



Water and Wastewater Area Servicing Plan
For the Premier Gateway Phase 2B Employment Area
Draft Report

DRAFT

Prepared by

GM BluePlan for:

Town of Halton Hills

Project No. 717029

November 2021



Guelph | Owen Sound | Listowel | Kitchener | London | Hamilton | GTA

Royal Centre, 3300 Highway No. 7, Suite 402, Vaughan, ON L4K 4M3 P: 416-703-0667
www.GMBluePlan.ca

DRAFT

Table of Contents

1	Introduction	1
1.1	Proposed Development.....	1
1.2	Timing and Phasing	3
1.3	Interim Servicing	3
1.4	Organization of Report.....	3
2	Relevant Documents and Studies	5
2.1	Town of Halton Hills	5
2.1.1	Town of Halton Hills Official Plan.....	5
2.2	Halton Region	5
2.2.1	Halton Region Official Plan (2016).....	5
2.2.2	Halton Regional Council Motions Related to the GTA West Corridor.....	6
2.2.3	Sustainable Halton Water and Wastewater Master Plan (2011)	6
2.2.4	2017 Water & Wastewater Development Charges Update	7
2.2.5	Ongoing Halton Region Servicing Studies.....	9
3	Land Use and Planning Projections.....	11
3.1	Land Use	11
3.1.1	Existing	11
3.1.2	Future.....	11
3.2	Planning Estimates and Growth Assumptions.....	13
3.2.1	Best Planning Estimates (BPEs)	13
3.2.2	Premier Gateway Employment Area Phase 2B Secondary Plan Area - Growth Assumptions	14
3.2.3	Town of Halton Hills Projections	14
4	Water	16
4.1	Existing Water System	16
4.1.1	PGEA Area.....	16
4.2	Planned Water System	18
4.2.1	Ultimate Pressure Zone Boundary Realignment.....	18
4.2.2	Pumping and Storage.....	18
4.2.3	Region's Timing and Development Charges Projects	19
4.3	Estimated Water Demands	22
4.3.1	Design Criteria.....	22
4.3.2	Water Demands	23
4.4	Water Servicing Review and Needs Assessment.....	23
4.5	Development of the Proposed Water Servicing Strategy.....	24
4.5.1	Proposed Water Servicing Strategy.....	24

4.5.2	Local Service Watermains.....	26
4.5.3	Water Distribution Modelling Analysis.....	28
5	Wastewater	29
5.1	Existing Wastewater System.....	29
5.2	Planned Wastewater System	31
5.2.1	Region's Timing and Development Charges Projects	31
5.3	Wastewater Design Criteria and Flows	34
5.3.1	Wastewater Design Criteria	34
5.3.2	Wastewater Flows	35
5.4	Wastewater Servicing Review and Needs Assessment.....	35
5.4.1	Review of Available Capacity Under Scenario 1 Prior to Commissioning of the Eighth Line/Trafalgar Trunk Sewer	35
5.5	Development of the Proposed Wastewater Servicing Strategy.....	36
5.5.1	Proposed Wastewater Servicing Strategy.....	37
5.5.2	Local Sewers.....	40
5.5.3	Wastewater Collection Modelling Analysis.....	40
6	Phasing of Servicing	42
6.1	General.....	42
6.2	Water	42
6.2.1	West of GTA West Corridor	42
6.2.2	East of GTA West Corridor.....	42
6.3	Wastewater.....	45
6.3.1	Prior to Commissioning of Eighth Line/Trafalgar Trunk Sewer	45
6.3.2	West of GTA West Corridor	45
6.3.3	East of the GTA West Corridor	45
7	Cost Estimates	48
7.1	Water and Wastewater Servicing Cost Estimates	48
7.1.1	Water and Wastewater DC Projects Cost Estimates Approach	48
7.1.2	Water Projects.....	48
7.1.3	Wastewater Projects	49
8	Conclusion.....	52
8.1	General.....	52
8.2	Water	52
8.3	Wastewater.....	53

List of Figures

Figure 1-1: Study Area.....	2
Figure 3-1: Preferred Land Use Concept.....	12
Figure 3-2: Premier Gateway Employment Area Phases & SGU Boundaries.....	13
Figure 4-1: Existing Water System in the Area of PGEA P2B Lands	17
Figure 4-2: Planned Halton Region Water Projects in the Area of PGEA P2B Lands	21
Figure 4-3: Proposed Water Servicing Solution for PGEA P2B	27
Figure 5-1: Existing Wastewater System in the Area of PGEA P2B Lands.....	30
Figure 5-2: Planned Halton Region Wastewater Projects in the Area of the PGEA P2B Lands	33
Figure 5-3: Proposed Wastewater Servicing Solution for PGEA P2B.....	39
Figure 6-1: Proposed Phasing and Future Considerations for Interim Water Servicing of PGEA P2B Lands.....	44
Figure 6-2: Proposed Phasing and Future Considerations for Interim Wastewater Servicing of PGEA P2B Lands	47

List of Tables

Table 3-1: PGEA P2B Secondary Plan Employment Growth Projections (Halton Region)	14
Table 3-2: PGEA P2B Secondary Plan Employment Growth Projections (Secondary Plan Economic Study).....	15
Table 4-1: HH PGEA P2B Lands Existing and Future Water Pressure Zone.....	18
Table 4-2: Future Water Storage Requirements.....	19
Table 4-3: Halton Region Area Water Projects.....	19
Table 4-4: Water Design Criteria.....	22
Table 4-5: Water Design Criteria for Water System Components.....	22
Table 4-6: Water Modelling Results for PGEA P2B (Current and Ultimate Pressure Zone Boundary Configurations)	28
Table 5-1: Halton Region Area Wastewater Projects.....	31
Table 5-2: Wastewater Design Criteria (Treatment Plant)	34
Table 5-3: Wastewater Design Criteria (Collection System)	34
Table 5-4: Design Criteria for Wastewater System Components.....	35
Table 5-5: Downstream Pumping Stations Available Capacities (Prior to Commissioning of Eighth Line/Trafalgar Trunk Sewer)	36

Table 5-6: Summary of PGEA P2B Wastewater Sub-Catchments37

Table 5-7: Overall InfoSewer Model Scenarios to Evaluate PGEA P2B Development.....40

Table 7-1: Cost Estimate for Proposed Development Charges Water Infrastructure Required for PGEA P2B Development.....49

Table 7-2: Cost Estimate for Proposed Development Charges Wastewater Infrastructure Required for PGEA P2B Development.....50

Table 7-3: Cost Estimate for Alternative Equivalent Tunnelled Steeles Avenue Trunk Sewer Required for PGEA P2B Development.....51

Appendices

- Appendix A Halton Region Future Water Pressure Zones, Wastewater Drainage Areas and Water and Wastewater Capital Implementation Plans (2017-2031)
- Appendix B Drainage Plans and Sanitary Design Sheets
- Appendix C Cost Estimates

DRAFT

1 Introduction

GM BluePlan have been retained to complete the water and wastewater Area Servicing Plan (ASP) for the Premier Gateway Phase 2B Employment Area (PGEA P2B) Secondary Plan. GMBP are part of the project team lead by Macaulay Shiomi Howson Ltd (MSH) to develop the Secondary Plan for the Town of Halton Hills.

The Water and Wastewater ASP for the PGEA P2B will identify and evaluate water and wastewater servicing alternatives and recommend a servicing solution. The Water and Wastewater ASP will support the Premier Gateway Employment Area (PGEA), which is designated as an urban area, a natural heritage system as well as an Employment Area in the Town of Halton Hills and Halton Region Official Plans.

The PGEA will serve as a key employment growth area including industrial, office, commercial and institutional services. The completion of this Water and Wastewater ASP for the PGEA P2B is a critical step in the development of a key employment area by Halton Region and the Town of Halton Hills.

The key objectives of this Water and Wastewater ASP are to:

- Develop a comprehensive servicing strategy to meet the requirements of PGEA P2B that can be cost-effectively constructed.
- Provide a defensible framework and implementation plan for servicing of the PGEA P2B.
- Provide justification and recommendations for timing and phasing of new Regional and local infrastructure.
- Build on previous studies and create a forward-looking document to support the Town of Halton Hills that aligns with infrastructure planning across Halton Region.

1.1 Proposed Development

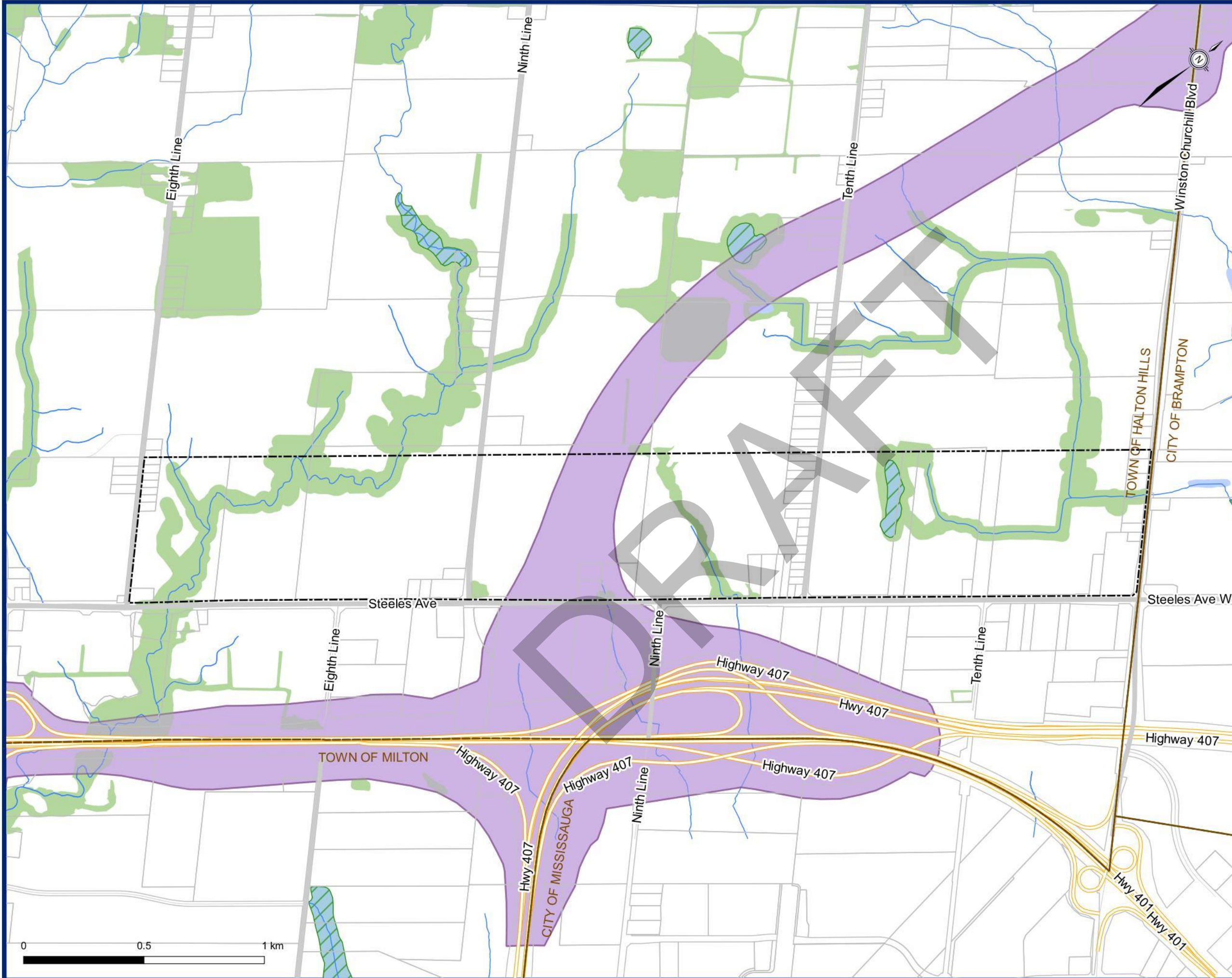
The PGEA is an important designated employment area in the Town of Halton Hills located in the western GTA/Highway 401 corridor. The PGEA is located along Steeles Avenue north of Highway 401, west of Winston Churchill Blvd, and east of Esquesing Line. The PGEA consists of four distinct Phases: 1A, 1B, 2A and 2B. The Area Servicing Plan will focus on Phase 2B of the PGEA.

The ASP study area is comprised of the Phase 2B area of the PGEA and includes the lands within the Urban Area located north of Steeles Avenue between Eighth Line and Winston Churchill Boulevard.

The study area is shown in Figure 1-1.



Water & Wastewater Area Servicing Plan
for the Premier Gateway Phase 2B



Premier Gateway Phase 2B

General Features

- Highway
- Major Road
- Local Road
- Property Parcel
- Municipal Boundary
- Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

Environmental Features

- Water Course
- Water Body
- Natural Heritage System
- Wetland

Figure 1-1
Study Area



1.2 Timing and Phasing

The PGEA 2B area is the second phase of employment lands to the 2031 planning horizon. It is anticipated that development of areas will occur concurrently with the required planning processes (zoning by-law amendments with supporting functional servicing plans, etc.). The Secondary Plan project aims to supply employment lands to accommodate employment growth within the area to 2031. Proposed water and wastewater infrastructure will be coordinated together with stormwater infrastructure and road improvements recommended as part of the Town of Halton Hill's PGEA P2B Secondary Plan.

1.3 Interim Servicing

This Report has been prepared to provide the Town of Halton Hills and Halton Region with a proposed plan for the water and wastewater servicing of the PGEA P2B area. The primary objective of the analysis is the provision of servicing across the entire secondary plan area that aligns with the respective Secondary Plan's planning horizon.

The analysis has considered existing Halton Region water and wastewater infrastructure as well as anticipated timing for Halton Region's planned area infrastructure, including the Ultimate Water Pressure Zone Boundary Realignment and construction of the Eighth Line Trunk Sewer.

Requirements for interim servicing to allow for planned development to proceed ahead of commissioning of planned Region infrastructure for the area are included to support detailed servicing designs to be undertaken as part of future Zoning By-law Amendments and Draft Plans of Subdivision.

1.4 Organization of Report

The ASP Report documents the comprehensive process undertaken to develop and recommend a proposed water and wastewater servicing strategy for the PGEA P2B Study Area. The Report is organized as follows:

- **Section 1 – Introduction**

An introduction to the study, description of study area, study purpose and objectives, and the report outline.

- **Section 2 – Background Study Context**

Provides the background plans, related studies, legislative and policy planning context, water and wastewater servicing principles and policies relevant to the PGEA P2B Water and Wastewater ASP.

- **Section 3 – Land Use and Best Planning Estimates**

Outlines the existing land use and environmental conditions, future planned land use, and population and employment growth forecasts for the PGEA P2B area.

- **Section 4 – Water**

Baseline description of the existing water system, estimated water demands, assessment of existing infrastructure capacity and development of servicing strategies.

- **Section 5 – Wastewater**

Baseline description of the existing wastewater system, estimated wastewater flows, assessment of existing infrastructure capacity and development of servicing strategies.

- **Section 6 – Phasing, Timing and Cost Estimate**

Identifies the phasing / timing and cost estimate of capital projects to service the PGEA P2B area, taking into consideration the system-wide needs.

- **Section 7 – Conclusion**

Summarizes the servicing solution for the study area and lists the capital upgrades and improvements recommended.

DRAFT

2 Relevant Documents and Studies

2.1 Town of Halton Hills

2.1.1 Town of Halton Hills Official Plan

The Town of Halton Hills Official Plan (OP) provides policies related to the Town of Halton Hill's growth and development through to the year 2031. The OP relates to all lands within the Town of Halton Hills.

According to the OP, the PGEA is divided into six land designations: prestige industrial area, gateway area, green lands, major parks and open space area, private open space area, and Employment.

All development shall proceed based on full municipal services. Halton Region is responsible for the extension of municipal water and wastewater services.

2.2 Halton Region

2.2.1 Halton Region Official Plan (2016)

The Halton Region Official Plan (OP) provides policies for Halton Region and all its municipalities including the Town of Halton Hills. The OP also includes strategies and objectives related to Regional growth and development through to the year 2031.

The Phase 2B study area is designated as an *Employment Area* within the Urban Area. The OP defines an employment area as:

"...areas designated for clusters of business and economic activities including, but not limited to, manufacturing, warehousing, offices and associated retails and ancillary facilities".

The OP also identifies the area north of the PGEA lands for Future Strategic Employment Area. The Future Strategic Employment Area is not a land use designation but represent lands that are strategically located near major transportation facilities and existing Employment Areas and are best suited for employment beyond the planning horizon of the current OP. Sizing of the proposed water and wastewater infrastructure in the PGEA P2B ASP does not include capacity allocation for the future strategic employment area.

Regional Official Plan Amendment (ROPA) 43 – HPBATS/GTA West Corridor Protection identified a corridor protection area to be protected for the *Halton Peel Boundary Area Transportation Study / Greater Toronto Area West Corridor Study Area* through the Town of Halton Hills and Town of Milton until the completion of the GTA West Corridor Environmental Assessment study. The area protected is generally bounded by Winston Churchill Boulevard to the east, No. 10 Side Road to the north, Eight Line to the west and Steeles Avenue to the south.

In 2017, the previous Provincial government announced the suspension of the GTA West Study and the re-evaluation of the project to consider additional transportation options for the corridor such as utilities, transit or other transportation alternatives, and released a refined corridor which partially affected the Premier Gateway Phase 2B Lands.

In June 2019, the current Provincial government announced that it would resume the GTA West Environmental Assessment. In September 2019, the draft Technically Preferred Route (TPR) was presented and the MTO stated that they have reduced interest in areas outside the draft Focused Analysis Area (FAA). The FAA continues to be refined through the Class EA Process. MTO issued an updated 2020 FAA based on review and feedback following the presentation of the

2019 FAA at PIC #2. Much of the east and west portions of the Study Area now fall within the Reduced Interest Area; with the FAA through the Study Area refined to an area between Ninth and Tenth Line.

For properties within the MTO's Reduced Interest Area, applications can proceed through municipal development processes. MTO will continue to review all development applications in the GTA West Study Area (which includes the entire Phase 2B lands). It is anticipated that applications in the MTO's Reduced Interest Area will not be impacted by the GTA West Transportation Corridor.

The GTA West Project Team aims to further reduce the FAA when the preliminary design of the Preferred Route is presented at PIC #3.

2.2.2 Halton Regional Council Motions Related to the GTA West Corridor

On November 20, 2019, Regional Council endorsed a motion on the GTA West Environmental Assessment Study:

“THAT the Region of Halton Council opposes further investment by the Province in the GTA West Transportation Corridor”.

