10. Description of Existing Wastewater Collection and Treatment System

The Region of Halton is responsible for all wastewater systems, including treatment plants and collection infrastructure. The existing Regional wastewater treatment system consists of four Lake Ontario based wastewater treatment plants servicing Oakville, Burlington and part of Milton and three stream based wastewater treatment plants that service Halton Hills (Georgetown and Acton) and part of Milton. The existing Regional wastewater collection system consists of over 1,700 km of wastewater gravity mains and forcemains and over 100 pumping stations.

This section summarizes the existing wastewater treatment and collection systems currently in service in the Region. Further background information relevant to each wastewater treatment plant and pumping station is provided in Appendix 1-2. Figure 21 shows a map of the existing Regional wastewater system.

10.1 South Halton Lake-Based System

10.1.1 Wastewater Treatment Plants

The lake-based wastewater system is comprised of four large drainage areas that discharge to Lake Ontario based treatment plants: Skyway, Mid-Halton, Oakville Southeast, and the Oakville Southwest Wastewater Treatment Plants. These plants service the urban area of the municipalities of Burlington, Oakville and parts of Milton.

Burlington Skyway WWTP

The Skyway Wastewater Treatment Plant (WWTP) provides wastewater treatment for the City of Burlington urban area and is comprised of a conventional activated sludge secondary treatment facility. Treated effluent is discharged to Hamilton Harbour. As such, the Skyway WWTP is subject to meeting stringent effluent requirements pursuant to the Hamilton Harbour Remedial Action Plan (RAP).

The requirement of higher level of treatment for the Skyway WWTP could reduce the capacity of existing processes, thereby requiring more tankage and site area to achieve the same level of treatment. Additional unit processes, such as tertiary treatment will also further reduce available site capacity.

A Schedule C Municipal Class EA was initiated to expand the plant from current rated capacity of 118 MLD to 140 MLD in 2008. The EA study was completed in 2009 and the implementation of design and construction is currently underway for the plant expansion. The expanded plant is anticipated to be in service in 2014.

Oakville Southwest WWTP

The Oakville Southwest WWTP currently provides wastewater treatment capacity to the urban area in south Oakville bounded by Burloak Drive to the west, Reynolds Street to the east, the QEW to the North and Lake Ontario to the south, in addition to a small area just west of Sixteen Mile Creek north of the QEW. The plant is a conventional activated sludge secondary treatment facility and discharges treated effluent to Lake Ontario through a diffused outfall that combines with treated effluent from the Mid-Halton WWTP.

The existing rated capacity of the Oakville Southwest WWTP is 45.4 MLD. The existing plant site is surrounded by residential land use; as such, there is limited opportunity for expansion of the plant outside of the existing boundaries. Based on conventional treatment processes, the existing site capacity is approximately 60 MLD.

The plant recently underwent major plant upgrades and reconstruction on site.

Oakville Southeast WWTP

The Oakville Southeast WWTP currently provides wastewater treatment to an area bounded by Reynolds Street on the west, Winston Churchill on the east, Upper Middle Road on the north and Lake Ontario on the south, and includes a small area north of Upper Middle Road at Joshua Creek. The service area includes residential as well as industrial, commercial, and institutional land uses. The plant is a secondary treatment plant and discharges treated effluent to Lake Ontario.

The existing rated capacity of the Oakville Southeast WWTP is 31.8 MLD. Currently the plant is not operating close to its capacity; however, most of the remaining capacity will be used by the approved development within the service area. There is limited available area for expansion within the existing site. Based on conventional treatment processes, the existing site capacity is approximately 60 MLD.

Mid-Halton WWTP

The Mid-Halton WWTP currently provides wastewater treatment for a portion of the urban area in the Town of Oakville, bounded by the QEW to the south, Bronte Road to the West, and Morrison Creek to the east. The plant will also service growth in North Oakville, greenfield areas in Milton and the Halton Hills 401 Corridor. The Mid-Halton WWTP can also provide wastewater treatment for Milton's urban core when flows to the Milton WWTP exceed 18.5 ML/d and need to be diverted. The plant is a conventional secondary treatment facility and discharges to Lake Ontario through a diffused outfall that combines with treated effluent from the Oakville Southwest WWTP.

The existing rated capacity of the Mid-Halton WWTP is 75 MLD. The site has an ultimate capacity of 400 MLD based on current secondary effluent criteria.

A Schedule C Municipal Class EA was initiated in 2008 to expand the plant from current rated capacity of 75 MLD to 125 MLD. The EA study was completed in 2010 and the implementation of design and construction is currently underway for the plant expansion. The expanded plant is anticipated to be in service in 2015.

Table 34 shows a summary of the Halton Region's lake-based wastewater treatment plants and their existing treatment capacities.

Table 34 Lake-Based Wastewater Treatment Plants in Halton Region

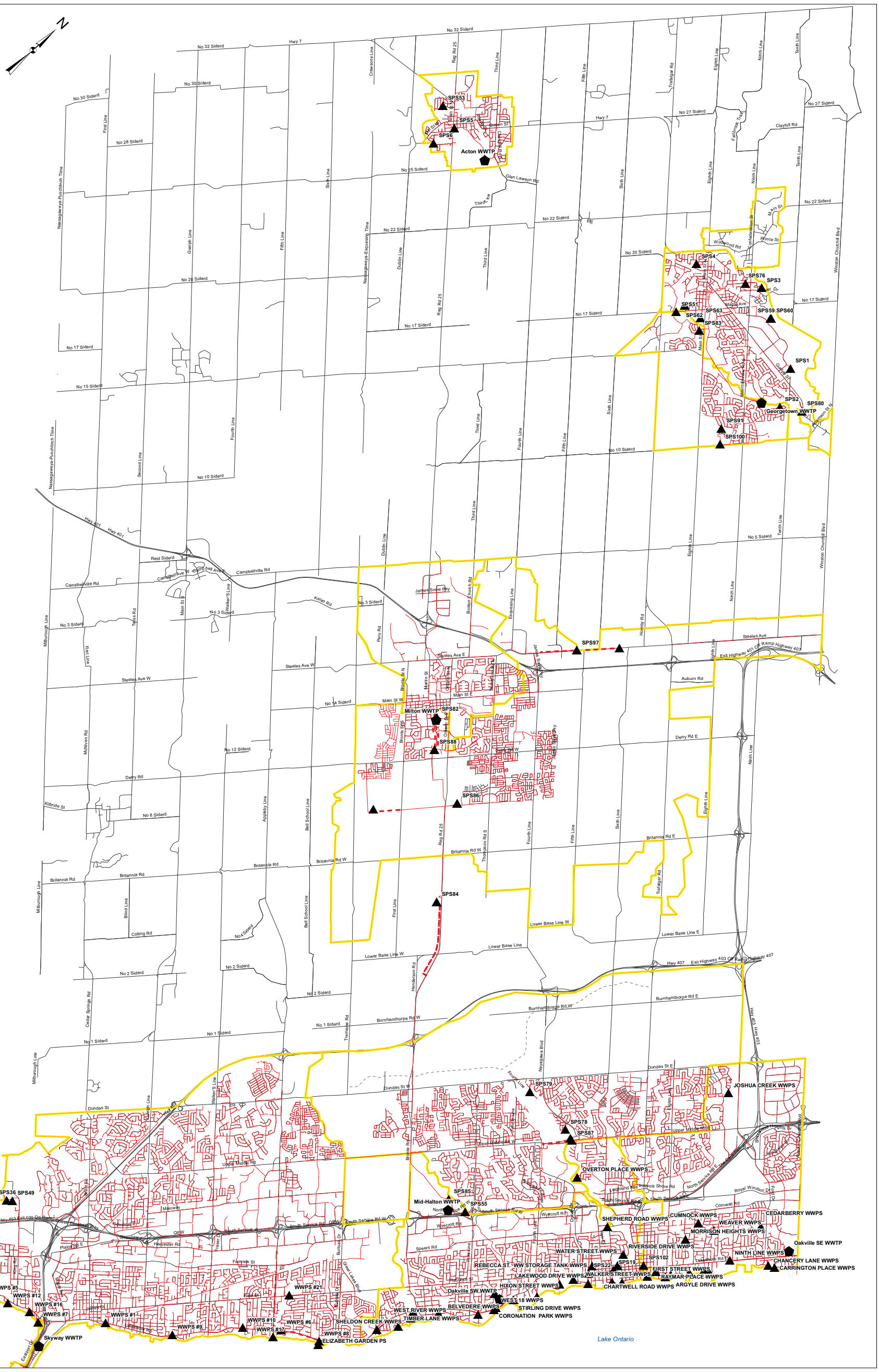
WWTP	Location	Existing Rated Capacity (MLD)	2010 Avg Daily Flows (MLD)	Water Receiver
Skyway WWTP	1125 Lakeshore Road, Burlington	118.0 [1]	106.9	Lake Ontario
Mid-Halton WWTP	2195 North Service Road, Oakville	75.0	45.3	Lake Ontario
Oakville Southeast WWTP	2477 Lakeshore Road East, Oakville	31.8	21.9	Lake Ontario
Oakville Southwest WWTP	1385 Lakeshore Road West, Oakville	45.4	27.5	Lake Ontario

Note: [1] The Skyway WWTP existing treatment capacity is 118 MLD and is planned to be expanded to 140 MLD. The Schedule C Class EA Environmental Study Report supporting this expansion was completed by Halton in December 2009. This expansion will provide services for growth and intensification in the City of Burlington, with continued discharge to the Hamilton Harbour.

Legend

Existing Infrastructure

- Wastewater Pumping Station
- Wastewater Treatment Plant
- Existing Sewer
- Existing Forcemain
- WWTP Drainage Area



Halton Region
Existing Wastewater System
Figure 21

Sustainable Halton
Water and Wastewater Master Plan

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In general, wastewater flows are conveyed by gravity to areas of lower elevation downstream in the collection system. Where the continuation of the gravity system is not possible due to topography or natural features, wastewater pumping stations are introduced to intercept flows and pump them via pressurized forcemains to trunk sewers further downstream. The major trunk sewers eventually outlet to either a wastewater pumping station at a WWTP, or directly to a WWTP.

In most of Halton Region, the ground elevation gradually slopes down from north to south, which has led to the planning and construction of gravity collection systems that ultimately outlet to Lake Ontario. The lake-based wastewater collection system consists of approximately 190 km of sanitary sewers, and over 60 pumping stations. The wastewater pumping stations vary in size, with some servicing very localized areas to others servicing significant drainage areas, with firm capacities ranging from approximately 1.5 L/s to 950 L/s.

Wastewater service areas are categorized by the treatment plants that receive and treat wastewater flows. Existing wastewater treatment plant drainage areas are shown in Figure 22and described below.

Burlington Skyway WWTP Drainage Area

Within the Skyway WWTP Drainage Area, there are 25 pumping stations; 19 of which are located near the shoreline of Lake Ontario that pump wastewater to various locations in the gravity collection system. The total drainage area for the Skyway WWTP is approximately 8,700 ha.

Wastewater flows are conveyed to the treatment plant via two main wastewater trunks – the East Trunk and the West Trunk:

- The East Trunk services an area that extends from Appleby Line and the Ontario Hydro rights-of-way to the Skyway WWTP. Within this area, there are eight pumping stations, which pump flow north into the East Trunk from lower lying areas in the south. Areas north of the East Trunk flow by gravity through eight sub-trunks and a number of local sewers into the East Trunk, including Appleby Line, Shoreacres Drive, Dyne Road, Drury Land, Brant Street and Maple Avenue.
- The West Trunk extends from Plains Road at the Royal Botanical Gardens and ends at the East Trunk, just upstream of the Skyway WWTP. The West Trunk drainage area includes 14 pumping stations. Pumping is required for areas to the south and west of the west trunk. The areas north of the West Trunk flow by gravity in four sub-trunks, along Francis Road, Flacon Boulevard, Shadeland Avenue and Glenwood Avenue, and several local mains into the West Trunk.

Oakville Southwest WWTP Drainage Area

The Oakville Southwest WWTP Drainage Area is bounded by Sheldon Creek to the west, Trafalgar Road to the east and as far north as Upper Middle Road, east of the Glen Abbey Golf Club. The QEW forms a major portion of the northern boundary of the WWTP drainage area.

Within the Oakville Southwest WWTP Drainage Area, there are 22 pumping stations, 14 of which are located near the shoreline of Lake Ontario to pump wastewater to various locations in the gravity collection system. The total drainage area is approximately 2,700 ha.

