_S)] / (Q_R + Q_S)$
$A_S = [A_{MIX} \times (Q_R + Q_S) - (Q_R \times A_R)] / (Q_S)$
A_S = [0.749 mg/L x (4070 L/s + 116 L/s) - (4070 L/s x 0.05 mg/L)] / (116 L/s)
A_S = 25.3 mg/L

ANALYSIS FOR APRIL 1 – MAY 31 PERIOD

Mass Balance Assessment

Input Values:
River 7Q20 Flow (Q_R) = 4.07 m^3/s = 4070 L/s (from Appendix A)
WPCP Rated Capacity of Sewage (Q_S) = 10,000 m^3/d = 116 L/s (from main report Section 3.1)
75%-ile Total Ammonia of the River (A_R) = 0.04 mg/L (from Appendix C)
75%-ile Temperature of the River (T) = 17.0 degrees C = 290.15 K (from Appendix C)
Assume Temperature of the River/Effluent Mix is equal to 75%-ile Temperature of the River
75%-ile pH of the River (pH) = 8.13 (from Appendix C)
Assume pH of the River/Effluent Mix is equal to 75%-ile pH of the River
PWQO for un-ionized ammonia = 0.02 mg/L

Calculate Fraction (f) of Total Ammonia which is Un-ionized:
pKa = 0.09018 + 2729.92 / T(in K)
pKa = 9.277
$f = 1 / (10^{pKa - pH} + 1)$
$f = 1 / (10^{9.277 - 8.5} + 1)$
f = 0.041

Calculate Maximum Total Ammonia Concentration of the Mix (A_{MIX}):
A_{MIX} = PWQO for un-ionized ammonia / f
A_{MIX} = 0.02 mg/L / 0.041
A_{MIX} = 0.4878 mg/L

Calculate Maximum Total Ammonia Concentration of the Sewage (A_S):

$A_{MIX} = [(Q_R \times A_R) + (Q_S \times A_S)] / (Q_R + Q_S)$

$A_S = [A_{MIX} \times (Q_R + Q_S) - (Q_R \times A_R)] / (Q_S)$

$A_S = [0.4878 mg/L \times (4070 L/s + 116 L/s) - (4070 L/s \times 0.04 mg/L)] / (116 L/s)$

$A_S = 16.2 mg/L$

APPENDIX D

Opinion of Probable Cost
Water Pollution Control Plant Capacity Expansion
Present Worth Analysis

	Capital Cost (2008 dollars)	Present Worth of Future Capital Cost (2008 dollars)	Anticipated Year of Construction
Alternative 1	$8,600,000	$6,093,612	2020
Alternative 2 - Stage 1	$6,700,000	$4,747,349	2020
Alternative 2 - Stage 2	$3,600,000	$1,611,315	2036
Alternative 2 - Total	$10,300,000	$6,358,664	

This analysis assumes a 3% inflation rate to project 2008 construction values into the future. A 6% discount rate is then used to bring the future cost back into 2008 dollars and establish the Present Worth.

No guarantee or prediction of future rates is made or implied. Assumed rates are based upon historical averages and current conditions.

Opinion of Probable Cost
Water Pollution Control Plant Capacity Expansion
Alternative 1: Single Stage Construction

Major Component	Cost
Headworks	$700,000
Primary Clarification	$700,000
Aeration	$1,500,000
Secondary Clarification	$2,400,000
Disinfection	$400,000
Phosphorous Removal	$100,000
Tertiary Treatment	$2,800,000
TOTAL	**$8,600,000**

Alternative 2: Two Stage Construction

Major Component	Stage 1 Cost	Stage 2 Cost	Total Cost
Headworks	$420,000	$420,000	$840,000
Primary Clarification	$420,000	$420,000	$840,000
Aeration	$900,000	$900,000	$1,800,000
Secondary Clarification	$1,440,000	$1,440,000	$2,880,000
Disinfection	$400,000	$80,000	$480,000
Phosphorous Removal	$60,000	$60,000	$120,000
Tertiary Treatment	$3,060,000	$300,000	$3,360,000
TOTAL	**$6,700,000**	**$3,600,000**	**$10,300,000**

Note: This opinion of probable cost (Class "D" Order of Magnitude estimate) is not intended to predict the future construction cost, but to give the client an idea of the relative size of the project. Costs for Alternative 2 factor in a 20% premium for breaking the work into two stages. The costs are based upon construction in 2008. Total costs have been rounded to the nearest $100,000 to avoid confusion as to the accuracy. All prices shown are in 2008 dollars. Taxes have not been included.

APPENDIX E

Town of Carleton Place

WPCP Capacity Expansion Master Plan

Prepared by Stantec Consulting Ltd.

August 5, 2011

Master Plan Recommendation of Future Project

Planned Project	Capital Cost (2008$)	Anticipated Date
WPCP Upgrade	$8,600,000	2020

APPENDIX F

Town of Carleton Place
WPCP Master Plan
Stantec Project #163400725
Notice of Study Completion

Town of Carleton Place
Master Plan
Water Pollution Control Plant Capacity Expansion
Notice of Study Completion

The Town of Carleton Place has prepared a Master Plan for capacity expansion for the Water Pollution Control Plant (WPCP). Expansion will be required in the future to accommodate the growing population of the Town of Carleton Place. This study began as a Municipal Class Environmental Assessment, however, due to the long-range nature of the recommendations, it is being finalized as a Master Plan. The proposed expansion includes construction of facilities at the existing site of the Water Pollution Control Plant (122 Patterson Crescent, Town of Carleton Place). The Master Plan identifies the recommended infrastructure to service the future growth of the Town while minimizing environmental impacts. The Master Plan incorporates the comments received from the public and review agencies during the course of the study.

Master Plan Recommendation of Future Work

Planned Project	Capital Cost	Anticipated Date
WPCP Upgrade	$8,600,000	2020

The Master Plan is available for review at the office of the Town Clerk. This study has met the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment. For further information on this project please contact Paul Knowles, Town of Carleton Place, 175 Bridge Street, Carleton Place, Ontario K7C 2V8 Telephone (613) 257-6200. Thereafter, the Master Plan will be reviewed and revised taking into consideration the comments which are received from the public. The recommended Master Plan will be presented to Town Council for approval.

Town of Carleton Place
Class Environmental Assessment
Water Treatment Plant and Water Storage Capacity Expansion
Notice of Study Commencement

The Town of Carleton Place is commencing with the study of capacity expansion for the Water Treatment Plant and water storage facilities. Expansion will be required in the future to accommodate the growing population of the Town of Carleton Place. The expansion is expected to include construction of facilities at the existing site of the Water Treatment Plant (199 John Street, Town of Carleton Place) and possibly at another site to be determined during the study.