Further, on March 24, 2021, Halton Region Council passed a Motion regarding the Designation Request for the Proposed GTA West Project Under the Impact Assessment Act:

“THAT further to the letter, The Regional Municipality of Halton reaffirms its opposition to the GTA West project and its commitment to protecting and preserving the natural environment and its work to mitigate the impacts of climate change,

AND FURTHER THAT The Regional Municipality of Halton hereby reiterates its request as set out in the March 3, 2021 letter and forwards a copy of that letter and this resolution to the Minister of Environment and Climate Change Canada Wilkinson urging designation of the GTA West project for an Impact Assessment under the Impact Assessment Act.

AND FURTHER THAT this resolution be circulated to the Prime Minister of Canada, Halton's MPs, Premier of Ontario, Ontario Minister of Transportation, Ontario Minister of Environment, Conservation and Parks, Halton's MPPs, City of Burlington, Towns of Halton Hills, Milton and Oakville.”

Further, on May 3, 2021, The Minister of Environment and Climate Change determined that the GTA West Project proposed by the Ontario Ministry of Transportation warrants designation under the Impact Assessment Act (Federal assessment).

2.2.3 Sustainable Halton Water and Wastewater Master Plan (2011)

In 2011, Halton Region completed the Sustainable Halton Water and Wastewater Master Plan (SHWWMP) to support Regional implementation of the Official Plan Amendment (ROPA 38/39) based on Halton Region's Bests Planning Estimates (June 2011). The Master Plan provided a Region-wide water and wastewater servicing strategy to accommodate growth from 2011 to 2031.

Halton Region, with support from local municipalities, updated their planning data to 2031 as part of the Master Planning process.

The key water servicing components for the Milton/Halton Hills 401 Employment Corridor are:

- Serviced by Zone M5L located along Steeles Avenue

- Water supply is lake based. Pumping stations pump the water north to Milton/Halton Hills 401 Corridor

Servicing of the PGEA is reliant on the following water and wastewater capital projects identified in Halton Region's Development Capital Plan (as outlined in the 2017 Development Charges (DC) Update Technical Report (detailed below)).

Key water servicing components for the broader Milton/Halton Hills 401 Employment Corridor include:

- Infrastructure upgrades maximizing use of existing capacity;
- New Zone 4/5 boundary;
- Second spine up Trafalgar Road alignment and third spine along Neyagawa Boulevard;
- Burloak WPP and Oakville Water Purification Plant (WPP) water supply capacity expansion; and,
- Integration of Zone 5 infrastructure providing Milton supply security.

The following Sustainable Halton servicing components have been removed from the Region's capital program:

- Addition of Zone 5 Pumping Station (at Zone 4 Reservoir) and transmission for additional feed to 401 Corridor.

Key wastewater servicing components for the broader Milton/Halton Hills 401 Employment Corridor include:

- Additional capacity at Mid-Halton Wastewater Treatment Plant (WWTP);
- Utilization of the two (2) existing wastewater pumping stations located along Steeles Avenue to minimize sewer depth and transfer flows along Steeles Avenue to the existing Milton gravity system to the south.
- Eastern area will continue to pump wastewater flows to existing infrastructure to the west;
- Diversion of flows to the future Eighth Line/Trafalgar Trunk Sewer.

2.2.4 2017 Water & Wastewater Development Charges Update

The 2017 DC Update Water and Wastewater Technical Report was completed in September 2016 to update the 2012 DCs and includes a number of technical updates to the SHWWMP and its associated Capital Implementation Plan. The report provides the basis for developing costs and capital implementation timing of water and wastewater projects required to service population and employment growth across Halton Region from 2017 to 2031 using 2011 Best Planning Estimates (BPEs).

The following summarizes the water and wastewater servicing recommendations made under the 2017 DC Update that are relevant to the PGEA P2B study area:

Water Servicing Recommendations

- Realignment of water pressure zone boundaries in the Town of Milton and the Town of Oakville (Zones 3, 4, and 5) to optimize customer water pressure in these areas.

Previously Approved and Funded Projects, Not Yet Constructed

- 600 mm diameter Zone M5L watermain on Steeles Avenue from Trafalgar Road to East of Ninth Line (Region IPFS ID 3844)

- 600mm diameter Zone M5L watermain on Steeles Avenue from East of Ninth Line to Peel Interregional Connection at Winston Churchill Boulevard (Region IPFS ID 5948)

Significant Water Projects (2017-2031):

- Oakville/Milton Water Pressure Zone Realignment (Zones 3, 4, 5) and alterations to Neyagawa, Fourth Line and Eighth Line Pumping Stations (Region IPFS IDs 7509, 7513, 7514)
- Zone 4 (Future Zone 250) Twin 900mm diameter trunk watermain along Trafalgar Road from Britannia Road to new Zone 4 (Future Zone 250) Reservoir (SH Halton Region IPFS ID 4985)
- 400mm diameter watermain along Hornby Road (Zone M5L / Future Zone 250) (Region IPFS ID 6641)
- 400mm diameter watermain from Hornby Road to Trafalgar Road (Zone M5L / Future Zone 250) (Region IPFS ID 6642)
- 400mm diameter watermain from Trafalgar Road to approximately 400m east of Eight Line (Zone M5L / Future Zone 250) (Region IPFS ID 6643)
- 400mm diameter watermain from Steeles Avenue to approximately 300m north (Zone M5L / Future Zone 250) (Region IPFS ID 6644)
- 400mm diameter watermain in the 401 growth corridor north of Steeles Avenue from 1,000 metres west of Ninth Line to 900 metres east of Ninth Line (Region IPFS ID 6645)
- 400mm diameter watermain in the 401 growth corridor from Steeles Avenue to approximately 330 metres north of Steeles Avenue (Region IPFS ID 6646)
- 400mm watermain in the 401 growth corridor north of Steeles Avenue from 600 metres west of Tenth Line to 1,000 metres east of Tenth Line (Region IPFS ID 6647)
- 400mm diameter watermain in the 401 growth corridor from Steeles Avenue to 340 metres north of Steeles Avenue (Region IPFS ID 6648)

Wastewater Servicing Recommendations

Previously Approved and Funded Projects, Not Yet Constructed

- Wastewater main on Steeles Avenue from East of Ninth Line to Eighth Line (Halton Hills (HH) #3 Wastewater Pumping Station (WWPS) / 7553 – Eighth Line Trunk Sewer) (Region IPFS ID 3863)
- Halton Hills (HH) #4 WWPS at intersection of Steeles Avenue and Winston Churchill Boulevard (Region IPFS ID 3864)
- Wastewater forcemain on Steeles Avenue from HH #4 WWPS to wastewater main on Steeles Avenue, east of Ninth Line (Region IPFS ID 3865)
- Wastewater main on Steeles Avenue from East of Ninth Line to Winston Churchill Boulevard (outletting to HH#4 WWPS) (Region IPFS ID 4648)

Significant Wastewater Projects (2017-2031):

- Georgetown Eighth Line/Trafalgar Trunk Sewer (Region IPFS ID 6569/7550, 6572/7552, 6573/7553, 6574/7554, 6575/7555, 6576/7529, 6577/7530)
- Decommissioning of Halton Hills #3 WWPS and connection to new Eighth Line trunk sewer and conversion of site to septage receiving facility (Region IPFS ID 6508)

2.2.5 Ongoing Halton Region Servicing Studies

Halton Region is currently completing projects that will support the future update of the Region-wide water and wastewater servicing strategies. The work is ongoing and final recommendations will consider the update of the water and wastewater servicing strategies for the Town's PGEAs. Until the studies are issued as final, servicing of the Secondary Plan area will consider the approved servicing strategy and projects included in the Sustainable Halton Water & Wastewater Master Plan and 2017 Water & Wastewater Development Charges Update.

Servicing requirements outlined in this Area Servicing Plan will be considered as part of the Region's updated servicing strategy for the area.

2.2.5.1 Wastewater Pumping Station Servicing Strategy Update

Halton Region is currently undertaking a Wastewater Pumping Station Servicing Strategy Update. The outcomes of this project will ultimately be incorporated in Halton Region's future infrastructure planning studies such as the upcoming Water and Wastewater Master Plan Update. The study primarily considers opportunities for WWPS related capital projects that will result in lower life-cycle costs and reduced energy consumption.

The study is considering the planned Halton Hills #4 WWPS and finalized recommendations from the Wastewater Pumping Station Servicing Strategy Update will be incorporated into the Region's future Master Plan Update project.

2.2.5.2 Halton Region Integrated Growth Management Strategy

Halton Region is currently completing an Integrated Growth Management Strategy (IGMS) Study as part of the Regional Municipal Comprehensive Review (including Halton's Official Plan review). The Study is currently considering alternative planning scenarios with focus on growth in alternative areas across Halton Region.

Growth management within the Future Strategic Employment Areas north of HH PGEA P2B lands and generally surrounding the GTA West Transportation Corridor Preferred Route is included as part of the Study. Various densification and greenfield expansion scenarios are being considered as part of the Study's four growth concepts. Servicing potential is a primary consideration for the Growth Concepts Employment Areas.

GMBP is supporting Halton Region's IGMS study, undertaking the review of water and wastewater servicing requirements. GMBP have completed a review of the water and wastewater servicing opportunities and constraints for alternative Growth Concepts, including review of impacts of projected growth to 2041 and 2051 on existing and approved future water and wastewater infrastructure; and high-level servicing needs to meet 2041 and 2051 growth.

At this stage of the Study, a preferred growth concept has been developed. GM BluePlan has identified servicing needs based on the preferred growth concept to meet 2041 and 2051 growth and completed a cost analysis of potential water and wastewater capital improvements. Servicing requirements to support the preferred growth concept will be updated as the Strategy is finalized,

and the final recommendations will support Halton Region's Official Plan review and the supporting servicing studies will support the Region's future Master Plan update project.

2.2.5.3 2022 Water and Wastewater Development Charges Update

Halton Region is currently completing the background studies in support of the 2022 Development Charges By-Law. The Water and Wastewater Background Study in support of the 2022 DC Update is being completed by GM BluePlan, based on the Sustainable Halton Water and Wastewater Master Plan and has updated cost estimates and capital implementation timing for water and wastewater projects to service Halton Region growth from 2023 to 2031.

As part of the 2022 DC Update work, the 2012 and 2017 Water and Wastewater DC Background Studies were reviewed with focus on the following key elements:

- Re-assessing existing and future water and wastewater system capacities;
- Comparing actual growth uptake with planned theoretical growth projections;
- Identifying opportunities to further optimize water and wastewater system infrastructure; and,
- Validating the long-range Water and Wastewater Development Capital Implementation Plan to 2031 (i.e. project scope, timing, and cost) as identified in the 2011 Master Plan and refined through the 2017 DC Update Technical Report.

The Final 2022 Development Charges Update Water/Wastewater Technical Report was submitted to Halton Region in September 2021.

3 Land Use and Planning Projections

3.1 Land Use

3.1.1 Existing

The existing land use within the PGEA P2B study area currently consists of largely vacant lands, agricultural lands and a few areas of commercial and residential uses. Most commercial properties are located along Steeles Avenue, while residential rural areas are located along Steeles Avenue, Eighth Line, Ninth Line, Tenth Line and Winston Churchill.

3.1.2 Future

The objective of the PGEA is to ensure the availability of land to accommodate projected employment growth and support the Town of Halton Hills' and Halton Region's economy. The PGEA contains areas that are designated as Prestige Industrial Area with the intention to form an economically competitive and attractive employment area. PGEA P2B has been identified as a Provincially Significant Employment Zone.

The preferred land use concept is shown in Figure 3-1.

The permitted uses within this area will be limited to mainly employment such as industrial uses, business and professional offices, and some other facilities that do not cause or are not likely to cause air pollution, offensive odours, ground or water pollution, or noise in excess of current regulations.

The Supportive Commercial Area located northwest of the intersection of Steeles Avenue West and Winston Churchill Boulevard is anticipated to include facilities such as restaurants, gyms, etc.

The Residential Special Policy Areas represent the existing concentration of rural residential developments, which are unlikely to redevelop in the short term for employment uses.

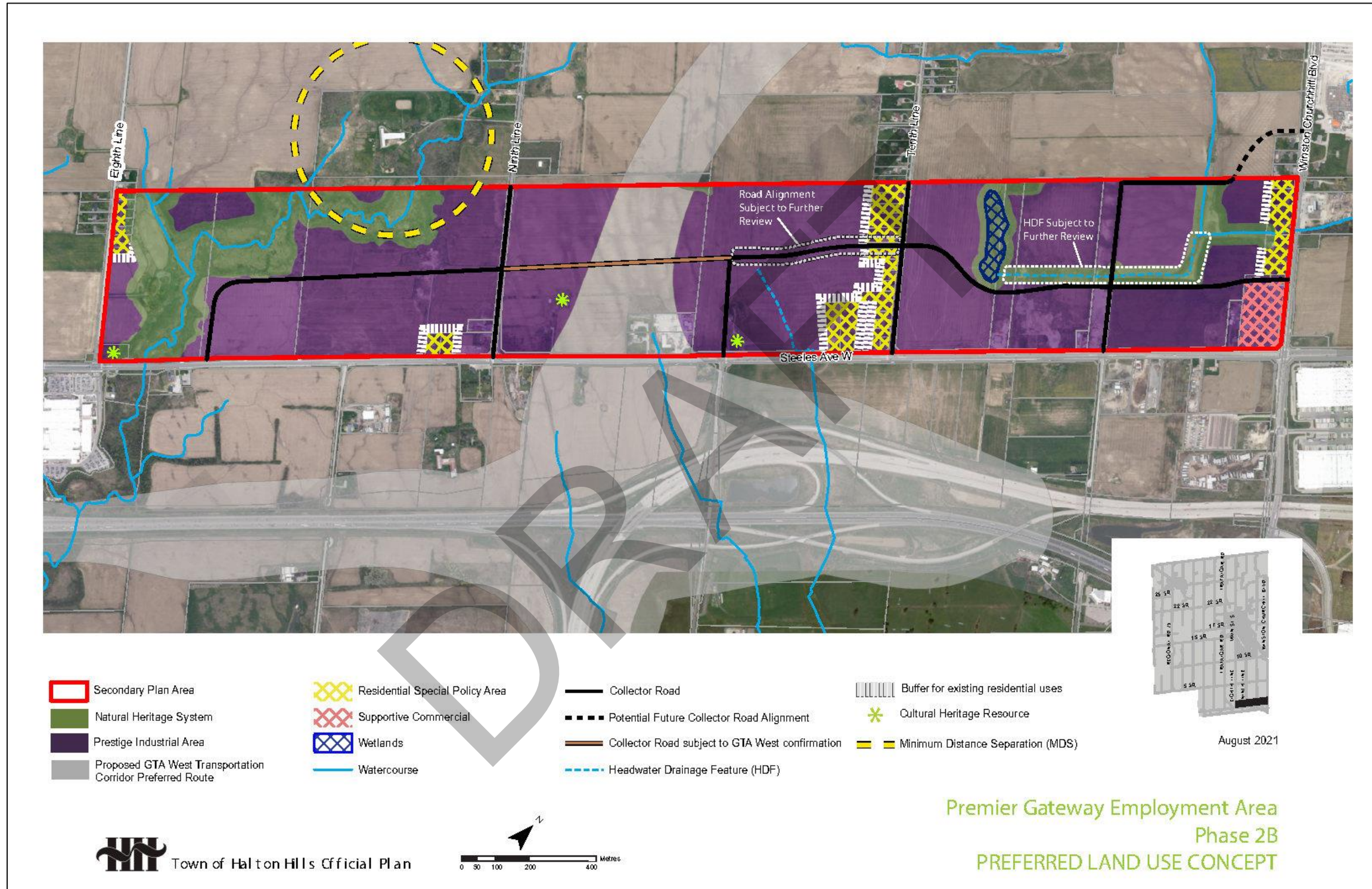


Figure 3-1: Preferred Land Use Concept

3.2 Planning Estimates and Growth Assumptions

3.2.1 Best Planning Estimates (BPEs)

Halton Region Best Planning Estimates (BPEs) Data from June 2011 are generally used to determine the current and future water and wastewater servicing needs in Halton Region. This data is geographically distributed by Traffic Survey Zone (TSZ) and Small Geographic Units (SGUs) and contains approved population and employment projections for Halton Region up to the year 2031 consistent with Halton Region's Official Plan.

Figure 3-2 shows the SGUs associated with the PGEA P2B Water and Wastewater Area Servicing Plan.

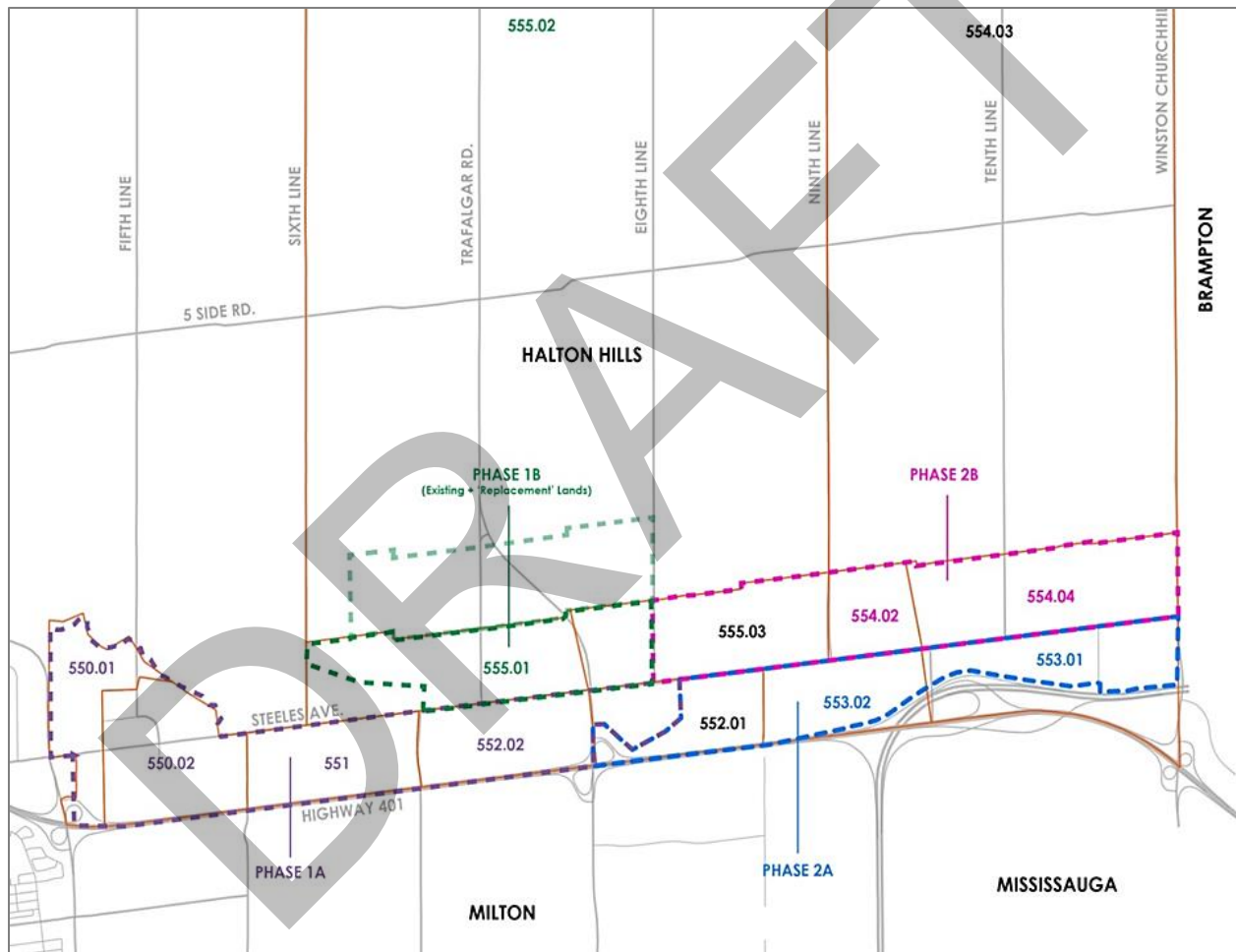


Figure 3-2: Premier Gateway Employment Area Phases & SGU Boundaries

3.2.2 Premier Gateway Employment Area Phase 2B Secondary Plan Area - Growth Assumptions

For the P2B lands located within the Urban Area, the planning forecasts provided by Halton Region were based on the 2011 Best Planning Estimates (BPEs) consistent with the SHWWMP. The PGEA P2B SGU growth projections are summarized in Table 3-1.