There are two major trunk sewers that deliver wastewater to the Oakville Southwest WWTP – Rebecca Street and Lakeshore Road:

- The Rebecca Street Trunk Sewer extends from Trafalgar Road and Summer Avenue to the treatment plant. Flow from areas south of the Rebecca Street Trunk Sewer is pumped via 10 pumping stations, while wastewater from the north flows by gravity through five sub-trunks and several local collection sewers. The five main sub-trunks are located on Warminister Drive, Fourth Line, Morden Road, Queen Mary Drive and Trafalgar Road. A wastewater storage tank on Rebecca Street at Felan Avenue serves to control flows during storm events.
- There are a number of overflows and bypass structures located at Fourth Line, Pumping Station No. 18, West River Pumping Station and Stirling Pumping Station which sever to reduce the potential for property damage and health impacts by allowing for wastewater collection system overflows during periods when peak design capacity is exceeded.
- The Lakeshore Road West Trunk Sewer is tributary to nine pumping stations which pump flows from the areas located south of the trunk. Northern areas flow by gravity through two sub-trunks, located on Solingate Drive and Third Line, and several local collection sewers, into the Lakeshore Road West Trunk.

Oakville Southeast WWTP Drainage Area

The Oakville Southeast WWTP Drainage Area is bounded by Allen Street to the west, Winston Churchill Boulevard to the east and as far north as Dundas Street. The Southeast WWTP drainage area is 2,800 ha.

Within the Oakville Southeast WWTP Drainage Area, there are 14 pumping stations, 10 of which are located near the shoreline of Lake Ontario.

The plant is fed by three main trunk sewers – Lakeshore Road East, Claremont Road, and Devon Road:

- The Lakeshore Road East Trunk Sewer is tributary to eight pumping stations, seven of which collect and pump flow from areas south of the Lakeshore Road East Trunk Sewer and one that pumps flow from a small area north of the trunk. There are four sub-trunks located on Brantford Avenue, Morrison Road, Treelawn Avenue, Maple Grove Road and All-Saints Crescent that convey flow by gravity into the Lakeshore Road East Trunk. The trunk extends from Chartwell Road to the Caulder Drive Pumping Station. The pumping station discharges directly to the Southeast WWTP through approximately 2 km of forcemain.
- The Claremont Road Trunk Sewer starts at the Winston Business Park and extends to the Southeast WWTP, servicing an area of approximately 600 ha, and has only one pumping station servicing a small tributary area.
- The Devon Road Trunk Sewer, with a tributary area estimated at 200 ha, extends from Devon Road and Maple Grove Road to the Southeast WWTP, and has one pumping station servicing a small area.

Mid-Halton WWTP Drainage Area

The Mid-Halton WWTP Drainage Area extends generally north of the QEW, east of Bronte Road, and west of the Glen Abbey Golf Course and as far north as Dundas Street in Oakville. The Mid-Halton WWTP drainage area covers a total area of approximately 11,000 ha. An area north of Upper Middle Road between Eighth Line and Sixteen Mile Creek is also directed to the Mid-Halton WWTP. The existing Oakville tributary area of the plant is about 910 ha.

Within the Mid-Halton WWTP Drainage Area, there are five main pumping stations (Mid-Block Arterial WWPS (Milton), Boyne WWPS (Milton), Upper Middle Rd WWPS (Oakville), North WWPS (Oakville) and Third Line WWPS (Oakville)).

Wastewater flow is conveyed to the Mid-Halton WWTP from the east via a trunk sewer along Upper Middle Rd, part of Dorval Dr and North Service Rd, discharging to the Third Line WWPS. The Third Line WWPS then pumps flow across Bronte Creek to the Mid-Halton WWTP. Flow is conveyed to the plant from the north/northwest via trunk sewers on Bronte Rd from south of Lower Base Line to Upper Middle Rd and along Third Line and Upper Middle Rd.

These sewers connect at Bronte Rd just south of Upper Middle Rd before crossing a golf course and discharging to the North WWPS. Flows from the North WWPS are then pumped to the Mid-Halton WWTP.

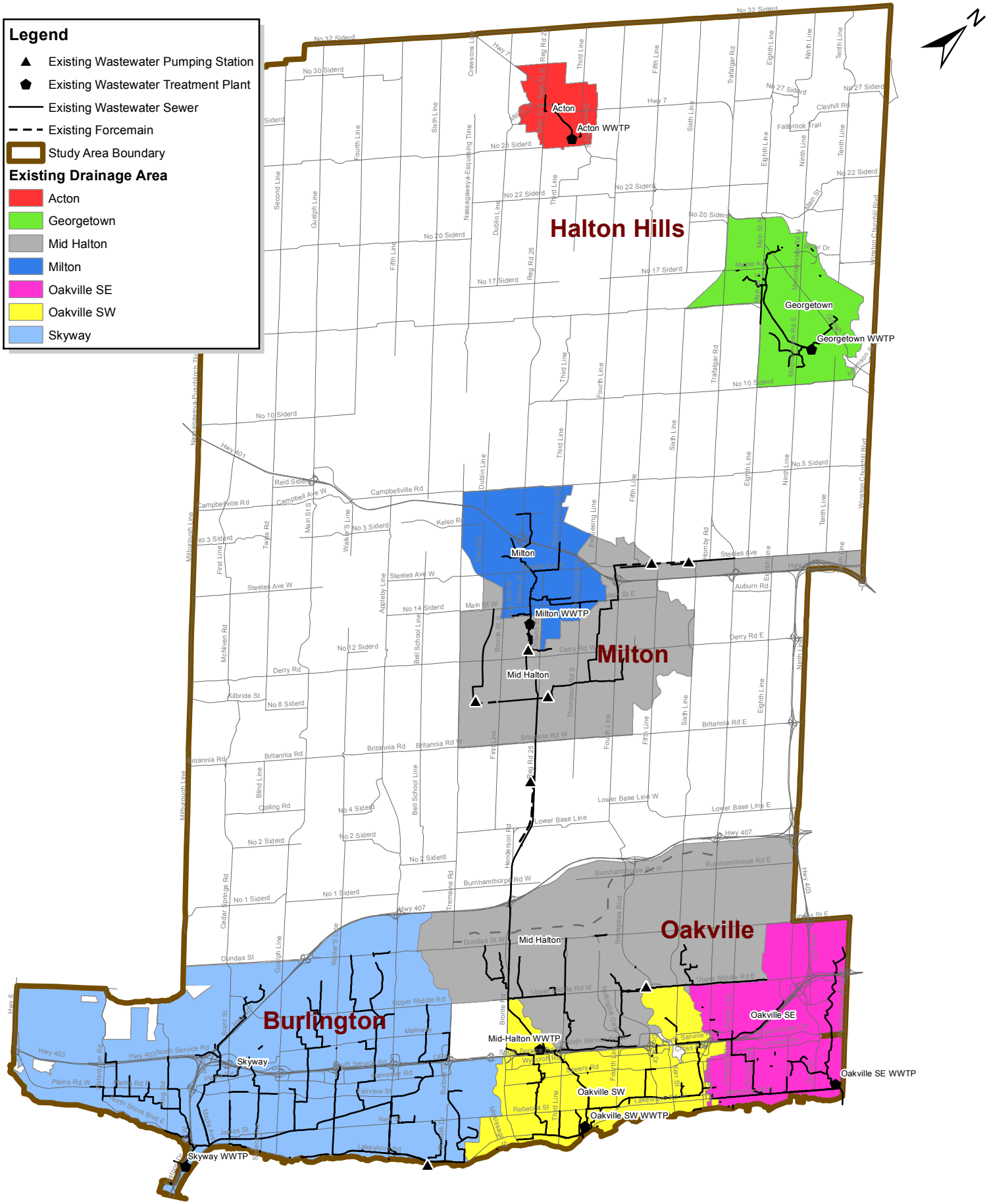
The Mid-Halton WWTP drainage area also includes parts Milton and the Halton Hills Hwy 401 Corridor. In the south area of Milton is a trunk sewer on Laurier Avenue that collects flow east and west of Commercial Street. The Laurier WWPS is located at the Southeast corner of Commercial Street and Laurier Avenue and pumps flow through a forcemain which runs south on Commercial Street to a gravity trunk sewer to Mid-Halton WWTP. In addition, the Halton Hills Hwy 401 Corridor along Steeles Ave as well as areas outside the Milton core, convey flows via the Miller Way trunk sewer, Tremaine Road WWPS and Mid-Block WWPS.

Table 35 summarizes the existing pumping stations in the lake-based wastewater drainage areas and their approximate firm capacities.

Table 35 Wastewater Pumping Stations in the South Halton Lake-Based System

SPS #	Facility Name	Firm Capacity (L/s)	Drainage Area
7	Water St WWPS	20.0	Oakville SW WWTP East Trunk DA
8	Cedarberry WWPS	7.5	Oakville SE WWTP DA
9	Carrington Place WWPS	22.5	Oakville SE WWTP DA
10	Chancery Lane WWPS	16.7	Oakville SE WWTP DA
11	Ennisclare Dr WWPS	6.5	Oakville SE WWTP DA
12	Ninth Line WWPS	439.0	Oakville SE WWTP DA
13	Bel Air Estates WWPS	3.0	Oakville SE WWTP DA
14	Argyle Dr WWPS	15.1	Oakville SE WWTP DA
15	Raymar Place WWPS	6.0	Oakville SE WWTP DA
16	First St WWPS	8.2	Oakville SW WWTP East Trunk DA
17	Gairloch Gardens WWPS	7.0	Oakville SE WWTP DA
18	Navy St WWPS	66.1	Oakville SW WWTP East Trunk DA
20	Lakewood Dr WWPS	21.0	Oakville SW WWTP East Trunk DA
21	Walker St WWPS	43.8	Oakville SW WWTP East Trunk DA
23	Birch Hill Lane WWPS	38.6	Oakville SW WWTP East Trunk DA
24	Westdale Rd WWPS	30.0	Oakville SW WWTP East Trunk DA
25	West 18 WWPS	947.0	Oakville SW WWTP East Trunk DA
26	Timber Lane WWPS	2.4	Oakville SW WWTP West Trunk DA
27	Hixon St WWPS	10.0	Oakville SW WWTP West Trunk DA
28	Bronte Yacht Club WWPS	2.0	Oakville SW WWTP West Trunk DA
29	West River WWPS	66.9	Oakville SW WWTP West Trunk DA
30	Pinedale WWPS (#21)	260.5	Skyway WWTP East Trunk DA
31	Elizabeth Gardens WWPS (#8)	594.0	Skyway WWTP East Trunk DA
32	Lakeshore Rd WWPS (#6)	133.0	Skyway WWTP East Trunk DA
33	Junction St WWPS (#1)	104.0	Skyway WWTP East Trunk DA
34	Lakeshore Rd WWPS (#9)	255.0	Skyway WWTP East Trunk DA
35	Lakeshore Rd WWPS (#10)	75.0	Skyway WWTP East Trunk DA
37	Edgewater Cres WWPS (#12)	4.0	Skyway WWTP West Trunk DA
38	Spring Garden Rd WWPS (#20)	6.3	Skyway WWTP West Trunk DA

