

Smithville Water Wastewater Master Plan

Township of West Lincoln

ProjectReference: Smithville Master Community Plan
Project number: 60619866

March 10 2023

Executive Summary

The Smithville settlement area located in the Township of West Lincoln, in the Niagara Region is currently planning for the expansion of the existing urban boundary to accommodate the anticipated growth. A key feature of the planned growth will be the development of a water and wastewater servicing system that supports the uses and needs of existing populations whilst supplying the future capacity and options to support the growth of the area. This water and wastewater master servicing plan document sets out to provide an understanding of the existing water and wastewater infrastructure, the potential demand of proposed development, the potential permits needed for development, and the infrastructure and programs recommended to provide a sustainable service for Smithville.

Smithville is located on a key east west corridor in the Niagara peninsula (Highway 20), while also being home to about six thousand people and a number of industries and businesses. Current water and wastewater systems are serviced by a single water pumping station and two sanitary pumping stations. The Township has not previously had a Water and Wastewater Master Plan, however, as a lower tier municipality, major water and wastewater infrastructure has been previously identified in various iterations of the Niagara Region Water and Wastewater Master Plan. In addition to the Region's Master Plan, provincial and Township policies and guidance have been utilised to develop a vision and series of objectives that the Water and Wastewater Master Plan should aim to follow:

1. Create a complete water and wastewater network;
2. Incorporate both local and regional economic growth;
3. Sustainably servicing to the community; and
4. Consistent implementation.

The Smithville settlement area currently has a water-wastewater network that is developed around one water pumping station and two sewer pumping stations. In addition, Smithville is dependent on an inground reservoir, an elevated storage facility and two sewer lift stations. The current overall water-wastewater system is comprised of roughly 33 kilometres of watermains and 34 kilometres of sewerlines and provides servicing to a population of 7,140 and 1,860 jobs. Whilst the infrastructure network within the existing urban boundary of Smithville is extensive, current imaging highlights the network as a limiting factor in population growth.

The urban boundary expansion and associated development will bring an additional 540 hectares adjacent to the current Smithville urban boundary, effectively doubling the size of the community of Smithville, and leading to a forecasted population of about 29,000 by 2051. This level of growth requires an assessment of the existing water and wastewater network to understand what the possible impacts of the new development are, this exercise was conducted using a hydraulic model which replicates existing water and wastewater conditions and servicing capacity and then forecasts the growth system usage as a result of the new development.