Table 3-1: PGEA P2B Secondary Plan Employment Growth Projections (Halton Region)

PGEA P2B SGU	2031 Projections				
	Res	Com	Ind	Ins	Total Employment
554.02	0	189	857	29	1,075
554.04	99	480	2,056	338	2,874
555.03	41	332	1,289	45	1,665
Total	140	1,001	4,202	412	5,614

Growth projections for the area were updated in support of the PGEA P1B ASP completed by Halton Region. The PGEA P1B ASP growth projections considered the impact of the potential GTA West Highway Corridor and the reallocation of growth from SGU 554.02 (where the potential GTA West Corridor will intersect) to replacement lands within SGU 555.01 located within the P1B lands.

3.2.3 Town of Halton Hills Projections

Employment targets for the P2B lands continue to be developed as part of the Secondary Plan. The P2B lands were previously frozen for development as the Greater Toronto Area (GTA) West Class Environmental Assessment (EA) process was progressed. The Class EA has progressed to a point where a Secondary Plan can be commenced for the area of the P2B lands will not be required for the transportation corridor and will be released for development.

Employment forecasting completed as part of the economic study in support of the Secondary Plan (completed by Watson Associates Ltd.) anticipated an employment density of 25 jobs per net hectare. The calculated net area discounted the environmental features (and the potential for restricted development within the GTA West Corridor Focused Analysis Area). The economic study assumed that 80% of the gross developable area will be developable.

The economic study employment forecasting growth projections are shown in Table 3-2.

Table 3-2: PGEA P2B Secondary Plan Employment Growth Projections (Secondary Plan Economic Study)

PGEA P2B SGU	2031 Projections		
	Gross Developable Area (Excluding Environmental Features and GTA West Corridor)	Net Developable Area (80% of Gross Developable Area)	Total Employment (@ 25 jobs per net hectare)
SGU 554.02			
Excluding GTA West Corridor Lands	56.4 Ha	45.1 Ha	1,128
GTA West Corridor Lands within 554.02 (If released for Development)	21.9 Ha	17.5 Ha	438
Total SGU 554.02 (Including GTA West Corridor)	78.3 Ha	62.7 Ha	1,566
SGU 554.04	56.6 Ha	45.2 Ha	1,132
SGU 555.03	43.6 Ha	34.9 Ha	872
SGUs Total	178.5 Ha	142.8 Ha	3,570

The Region's total growth projections for the PGEA 2B area are more than 50% greater than the growth projections based on Watson's economic study (5,614 compared to 3,570).

Consideration for growth projections for the area will be focused on the impacts related to P2B lands and phasing of development to meet the Town of Halton Hills planned and anticipated timelines. Long-term servicing for the larger area is being addressed as part of the Regional Municipal Comprehensive Review and the subsequent Halton Region Water and Wastewater Master Plan.

The ASP has considered servicing based on the more conservative (higher total growth projections) established by the Region. The Region's BPEs have been adopted as part of previously approved planning and servicing studies and remain the approved planning projections for the area.

Total employment projections will be included as part of the final Secondary Plan.

4 Water

4.1 Existing Water System

Three (3) water treatment plants provide potable water for Halton Region's lake-based service areas: Burlington WTP, Oakville WTP and Burloak WTP. Halton Region's water transmission and distribution network is interconnected throughout Burlington and Oakville; however, the Oakville WTP and Burloak WTPs are the main supply sources to the Milton/Halton Hills lake-based area. PGEA P2B lies predominantly within the existing Milton Zone 5 (M5L) pressure zone whose boundaries have recently been reviewed.

Reference maps from the Sustainable Halton Water and Wastewater Master Plan Update, including Halton Region's existing water infrastructure (at the time of issue of the Sustainable Halton Report) and existing pressure zones are included in Appendix A.

4.1.1 PGEA Area

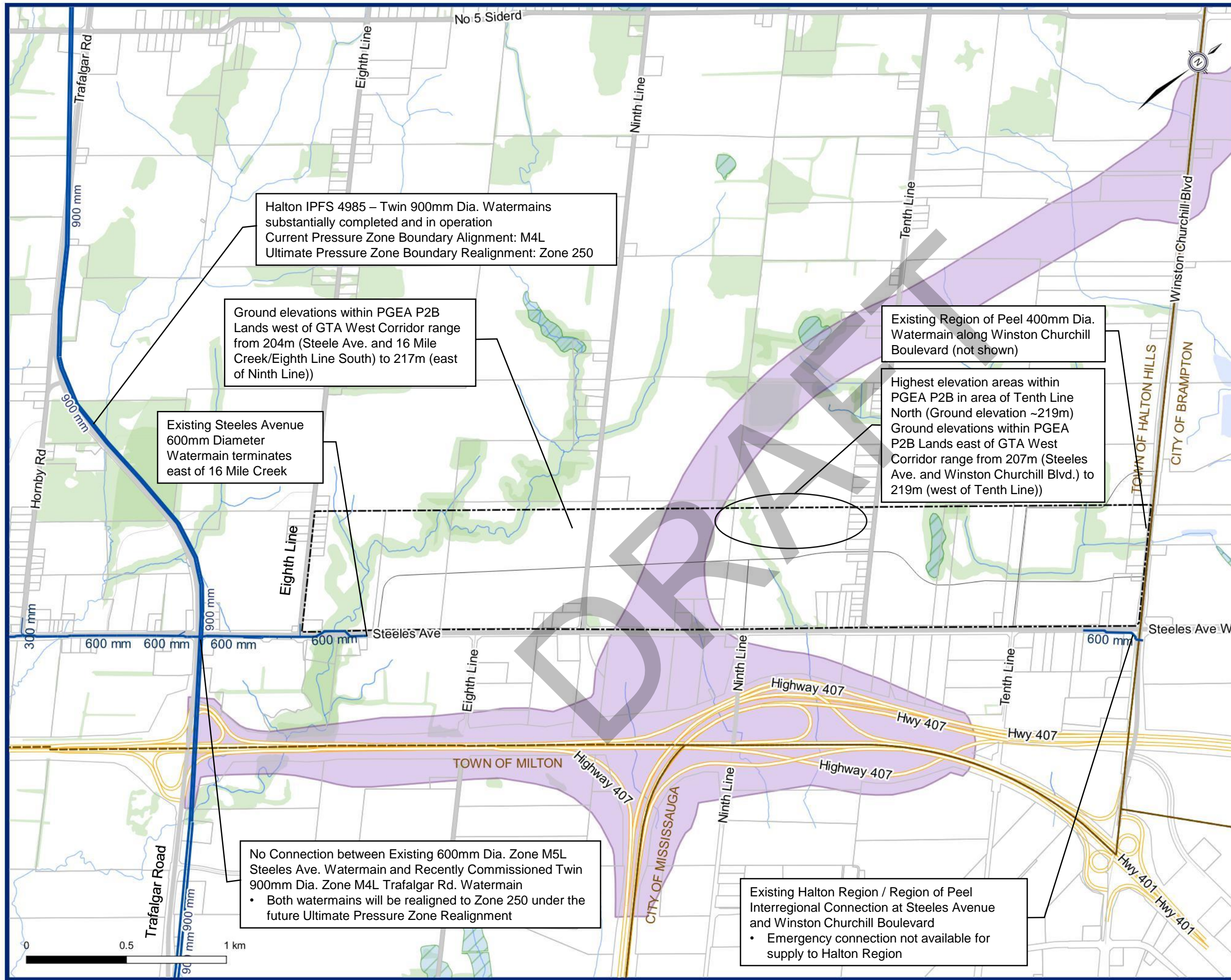
Currently the area is serviced from the west via an existing 600mm diameter trunk watermain running along Steeles Avenue (from James Snow Parkway). Additionally, there is an emergency regional interconnect with Peel at Steeles Avenue and Winston Churchill Boulevard. The Region of Peel has an existing 400mm diameter watermain running north along Winston Churchill Boulevard. The current supply to the PGEA P2B area is effectively the 5 km long single dead-end feed running along Steeles Avenue from James Snow Parkway.

Within the area of the PGEA, Zone M4L 900mm diameter watermain along Trafalgar Road to the new Zone 4 Reservoir have recently been commissioned. Existing water infrastructure in the area of the PGEA P2B lands is shown in Figure 4-1.



Water & Wastewater Area Servicing Plan
for the Premier Gateway Phase 2B

- Water Infrastructure**
- Pumping Station (PS)
 - Storage
 - Treatment
 - Feeder Main (Diameter >= 400mm)
 - Local Watermain (Diameter < 400mm)
- General Features**
- Premier Gateway Phase 2B
 - Highway
 - Major Road
 - Local Road
 - Property Parcel
 - Municipal Boundary
 - Preferred Route and Interchange Locations for GTA West Transportation Corridor Study



Halton IPFS 4985 – Twin 900mm Dia. Watermains substantially completed and in operation
Current Pressure Zone Boundary Alignment: M4L
Ultimate Pressure Zone Boundary Realignment: Zone 250

Ground elevations within PGEA P2B Lands west of GTA West Corridor range from 204m (Steele Ave. and 16 Mile Creek/Eighth Line South) to 217m (east of Ninth Line))

Existing Steeles Avenue 600mm Diameter Watermain terminates east of 16 Mile Creek

Existing Region of Peel 400mm Dia. Watermain along Winston Churchill Boulevard (not shown)

Highest elevation areas within PGEA P2B in area of Tenth Line North (Ground elevation ~219m)
Ground elevations within PGEA P2B Lands east of GTA West Corridor range from 207m (Steeles Ave. and Winston Churchill Blvd.) to 219m (west of Tenth Line))

No Connection between Existing 600mm Dia. Zone M5L Steeles Ave. Watermain and Recently Commissioned Twin 900mm Dia. Zone M4L Trafalgar Rd. Watermain
• Both watermains will be realigned to Zone 250 under the future Ultimate Pressure Zone Realignment

Existing Halton Region / Region of Peel Interregional Connection at Steeles Avenue and Winston Churchill Boulevard
• Emergency connection not available for supply to Halton Region

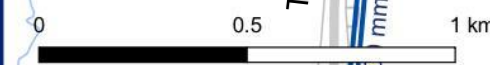


Figure 4-1
Existing Water System

4.2 Planned Water System

4.2.1 Ultimate Pressure Zone Boundary Realignment

Due to existing and potential future level of service challenges, Pressure Zones 3, 4 & 5 boundaries have recently undergone extensive review. This review and analysis have resulted in the recommendation to realign the pressure zones boundaries within the existing Oakville and Milton Zones 3, 4 & 5. New pressure zones will be created and will be referred to based on their proposed top water level (TWL). These zones are 211 m, 223.5 m and 250 m. The boundaries for Milton Zone M5L (TWL 267 m) have also been modified. The PGEA P2B study area generally lies at the lower elevations within the existing M5L pressure zone where high pressures can occur during certain conditions. Upon commissioning of the Ultimate Pressure Zone Boundaries Realignment, the study area will lie completely within pressure zone TWL 250 m.

The existing and future pressure zone of the HH PGEA P2B lands is summarized in Table 4-1.

Table 4-1: HH PGEA P2B Lands Existing and Future Water Pressure Zone

Existing Pressure Zone	Future Pressure Zone (After Commissioning of Halton Region Ultimate Pressure Zone Boundary Realignment)
Zone M5L	Zone 250

Several areas along Steeles Avenue within or in proximity of the PGEA are currently being serviced by the existing Milton Zone M5L. A major interconnection watermain in the study area was recommended as part of the SHWWMP along Trafalgar Road to connect the existing lake-based water system to the new Zone 250 m reservoir. The Zone 250 m reservoir will service the future growth in pressure Zone 250 m, including the developments in the PGEA. Additionally, some distribution watermains have been proposed to service the growth in the Milton/401 corridor as part of the SHWWMP and the 2017 DC Update.

The reference map from the Sustainable Halton Water and Wastewater Master Plan Update, showing Halton Region's Ultimate Pressure Zone Boundary Realignment is included in Appendix A.

4.2.2 Pumping and Storage

The proposed Zone 250 400mm diameter watermain running along Hornby Road between Trafalgar Road and Steeles Avenue (in Halton Region's current capital program (Region IPFS 6641)) will provide the area with additional security of supply. The proposed Hornby Road watermain will connect the existing Steeles Avenue watermain with the Zone 250 900mm diameter trunk watermain running along Trafalgar Road. This will provide the area with additional supply from Neyagawa BPS and the new Trafalgar Road Zone 4 / Zone 250 Reservoir.

Halton Region has identified a potential water storage deficiency within the future Zone 250 that will service PGEA P2B lands. Halton Region continues to monitor the demand projections for the pressure zone. The potential deficiency will be addressed through the on-going Regional Municipal Comprehensive Review and the next Water and Wastewater Master Plan. Future water storage requirements estimated as part of work completed to support Halton Region's 2017 Development Charges Background Study are summarized in Table 4-2.

Table 4-2: Future Water Storage Requirements

Pressure Zone Service Area	Total Storage Requirement (ML)			Planned Available Storage (ML)	Related Infrastructure
	2021	2026	2031	2031	
250, 223.5, 211	30.6	38.3	46.0	45.0	Zone 4 Reservoir

Taken from Table 10 – Future Water Storage Requirements, Technical Memorandum #2 – Baseline and Future Capacity, Opportunities and Constraints, prepared for Halton Region by GM BluePlan Engineering Limited, April 2017.

It is not expected that the potential Zone 250 storage deficiency will impact the servicing timing for the P2B lands. Required storage for development phasing of the P2B lands will be reviewed compared to available storage capacity, and the P2B lands phasing plan will outline the servicing of planned development within the anticipated timeframe and within the context of Halton Region’s proposed water servicing to the area.

4.2.3 Region’s Timing and Development Charges Projects

Table 4-3 summarizes Halton Region’s planned water infrastructure projects for the area with timing.

Table 4-3: Halton Region Area Water Projects

Region Project ID	Project Description	Timing	Timing Reference	Pressure Zone	
				Current Pressure Zone Boundary Alignment	Ultimate Pressure Zone Boundary Realignment
3844	600 mm Zone M5L WM on Steeles Ave. from Trafalgar Rd. to East of Ninth Line	Funded, but not constructed	Funded Project – Construction delayed (Region considering GTA West Corridor requirements)	M5L	250
5948	600mm Zone M5L WM on Steeles Ave. from East of Ninth Line to Peel Interregional Connection at Winston Churchill Boulevard	Funded, but not constructed		M5L	250
4985	900 mm WMs on Trafalgar Rd from Britannia Rd to new Zone 4 Reservoir (Zone M4L / Zone 250)	Substantially completed and in service		M4L	250
6641	400 mm WM on Hornby Rd. from Steeles Ave to Trafalgar Rd.	2025	2019 Budget and Business Plan (Development Capital Plan)	-	250

Region Project ID	Project Description	Timing	Timing Reference	Pressure Zone	
				Current Pressure Zone Boundary Alignment	Ultimate Pressure Zone Boundary Realignment
6642	400 mm WM in the 401 growth corridor north of Steeles from Hornby Rd. to Trafalgar Rd.	2025		-	250
6643	400 mm WM in the 401 growth corridor north of Steeles from Trafalgar Rd to approximately 400m east of 8th Line	2025		-	250
6644	400mm WM in the 401 growth corridor from Steeles Ave to approximately 300 m north	2025		-	250
6645	400mm WM in the 401 growth corridor north of Steeles Ave. from 1,000 m west of 9th Line to 900 m east of 9th Line	2029	2017/2022 Development Charges Water/Wastewater Technical Report	-	250
6646	400mm WM in the 401 growth corridor from Steeles Ave to approximately 330 m north	2029		-	250
6647	400mm WM in the 401 growth corridor north of Steeles Ave. from 600 m west of 10 th Line to 1,000 m east of 10th Line	2029		-	250
6648	400mm WM in the 401 growth corridor from Steeles Ave to 340 m north	2029		-	250

Halton Region Project 3844 – 600mm diameter transmission watermain running along Steeles Avenue was funded and carried forward to detailed design in 2013/2014. Design of the project was suspended after implementation of the corridor protection area and policies to protect for the Halton Peel Boundary Area Transportation Study (now the GTA West Corridor Study) and adoption of ROPA 43 (discussed further in Section 2.2.1).

The existing system and planned water projects for the area are shown in Figure 4-2.

The reference map from Halton Region’s 2017 Development Charges Water and Wastewater Technical Report, showing Halton Region’s Water Development Capital Implementation Plan (2017-2031) is included in Appendix A.



Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B

- Water Infrastructure**
- Pumping Station (PS)
 - Storage
 - Treatment
 - Feeder Main (Diameter >= 400mm)
 - Local Watermain (Diameter < 400mm)

- General Features**
- Premier Gateway Phase 2B
 - Highway
 - Major Road
 - Local Road
 - Property Parcel
 - Municipal Boundary
 - Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

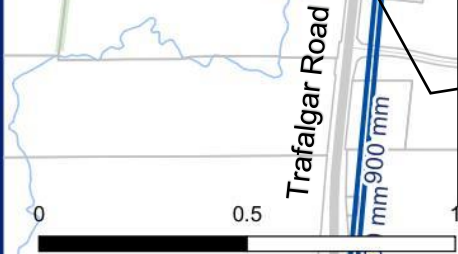
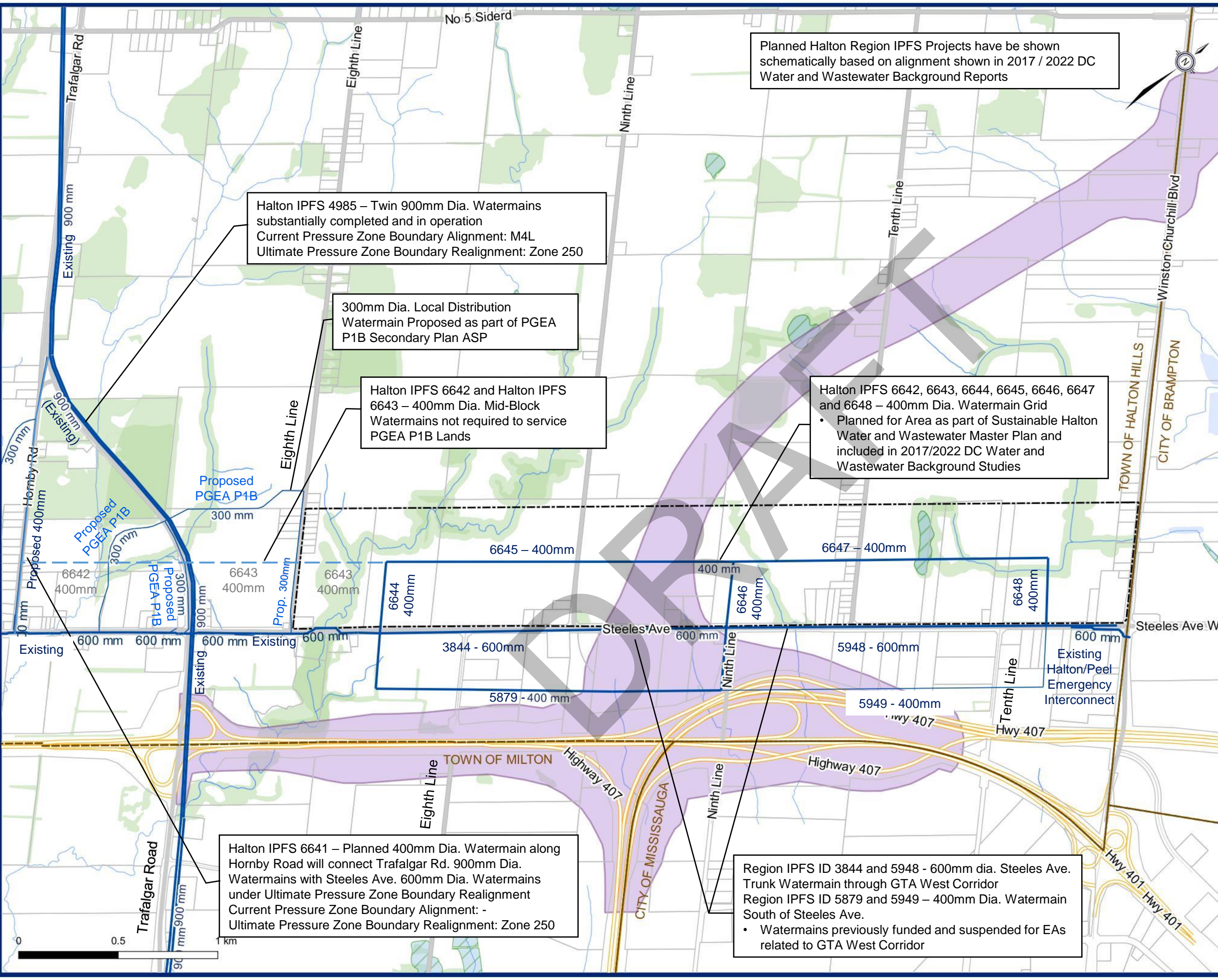
Planned Halton Region IPFS Projects have been shown schematically based on alignment shown in 2017 / 2022 DC Water and Wastewater Background Reports

Halton IPFS 4985 – Twin 900mm Dia. Watermains substantially completed and in operation
Current Pressure Zone Boundary Alignment: M4L
Ultimate Pressure Zone Boundary Realignment: Zone 250

300mm Dia. Local Distribution Watermain Proposed as part of PGEA P1B Secondary Plan ASP

Halton IPFS 6642 and Halton IPFS 6643 – 400mm Dia. Mid-Block Watermains not required to service PGEA P1B Lands

Halton IPFS 6642, 6643, 6644, 6645, 6646, 6647 and 6648 – 400mm Dia. Watermain Grid
• Planned for Area as part of Sustainable Halton Water and Wastewater Master Plan and included in 2017/2022 DC Water and Wastewater Background Studies



Halton IPFS 6641 – Planned 400mm Dia. Watermain along Hornby Road will connect Trafalgar Rd. 900mm Dia. Watermains with Steeles Ave. 600mm Dia. Watermains under Ultimate Pressure Zone Boundary Realignment
Current Pressure Zone Boundary Alignment: -
Ultimate Pressure Zone Boundary Realignment: Zone 250

Region IPFS ID 3844 and 5948 - 600mm dia. Steeles Ave. Trunk Watermain through GTA West Corridor
Region IPFS ID 5879 and 5949 – 400mm Dia. Watermain South of Steeles Ave.
• Watermains previously funded and suspended for EAs related to GTA West Corridor

Figure 4-2

Planned Region Water Projects



4.3 Estimated Water Demands

4.3.1 Design Criteria

For the PGEA P2B ASP the recommendation is to use the design criteria developed for the Region's 2017 DC Update (also used for the Region's 2022 DC Update). The 2017/2022 DC Update Design Criteria is the best information available, developed based on a comprehensive review of the water and wastewater design criteria using 2011-2015 demand and flow data and updated estimates of actual population and employee numbers based on the 2011 census. At the time of the DC Update, Halton Region expressed that the revised criteria were representative of existing and ongoing system measures to reduce lost water and I/I (which will offset the need to upsize trunk infrastructure).

The recommended design criteria for the PGEA P2B proposed water demands is summarized in Table 4-4.

Table 4-4: Water Design Criteria

Design Criteria	Design Criteria	Design Criteria Reference
Residential	265 lpcd ¹	Based on Design Criteria from the 2017 DC Update
Industrial	295 lpcd	Based on Design Criteria from the 2017 DC Update
Commercial	175 lpcd	Based on Design Criteria from the 2017 DC Update
Institutional	220 lpcd	Based on Design Criteria from the 2017 DC Update
Max Day (lake based) PF	1.9	Based on Design Criteria from the 2017 DC Update
Peak Hour PF	3	Based on Design Criteria from the 2017 DC Update

¹lpcd refers to litres per capita per day.

Similar to recommendations for the PGEA P1B ASP completed for Halton Region, it is recommended that industrial design criteria be applied for the projection of employment water demands (as well as wastewater flows) throughout the study area. This a conservative and reasonable approach that provides flexibility with regards to the future employment development in the study area. This also provides for a consistent design criteria approach applied to all PGEAs simplifying future comparison and allocation considerations.

Design criteria for water system components is summarized in Table 4-5.

Table 4-5: Water Design Criteria for Water System Components

Component	Design Criteria	
Feeder mains	Flow capacity	Convey maximum day demand while achieving water velocity requirements
Local Water mains	Flow capacity	Convey the greater of: <ul style="list-style-type: none"> • Maximum day demand plus fire flow demand, or • Peak hour demand while achieving water velocity requirements
Pumping Stations	With adequate zone storage available	Supply maximum day demand to zone and all subsequent zones

Component	Design Criteria	
	Without adequate storage available	Supply peak hour demand to zone and maximum day demand to all subsequent zones
Storage Facilities	Equalization (A)	25% of maximum day demand
	Fire (B)	Largest expected fire in zone (based on land use)
	Emergency (C)	25% of (A + B)
	Total Volume	= A + B + C
Fire Flow	Residential Flow	5,500 L/min for 2 hours @ minimum 140 kPa (20 psi)
	Minimum Employment Flow (Industrial / Commercial / Institutional)	15,000 L/min for 3 hours @ minimum 140 kPa (20 psi)
System Pressures	Minimum and maximum operating conditions	280 kPa (40 psi) to 700 kPa (100 psi)

For pressure zones with sufficient storage volume, water supply requirements are based on the maximum day demands (MDD). For pressure zones without floating storage, water supply requirements are based on peak hour demands. Transmission mains are required to convey the total pumping capacity of the receiving pumping station and the upper zone reservoir.

4.3.2 Water Demands

Consistent practice in the SHWWMP and 2017 DC Update is to develop water demands using existing conditions + growth demands. Existing conditions plus growth demands have been developed for the PGEA P2B lands based on the Region's updated planning projections.

As noted in Section 3.2.3, the employment targets for the P2B lands, developed as part of the Secondary Plan's supporting economic study, anticipate growth less than the Region's BPEs. The ASP has considered servicing based on the more conservative (higher total growth projections) established by the Region. The Region's BPEs have been adopted as part of previously approved planning and servicing studies and remain the approved planning projections for the area. Total employment projections will be included as part of the final Secondary Plan.

Long-term servicing for the area for projected growth from 2041 to 2051 is being addressed as part of the Regional Municipal Comprehensive Review, including development of Halton Region's Integrated Growth Management Strategy and the subsequent Halton Region Water and Wastewater Master Plan. The findings of the PGEA P2B ASP will support Halton Region's Municipal Comprehensive Review and MP Update projects.

4.4 Water Servicing Review and Needs Assessment

Assessment of the existing water system included review of existing GIS asset data, current Halton Region water model and most recent available design and construction drawings. Hydraulic modelling was undertaken to assess preliminary water infrastructure demand and capacity.

4.5 Development of the Proposed Water Servicing Strategy

The water servicing strategy in support of the Secondary Plan was developed based on supplying water to the PGEA P2B area under the current zone alignment (study area located within Zone M5L) as well as under the proposed zone realignment (study area located within Zone 250).

Per Halton Region's current Development Capital Program, the ultimate pressure zone boundary realignment is anticipated to be completed within the same timeframe as development of the PGEA P2B lands. Based on this, two scenarios were considered:

1. Current Pressure Zone Boundary Alignment; and,
2. Ultimate Pressure Zone Boundary Realignment.

Consideration of full development of the PGEA P2B lands under both zone boundary configurations ensures that development can proceed independent of the Ultimate Pressure Zone Boundary Realignment.

The proposed water servicing strategy was developed to meet the operational and fire flow requirements within the PGEA P2B lands and provide flexibility to:

- Be effectively incorporated into a future Region Master Plan water servicing update for the area; and,
- Meet the short-term needs of anticipated development within the area.

Supply and transmission to the area will be updated as part of the Region's upcoming Water and Wastewater Master Plan Update. Water servicing of the area to the 2051 horizon will need to further consider inclusion of Future Strategic Employment Area lands north of the PGEA, and the potential GTA West Corridor.

Future Strategic Employment Area lands located north of the PGEA do not have land use designations and inclusion of lands within the Future Strategic Employment Areas into the Urban Area is to be completed through a municipal comprehensive review.

Servicing to the small development areas located in the northwest portion of PGEA P2B (north of the designated Natural Heritage System between Eighth Line and Ninth Line) will require watermain crossings of environmental features or servicing along north limit of Secondary Plan area. It is anticipated that 3.5 Ha of development area within the northwest will require development of Future Strategic Employment Areas to the north to support the construction costs of water (and wastewater) infrastructure crossing the environmental features to service the projected 70 to 175 jobs for the areas.

4.5.1 Proposed Water Servicing Strategy

It is anticipated that development timing will proceed ahead of Region construction of transmission watermains and the opportunity to construct water (and wastewater) servicing to the area through Developer front-ended servicing agreements.

Halton Region currently has a policy to allow the Regional development-related projects to be designed and constructed by the development industry which may result in the construction of a project that was not identified in the current or prior years' capital budget. This policy can provide for enhanced coordination of Region to local watermain connections.

Council approval is required in the event that Regional funding is not available in the current capital budget. The developer will be required to enter into an agreement with Halton Region and initially fund and secure the work(s) and the developer will not be reimbursed (up to the upset limit identified in the agreement) until the budget is approved and the financing is available under an approved Halton Region financing plan.

The proposed servicing strategy incorporates the following infrastructure recommendations:

Under Current Pressure Zone Boundary Alignment (Prior to Commissioning of Ultimate Pressure Zone Boundary Realignment)

Under the current pressure zone alignment (PGEA P2B within Zone M5L):

- Supply from the proposed Zone M5L 600mm diameter watermain running along Steeles Avenue; and,
- Two (2) 400mm diameter watermains running along Ninth Line and Tenth Line north, supplied by the proposed 600mm diameter Steeles Avenue watermain.
- One (1) 400mm diameter watermain running along the proposed PGEA P2B Collector Road from the proposed Ninth Line 400mm diameter watermain to the proposed Tenth Line 400mm diameter watermain.

The proposed 600mm diameter transmission watermain running along Steeles Avenue supplying the proposed 400mm diameter watermain loop running along Ninth Line, the Proposed Collector Road and Tenth Line is essential to provide sufficient available fire flow to the Employment Lands located near Tenth Line, north of the Proposed Collector Road.

The proposed watermains can be constructed as components of the DC projects for the area. A watermain crossing of the potential GTA West Corridor will be required to provide security of supply and sufficient available fire flow to the PGEA P2B lands located near Tenth Line in the north portion of the Study Area. The ultimate alignment/corridor for the watermain crossing of the GTA West Corridor is flexible and can be aligned with future road alignment through the study area or at the north limit of the PGEA P2B lands. The 400mm diameter watermain will be required to be constructed at sufficient depth under the potential MTO corridor and any future highway structures footings (typically 5 metres or greater), and design and construction can be coordinated with MTO to allow for construction of the watermain to proceed ahead of a future highway.

The proposed 400mm diameter servicing loop running along Ninth Line, the Proposed Collector Road and Tenth Line allows for flexibility of future Region transmission watermain alignments. The updated servicing strategy for the area can include future extension of transmission watermain to the north, which can include a north/south crossing of the GTA West Corridor along Tenth Line (within the Future Strategic Employment Areas) – or other configurations to suit development for the broader area to 2051.

The planned 600mm diameter and 400mm diameter watermain crossings of the GTA West Corridor can be relocated further to the north to accommodate development phasing and planning approvals (for both the GTA West Corridor and Future Strategic Employment Lands located north of the PGEA P2B lands) as well as constructability considerations for watermain crossings of a potential GTA West Corridor highway. The watermain crossings of the GTA West Corridor will be required to supply sufficient available fire flow to lands within the PGEA P2B Study Area located east of the GTA West Corridor. To meet the servicing requirements of these lands, ultimate alignment of the planned trunk watermain crossings will need to be further considered in

coordination with the GTA West Corridor study and design (as well as part of the Region's Water and Wastewater Master Plan Update). The Proposed Water Servicing Strategy provides for flexibility of the ultimate location and alignment of the trunk water mains crossing the GTA West Corridor. Phasing of the proposed water servicing strategy is detailed further in Section 6.2.

After Commissioning of Ultimate Pressure Zone Boundary Realignment

After commissioning of the Ultimate Pressure Zone Boundary Realignment, the Steeles Avenue watermain feed into the PGEA P2B area will be supplemented by connection to the Trafalgar Road feeder mains from a future transmission watermain to be installed along Hornby Road.

4.5.2 Local Service Water mains

Local 300mm diameter watermain is proposed along the Proposed East-West Collector Road, connecting to the proposed 400mm diameter transmission main at Ninth Line and Tenth Line. This will provide the PGEA P2B area with a large diameter distribution main across the PGEA P2B area for connection of smaller diameter water mains to service future development along future internal roads or direct water service connection for larger site plan applications.

A 300mm diameter watermain running north along Eighth Line, proposed as part of the PGEA P1B, can provide service to development fronting Eighth Line.

The Winston Churchill Boulevard is an arterial corridor that already has an existing Region of Peel 400mm diameter watermain installed within the right-of-way. A proposed 300mm diameter watermain is shown running along Winston Churchill. A 300mm diameter watermain at the east limit of the PGEA P2B lands, connected to the proposed Steeles Avenue trunk watermain is required to provide security of supply to the eastern-most portion of the Secondary Plan study area. The proposed watermain, shown on Winston Churchill Boulevard, can be relocated from the arterial road to future local internal roads under Draft Plan of Subdivision to provide the area with services and security of supply and mitigate construction costs and disruption within Winston Churchill Boulevard.

Local watermain alignments and connections to the proposed DC water mains can be developed as part of future Draft Plans of Subdivision (or Zoning By-law Amendment) applications.

Halton Region does not permit service connections to water mains of 400 mm diameter or greater. Development fronting Steeles Avenue, Ninth Line and Tenth Line (and the Proposed Collector Road between Ninth Line and Tenth Line) will require connections to local watermain to service any properties in the area.

The proposed Water Servicing Solution for the PGEA P2B lands is shown in Figure 4-3.



