Appendix A

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File: 165620102-203

Town of Kingsville
2021 Division Road North
Kingsville, Ontario, N9Y 2Y9

Attention: **Mr. Andrew Plancke, CET**
Director of Municipal Services

Dear Andrew:

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

At the request of the Town of Kingsville's Municipal Services, we have carried out a water availability review to support potential future development on vacant lands in the southwestern service area of the Town immediately west of the former Town center, south of County Road 20 between Heritage Road and McCain Sideroad as shown in Figure 1 found in Appendix "A". This request was initiated by the developer of the recently approved residential development located in the southern quadrant of the Kingsville southwest service area otherwise known as the Valente lands.

BACKGROUND

The Kingsville southwest water service area (Kingsville SWWSA) is comprised predominately of residential and commercial development with a total equivalent service population of approximately 5,000 people.

The area is serviced with potable water from the Union Water Supply System (Union WSS) and forms part of the Union southeast service area or pressure zone. Water is treated and supplied from the Union Water Treatment Plant (Union WTP) situated on County Road 45 in the community of Ruthven and delivered to the Kingsville SWWSA along a network of trunk watermains along Road 2 East westerly to McCain Sideroad and then southerly to County Road 20 and County Road 50 along the shores of Lake Erie.

System pressures in the Kingsville SWWSA are generally governed through a combination of both the pressure head developed by the high lift pumps at the Union WTP and water level in the Union water tower (UWT) located near County Road 31 and County Road 34. There are no system storage facilities located within the Kingsville southwest service area. Water supply for peak equalization, emergencies and fire protection is obtained from system storage and supply capacity at the Union WTP and UWT.

The water distribution system serving the Kingsville SWWSA consists of approximately 43 km of watermains ranging in size from 50 mm to 250 mm in diameter. Plans of the existing water distribution system within the Kingsville SWWSA are presented Figure 1 found in Appendix "A". The Union WSS is considered a "large municipal residential system" under O. Regulation 170/03 and is regulated though a Ministry of Environment &Climate Control (MOECC) Drinking Water System License No. 041-101 and MOECC Drinking Water Works Permit No. 041-201.

GROWTH AND WATER DEMAND

Population Projections

Population growth projections from the 2012 Union Master Plan (Union MP) authored by Stantec Consulting Ltd. form the basis for establishing water demand assumptions and ultimately future servicing plans. Growth projections in the Union MP were established from a range of Town specific resources including Official Plans, Servicing Plans, Master Plans and communications with Water and Building Departments. Projected growth rates in the Union MP for the Town of Kingsville for the planning horizon 2012 to 2028 were in the order of approximately 0.95% per year.

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Following the 2012 Union MP, new and emerging residential development initiatives and pressures in the Kingsville SWWSA have been either received, considered, and/or approved by the Town. Based on discussions with Town Municipal & Planning Services, a listing of these development initiatives along with their locations are presented in Figure 2 found in Appendix" A". As part of this study, existing populations within the Town of Kingsville were reassessed to reflect a more up-to-date status.

Based on the above listing, existing and projected equivalent service populations for the Kingsville SWWSA were developed for the 20-year planning horizon and summarized in Table 1 below. Equivalent service populations take into account not only the actual number of persons in the system but an equivalent number taking in consideration non-residential demands from industrial, commercial and institutional consumers.

Table 1: Summary of Equivalent Service Population Projections (Kingsville SWWSA)

Development Location		*Area (Hectares)*	*Estimated Number Lots*	*Existing (2015) Population*	*20-Year (2035)* [1] *Population*
Parcel	*Roll Number*				
1	010-01800	25.75	515	0	1,545
2	270-31200	2.66	53	0	159
3	270-31100	14.74	295	0	885
4	270-31000	0.11	2	0	6
5	270-30900	0.77	15	0	45
6	270-30800	6.65	133	0	399
7	270-30700	1.44	29	0	87
8	270-00600	18.44	369	0	1,107
9	270-00900	8.14	163	0	489
10	270-23000	4.81	96	0	288
11	270-01010	0.65	9 [2]		27
12	270-01100	2.54	51	0	153
13	270-01110	12.13	176 [2]	0	528
14	270-01400	19.96	290 [2]	0	870
15	270-01702	4.0	80	0	240
16	270-01750	19.55	284 [2]	0	852
17	270-07100	0.40	8	0	24
18	270-02600	1.87	37	0	111
19	270-02401	7.58	56 [2]	0	168
20	270-02800	3.32	66	0	198
21	270-02900	2.87	57	0	171
22	270-03190	0.65	13	0	39
23	270-03180	0.27	5	0	15
24	270-03100	1.73	35	0	105
25	270-03150	1.06	21	0	63
26	270-34000	4.42	88	0	264
Kingsville SWWSA		-	-	5,000	6,037 [3]
Totals		**166.51**	**2,946**	**5,000**	**14,875**

Notes:

1. Estimated equivalent service population for new development based of 20 lots per hectare and 3 persons per lot per Town of Kingsville Planning Department criteria.
2. Based on estimated number of lots of 759 per draft plan of subdivision dated January 25, 2017.
3. Based on projected 20-year growth from infilling only (restricted to projected growth rate of 0.95% per year per 2012 Union Master Plan)

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Existing & Projected Water Demands

Average day, maximum day and peak hour demands are key design parameters when determining water system infrastructure needs. The average day demand is the total volume of water consumed in the system over the entire year divided by 365 days. The maximum day demand is the highest single day water consumption in a given year and is the main design parameter for determining the size of water treatment facilities. Peak hour demand is the highest single hour water demand on the maximum day.

Typically, maximum day and peak hour demands are established by multiplying the average day demand by a corresponding factor. MOECC Design Guidelines for water distribution systems provide a table setting out maximum day and peak hour rate factors for systems using equivalent service populations. Since the Kingsville southwest water service area is part of the greater Union water service area, maximum day and peak hour factors are based on the total Union water service area population

Projected water demands for existing and future residential consumers in the Kingsville SWWSA have been based on a representative unit average day water demand of 360 Liters per capita per day (L/cap/day) or 80 Imp. gallons/cap/day. The following Table 2 summarizes the existing and 20-year water demand projections for the Kingsville SWWSA.

Table 2: Existing and Projected Water Demands – Kingsville SWWSA

	Existing (2015)	***20-Year (2035)***
Component		
Kingsville SWWSA – Equivalent Service Population	5,000	6,037
New Development - Equivalent Service Population	0	8,838
Total Estimated Equivalent Service Population	5,000	14,875
Water Demand		
Kingsville SWWSA (@ 360 L/cap/day) *(m^3/day)*	1,800	2,173
New Development Area (@ 360 L/cap/day) *(m^3/day)*	0	3,182
Total Average Day Water Demand (m^3/day)	1,800	5,355
Maximum Day Peaking Factor (1)	1.75	1.75
Total Calculated Maximum Day Water Demand (m^3/day)	**3,150**	**9,371**
Peak Hour Peaking Factor (1)	2.52	2.52
Total Calculated Peak Hour Water Demand (m^3/day)	**4,536**	**13,495**

Notes:
1. Maximum day and peak hour peaking factors based on those in 2012 Union Master Plan.

WATER DISTRIBUTION SYSTEM ASSESSMENT

System Requirements

MOECC design guidelines recommend that water distribution systems should be capable of supplying water under the following conditions:

1. Peak hour flow while maintaining a minimum residual pressure of 40 psi (275 kPa) in the system.
2. Maximum day plus fire flow with a minimum residual pressure of 20 psi (138 kPa) in the system.
3. Under normal conditions, residual pressures should range between 50 to 80 psi (350 to 550 kPa).
4. Maximum pressure should not exceed 100 psi (700 kPa).

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Fire Protection

The level of fire protection provided by a municipality owned water supply system is determined by the Town. Fire flow requirements are typically determined using the Fire Underwriters Survey document "Water Supply for Public Fire Protection" (FUS). The minimum fire flow recognized by the FUS is 30 L/s (400 Igpm) and to receive credit, the water supply system must be capable of satisfying the simultaneous maximum day demand + fire flow requirement.

The water distribution systems within the Town of Kingsville were intended to provide fire protection in urbanized areas only. Distribution systems located within rural areas were only intended to provide an adequate potable water supply to existing and future consumers and not a piped water supply for fire protection purposes. Provision for fire flow to all portions of the distribution system would result in a much larger and more costly distribution system. However, it may be possible that in some rural areas, some level of fire protection can be provided particularly along trunk watermains.

Fire hydrants are provided in the rural distribution system at select road intersections and at system extremities primarily for flushing and cleaning purposes while also serving as a source of water to fill pumper trucks for firefighting. The actual amount of fire flow that can be supplied by the distribution system during maximum day demand conditions can only be confirmed through hydrant flow testing in the field.

FUS fire flows are specific to criteria such as building type, construction material and population density. In the absence of a detailed evaluation of specific building types throughout the Town and the establishment of site specific fire flow requirements, typical fire flow targets were adopted for the purposes of evaluating the existing distribution systems and improvements needed to satisfy projected future conditions. For the purposes of this study, a fire flow target of 30 L/s (400 Igpm) was used for urbanized areas.

Hydraulic Analyses

Computer modeling is a useful tool for analyzing the hydraulic behavior of water distribution systems. While such analysis cannot simulate exact "real-life" conditions, they can be very useful in identifying "bottlenecks" in existing systems as well as assist in determining system improvements needed to satisfy both existing and future projected water demands.

WaterCAD, a Windows based software program originally developed by Haested Methods was used to carry out the hydraulic modeling work. WaterCAD is used for its flexibility in modeling both steady state (static) and extended period (dynamic) simulations. This capability allows for simulating filling and draining of tanks, regulating of control valves and associated pressure and flow rate changes throughout the system in response to varying demand. Dynamic simulations are more representative of real life conditions and allow the prediction of system behavior throughout the 24 hour cycle.

Hydraulic computer models were originally developed for the Union WSS in the Union MP with the inputting of watermain characteristics including pipe diameter, length, friction factor, ground elevation and average day water demands. Maximum day demand diurnals were also developed using plant pumping and corresponding elevated tower level and/or reservoir records. This diurnal was used to simulate dynamic conditions in both water supply systems over a period of several days.

The hydraulic model for the Union WSS been updated to reflect both existing and projected 20 year demand conditions and has been use to analyze the Kingsville SWWSA for the purposes of this study. Output from the model simulations were reviewed to assess the capabilities of the water system towards maintaining adequate residual pressures under peak hour and/or maximum day + fire flow conditions in accordance with MOECC Design Guidelines.

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Existing Conditions

The performance of the water distribution system in the Kingsville SWWSA was assessed to predict system behavior under existing conditions using the updated Union WSS hydraulic model.

Generally, under normal flow conditions, system pressures were observed to range in the neighborhood of 50 to 80 psi in most of the service area with the exception along the lake front where pressures can exceed the upper MOECC limit of 100 psi at approximately 110 psi. This is a direct result of the area's lower elevation in comparison to the elevation of the water supply source at the Union WTP. Although not ideal, the higher pressures have been successfully managed with pressure reduction devices in most homes and businesses.

Under peak hour flow conditions, system pressures were observed to be at or marginally above the 40 psi benchmark along Road 2 West and County Road 50. However, system pressures below 40 psi were observed in the entire central quadrant of the Kingsville SWWSA centered along County Road 20 east and west of McCain Sideroad. Pressures in this quadrant were observed to drop to as low as 22 psi at the extreme eastern boundary with the community of Kingsville along County Road 20. A map of system pressures during peak hour flow conditions is illustrated in Figure 3 found in Appendix "A".

Peak hour flows were also observed to being conveyed within the service area at acceptable flow velocities (<=1.5 m/s) and headloss gradients (<=3.0 m/km) with the exception of the 250-mm dia. watermain along Road 2 West & McCain Sideroad and the 150mm dia, watermain along County Road 20 where headloss gradients approach 6 m/km significantly exceeding the upper limits.

It was also observed that the minimum recognized fire flow of 30 L/s could be obtained throughout most the service area during maximum day demand conditions with the exception being along the existing 150 mm dia. watermain on County Road 20 east of Kingsville Golf & Country Club.