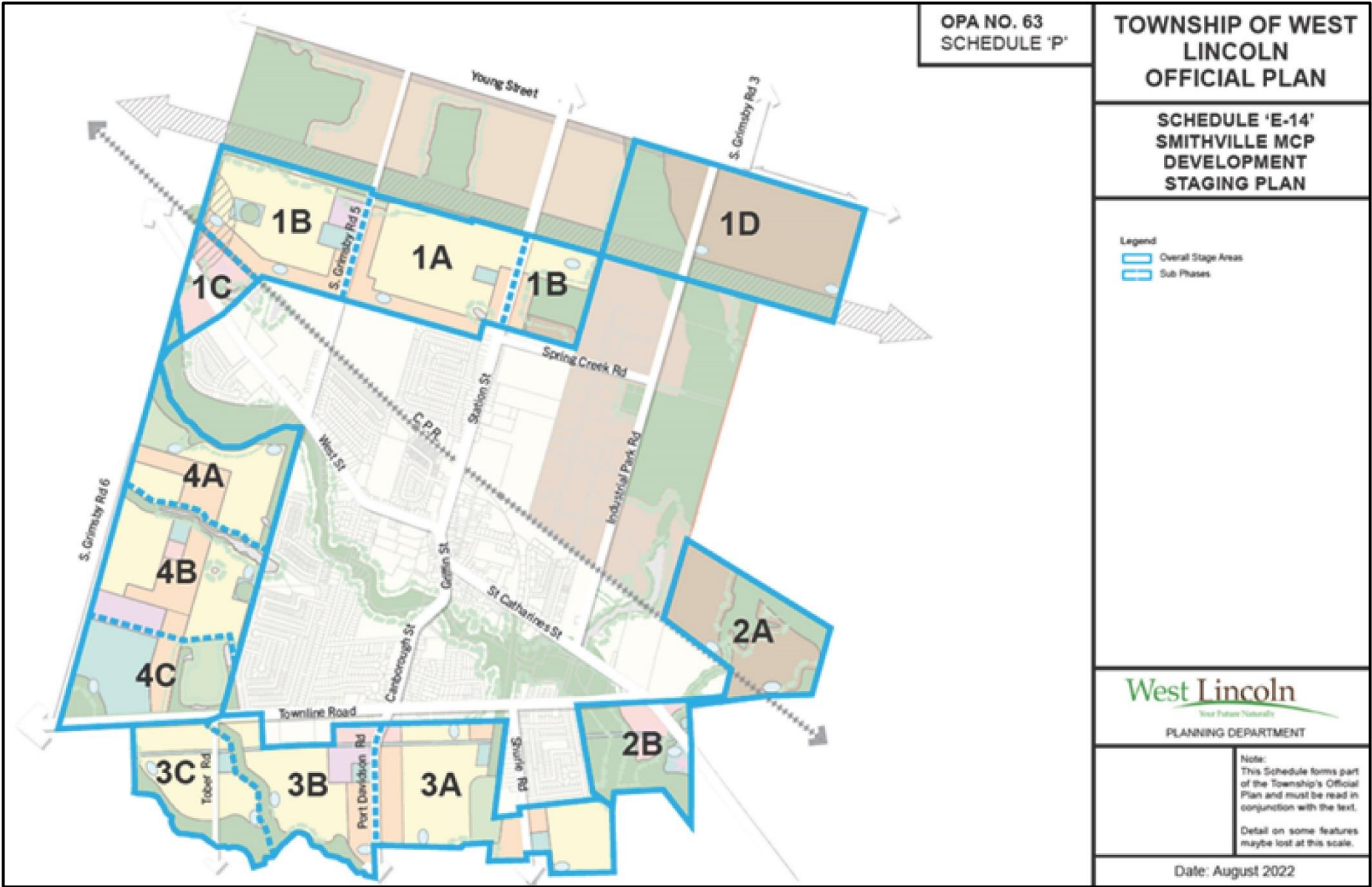
The development Staging Plan was prepared as part of OPA No. 63 and is shown in **Figure ES-1**.

The Master Community Plan is a 30-year plan for accommodating growth in Smithville to 2051 through both intensification and greenfield development to achieve a complete community. To achieve the level of growth planned in a well designed, balanced and inclusive manner, while ensuring minimal disruption to the existing community it is necessary to develop an orderly and aligned staging program for the provision of the necessary infrastructure, transportation improvements and community facilities. The development rational and identification of infrastructure to support the development of Smithville are detailed in a series of supporting Master Plans.

Policy 6.11.7.6.3 h) of Official Plan Amendment 63 (OPA 63) provides that “The Township may, at its sole discretion, revise the Development Staging Plan without an amendment to this Plan where circumstances warrant, such as, but not limited to, unreasonable delay by landowner(s), in order to facilitate the planned progression of growth and development in a manner that supports the implementation of the MCP.” The policies provide for an appropriate level of flexibility and provide a solid framework for implementation through more detailed Block Plans, MESP’s and Environmental Assessment addendums, while acknowledging that future updates and changes may be needed over the 30-year time period of the plan.

Although the various Master Plan documents set out anticipated timescales and staging program for the design and implementation of various infrastructure requirements within Smithville. The flexibility provisions of OPA 63 have been specifically designed to reflect the need to accommodate changes and adjustment that can occur over the 30-year planning horizon of the Master Community Plan. OPA 63 recommendations were presented to the public, Council, and the landowners on multiple occasions including: the Public Meeting, Council adoption of OPA 63, and Technical Advisory Committee meetings as late as December 16, 2022.