This project is being planned under Schedule C of the Municipal Class Environmental Assessment. Public consultation is a key component of the planning process. For further information or to provide input/comments on this project please contact Dave Young, Town of Carleton Place, 175 Bridge Street, Carleton Place, Ontario K7C 2V8 Telephone (613) 257-6200.

Town of Carleton Place
Class Environmental Assessment
Water Pollution Control Plant Capacity Expansion
Notice of Study Commencement

The Town of Carleton Place is commencing with the study of capacity expansion for the Water Pollution Control Plant. Expansion will be required in the future to accommodate the growing population of the Town of Carleton Place. The expansion is expected to include construction of facilities at the existing site of the Water Pollution Control Plant (122 Patterson Crescent, Town of Carleton Place).

This project is being planned under Schedule C of the Municipal Class Environmental Assessment. Public consultation is a key component of the planning process. For further information or to provide input/comments on this project please contact Dave Young, Town of Carleton Place, 175 Bridge Street, Carleton Place, Ontario K7C 2V8 Telephone (613) 257-6200.

Trans-Northern Pipelines Inc.

45 VOGELL ROAD, SUITE 310
RICHMOND HILL, ONTARIO L4B 3P6
TEL: (905) 770-3353 FAX: (905) 770-8675

2007-07-17

Mr. Dave Young
Town of Carleton Place
175 Bridge Street
Carleton Place
Ontario K7C 2V8

Dear Mr. Young:

Water Treatment Plant and Water Storage Capacity Expansion
Water Pollution Control Plant Capacity Expansion
Notice of Commencement of Class Environmental Assessment Studies

Thank you for notice that the Town has initiated the subject studies.

As indicated on the enclosed map, Trans-Northern's Ottawa Lateral pipeline lies well to the east, mostly east of the Rideau River. As Trans-Northern has no facilities within the Town of Carleton Place, it need not participate further in the process.

Again, thank you for including Trans-Northern in your consultation. Please do not hesitate to call if I may be of assistance in a pipeline-related matter.

Yours very truly,

Walter H. Watt
Property Administrator

WHW/ww

c.c. Mr. Marc Bezanson, Project Manager, Stantec Consulting Ltd.

Ministry of the Environment

P.O. Box 22032
Kingston, Ontario
K7M 8S5
613/549-4000 or 1-800/267-0974
Fax: 613/548-6908

Ministère de l'Environnement

C.P. 22032
Kingston (Ontario)
K7M 8S5
613/549-4000 ou 1-800/267-0974
Fax: 613/548-6908

Ontario

July 27, 2007

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa, Ontario
K1Z 7T1

Attention: Marc Bezanson
Project Manager

Dear Mr. Bezanson:

Re: Town of Carleton Place Water and Wastewater Expansion

Thank you for your June 29, 2007 letter and the copy of the Notice of Commencement. Please continue to keep me informed of the progress of this project.

The proposed project includes water treatment plant and water storage capacity expansion, and water pollution control plant (WPCP) capacity expansion.

Barry Burns, Surface Water Evaluator, provided preliminary comments on effluent criteria in a December 12, 2006 email to Jean Hébert of Stantec. In the email, Mr. Burns indicated that the Ministry would require an effluent compliance limit of 0.3 mg/L for Total Phosphorus for any expansion of the Carleton WPCP; however, this does not preclude the imposition of a lower compliance limit that may be identified through a site specific receiving stream assessment. He also discussed the need for monitoring of lethality of the sewage effluent, and clarified a misunderstanding concerning the current Certificate of Approval.

Class Environmental Assessment Process

The Regional Office is a mandatory contact for projects carried out under the Municipal Class Environmental Assessment (Class EA). We would like the opportunity to review reports and documentation provided as part of the Class EA process, such as an interim Phase 1 and 2 Report, the Environmental Study Report, information bulletins, and technical reports such as receiving stream assessments. The Regional office circulates the information to reviewers within the Regional and District offices and coordinates the Ministry of the Environment (MOE) review of the Class Environmental Assessment project.

Technical studies in support of the project, such as a receiving stream assessment, should be submitted to this Ministry early in the Class EA process.

The Class EA process for schedule C projects includes: identification of the problem (phase 1); evaluation of alternative planning solutions and their impacts on the environment, and selection of the preferred planning solution (phase 2); evaluation of alternative designs to implement the preferred planning solution, their impacts on the environment, and selection of the preferred design alternative (phase 3); mandatory public and review agency consultation (phases 2, 3, 4); documentation of the planning/evaluation process, the public and review agency consultation, and rationale for selection of the preferred alternative solution and alternative design, in an Environmental Study Report (phase 4); and final design, construction, and implementation of mitigation measures (phase 5).

MOE Technical Review

This Ministry's technical review of the project would consider such issues as: problems identified during MOE inspections of the existing facilities; impacts to the receiving water body due to increase in the discharge of sewage treatment plant effluent; quality of the drinking water source; impacts to groundwater and surface water due to construction (i.e. dewatering of trenches during installation of sewers and watermains, control of erosion and sedimentation, construction and/or dredging at outfall or intake locations); noise and odour impacts to nearby residents from new infrastructure; and proposed water and sewage service areas.

To evaluate surface water impacts due to discharge of sewage effluent, appropriate site-specific receiving water assessments must be conducted to determine the effluent requirement based on the waste assimilative capacity of the receiver. The site-specific effluent requirements derived from the receiving water assessment must be compared to provincial guidelines for effluent discharge (i.e. MOE procedure F-5-1: Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works Discharging to Surface Waters), and the most stringent criteria will apply. In the absence of available information the receiving stream assessment, including background water quality and flow data, must be provided to MOE by the proponent.

The Class EA study should consider the need for an adequate buffer area between the sewage treatment facility and residences, and should identify the separation distances between the facility and nearest residences. Adequate buffer area should be acquired for new facilities or enlargements of existing facilities. Alternatively, noise and odour control could be provided where expansion of the buffer area is not feasible. Please refer to this Ministry's Guideline D-2 Compatibility between Sewage Treatment and Sensitive Land Use.

Please send copies of technical reports, Environmental Study Reports and any other EA documentation to my attention. I will circulate copies of the reports to the appropriate reviewers and coordinate the response on behalf of this Ministry's Regional and District offices.