The primary reason for the low system pressures in this quadrant is due to the relatively large friction losses being experienced in the existing 250 mm dia. trunk watermain running westerly along Road 2 West and southerly along McCain Sideroad to County Road 20 and County Road 50 caused by excessive demands. In fact, the entire Kingsville southwestern water service area is supplied through this single 250 mm dia. trunk watermain with no redundancy in case of failure.

These low-pressure issues were also identified and documented in the 2012 Union MP where it was also concluded that there was an inadequate level of system redundancy and security of supply should there occur a water service interruption with the existing 250 mm watermain along Road 2 West and McCain Sideroad.

In summary, the existing water distribution system is generally not able to maintain a satisfactory level of service for the existing needs of the Kingsville SWWSA. Less than adequate system pressures within the urbanized areas south of County Road 20 and east of McCain Sideroad must be given serious consideration in the evaluation of any future system improvements.

On this basis, the existing water distribution system within the Kingsville SWWSA is considered to have insufficient unreserved capacity to support any further development without having a significant detrimental impact on the remainder of the water distribution system until system improvements can be implemented.

Future Conditions

The performance of the water distribution system in the Kingsville SWWSA was assessed to predict system behavior under future conditions and determine whether it was capable of supplying the projected 20-year future water demands. The analyses were based on the assumption that the Union WTP would have sufficient treatment, pumping capacity and system storage to satisfy the projected 20-year future water demands and that the only constraints would be those imposed by the water supply system watermains.

Modeling results confirm that the existing water distribution system would not be capable of maintaining an adequate level of service to satisfy the projected 20-year future water demands of the service area.

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

ALTERNATIVE SOLUTIONS

Several conceptual alternative solutions may be proposed to address the identified problems and needs of the Kingsville SWWSA as follows:

1. Do Nothing
2. Restrict Community Growth
3. Implement water use reduction practices.
4. Construct new watermains in the distribution system to augment water conveyance capacity to service existing and future development.

1. Do Nothing

This alternative involves retaining the existing water supply system and carrying out no improvements, expansions or new works to remedy the identified problems and needs. It eliminates the need for large capital expenditures; however, it does not address the problems and needs of the Kingsville SWWSA. Under this alternative, there is no further capacity in the existing water distribution system to service future growth as conveyance capacity has been exceeded.

Clearly, the Do Nothing alternative will limit future growth in the community and does not provide an acceptable solution to the identified water supply problems and needs while satisfying the planning objectives of the Town of Kingsville.

The Do Nothing alternative is not considered a viable option and will not be considered further in this study; however, it can serve as a benchmark to evaluate the implications if none of the other planning alternatives are implemented.

2. Restrict Community Growth

This alternative involves placing restrictions on the type, location and extent of development within the Kingsville SWWSA. Although this alternative eliminates or delays the need for large capital expenditures, it would have an adverse economic impact on the Town due to stagnation of development and is not compatible with the objectives of the Town of Kingsville Official Plan.

Restricting Community Growth is not considered a viable option to address the identified water supply problems and needs of the Kingsville SWWSA and accordingly will not be considered further in this study.

3. Water Use Reduction Practices

This alternative involves the development of water conservation programs or practices that place restrictions on water use. Possible programs could entail the education of the general public as well as industrial, commercial and institutional users about water conservation as well as the implementation of municipal bylaws aimed at reducing water usage during peak summer months when community water demands are at their highest.

The implementation of water use reduction measures would involve costs associated with educating the public and bylaw enforcement, however, it could potentially help defer the construction of water system expansions and new works if lower water demands could be realized.

The Town of Kingsville currently has water use reduction and efficiency programs in place to curtail water use. However, these measures have been difficult to regulate and are highly dependent on the willingness of water consumers to comply on a voluntary basis. Increased enforcement may result in reduced water demand but cannot be relied upon.

While it is recognized that increased water efficiency and reduction measures have the potential to further reduce water demands associated with the existing system, this alternative alone will not be sufficient to address the long-term needs of the Kingsville SWWSA. However, these measures are beneficial to reducing

future capital and operating costs and accordingly it is recommended that these measures continue to form an important component of the Town's long-term, on-going initiative to curtail water use and promote water use efficiency practices.

4. Construct New Watermains in the Distribution System to Augment Water Conveyance Capacity to Service Existing and Future Development

This alternative involves the construction of new watermains within the Kingsville SWWSA and greater Kingsville water service area to resolve the identified water supply problems in the Kingsville SWWSA to service existing and projected future 20-year growth.

The advantages of this alternative are:

- → Assures adequate water supply to permit orderly growth and development in the Kingsville SWWSA.
- → Will create a general benefit to the Town enhancing attractiveness for investment and economic growth.
- → Will permit ongoing implementation of development and other activities as envisioned in Kingsville's planning documents which have positive impacts on the socio-economic environment.
- → Will provide an improved water distribution system for servicing existing and future consumers.
- → Provides for handling of peak flow rates and fire protection requirements.
- → May provide fire protection in rural areas currently without fire protection.
- → System designed to MOECC guidelines.
- → Will address issue of inadequate system redundancy and security of supply by reinforcing distribution network to Kingsville SWWSA by providing second feed link to meet existing and projected future 20-year water demands while enabling water supply to continue in event existing 250 mm dia. watermains along Road 2 West and McCain Sideroad is to be out of operation for maintenance or repair due to failure.
- → Will address need to relieve overstressed existing 250 mm dia. watermain along Road 2 West and McCain Sideroad.

The disadvantages are:

- → Will incur large capital expenditures for construction of additional watermains.
- → Will need to mitigate impacts on the environment from construction activities.
- → Will require the acquisition of utility easements at some inconvenience to existing property owners where there is a lack of municipal rights-of-ways or insufficient room in the existing municipal rights-of-ways.
- → Will further delay the implementation of new development until watermain improvements are implemented.

Based on the forgoing, this planning alternative represents a viable solution to the water supply problems identified in the Kingsville SWWSSA and will be considered further in this study.

Environmental Impacts and Mitigating Measures

As a group, the alternative planning solutions (except the "Do Nothing" and "Restrict Community Growth" alternatives) will have a limited effect on the environment and that effect will be mostly due to construction activities. A summary of potential environmental impacts and proposed mitigating measures is presented in Table 3 below.

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Table 3: Environmental Effects and Mitigating Measures

OPERATION	*EFFECT*	*MITIGATING MEASURES*
Cutting, digging, or trimming ground covers, shrubs and trees	Reduced terrestrial wildlife habitat quality (i.e., diversity, area, function) and increased fragmentation of habitat.	➢ This is not a concern as there is no significant existing terrestrial wildlife habitat in the proposed area of construction
	Loss of unique or otherwise valued vegetation features	➢ This are no known unique vegetation features in the area that may be disturbed by construction activities. ➢ Where possible, existing vegetation features will be restored to a preconstruction condition.
Trenching / tunnelling for sewers, watermains and forcemains, excavation and construction for water and wastewater pumping and treatment structures	Soil erosion and sediment transport to adjacent water bodies causing sedimentation and turbidity of adjacent water bodies and drainage ditches	➢ Use of erosion control measures (i.e. sediment traps, silt fences, etc.) ➢ Collect contaminated runoff ➢ Restore vegetation growth quickly ➢ Stage construction activities to minimize potential of adverse impacts
	Reduced water quality and clarity due to increased erosion and sedimentation, and transport of debris.	➢ Apply wet weather restrictions to construction activity. ➢ Comply with any local regulations, policies and guidelines that stipulate a minimum acceptable buffer width (the allowable distance from a water body). Maximum buffer widths are desirable. ➢ If possible, direct surface drainage away from working areas and areas of exposed soils. To the maximum extent possible, promote overland sheet flow to well vegetated areas. ➢ Install and maintain silt curtains, sedimentation ponds, check dams, cofferdams or drainage swales, and silt fences around soil storage sites and elsewhere, as required.
	Loss of vegetation and topsoil and mixing topsoil and subsoil	➢ Restore site by replacing topsoil and reinstate vegetation to prevent erosion
	Removal and/or disturbance of trees and ground flora	➢ Avoid treed areas where possible ➢ Employ tree protection measures ➢ Replace trees and provide site landscaping
	Temporary disruption of pedestrian and vehicle traffic	➢ Provide and maintain detours ➢ Provide for safe alternate routes ➢ Select alternate routes to minimize inconvenience
	Temporary disruption and inconvenience during construction to adjacent properties, buildings and inhabitants	➢ Notify public agencies and neighbouring owners of construction activities ➢ Prepare program for reporting and resolving problems ➢ Ensure access is provided for emergency vehicles and personnel ➢ Apply noise and vibration control measures ➢ Apply dust control measures ➢ Control emissions from construction equipment and vehicles ➢ Use silencers to reduce noise ➢ Require compliance with municipal noise by-laws
	Possible need to remove petroleum contaminated excavated material.	➢ Sample material. ➢ Handle and dispose of contaminated material in an acceptable manner
	Decreased ambient air quality due to dust and other particulate matter.	➢ Avoid site preparation or construction during windy and prolonged dry periods. ➢ Cover and contain fine particulate materials during transportation to and from the site. ➢ Instruct workers and equipment operators on dust control methods. ➢ Spray water to minimize dust off paved areas or exposed soils. ➢ Stabilize high traffic areas with a clean gravel surface layer or other suitable cover material. ➢ Cover or otherwise stabilize construction materials, debris and excavated soils against wind erosion.
	Disturbance to microscopic organisms in the soil.	➢ Limit the size of stockpiles to avoid anaerobic conditions. ➢ Protect stockpiled soils from exposure to and sterilization by solar radiation (or stockpile in an uncovered shaded area).

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

OPERATION	*EFFECT*	*MITIGATING MEASURES*
	Reduced soil capability through compaction and rutting, and mixing of topsoil and layers below.	➢ Avoid working during wet conditions and/or confine operation to paved or gravel surfaces. ➢ Whenever possible, strip and store topsoil separately from the layers below and return to excavation in sequence.
	Removal and/or disturbances of tress and flora.	➢ Avoid treed areas ➢ Employ tree protection measures ➢ Avoid areas with significant vegetation
	Loss of productive farm land.	➢ Locate facilities to minimize land requirements ➢ Use existing rights-of-way as much as possible ➢ No loss within utility easements as they can still be cultivated.
	Agricultural disruption of field access.	➢ All driveways, roadways and field access will be restored to pre-construction condition ➢ Staging of construction and advance notice to property owners prior to disruption of construction to minimize inconvenience
	Disruption of tile and surface drainage systems.	➢ Provide for temporary drainage systems until final restoration is accomplished. ➢ Avoid disturbing drainage systems during critical periods. ➢ All existing culverts, tiles and drainage systems to be restored to pre-construction conditions following construction.
	Reduced water quality of nearby surface waters having value as wildlife habitat.	➢ Use sediment control techniques for stockpiled materials to minimize degradation of water quality.
	Modifications or removal of aquatic habitat.	➢ Stage construction to minimize potential of adverse impacts.
	Residential impacts.	➢ Construction noise and dust impacts will be controlled through noise by-laws and dust control measures in contract specification. ➢ Inconvenience due to temporary loss of property access will be minimized through proper communication and advance notice of disruption. ➢ Pedestrian safety will be maintained through excavation barricades and construction fencing
	Traffic disruption.	➢ Construction activities will attempt to maintain a minimum of one lane of open traffic at all times with necessary detour signage and flag persons. ➢ If complete closure is required, emergency services will be advised in advance and through access will be restored at the end of each working day.
	Visual aesthetics.	➢ Watermains and sewers will be buried and have no impact on aesthetics. ➢ Incorporate landscaping and architectural features at treatment plants.
	Recreation.	➢ Maintain access to recreational sites during construction. ➢ Locate water and wastewater infrastructure components to minimize impact.
	Heritage resources.	➢ Assess archaeological significance in areas undisturbed by previous activities such as farmland. Complete Stage 1 & 2 Archaeological Assessment and follow mitigative measures outlined in cooperation with the Ministry of Culture.
Use of construction equipment	Contamination of surface waters, drains and public roadways from spills, leaks or equipment refuelling.	➢ Use containment facilities ➢ Inspect equipment regularly for fuel and oil leaks ➢ Clean equipment before it travels off site
	Decreased air quality due to vehicular emissions causing increased concentrations of chemical pollutants.	➢ Minimize operation and idling of vehicles and gas-powered equipment, particularly during local smog advisories. ➢ Use well-maintained equipment and machinery within operating specifications.