Figure ES-1: Development Staging Plan



As part of the Township's Official Plan, additional flexibility is provided through periodic review and updating of the plan and policies over the 30-year planning horizon of the plan.

The water and wastewater system assessment forms the primary method for assessing possible mitigation measures which can include upgrades to existing servicing infrastructure as well as the development of new infrastructure including water and forcemains, gravity sewers, and pumps.

In assessing the existing water system, it was identified that the available pumping capacity at the existing London Road Pumping Station would be sufficient to meet the projected demands with the future Smithville Elevated Tank being implemented. An additional pump would be required at the station to meet the fire flow requirement. The future elevated tank has been identified in the Region's DC Study (Region's DC Study project number: W-S-010)

In assessing the existing wastewater system involving the Smithville Sewage Pump Station and Streamside Sewage Pump Station, it was identified that both stations require pumping capacity upgrades to meet the future peak wet weather flow. The Region is currently undergoing a capacity increase at Streamside Sewage Pump Station; the upgraded station is expected to provide adequate capacity to address the future peak wet weather flow. The Region also identified a future upgrade at the Smithville Sewage Pump Station in their DC study for addressing the future needs (Region's DC Study project number: WW-SPS-012).

Current urban boundary expansion plans were developed to improve existing infrastructure and centre around four distinct development Stages (1 to 4) with each Stage requiring an individualized water and wastewater servicing strategy to both fit the needs of Township and minimize impacts. The following section provides the list of preferred options for each stage's servicing strategy.

Table ES-1: List of Preferred Options for Each Stage's Servicing Strategy

Stage	Preferred Water Servicing Strategy	Preferred Wastewater Servicing Strategy
1	S1W1	S1WW1
2	S2W2	S2WW1
3	S3W1	S3WW1A, S3-FM1B, S3WW2A
4	S4W3	S4WW1, S4-FM2

Figure ES-2 and **Figure ES-3** present the preferred water and wastewater servicing strategy, respectively.