SPS #	Facility Name	Firm Capacity (L/s)	Drainage Area
40	Oakland Park Court WWPS (#22)	12.0	Skyway WWTP West Trunk DA
41	Danforth Place WWPS (#3)	4.8	Skyway WWTP West Trunk DA
42	Chartwell Rd WWPS	6.4	Oakville SE WWTP DA
43	Morrison Heights WWPS	5.0	Oakville SE WWTP DA
44	Cumnock WWPS	7.4	Oakville SE WWTP DA
45	Weaver WWPS	25.8	Oakville SE WWTP DA
46	Riverside Dr WWPS	82.0	Oakville SW WWTP East Trunk DA
47	Shepherd Rd WWPS	14.9	Oakville SW WWTP East Trunk DA
48	Cardinal Dr WWPS (#13)	8.3	Skyway WWTP West Trunk DA
50	Sheldon Creek WWPS	32.0	Oakville SW WWTP West Trunk DA
52	Shorewood Place WWPS	8.0	Oakville SW WWTP East Trunk DA
54	LaSalle Park Road WWPS (#4)	100.0	Skyway WWTP West Trunk DA
56	Stirling Dr WWPS	18.7	Oakville SW WWTP East Trunk DA
55	Third Line WWPS	1,568.0	Mid-Halton WWTP DA
57	Northshore Blvd WWPS (#5)	38.7	Skyway WWTP West Trunk DA
64	Marine Dr WWPS	108.0	Oakville SW WWTP West Trunk DA
65	Cornonation Park WWPS	12.0	Oakville SW WWTP West Trunk DA
66	Belvedere Dr WWPS	25.7	Oakville SW WWTP West Trunk DA
67	Appleby Place WWPS (#17)	4.8	Skyway WWTP East Trunk DA
68	Indian Rd WWPS (#7)	3.0	Skyway WWTP West Trunk DA
69	Bellview St WWPS	6.5	Skyway WWTP East Trunk DA
70	Stillwater Cres WWPS (#10)	4.8	Skyway WWTP West Trunk DA
71	Unsworth Ave WWPS (#15)	6.9	Skyway WWTP West Trunk DA
72	Northshore Blvd WWPS (#14)	1.4	Skyway WWTP West Trunk DA
73	Bayshore Blvd WWPS (#18)	9.5	Skyway WWTP West Trunk DA
74	Grandview Ave WWPS (#19)	13.7	Skyway WWTP West Trunk DA
75	Overton Place WWPS	26.7	Oakville SW WWTP East Trunk DA
77	Bridgeview St WWPS (#24)	10.4	Skyway WWTP West Trunk DA
78	Providence Rd WWPS	58.4	Mid-Halton WWTP DA
79	Riverbank Way WWPS	21.0	Mid-Halton WWTP DA
81	Rebecca St WW Storage Tank PS	75.0	Oakville SW WWTP East Trunk DA
82	Fulton St WWPS	310.0/310.0	Milton WWTP/Mid-Halton WWTP
84	Boyne WWPS	1,110.0	Mid-Halton WWTP DA
85	North WWPS	1,898.0	Mid-Halton WWTP DA
86	Midblock Arterial WWPS	1,215.0	Mid-Halton WWTP DA
87	16 Mile Creek/Upper Middle Rd WWPS	570.0	Mid-Halton WWTP DA
88	Laurier WWPS	258.0	Mid-Halton WWTP DA
92	Garden Trails WWPS	28.7	Skyway WWTP West Trunk DA
97	Halton Hills WWPS No. 1	510.0	Mid-Halton WWTP DA
99	Joshua Creek WWPS	6.3	Oakville SE WWTP DA
103	Tremaine WWPS	366.0	Mid-Halton WWTP DA
104	Halton Hills WWPS No. 2	300.0	Mid-Halton WWTP DA



Halton REGION

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Halton Region
Existing Wastewater Drainage Area
Figure 22

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10.2 North Halton Stream Based System

10.2.1 Wastewater Treatment Plants

The stream based wastewater system is comprised of three major drainage areas delineated by treatment plant: the Milton WWTP, the Acton WWTP and the Georgetown WWTP. These wastewater treatment plants each discharge to a different receiving stream, each of which has its own unique hydrological characteristics.

Milton WWTP

The Milton WWTP currently provides wastewater treatment for the centre core of the urban area of Milton. The plant is a tertiary treatment facility and discharges treated effluent to Sixteen Mile Creek.

Raw wastewater to the Milton WWTP is fed by gravity sewers to the onsite Fulton Street Wastewater Pumping Station. Earlier studies have concluded that the capacity of the existing Milton WWTP is insufficient to meet the long term requirements within its catchment area. Additional capacity for the plant is limited due to the assimilative capacity of the stream. Notwithstanding, there is a benefit of maintaining existing levels of Milton WWTP effluent flow, as it contributes to the base flow of Sixteen Mile Creek for the area.

The existing rated capacity of the Milton WWTP is 18.5 MLD. The on-site inlet Fulton WWPS is being designed for major upgrades and construction for current and future servicing strategies.

Georgetown WWTP

The Georgetown WWTP currently provides wastewater treatment for the urban area in the Town of Georgetown. The plant is a tertiary treatment facility and discharges treated effluent to Silver Creek, a sensitive receiving stream.

The existing rated capacity of the Georgetown WWTP is 22.7 MLD. There is limited area within the existing site to expand the capacity of the Georgetown WWTP. Expansion of the plant for additional capacity is also restricted due to the limited assimilative capacity of Silver Creek.

Acton WWTP

The Acton WWTP currently provides wastewater treatment for the urban area of the Town of Acton. The plant is a tertiary treatment facility and discharges treated effluent year-round to Black Creek, a sensitive cold water fishery.

The existing rated capacity of the Acton WWTP is 4.5 MLD. A Schedule C Municipal Class EA was completed in May of 2011 for expansion of the plant from current rated capacity of 4.5 MLD to 7 MLD. The implementation of design is currently underway for the plant expansion.

Table 36 shows a summary of the stream based wastewater treatment plants in Halton Region including their location, firm capacity, and receiving stream. Acton WWTP and Georgetown WWTP are located within the Credit Valley Conservation watershed, and Milton WWTP is located in Conservation Halton watershed.

Table 36 Existing Wastewater Treatment Plants in Halton Region (Stream Based)

WWTP	Location	Existing Rated Capacity (MLD)	2010 Avg Daily Flows (MLD)	Receiving Stream
Milton WWTP	161 Fulton Street, Milton	18.5	10.4	Sixteen Mile Creek
Georgetown WWTP	275 Mountainview Road South, Georgetown	22.7	14.7	Silver Creek [2]
Acton WWTP	202 Churchill Road South, Acton	4.5 [1]	3.95	Black Creek [3]

Note: [1] The Acton WWTP is currently operating near its rated capacity and is planned for expansion to 7.0 MLD. A Schedule C Class EA Environmental Study Report was completed by Halton in spring of 2011

[2] Silver Creek is a tributary of the Credit River

[3] Black Creek is a tributary of Silver Creek, and ultimately the Credit River

10.2.2 Wastewater Collection System

Similar to the lake-based wastewater collection system, wastewater from the stream based system are conveyed by gravity to areas of lower elevation downstream in the collection system. Where the continuation of the gravity system is not possible due to topography or natural features, wastewater pumping stations are introduced to intercept flows and pump them via pressurized forcemains to trunk sewers further downstream. The major trunk sewers eventually outlet to either a wastewater pumping station at a WWTP, or directly to a WWTP.

The stream based wastewater collection system consists of over 2.9 km of sanitary sewers and several local pumping stations and forcemains. The drainage areas, sewer sizes, and pumping capacities in the stream based systems are smaller than those in the lake-based system. The wastewater pumping stations in the stream based system vary in size, with capacities ranging from approximately 10 L/s to 170 L/s.

Acton WWTP Drainage Area

The Acton WWTP Drainage Area covers an area of approximately 670 ha and is serviced by three wastewater pumping stations. Wastewater collection is mainly achieved by smaller local sewers throughout the drainage area. Flow in the west is directed to the Agnes St WWPS, which pumps flow east to the main trunk sewer along the Black Creek alignment to the plant. Flow in east Acton is collected along Churchill Rd and reaches the plant by gravity from the east.

Georgetown WWTP Drainage Area

The Georgetown WWTP Drainage Area covers an area of approximately 2,200 ha and is serviced by 15 wastewater pumping stations, most of which service smaller local drainage areas. There are three main trunk sewers that outlet to the plant. Flow from Georgetown South is collected by local and sub-trunk sewers which merge into a larger trunk sewer near Ninth Line near Mountainview Rd South and Barber Dr. The trunk then runs along Resource Rd to the Georgetown WWTP. Flow from the northwest areas in Georgetown is collected by a trunk sewer generally aligned along Silver Creek from Mill St to the WWTP. Flow from the northwest is collected by a trunk sewer flowing through the residential neighbourhood mainly along Delrex Blvd from Guelph St to the WWTP.

Milton WWTP Drainage Area

The Milton WWTP Drainage Area covers an area of approximately 1,780 ha.

North of the Milton WWTP are two major trunk sewers that run east-west generally along Main Street East and Steeles Avenue East. In addition, a trunk sewer traverses from north to south generally on Regional Road 25 and the 16 Mile Creek alignment, across Highway 401 and through residential areas to the WWTP. The other trunk sewers are located on Main Street East and Steeles Avenue East which outlet to the main north-south trunk.

In cases where there is a need to divert a portion of wet weather flows from the Milton WWTP to the Mid-Halton WWTP, flow could be pumped from the Fulton WWPS to the Laurier WWPS and then south to the existing gravity collection network, South of Derry Rd, wastewater then flows by gravity and via pumping stations to the Mid-Halton WWTP.

Table 37 summarizes the existing pumping stations in the stream based wastewater drainage areas and their firm capacities.

Table 37 Wastewater Pumping Stations in the North Halton Stream Based System

SPS #	Facility Name	Firm Capacity (L/s)	Drainage Area
1	Armstrong Ave WWPS	170.0	Georgetown WWTP DA
2	Gollop Cr WWPS	63.1	Georgetown WWTP DA
3	Lynden Cl WWPS	54.3	Georgetown WWTP DA
4	Moore Park WWPS	31.5	Georgetown WWTP DA
5	Agnes St WWPS	140.0	Acton WWTP DA
6	Kingham Hill WWPS	41.6	Acton WWTP DA
53	Lakeview WWPS	33.2	Acton WWTP DA
59	Leachate Station 2 WWPS	10.0	Georgetown WWTP DA
60	Leachate Station 1 WWPS	10.0	Georgetown WWTP DA
62	Gardiner Dr WWPS	14.7	Georgetown WWTP DA
63	Cinderbarke Terr WWPS	10.0	Georgetown WWTP DA
76	John St WWPS	135.0	Georgetown WWTP DA
80	Norval WWPS	50.0	Georgetown WWTP DA
83	Main St WWPS	147.0	Georgetown WWTP DA
91	Robinson Rd WWPS	10.0	Georgetown WWTP DA
100	10th Sideroad WWPS	130.5	Georgetown WWTP DA
501	Maple Ave WWPS	10.0	Georgetown WWTP DA

11. Existing and Future Wastewater Infrastructure Assessment

This section summarizes findings from the analysis of the performance of the existing wastewater systems and assessment of future servicing needs. The approach focused on identifying existing system opportunities and constraints and layering on population and employment growth to determine future servicing requirements.

Based on the June 2011 BPE data and Design Criteria, evaluation of the planning data and ultimately the project requirements was completed through summarizing the wastewater flows for the following geographic areas:

- Acton stream based service area (i.e., serviced by Acton WWTP)
- Georgetown stream based service area (i.e., serviced by Georgetown WWTP)
- Milton lake-based service area (i.e., serviced by Mid-Halton WWTP)
- Milton stream based service area (i.e. serviced by Milton WWTP)
- South Halton lake-based service area (i.e., serviced by Burlington Skyway, Oakville Southwest, and Oakville Southeast WWTPs)
- Sub-drainage areas (i.e., serviced by pumping stations and forcemains)
- Localized TSZs (i.e., serviced by local trunk wastewater mains).

11.1 Opportunities and Constraints

Opportunities and constraints were identified for each system through discussions with Regional and local area municipal staff and based on the ability to provide adequate levels of service, such as conveying peak wastewater flows. This was previously mentioned in Sections 4.3 and 4.7.

11.1.1 Acton Wastewater System

The following opportunities and constraints were identified in the Acton Wastewater System:

- Existing treatment capacity not sufficient to meet projected growth
- High inflow & infiltration
- Isolated service area
- Planned growth is within existing urban boundary (smaller scale growth)
- Stream based assimilative capacity criteria is restrictive for expansion
- Need to consider minimum flows in receiving streams and water balance
- Potential impact on existing infrastructure with additional intensification flow

11.1.2 Georgetown Wastewater System

The following opportunities and constraints were identified in the Georgetown Wastewater System:

- Existing treatment capacity not sufficient to meet 2031 flows
- Isolated system
- Topographical constraints may require pumping

- Large, Greenfield service area growth
- Potential impact on existing infrastructure with additional intensification flow
- Stream based stringent effluent criteria requires to be met if expanded

11.1.3 Milton Wastewater System

The following opportunities and constraints were identified in the Milton Wastewater System:

- Existing treatment capacity at the Mid-Halton WWTP is not sufficient to meet projected growth
- Existing treatment capacity at the Milton WWTP is not sufficient to meet projected growth
- Stream based stringent effluent criteria requires to be met if expanded
- Existing & planned infrastructure sized to divert flow in excess of existing plant capacity
- Milton experiencing significant new growth post 2021
- Divided drainage areas due to environmental features
- Potential impact on existing infrastructure with additional intensification flow
- Growth is distributed throughout the south and east areas of Milton
- Phasing challenges

11.1.4 South Halton Wastewater System

The following opportunities and constraints were identified in the South Halton Wastewater System:

- Potential impact on existing infrastructure with additional intensification flow
- Continued operation & maintenance cost of existing wastewater collection system
- High operation, maintenance and life cycle costs with continued operation of South Halton wastewater pumping stations
- Treatment capacity not sufficient to meet projected flows at Mid Halton WWTP
- Skyway WWTP tertiary treatment required to support Remedial Action Plan (RAP) targets

11.2 Wastewater Flow Requirements

The wastewater flow requirements have been calculated for each WWTP and WWPS. The future flows are based on the growth identified from the Best Planning Estimates. The flow calculation is based on identifying the existing conditions “starting point” and adding the growth related flows. The detailed summary of the wastewater flow projections is provided in Appendix 1-3. A summary of the average day flows and estimated peak flows is provided in Table 38.