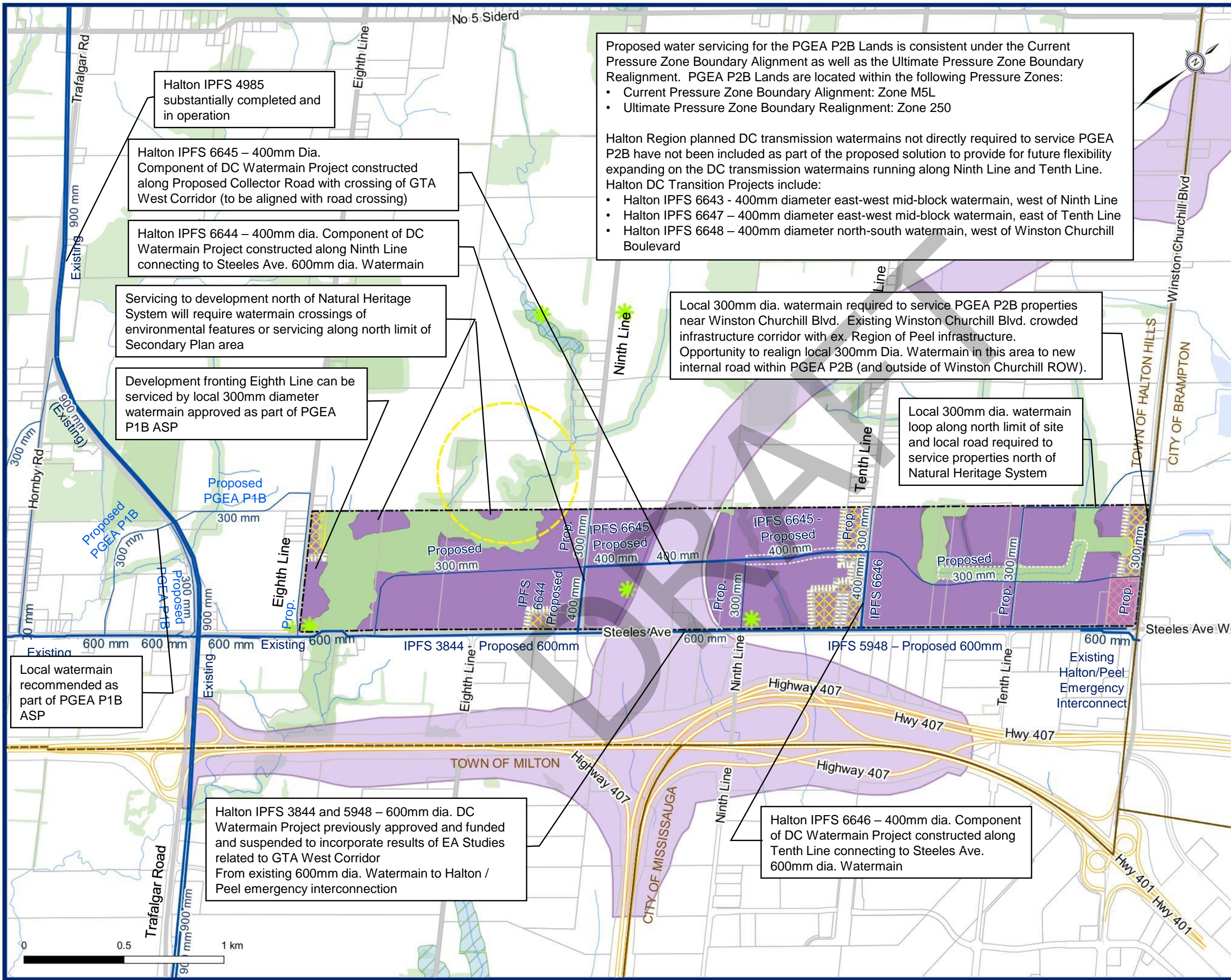
Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B

Proposed water servicing for the PGEA P2B Lands is consistent under the Current Pressure Zone Boundary Alignment as well as the Ultimate Pressure Zone Boundary Realignment. PGEA P2B Lands are located within the following Pressure Zones:

- Current Pressure Zone Boundary Alignment: Zone M5L
- Ultimate Pressure Zone Boundary Realignment: Zone 250

Halton Region planned DC transmission watermain not directly required to service PGEA P2B have not been included as part of the proposed solution to provide for future flexibility expanding on the DC transmission watermain running along Ninth Line and Tenth Line. Halton DC Transition Projects include:

- Halton IPFS 6643 - 400mm diameter east-west mid-block watermain, west of Ninth Line
- Halton IPFS 6647 - 400mm diameter east-west mid-block watermain, east of Tenth Line
- Halton IPFS 6648 - 400mm diameter north-south watermain, west of Winston Churchill Boulevard



Water Infrastructure

- ▲ Pumping Station (PS)
- Storage
- ◆ Treatment
- Feeder Main (Diameter >= 400mm)
- Local Watermain (Diameter < 400mm)

General Features

- ▭ Premier Gateway Phase 2B
- Highway
- Major Road
- Local Road
- Property Parcel
- ▭ Municipal Boundary
- ▭ Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

Preferred Land Use

- Natural Heritage System
- Prestige Industrial Area
- Residential Special Policy Area
- Supportive Commercial
- Headwater Drainage Feature
- Buffer for Existing Residential Use
- ★ Cultral Heritage Resource
- ▭ Minimum Distance Separation

Figure 4-3

Proposed Water Servicing Solution for PGEA P2B

4.5.3 Water Distribution Modelling Analysis

Halton Region's InfoWater models were utilized to analyse the servicing scheme for the PGEA P2B lands under 2031 conditions. The following scenarios will be run for the analysis of PGEA P2B:

- Maximum Day Demand (MDD);
- Peak Hour Demand (PHD); and,
- Maximum Day Demand plus Fire Flow (MDD+FF)

Model simulations were completed utilizing Halton Region's current pressure zone boundary conditions model as well as the Ultimate Pressure Zone Boundary Realignment model.

Modelling shows that operating pressures in the Study Area range from approximately 45 psi to 65 psi (elevation range for the service area is around 204m to 219m).

With anticipated looping and security of supply of proposed watermains throughout the study area, modelled available fire flow will exceed 300L/s. The water modelling results are summarized in Table 4-6.

Table 4-6: Water Modelling Results for PGEA P2B (Current and Ultimate Pressure Zone Boundary Configurations)

	Demand Condition		
	ADD	MDD	PHD
Range of Service Elevations in Block	~204m to 219m		
Current Pressure Zone Boundary Configuration (PGEA P2B in Zone M5L)			
HGL (m)	~250m	~250m	~249m
Pressure Range	44 to 64psi	44 to 64psi	42 to 62psi
Fire Flow Availability	n/a	~300L/s	n/a
Ultimate Pressure Zone Boundary Configuration (PGEA P2B in Zone 250)			
HGL (m)	~250m	~250m	~249m
Pressure Range	44 to 64psi	44 to 64psi	42 to 62psi
Fire Flow Availability	n/a	~300L/s	n/a

5 Wastewater

5.1 Existing Wastewater System

The PGEA P2B study area lies within the Mid-Halton Wastewater Treatment Plant (WWTP) catchment area. Existing wastewater flows in the study area and surrounding areas are collected through sewers along Steeles Avenue, which convey flows to two (2) sewage pump stations: Halton Hills #3 Wastewater Pumping Station (WWPS) and Halton Hills #2 WWPS. From these two stations, wastewater flows are conveyed west to Halton Hills #1 WWPS and ultimately conveyed south through a series of trunk sewers and pump stations (the Miller Way Trunk Sewer and Mid-Block WWPS) discharging at the Mid-Halton WWTP. Existing wastewater infrastructure in the area of the PGEA P2B lands is shown in Figure 5-1.

Reference maps from the Sustainable Halton Water and Wastewater Master Plan Update, showing Halton Region's existing wastewater network (at the time of issue of the Sustainable Halton Report) and existing wastewater drainage areas are included in Appendix A.

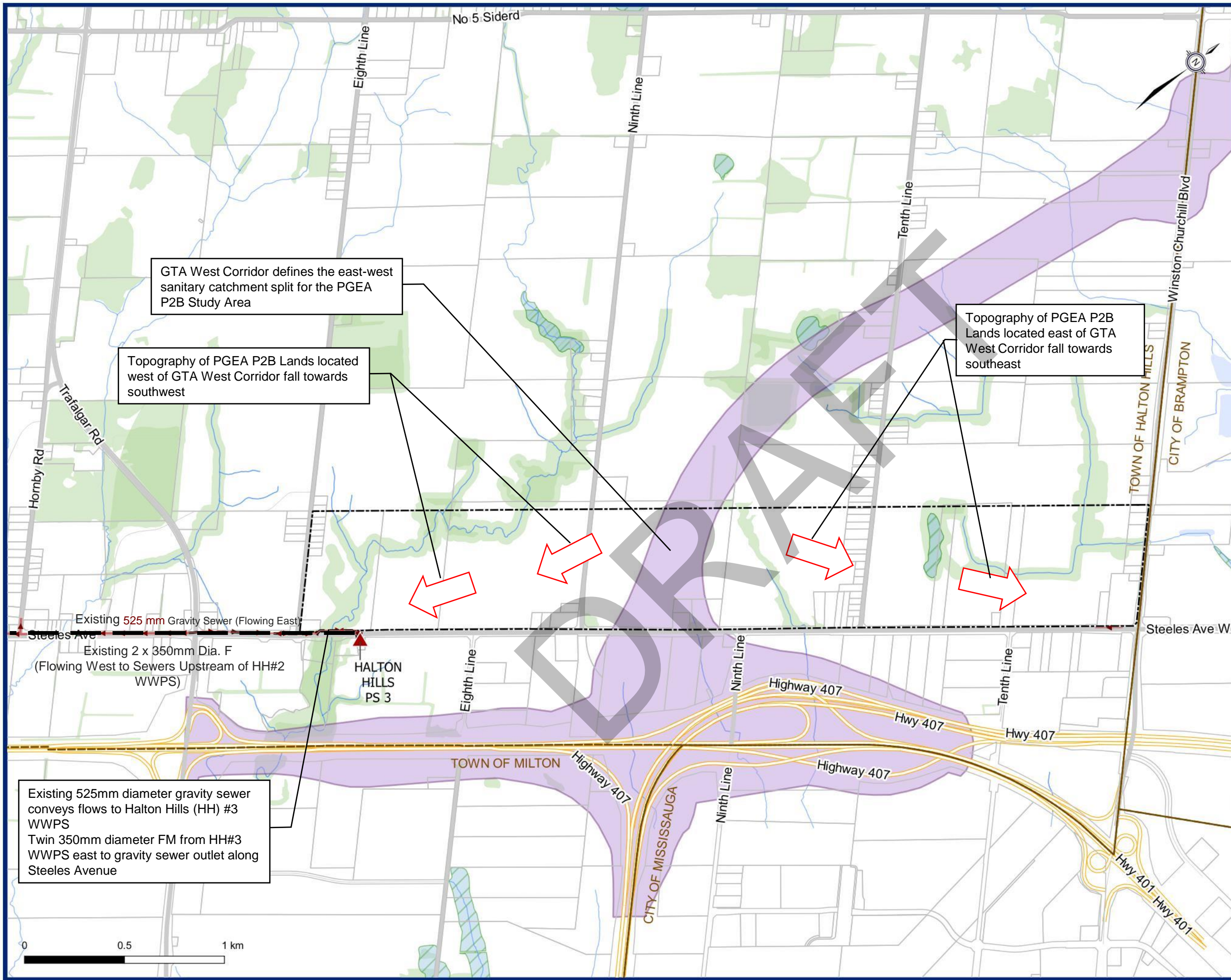
DRAFT



Water & Wastewater Area Servicing Plan
for the Premier Gateway Phase 2B

- Wastewater Infrastructure**
- Sewage Pumping Station (SPS)
 - Trunk Sewer (diameter >= 450mm)
 - Local Sewer (diameter < 450mm)
 - Forcemain

- General Features**
- Premier Gateway Phase 2B
 - Highway
 - Major Road
 - Local Road
 - Property Parcel
 - Municipal Boundary
 - Preferred Route and Interchange Locations for GTA West Transportation Corridor Study
- Direction of Existing Topography Grade (High Elevations to Low Elevations)



GTA West Corridor defines the east-west sanitary catchment split for the PGEA P2B Study Area

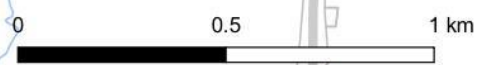
Topography of PGEA P2B Lands located west of GTA West Corridor fall towards southwest

Topography of PGEA P2B Lands located east of GTA West Corridor fall towards southeast

Existing 525mm diameter gravity sewer conveys flows to Halton Hills (HH) #3 WWPS
Twin 350mm diameter FM from HH#3 WWPS east to gravity sewer outlet along Steeles Avenue

Figure 5-1

Existing Wastewater System



Document Path: \\MAG\720000\720010 - Halton Hills Premier Gateway Phase 2B\Work in Progress\GIS and Database\720010-001 - Base Map.aprx

5.2 Planned Wastewater System

5.2.1 Region's Timing and Development Charges Projects

A major trunk sewer (Eighth Line/Trafalgar Trunk Sewer) was identified in the SHWWMP to service growth within Halton Hills, specifically by extending the lake-based wastewater service area to the southern lands of Georgetown. This trunk sewer will be located at the west boundary of the study area and will service PGEA P2B.

Additionally, the 2017 DC Update identified a project to decommission Halton Hills #3 WWPS and free up capacity in the downstream infrastructure (Halton Hills #1 WWPS, Halton Hills #2 WWPS, and internal Milton sewer network).

A recommendation of the draft WWPS Servicing Strategy Update is that the HH#4 WWPS and associated forcemain and trunk sewers be replaced by a tunnelled gravity trunk sewer running along Steeles Avenue.

Table 5-1 summarizes Halton Region's planned wastewater infrastructure projects for the area with timing. Projects that are to be replaced by the Steeles Avenue trunk sewer recommended as part of Halton Region's draft WWPS Servicing Strategy Update are noted in the table.

Table 5-1: Halton Region Area Wastewater Projects

Region Project ID	Project Description	Timing	Timing Reference
3863	WWM on Steeles Ave. from East of Ninth Line to Eighth Line (HH #3 WWPS / 7553 – Eighth Line Trunk Sewer)	Funded, but not constructed	Sustainable Halton MP notes Project as Funded Project (WM – 2008 MP Projects)
3864	Halton Hills (HH) #4 WWPS at intersection of Steeles Ave. and Winston Churchill Blvd.		
3865	WWFM on Steeles Ave. from HH #4 WWPS to 3863 – WWM on Steeles Ave.		
4648	WWM on Steeles Ave. from East of Ninth Line to Winston Churchill Boulevard (3864 - HH#4 WWPS)		
6508	Decommissioning of HH #3 WWPS and connection to new Eighth Line trunk sewer and conversion of site to septage receiving facility	2025 - under Design	2020 Halton Region Allocation Program Update
7550	1200mm WWM on 8th Line from No. 5 Side Road to Steeles Avenue		
7552	1050mm WWM on Steeles Avenue from 8th Line to easement crossing Highway 401		
7553	1050mm WWM from ID 7552 on Steeles Avenue to Auburn Road, (crossing Highway 401)		

Steeles Avenue Trunk Sewer and HH#4 WWPS and Forcemain

Halton Region Projects 3863, 3864 and 3865 (the proposed trunk sewer running along Steeles Avenue to service the west portion of the Study Area and the future HH#4 WWPS and forcemain to service the eastern portion of the PGEA P2B lands) were previously approved and funded.

Design of the project was suspended after implementation of the corridor protection area and policies to protect for the Halton Peel Boundary Area Transportation Study (now the GTA West Corridor Study) and adoption of ROPA 43 (discussed further in Section 2.2.1).

The Region has considered updated servicing alternatives for the area and the ultimate servicing will be updated as part of the Region's upcoming Water and Wastewater Master Plan Update.

Eight Line/Trafalgar Trunk Sewer

Design of the Eighth Line/Trafalgar Trunk Sewer is currently underway. Halton Region has approved financing for the Eighth Line/Trafalgar Trunk sewer as part of their updated 2020 Allocation Program. The 2020 Allocation Program includes a 'full program' that will accommodate new greenfield growth to the year 2022. It is estimated that Halton Region's Eight Line Trunk Sewer will be commissioned to service area development by 2025.

Halton Region had indicated through the HH PGEA Phase 1B Lands work that construction and commissioning of the Eighth Line Trunk Sewer would be triggered through approval within the updated Allocation Program.

Also considered was the scenario where the Eighth Line/Trafalgar Trunk Sewer is not commissioned prior to development proceeding within the Lot 1 and Lot 2 lands. Flows from PGEA P2B lands will be conveyed east to HH #3 WWPS and then west to HH#2 WWPS, and HH#1 WWPS (rather than to the Eighth Line/Trafalgar Trunk Sewer).

Region trunk sewers running along Ninth Line, Tenth Line or Winston Churchill Boulevard are not included in the Development Capital Implementation Plan.

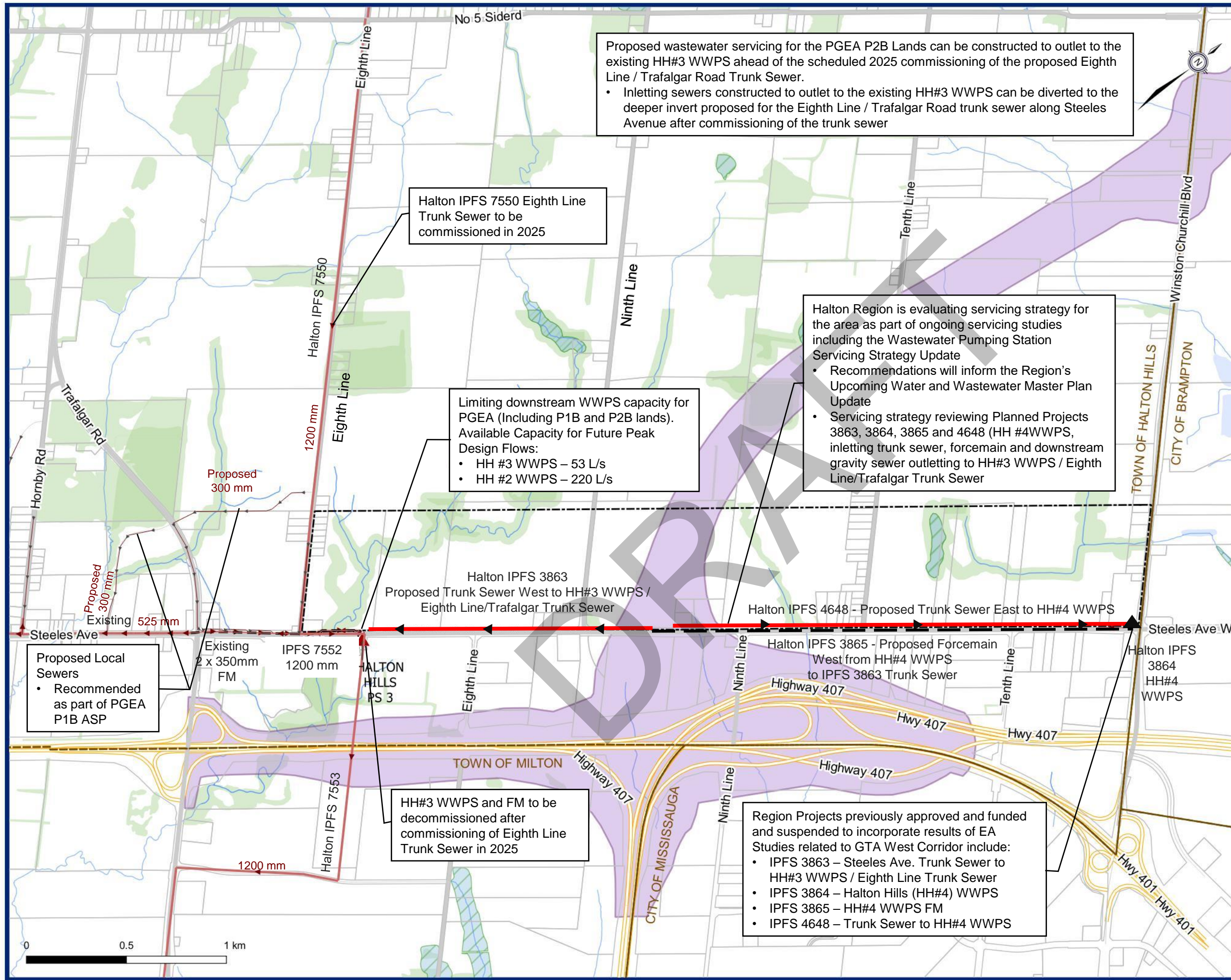
The planned wastewater projects for the area are shown in Figure 5-2.