OPERATION	*EFFECT*	*MITIGATING MEASURES*
	Disruption to wildlife migration and movement patterns, breeding, nesting or hibernation.	➢ There are no known areas containing sensitive vegetation and wildlife. ➢ There are no known areas where migratory birds are breeding.
	Introduction of non-native vegetation, including opportunistic species.	➢ Clean heavy machinery and equipment prior to transporting to new location.
	Loss of unique or otherwise valued vegetation features	➢ Avoid or minimize trampling vegetation with equipment. ➢ Minimize physical damage to vegetation by avoiding push-outs and avoiding the placement of slash onto living vegetation.
	Reduced water quality and clarity due to increased erosion and sedimentation, and transport of debris.	➢ Operate heavy machinery on the shore above the normal water level. ➢ Where possible, conduct activities in the dry, above the actual water level and above any expected rises in water level that may occur during a rainfall or snowmelt event.
	Reduced water quality due to inputs of contaminants from surface runoff during construction and operation.	➢ Refuel equipment off slopes and well away from water bodies. ➢ Securely contain and store all oils, lubricants, fuels and chemicals. If necessary, use impermeable pads or berms.

Screening Summary and Recommended Alternative Solutions

A comparative summary of the four-conceptual planning level alternative solutions and their ability to meet the overall long-term water infrastructure needs of the Kingsville SWWSA is presented in Table 4 below.

Table 4: Comparative Summary of Conceptual Planning Alternatives

Conceptual Planning Alternative Solutions	***Advantages***	***Disadvantages***	***R / NR ****
Do Nothing	• eliminates need for large capital expenditures • no impacts of construction on the environment	• retains status quo • does not address the need to maintain adequate water service to existing consumers • does not address lack of available capacity in existing distribution system to service growth • does not address the need to reinforce water distribution network • adverse economic impact due to stagnation of development • objectives of Official Plan cannot be realized • could affect safety and health of consumers	NR
Restrict Community Growth	• eliminates or defers the need for large capital expenditures • no impacts of construction on the environment	• does not address the need to maintain adequate water service to existing consumers • does not address lack of available capacity in existing distribution system to service growth • does not address the need to reinforce water distribution network • adverse economic impact due to stagnation of development • objectives of Official Plan cannot be realized • could affect safety and health of consumers	NR

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Conceptual Planning Alternative Solutions	***Advantages***	***Disadvantages***	***R / NR ****
Water Use Reduction Practices	• can potentially defer timing for large capital expenditures • could help reduce future operating and capital infrastructure costs • could delay impacts of construction on the environment	• Increased costs for public and private sector education programs and by-law enforcement • measures difficult to regulate and dependent on willingness of public to comply • measures alone will not meet long-term serviocing needs	R
Construct New Watermains in Distribution System to Augment Water Conveyance Capacity to Service Existing and Future Development	• assures adequate water supply to permit orderly growth and development • will create a general benefit to the Town enhancing attractiveness for investment and economic growth • will permit the ongoing implementation of development and other activities as envisioned in Kingsville's Official Plan which have positive impacts on the socio-economic environment. • will provide an improved water distribution system for servicing existing and future consumers. • provides for handling peak flow rates and fire protection requirements • may provide fire protection in rural areas currently without fire protection • system designed to MOECC guidelines. • will address issue of inadequate system redundancy and security of supply by reinforcing supply network with second feed link to meet existing and projected future 20 year water demands while enabling water supply to continue in the event existing 250 mm dia. watermain along Road 2 West and McCain Sideroad is out of operation for maintenance or repair due to failure • will address the need to relieve the overstressed existing 250 mm dia. watermain along on Road 2 West and McCain Sideroad	• will incur large capital expenditures for construction of additional watermains. • will need to mitigate impacts on the environment from construction activities. • will require the acquisition of utility easements at some inconvenience to existing property owners where there is a lack of municipal rights-of-ways or insufficient room in existing municipal rights-of-ways • will further delay implementation of new development until watermain improvements are implemented	R

**** (R = Recommended NR = Not Recommended)***

Based on a review of the comparative evaluation and recommendations made herein, the results of preliminary screening clearly indicate that the recommended alternative solutions which address the identified problems and study objectives identified herein are as follows:

1. **Construct new watermains in the distribution system to augment water conveyance capacity to service existing and future development**
2. **Maintain water use reduction practices.**

Other than the environmental effects listed in Table 3, it is anticipated that the above recommended conceptual planning alternatives are not considered to have any significant effect on wildlife, vegetation or the habitat characteristics of any particular species.

With respect to other socio-economic impacts, the above recommended conceptual planning alternatives are also not considered to have any serious impacts on existing land uses, cultural activities, heritage

resources or any other community program except to the extent that it will permit the ongoing implementation of development and other activities as envisaged in planning documents which have positive impacts on the socio-economic environments.

The following sections identify and evaluate the alternative water servicing solutions that address the specific problems and needs of the Kingsville SWWSA. These alternatives have been developed on the basis that the Town of Kingsville will implement the recommended solutions within its rights-of-way and through servicing agreements with its developers.

Recommended Water Distribution System Improvements

The updated hydraulic computer model of the Union WSS was used together with projected increases in water demand from population growth and proposed new developments to simulate future conditions and test various system improvements that would adequately supply the respective projected 20 year water demands of the Kingsville SWWSA under the following conditions in accordance with MOECC Design Guidelines:

i) peak hour conditions
ii) maximum day plus fire flow conditions

Proposed watermain improvements are intended to achieve one or more of the following objectives:

- Growth – provide for future service area development
- Capacity – increase conveyance capacity and minimize pipeline headloss
- Fire Flow – improve fire flows to target levels
- Looping, Redundancy & Reliability – maintain water quality by reducing the number of "dead-ends" and wherever possible reinforce watermain network so as to provide more than one point of delivery

Many computer runs of the hydraulic model were performed to achieve a system that would adequately supply the projected water demands of the Kingsville SWWSA so as to comply with MOECC design guidelines under both existing and future growth projections but also to restore fire protection to target levels while reinforcing the watermain network.

System redundancy and security of supply is considered a very important aspect for the study area for there is currently only one watermain feeding the Kingsville SWWSA. Should there occur a break or service interruption in the existing 250 mm dia. watermain along Road 2 West and McCain Sideroad, there would be no capacity to maintain adequate service and the entire southern service area would experience total pressure failure and subject to potential contamination from groundwater ingress. Emergency points of interconnection do exist on County Road 20 and County Road 50 where it borders with the Community of Kingsville's and town of Essex, however, they would only serve for emergency use only for they have insufficient capacity to adequately service the Kingsville SWWSA.

Based on the above considerations, the following watermain infrastructure improvements are recommended to support both the existing and projected 20-year water demands of the Kingsville SWWSA while addressing noted system deficiencies and providing a security of supply. These improvements are illustrated in Figure 4 and 5 found in Appendix "A".

→ A new 300 mm dia. watermain to complement the existing 150 mm dia. PVC watermain along County Road 20 from the existing 250 mm asbestos cement (AC) watermain at McCain Sideroad easterly to a point fronting the Valente lands.

- → A new 400 mm dia. watermain to complement the existing 150 mm dia. PVC watermain along County Road 20 from the Valente lands easterly to a point immediately west of Heritage Road (County Road 50).
- → A new 400 mm dia. watermain running North-South from County Road 20 to Road 2 West within proposed utility easement(s) on private property.
- → A new 400 or 600 mm dia. watermain to complement the existing 250 mm dia. AC watermain along Road 2 West from where it exits the proposed utility easement easterly to the East side of Division Road (County Road 29) where it would connect to the existing 600 mm trunk watermain.

  To provide greater flexibility in accommodating future growth and opportunities along Road 2 West west of Division Road (County Road 29), serious consideration is to be given by the Town towards taking advantage of the opportunity towards oversizing of the proposed 400 mm dia. watermain on Road 2 West to 600 mm diameter.

  The 2012 Union MP forecast approximately 400 acres of new greenhouse development along Road 2 East between Graham Sideroad and Division Road. Since the exact location of future greenhouse development cannot be determined until time of development, oversizing of the proposed 400 mm dia, watermain along Road 2 West would essentially serve to expand the available corridor for greenhouse development and benefit the system overall.
- → A new. trunk watermain to complement the existing 600 mm dia. AC trunk watermain along Road 2 East from Division Road (County Road 29) to Peterson Sideroad as follows:
  - ➢ A new 600 mm dia. trunk watermain along Road 2 East from Division Road (County Road 29) easterly to Graham Sideroad.
  - ➢ A new 1050 mm dia. trunk watermain along Road 2 East from Graham Sideroad easterly to west side of Peterson Sideroad and connect to existing 1050 mm dia. pipe stub.

It is anticipated that routing of the new watermains can be undertaken within the existing public rights-of-way, however, a section of the proposed new watermains from Road 2 West to County Road 20 will need to be routed through private property within utility easements. The exact location of the proposed utility easement has not been established and beyond the scope of this preliminary report.

However, in keeping with the recommendations of the 2012 Union MP and further discussions with Town administration, the recommended route of the proposed watermain through utility easements shown in Figure 4 on or in the vicinity of Fox Lane is to be regarded as general in nature and can easily shift east or west without detrimental impact. It is acknowledged that this proposed route through private property represents the most direct and least cost alternative solution towards augmenting water supply capacity to the southwest quadrant.

Projects that require the purchasing of land will require additional planning studies to be undertaken before the proposed works can proceed to design and construction; specifically, the completion of a Class Environmental Assessment (Class EA). This project has been identified as a Schedule "B" activity under the Class Environmental Assessment process.

<u>Valente Subdivision</u>

An assessment of the existing water distribution system within the Kingsville SWWSA established there was insufficient unreserved capacity to support any further development without having a significant detrimental impact on the remainder of the water distribution system until system improvements can be implemented.

As part of this engineers report, a review of the water servicing arrangement within the recently approved residential development known as the Valente Subdivision was undertaken in coordination with the

proposed system improvements identified herein. The review has been premised on achieving a distribution system layout that would adequately supply the projected water demands of the subdivision in compliance with MOECC design guidelines including consideration for looping, redundancy and reliability while providing the minimum recognized fire flow target of 30 L/s to all areas of the proposed subdivision; all in coordination with the overall proposed servicing scheme of the Kingsville SWWSA established in this report.

The recommended proposed water distribution system layout is illustrated in Figure 6 found in Appendix "A". This layout is premised on the proposed 400 mm dia. watermain along County Road 20 being available as a supply point and that the proposed 300 mm dia. watermain from County Road 20 southerly to County Road 50 take precedence.

It is understood that the subdivision is to be constructed in a number of phases over an approximate 20-year period. To fulfill the performances objectives of the recommended alternative solution, phasing of development must be planned so that construction of the proposed 300 mm dia. watermain from County Road 20 southerly to County Road 50 is given priority.

Upon further review and analysis, it was determined that approximately 120 lots or units can be adequately serviced by undertaking only a portion of the recommended water distribution system improvements from County Road 29 to County Road 20 identified as Stage 1 in the Scheduling section of this report. Stage 1 must be constructed and in service prior to the servicing of any new homes or units within the subdivision.

COST SUMMARY & SCHEDULING

Scheduling

A staged approach to implementation of the recommended water distribution system improvements was envisioned so that capital costs can be deferred and triggered by community growth.

The overall concept is to initially augment and upgrade the water distribution system under Stage 1 to restore water capacity to the Kingsville SWWSA to meet current water demands and fire flow targets while providing sufficient available capacity to support approximately 120 lots within the proposed Valente subdivision development. Subsequent project stages would then be undertaken based on community growth and development. A preliminary project staging plan is illustrated in Figure 7 found in Appendix "A".