Yours truly,

VM

V. Mitchell
Environmental Assessment Coordinator
Technical Support Section
Eastern Region
VM/gl

c: Town of Carleton Place, 175 Bridge Street, Carleton Place ON K7C 2V8
Attn: Dave Young

Bezanson, Marc

From: Hebert, Jean
Sent: Wednesday, November 21, 2007 3:44 PM
To: Bezanson, Marc
Subject: 634_00426_moe_061102_Carleton_Place_WWTP_effluent_criteria

From: Burns, Barry (ENE) [mailto:Barry.Burns@ontario.ca]
Sent: Tuesday, December 12, 2006 12:57 PM
To: Hebert, Jean
Cc: Castro, Victor (ENE); Leavoy, Jena (ENE); Mitchell, Vicki (ENE)
Subject: RE: 634_00426_moe_061102_Carleton_Place_WWTP_effluent_criteria

Hi Jean,

As a follow up to your e-mail of November 2, 2006 regarding effluent criteria for a potential expansion at the Carleton Place WWTP, I would like to provide the following.

As you know, effluent criteria are normally developed as part of the Municipal Class EA process through site specific receiving water assessments, the results of which are compared to the appropriate standard. The most stringent of those criteria are then applied. Usually, larger receiving streams will be subject to the standard secondary treatment requirements of 25 mg/l for CBOD5 and Suspended Solids, 1.0 mg/l for Total Phosphorus (TP) as well as meeting whole effluent non-toxicity.

In the case of the Mississippi River downstream from Mississippi Lake, significant reductions in TP concentrations and a corresponding increase in water quality have been realized over the last 10 – 15 years, raising the river's status from policy 2 to Policy 1 for TP. The overall reductions in TP are attributable to a number of factors, and would certainly include the substantially lower (in comparison to that allowed) phosphorus loading from the Carleton Place WWTP. A review of plant operating data for the years 2002 through 2006 has shown that this plant is very well operated, and despite a current TP compliance level of 1.0 mg/l, there have in fact been very few occasions where the plant effluent has exceeded 0.3 mg/l TP as a monthly average.

Maintaining these improvements to water quality in the Mississippi River needs to be a key component of any proposed upgrade to the Carleton Place WWTP, and to that end the ministry will require compliance criteria of 0.3 mg/l TP for any expansion of the Carleton Place WWTP. This requirement however, does not preclude the imposition of lower compliance value for TP that may be identified through a receiving water assessment.

Compliance criteria of 0.3 mg/l TP for an expansion of the Carleton Place sewage works is consistent with that required for the recently proposed expansion of the sewage works at Almonte, where effluent compliance criteria of 0.3 mg/l TP will apply for 9 months of the year from September through May, and is reduced to 0.2 mg/l for the months of June, July and August.

Additionally, in order to verify the acute non-lethality of sewage effluents, there will be a condition on the Certificates of Approval requiring the operator to perform lethality testing for rainbow trout and Daphnia magna, in accordance with the most current procedures published by Environment Canada. For plants with design flows in excess of 5000 m^3/day, the testing is carried out on a monthly basis, and can be reduced to quarterly testing following 12 consecutive months of successfully demonstrating non-lethality. For plants less than 5000 m^3/day, testing is carried out on a quarterly basis. In the event of failure of any test, the owner would be required to investigate possible causes of the toxicity based on sampling data and monitoring, and upon determination of the cause or source of the lethality determine appropriate control measures.

I would also like to clarify what appears to be a minor misunderstanding concerning the current Certificate of Approval. The Table attached to your e-mail indicates that there are no compliance limits applied to any parameters for plant flows between 11,900 m^3/day and 22,000 m^3/day. The compliance limits for the effluent listed in the Certificate of Approval apply to all discharges from the STP, regardless of flows. Compliance loadings are in fact based on the maximum flow rate of 22,000 m^3/day.

Please let me know if you have any questions or comments.

Regards

Barry

B.D. Burns, P.Eng.
Surface Water Scientist
Eastern Region

From: Hebert, Jean [mailto:jean.hebert@stantec.com]
Sent: November 2, 2006 3:13 PM
To: Burns, Barry (ENE)
Cc: Dicaire, Fern
Subject: 634_00426_moe_061102_Carleton_Place_WWTP_effluent_criteria

Hi, Barry.

Stantec is preparing on behalf of the Town of Carleton Place an assessment report for the Carleton Place Wastewater Treatment Plant, for planning purpose only. This activated sludge process plant is discharging treated effluent to Misssissippi River on a continuous basis. Effluent is disinfected with UV ligths. This is a desktop exercise only, since the plant is operated at a current flow rate representing about 76% of the average (dry weather) capacity.

We would need to confirm what would be the plant effluent criteria, would the plant be upgraded this year.

For reference, we provide into the attached table the current plant effluent criteria.

<<WWTP_effluent_criteria.doc>>

Thank you for your collaboration.

Jean Hébert, M.A.Sc., P.Eng.
Environmental Engineer, Project Manager
Stantec
1505 Laperriere Avenue
Ottawa ON K1Z 7T1
Ph: (613) 725-5562
Fx: (613) 722-2799
Cell: (613) 294-4264
jean.hebert@stantec.com
stantec.com

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Bezanson, Marc

From: Mitchell, Vicki (ENE) [Vicki.Mitchell@ontario.ca]
Sent: Monday, November 26, 2007 11:06 AM
To: Bezanson, Marc
Cc: Leavoy, Jena (ENE); Burns, Barry (ENE)
Subject: RE: Carleton Place WTP ESR & WPCP ESR

Hi Marc,

Thank you for your email. It is not clear to me what EA approach you will be using for planning for the expansions. If you are doing a conceptual level review at this time, it may be appropriate to undertake the planning through a Master Planning process (i.e. completing phases 1 and 2 as a minimum), and then complete phases 3 and 4 of the Class EA process at a later date, when the municipality is more certain about going ahead.

If the municipality is planning to complete Environmental Study Reports for the water and sewage treatment plants in the near future, it will need to fulfill all of the requirements of the Class EA process, including evaluation of alternative designs, selection of both a preferred alternative solution and a preferred design alternative, and detailed assessment of impacts to the environment (including any necessary receiving stream assessment).

If the municipality is planning to complete a master planning process, then it should review the information in appendices of the Class EA and determine which master plan approach would be most appropriate (i.e. Appendix 4 outlines 4 common approaches to master planning). If a master plan approach is followed, the final notification for the master plan would list all of the projects and corresponding schedules of the individual projects within that plan that are deemed to be complete. (For example, if the master plan fulfills phases 1 and 2 of the Class EA process, then the notice may list schedule B projects for which the EA planning is complete, and provide members of the public with the opportunity to request a Part II Order for those specific projects only).