Reference maps from Halton Region's 2017/2022 Development Charges Water and Wastewater Technical Report, showing Halton Region's Wastewater Development Capital Implementation Plan (2017-2031) and Future Wastewater Drainage Areas are included in Appendix A.



Water & Wastewater Area Servicing Plan
for the Premier Gateway Phase 2B

- Wastewater Infrastructure**
- Sewage Pumping Station (SPS)
 - Trunk Sewer (diameter >= 450mm)
 - Local Sewer (diameter < 450mm)
 - Forcemain
- General Features**
- Premier Gateway Phase 2B
 - Highway
 - Major Road
 - Local Road
 - Property Parcel
 - Municipal Boundary
 - Preferred Route and Interchange Locations for GTA West Transportation Corridor Study



Proposed wastewater servicing for the PGEA P2B Lands can be constructed to outlet to the existing HH#3 WWPS ahead of the scheduled 2025 commissioning of the proposed Eigth Line / Trafalgar Road Trunk Sewer.

- Inletting sewers constructed to outlet to the existing HH#3 WWPS can be diverted to the deeper invert proposed for the Eigth Line / Trafalgar Road trunk sewer along Steeles Avenue after commissioning of the trunk sewer

Halton IPFS 7550 Eigth Line Trunk Sewer to be commissioned in 2025

Limiting downstream WWPS capacity for PGEA (Including P1B and P2B lands). Available Capacity for Future Peak Design Flows:

- HH #3 WWPS – 53 L/s
- HH #2 WWPS – 220 L/s

Halton Region is evaluating servicing strategy for the area as part of ongoing servicing studies including the Wastewater Pumping Station Servicing Strategy Update

- Recommendations will inform the Region's Upcoming Water and Wastewater Master Plan Update
- Servicing strategy reviewing Planned Projects 3863, 3864, 3865 and 4648 (HH #4WWPS, inletting trunk sewer, forcemain and downstream gravity sewer outletting to HH#3 WWPS / Eigth Line/Trafalgar Trunk Sewer

Proposed Local Sewers

- Recommended as part of PGEA P1B ASP

HH#3 WWPS and FM to be decommissioned after commissioning of Eigth Line Trunk Sewer in 2025

Region Projects previously approved and funded and suspended to incorporate results of EA Studies related to GTA West Corridor include:

- IPFS 3863 – Steeles Ave. Trunk Sewer to HH#3 WWPS / Eigth Line Trunk Sewer
- IPFS 3864 – Halton Hills (HH#4) WWPS
- IPFS 3865 – HH#4 WWPS FM
- IPFS 4648 – Trunk Sewer to HH#4 WWPS

Figure 5-2
Planned Region Wastewater
Projects

5.3 Wastewater Design Criteria and Flows

5.3.1 Wastewater Design Criteria

As noted under Section 4.3.1, it is recommended that the design criteria developed for the Region's 2017 DC Update (and used in the Region's 2022 DC Update) be utilized for this ASP. The 2017/2022 DC Update Design Criteria is representative of existing and ongoing system measures to reduce I/I (which will offset the need to upsize trunk infrastructure).

The recommended design criteria for the PGEA P2B proposed wastewater flows for Treatment Plant and Collection System are summarized in Table 5-2 and Table 5-3.

Table 5-2: Wastewater Design Criteria (Treatment Plant)

Design Criteria	Average Flow	Design Criteria Reference
Residential	360 lpcd	Based on Design Criteria from the 2017 DC Update
Industrial	405 lpcd	Based on Design Criteria from the 2017 DC Update
Commercial	245 lpcd	Based on Design Criteria from the 2017 DC Update
Institutional	305 lpcd	Based on Design Criteria from the 2017 DC Update

Table 5-3: Wastewater Design Criteria (Collection System)

Design Criteria	Dry Weather Flow	Design Criteria Reference
Residential	215 lpcd	Based on Design Criteria from the 2017 DC Update
Industrial	240 lpcd	Based on Design Criteria from the 2017 DC Update
Commercial	145 lpcd	Based on Design Criteria from the 2017 DC Update
Institutional	180 lpcd	Based on Design Criteria from the 2017 DC Update

Similar to recommendations for the PGEA P1B ASP completed for Halton Region, it is recommended that Industrial design criteria be applied for the projection of employment wastewater flows throughout the study area. This a conservative and reasonable approach that provides flexibility with regards to the future employment development in the study area. This also provides for a consistent design criteria approach applied to all PGEAs simplifying future comparison and allocation considerations.

Design criteria for wastewater system components is summarized in Table 5-4.

Table 5-4: Design Criteria for Wastewater System Components

Component	Design Criteria	
Local Sewers	Roughness Coefficient	n = 0.013 for PVC sewers (based on Halton Engineering Design Guidelines for Area Servicing Plans)
	Capacity	Peak flow (Q) versus Sewer full flow capacity (q_{manning}) less than 85% (based on criteria established for Halton 2017 Development Charges Water and Wastewater Background Study).

5.3.2 Wastewater Flows

Consistent practice in the SHWWMP and 2017 DC Update is to develop wastewater flows using existing conditions + growth flows. Existing conditions plus growth flows will be evaluated for the Town of Halton Hill's employment projections within the PGEA P2B lands and compared to the flows derived from the 2017 DC Update.

Growth projections and flows for the PGEA (including P2B lands) were updated by the Region as part of the PGEA P1B ASP. The Region's updated growth projections showed that total flows from the PGEA will remain effectively the same, with some realignment within the Mid-Halton WWTP catchment (based on Regional Official Plan Amendment 47 planning projection adjustments to PGEA P1B lands). The treatment plant-level wastewater analysis, evaluation and recommendations from the 2017 and 2022 DC Updates can be carried forward as the realignment of flows is entirely within the Mid-Halton WWTP catchment area.

As noted in Section 3.2.3, the employment targets for the P2B lands, developed as part of the Secondary Plan's supporting economic study, anticipate growth less than the Region's BPEs. The ASP has considered servicing based on the more conservative (higher total growth projections) established by the Region. The Region's BPEs have been adopted as part of previously approved planning and servicing studies and remain the approved planning projections for the area. Total employment projections will be included as part of the final Secondary Plan.

Long-term servicing for the area for projected growth from 2041 to 2051 is being addressed as part of the Regional Municipal Comprehensive Review, including development of Halton Region's Integrated Growth Management Strategy and the subsequent Halton Region Water and Wastewater Master Plan. The findings of the PGEA P2B ASP will support Halton Region's Municipal Comprehensive Review and MP Update projects.

5.4 Wastewater Servicing Review and Needs Assessment

Assessment of the existing wastewater system included review of existing GIS asset data, current Halton Region wastewater model (InfoSewer) and most recent available design and construction drawings. Hydraulic modelling was undertaken to confirm the existing wastewater flows, capacity and potential required infrastructure upgrades.

5.4.1 Review of Available Capacity Under Scenario 1 Prior to Commissioning of the Eighth Line/Trafalgar Trunk Sewer

Through previous work, including the SHWWMP, Halton Region had noted potential capacity issues downstream of the PGEA lands. Downstream capacity for the PGEA lands was reviewed as part of Halton Region's June 2019 PGEA P1B ASP.

Peak flows from PGEA lands (including projected P1B peak flows) and available peak flow capacity at downstream pumping stations are shown in Table 5-5.

Table 5-5: Downstream Pumping Stations Available Capacities (Prior to Commissioning of Eighth Line/Trafalgar Trunk Sewer)

WWPS	Firm Capacity	Existing Peak Flow (Provided by Halton Region as part of PGEA P1B Study)	Peak Flow from PGEA (excluding P2B)	Available Peak Flow Capacity for PGEA P2B
HH #3	64 L/s (2 Pumps)	11 L/s	25 L/s	39 L/s
HH #2	160 L/s (3 Pumps)	44 L/s	144 L/s	16 L/s
HH #1	280 L/s (2 Pumps + 1 Standby)	60 L/s	160 L/s	120 L/s
Mid-Block WWPS	1,215 L/s (3 Pumps + 1 Standby)	783 L/s	883 L/s	332 L/s

Assuming previously approved PGEA P1B development proceeds in full ahead of the P2B lands, HH#2 WWPS will only have 16 L/s available peak capacity.

Allocation of development of future PGEA P2B lands (as well as PGEA P1B lands) ahead of the 2025 commissioning of the Eighth Line Trunk Sewer will need to have consideration for downstream pumping station capacity as well as detailed phasing of development of future P1B lands.

5.5 Development of the Proposed Wastewater Servicing Strategy

The overall servicing strategy is based conveying flows from the PGEA P2B lands south to the proposed trunk sewer running along Steeles Avenue from east to west and ultimately outletting to:

- The existing HH #3 WWPS (ahead of commissioning of the Eighth Line Trunk Sewer); and,
- the proposed Eighth Line Trunk Sewer (after proposed commissioning in 2025).

Prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer, PGEA P2B lands will ultimately outlet to HH #3 WWPS, and ultimately through HH #2 WWPS, HH#1 WWPS, Miller Way Trunk Sewer, Mid-Block WWPS and outletting at the Mid-Halton WWTP. After commissioning of the Eighth Line/Trafalgar Trunk Sewer, PGEA P2B lands will outlet to the proposed Eighth Line/Trafalgar Trunk Sewer and ultimately to the Mid-Halton WWTP. Consideration of development of the PGEA P2B lands under pre- and post-commissioning of the Eighth Line/Trafalgar Trunk Sewer ensures that development can proceed independent of the commissioning of the Region's trunk sewer.

The proposed wastewater servicing strategy was developed to meet the short-term needs of anticipated development within the area, with understanding that the long-term servicing strategy for the area will be reviewed and potentially updated as part of the Region's updated Water and Wastewater Master Plan.

The topography of the PGEA P2B area provides for two (2) sanitary sub-catchments that can be delineated at the potential GTA West Corridor (generally mid-block between Ninth Line and Tenth Line). Sanitary conveyance requirements for each of the sub-catchments are summarized in Table 5-6.

Table 5-6: Summary of PGEA P2B Wastewater Sub-Catchments

PGEA P2B Development Scenario	West of GTA West Corridor (Mid-Block between Ninth Line and Tenth Line)	East of GTA West Corridor (Mid-Block between Ninth Line and Tenth Line)
Proposed Sanitary Conveyance	<ul style="list-style-type: none"> Wastewater flows can be conveyed by local gravity sewers to the southwest, connecting to the planned Steeles Avenue trunk sewer, or via local sewers, directly to the HH#3 WWPS (or Eighth Line/Trafalgar Trunk Sewer) 	<ul style="list-style-type: none"> Wastewater flows can be conveyed by local gravity sewers to the southeast via local gravity sewers
Required Infrastructure to Connect to the Halton Region Wastewater Network	<ul style="list-style-type: none"> Lands located west of the GTA West Corridor can drain via future local gravity sewers with future direct connection to existing Region infrastructure Ultimately a future Region trunk sewer constructed along Steeles Avenue (draining from west of the GTA West Corridor to existing downstream Region infrastructure) can collect flows from local sewers. 	<ul style="list-style-type: none"> A future pumping station and forcemain (Region's planned HH#4 WWPS and forcemain) or deep trunk sewer (draining from east to west) is required to convey flows from the lands located east of the GTA West Corridor.

Servicing to the small development areas located in the northwest portion of PGEA P2B (north of the designated Natural Heritage System between Eighth Line and Ninth Line) will require watermain crossings of environmental features or servicing along north limit of Secondary Plan area. It is anticipated that 3.5 Ha of development area within the northwest will require development of Future Strategic Employment Areas to the north to support the construction costs of water (and wastewater) infrastructure crossing the environmental features to service the projected 70 to 175 jobs for the areas.

5.5.1 Proposed Wastewater Servicing Strategy

As noted in Section 4.5.1, it is anticipated that development timing will proceed ahead of Region construction of sewers and the opportunity to construct wastewater servicing to the area through Developer front-ended servicing agreements.

Halton Region currently has a policy to allow the Regional development-related projects to be designed and constructed by the development industry which may result in the construction of a project that was not identified in the current or prior years' capital budget. This policy can provide for enhanced coordination of Region to local watermain connections.

Council approval is required in the event that Regional funding is not available in the current capital budget Council. The developer will be required to enter into an agreement with Halton Region and initially fund and secure the work(s) and the developer will not be reimbursed (up to the upset limit identified in the agreement) until the budget is approved and the financing is available under an approved Halton Region financing plan.

The proposed servicing strategy incorporates the following infrastructure recommendations:

Prior to Commissioning of the Eighth Line/Trafalgar Trunk Sewer

Prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer:

- Conveyance of wastewater flows from lands west of the GTA West Corridor by local gravity sewers and/or Steeles Avenue trunk sewer, outletting to the inlet sewer upstream of HH#3 WWPS; and,
- Conveyance of wastewater flows from lands east of the GTA West Corridor to:
 - The proposed HH#4 WWPS and forcemain; or,
 - Equivalent front-ended, interim or private wastewater pumping station located within the PGEA P2B lands to service landowner(s) with associated forcemain that discharges to downstream sewers, ultimately discharging to the HH#3 WWPS.

Alternatively, if the east portion of the PGEA P2B lands are to drain entirely by gravity, then a deep trunk sewer running east-to-west along Steeles Avenue will be required. A Steeles Avenue trunk sewer can be constructed to meet the servicing requirements of the PGEA P2B area and outlet to the inlet MH invert at the exiting HH#3 WWPS. A trunk sewer alternative would range in depth from approximately 3 metres at Steeles Avenue and Winston Churchill Boulevard to nearly 20 metres through the GTA West Corridor (where ground elevations are highest along the alignment).

Sizing of the Region's DC projects related to the HH#4 WWPS, inletting Steeles Avenue trunk sewer, forcemain and downstream Steeles Avenue trunk sewer have been sized to accommodate wastewater flows from PGEA P2B (to 2031). Ultimately, the projects may be updated to include more catchment area as part of the Region's ongoing servicing projects being completed in support of the Regional Municipal Comprehensive Review.

The Region's ongoing Wastewater Pumping Station Servicing Strategy Update is considering opportunities for pumping station alternative projects in the area. The recommendations from the Study will be incorporated into Halton Region's Water and Wastewater Master Plan Update.

After Commissioning of the Eighth Line/Trafalgar Trunk Sewer

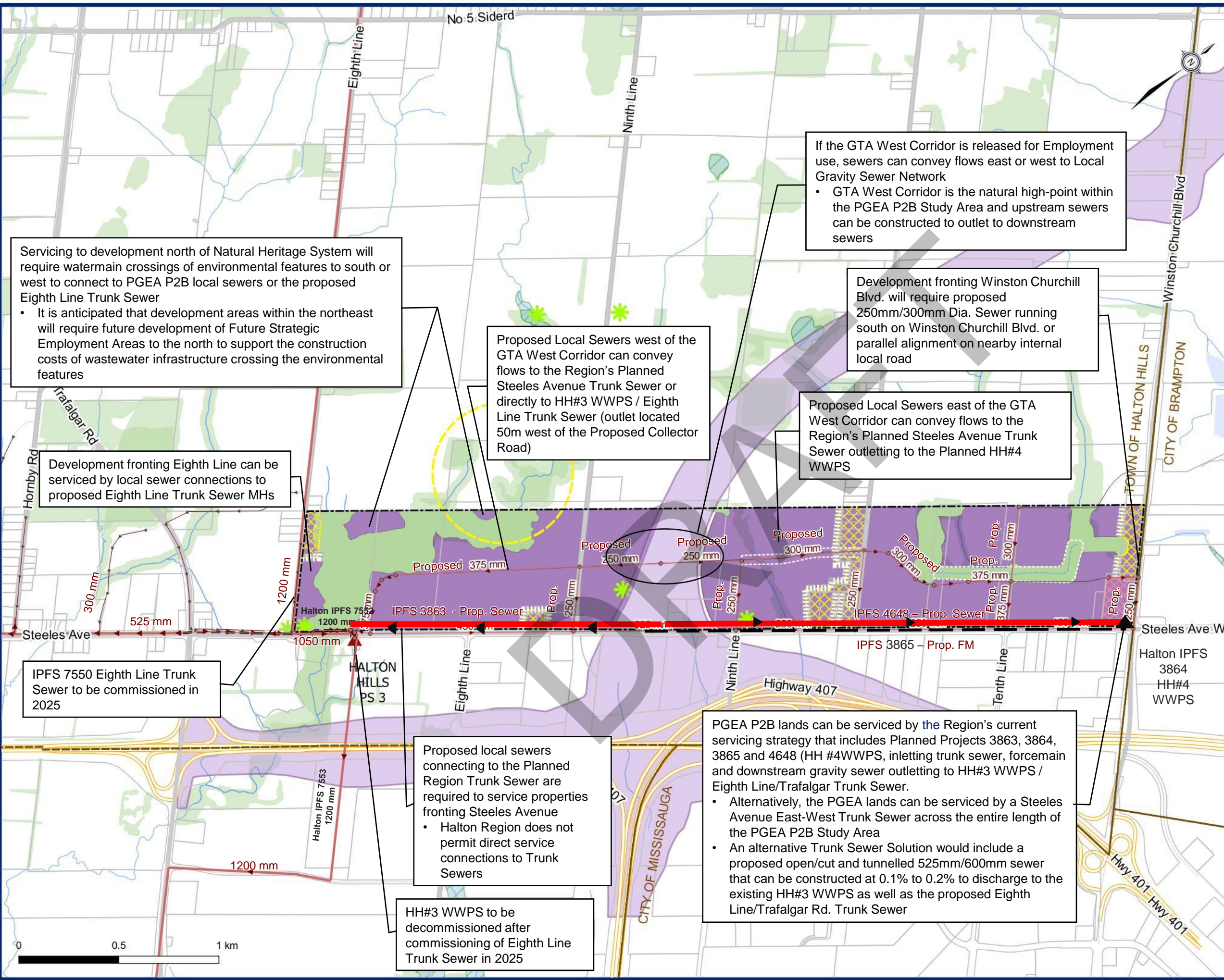
After commissioning of the Eighth Line/Trafalgar Trunk Sewer, the proposed servicing strategy for the PGEA P2B lands will be similar, with no capacity constraints for the development of the P2B lands.

A Steeles Avenue trunk sewer could be constructed to outlet to the proposed Eighth Line / Trafalgar Road Trunk Sewer. The Steeles Avenue trunk sewer could be constructed at a grade of 0.2% or greater to achieve the appropriate connection invert elevations with the Eighth Line Trunk Sewer. A proposed 600mm sewer could be installed by trenchless methods, within the Steeles Avenue right-of-way or directly north of the road, running parallel through a future easement. Any future sewer through the GTA West Corridor would require extensive confirmation/coordination with any future GTA West highway structures designs (depth of footings conflict with watermain, etc.)