Note that nothing precludes the various Stages from being undertaken out of order and/or in combination with each other. Of particular note is the timing of the proposed 600 mm dia. trunk watermain twinning along Road 2 East under Stages 4, 5 & 6 where the trigger for this work can come from greenhouse development along Road 2 East and/or future growth/development within the Kingsville SWWSA whichever comes first.

Upon the requirements of the Class EA process being complete, final design and construction can proceed. It is anticipated that the requirements of the Class EA process can be completed within an 8 to 10-month period followed by property acquisition for utility easements immediately thereafter to minimize any delays with final design and construction. Final design and tendering is anticipated to be carried out separately for each stage to expedite construction.

A preliminary schedule of the recommended works is presented in Table 5 below. Timelines are presented in months for planning and budgeting purposes and is to be updated after completion of the Class EA and available funding.

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Table 5: Preliminary Project Staging

Project Activity	*Estimated Design Period*	*Estimated Construction Period*	*Class EA Schedule*
Stage 1 - 400/600 mm dia. watermain along Road 2 West from County Road 29 to Utility Easement - 400 mm dia. watermain within Utility Easements from Road 2 West to County Road 20	6 months	6 months	B
Stage 2 - 400 mm dia. watermain along County Road 20 from Utility Easement to Valente Subdivision	6 months	6 months	A+
Stage 3 - 300 mm dia. watermain along County Road 20 from Valente Subdivision to McCain Sideroad	6 months	5 months	A+
Stage 4 - 1050 mm dia. trunk watermain twinning along Road 2 East from Peterson Sideroad to Graham Sideroad	6 months	5 months	A+
Stage 5 - 600 mm dia. trunk watermain twinning along Road 2 East from Graham Sideroad to Kratz Sideroad	6 months	5 months	A+
Stage 6 - 600 mm dia. trunk watermain twinning along Road 2 East from Kratz Sideroad to County Road 29	6 months	5 months	A+

Cost Summary

Capital cost estimates or opinions of probable cost are based on preliminary information and accordingly are to be treated as planning level estimates. In some cases, the cost of similar facilities used on other projects and from experience have been used to estimate costs. Construction costs are significantly affected by economic conditions at the time of tender amongst other factors and will vary from these estimates.

Opinions of probable cost are typically provided throughout the various stages of a project's life cycle. There are several classifications for estimates that identify typical minimum and maximum probable costs for various levels of accuracy. These classifications vary widely by industry, but all are based on the fact that the level of accuracy is directly proportional to the level of detail available at the time the opinion of costs are prepared.

The level of accuracy for the opinions of cost increases as the project moves through the various stages of the project life cycle, from planning to preliminary design to final design. A wide range of accuracy would be expected at the planning stage of project development because several details would be unknown. As the project moves closer to completion of final design, the opinion of cost would become more accurate due to the increased level of detail. The following Table 6 summarizes typical cost classifications throughout a project's life cycle including a description of the typical project stage and range of accuracy. The opinions of probable cost in this report are estimated at the preliminary stage (Class 3) and the corresponding level of accuracy ranges from +25% to -10%.

Table 6: Classifications of Opinions of Probable Cost

Class	*Description*	*Level of Accuracy*	*Stage of Project Lifecycle*
5	Conceptual Stage	+50% to -30%	Coincides with preliminary project scope, design and site data.
4	Study Stage	+30% to -15%	Coincides with site selection and a more defined scope of work.
3	Preliminary Stage	+25% to -10%	Coincides with a defined project scope
2	Detailed Stage	+15% to -5%	Clearly defined project scope and some approvals in place.
1	Tender Stage	+10% to -3%	Actual tender price

Reference: Kingsville Southwest Service Area Water Supply –Preliminary Engineers Report

Probable capital cost estimates for the recommended works are presented in Table 7 below and have been prepared taking into consideration the following factors:

- estimates are in 2017 dollars
- estimates include an allowance for Class EA work
- estimates include 15% allowance for engineering work & project management
- estimates include an allowance for geotechnical and environmental investigations
- estimates include an allowance for survey work
- estimates include an allowance for property acquisition, land costs and legal costs
- estimates include a 10% contingency allowance
- estimates include 13% HST
- estimates do not include any allowance for interim financing or Federal/Provincial grant funding

Detailed probable cost estimates for each Stage can be found in Appendix "B".

Table 7: Probable Capital Cost Summary of Recommended Works

Project Activity	***Probable Capital Cost***
Stage 1 - 400 mm dia. watermain along Road 2 West from County Road 29 to Utility Easement - 400 mm dia. watermain within Utility Easements from Road 2 West to County Road 20	$4,600,000
Stage 2 - 400 mm dia. watermain along County Road 20 from Utility Easement to Valente Subdivision	$1,500,000
Stage 3 - 300 mm dia. watermain along County Road 20 from Valente Subdivision to McCain Sideroad	$1,700,000
Stage 4 - 1050 mm dia. trunk watermain twinning along Road 2 East from Peterson Sideroad to Graham Sideroad	$4,100,000
Stage 5 - 600 mm dia. trunk watermain twinning along Road 2 East from Graham Sideroad to Kratz Sideroad	$3,850,000
Stage 6 - 600 mm dia. trunk watermain twinning along Road 2 East from Kratz Sideroad to County Road 29	$3,450,000
Total Capital Cost I	**$19,200,000**
Cost of oversizing 400 mm dia. watermain to 600 mm dia. on Road 2 West under Stage 1	$600,000
Total Capital Cost II	**$19,800,000**

We trust the foregoing report is to the Municipality's satisfaction and would be pleased to meet with you and your administration at your convenience to further discuss this report and answer any questions that may arise. Please contact me directly should you have any questions or concerns or require additional information.

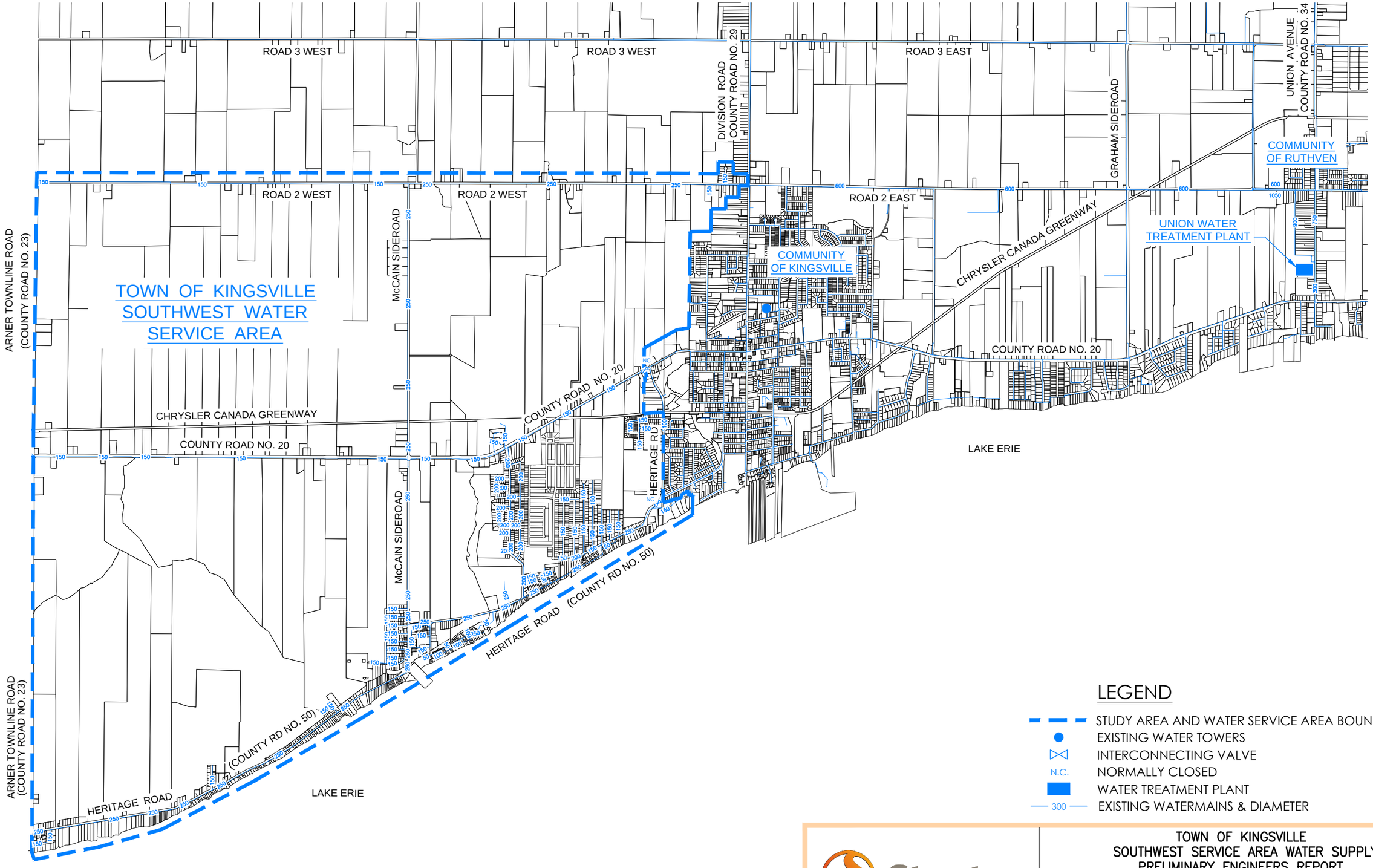
Sincerely,

STANTEC CONSULTING LTD.

Tony Berardi, P.Eng.
Principal & Sector Leader
Phone: 519-966-2250 Ext 255
Fax: 519-966-5523
Email: tony.berardi@stantec.com

APPENDIX "A"

FIGURES



LEGEND

- STUDY AREA AND WATER SERVICE AREA BOUNDARY
- EXISTING WATER TOWERS
- INTERCONNECTING VALVE
- N.C. NORMALLY CLOSED
- WATER TREATMENT PLANT
- 300 EXISTING WATERMAINS & DIAMETER

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TOWN OF KINGSVILLE
SOUTHWEST SERVICE AREA WATER SUPPLY
PRELIMINARY ENGINEERS REPORT

STUDY AREA & EXISTING WATERMAINS

PROJECT NO.		DRAWING NO.
165620102-203	0 350 1050 1750m 1:35000	FIGURE 1

W:\active\165620102\TASK_203\preliminary\drawing\FIGURE-1.dwg
2017-7-20 09:08am BY: jholmes

W:\active\165620102\TASK_203\preliminary\drawing\FIGURE-1.dwg
2017-7-20 08:35am BY: jholmes

PARCEL	ROLL NO.	PARCEL	ROLL NO.
1	010-01800	14	270-01400
2	270-31200	15	270-01702
3	270-31100	16	270-01750
4	270-31000	17	270-07100
5	270-30900	18	320-02600
6	270-30800	19	270-02401
7	270-30700	20	270-02800
8	270-00600	21	270-02900
9	270-00900	22	270-03190
10	270-23000	23	270-03180
11	270-01010	24	270-03100
12	270-01100	25	270-03150
13	270-01110	26	280-34000

TOWN OF KINGSVILLE SOUTHWEST WATER SERVICE AREA

N

McCAIN SIDEROAD
CHRYSLER CANADA GREENWAY
HIGHWAY NO. 18
COUNTY ROAD NO. 20
HERITAGE ROAD (COUNTY RD NO. 50)
WIGLE CREEK
SCRATCH LANE
PETER ST.
ESSEX ST.
KING STREET
LAKE DRIVE
CREEKVIEW BOULEVARD
MARSHWOODS BLVD
CONSERVATION BOULEVARD
GREENVIEW DRIVE
COTTAGE GROVE AVENUE
LAWNDALE AVENUE
WRIDE AVENUE
ERIE AVENUE
PARK STREET
PLAYVIEW AVENUE
MALOTT AVENUE
DEERPATH CRESCENT
NORMANDY AVE.
AVENUE
KATRISHE
JAMESE
OWENWOOD
ALLEN
LONG
COCHILL
STONEHEDGE
SUMMERSET
PARKDALE
CRESCENT
COMMUNITY
OBRIOLE
PINEWAY
MACDONALD STREET
CEMETERY
OAK AVE.
MAPLE AVE.
BIRCH AVE.
HEMLOCK RD.
SPRUCE AVE.
CHERRY AVE.
SYCAMORE AVE.
CEDAR AVE.
CATA COURT
CEDAR ISLAND RD.
HERITAGE RD.