Table 38 Wastewater Flow Requirements for each WWTP

	Average Day Flow (MLD)		Peak Wet Weather Flow[1] (MLD)	
WWTP	**Existing**	**2031**	**Existing**	**2031**
Acton	4.7	6.5	16.0	25.0
Georgetown (Including Hamlets and Catch-Up, after transfer to Mid-Halton)	18.4	18.7[2]	86.0	80.0[2]
Milton	15.5	18.5[3]	61.0	50.0[3]
Mid Halton	58.1	171.3[2]	162.0	600.0[2]
Oakville SE	26.8	28.7	109.0	122.0
Oakville SW	36.1	45.5	150.0	170.0
Skyway	122.6	131.1	339.0	402.0

[1] Peak wet weather flows are referenced from the hydraulic model and are based on existing calibrated conditions plus peak wet weather flow associated with growth.

[2] Georgetown South flow diverted to Mid-Halton WWTP in 2021.

[3] Average Day Flow in excess of 18.5 MLD and peak wet weather flow in excess of 50 MLD is diverted from Milton WWTP to Mid-Halton WWTP.

11.3 Hydraulic Analysis

11.3.1 Pumping Capacity

The hydraulic analysis carried out in this Master Plan study identified the need for a number of new pumping stations that will be required within the 2031 timeframe to service new growth areas. The timing of these projects is mainly driven by best planning estimates, and has incorporated input from the allocation program, the Transportation Master Plan and other planned roadwork. These new pumping stations are triggered in future growth areas located along the periphery of the existing urban boundary.

11.3.2 Intensification Analysis

A fundamental component of the Provincial Places to Grow Act is providing growth within the existing built boundary of the Region. For the purposes of intensification, the existing built boundary was established as the year 2006. The Province's Growth Plan identifies that by 2015 and for each year thereafter Halton Region must have a minimum of 40 per cent of all residential development occurring annually within the 2006 built boundary.

The approach for the intensification analysis under the Master Plan was in 2 stages:

1. Complete a Region wide review of the existing systems, both trunk and local, and identify high level opportunities and constraints to support intensification
2. Complete a detailed hydraulic modeling exercise to identify specific projects related the proposed intensification

The results from both stages of the intensification analysis are presented in Appendix 1-7 and discussed further in Section 15.

12. Wastewater Alternative Solutions

12.1 Servicing Strategy Development and the Sustainable Halton Process

The evaluation and decision making process carried out as part of the Sustainable Halton Water and Wastewater Master Plan was completed to a greater level of detail than previous Water and Wastewater Master Plans.

The Sustainable Halton Water and Wastewater Master Plan is an integrated component of the overall Sustainable Halton process. As such, the development of the servicing strategies evolved in complexity and detail throughout the implementation of Sustainable Halton.

For the Growth Conformity Exercises under Sustainable Halton, land use plans evolved over time from overall growth concepts, to a short list of growth options, to the preferred land use plan ultimately updated for the Regional Official Plan Review ROPA 38. During this land use evaluation process, preliminary water and wastewater servicing considerations and comments were provided to support the land use decision making.

Once the preferred growth option/land use plan was finalized, the Sustainable Halton Water and Wastewater Master Plan utilized the planning data as the foundation for the servicing needs.

At this point in the Sustainable Halton process, the Class EA process for the Master Plan was initiated. The Master Plan followed Phases 1 and 2 of the Class EA process including establishing and evaluating servicing alternatives.

The process for evaluating and selecting the preferred servicing strategies was as follows:

1. Generate a long list of water and wastewater concepts for the lake-based, groundwater-based and stream-based systems – this was a general description of the servicing strategy/intent with only high level description of infrastructure needs
2. Evaluate the long list of concepts and short-list preferred servicing concepts
3. Generate specific servicing alternatives from the short-listed concepts – this involved determination of specific infrastructure needs, locations and capacity for each alternative
4. Evaluate the servicing alternatives using Triple Bottom Line evaluation criteria
5. Establish the preferred water and wastewater servicing strategies including the capital and implementation programs

Figure 23 provides visual context for understanding the development of the preferred servicing strategy.

The overall capital and implementation programs for the water and wastewater servicing strategies form the primary recommendations of the Sustainable Halton Water and Wastewater Master Plan. The Master Plan documentation is ultimately integrated into the total documentation of the Sustainable Halton process.

12.1.1 Stream Based Servicing Impact

From the outset the Master Plan process recognized the interrelationship between the stream based servicing and lake –based servicing strategies. The generation and evaluation of servicing solutions for the Region was undertaken in an integrated and holistic manner. The northern stream based systems of Acton, Georgetown, and Milton were evaluated first in order to determine the impact on the south lake-based system.

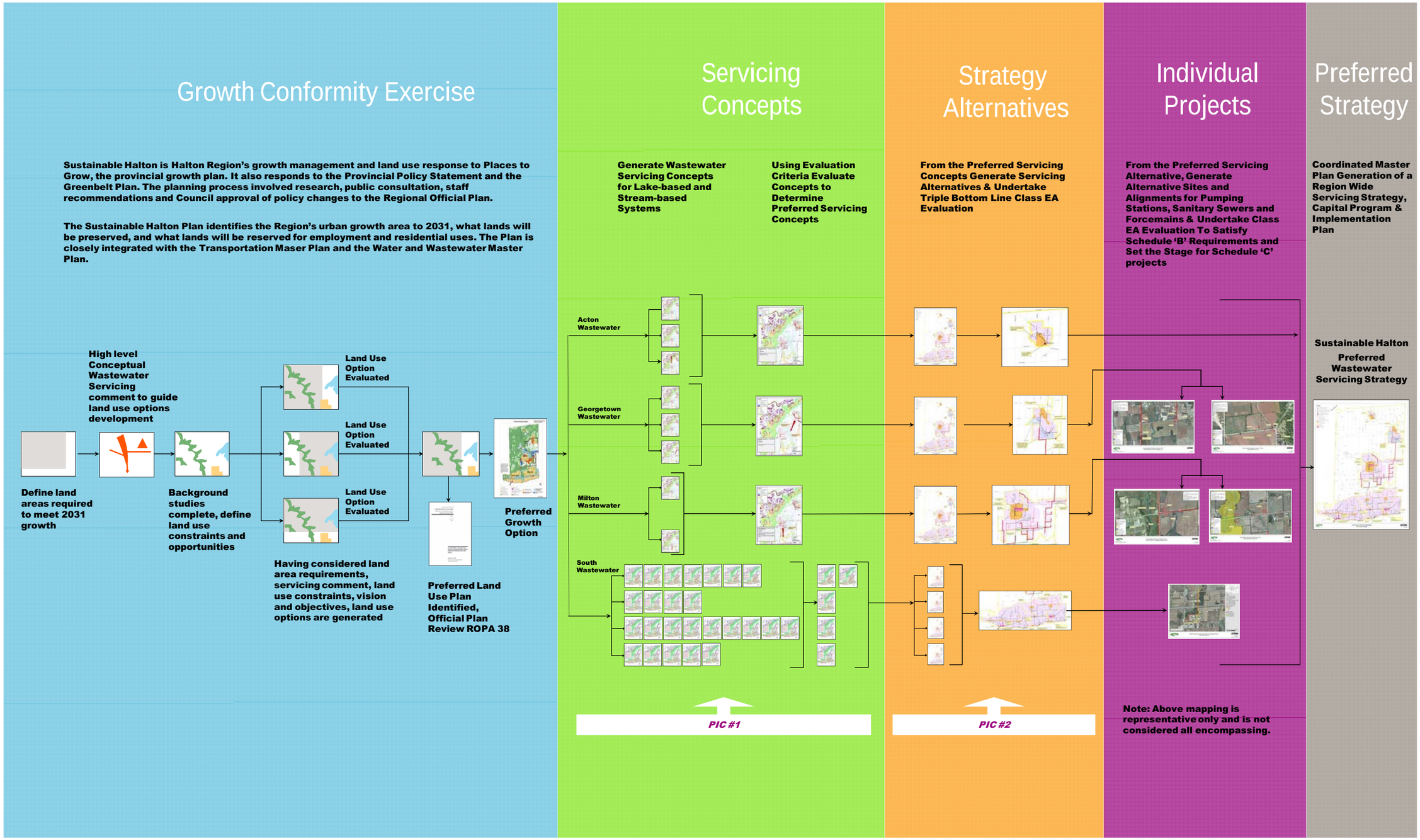


Figure 23 Overall Wastewater Evaluation and Decision Making Process

12.2 Acton Wastewater System

Acton's existing wastewater system is currently being serviced by a network of gravity sewers and local pumping stations that convey flows to the Acton Wastewater Treatment Plant (WWTP). This is a stream based system, as the Acton WWTP discharges to Black Creek.

Drawing from the opportunities and constraints in the Acton Wastewater System described in Section11.1.1, the need to develop alternative servicing concepts and strategies was based on addressing the limited treatment capacity to accommodate projected growth, while recognizing the implications of having a stream based receiver. Any potential plant expansions would be challenged by the limited assimilative capacity in the receiving water and the requirement to maintain a healthy water balance across watersheds. Future improvements would also need to address the high levels of inflow and infiltration that are currently consuming conveyance and treatment capacity from the system. Consideration must also be given to additional flows due to intensification and that all planned growth is within the existing urban boundary.

12.2.1 Concepts

Three servicing concepts were identified and evaluated for the Acton Wastewater System:

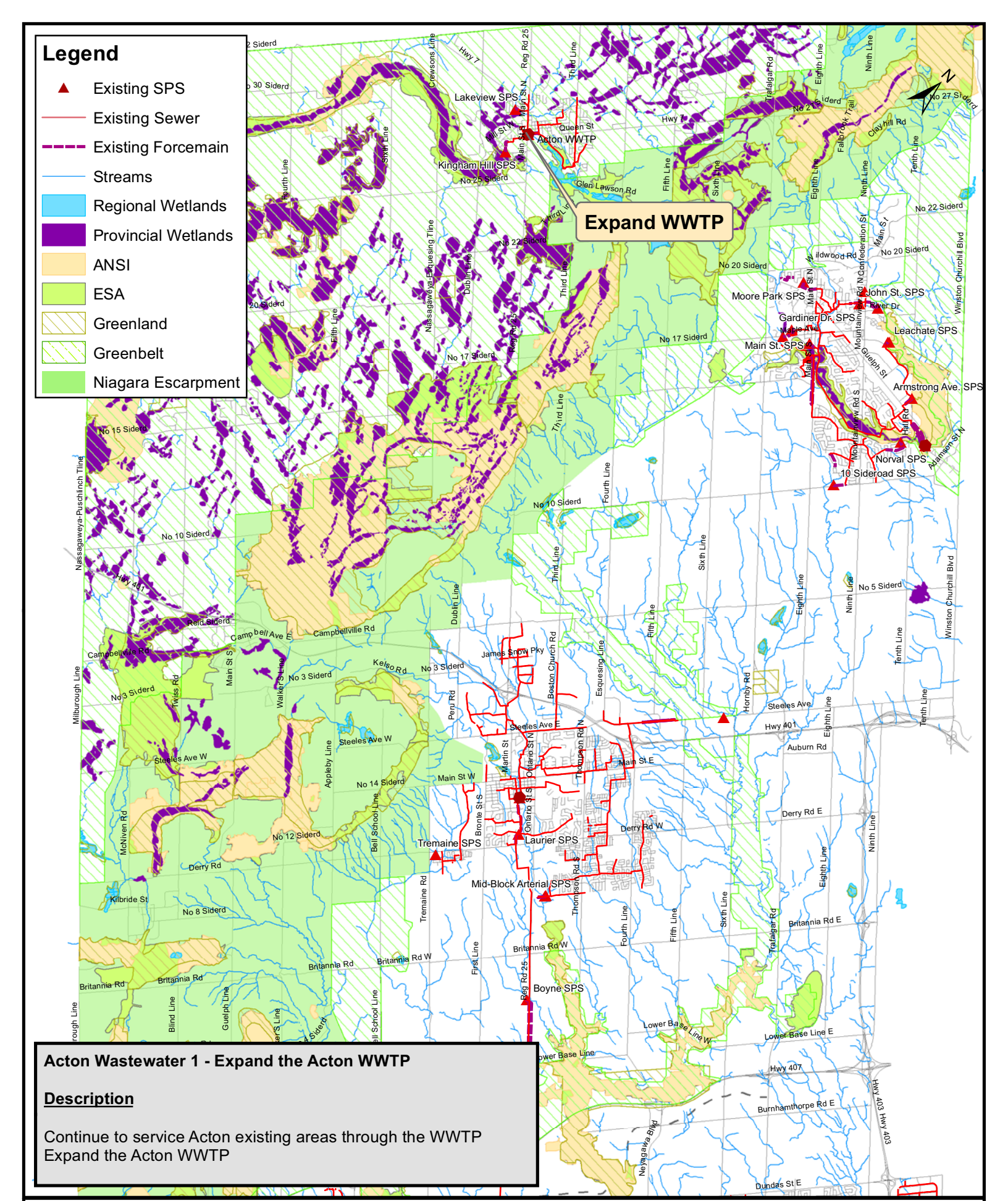
- Concept 1 is based on expanding the treatment capacity at the Acton WWTP. The existing drainage area will continue to be serviced by the Acton WWTP, and will require an expansion to accommodate the future projected flows.
- Concept 2 is based on implementing an inflow and infiltration program to reduce extraneous flows in the Acton wastewater system. This will help alleviate some of the capacity constraints at the Acton WWTP.\
- Concept 3 is based on diverting excess flows to the Georgetown or South Halton system. This will require extensive linear works to connect the Acton wastewater system to a different WWTP Drainage Area.