Figure ES-2: Preferred Water Servicing Strategy

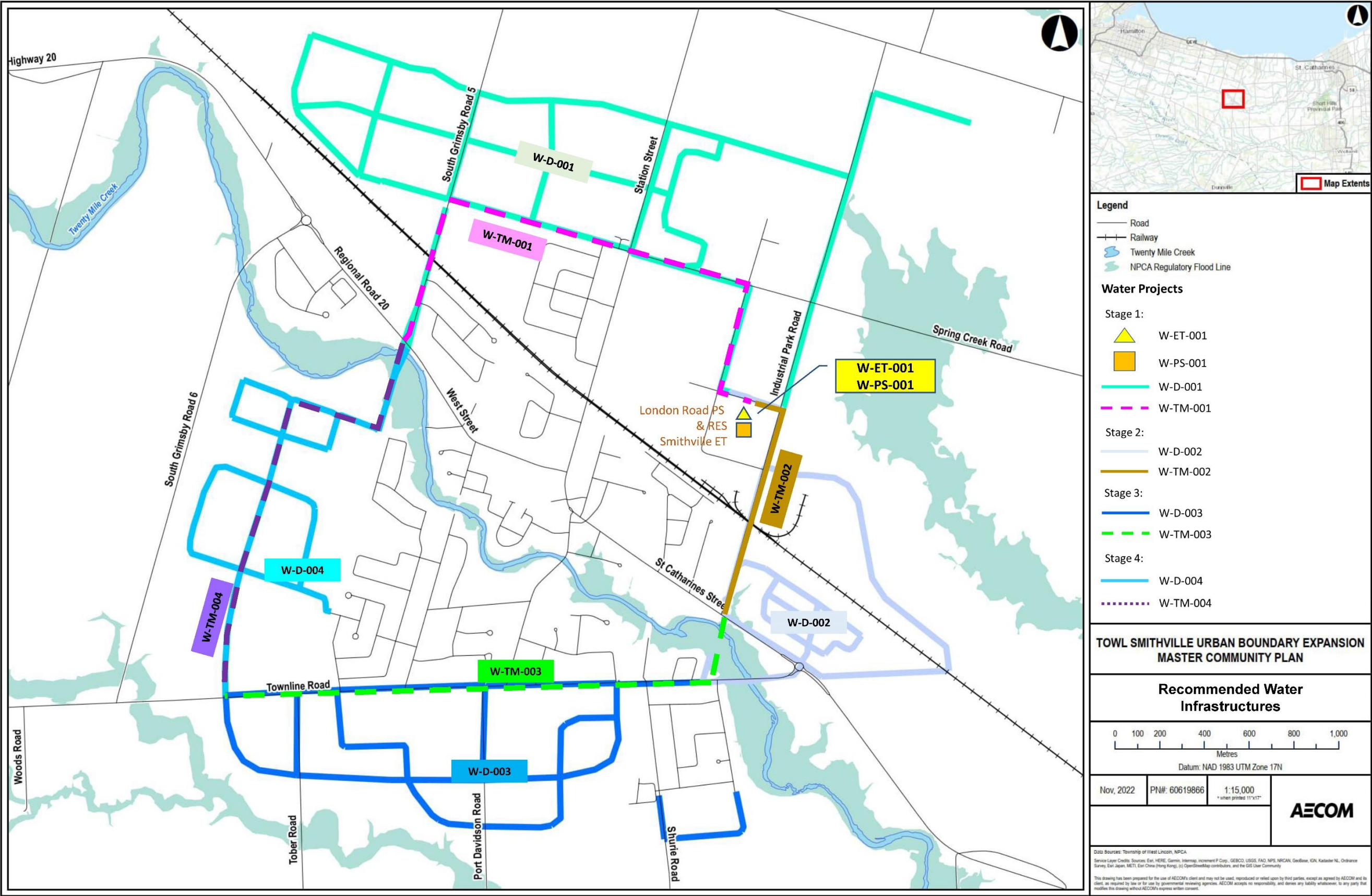


Figure ES-3: Preferred Wastewater Servicing Strategy

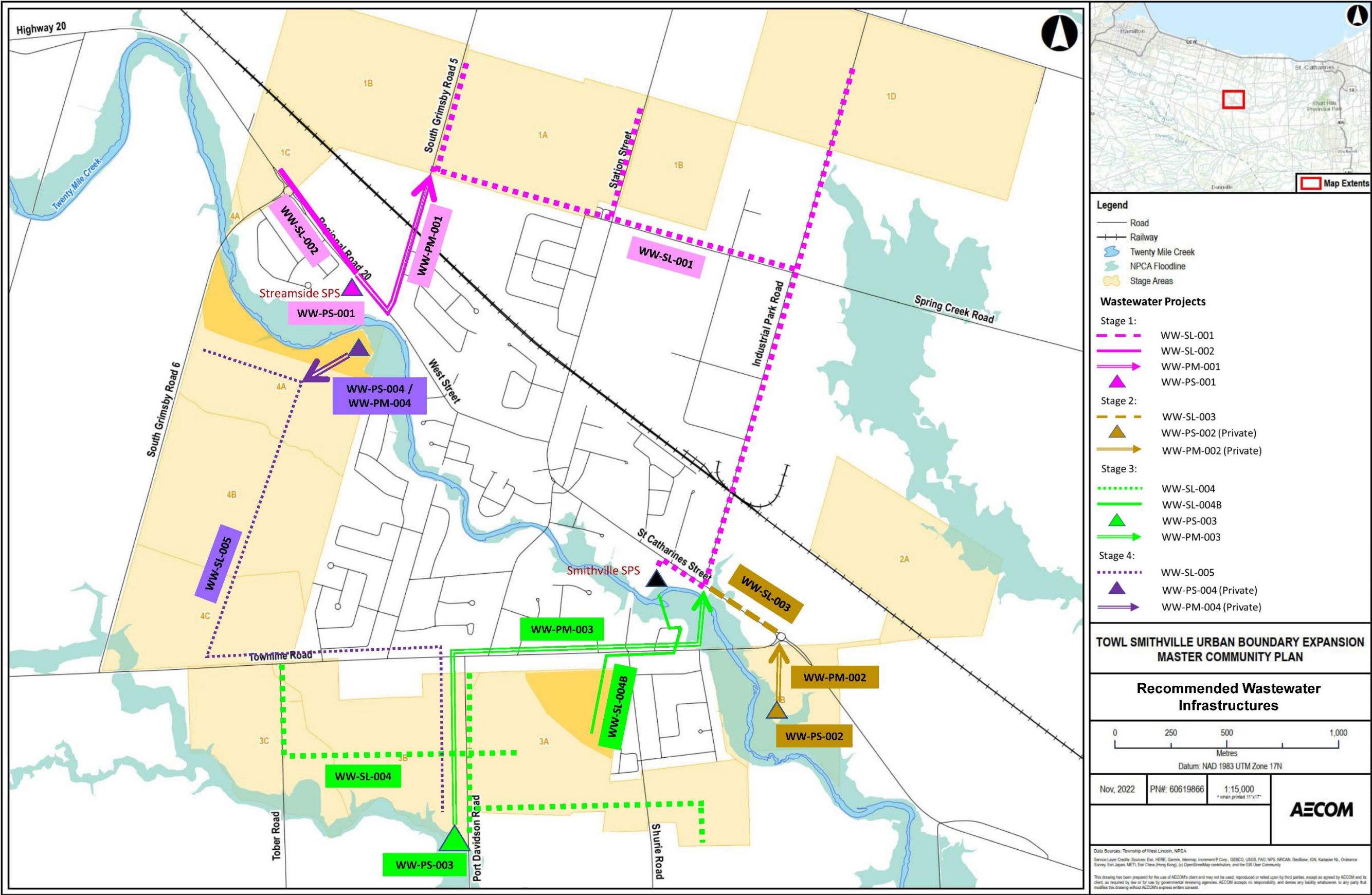


Table ES-2: Capital Costs Summary for the Recommended Water Infrastructures for the Township of West Lincoln

Capital Project ID	Stage	Descriptions	Size	Costs (2022\$)	Class Environmental Assessment Project Schedule	Anticipated Schedule
W-D-001	1	Local distribution mains for Stage 1	300mm	\$ 13,579,650	A	Next 10 years
W-D-002	2	Local distribution mains for Stage 2	300mm	\$ 5,308,538	A	Next 10 years
W-D-003	3	Local distribution mains for Stage 3	300mm	\$ 7,763,648	A	10 – 20 years
W-D-004	4	Local distribution mains for Stage 4	300mm	\$ 4,235,490	A	> 20 years

Table ES-3: Capital Costs Summary for the Recommended Water Infrastructures for the Region of Niagara

Capital Project ID	Stage	Descriptions	Size	Costs (2022\$)	Class Environmental Assessment Project Schedule	Anticipated Implementation Schedule
W-TM-001	1	<ul style="list-style-type: none">Watermain extends northerly on South Grimsby Road 5 from Regional Road 20 to Spring Creek RoadEasternly along Spring Creek Road to Thompson RoadSouthernly on Thompson Road and easternly to London Road pumping stationNo crossing of Twenty Mile CreekCrossing of rail tracks on South Grimsby Road 5	400mm	\$ 5,852,576	A	Next 10 years