If you would like to discuss these issues in greater detail, please feel free to contact me at (613) 540-6852.

Vicki Mitchell
Environmental Assessment Coordinator
Technical Support, Eastern Region
(613) 540-6852
1259 Gardiners Road
P.O. Box 22032, Kingston, ON K7M 8S5

From: Bezanson, Marc [mailto:marc.bezanson@stantec.com]
Sent: November 26, 2007 9:34 AM
To: Mitchell, Vicki (ENE)
Subject: Carleton Place WTP ESR & WPCP ESR

Vicki,

In response to your letter of July 27, 2007, I am writing to inform you of the approach that the Town of Carleton Place will be taking for the WTP ESR and the WPCP ESR. Both ESRs are reviewing capacity expansion needs for the future. The intent is to look at where capacity will need to be upgraded in the process, what is a logical staging of the upgrades, and is there available land. This is a proactive approach since capacity upgrades are still several years off in the future. At this point, existing receiving stream assessments and previous input from Barry Burns will be used to establish discharge criteria. When the Town is ready to go to the next level of planning (closer to actual implementation), then a new receiving stream assessment could be obtained.

Thank you for your time and input into this process. We will be in touch as more information becomes available.

Sincerely,

Marc Bezanson, MBA, P.Eng.
Project Manager, Environmental Infrastructure
Stantec
Ph: (613) 724-4096
Fx: (613) 722-2799
marc.bezanson@stantec.com
stantec.com

The content of this email is the confidential property of Stantec and should not be copied, modified, retransmitted, or used for any purpose except with Stantec's written authorization. If you are not the intended recipient, please delete all copies and notify us immediately.

Please consider the environment before printing this email.

Memo

Stantec

To:	Project File Stantec Ottawa	From:	Marc Bezanson Stantec Ottawa
File:	1634-00725	Date:	March 14, 2008

RECORD OF TELEPHONE CONVERSATION

March 13, 2008 with Barry Burns, Surface Water Scientist, MOE

- Barry Burns would expect discharge criteria similar to Almonte Ward Communal Sewage System (Town of Mississippi Mills); this should be able to be justified with available river water quality data (even though there is not much recent data upstream); Barry Burns is comfortable with us making some assumptions about background river quality based upon downstream data

- Anything different from the expected criteria would require an extensive water sampling program which would need to span at least one calendar year

STANTEC CONSULTING LTD.

Marc Bezanson, MBA, P.Eng.
Project Manager, Environmental Infrastructure
marc.bezanson@stantec.com

c. Paul Knowles, Town of Carleton Place
Dave Young, Town of Carleton Place
Andy Trader, OCWA
Brian Symondson, OCWA

mtb w:\active\1634 00725 carleton place esr\project_management\correspondence\080314_memo to file_moe opinion on water quality data.doc

Carleton Place
See it... live it... love it!

Municipal Matters

COUNCIL HIGHLIGHTS

May 27, 2008

7:00p.m Council

Followed by:
Policy Review Committee

INTERIM REALTY TAX NOTICE - 2008
INSTALLMENT DUE - MAY 29, 2008

Payment by Mail – Remove the stub from your tax billing, attach it to your cheque and mail it to the Town of Carleton Place, 175 Bridge Street, Carleton Place, Ontario, K2C2V7

In Person – The tax office in the Town Hall is open for collection of taxes from 8:30 a.m. to 4:30 p.m. Monday through Friday. Payment after hours may be deposited in the payment box in the foyer at the police station.

If payment is made by mail or after the office hours, and you require a receipt, please include the complete bill with your cheque. The bill will be receipted and returned to you by mail.

Payments accepted at most financial institutions. For more information or questions, call C. Manzon, Tax Collector 257-6218.

EMERGENCY NUMBERS
Emergency – Police Fire Ambulance: 911
Public Works Emergency Number 24/7:
613-257-2253

info@carletonplace.ca

175 Bridge Street,
Carleton Place, ON K7C 2V8
613-257-6200

PUBLIC MEETING FOR THREE TOPICS
JUNE 17, 2008 @ 7:00 P.M.
NEELIN STREET COMMUNITY CENTRE SMALL UPPER HALL

1) CLASS ENVIRONMENT ASSESSMENT
REPAIR BRIDGE STREET WATERMAIN

The Town of Carleton Place conducted a Water Leakage Survey and has discovered that the watermain on Bridge Street is leaking. The leak has been identified in the section between Mill Street and Bell Street where the watermain crosses under the Mississippi River underneath the bridge. The leak appears to be located directly under the north abutment wall of the bridge. Given the location of the leak, conventional watermain repair techniques cannot be employed. Instead, the options to repair include utilizing trenchless technology to structurally line the watermain or replacing the watermain with a new watermain suspended from the bridge.

Repair options being considered will not likely impact the river or shoreline. However, access pits and work sites, on both sides of the river, will likely impact adjacent properties and traffic flow.

The preferred solution, to repair the watermain, will be presented at this public meeting.

The project is being planned under Schedule B of the Municipal Class Environmental Assessment.

For further information on this project, or to inspect a copy of the Class Environmental Assessment, please contact

Paul Knowles, Chief Administrative Officer
Carleton Place Town Hall
175 Bridge Street, ON K7C 2V8
Telephone: 613-257-6207

2) CLASS ENVIRONMENT ASSESSMENT
WATER AND WASTEWATER PLANT EXPANSIONS
TO INCREASE THE CAPACITY OF BOTH WATER AND
WASTEWATER TREATMENT PLANTS

Growth in Carleton Place is expected to continue. To accommodate this growth, the Town is developing plans to expand the capacity of both the Water and Wastewater Treatment Plants.

This project is being planned as a Schedule C project under the Municipal Class Environmental Assessment. A public meeting is planned to provide further information to the public, on the proposal, and to receive input and comment from interested persons.

Further comments are invited, for incorporation into the planning and design of this project, and will be received until July 11, 2008. For further information, please contact:

Marc Bezanson, MBA, P.Eng.
Project Manager, Environmental Infrastructure
Stantec Consulting Ltd.
1505 Laperriere Avenue, Ottawa, ON K1Z 7T1
Telephone: (613) 724-4096

Subject to comments received as a result of this Notice, the Town plans to instruct the consultants to proceed with the planning for this project and an Environmental Study Report will be prepared and placed on the public record for a minimum 30 day review period.