LEGEND

- STUDY AREA AND WATER SERVICE AREA BOUNDARY
- 300 EXISTING WATERMAINS & DIAMETER
- PROPOSED DEVELOPMENTS

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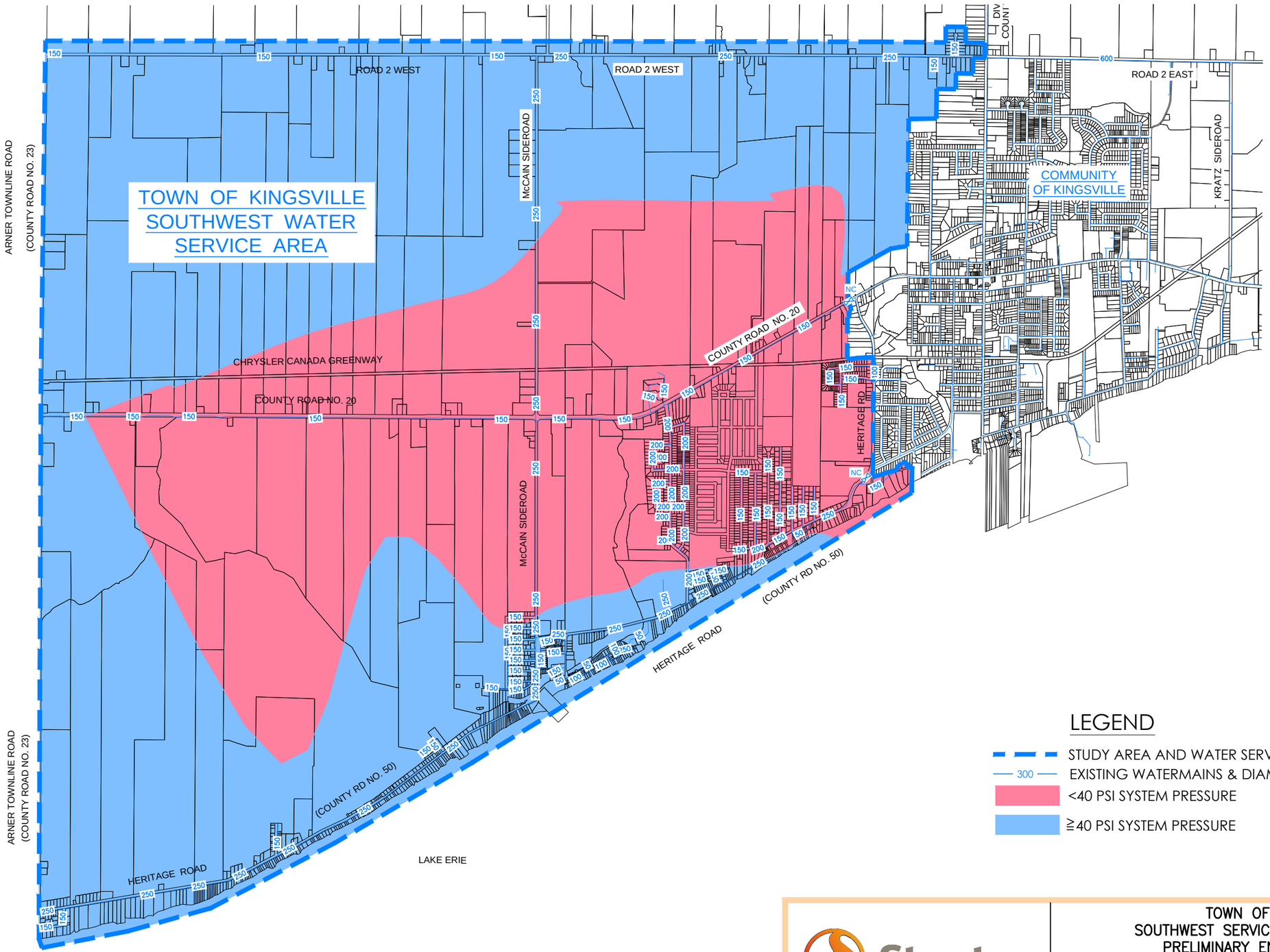
TOWN OF KINGSVILLE
SOUTHWEST SERVICE AREA WATER SUPPLY
PRELIMINARY ENGINEERS REPORT

PROPOSED DEVELOPMENTS

PROJECT NO. 165620102-203

0 125 375 625m
1:12500

DRAWING NO. FIGURE 2



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TOWN OF KINGSVILLE
SOUTHWEST SERVICE AREA WATER SUPPLY
PRELIMINARY ENGINEERS REPORT

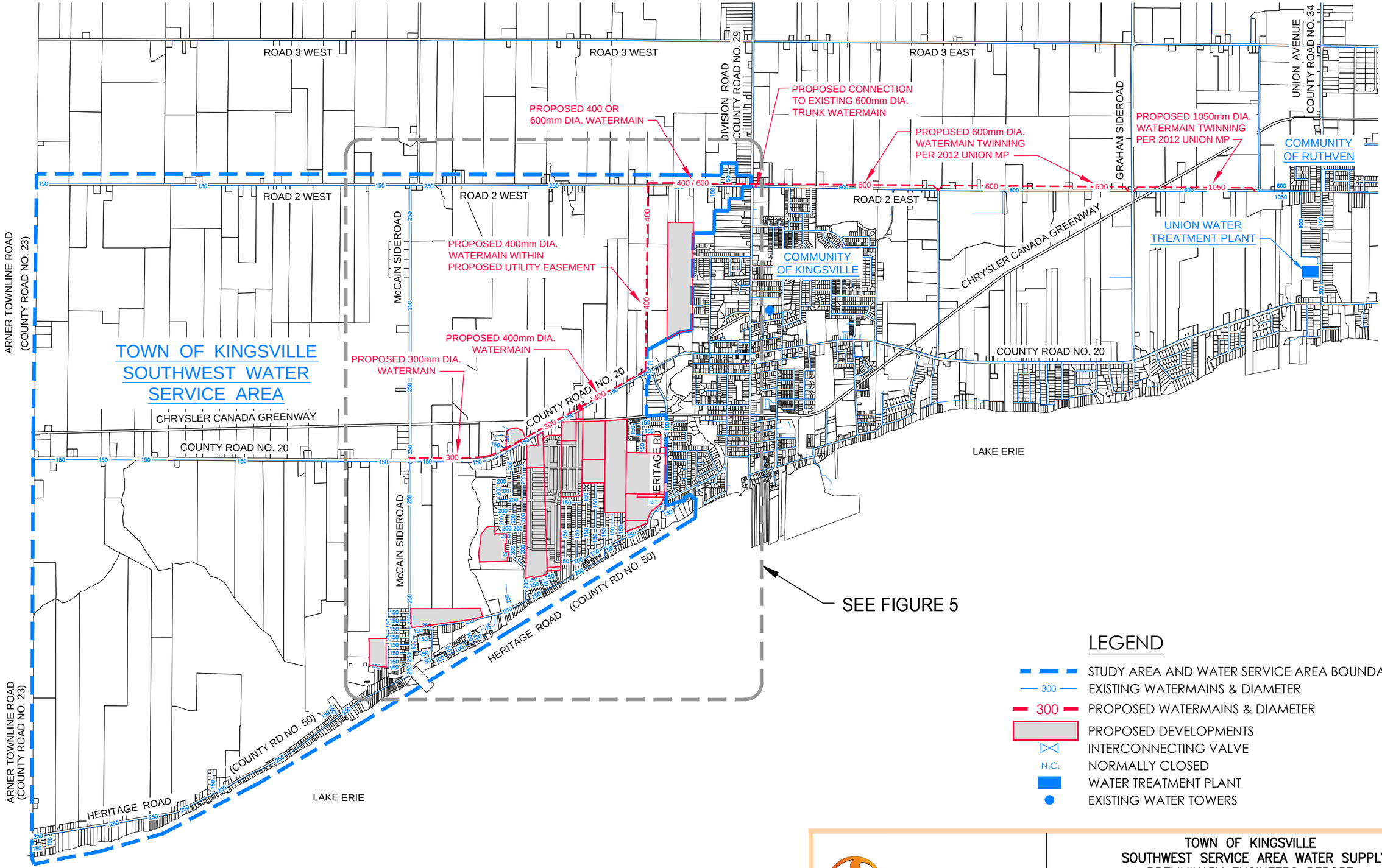
EXISTING SYSTEM PRESSURE MAP UNDER PEAK HOUR FLOW CONDITIONS

PROJECT NO. 165620102-203

0 300 900 1500m
1:30000

DRAWING NO. FIGURE 3

W:\active\165620102\TASK_203\preliminary\drawing\FIGURE-1.dwg
2017-7-20 08:37am BY: jholmes



LEGEND

- STUDY AREA AND WATER SERVICE AREA BOUNDARY
- 300 — EXISTING WATERMAINS & DIAMETER
- 300 — PROPOSED WATERMAINS & DIAMETER
- PROPOSED DEVELOPMENTS
- INTERCONNECTING VALVE
- N.C. NORMALLY CLOSED
- WATER TREATMENT PLANT
- EXISTING WATER TOWERS

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TOWN OF KINGSVILLE
SOUTHWEST SERVICE AREA WATER SUPPLY
PRELIMINARY ENGINEERS REPORT

PROPOSED WATERMAIN IMPROVEMENTS

PROJECT NO.		DRAWING NO.
165620102-203	1:35000 (0, 350, 1050, 1750m)	FIGURE 4

W:\active\165620102\TASK_203\preliminary\drawing\FIGURE-1.dwg
2017-7-20 08:35am BY: jholmes

PROPOSED 600mm DIA. TRUNK WATERMAIN TWINNING ALONG ROAD 2 EAST RIGHTS-OF-WAY PER 2012 UNION MP

PROPOSED 400 OR 600mm DIA. WATERMAIN ALONG TOWN RIGHTS-OF-WAY

400 / 600

600

VICINITY OF PROPOSED CONNECTION TO EXISTING 600mm DIA. TRUNK WATERMAIN

PROPOSED 400mm DIA. WATERMAIN WITHIN PROPOSED UTILITY EASEMENT

TOWN OF KINGSVILLE
SOUTHWEST WATER
SERVICE AREA

PROPOSED 400mm DIA. WATERMAIN ALONG TOWN RIGHTS-OF-WAY

PROPOSED 300mm DIA. WATERMAIN ALONG TOWN RIGHTS-OF-WAY

ROAD 2 WEST

CHRYSLER CANADA GREENWAY

HIGHWAY NO. 18

COUNTY ROAD NO. 20

McCAIN SIDEROAD

HERITAGE ROAD (COUNTY RD NO. 50)

LAKE ERIE

LEGEND

- STUDY AREA AND WATER SERVICE AREA BOUNDARY
- 300 EXISTING WATERMAINS & DIAMETER
- 300 PROPOSED WATERMAIN & DIAMETER
- PROPOSED DEVELOPMENTS

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TOWN OF KINGSVILLE
SOUTHWEST SERVICE AREA WATER SUPPLY
PRELIMINARY ENGINEERS REPORT

PROPOSED WATERMAIN IMPROVEMENTS

PROJECT NO. 165620102-203

1:15000 0 150 450 750m

DRAWING NO. FIGURE 5

W:\active\165620102\TASK_203\preliminary\drawing\FIGURE-1.dwg
2017-7-20 08:35am BY: jholmes

PROPOSED 400mm DIA. WATERMAIN ALONG TOWN RIGHTS-OF-WAY

PROPOSED 300mm DIA. WATERMAIN ALONG TOWN RIGHTS-OF-WAY

CHRYSLER CANADA GREENWAY

HIGHWAY NO. 18

CONSERVATION BOULEVARD

GOLFVIEW DRIVE

CREEKVIEW BOULEVARD

MARSHWOODS BLVD

ESSEX ST.