The preferred concept for the Acton WWTP drainage area is a combination of Concept 1 and Concept 2. The existing Acton WWTP does not have the capacity to treat the full buildout flows of Acton and it is anticipated that inflow and infiltration reduction alone will not free up sufficient capacity for future flows. Concept 3 was screened out due to several environmental and financial drawbacks. The wastewater system alternatives were fully evaluated under a separate Class EA Study for the expansion of the Acton WWTP which is now complete.

The preferred wastewater servicing strategy for Acton is a stand-alone solution and does not impact the South Halton Wastewater Servicing Concepts described herein. The evaluation for the preferred servicing concept is described in Table 39 and the preferred concept is depicted in Figure 24.

12.2.2 Strategies

Following the conceptual servicing analysis, a strategy analysis was carried out in order to translate the preferred concept into actual infrastructure projects. The preferred concept for the Acton system described above, does not impact the South Halton wastewater servicing strategy. As such, one servicing strategy was identified based on the preferred concept. The preferred servicing strategy for the Acton Wastewater System consisted of linear upgrades within the existing collection system (triggered by intensification) and the expansion of the Acton WWTP.



Acton Wastewater 1 - Expand the Acton WWTP

Description

Continue to service Acton existing areas through the WWTP
Expand the Acton WWTP

Halton Region
Sustainable Halton
Water and Wastewater Master Plan

Acton Preferred Wastewater
Servicing Concept
Figure 24

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Table 39 Acton Wastewater Servicing Decision Making Process

Long List of wastewater servicing concepts	High Level Evaluation & Screening based on 12 pt criteria		Preferred wastewater servicing concepts from PIC#1	Summary of Triple Bottom Line Evaluation & Screening (including hydraulic modelling) based on 12 pt criteria to develop alternative solutions				Preliminary Preferred Alternative Solution from PIC#2
	Positives	**Negatives**		**Environmental**	**Social/Legal**	**Technical**	**Financial**	
Concept 1 - Expand the Acton WWTP	• Maximizes existing infrastructure • Addresses growth within existing urban boundary	• Potential impacts during construction • Assessment of site capacity required • Requirement to meet stringent effluent discharge criteria	**Concept 1 – Expand the Acton WWTP**	Maintain water balance in community **Preferred**	Need to mitigate impacts during construction **Preferred**	Site capacity and treatment capacity can meet 2031 wastewater flows and effluent discharge criteria **Preferred**	Capital investment into existing infrastructure is required High cost alternative **Preferred**	**Alternative 1 - Expand Acton WWTP to accommodate 2031 wastewater flows**
Concept 2 – Reduce Inflow and Infiltration	• Maximizes existing infrastructure • No major upgrades required	• Requires implementation of flow reduction program • Potential to not meet flow reduction targets • Generally dependent on public participation and commitment	**Concept 2 – Reduce Inflow and Infiltration**	Minor impact during construction **Neutral**	Dependent on public participation **Neutral**	Does not adequately address growth needs in Acton **Least Preferred**	Dependent on public and private infrastructure investment Lower cost alternative but does not adequately address growth needs **Neutral**	Notes: Inflow /Infiltration program recommended in conjunction with preliminary recommended servicing solution
Concept 3a – Trunk Sewer Diversion - Send flows to the Georgetown WW System	• No upgrades required to existing plant • Provides redundancy	• Protected Area (NEC) Crossing • Potential imbalance of water budget • High cost for new infrastructure • High reliance on capacity in Georgetown	**Concept 3 – Trunk Sewer Diversion - send flows to the Georgetown WW System**	(Screened Out – No further evaluation undertaken)				
Concept 3b – Trunk Sewer Diversion - Send flows to the South Halton WW System	• No upgrades required to existing plant • Provides redundancy • Could potentially address full build-out needs	• Protected Area (NEC) Crossing • Potential imbalance of water budget • High cost for new infrastructure	**Concept 4 – Trunk Sewer Diversion - Send flows to the South Halton WW System**	Significant sewer crossing of NEC Water balance concerns **Least Preferred**	Coordination needs for infrastructure alignments Need to address Greenbelt Plan **Least Preferred**	Minimizes requirements at existing Acton WWTP Greater distance, more crossings, and more challenging alignments than 3a. **Least Preferred**	Significant capital costs by diversion to South Halton Multiple crossings Potentially multiple wastewater pumping stations Highest cost alternative **Least Preferred**	

The recommended wastewater servicing strategy for Acton is as follows:

- Continuing to service Acton through the existing Acton WWTP
- Expanding capacity at the Acton WWTP
- Providing local servicing improvements to service new growth as required

The decision-making process behind the development of the preferred servicing strategy for the Acton Wastewater System is summarized in Table 39.

12.2.3 Individual Projects

The individual projects identified under the Master Plan include the Acton WWTP expansion, which has completed the Schedule C Class EA study, upgrades to the existing sewer along the Black Creek alignment, which will require a separate Schedule B Class EA study and is not satisfied under this Master Plan, and new local sewer categorized as Schedule A+. There are no Schedule B projects being satisfied under this Master Plan.

12.3 Georgetown Wastewater System

Georgetown's existing wastewater system is currently being serviced by a network of gravity sewers and local pumping stations that convey flows to the Georgetown Wastewater Treatment Plant (WWTP). The system is a stream based system, as the Georgetown WWTP discharges to Silver Creek, a sensitive stream tributary to the Credit River.

Drawing from the opportunities and constraints in the Georgetown Wastewater System described in Section 11.1.2, the need to develop alternative servicing concepts and strategies was based on addressing the limited treatment plant capacity to accommodate projected growth, while recognizing the implications of having a sensitive stream based receiver. Any plant expansions would be required to meet the stringent effluent criteria. There is a significant amount of Greenfield service area growth both within and outside the existing urban boundary. Service areas with topographical constraints that require pumping and flows due to intensification will need to be accommodated.

Evaluations for individual projects are provided in *Volume II - Project File.*

12.3.1 Concepts

Three servicing concepts were identified and evaluated for the Georgetown Wastewater System:

- Concept 1 is based on expanding the treatment capacity at the Georgetown WWTP. The existing drainage area and future expanded drainage area will continue to be serviced by the Georgetown WWTP.
- Concept 2 is based on implementing an inflow and infiltration program to reduce extraneous flows in the Georgetown wastewater system. This will help alleviate some of the treatment constraints at the Georgetown WWTP and will free up capacity to accommodate flows from the new growth areas.
- Concept 3 is based on maximizing the existing capacity at the Georgetown WWTP and diverting flows in excess of the existing treatment capacity to the South Halton or Peel wastewater systems. This diversion will require a sewer connection from Georgetown to the South Halton or Peel systems.

Preliminary consideration was given to the concept of decommissioning the Georgetown WWTP and sending all flows to a Lake Ontario based treatment facility. This concept was screened out based on concerns regarding water balance in the community, desire to maintain base flows in the stream from the existing plant and comments regarding these same concerns from Credit Valley Conservation.

The preferred Concept for the Georgetown Wastewater System is a combination of Concept 2 and Concept 3. The existing Georgetown WWTP does not have the capacity to handle the full buildout of Georgetown and it is anticipated that inflow infiltration reduction alone will not free up enough capacity for future flows. Flows from the Georgetown Southwest Greenfield growth area and Georgetown South will need to be sent south to either the Mid-Halton WWTP in Oakville or the Clarkson WWTP in Mississauga with the Halton-only solution preferred. Concept 1 was screened out as it does not provide an adequate servicing solution. Concept 2 and 3 were chosen based on the ability to maximize the existing stream based and lake-based infrastructure and to accommodate the projected growth within Georgetown. The preferred concepts for the Georgetown Wastewater System feed into the South Halton Wastewater Servicing Concepts described herein.

The evaluation for the preferred servicing concept is described in Table 40 and the preferred concept is depicted in Figure 25.

12.3.2 Strategies

Following the conceptual servicing analysis, a strategy analysis was carried out in order to translate the preferred concept into actual infrastructure projects. The preferred concept for the Georgetown system described above, feeds into the South Halton wastewater servicing strategy. The preferred servicing strategy for the Georgetown Wastewater System consists of linear upgrades triggered by intensification and required to service projected growth within 2031.

The recommended wastewater servicing strategy for Georgetown is described below.

Georgetown Wastewater Servicing

- Maximize existing service areas to the existing Georgetown WWTP
- Maintain existing process capacity at Georgetown WWTP

Georgetown South and Georgetown Southwest

- Areas within Georgetown South and Georgetown Southwest generally lie south of the 15th Sideroad and Silver Creek
- The wastewater servicing and strategies for areas is to convey flows south to the Mid-Halton WWTP

Georgetown Southeast Greenfield Area

- Areas within the Georgetown Southeast Greenfield Area generally lie south of Guelph Street and east of 10th Line
- The wastewater servicing and strategy for this area is to convey flows north to Georgetown WWTP
- Lake-based and groundwater water service areas are paralleled by lake-based and stream-based wastewater collection respectively to ensure water balance within the watershed.

The decision-making process behind the development of the preferred servicing strategy for the Georgetown Wastewater System is summarized in Table 40.