---

3) DEVELOPMENT CHARGES B7-LAW AND WATER AND SEWER IMPOSE FEE BY-LAW

Council is proposing to update the Development Charges By-law and the Water and Sewer Impose Fee By-law. Proposed fees are shown below.

	Current			Proposed		
Unit	Development Charge	Water &Sewer	Total	Development Charge	Water &Sewer	Total
Single	$4,369	$3,923	$8,292	$3,472.63	$5,750	$9,223
Townhouse	$3,727	$3,923	$7,650	$2,958.17	$5,750	$8,708
Duplex	$3,084	$3,923	$7,007	$2,829.55	$5,750	$8,580
Apartments	$1,671	$3,295	$4,966	$1,643.39	$4,830	$6,473
Seniors	$1,285	$3,295	$4,580	$1,286.16	$4,830	$6,116
Commercial	nil	*		$1.77 /sq. ft	*	1.77 /sq. ft.

* included in quarterly water bill.

A copy of the Development Charges Background Report, the proposed Development Charges By-law and the Water and Sewer Impose Fee By-law are posted on the Town's Web Site.

This Notice issued May 23, 2008

Carleton Place

See it... live it... love it!

Municipal Matters

COUNCIL HIGHLIGHTS

Tuesday, June 3, 2008

7:00pm — **Planning and Development Committee**

Major Topics: Development Permit Bylaw

Followed by: Community Issues Committee

Major Topics: Childcare Facility

PLEASE NOTE:

The Corporate Services Committee meeting originally scheduled for June 3, 2008 has been postponed until June 17, 2008.

EMERGENCY NUMBERS

Emergency – Police Fire Ambulance: 911

Public Works Emergency Number 24/7:

613-257-2253

info@carletonplace.ca

175 Bridge Street,
Carleton Place, ON K7C 2V8
613-257-6200

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The preferred solution, to repair the watermain, will be presented at this public meeting.

The project is being planned under Schedule B of the Municipal Class Environmental Assessment.

For further information on this project, or to inspect a copy of the Class Environmental Assessment, please contact

Paul Knowles, Chief Administrative Officer
Carleton Place Town Hall
175 Bridge Street, ON K7C 2V8
Telephone: 613-257-6207

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TO INCREASE THE CAPACITY OF BOTH WATER AND WASTEWATER TREATMENT PLANTS

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Marc Bezanson, MBA, P.Eng.
Project Manager, Environmental Infrastructure
Stantec Consulting Ltd.
1505 Laperriere Avenue, Ottawa, ON K1Z 7T1
Telephone: (613) 724-4096

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* included in quarterly water bill.

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This Notice issued May 23, 2008

163400725

Stantec Consulting Ltd.
1505 Laperriere Avenue
Ottawa ON K1Z 7T1
Tel: (613) 722-4420 Fax: (613) 722-2799
stantec.com

Stantec

July 7, 2008
File: 163400725

To Whom It May Concern:

Reference: **Town of Carleton Place – Environmental Study Reports Phase 3 Notification**
Water Treatment Plant and Water Storage Capacity Expansion

And

Water Pollution Control Plant Capacity Expansion

On behalf of our client, the Town of Carleton Place, we are providing notification to you regarding the environmental planning of the above mentioned projects. Attached please find a copy of the Executive Summary for the Draft Phase 3 Report for each of these Environmental Assessments. The planning process indicates that the preferred alternative for the Water Treatment Plant (WTP) would include Stage 1 of Water Storage Expansion in the year 2016, Stage 2 of Water Storage Expansion and WTP Expansion in 2028. The preferred alternative for the Water Pollution Control Plant would be to expand in 2020. If you are interested in receiving more information or providing input for the planning process, please contact Marc Bezanson.

Sincerely,

STANTEC CONSULTING LTD.

Marc Bezanson, MBA, P.Eng.
Project Manager
Tel: (613) 724-4096
Fax: (613) 722-2799
marc.bezanson@stantec.com

Attachment: Executive Summary for each of two draft Phase 3 Municipal Class EAs

cc. Dave Young, Town of Carleton Place

mtb w:\active\1634_00725 carleton place esr\project_management\correspondence\080707_ltr_ notification to review agencies of phase 3.doc

Bezanson, Marc

From: John Price [jprice@mvc.on.ca]
Sent: Friday, July 11, 2008 2:49 PM
To: Bezanson, Marc
Subject: Town of Carleton Place Phase 3 Environmental Study Reports

Marc:

Thank you for the notice regarding the latest status of the planning of the Town of Carleton Place water treatment plant and water pollution plant expansions. MVC is interested keeping informed regarding the projects. What is the procedure for viewing a copy of the two Phase 3 Class Environmental Reports?

John Price, P.Eng.
Watershed Management Coordinator
Mississippi Valley Conservation
4175 Highway 511
Lanark, ON K0G 1K0
Phone - 613-259-2421 Ext. 226
Fax - 613-259-3468
e-mail - jprice@mvc.on.ca
www.mvc.on.ca

Bezanson, Marc

From: MacHardy, Sarah (MNR) [sarah.machardy@ontario.ca]
Sent: Tuesday, July 15, 2008 11:50 AM
To: Bezanson, Marc
Subject: Carleton Place: Water Treatment, Water Storage & Water Pollution Capacity Expansion

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Purple Category

Hello Marc

Last week, I received notification of water treatment, water pollution control and water storage expansion in the town of Carleton Place. Do you have a project description of the works that are being proposed and the natural environment that may be affected, including a map of where the project is located?

Kind regards,

Sarah MacHardy
Water Resources Coordinator
Kemptville District
Ministry of Natural Resources
Postal Bag 2002
10 Campus Drive
Kemptville ON
K0G 1J0
613-258-8386

Too often in our efforts to grow crops and expand cities, generate electricity, and keep floods from their floodplains, we have disrupted the natural flows of water and broken precious cycles of life. Instead we can design ways to divert or store water for human purposes, while maintaining some semblance of natural flow patterns that works with nature's water rhythms rather than against them.
(The Nature Conservancy)

Ministry of Citizenship and Immigration

Ministry of Culture

Ministry of Tourism

Ministry of Health Promotion
347 Preston St., 4th Floor
Ottawa, ON K1S 3J4
Tel. (613)742-3369
1-800-267-9340

Ontario

August 5, 2008

Mr. Marc Bezanson
Project Manager
Stantec Consulting Ltd.
1505 Laperriere Ave.
Ottawa, ON K1Z 7T1

Dear Mr. Bezanson;

Re: Town of Carleton Place – Environmental Study
Water Treatment Plant and Water Storage Capacity Expansion

Thank you for your letter of July 7, 2008, informing us of the project status for the above-mentioned study.