W-TM-002	2	<ul style="list-style-type: none">Watermain extends southernly from London Road Pumping Station towards Industrial Park Road and Regional Road 20 (St Catharines Street) intersectionNo crossing of Twenty Mile CreekCrossing of rail tracks on Industrial Park Road	400mm	\$ 3,787,184	A	Next 10 years
W-TM-003	3	<ul style="list-style-type: none">New watermain extends easternly along Townline Road to existing North South easement east of Anderson CrescentNorthernly from easement to Industrial Park Road / Regional Road 20 and connection future Stage 2 watermainTrenchless crossing of Twenty Mile Creek south of Industrial Park Road and Regional Road 20	400mm	\$ 8,674,160	A	10 – 20 years
W-TM-004	4	<ul style="list-style-type: none">Watermain extends southernly from Regional Road 20 along future development lands to Townline RoadTrenchless crossing of Twenty Mile Creek on South Grimsby Road 5Within planned utility / active transportation corridor and planned Stage 4 local collector roadSouthernly on local north south collector road to Townline Road	400mm	\$ 8,311,280	A	> 20 years
W-ET-001	1	<ul style="list-style-type: none">New elevated tank (8.8 ML)	8.8 ML	\$ 14,850,000	B	Next 10 years
W-PS-001	1	<ul style="list-style-type: none">Dedicated fire pump (356 Litres per second)	356 Litres per second	\$ 675,000	A	Next 10 years