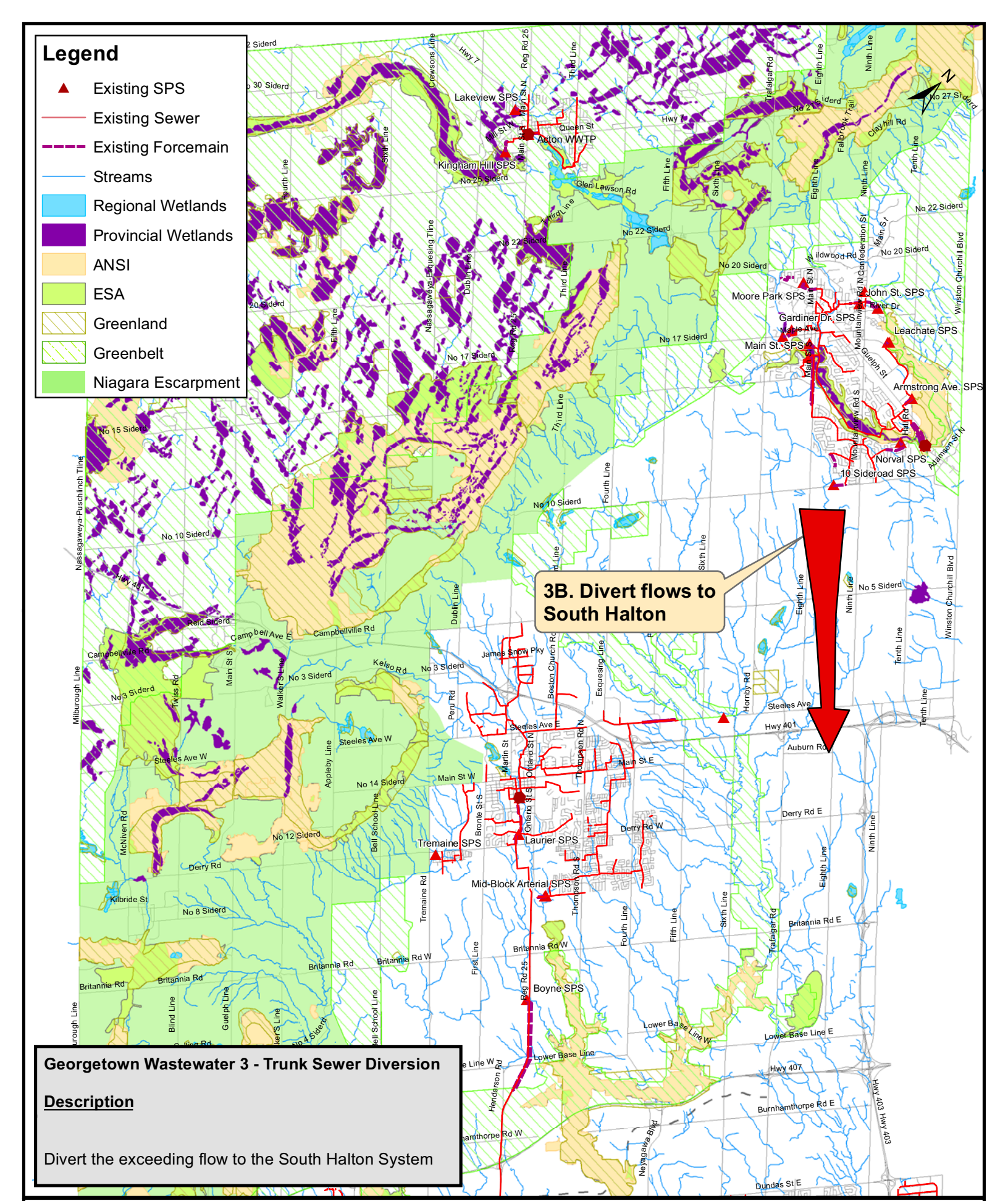
12.3.3 Individual Projects

The preferred servicing strategy led to a number of projects requiring separate evaluations for alternative sites and alignments. This separate evaluation was carried out with the intent to satisfy Phases 1 and 2 of the Class EA requirements particularly for Schedule B projects identified through the Sustainable Halton Water and Wastewater Master Plan.

Individual projects within the Georgetown service area and located within the southern areas of Halton Hills that are being screened under this Master Plan include:

- Project No. 6589 – Pumping station (3 MLD) near No. 10 Sideroad and Adamson Street, in Georgetown Southeast Greenfield Growth Area (35 L/s)
- Project No. 6570 – Pumping station (24 MLD) near No. 10 Sideroad and Ninth Line, in Georgetown South (275 L/s)
- Project No. 6572 – 1050 mm Wastewater Main on Steeles Ave from Eighth Line to Crossing Easement

Full documentation for the above projects, including tracking sheets, evaluation tables, maps, and other technical supporting documentation are provided in *Volume II –Project File*.



Halton Region
Sustainable Halton
Water and Wastewater Master Plan

Georgetown Preferred Water Servicing Concept
Figure 25

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Table 40 Georgetown Wastewater Servicing Decision Making Process

Long List of wastewater servicing concepts	High Level Evaluation & Screening based on 12 pt criteria		Preferred wastewater servicing concepts from PIC#1	Summary of Triple Bottom Line Evaluation & Screening (including hydraulic modelling) based on 12 pt criteria to develop alternative solutions				Preliminary Preferred Alternative Solution from PIC#2
	Positives	**Negatives**		**Environmental**	**Social/Legal**	**Technical**	**Financial**	
Concept 1 - Expand the Georgetown WWTP	• Maximizes existing infrastructure • Addresses growth within existing urban boundary	• Potential impacts during construction • Assessment of site capacity required • Requirement to meet stringent effluent discharge criteria • Concern regarding meeting the full buildout requirements	**Concept 1 – Expand the Georgetown WWTP Only**	Need to mitigate impact to effluent receiving stream **Least Preferred**	Need to mitigate impact during construction **Least Preferred**	Existing site capacity concerns Unable to meet full growth capacity Requirements to meet stringent effluent discharge requirements **Least Preferred**	Requires significant capital investment High cost alternative **Least Preferred**	
Concept 2 – Reduce Inflow and Infiltration	• Maximizes existing infrastructure • No major upgrades required	• Requires implementation of flow reduction program • Potential to not meet flow reduction targets • Generally dependent on public participation and commitment	**Concept 2 – Reduce Inflow and Infiltration**	Minor impact during construction Neutral	Dependent on public participation Neutral	Does not adequately address growth needs in Acton **Least Preferred**	Dependent on public and private infrastructure investment Lower cost alternative but does not adequately address growth needs Neutral	Notes: Inflow /Infiltration program recommended in conjunction with preliminary recommended servicing solution
Concept 3a – Trunk Sewer Diversion - Send flows to the Peel WW System	• No upgrades required to existing plant for growth • Provides redundancy • Addresses greenfield growth and could consider full system capacity	• Potential impact on local aquifer due to water balance management • High cost for new infrastructure • Confirmation of available Peel capacity and trunk system impacts need to be confirmed • Fundamentals of agreement need to be established	**Concept 3a – Trunk Sewer Diversion - Send flows to the Peel WW System**	Maintains water balance in community Neutral	Requires coordination and agreement with Peel Neutral	Provides service area flexibility Requires significant Peel infrastructure Staging dependent on Peel capacity Neutral	Requires investment in Region of Peel infrastructure Highest cost alternative **Least Preferred**	
Concept 3b – Trunk Sewer Diversion - Send flows to the South Halton WW System	• No upgrades required to existing plant for growth • Provides redundancy • Addresses greenfield growth and could consider full system capacity	• Potential imbalance of water budget • High cost for new infrastructure would require coordination with post 2021 service area	**Concept 3b – Trunk Sewer Diversion - Send flows to the South Halton WW System**	Maintains water balance in community **Preferred**	Need to mitigate impacts during construction Majority of infrastructure located within existing road right-of-ways **Preferred**	Provides service area flexibility Requires significant South Halton infrastructure Some phasing opportunities for servicing **Preferred**	Cost for sewers to South Halton Leverages capital program for South Halton Medium cost alternative **Preferred**	**Alternative 3b** **Trunk sewer diversion of new growth flow as well as strategic upgrades/improvements to the Georgetown WWTP** **Preferred**

12.4 Milton Wastewater System

Milton's existing wastewater system is currently being serviced by a network of gravity sewers and local pumping stations that convey flows to either Milton WWTP or Mid-Halton Wastewater Treatment Plant (WWTP). Milton WWTP is a stream based system, as the plant discharges to the Sixteen Mile Creek.

Drawing from the opportunities and constraints in the Milton Wastewater System described in Section 11.1.3, the need to develop alternative servicing concepts and strategies was based on addressing the limited treatment plant capacity to accommodate projected growth, while recognizing the implications of having a stream based receiver. Any plant expansions would need to meet the stringent effluent criteria. There is a significant amount of post-2021 growth both within and outside the existing urban boundary, which will require phasing of infrastructure and integration with planned roadwork. Drainage areas are divided due to environmental features and require pumping. Flows due to intensification within the Milton Core will also need to be accommodated.

Evaluations for individual projects are provided in *Volume II - Project File.*

12.4.1 Concepts

Two servicing concepts were identified and evaluated for the Milton Wastewater System:

- Concept 1 is based on expanding the treatment capacity at the Milton WWTP. The existing drainage area will continue to be serviced by the Milton WWTP.
- Concept 2 is based on diverting flows to the Mid-Halton drainage area. A portion of the flow from the Milton WWTP drainage area will continue to be serviced by the Milton WWTP in order to maximize the plant efficiencies. Flows in excess of the rated capacity at the Milton WWTP will be diverted to the Mid-Halton WWTP drainage area via the reconstructed Fulton WWPS and WWFM plus new RR25/Boyne Trunk Sewer.

Preliminary consideration was given to the concept of decommissioning the Milton WWTP and sending all flows to a Lake Ontario based treatment facility. This concept was screened out based on concerns regarding water balance in the community, desire to maintain base flows in the stream from the existing plant and comments regarding these same concerns from Conservation Halton.

The preferred Concept for the Milton WWTP drainage area is Concept 2. This concept builds on the previous Master Plan recommendation to divert flows in excess of the Milton WWTP plant capacity to the Mid-Halton drainage area. The advantages of this concept are based on the ability to maximize the existing lake-based infrastructure and also due to plant site expansion constraints. The preferred concept for the Milton Wastewater System feeds into the South Halton Wastewater Servicing Concepts described herein.

The evaluation for the preferred servicing concept is described in Table 41 and the preferred concept is depicted in Figure 26.

12.4.2 Strategies

Following the conceptual servicing analysis, a strategy analysis was carried out in order to translate the preferred concept into actual infrastructure projects. The preferred concept for the Milton system described above, feeds into the South Halton wastewater servicing strategy. Due to the significant Greenfield growth anticipated in Milton within 2031, there were numerous projects identified within the 2021 urban boundary and the 2031 planned urban boundary expansion areas.

The recommended wastewater servicing strategy for Milton is described below.

Milton Lake-Based Wastewater Servicing

- Milton lake-based wastewater service area includes the areas generally outside the central core of the community. These areas flow to the Mid-Halton WWTP
- Wastewater from the core Milton area is conveyed to the Milton WWTP. Wastewater flow to the Milton WWTP beyond the plant's rated capacity for average and peak flows(18.5 MLD and 50 MLD respectively) are diverted to the Mid-Halton WWTP.

Core Milton Servicing

- Wastewater is conveyed south to the Milton WWTP for the northwest areas of the Milton core. Remaining areas direct flows to Mid-Halton Wastewater Treatment Plant
- As described above, the excessive flows over the Milton plant rated capacity will be diverted to the Mid-Halton Wastewater Treatment Plant

Milton & Halton Hills/401 Employment Corridor Wastewater Servicing

- Halton Hills 401 Corridor lake-based wastewater service area includes the areas generally along Steeles Ave
- Wastewater is conveyed south to the Mid-Halton WWTP

The Milton servicing analysis included the creation of profiles for the various alternative sewer and forcemain alignments and the hydraulic analysis of alternative pumping stations and sub-drainage areas. The preferred servicing strategy for the Milton Wastewater System extends the existing collection system to a larger network of trunk sanitary sewers and pumping stations, phased within 2031.

The decision-making process behind the development of the preferred servicing strategy for the Milton Wastewater System is summarized in Table 41.