Please note that we have forwarded the information to the Ministry's Heritage Operations Unit in Toronto. They will be reviewing it from a cultural heritage and archaeological perspective. They will also provide comments to you directly under separate cover.

We presently have no additional comments to provide to you but we would like to be kept advised and updated on the project.

Sincerely,

Mary Beach
Area Manager

c.c. Michael Johnson, MCL Heritage Operations Unit

Ministry of Natural Resources

Kemptville District

10 Campus Drive
Postal Bag 2002
Kemptville, ON K0G 1J0
Tel: 613-258-8386
Fax: 613-258-3920

Ministère des Richesses naturelles

District de Kemptville

10 Dr. Campus
Sac Postal, 2002
Kemptville, ON K0G 1J0
Tél.: 613-258-8386
Téléc.: 613-258-3920

Ontario

February 6, 2009

Marc Bezanson, MBA, P.Eng.
Project Manager, Environmental Infrastructure
Stantec Conuslting Ltd.
100 – 1505 Laperriere Avenue
Ottawa ON
K1Z 7T1

RE: Phase 3 Class Environmental Assessment Reports for the Town of Carleton Place Water Pollution Control Plant Expansion and the Water Treatment Plant Capacity Expansion

Dear Mr. Bezanson

Thank you for the opportunity to provide comments on the environmental assessment reports for the Town of Carleton Place Water Pollution Control Plant Expansion (WPCP) and the Water Treatment Plant (WTP) Capacity Expansion.

Should the preferred design alternative include extension of the sewage outfall, construction of an outfall at a new location or any other in-water works or works on shore lands, a permit may be required under the Public Lands Act. If in-water works or work on shore lands is required please do not only contact our office for more information on permitting requirements under the Public Lands Act, but please also consider these comments in preparation of the next environmental screening report:

a. Walleye spawning areas are found in the Mississippi River downstream of both the sites

b. A fisheries community and habitat assessment should be completed, keeping in mind surveys should be timers to address concerns regarding the different species present e.g. American Eel, walleye, other species at risk and sportfish.

c. Any in-water works must respect timings windows and will require appropriate mitigation for erosion, sedimentation, etc. For example, no in-water work may occur between March 15 and June 30th for the protection of fish. Other timing windows may apply if the works affect habitat of other species.

On June 30, 2008 Ontario's new Endangered Species Act (ESA 2007) came into force providing protection to all extirpated, endangered and threatened species on the Species At Risk in Ontario (SARO) list. Section 9 of the Act includes prohibitions against killing, harming, harassing, capturing, possessing, etc., any extirpated, endangered or threatened species. In addition, the new Act prohibits damage or destruction of habitat (section 10) for species at risk (those listed as endangered or threatened on the Species at Risk in Ontario (SARO) List).

Currently, habitat protection only applies to the 42 endangered species that were previously regulated under the 1971 Endangered Species Act. All other endangered and threatened species will receive habitat protection by June 30, 2013, unless a habitat regulation is made for the species at an earlier date. Proponents are therefore encouraged to contact the Ministry of Natural Resources (OMNR) for updated information regarding species-specific habitat protection prior to any activities.

OMNR may screen for the presence of known species at risk (SAR) occurrences at a proposed project's site. The majority of information OMNR uses to screen these sites comes from the Natural Heritage Information Centre (NHIC). Although this data represents our best current available information, it is important to note that a lack of occurrence at a site does not mean that there are no SAR at that location. Therefore, prior to any proposed activity, OMNR recommends a site assessment to determine the potential for other SAR occurrences.

When a SAR does occur on a proposed site, it is recommended that the proponent contact OMNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as section 9 or 10), the proponent must contact OMNR to discuss the potential for application of certain permits (section 17) or agreement (Reg 242/08).

Please consider the following site specific comments related to species at risk (SAR) and the ESA 2007:

d. There are occurrences of Stinkpot Turtle in the Mississippi River and specifically for this reach of the river. In the report a description of in-water habitat sounds suitable for this species so it is likely they do exist in the river adjacent to both sites under review. Stinkpot turtles are identified as threatened under the ESA 2007.

e. American eel is known from the Mississippi system as well and there was reference in the report acknowledging its presence in the river. American eel is identified as endangered under the ESA 2007.

f. Based on occurrence information and local knowledge of the area it is also possible that milksnake and river redhorse are present in this reach of the Mississippi River as well. Both of these species are identified as special concern under the ESA 2007.

g. Blanding's turtle is mentioned in the report, but it is unlikely to occur in the area due to an absence of occurrences and the habitat present.

h. In the report a number of settings, including woodlots and fencerows are described with document plant species. There is a possibility of butternut occurring in these areas. There is butternut documented on similar sites in the Carleton Place area (east along Hwy. 7) and given the site description it is a high possibility.

I would also like to take this opportunity to make you aware of a new process that the Kemptville District Ministry of Natural Resources implemented this past month to respond to requests for comments and information. Through this process we hope to improve our response times and better handle your requests.

In the future, please submit your requests for information to the following email address:

Kemptville.Inforequest@ontario.ca

Thanks again for the opportunity to provide comments on these two project proposals and if you have any questions or concerns, please do not hesitate to contact me.

Yours truly,

Sarah Nugent
Water Resources Coordinator
Kemptville District

CARLETON PLACE

Meet me on the Mississippi

Municipal Matters • Thurs., June 10, 2010

Community Information brought to you by the Town of Carleton Place

TUESDAY, JUNE 15TH, 2010

7pm: Corporate Service Committee
Major Topics: Sewer & Water Budget 2011
Public Meeting, Proposed increase 3.95%

Followed by: Community Issues Committee

Please Note: As of June 23rd, regular meetings have been cancelled until Sept. 7. Special meetings scheduled are:

June 29 at 7pm - Meeting with Property owners along Franktown Road to discuss potential development.

July 20 at 7pm - Combined Committee followed by Council

EMERGENCY NUMBERS

Police • Fire • Ambulance

911

Emergency Only
Public Works Emergency
Number 24/7
613-257-2253
info@carletonplace.ca
175 Bridge Street,
Carleton Place, ON K7C 2V8
613-257-6200
www.carletonplace.ca

PUBLIC OPEN HOUSE

Mississippi Valley Conservation and the Town of Carleton Place are considering a proposal to construct the MVC's new administrative office building in Roy Brown Park on Hwy 7. The public is invited to view preliminary information regarding this proposal at an Open House on:

Monday June 14, 2010
From: 4:00pm to 7:30 pm
Where: Town Hall Auditorium

Comments can also be submitted to either the Town or MVC.