The proposed wastewater servicing solution for PGEA P2B is shown in Figure 5-3.



Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B



Wastewater Infrastructure

- Sewage Pumping Station (SPS)
- Trunk Sewer (diameter >= 450mm)
- Local Sewer (diameter < 450mm)
- Forcemain

General Features

- Premier Gateway Phase 2B
- Highway
- Major Road
- Local Road
- Property Parcel
- Municipal Boundary
- Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

Preferred Land Use

- Natural Heritage System
- Prestige Industrial Area
- Residential Special Policy Area
- Supportive Commercial
- Headwater Drainage Feature
- Buffer for Existing Residential Use
- Cultural Heritage Resource
- Minimum Distance Separation

Figure 5-3

Proposed Wastewater Servicing Solution for PGEA P2B



5.5.2 Local Sewers

Local sewer alignments, depths grades and connections to potential Steeles Avenue trunk sewers have been developed based on the proposed land use concept and proposed road patterns and environmental constraints.

There is opportunity for development within the west sub-catchment to drain by local sewer directly to the existing HH#3 WWPS.

Under the ultimate servicing solution for the area, a local sewer crossing of the GTA West Transportation Corridor is not required. The GTA West Transportation Corridor follows a high ridge within the Study Area and conveying flows from east of the corridor to the west by gravity will drive the depth of the west gravity sewers significantly deeper (to greater than 10 metres depth).

Halton Region does not permit service connections to sanitary sewers of 450 mm diameter or greater. Development fronting Steeles Avenue will be required to connect to sections of local sewer that outlet to the proposed Region trunk sewer at manhole connections. Similar to for water service connections for Steeles Avenue fronting properties, alternate sanitary connections to local sewers along future internal roads will be considered, where topography and planned development phasing will allow for local sanitary sewer and service construction.

Local sewer alignments and connections to the proposed trunk sewers can be developed as part of future Draft Plans of Subdivision (or Zoning By-law Amendment) applications.

It is anticipated that local sewers running along future internal roads as well as along existing Town of Halton Hills and Halton Region roads including Ninth Line, Tenth Line, Winston Churchill and potentially Eighth Line and Steeles Avenue will be constructed through Developer front-end agreements.

As noted in Section 4.5.2, Halton Region currently has a policy to allow the Regional development-related projects to be designed and constructed by the development industry which may result in the construction of a project that was not identified in the current or prior years' capital budget.

5.5.3 Wastewater Collection Modelling Analysis

Halton Region's InfoSewer model was utilized to analyse the servicing scheme for the PGEA P2B lands under the two scenarios that consider pre and post commissioning of the Eighth Line Trunk Sewer. The model simulations analysed as part of the Secondary Plan analysis are summarized in Table 5-7.

Table 5-7: Overall InfoSewer Model Scenarios to Evaluate PGEA P2B Development

PGEA P2B Development Scenario	Halton Region InfoSewer Model to be Used	Note
PGEA P2B Build-out Ahead of 2025 Commissioning of Eighth Line Trunk Sewer	<ul style="list-style-type: none"> • 2026 Growth Scenario • HH#3 WWPS still in service • Eighth Line Trunk Sewer not yet commissioned 	<ul style="list-style-type: none"> • 2026 Growth Scenario will be used as it is closest growth timing to the 2025 Eighth Line Trunk Sewer commissioning and will not underestimate growth to downstream pumping stations. • 2026 Growth Scenario will include PGEA P2B build-out as well as previously approved PGEA P1B build-out

PGEA P2B Development Scenario	Halton Region InfoSewer Model to be Used	Note
PGEA P2B Build-out After 2025 Commissioning of Eighth Line Trunk Sewer	<ul style="list-style-type: none"> • 2031 Growth Scenario • Eighth Line Trunk Sewer commissioned • HH#3 WWPS decommissioned 	<ul style="list-style-type: none"> • 2031 Growth Scenario will be used to evaluate full buildout of PGEA lands under current OP/MP projections • 2031 Growth Scenario will include PGEA P2B build-out as well as previously approved PGEA P1B build-out

Sanitary design sheets for flows from the PGEA P2B lands were also completed. The sanitary design sheets were based on engineering standards outlined in Halton Region's Water and Wastewater Linear Design Manual. The sanitary design sheets have been included in Appendix B.

DRAFT

6 Phasing of Servicing

6.1 General

Similar to for previous PGEA Secondary Plans, it is anticipated that the preference will be for the entire study area to come online under a single (initial) phase. This provides the flexibility for development of any parcels within the PGEA P2B lands, and the ability for development phasing/servicing that aligns with development interest.

However, the limited available connections to the Region's existing infrastructure will initially restrict the general phasing of development from Eighth Line progressing east toward the GTA West Corridor.

Development east of the potential GTA West Corridor will require interim servicing to proceed ahead of commissioning of the Region's planned water and wastewater infrastructure for the area.

Also to be considered is Halton Region's policy to allow the Regional development-related projects to be designed and constructed by the development industry which may result in the construction of a project that was not identified in the current or prior years' capital budget. Opportunity to incorporate the construction of required P2B DC watermains with development infrastructure will be reviewed as part of the ASP phasing considerations.

6.2 Water

6.2.1 West of GTA West Corridor

Initial development within the western half of the PGEA P2B lands can be serviced by local watermain connecting to the existing Halton Region 600mm diameter trunk watermain. The existing trunk watermain terminates at the east limit of the HH#3 WWPS property, approximately 50 metres away from the intersection of the Proposed Collector Road and Steeles Avenue. The 600mm Region main can be extended to the Proposed Collector Road and 300mm diameter local watermain constructed northeast along the collector road to service initial development.

Construction of a component of the Region's planned 600mm diameter watermain along Steeles Avenue to west of the GTA West Corridor, along with connection to / construction of the proposed 400mm diameter transmission watermain along Ninth Line will provide sufficient fire flow for all development west of the GTA West Corridor.

6.2.2 East of GTA West Corridor

Initial water servicing to development within the eastern portion of the P2B lands will require at minimum commissioning of the Region's planned 600mm diameter Steeles Avenue watermain. Design and construction of the 600mm diameter watermain was suspended to accommodate the EA studies associated with the GTA West Corridor. It is not anticipated that the Steeles Avenue trunk watermain project will be resumed ahead of the completion of the GTA West Corridor EA Study, and the watermain project will be considered further as part of the Region's upcoming Water and Wastewater Master Plan Update.

Design of the future watermain will require consideration for depth through the GTA West Corridor and potential conflict with possible future overpass structure footings and other structures. If the preferred alternative developed from the GTA West Corridor EA leads to conceptual and detailed design of a new highway interchange south of Steeles Avenue (including associated overpass/underpass structures in the area of Steeles Avenue), then significant coordination between future water and wastewater infrastructure crossings will be required. It is unlikely that

trunk watermain design and construction would be able to proceed ahead of design of potential MTO works in the area.

As the Steeles Avenue trunk watermain may not be constructed to meet the Secondary Plan's anticipated development timing, alternative initial supply to the eastern portion of the PGEA P2B lands was considered. Construction and commissioning of the proposed 300mm/400mm diameter watermain along the Proposed Collector Road (ahead of commissioning of the Steeles Avenue trunk watermain) was evaluated. The intent was to determine if a developer front-ended watermain along the Proposed Collector Road could provide sufficient available fire flow to potential east development areas fronting/near the Proposed Collector Road. Crossing of the GTA West Corridor lands is still required, including significant coordination with the MTO to complete the works. A dead-end 300mm/400mm diameter watermain along the Proposed Collector Road can provide approximately 90 L/s of available fire flow to areas east of the GTA West Corridor. This interim servicing and available fire flow will not meet the Region's minimum requirement of 15,000 L/min (250 L/s) available fire flow for Employment Lands.

Looped watermain across the GTA West Corridor will be required to provide sufficient available fire flow to proposed Employment Lands east of the GTA West Corridor. Even a scenario where the planned 600mm diameter watermain crossing from Steeles Avenue is relocated to the Proposed Collector Road cannot by itself provide the required available fire flow to employment lands located east of the GTA West Corridor. An additional 400mm diameter crossing is still required and can be located at the north limit of the PGEA P2B lands, or to align with a future road crossing through the Future Strategic Employment area lands (if planning timing and approvals can be aligned with development requirements within the east portion of the PGEA P2B lands).

Relocation of the planned 600mm diameter watermain crossing of the GTA West Corridor to north of Steeles Avenue to potentially provide for a less complex crossing of the highway corridor (clear of any potential interchange/overpass/underpass structures that may be constructed within the area of Steeles Avenue) can be explored. A proposed strategy that includes the required 600mm diameter and 400mm diameter trunk watermain crossings of the GTA West Corridor can be applied across various crossing locations throughout the study area. As the ultimate location of the watermain crossings is flexible, it can be adapted to the future requirements of study and development timing, approvals and constructability considerations.

Connection to the Region of Peel's system at Winston Churchill Boulevard could also be considered for supply to the east portion of the PGEA P2B lands. This alternative has not been reviewed with Halton Region or the Region of Peel but could be explored for feasibility if it is determined that potential delays to the timing of the planned Steeles Avenue Trunk Watermain commissioning will significantly impact planned development within the eastern portion of the PGEA P2B lands. At minimum, a connection to the Region of Peel system would require confirmation that the Peel water system has the capacity to supply the area, an agreement between Halton Region and the Region of Peel to supply water to the area and metered connection chamber(s). Halton Region and the Region of Peel do not currently have any existing agreements to provide water supply for normal operations. Feasibility analysis for this alternative is outside of the scope of this assignment. It has only been included as an alternative for consideration based on the expectation that the timing of the Steeles Avenue trunk watermain may not meet the requirements of desired development timing for the PGEA P2B lands.

Proposed phasing and future considerations for interim water servicing of PGEA P2B lands is shown in Figure 6-1.



Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B

- Water Infrastructure**
- ▲ Pumping Station (PS)
 - Storage
 - ◆ Treatment
 - Feeder Main (Diameter >= 400mm)
 - Local Watermain (Diameter < 400mm)
 - - - Alternate Watermain Alignment
- General Features**
- ⋯ Premier Gateway Phase 2B
 - Highway
 - Major Road
 - Local Road
 - Property Parcel
 - ⋯ Municipal Boundary
 - ▨ Preferred Route and Interchange Locations for GTA West Transportation Corridor Study
- Preferred Land Use**
- Natural Heritage System
 - Prestige Industrial Area
 - ▨ Residential Special Policy Area
 - ▨ Supportive Commercial
 - Headwater Drainage Feature
 - ⋯ Buffer for Existing Residential Use
 - ★ Cultral Heritage Resource
 - ▨ Minimum Distance Separation

Region IPFS ID 6644, 6645 and 6646 – 400mm Dia. Watermain Loop

- Opportunity to locate required 400mm Dia. Watermain Crossing of GTA West Corridor further north to align with Development progress, GTA West Corridor Study recommendations

Region IPFS ID 3844

Construction / commissioning of Region IPFS 3844 to Ninth Line North (west of GTA West Corridor) and connection to 400mm Dia. Ninth Line WM will provide for full development of PGEA P2B Lands west of GTA West Corridor

Servicing to development north of Natural Heritage System will require watermain crossings of environmental features or servicing along north limit of Secondary Plan area

- It is anticipated that development areas within the northwest will require development of Future Strategic Employment Areas to the north to support the construction costs of wastewater infrastructure crossing the environmental features

Development fronting Eighth Line can be serviced by local 300mm diameter watermain approved as part of PGEA P1B ASP

Development east of GTA West Corridor requires supply from Planned 600mm Dia. Steeles Avenue to provide sufficient fire flow for Employment Uses

- Development of higher elevation lands near Tenth Line North will also require additional north crossing of GTA West Corridor

Phasing of PGEA P2B lands west of GTA West Corridor can be supplied by existing 600mm Dia. Steeles Avenue watermain, extended 50 metres to new local watermain network running along Proposed Collector Road

Region IPFS ID 3844 and 5948

600mm dia. Steeles Avenue trunk watermain to west of GTA West Corridor

- Previously funded and suspended for EAs related to GTA West Corridor
- Requires confirmation/coordination with any future GTA West highway structures designs (depth of footings conflict with watermain, etc.)
- Project not anticipated to be resumed until completion of GTA West Corridor EA

Potential opportunity to realign planned watermain to run west along Steeles Avenue from ex. Connection to Ninth Line, north on Ninth Line to Proposed Collector Road 1 and crossing GTA West Corridor along Proposed Collector Road 1

- Can support development timing for East PGEA P2B lands if complex Steeles Avenue crossing of GTA West Corridor can be postponed (or is no longer required)

Existing Halton Region / Region of Peel Interregional to supply

- Feasibility of utilizing connection to supply PGEA P2B lands ahead of availability of Steeles Avenue watermain could be explored
- This would require, at minimum:
 - Confirmation of available capacity from Region of Peel system
 - Agreement between Halton Region and Region of Peel for interim water supply

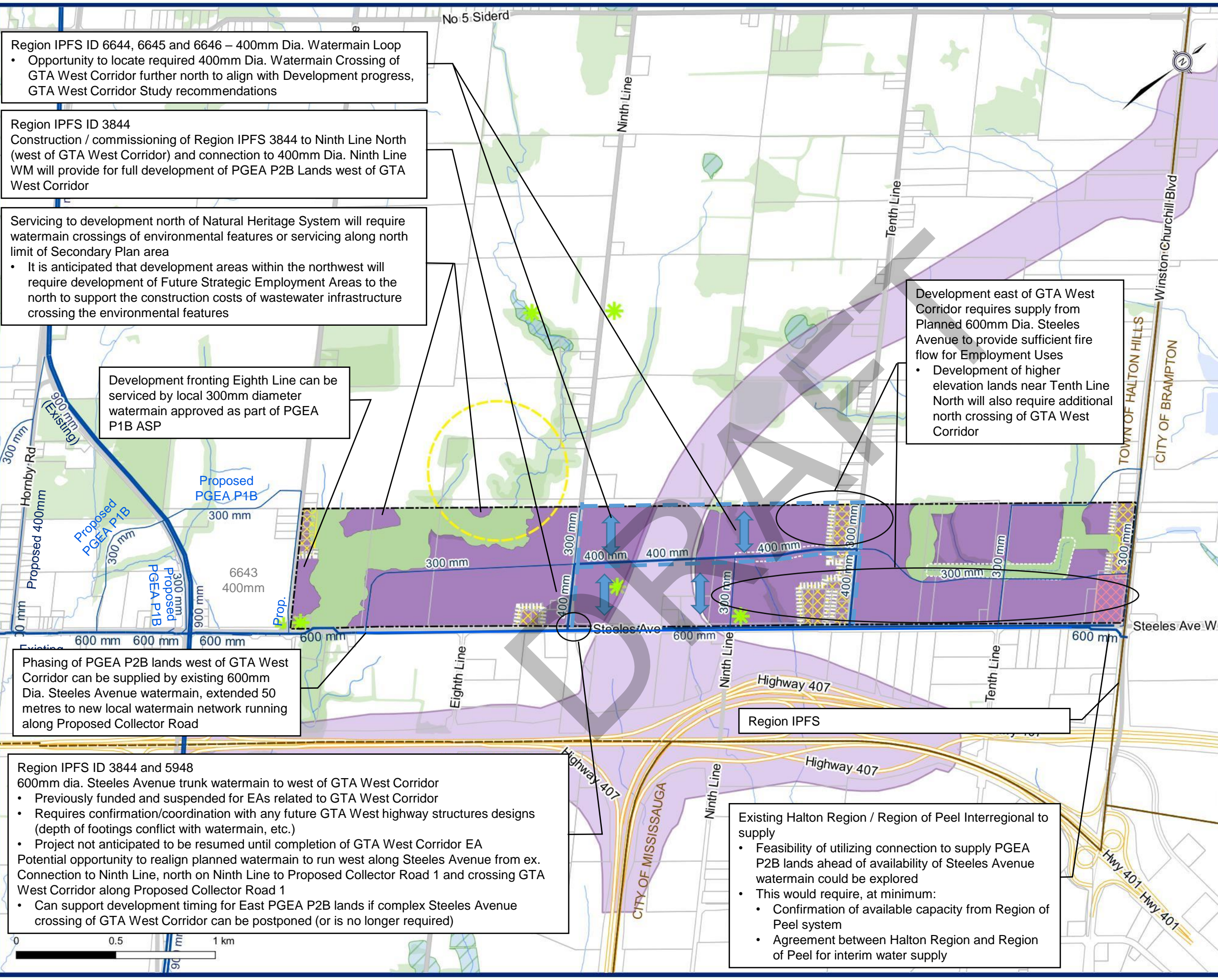


Figure 6-1
Proposed Phasing and Future Considerations
Interim Water Servicing
PGEA P2B Lands

6.3 Wastewater

6.3.1 Prior to Commissioning of Eighth Line/Trafalgar Trunk Sewer

Development within all PGEA lands, including P2B as well as P1B will need to consider the downstream pumping station capacity constraints prior to commissioning of the Eighth Line/Trafalgar Trunk Sewer. Existing pumping station constraints are discussed further in Section 5.4.1. Allocation will be required to ensure that peak wastewater flows for future development within the PGEA does not exceed the existing capacity at HH#2 WWPS.

6.3.2 West of GTA West Corridor

Development within the western half of the PGEA P2B lands can be serviced by local sanitary sewers initially outletting to the HH#3 WWPS and ultimately to the Eighth Line/Trafalgar Trunk Sewer after commissioning.

6.3.3 East of the GTA West Corridor

It is anticipated that the HH#4 WWPS and forcemain will not be commissioned in time to meet anticipated development demand within the eastern portion of the PGEA 2B lands. As discussed in Section 5.5, the Region's ongoing Wastewater Pumping Station Servicing Strategy Update is considering opportunities for pumping station alternative projects in the area, and the recommendations from the Study will be incorporated into Halton Region's Water and Wastewater Master Plan Update.

A pumping station constructed to Halton Region standards, located within development lands and front-ended by developers can be considered. The project could be considered for DC recovery, designed and constructed with input and approval of Halton Region to service broader growth within the area and incorporated into the Region's updated servicing strategy.

Alternatively, an interim / private pumping station could be constructed to service the short-term needs of area development (with approval from Halton Region). The interim WWPS could be considered as a component of the Region's updated servicing strategy for the area, constructed to meet temporary development needs and ultimately upgraded or decommissioned once the Region's ultimate servicing strategy for the area is commissioned.