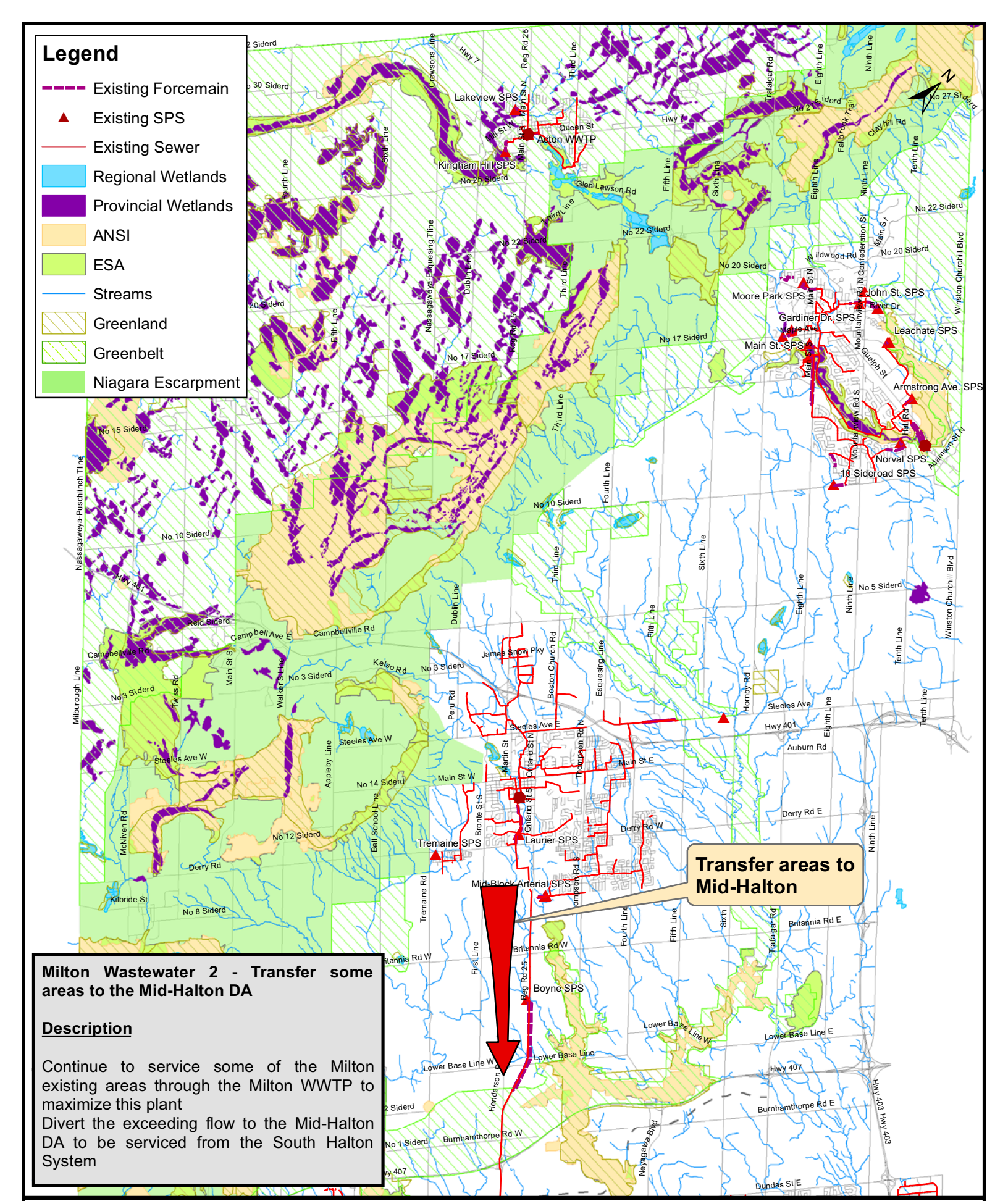
12.4.3 Individual Projects

The preferred servicing strategy led to a number of projects requiring separate evaluations for alternative sites and alignments. This separate evaluation was carried out with the intent to satisfy Phases 1 and 2 of the Class EA requirements particularly for Schedule B projects identified through the Sustainable Halton Water and Wastewater Master Plan.

Individual projects within the Milton service area include:

- Project No. 6555 – 17 MLD Pumping Station on Tremaine Road (200 L/s)
- Project No. 6571 – 104 MLD Pumping Station at Trafalgar Road/ Britannia Road
- Project Nos. 6573, 6574 – 1050 mm Trunk Sewer crossing from Steeles Ave to Auburn Road and on Auburn Road from Hwy 401 crossing easement to Trafalgar Road
- Project No. 6584 – 156 MLD Pumping Station at Lower Base Line and Fourth Line (1805 L/s)

Full documentation for the above projects, including tracking sheets, evaluation tables, maps, and other technical supporting documentation are provided in *Volume II – Project File*.



Sustainable Halton
Water and Wastewater Master Plan

Milton Preferred Wastewater
Servicing Concept
Figure 26

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Table 41 Milton Wastewater Servicing Decision Making Process

Long List of wastewater servicing concepts	High Level Evaluation & Screening based on 12 pt criteria		Preferred wastewater servicing concepts from PIC#1	Summary of Triple Bottom Line Evaluation & Screening (including hydraulic modelling) based on 12 pt criteria to develop alternative solutions				Preliminary Preferred Alternative Solution from PIC#2
	Positives	**Negatives**		**Environmental**	**Social/Legal**	**Technical**	**Financial**	
Concept 1 - Expand Existing Milton Wastewater Treatment Plant	• Maximizes existing infrastructure	• Concern that the existing plant site/stream capacity can not meet buildout requirements. System is currently diverting flows to Mid Halton. • Potential impacts during construction • Requirement to meet stringent effluent discharge criteria	**Concept 1 -** Expand Existing Milton Wastewater Treatment Plant	Need to mitigate impact to effluent receiving stream	Need to mitigate impacts during construction	Site capacity concerns. Requirements to meet stringent effluent discharge criteria.	Requires significant capital investment for minimal capacity gain.	
				Least Preferred	**Least Preferred**	**Least Preferred**	**Least Preferred**	
Concept 2 – Transfer Flows to Mid-Halton Drainage Area	• Addresses build-out requirements of existing service area • Maximizes existing Lake based infrastructure • Opportunity for staging. Lake based servicing already provided in Milton • Opportunity to consider transfer of the full system • Allowance for redundancy • No upgrade required to existing plant • Status Quo	• Requires operational plans to implement • Capacity required at Lake based system • Assessment of stream flow requirements is needed if plant flows are reduced	**Concept 2-** Transfer Flows to Mid-Halton Drainage Area	Maintains current water balance **Preferred**	Minimize impact to community **Preferred**	Provides greatest operating and security flexibility **Preferred**	Cost effective diversion strategy **Preferred**	**Alternative 2 – Transfer Flows to Mid-Halton Drainage Area** Ultimate diversion requirements to be coordinated with water supply strategy

12.5 South Halton Lake-Based Wastewater System

South Halton's existing wastewater system is being serviced by a network of gravity sewers and a large number of local pumping stations that convey flows to the Burlington Skyway, Mid-Halton, Oakville Southwest, and Oakville Southeast Wastewater Treatment Plants. The system is a lake-based system, as all four plants discharge to Lake Ontario.

Drawing from the opportunities and constraints in the South Halton Wastewater System described in Section 11.1.4, the need to develop alternative servicing concepts and strategies was based on ensuring that there is sufficient plant capacity available in time to service projected growth in South Halton, including any diverted flows from upstream service areas. The high number of pumping stations in the South Halton system that are resulting in high operation, maintenance and life cycle costs, need to be reduced while maintaining levels of service in the collection system. Flows due to intensification within the Burlington Core and Oakville Core will also need to be accommodated.

Evaluations for individual projects are provided in *Volume II - Project File.*

12.5.1 Concepts

Four servicing concepts were identified and evaluated for the South Halton Wastewater System:

Concept 1

Concept 1 is based on conveying flows from new growth areas in Georgetown and Milton to the south, crossing 16 Mile Creek to the RR25/Boyne trunk Sewer via Lower Baseline. Flows from the Georgetown Southwest and east Milton drainage area drain south by gravity on the Eighth Line/ Trafalgar Rd Trunk Sewer to Britannia Road, are pumped west crossing the eastern branch of 16 Mile Creek, then flow south by gravity to Lower Base Line before being pumped west to the new RR25/Boyne Trunk Sewer. Flows from the Halton Hills 401 Corridor are split with the area west of Sixth Line conveyed west to the existing Fourth Line trunk sewer in Milton, and the area east of Sixth Line conveyed south to the new Trafalgar Road trunk sewer. Flows from the southwest Milton drainage area are conveyed south on Tremaine Rd to a new WWPS, pumped east to Lower Baseline, then flow on Lower Baseline to the new RR25/Boyne trunk sewer. New growth flows are conveyed to and treated at the Mid Halton WWTP.

Seven (7) alternatives (1A-G) were developed within Concept 1, with Concept 1A being the main baseline Alternative within the Concept. The six other alternatives are slight variations to the overall concept whose main component is sending the majority of new growth flows south to a new WWPS at Lower Baseline and Fourth Line. The other alternatives maintain a similar overall servicing strategy as Concept 1A, but strategically incorporate diversions of flows from certain existing and future trunk sewers and WWPSs to alternate catchment areas.

These variations to Concept 1A include: sending Georgetown and Halton Hills 401 Corridor flows to the RR25 Boyne Trunk sewer via Fourth Line / James Snow Pkwy or Derry Road in Milton, decommissioning BPII WWPS, decommissioning Britannia/James Snow Pkwy WWPS or decommissioning both BPII WWPS and Britannia/James Snow Pkwy WWPS

Concept 1A was chosen as the preferred Alternative from Concept 1. It provides the most efficient and cost effective servicing solution, while limiting the strain on existing infrastructure and facilitating phasing of new projects.

Concept 2

Concept 2 is based on conveying flows from new growth areas in Georgetown Southwest and Milton to the south, crossing 16 Mile Creek to RR25 via Britannia Rd. Flows from Georgetown and the east Milton drainage area drain south by gravity on the Eighth Line/Trafalgar Rd Trunk Sewer to Britannia Road, are pumped west crossing the eastern branch of 16 Mile Creek, then flow west by gravity to the Britannia/James Snow Pkwy WWPS before being pumped west to the new RR25/Boyne trunk sewer. Flows generated south of Britannia Rd in Milton will be pumped north to the Britannia Trunk Sewer via a new WWPS on Lower Baseline and Fourth Line. Flows from the Halton Hills 401 Corridor are split with the area west of Sixth Line conveyed west to the existing Fourth Line trunk sewer in Milton, and the area east of Sixth Line conveyed south to the new Trafalgar Road trunk sewer. Flows from the southwest Milton drainage area are conveyed south on Tremaine Rd to a new WWPS, pumped east to Lower Baseline, then flow on Lower Baseline to the new RR25/Boyne trunk sewer. New growth flows are conveyed to and treated at the Mid Halton WWTP.

Four (4) alternatives (2A-D) were developed within Concept 2, with Concept 2A being the main baseline Alternative within the Concept. The three other alternatives are slight variations to the overall concept whose main component is sending new growth flows to the west to a new WWPS at Britannia Rd and Thompson Rd. The other alternatives maintain a similar overall servicing strategy as Concept 2A, but strategically incorporate diversions of flows from certain existing trunk sewers and WWPSs to alternate catchment areas.

These variations to Concept 2A include: sending Georgetown and Halton Hills 401 Corridor flows to the new RR25/Boyne Trunk sewer via Fourth Line, James Snow Parkway or Derry Road in Milton, and decommissioning the BPII WWPS.

Concept 2A was chosen as the preferred Alternative from Concept 2. It provided the most efficient and cost effective servicing solution, while limiting the strain on existing infrastructure and facilitating phasing of new projects.

Concept 3

Concept 3 is based on conveying flows from new growth areas in Georgetown Southwest and Milton to the south, crossing 16 Mile Creek via North Oakville. Flows from Georgetown Southwest and the east Milton drainage area drain south by gravity on the Eighth Line/Trafalgar Rd Trunk Sewer to a new WWPS south of Britannia Rd, then are pumped south to Lower Baseline, then drain by gravity to another WWPS on the new Burnhamthorpe Rd alignment. Flows are then pumped again across 16 Mile Creek to the new RR25/Boyne Trunk Sewer. Flows generated south of Britannia Rd in Milton will be pumped north to the Britannia Trunk Sewer via a new WWPS on Lower Baseline and Fourth Line. Flows from the Halton Hills 401 Corridor are split with the area west of Sixth Line conveyed west to the existing Fourth Line trunk sewer in Milton, and the area east of Sixth Line conveyed south to the new Trafalgar Road trunk sewer. Flows from the southwest Milton drainage area are conveyed south on Tremaine Rd to a new WWPS, pumped east to Lower Baseline, then flow on Lower Baseline to the RR25/Boyne trunk sewer. New growth flows are conveyed to and treated at the Mid Halton WWTP.

Nine (9) alternatives (3A-I) were developed within Concept 3, with Concept 3A being the main baseline Alternative within the Concept. The eight other alternatives are slight variations to the overall concept whose main component is sending flows to the south then west via Burnhamthorpe Rd in North Oakville. The other alternatives maintain a similar overall servicing strategy as Concept 3A, but strategically incorporate diversions of flows from existing and future trunk sewers and WWPSs to different catchment areas.

These variations to Concept 3A include sending Georgetown and Halton Hills 401 Corridor flows to the new RR25/Boyne Trunk Sewer via Fourth Line or Derry Road in Milton or via Burnhamthorpe Road, Hwy 407, Neyagawa Boulevard or Trafalgar Road in North Oakville.

Concept 3A was chosen as the preferred Alternative from Concept 3. It provided the most efficient and cost effective servicing solution, while limiting the strain on existing infrastructure and facilitating phasing of new projects.