COTTAGE GROVE AVENUE

LAWNDALE AVENUE

WRIDE AVENUE

ERIE AVENUE

PARK STREET

BAYVIEW AVENUE

MALOTT AVENUE

KING STREET

HERITAGE ROAD (COUNTY RD NO. 50)

LAKE DRIVE

SCRATCH LANE

MALO ST.

PETER ST.

ALTERNATE ROUTE

CONNECT TO EXISTING 250mm DIA. WATERMAIN

LEGEND

- 300 — EXISTING WATERMAINS & DIAMETER
- 300 — PROPOSED WATERMAIN & DIAMETER
- PROPOSED VALENTE SUBDIVISION

Stantec

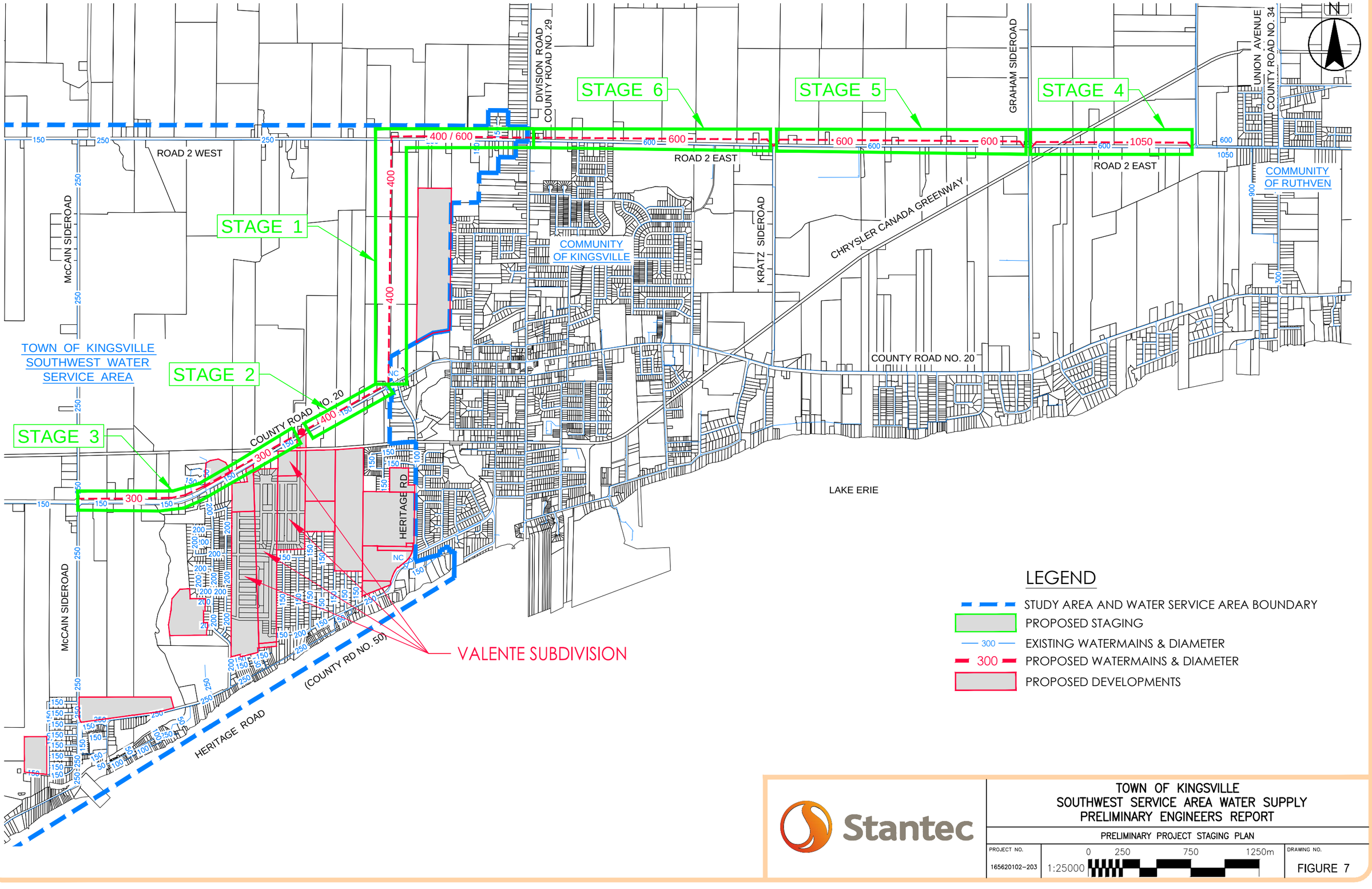
TOWN OF KINGSVILLE
SOUTHWEST SERVICE AREA WATER SUPPLY
PRELIMINARY ENGINEERS REPORT

PROPOSED WATERMAINS FOR VALENTE SUBDIVISION

PROJECT NO. 165620102-203

1:5000 0 50 150 250m

DRAWING NO. FIGURE 6



LEGEND

- STUDY AREA AND WATER SERVICE AREA BOUNDARY
- PROPOSED STAGING
- 300 — EXISTING WATERMAINS & DIAMETER
- 300 — PROPOSED WATERMAINS & DIAMETER
- PROPOSED DEVELOPMENTS

Stantec

TOWN OF KINGSVILLE SOUTHWEST SERVICE AREA WATER SUPPLY PRELIMINARY ENGINEERS REPORT

PRELIMINARY PROJECT STAGING PLAN

PROJECT NO. 165620102-203

0 250 750 1250m

1:25000

DRAWING NO. FIGURE 7

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2017-7-20 08:36am BY: jholmes

APPENDIX "B"

OPINION OF PROBABLE COST

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 400 mm Road 2 West Watermain - Stage 1
(County Road 29 to County Road 20)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie-in work to exist 600 AC at CR 29 - Coordination & Labour	1	ea	$30,000	$30,000
2	600x600x600 Cut-in Tee & 2-600 bolted couplings	1	ea	$15,000	$15,000
3	600 isolation gate valve	1	ea	$35,000	$35,000
4	600 Tie-in lead pipe & bolted coupling	10	m	$1,500	$15,000
5	600x600x600 Tee	1	ea	$10,000	$10,000
6	600 Cap for future extension from Kratz SR	1	ea	$5,000	$4,000
7	600 Isolation butterfly valve with bolted coupling	1	ea	$18,000	$18,000
8	600x600x600&300 Tee	1	ea	$12,000	$12,000
9	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
10	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
11	600x400 Reducer	1	ea	$5,000	$5,000
12	400 Fusible PVC across CR 29 under box culvert by directional drilling methods - in Pavement	100	m	$1,100	$110,000
13	Tie-in work from new 400 to exist 400 at CR 29 in cofferdam - Coordination & labour	1	ea	$50,000	$50,000
14	400x400 Tapping Saddle for new & exist 400 w/m	2	ea	$10,000	$20,000
15	400 Tapping Valve for exist 400 w/m	1	ea	$10,000	$10,000
16	400 Pipe	10	m	$500	$5,000
17	400 - 90° Bend	2	ea	$1,500	$3,000
18	400x400x300 Tee	1	ea	$5,000	$5,000
19	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
20	Tie-in work to exist 250 AC west of CR 29 - Coordination & Labour	1	ea	$8,000	$8,000
21	300x300x250 Tee	1	ea	$1,500	$1,500
22	250 Lead Pipe	10	m	$250	$2,500
23	250 Gate Valve	1	ea	$3,000	$3,000
24	250x250x250 Cut-in Tee & 2-250 bolted couplings	1	ea	$5,000	$5,000
25	400 Gate Valve	1	ea	$14,000	$14,000
26	400 westerly along Road 2 West to Utility Easement in Road	950	m	$500	$475,000
27	Directionally drill 400 across 2nd Concession Road Drain West	20	m	$1,500	$30,000
28	400 Intermediate Mainline Gate Valves	1	ea	$14,000	$14,000
29	400x400x400 Tee	1	ea	$5,000	$5,000
30	400 Gate Valve	1	ea	$14,000	$14,000
31	400x400x300 Tee	1	ea	$5,000	$5,000
32	400 Cap for future extension westerly	1	ea	$3,000	$4,000
33	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
34	Tie-in work to exist 250 AC on CR 20 at Fox Lane - Coordination & Labour	1	ea	$5,000	$5,000
35	300x300x250 Tee	1	ea	$1,500	$1,500
36	250 Lead Pipe	10	m	$200	$2,000
37	250 Gate Valve	1	ea	$3,000	$3,000
38	250x250x250 Cut-in Tee & 2-250 bolted couplings	1	ea	$5,000	$5,000
39	400 southerly along Utility Easement to CR 20 in gravel	400	m	$450	$180,000
40	400 southerly along Utility Easement to CR 20 in farmland	1400	m	$400	$560,000
41	400 Intermediate Mainline Gate Valves	3	ea	$14,000	$42,000
42	400x400x300 Tee	1	ea	$5,000	$5,000
43	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
44	400x400x400 Tee at CR20 in pavement	1	ea	$5,000	$5,000
45	400 Cap for future extension easterly along CR 20 in pavement	1	ea	$3,000	$4,000
46	400x400x300 Tee	1	ea	$5,000	$5,000
47	400 Cap for future extension westerly along CR 20 in pavement	1	ea	$3,000	$4,000
48	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
49	Tie-in work to exist 150 at Sabo St and Main St - Coordination & Labour	2	ea	$7,000	$14,000
50	300x300x150 Tee	2	ea	$1,500	$3,000
51	150 Lead Pipe	20	m	$225	$4,500
52	150 Gate Valve	2	ea	$1,500	$3,000
53	150x150x150 Cut-in Tee & 2-150 bolted couplings	2	ea	$5,000	$10,000
54	Apshalt Road Restoration along Road 2 West	3600	m2	$30	$108,000
55	Apshalt Road Restoration at CR 20	100	m2	$100	$10,000
56	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	16	ea	$8,000	$128,000
57	Swabbing, Testing & Chlorination	1	L.S.	$25,000	$25,000
58	Extra Granular for Backfilling	1000	tonne	$25	$25,000
59	Traffic Control & Signage	1	L.S.	$30,000	$30,000
60	Restoration & Landscaping	1	L.S.	$50,000	$50,000
61	Control Testing Allowance	1	L.S.	$25,000	$25,000
62	Field Office	1	L.S.	$10,000	$10,000
63	Project Signs	1	L.S.	$10,000	$10,000
64	General Contract Requirements (15%)	1	L.S.	$344,250	$344,250
65	Contingency Allowance (10%)	1	L.S.	$263,925	$263,925
Probable Construction Cost					**$2,903,175**
Municipal Class Environmental Assessment Allowance				$150,000	$3,053,175
Allowance for Property & Land Acquisition Costs for Utility Easements (6.1 m Wide x 1.8 Km Long =11,000 m2 = 2.72 Acres @ $25,000/acre)				$100,000	$3,153,175
Allowance for Archeological Assessments for Easements				$10,000	$3,163,175
Allowance for Survey Costs for Easements				$15,000	$3,178,175
Alowance for Legal Costs for Easements				$20,000	$3,198,175
Allowance for Engineering Project Management, Design, Tender & Contract Administration & Inspection Services (15%)				$435,476	$3,633,651
Allowance for Geotechnical & Environmental Investigations				$25,000	$3,658,651
Allowance for Topographic Survey Costs				$25,000	$3,683,651
Contingency Allowance (10%)				$368,365	$4,052,016
HST @ 13%				$526,762	$4,578,779
Probable Capital Cost					**$4,600,000**