Table ES-4: Capital Costs Summary for Recommended Wastewater Infrastructures for the Township of West Lincoln

Capital Project ID	Stage	Descriptions	Size	Costs (2022\$)	Class Environmental Assessment Project Schedule ¹	Anticipated Implementation Schedule
WW-SL-001	1	<ul style="list-style-type: none">■ New sewer gravity main on Spring Creek Road from South Grimsby Road 5 and easterly to Industrial Park Road■ Gravity sewer continues southernly down Industrial Park Road■ Industrial Park to Regional Road 20■ Westerly on Regional Road 20 to Smithville Pumping Station■ No crossing of Twenty Mile Creek required■ Crossing of rail tracks on Industrial Park Road	■ 375 to 525 millimetres	■ \$ 10,352,238	■ A	■ Next 10 years
WW-SL-002	1	<ul style="list-style-type: none">■ New gravity main on Regional Road 20 to Streamside Sanitary Pumping Station	■ 375 millimetres	■ \$ 1,556,820	■ A	■ Next 10 years
WW-SL-003	2	<ul style="list-style-type: none">■ New sewer gravity main from Smithville sanitary pumping station on east side from Regional Road 20 (St Catharines Street) towards Townline Road■ No crossing of Twenty Mile Creek required■ No crossing of rail tracks	■ 375 to 525 millimetres	■ \$ 1,826,904	■ A	■ Next 10 years
WW-SL-004	3	<ul style="list-style-type: none">■ New Gravity Sewer follows Stage 3 North South and easterly local collector road starting at Townline Road■ Connection to new Sewage Pump Station at Port Davidson Road / North Creek■ Also includes flow from new gravity sewers within Stage 3 east of Port Davidson Road■ Trenchless crossing of Twenty Mile Creek required■ Does not service Stage 4	■ 375 to 525 millimetres	■ \$ 8,132,061	■ A	■ 10 – 20 years
WW-SL-004B	3	<ul style="list-style-type: none">■ New gravity sewer northernly from Stage 3A area to Townline Road■ Easternly along Townline Road to Anderson Crescent■ Northernly on Anderson Crescent via existing easement to southside of Twenty Mile Creek	<ul style="list-style-type: none">■ New gravity sewerline: 250 millimetres■ Ex. Gravity sewerline replacement 250 millimetres / 300 millimetres	■ \$ 727,935	■ A	■ Nex 10 years
WW-SL-005	4	<ul style="list-style-type: none">■ Gravity sewer starting at north end of South Grimsby Road 6■ Easternly across the Stage 4 local collector road■ Southernly on north south local collector road to Townline Road■ Connects directly to future Port Davidson Sewage Pump Station	■ 300 to 525 millimetres	■ \$ 5,939,325	■ A	■ > 20 years
WW-PS-002	2	<ul style="list-style-type: none">■ New Sewage Pump Station for Stage 2B■ Assumed to be privately owned / operated pumping system	■ 4.8 Litres per second	■ \$ 0	■ Subject to Town's / Region's approval	■ Next 10 years
WW-PS-003 ²	3	<ul style="list-style-type: none">■ Infrastructure Option S1; New Sewage Pump Station for Stages 3 & 4	■ 143 Litres per second	■ \$ 4,374,000	■ A	■ 10 – 20 years
WW-PS-004 / WW-PM-004	4A	<ul style="list-style-type: none">■ New Sewage Pump Station on south side of Twenty Mile Creek within staging area 4A; this station is considered a private pumping system■ New forcemain on Regional Road 20 to future gravity sewer within Stage 4	■ 7.0 Litres per second / 200 millimetres	■ \$ 0	■ Subject to Town's / Region's approval	■ > 20 years
WW-PM-002	2	<ul style="list-style-type: none">■ New FM for future Sewage Pump Station to future gravity sewer on RR20■ Assumed to be privately owned / operated pumping system	■ 150 millimetres	■ \$ 0	■ Subject to Town's / Region's approval	■ Next 10 years
WW-PM-003	3	<ul style="list-style-type: none">■ New forcemain extending Northernly on port Davidson Road from Sewage Pump Station towards Townline road■ Easternly along Townline Road to watermain easement. Northernly through easement towards Twenty Mile Creek■ Trenchless crossing of Twenty Mile Creek■ Connects to future gravity sewer at Regional Road 20 and Industrial Park Road	■ 500 millimetres	■ \$ 8,363,342	■ A	■ 10 – 20 years