TOWN OF CARLETON PLACE

Class Environmental Assessment
Water Treatment Plant and Water Pollution Control Plant - Capacity Expansion
Notice of Public Meeting

The Town of Carleton Place is continuing with the study of capacity expansion for the Water Treatment Plant and Water Pollution Control Plant facilities. Expansion will be required in the future to accommodate the growing population of the Town of Carleton Place. The expansion is expected to include construction of facilities at both of the existing sites for the Water Treatment Plant (199 John Street, Town of Carleton Place) and the Water Pollution Control Plant (122 Patterson Crescent, Town of Carleton Place).

These projects are being planned under Schedule C of the Municipal Class Environmental Assessment. A Public Open House has been scheduled to review recent developments in the study related to long-term plans for the two plants, current upgrade projects, proposed upgrade projects for the next twenty years, and the proposed 2011 sewer and water budget. Opportunity will also be given to receive input and comments from interested parties.

OPEN HOUSE DETAILS

Location: Water Pollution Control Plant, 122 Patterson Crescent, Town of Carleton Place
Date: Thursday, June 24, 2010
Time: 5:00 PM until 7:00 PM

Subject to the comments received as a result of this Notice and the Public Open House, the Town plans to instruct the consultant to proceed with the planning for this project and an Environmental Study Report will be prepared and placed on the public record for a minimum 30 day review period.

For further information or to provide input/comments on this project please contact Dave Young, Town of Carleton Place, 175 Bridge Street, Carleton Place, Ontario K7C 2V8 Telephone (613) 257-6200.

This Notice first issued on June 10, 2010.

MAKE SURE THAT YOU ARE ON THE VOTER'S LIST!! FOR THE 2010 MUNICIPAL ELECTION

REMINDER OF MUNICIPAL ENUMERATION FORMS IN THE MAIL JUNE 2010

The Municipal Property Assessment Corporation will be mailing 2010 Municipal Enumeration Forms to help confirm and collect information for individuals owning or occupying property in Ontario. The forms will be mailed out to specific households where MPAC needs to confirm or update the occupant information currently on file. This information is used by MPAC to create a Preliminary List of Voters for every municipal and school board election in Ontario. The preliminary list is provided to municipalities, school boards to help them create the final Voter's List for Election Day on October 25, 2010.

If you receive a Municipal Enumeration Form from MPAC, please confirm the information included on the form and make any necessary changes or additions. Once the form has been completed, please sign and return to MPAC in the envelope provided.

For further information, you may contact MPAC at 1-877-889 MPAC or www.mpac.ca

2010 SENIOR ACHIEVEMENT AWARD

The Ministry of Ontario is accepting nominations for the 2010 Senior Achievement Award (65+ years). Deadline 15 June 2010. Details are available online at www.ontario.ca/honoursandawards or calling the Secretariat at 1-877-832-8622.

372091

CARLETON PLACE

Meet me on the Mississippi

Municipal Matters • Thurs., June 17, 2010

Community Information brought to you by the Town of Carleton Place

TUESDAY, JUNE 22ND, 2010

7pm: Council

Followed by: Policy Review Committee

Major Topics: 7 Beckwith St.

Please Note: As of June 23rd, regular meetings have been cancelled until Sept. 7. Special meetings scheduled are:

June 29 at 7pm - Meeting with Property owners along Franktown Road to discuss potential development.

July 20 at 7pm - Combined Committee followed by Council

EMERGENCY NUMBERS

Police • Fire • Ambulance

911

Emergency Only

Public Works Emergency Number 24/7

613-257-2253

info@carletonplace.ca

175 Bridge Street,

Carleton Place, ON K7C 2V8

613-257-6200

www.carletonplace.ca

TOWN OF CARLETON PLACE

Class Environmental Assessment
Water Treatment Plant and Water Pollution Control Plant
Capacity Expansion
Notice of Public Meeting

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For further information, you may contact MPAC at 1-877-889 MPAC or www.mpac.ca

GARBAGE PICKUP ON CANADA DAY

Garbage pickup scheduled for Thursday, July 1st, 2010 will instead occur on Friday, July 2nd, 2010 because of the holiday.

372092

OPEN HOUSE WEDNESDAY JUNE 29, 2016

PLEASE SIGN IN

NAME	ADDRESS	
MARC BEZANSON	STANTEC	OTTAWA
DOUG SMITH	CP	
Rick Kwissa	CP	
Anne-George Buchanan	CP	

1634 00725

Bezanson, Marc

From: Janice Zeitz [Janice.Zeitz@ainc-inac.gc.ca]
Sent: Thursday, September 02, 2010 10:04 AM
To: Bezanson, Marc
Cc: Don Boswell; Ralph Vachon
Subject: Obtaining First Nations Contact Information – Town of Carleton Place, Ontario

I am writing in response to your e-mail of August 31, 2010 inquiring about obtaining First Nations contact information in the above noted area.

In determining your duty to consult, you may wish to contact the First Nations in the vicinity of your area of interest to advise them of your intentions. To do this you may:

1.find the Reserves in your area of interest by consulting a map of the region such as the Province of Ontario Ministry of Aboriginal Affairs online map at http://www.aboriginalaffairs.gov.on.ca/english/services/firstnations.asp;
then
2.search for the First Nations located on those Reserves by using the INAC Search by Reserve site at http://pse5-esd5.ainc-inac.gc.ca/fnp/Main/Search/SearchRV.aspx?lang=eng.

To determine the First Nations in your area of interest who have submitted claims please consult the Reporting Centre on Specific Claims at http://pse4-esd4.ainc-inac.gc.ca/SCBRI/Main/ReportingCentre/External/ExternalReporting.aspx?lang=eng.

It should be noted that the reports available on the INAC website are updated regularly and therefore, you may want to check this site often for updates. In accordance with legislative requirements, confidential information has not been disclosed.

Please rest assured that it is the policy of the Government of Canada as expressed in The Specific Claims Policy and Process Guide that:

"in any settlement of specific native claims the government will take third party interests into account. As a general rule, the government will not accept any settlement which will lead to third parties being dispossessed."