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 600 / 400 mm Road 2 West Watermain - Stage 1
(County Road 29 to County Road 20)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie-in work to exist 600 AC at CR 29 - Coordination & Labour	1	ea	$30,000	$30,000
2	600x600x600 Cut-in Tee & 2-600 bolted couplings	1	ea	$15,000	$15,000
3	600 isolation gate valve	1	ea	$35,000	$35,000
4	600 Tie-in lead pipe & bolted coupling	10	m	$1,500	$15,000
5	600x600x600 Tee	1	ea	$10,000	$10,000
6	600 Cap for future extension from Kratz SR	1	ea	$5,000	$4,000
7	600 Isolation butterfly valve with bolted coupling	1	ea	$18,000	$18,000
8	600x600x600&300 Tee	1	ea	$12,000	$12,000
9	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
10	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
11	600x400 Reducer	0	ea	$5,000	$0
12	600 Fusible PVC across CR 29 under box culvert by directional drilling methods - in Pavement	100	m	$1,300	$130,000
13	Tie-in work from new 600 to exist 400 at CR 29 in cofferdam - Coordination & labour	1	ea	$60,000	$60,000
14	400x400 Tapping Saddle for new & exist 400 w/m	2	ea	$10,000	$20,000
15	400 Tapping Valve for exist 400 w/m	1	ea	$10,000	$10,000
16	400 Pipe	10	m	$500	$5,000
17	400 - 90° Bend	2	ea	$1,500	$3,000
18	600x600x300 Tee	1	ea	$8,000	$8,000
19	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$18,000	$18,000
20	Tie-in work to exist 250 AC west of CR 29 - Coordination & Labour	1	ea	$8,000	$8,000
21	300x300x250 Tee	1	ea	$1,500	$1,500
22	250 Lead Pipe	10	m	$250	$2,500
23	250 Gate Valve	1	ea	$3,000	$3,000
24	250x250x250 Cut-in Tee & 2-250 bolted couplings	1	ea	$5,000	$5,000
25	600 Gate Valve	1	ea	$35,000	$35,000
26	600 westerly along Road 2 West to Utility Easement in Road	950	m	$750	$712,500
27	Directionally drill 600 across 2nd Concession Road Drain West	20	m	$2,000	$40,000
28	600 Intermediate Mainline Gate Valves	1	ea	$35,000	$35,000
29	600x600x400 Tee	1	ea	$10,000	$10,000
30	400 Gate Valve	1	ea	$14,000	$14,000
31	400x400x300 Tee	1	ea	$5,000	$5,000
32	400 Cap for future extension westerly	1	ea	$3,000	$4,000
33	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
34	Tie-in work to exist 250 AC on CR 20 at Fox Lane - Coordination & Labour	1	ea	$5,000	$5,000
35	300x300x250 Tee	1	ea	$1,500	$1,500
36	250 Lead Pipe	10	m	$200	$2,000
37	250 Gate Valve	1	ea	$3,000	$3,000
38	250x250x250 Cut-in Tee & 2-250 bolted couplings	1	ea	$5,000	$5,000
39	400 southerly along Utility Easement to CR 20 in gravel	400	m	$450	$180,000
40	400 southerly along Utility Easement to CR 20 in farmland	1400	m	$400	$560,000
41	400 Intermediate Mainline Gate Valves	3	ea	$14,000	$42,000
42	400x400x300 Tee	1	ea	$5,000	$5,000
43	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
44	400x400x400 Tee at CR20 in pavement	1	ea	$5,000	$5,000
45	400 Cap for future extension easterly along CR 20 in pavement	1	ea	$3,000	$4,000
46	400x400x300 Tee	1	ea	$5,000	$5,000
47	400 Cap for future extension westerly along CR 20 in pavement	1	ea	$3,000	$4,000
48	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
49	Tie-in work to exist 150 at Sabo St and Main St - Coordination & Labour	2	ea	$7,000	$14,000
50	300x300x150 Tee	2	ea	$1,500	$3,000
51	150 Lead Pipe	20	m	$225	$4,500
52	150 Gate Valve	2	ea	$1,500	$3,000
53	150x150x150 Cut-in Tee & 2-150 bolted couplings	2	ea	$5,000	$10,000
54	Apshalt Road Restoration along Road 2 West	3600	m2	$30	$108,000
55	Apshalt Road Restoration at CR 20	100	m2	$100	$10,000
56	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	16	ea	$8,000	$128,000
57	Swabbing, Testing & Chlorination	1	L.S.	$25,000	$25,000
58	Extra Granular for Backfilling	1000	tonne	$25	$25,000
59	Traffic Control & Signage	1	L.S.	$30,000	$30,000
60	Restoration & Landscaping	1	L.S.	$50,000	$50,000
61	Control Testing Allowance	1	L.S.	$25,000	$25,000
62	Field Office	1	L.S.	$10,000	$10,000
63	Project Signs	1	L.S.	$10,000	$10,000
64	General Contract Requirements (15%)	1	L.S.	$393,075	$393,075
65	Contingency Allowance (10%)	1	L.S.	$301,358	$301,358
Probable Construction Cost					**$3,314,933**
Municipal Class Environmental Assessment Allowance				$150,000	$3,464,933
Allowance for Property & Land Acquisition Costs for Utility Easements (6.1 m Wide x 1.8 Km Long =11,000 m2 = 2.72 Acres @ $25,000/acre)				$100,000	$3,564,933
Allowance for Archeological Assessments for Easements				$10,000	$3,574,933
Allowance for Survey Costs for Easements				$15,000	$3,589,933
Alowance for Legal Costs for Easements				$20,000	$3,609,933
Allowance for Property & Land Acquisition Costs for Utility Easements (6.1 m Wide x 1.8 Km Long =11,000 m2 = 2.72 Acres @ $25,000/acre)				$497,240	$4,107,172
Allowance for Geotechnical & Environmental Investigations				$25,000	$4,132,172
Allowance for Topographic Survey Costs				$25,000	$4,157,172
Contingency Allowance (10%)				$415,717	$4,572,890
HST @ 13%				$594,476	$5,167,365
Probable Capital Cost					**$5,200,000**

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 400 mm County Road 20 Watermain - Stage 2
(Utility Easement to Valente Subdivision)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie-in work to exist 400 Watermain at Utility Easement - Coordination & Labour	1	ea	$5,000	$5,000
2	400 easterly along CR 20 to Heritage Road in Road	60	m	$500	$30,000
3	400 westerly along CR 20 to Valente Subdivision in Road	760	m	$500	$380,000
4	Punch 400 across Morley Wigle Drain	2	ea	$3,000	$6,000
5	400 Intermediate Mainline Gate Valves	3	ea	$14,000	$42,000
6	400 Blind Flange & 25 dia. Blow off	1	ea	$4,000	$4,000
7	400x400x300 Tee	1	ea	$5,000	$5,000
8	Intermediate Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
9	Tie-in work to exist 150 AC - Coordination & Labour	1	ea	$7,000	$7,000
10	300x300x150 Tee	1	ea	$1,500	$1,500
11	150 Lead Pipe	10	m	$225	$2,250
12	150 Gate Valve	1	ea	$1,500	$1,500
13	150x150x150 Cut-in Tee & 2-150 bolted couplings	1	ea	$5,000	$5,000
14	400x400x300 Tee	1	ea	$5,000	$5,000
15	Swab Launching Facility incl. 300 pipe lead & 300 isolation gate valve	1	ea	$15,000	$15,000
16	Tie-in work to exist 200 on Heritage Road - Coordination & Labour	1	ea	$8,000	$8,000
17	300x300x200 Tee	1	ea	$1,500	$1,500
18	200 Lead Pipe	10	m	$240	$2,400
19	200 Gate Valve	1	ea	$2,200	$2,200
20	200x200x200 Cut-in Tee & 2-200 bolted couplings	1	ea	$5,000	$5,000
21	Tie-in work to exist 150 AC on CR 20 at west limit - Coordination & Labour	1	ea	$5,000	$5,000
22	300x300x150 Tee	1	ea	$1,500	$1,500
23	150 Lead Pipe	10	m	$225	$2,250
24	150 Gate Valve	1	ea	$1,500	$1,500
25	150x150x150 Cut-in Tee & 2-150 bolted couplings	1	ea	$5,000	$5,000
26	400x400x300 Tee	1	ea	$5,000	$5,000
27	400 Gate Valve	1	ea	$14,000	$14,000
28	400 Cap for future extension westerly along CR 20	1	ea	$3,000	$4,000
29	300 Gate Valve	1	ea	$4,000	$4,000
30	Tie-in work to exist (future) 300 Watermain to Valente Subdivision - Coordination & Labour	1	ea	$8,000	$8,000
31	Apshalt Road Restoration at CR 20	100	m2	$100	$10,000
32	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	4	ea	$8,000	$32,000
33	Swabbing, Testing & Chlorination	1	L.S.	$15,000	$15,000
34	Extra Granular for Backfilling	500	tonne	$25	$12,500
35	Traffic Control & Signage	1	L.S.	$30,000	$30,000
36	Restoration & Landscaping	1	L.S.	$50,000	$50,000
37	Control Testing Allowance	1	L.S.	$25,000	$25,000
38	Field Office	1	L.S.	$10,000	$10,000
39	Project Signs	1	L.S.	$10,000	$10,000
40	General Contract Requirements (15%)	1	L.S.	$118,215	$118,215
41	Contingency Allowance (10%)	1	L.S.	$90,632	$90,632
Probable Construction Cost					**$996,947**
Municipal Class Environmental Assessment Allowance				$0	$996,947
Allowance for Land Acquisition Costs for Utility Easements				$0	$996,947
Allowance for Archeological Assessments for Easements				$0	$996,947
Allowance for Survey Costs for Easements				$0	$996,947
Alowance for Legal Costs for Easements				$0	$996,947
Allowance for Engineering Project Management, Design, Tender & Contract Administration & Inspection Services (15%)				$149,542	$1,146,488
Allowance for Geotechnical & Environmental Investigations				$25,000	$1,171,488
Allowance for Topographic Survey Costs				$25,000	$1,196,488
Contingency Allowance (10%)				$119,649	$1,316,137
HST @ 13%				$171,098	$1,487,235
Probable Capital Cost					**$1,500,000**

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 300 mm County Road 20 Watermain - Stage 3
(Valente Subdivision to McCain Sideroad)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie-in work to exist 400 Watermain at Valente Subdivision - Coordination & Labour	1	ea	$8,000	$8,000
2	300 westerly along CR 20 from Valente to Conservation Dr in Gravel Shoulder	770	m	$300	$231,000
3	300 Intermediate Mainline Gate Valves	3	ea	$4,000	$12,000
4	300 Blind Flange & 25 dia. Blow off	3	ea	$3,000	$9,000
5	Tie-in work to exist 200 at Conservation Dr - Coordination & Labour	1	ea	$8,000	$8,000
6	300x300x200 Tee	1	ea	$1,500	$1,500
7	200 Lead Pipe	10	m	$240	$2,400
8	200 Gate Valve	1	ea	$2,000	$2,000
9	200x200x200 Cut-in Tee & 2-200 bolted couplings	1	ea	$5,000	$5,000
10	300 westerly along CR 20 from Conservation Dr to Wigle Creek in Gravel Shoulder	390	m	$300	$117,000
11	300 Gate Valve	1	ea	$4,000	$4,000
12	300 Fusible PVC across Wigle Creek by directional drilling methods - in gravel shoulder	60	m	$550	$33,000
13	300 Gate Valve	1	ea	$4,000	$4,000
14	300 westerly along CR 20 from Wigle Creek to McCain SR in Gravel Shoulder	530	m	$300	$159,000
15	Tie-in work to exist 150 along CR 20 at Crosswinds Boulevard - Coordination & Labour	2	ea	$7,000	$14,000
16	300x300x150 Tee	2	ea	$1,500	$3,000
17	150 Lead Pipe	20	m	$225	$4,500
18	150 Gate Valve	2	ea	$1,500	$3,000
19	150x150x150 Cut-in Tee & 2-150 bolted couplings	2	ea	$4,000	$8,000
20	Tie-in work to exist 250 at McCain SR - Coordination & Labour	1	ea	$5,000	$5,000
21	250 Lead Pipe	10	m	$200	$2,000
22	250 Gate Valve	1	ea	$1,500	$1,500
23	250x250x250 Cut-in Tee & 2-250 bolted couplings	1	ea	$5,500	$5,500
24	Apshalt Road Restoration at CR 20	100	m2	$100	$10,000
25	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	10	ea	$8,000	$80,000
26	Swabbing, Testing & Chlorination	1	L.S.	$20,000	$20,000
27	Extra Granular for Backfilling	1000	tonne	$25	$25,000
28	Traffic Control & Signage	1	L.S.	$30,000	$30,000
29	Restoration & Landscaping	1	L.S.	$50,000	$50,000
30	Control Testing Allowance	1	L.S.	$25,000	$25,000
31	Field Office	1	L.S.	$10,000	$10,000
32	Project Signs	1	L.S.	$10,000	$10,000
33	General Contract Requirements (15%)	1	L.S.	$135,360	$135,360
34	Contingency Allowance (10%)	1	L.S.	$103,776	$103,776
Probable Construction Cost					**$1,141,536**
Municipal Class Environmental Assessment Allowance				$0	$1,141,536
Allowance for Land Acquisition Costs for Utility Easements				$0	$1,141,536
Allowance for Archeological Assessments for Easements				$0	$1,141,536
Allowance for Survey Costs for Easements				$0	$1,141,536
Alowance for Legal Costs for Easements				$0	$1,141,536
Allowance for Engineering Project Management, Design, Tender & Contract Administration & Inspection Services (15%)				$171,230	$1,312,766
Allowance for Geotechnical & Environmental Investigations				$25,000	$1,337,766
Allowance for Topographic Survey Costs				$25,000	$1,362,766
Contingency Allowance (10%)				$136,277	$1,499,043
HST @ 13%				$194,876	$1,693,919
Probable Capital Cost					**$1,700,000**