1. as approved under the integrated MCEA process and subject to no OPA 63 appeal.
2. Based on the required capacity for the SPS, the implementation of WW-PS-003 & WW-PM-003 would be completed by the Township and the Region of Niagara will assume the ownership and O&M in accordance with the Region's SPS policy

Table ES-5: Capital Costs Summary for the Recommended Wastewater Infrastructures for the Region of Niagara

Capital Project ID	Stage	Descriptions	Size	Costs (2022\$)	Class Environmental Assessment Project Schedule	Anticipated Implementation Schedule
WW-PS-001	1	■ Streamside Sewage Pump Station Upgrade; Increase capacity to 42.6 Litres per second	■ 42.6 Litres per second	■ \$ 3,611,250	■ A	■ Next 10 years
WW-PM-001	1	■ New FM on South Grimsby Road 5 for Streamside Sewage Pump Station connect to future gravity sewer on Spring Creek Road	■ 250 millimetres	■ \$ 3,368,421	■ A	■ Next 10 years

In support of the modelling exercise a series of public and stakeholder engagement exercises were conducted to gain feedback and understand some of the challenges and opportunities facing Smithville. The information gathered from these exercises was reviewed and a series of mitigation measures that aligned with the stated objectives were developed and tested. In assessing the impacts of the proposed development around the Smithville settlement area, it was determined that there were several key measures that were required to mitigate the impacts of the new development on the water and wastewater system.

- The assessment indicated that either a water storage capacity increase or a new water pumping station is required to address the future water peak hour demands. In addition, a new sewer pumping station and new forcemains are required to address the future wet weather demands.
- A significant amount of development is planned on either side of Twenty Mile Creek and North Creek. To address this, a number of trenchless crossings are required to service future developments.
- The reduction of construction complexity will be a key part of reducing the impact of maintenance works for the new system. By employing designs with shorter pipe distances, easier access and less potential disturbances it ensures that potential infrastructure repairs can be completed in a timely manner.

The Water and Wastewater Master Plan has developed a capital program to support the phased implementation of the various water and wastewater infrastructure programs which is tied to the block plan process proposed under official plan amendment 63 (OPA 63). In developing the options and measures for implementation the Water and Wastewater Master Plan has addressed the phase 1 and 2 requirements of the Municipal Class Environmental Assessment process, and has also identified Class D cost estimates for each of the proposed measures. The recommended capital works will provide all necessary information to support the required Township's DC study update.

The Smithville Water and Wastewater Master Plan represents a key document for the future development of the Smithville settlement area, providing an infrastructure network to support the growth and development within the settlement area, while maintaining the needs and expectations of existing residents and businesses to have adequate connection to water and wastewater services. The Water and Wastewater Master Plan also supports the development of industrial and commercial facilities that increase employment opportunities in Smithville, promoting continued economic development and prosperity.