We can only speak directly to claims filed under the Specific Claims Policy in the Province of Ontario. We cannot make any comments regarding potential or future claims, or claims filed under other departmental policies. This includes claims under Canada's Comprehensive Claims Policy or legal action by a First Nation against the Crown. You may wish to contact the Assessment and Historical Research Directorate at (819) 994-6453, the Consultation and Accommodation Unit at (613) 944-9313 and Litigation Management and Resolution Branch at (819) 934-2185 directly for more information.

You may also wish to visit http://www.ainc-inac.gc.ca/ai/mr/is/acp/acp-eng.asp on the INAC website for information regarding the Federal Action Plan on Aboriginal Consultation and Accommodation.

To the best of our knowledge, the information we have provided you is current and up to date. However, this information may not be exhaustive with regard to your needs and you may wish to consider seeking information from other government and private sources (including Aboriginal groups). In addition, please note that Canada does not act as a representative for any Aboriginal group for the purpose of any claim or the purpose of consultation.

I hope this information will be of assistance to you. I trust that this satisfactorily addresses your concerns.

Sincerely,

Janice Zeitz for

Don Boswell
Senior Claims Analyst
Ontario Research Team
Specific Claims Branch

1634 00 725

You are at www.aboriginalaffairs.gov.on.ca

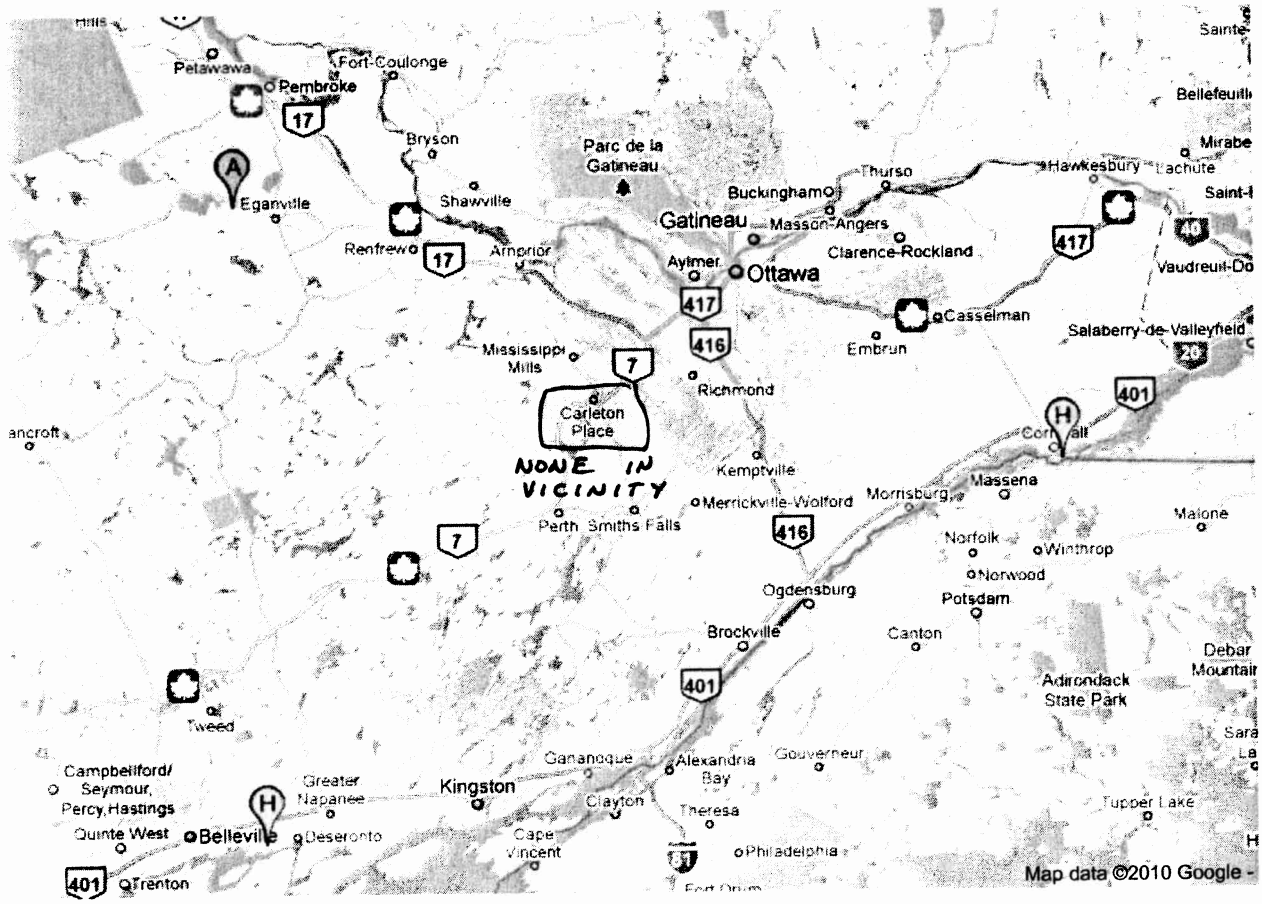
Disable this warning for 30 days.

View Larger Map

First Nations in Ontario

You are at maps.google.com

Disable this warning for 30 days.



For an official list of all the First Nations considered "bands" for the purpose of the *Indian Act*, please contact Indian and Northern Affairs Canada.

CANADA'S BEST MANAGED COMPANIES

www.jlrichards.ca

Ottawa

864 Lady Ellen Place
Ottawa ON Canada
K1Z 5M2
Tel: 613 728-3571

ottawa@jlrichards.ca

Kingston

203-863 Princess Street
Kingston ON Canada
K7L 5N4
Tel: 613 544-1424

kingston@jlrichards.ca

Sudbury

314 Countryside Drive
Sudbury ON Canada
P3E 6G2
Tel: 705 522-8174

sudbury@jlrichards.ca

Timmins

201-150 Algonquin Blvd. East
Timmins ON Canada
P4N 1A7
Tel: 705 360-1899
timmins@jlrichards.ca

North Bay

200-175 Progress Road
North Bay ON Canada
P1A 0B8
Tel: 705 495-7597

northbay@jlrichards.ca

Hawkesbury

326 Bertha Street
Hawkesbury ON Canada
K6A 2A8
Tel: 613 632-0287

hawkesbury@jlrichards.ca

Guelph

107-450 Speedvale Ave. West
Guelph ON Canada
N1H 7Y6
Tel: 519 763-0713

guelph@jlrichards.ca

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Tel: 519 763-0713

guelph@jlrichards.ca

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