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 1050mm Road 2 East Trunk Watermain - Stage 4
(Peterson Sideroad to Graham Sideroad)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie into existing 1050 CPP Watermain at Peterson SR - Remove Cap	1	L.S.	$5,000	$5,000
2	1050x1050x600&300 Tee	1	ea	$15,000	$15,000
3	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
4	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
5	Swab Launching Facility including lead pipe and valve	1	ea	$25,000	$25,000
6	1050 CPP along Road 2 East to Graham SR - in Pavement	1240	m	$1,300	$1,612,000
7	Open cut 1050 CPP across Lane Drain	1	L.S.	$15,000	$15,000
8	1050x1050x600 Tee	1	ea	$15,000	$15,000
9	600 isolation gate valve	1	ea	$35,000	$35,000
10	600 Tie-in lead pipe & bolted coupling	10	m	$1,500	$15,000
11	600x600x600 Cut-in Tee & 2-600 bolted couplings	1	ea	$20,000	$20,000
12	Tie-in work to exist 600 AC at Graham SR - Coordination & Labour	1	ea	$35,000	$35,000
13	1050x1050x600&300 Tee	1	ea	$20,000	$20,000
14	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
15	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
16	1050 Isolation butterfly valve with bolted coupling	1	ea	$40,000	$40,000
17	1050 Cap for future extension to Kingsville	1	ea	$6,000	$4,000
18	Apshalt Road Restoration along Road 2 East	4600	m2	$30	$138,000
19	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	7	ea	$8,000	$56,000
20	Swabbing, Testing & Chlorination	1	L.S.	$25,000	$25,000
21	Extra Granular for Backfilling	500	tonne	$25	$12,500
22	Traffic Control & Signage	1	L.S.	$15,000	$15,000
23	Restoration & Landscaping	1	L.S.	$25,000	$25,000
24	Control Testing Allowance	1	L.S.	$15,000	$15,000
25	Field Office	1	L.S.	$10,000	$10,000
26	Project Signs	1	L.S.	$5,000	$5,000
27	General Contract Requirements (15%)	1	L.S.	$332,625	$332,625
28	Contingency Allowance (10%)	1	L.S.	$255,013	$255,013
Probable Construction Cost					**$2,805,138**
Municipal Class Environmental Assessment Allowance				$0	$2,805,138
Allowance for Land Acquisition Costs for Utility Easements				$0	$2,805,138
Allowance for Archeological Assessments for Easements				$0	$2,805,138
Allowance for Survey Costs for Easements				$0	$2,805,138
Alowance for Legal Costs for Easements				$0	$2,805,138
Allowance for Engineering Project Management, Design, Tender & Contract Administration & Inspection Services (15%)				$420,771	$3,225,908
Allowance for Geotechnical & Environmental Investigations				$25,000	$3,250,908
Allowance for Topographic Survey Costs				$25,000	$3,275,908
Contingency Allowance (10%)				$327,591	$3,603,499
HST @ 13%				$468,455	$4,071,954
Probable Capital Cost					**$4,100,000**

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 600 mm Road 2 East Trunk Watermain - Stage 5
(Graham Sideroad to Kratz Sideroad)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie into existing 1050 Watermain at Graham SR - Remove Cap	1	L.S.	$5,000	$5,000
2	600x600x600&300 Tee	1	ea	$10,000	$10,000
3	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
4	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
5	Swab Launching Facility including lead pipe and valve	1	ea	$25,000	$25,000
6	600 CPP along Road 2 East to Kratz SR - in Pavement	1870	m	$750	$1,402,500
7	Additional cost to cross Municipal Drains	3	ea	$10,000	$30,000
8	Tie-in work to exist 200 at Scratch Wigle Drain Branch - Coordination & Labour	1	ea	$8,000	$8,000
9	600x600x200 Tee	1	ea	$2,500	$2,500
10	200 Lead Pipe	10	m	$240	$2,400
11	200 Gate Valve	1	ea	$2,000	$2,000
12	200x200x200 Cut-in Tee & 2-200 bolted couplings	1	ea	$5,000	$5,000
13	600x600x600 Tee	1	ea	$10,000	$10,000
14	600 isolation gate valve	1	ea	$35,000	$35,000
15	600 Tie-in lead pipe & bolted coupling	10	m	$1,500	$15,000
16	600x600x600 Cut-in Tee & 2-600 bolted couplings	1	ea	$25,000	$25,000
17	Tie-in work to exist 600 AC at Kratz SR - Coordination & Labour	1	ea	$40,000	$40,000
18	600x600x600&300 Tee	1	ea	$12,000	$12,000
19	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
20	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
21	600 Isolation butterfly valve with bolted coupling	1	ea	$25,000	$25,000
22	600 Cap for future extension to Kingsville	1	ea	$5,000	$4,000
23	Apshalt Road Restoration along Road 2 East	6900	m2	$30	$207,000
24	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	7	ea	$8,000	$56,000
25	Swabbing, Testing & Chlorination	1	L.S.	$25,000	$25,000
26	Extra Granular for Backfilling	500	tonne	$25	$12,500
27	Traffic Control & Signage	1	L.S.	$15,000	$15,000
28	Restoration & Landscaping	1	L.S.	$25,000	$25,000
29	Control Testing Allowance	1	L.S.	$15,000	$15,000
30	Field Office	1	L.S.	$10,000	$10,000
31	Project Signs	1	L.S.	$5,000	$5,000
32	General Contract Requirements (15%)	1	L.S.	$313,335	$313,335
33	Contingency Allowance (10%)	1	L.S.	$240,224	$240,224
Probable Construction Cost					**$2,642,459**
Municipal Class Environmental Assessment Allowance				$0	$2,642,459
Allowance for Land Acquisition Costs for Utility Easements				$0	$2,642,459
Allowance for Archeological Assessments for Easements				$0	$2,642,459
Allowance for Survey Costs for Easements				$0	$2,642,459
Alowance for Legal Costs for Easements				$0	$2,642,459
Allowance for Engineering Project Management, Design, Tender & Contract Administration & Inspection Services (15%)				$396,369	$3,038,827
Allowance for Geotechnical & Environmental Investigations				$25,000	$3,063,827
Allowance for Topographic Survey Costs				$25,000	$3,088,827
Contingency Allowance (10%)				$308,883	$3,397,710
HST @ 13%				$441,702	$3,839,412
Probable Capital Cost					**$3,850,000**

Kingsville Southwest Service Area Water Supply
Preliminary Engineers Report

Detailed Opinions of Probable Cost
for 600 mm Road 2 East Trunk Watermain - Stage 6
(Kratz Sideroad to County Road 29)

Item	Description	Estimated Quantity	Unit	Unit Price	Estimated Cost
1	Tie into existing 600 Watermain at Kratz SR - Remove Cap	1	L.S.	$5,000	$5,000
2	600x600x600&300 Tee	1	ea	$10,000	$10,000
3	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
4	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
5	Swab Launching Facility including lead pipe and valve	1	ea	$25,000	$25,000
6	600 CPP along Road 2 East to CR29 - in Pavement	1760	m	$750	$1,320,000
7	Tie-in work to exist 250 at Kratz SR - Coordination & Labour	1	ea	$8,000	$8,000
8	600x600x250 Tee	1	ea	$1,500	$1,500
9	250 Lead Pipe	10	m	$250	$2,500
10	250 Gate Valve	1	ea	$3,000	$3,000
11	250x250x250 Cut-in Tee & 2-250 bolted couplings	1	ea	$5,000	$5,000
12	Tie-in work to exist 300 at Jasperson Lane - Coordination & Labour	1	ea	$8,000	$8,000
13	600x600x300 Tee	1	ea	$2,500	$2,500
14	300 Lead Pipe	10	m	$300	$3,000
15	300 Gate Valve	1	ea	$4,000	$4,000
16	300x300x300 Cut-in Tee & 2-300 bolted couplings	1	ea	$8,000	$8,000
17	Tie-in work to exist 150 at Hazel Crescent - Coordination & Labour	1	ea	$7,000	$7,000
18	600x600x150 Tee	1	ea	$2,500	$2,500
19	150 Lead Pipe	10	m	$225	$2,250
20	150 Gate Valve	1	ea	$1,500	$1,500
21	150x150x150 Cut-in Tee & 2-150 bolted couplings	1	ea	$5,000	$5,000
22	600x600x600&300 Tee	1	ea	$12,000	$12,000
23	600 Blind Flange & 25 dia. Blow off	1	ea	$5,000	$5,000
24	300 Drain/Blow-Off Assembly incl. 300 pipe lead & 300 isolation gate valve	1	ea	$25,000	$25,000
25	600x400 Reducer	1	ea	$5,000	$5,000
26	Tie into existing 600 at CR29 - Remove Cap	1	ea	$10,000	$10,000
27	Apshalt Road Restoration along Road 2 East	6500	m2	$30	$195,000
28	Hydrants at 150 m spacing incl. 150 outlets, lead pipe & isolation valves	7	ea	$8,000	$56,000
29	Swabbing, Testing & Chlorination	1	L.S.	$25,000	$25,000
30	Extra Granular for Backfilling	500	tonne	$25	$12,500
31	Traffic Control & Signage	1	L.S.	$15,000	$15,000
32	Restoration & Landscaping	1	L.S.	$25,000	$25,000
33	Control Testing Allowance	1	L.S.	$15,000	$15,000
34	Field Office	1	L.S.	$10,000	$10,000
35	Project Signs	1	L.S.	$5,000	$5,000
36	General Contract Requirements (15%)	1	L.S.	$280,388	$280,388
37	Contingency Allowance (10%)	1	L.S.	$214,964	$214,964
Probable Construction Cost					**$2,364,601**
Municipal Class Environmental Assessment Allowance				$0	$2,364,601
Allowance for Land Acquisition Costs for Utility Easements				$0	$2,364,601
Allowance for Archeological Assessments for Easements				$0	$2,364,601
Allowance for Survey Costs for Easements				$0	$2,364,601
Alowance for Legal Costs for Easements				$0	$2,364,601
Allowance for Engineering Project Management, Design, Tender & Contract Administration & Inspection Services (15%)				$354,690	$2,719,291
Allowance for Geotechnical & Environmental Investigations				$25,000	$2,744,291
Allowance for Topographic Survey Costs				$25,000	$2,769,291
Contingency Allowance (10%)				$276,929	$3,046,221
HST @ 13%				$396,009	$3,442,229
Probable Capital Cost					**$3,450,000**