Concept 4

Concept 4 is based on conveying flows from new growth areas in Georgetown Southwest to the Region of Peel via a new trunk sewer draining to the east. Flows from East Milton will be conveyed south in a similar fashion as in Concept 1, while flows from Georgetown are sent east via a new trunk sewer on Winston Churchill Blvd and treated at the Clarkson WWTP. Flows from the Halton Hills 401 Corridor are split with the area west of Sixth Line conveyed west to the existing Fourth Line trunk sewer in Milton, and the area east of Sixth Line conveyed south to the new Trafalgar Road trunk sewer. Flows from the southwest Milton drainage area are conveyed south on Tremaine Rd to a new WWPS, pumped east to Lower Baseline, then flow on Lower Baseline to the newRR25/Boyne trunk sewer. Milton and some Halton Hills 401 Corridor growth flows are conveyed to and treated at the Mid Halton WWTP.

Five (5) alternatives (4A-E) were developed within Concept 4, with Concept 4A being the main baseline Alternative within the Concept. The four other alternatives are slight variations to the overall concept whose main component is sending Georgetown flows east to the Peel Region Wastewater System and sending flows from east and south Milton to the new RR25/Boyne Trunk via the Britannia/James Snow Pkwy WWPS and Lower Baseline WWPS. The other alternatives maintain a similar overall servicing strategy as Concept 4A, but strategically incorporate diversions of flows from certain existing and proposed trunk sewers and WWPSs to alternate catchment areas.

These variations to Concept 4A include sending Halton Hills 401 Corridor flows to the RR25/Boyne Trunk Sewer via Derry Road in Milton, decommissioning BPII WWPS, decommissioning Britannia/James Snow WWPS or decommissioning both BPII WWPS and Britannia/James Snow Pkwy WWPS.

Concept 4A was chosen as the preferred Alternative from Concept 4. It provided the most efficient and cost effective servicing solution, while limiting the strain on existing infrastructure and facilitating phasing of new projects.

The evaluation for the preferred servicing concept is described in Table 42 and the preferred concept is depicted in Figure 27.

12.5.2 Strategies

Following the conceptual servicing analysis, a strategy analysis was carried out in order to translate the preferred concept into actual infrastructure projects. The preferred servicing strategy for the South Halton Wastewater System is integrated with the strategies developed for Milton and Georgetown. Within the South Halton service area, there were no Schedule ‘B” projects however, all capital program projects consisted of linear upgrades triggered by intensification and other projected growth within 2031.

The recommended wastewater servicing strategy for South Halton is described below.

North Oakville (East Growth Area) Wastewater Servicing

- The North Oakville (East Growth Areas) are generally located east of Sixteen Mile Creek, North of Dundas Street, South of Hwy 407 and West of Ninth Line

- The wastewater servicing strategy for these lands is to convey wastewater flows south to Dundas Street trunk sewer and west to the Third Line trunk sewer which continues to convey flows to Mid-Halton WWTP

North Oakville (West Growth Area) Wastewater Servicing

- The North Oakville (West Growth Areas) are generally located west of Sixteen Mile Creek
- The wastewater servicing strategy for these lands is, for the eastern most section, to convey wastewater flows to the Third Line trunk sewer which continues to convey flows to Mid-Halton WWTP and, for the western most section, convey wastewater flows east along Dundas Street then south to existing sewers near Bronte Road ultimately to Mid-Halton WWTP

Burlington (Central) Wastewater Servicing

- The Burlington (Central Areas) include all areas in Burlington south of the Hwy 407 and Dundas Street excluding the North Aldershot areas
- The wastewater servicing strategy for these lands is to convey wastewater flows to the Skyway WWTP. This is achieved primarily through gravity sewers with localized wastewater pumping stations

North Aldershot Wastewater Servicing

- The North Aldershot service areas include all areas in Burlington generally west of the QEW
- The wastewater servicing strategy for these lands is to convey wastewater flows to the Skyway WWTP. This is achieved primarily through gravity sewers with localized wastewater pumping stations. Isolated areas maintain private servicing

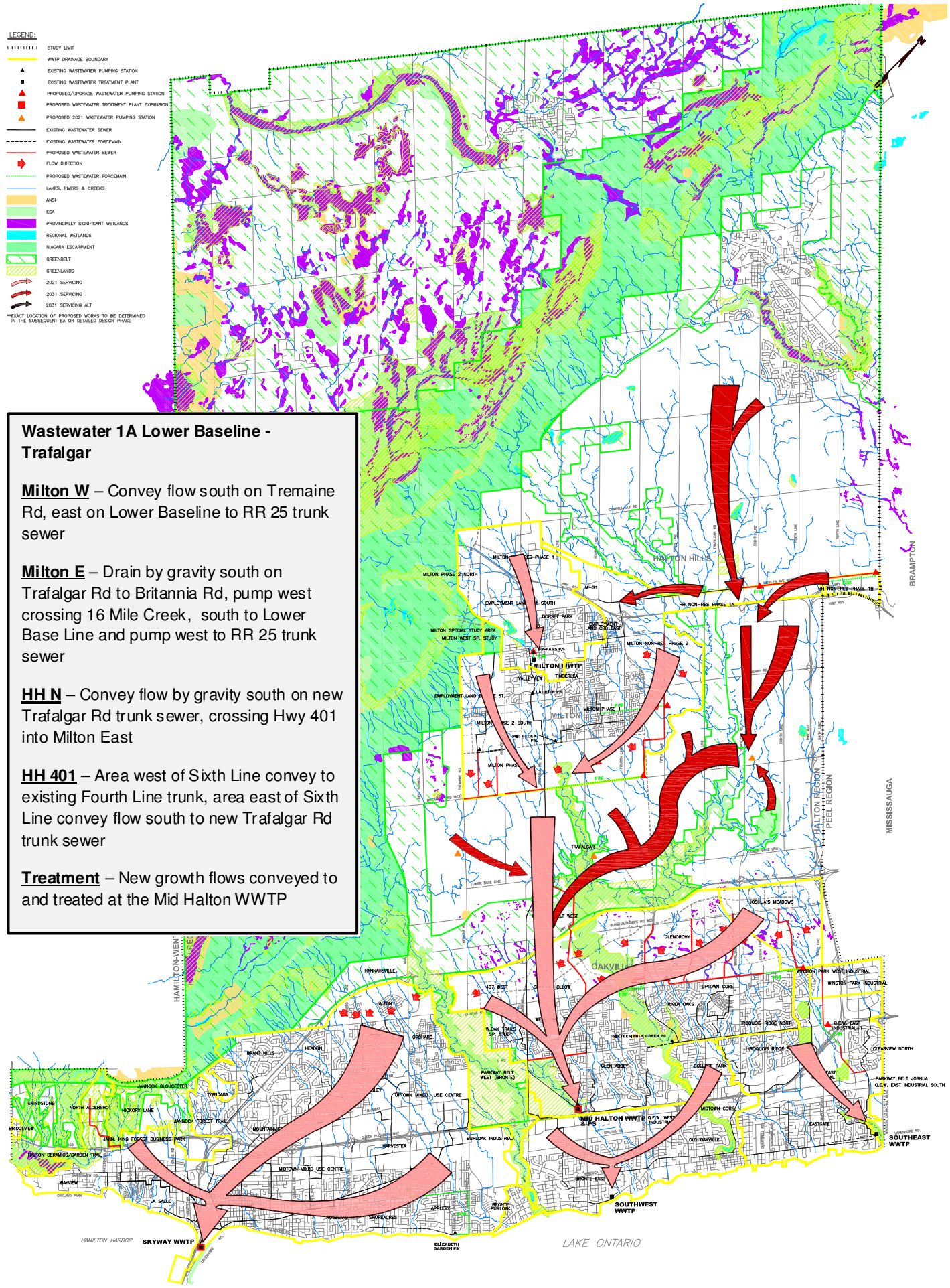
The decision-making process behind the development of the preferred servicing strategy for the South Halton Lake-Based Wastewater System is summarized in Table 42.

12.5.3 Individual Projects

The infrastructure projects identified in the South Halton service area, through the preferred water servicing strategy were related to upgrades of existing infrastructure. One project was identified as Schedule B and required a separate evaluation of alternative servicing options. This separate evaluation was carried out with the intent to satisfy Phases 1 and 2 of the Class EA requirements.

The individual project within the South Halton service area is as follows:

- Project No. 6541 – Deep trunk sewer on Rebecca Street and Lakeshore Road West from Wilson to Oakville Southwest WWTP



Wastewater 1A Lower Baseline - Trafalgar

Milton W – Convey flow south on Tremaine Rd, east on Lower Baseline to RR 25 trunk sewer

Milton E – Drain by gravity south on Trafalgar Rd to Britannia Rd, pump west crossing 16 Mile Creek, south to Lower Base Line and pump west to RR 25 trunk sewer

HH N – Convey flow by gravity south on new Trafalgar Rd trunk sewer, crossing Hwy 401 into Milton East

HH 401 – Area west of Sixth Line convey to existing Fourth Line trunk, area east of Sixth Line convey flow south to new Trafalgar Rd trunk sewer

Treatment – New growth flows conveyed to and treated at the Mid Halton WWTP

Halton Region
Sustainable Halton
Water and Wastewater Master Plan

South Halton
Preferred Wastewater Servicing Concept
Figure 27

AECOM

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Table 42 South Halton Lake-Based Wastewater Servicing Decision Making Process

Long List of water servicing concepts → **High Level Evaluation & Screening** based on 12 pt criteria → **Preferred water servicing concepts from PIC#1** → **Summary of Triple Bottom Line Evaluation & Screening (including hydraulic modelling)** based on 12 pt criteria to develop alternative solutions → **Preliminary Preferred Alternative Solution**

	Positives	Negatives		Environmental	Social/Legal	Technical	Financial	
Concept 1 - Expand 2021 Network (1A, 1B, 1C)	• Provides Halton Hills Z5 redundancy • Leverages existing infrastructure for full build-out • Greater flexibility for sizing and design to support strategy • Halton only servicing concept	• Requires extra Hwy 401 Crossing • One feed to Georgetown no supply redundancy	**Concept 1 A - Expand 2021 Network** **Georgetown & Milton East/HH 401 Corridor fed from Zone 4 Reservoir**	Common Halton only infrastructure. Infrastructure alignments will maximize existing roads and minimize environmental impacts **Preferred**	Maintains infrastructure within existing roads **Preferred**	Provides greatest operating and security flexibility. Maximizes existing infrastructure **Preferred**	Staging can provide opportunity to defer capital Lowest cost alternative **Preferred**	**Alternative 1 A - Expand 2021 Network** **Georgetown & Milton East/HH 401 Corridor fed from Zone 4 Reservoir** Separate alignment and facility site evaluations have been undertaken
Concept 2 – Third Spine (2A, 2B, 2C, 2D)	• Addresses potential full build-out needs • Potential to create further redundancy in Burlington/Oakville system • Independent feed to Milton (not reliant on Kitchen PS & RR25 and Trafalgar spines) • Halton only servicing concept	• New crossing through Greenbelt required • Overly redundant (not needed to service 2031 growth) • Does not maximize existing infrastructure (new pumping stations required) • One feed to Georgetown no supply redundancy	Concept 2 – Third Spine	(Screened Out - no further evaluation undertaken)				
Concept 3 – Inter-Regional (3A, 3B, 3C)	• Existing Peel infrastructure in close proximity to Halton service areas • Potential to provide early phasing strategy • More direct feed to Georgetown • Potential to defer Burloak WPP expansion • Existing Oakville system can support greater Oakville Plant Capacity (achieved through optimization at existing site)	• Fundamentals of agreement needs to be established • Confirmation of available Peel capacity and trunk system impacts need to be confirmed • Need to enter into Inter-regional cost sharing supply agreement • One feed to Georgetown no supply redundancy	**Concept 3A – Peel Inter-regional** **Inter-regional Peel Supply to Zone 5**	Common Halton only infrastructure. Triggers Peel infrastructure with environmental mitigation requirements **Least Preferred**	Requires coordination and agreement with Peel **Neutral**	Provides service area flexibility. Requires significant Peel infrastructure. Staging dependent on Peel capacity **Neutral**	Requires investment in Peel infrastructure Intermediate cost alternative **Least Preferred**	
			Concept 3B – Peel Inter-regional Inter-regional Peel Supply to Zone 6	Common Halton only infrastructure. Triggers less Peel infrastructure with environmental mitigation requirements **Least Preferred**	Requires coordination and agreement with Peel **Neutral**	Provides service area flexibility. Requires significant Peel infrastructure and greater amount of infrastructure over 3A Staging dependent on Peel capacity **Neutral**	Requires investment in Peel infrastructure Highest cost alternative **Least Preferred**	

Notes:
Zone 6 Peel interconnection has been carried forward under preliminary preferred alternative 1A as an emergency supply to Georgetown