Interim pumping stations can be constructed on developer-owned lands with associated forcemains constructed within proposed internal roads – with infrastructure and property ultimately assumed by the Region. Interim pumping station and forcemain construction can be designed and approved as part of future Zoning By-law Amendments or Draft Plans of Subdivision. Public consultation for any interim works can be completed as part of the associated Planning Act approval process. An interim pumping station can be located and designed to meet the needs of short-term development.

A prefabricated station is a cost-efficient solution that can be designed to meet the needs of initial development within the eastern portion of the P2B lands. A prefabricated station can be designed to pump initial development flows up to the 70 L/s peak flow for the entire east portion or even greater if required. Prefabricated stations typically include a pre-cast wet well with submersible pumps, an outdoor pad-mounted control panel with shelter and stand-by power generator. The precast wet wells can range in size up to 3.6 metres diameter. A proposed 150mm diameter to 200mm diameter forcemain can be utilized to pump flows from the interim station to gravity outlet located west of the GTA West Corridor.

Proposed phasing and future considerations for interim wastewater servicing of PGEA P2B lands is shown in Figure 6-2.

DRAFT



Water & Wastewater Area Servicing Plan for the Premier Gateway Phase 2B

Wastewater Infrastructure

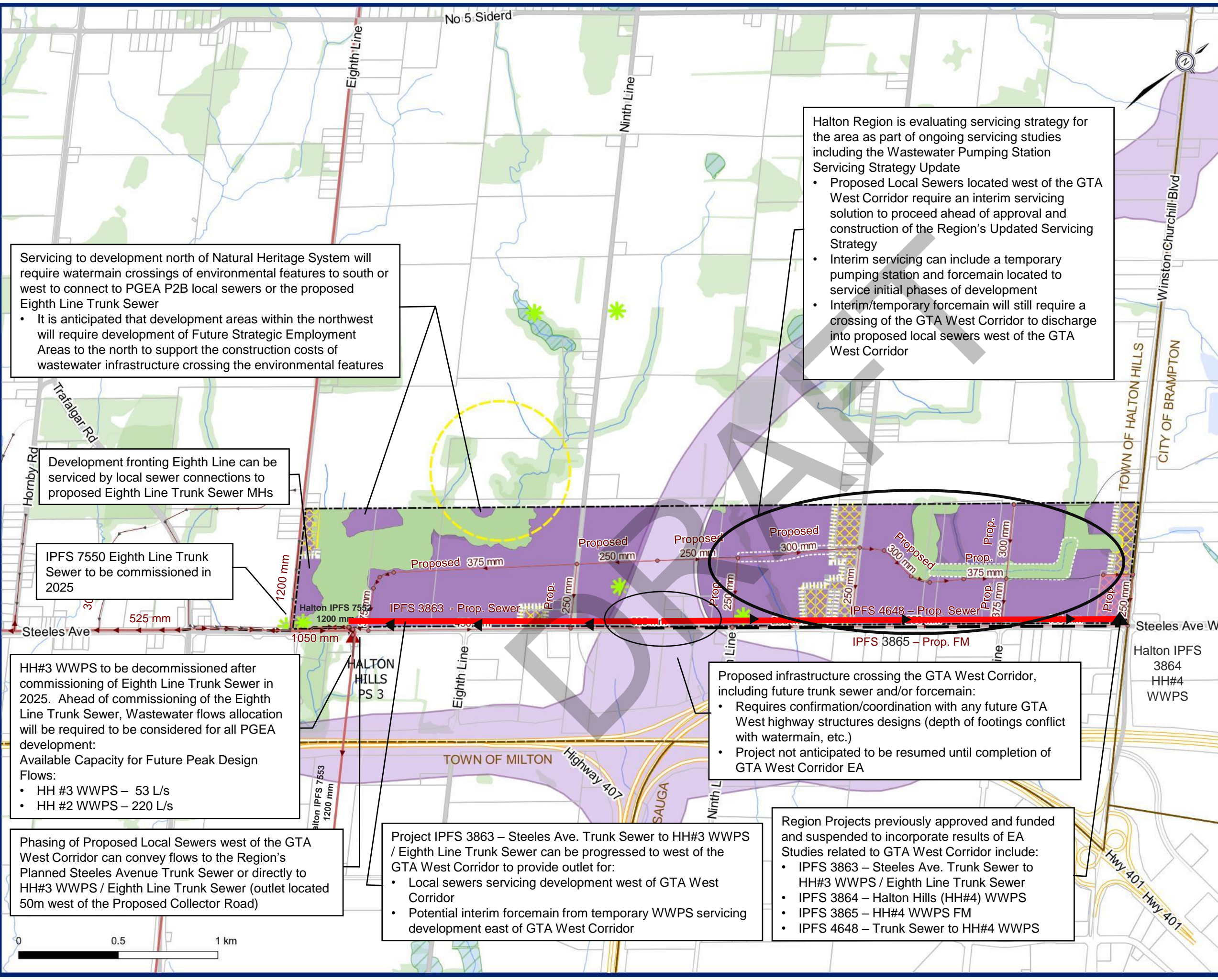
- ▲ Sewage Pumping Station (SPS)
- Trunk Sewer (diameter >= 450mm)
- Local Sewer (diameter < 450mm)
- - - Forcemain

General Features

- ▭ Premier Gateway Phase 2B
- Highway
- Major Road
- Local Road
- ▭ Property Parcel
- ▭ Municipal Boundary
- ▭ Preferred Route and Interchange Locations for GTA West Transportation Corridor Study

Preferred Land Use

- Natural Heritage System
- Prestige Industrial Area
- Residential Special Policy Area
- Supportive Commercial
- Headwater Drainage Feature
- ▭ Buffer for Existing Residential Use
- ★ Cultural Heritage Resource
- ▭ Minimum Distance Separation



Servicing to development north of Natural Heritage System will require watermain crossings of environmental features to south or west to connect to PGEA P2B local sewers or the proposed Eighth Line Trunk Sewer

- It is anticipated that development areas within the northwest will require development of Future Strategic Employment Areas to the north to support the construction costs of wastewater infrastructure crossing the environmental features

Halton Region is evaluating servicing strategy for the area as part of ongoing servicing studies including the Wastewater Pumping Station Servicing Strategy Update

- Proposed Local Sewers located west of the GTA West Corridor require an interim servicing solution to proceed ahead of approval and construction of the Region's Updated Servicing Strategy
- Interim servicing can include a temporary pumping station and forcemain located to service initial phases of development
- Interim/temporary forcemain will still require a crossing of the GTA West Corridor to discharge into proposed local sewers west of the GTA West Corridor

Development fronting Eighth Line can be serviced by local sewer connections to proposed Eighth Line Trunk Sewer MHs

IPFS 7550 Eighth Line Trunk Sewer to be commissioned in 2025

HH#3 WWPS to be decommissioned after commissioning of Eighth Line Trunk Sewer in 2025. Ahead of commissioning of the Eighth Line Trunk Sewer, Wastewater flows allocation will be required to be considered for all PGEA development:

Available Capacity for Future Peak Design Flows:

- HH #3 WWPS – 53 L/s
- HH #2 WWPS – 220 L/s

Phasing of Proposed Local Sewers west of the GTA West Corridor can convey flows to the Region's Planned Steeles Avenue Trunk Sewer or directly to HH#3 WWPS / Eighth Line Trunk Sewer (outlet located 50m west of the Proposed Collector Road)

Project IPFS 3863 – Steeles Ave. Trunk Sewer to HH#3 WWPS / Eighth Line Trunk Sewer can be progressed to west of the GTA West Corridor to provide outlet for:

- Local sewers servicing development west of GTA West Corridor
- Potential interim forcemain from temporary WWPS servicing development east of GTA West Corridor

Proposed infrastructure crossing the GTA West Corridor, including future trunk sewer and/or forcemain:

- Requires confirmation/coordination with any future GTA West highway structures designs (depth of footings conflict with watermain, etc.)
- Project not anticipated to be resumed until completion of GTA West Corridor EA

Region Projects previously approved and funded and suspended to incorporate results of EA Studies related to GTA West Corridor include:

- IPFS 3863 – Steeles Ave. Trunk Sewer to HH#3 WWPS / Eighth Line Trunk Sewer
- IPFS 3864 – Halton Hills (HH#4) WWPS
- IPFS 3865 – HH#4 WWPS FM
- IPFS 4648 – Trunk Sewer to HH#4 WWPS

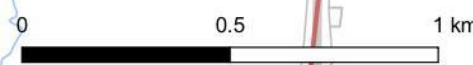


Figure 6-2
Proposed Phasing and Future Considerations
Interim Wastewater Servicing PGEA P2B Lands

7 Cost Estimates

7.1 Water and Wastewater Servicing Cost Estimates

7.1.1 Water and Wastewater DC Projects Cost Estimates Approach

As noted in Section 4.2.3 and Section 5.2.1, Region water and wastewater development charges projects for the area were previously funded and suspended to consider the previous and current EA Studies related to the GTA West Corridor.

Planned water and wastewater servicing for the area has been considered as part of ongoing Halton Region servicing studies, including the Region's Integrated Growth Management Study and Wastewater Pumping Station Servicing Strategy Update. The water and wastewater servicing strategy for the area will be updated as part of the Region's upcoming Water and Wastewater Master Plan Update project.

The cost estimate unit rates are based on Halton Region input and are generally inline with the Association for the Advancement of Cost Engineering (AACE) Class 4 estimates. AACE Class 4 estimates are:

- completed in support of project planning and initial preliminary design;
- are based on sufficient knowledge of site conditions adequate to identify high level risk;
- based on historical costs of similar projects and historical average unit costs for work activities; and,
- have an expected accuracy range of -20% to +30%.

For the Class 4 cost estimates, the risk related to construction considerations including environmental feature crossings, pumping station decommissioning and MTO coordination (as well as other approval authorities and utilities) is intended to be incorporated directly into the unit rate. The costs have been included primarily for reference purposes.

The cost estimate approach is detailed further in the 2022 Development Charges Update – Water/Wastewater Cost Estimation Approaches Technical Memorandum, October 2021, included in Appendix C.

7.1.2 Water Projects

Updated cost estimates for the Region's anticipated water development charges projects and local watermain required to service the PGEA P2B lands have been developed based on the unit rates included in the Region's 2022 Water and Wastewater DC Update. Total cost estimates are summarized in Table 7-1.

Table 7-1: Cost Estimate for Proposed Development Charges Water Infrastructure Required for PGEA P2B Development

Water	Total Project Construction Cost Estimate (2021\$)	Total Project Cost Estimate (including Property, Engineering and Associated Construction Fees) (2021\$)
Halton Region Project 3844 and Halton Region Project 5948 - 600 mm diameter watermain on Steeles Avenue, from Eighth Line to Peel Interregional Connection at Winston Churchill Boulevard (Approximately 3.8 km of watermain)	\$19.0 M	\$26.4 M
Halton Region Project 6644 – 300 metres of 400mm diameter watermain on Ninth Line from Steeles Avenue to PGEA P2B Proposed Collector Road	\$0.6 M	\$0.9 M
Halton Region Project 6645 – 1.5 km of 400mm diameter watermain on PGEA P2B Proposed Collector Rod from Ninth Line to Tenth Line (with potential crossing of GTA West Corridor)	\$7.0 M	\$9.7 M
Halton Region Project 6646 – 400 metres of 400mm diameter watermain on Tenth Line from Steeles Avenue to PGEA P2B Proposed Collector Road	\$0.7 M	\$1.0 M
Sub-Total Halton DC Projects Costs	\$27.3 M	\$38.0 M
Local Watermain Costs	\$6.4 M	\$8.7 M
Total Water Servicing Costs for HH PGEA P2B Area	\$33.7 M	\$46.7 M

Detailed cost estimates for the proposed local 300mm diameter watermains running along the proposed collector roads have been included in Appendix C. Cost estimates for local watermains have also been based on the unit rates included in the Region's 2022 Water and Wastewater DC Background Study. Distribution watermain cost estimates include an estimate of \$5,000/150m (\$33.33/m) construction cost estimate for hydrants based on Halton Region design standards and recent comparable construction pricing.

7.1.3 Wastewater Projects

Updated cost estimates for the Region's anticipated wastewater development charges projects and local sewers required to service the PGEA P2B lands have been developed based on the unit rates included in the Region's 2022 Water and Wastewater DC Update. Total cost estimates are summarized in Table 7-2.

Table 7-2: Cost Estimate for Proposed Development Charges Wastewater Infrastructure Required for PGEA P2B Development

Component	Total Project Construction Cost Estimate (2021\$)	Total Project Cost Estimate (including Property, Engineering and Associated Construction Fees) (2021\$)
Halton Region Project 3863 – Trunk Sewer on Steeles Avenue from East of Ninth Line to Eighth Line (HH #3 WWPS / 7553 – Eighth Line Trunk Sewer)	\$0.9 M	\$1.2 M
Halton Region Project 3864 - Halton Hills (HH) #4 WWPS at intersection of Steeles Avenue and Winston Churchill Boulevard	\$5.3 M	\$7.4 M
Halton Region Project 3865 - Forcemain on Steeles Avenue from HH #4 WWPS to the Proposed Halton Region Trunk Sewer (Project 3863)	\$2.7 M	\$3.8 M
Halton Region Project 3865 – Trunk Sewer on Steeles Avenue from East of Ninth Line HH#4 WWPS (Project 3864) (Estimated firm capacity of 71 L/s to service PGEA P2B East of GTA West Corridor)	\$1.4 M	\$1.9 M
Sub-Total Halton DC Projects Costs	\$10.3 M	\$14.3 M
Local Sewer Costs	\$16.2 M	\$22.3 M
Total Wastewater Servicing Costs for HH PGEA P2B Area	\$26.5 M	\$36.6 M

Cost estimates for the HH#4 WWPS, inlet sewer, forcemain and downstream gravity sewer are based design for the PGEA P2B lands only. Ultimately, the project may be updated to include more (or less) catchment area as part of the Region’s upcoming Water and Wastewater Master Plan Update.

The ultimate location of the proposed pumping station and upstream catchment area can have significant impacts on the cost estimate, including adjusted requirements for wet well depth and pump and energy requirements. The 2022 DC cost estimate approach for pumping stations is based on peak flow only. Additionally, if a temporary pumping station is constructed by developers ahead of commissioning of the Region’s updated wastewater servicing strategy for the area, then there may be cost efficiencies if construction of a prefabricated pumping station is determined to be the preferred alternative.

The cost estimate for an equivalent trunk sewer servicing the PGEA P2B lands, along Steeles Avenue from Winston Churchill Boulevard, crossing the GTA West Corridor and outletting to the existing HH#3 WWPS / Eighth Line Trunk Sewer is shown in Table 7-3.

Table 7-3: Cost Estimate for Alternative Equivalent Tunnelled Steeles Avenue Trunk Sewer Required for PGEA P2B Development

Component	Total Project Construction Cost Estimate (2021\$)	Total Project Cost Estimate (including Property, Engineering and Associated Construction Fees) (2021\$)
Equivalent Steeles Avenue trunk sewer from Winston Churchill Boulevard, crossing the GTA West Corridor, and outletting at the Ex. HH#3 WWPS / Proposed Eighth Line Trunk Sewer (Assumed 600mm Dia. to align with smallest diameter available microtunnelling boring machine (MTBM))	\$53.9 M	\$74.9 M

Detailed cost estimates are included in Appendix C.

DRAFT

8 Conclusion

8.1 General

The PGEA P2B ASP confirms that the planned Employment Area can ultimately be serviced by the Region's proposed upgrades to water and wastewater linear infrastructure along Steeles Avenue, Ninth Line and Tenth Line and crossing the GTA West Corridor.

The Region's previously approved and funded water and wastewater Master Plan projects, including the Steeles Avenue trunk watermain and the HH#3 WWPS, forcemain and downstream trunk sewer remain suspended while the Province's GTA West Corridor is completed.

Additionally, the Region's planned water and wastewater projects for the area are being considered further as part of studies supporting the Regional Municipal Comprehensive Review, including the Integrated Growth Management Strategy and the Wastewater Pumping Station Servicing Strategy. Ultimately the servicing strategy for the area will be updated as part of the Region's upcoming Water and Wastewater Master Plan Update. Recommendations from the PGEA P2B ASP will help inform the recommended water and wastewater projects for the area.

Halton Region does currently have a policy to allow the Regional development-related projects to be designed and constructed by the development industry - which may result in the construction of a project that was not identified in the current or prior years' capital budget. Opportunity to incorporate the construction of required PGEA P2B water and wastewater infrastructure by the development industry can be considered as part of future Zoning By-law Amendments or Draft Plans of Subdivision.

8.2 Water

Ultimate water servicing to the PGEA P2B lands generally requires commissioning of the Region's planned 600mm diameter Steeles Avenue trunk watermain with a 400mm diameter watermain loop along Ninth Line, the Proposed Collector Road and Tenth Line as well as 300mm diameter watermain running along the Proposed Collector Road with connections to the Steeles Avenue trunk at key locations. This will provide the future Employment Lands with suitable operating pressures and sufficient available fire flow.

Employment Lands located west of the GTA West Corridor can initially be serviced by 300mm diameter watermain network connected to a short (50 metre) extension of the 600mm diameter Steeles Avenue trunk main that terminates east of Eighth Line and Sixteen Mile Creek. Buildout of the Planned 600mm diameter Steeles Avenue watermain to west of the GTA West Corridor combined with the 400mm diameter Ninth Line transmission watermain will provide sufficient available fire flow to all development located west of the GTA West Corridor.

Prior to development of lands located east of the GTA West Corridor, construction of the Steeles Avenue trunk watermain to east of the GTA West Corridor will be required. The future 300mm diameter watermain network can be supplied from the Steeles Avenue trunk watermain. A looped watermain, including the planned 600mm diameter watermain and an additional 400mm diameter watermain crossing of the GTA West Corridor will be required prior to development of the east portion of the PGEA P2B lands. The only existing Halton Region water infrastructure located east of the GTA West Corridor is an emergency interregional connection to the Region of Peel's system, located at Steeles Avenue and Winston Churchill Boulevard. If uncertainty around timing of the GTA West Corridor study and associated impact on Region water infrastructure construction for the area will significantly impede development plans for the east portion of the PGEA P2B lands, then feasibility of alternative water supply to the area will need to be further

explored with Halton Region. This could include relocation of the planned Steeles Avenue 600mm diameter watermain to north of the potential GTA West Corridor interchange/overpass/underpass structures within the area of Steeles Avenue. The ultimate location of the watermain crossings is flexible and can be adapted to the future requirements of study and development timing, approvals and constructability considerations.

8.3 Wastewater

Ultimate wastewater servicing to the PGEA P2B lands will require a trunk sewer running west from the GTA West Corridor to the existing HH#3 WWPS / Eighth Line/Trafalgar Trunk Sewer and a pumping station and forcemain to service the Employment Lands located east of the GTA West Corridor (or an equivalent solution that can include a deeper trunk sewer running across the entire width of Steeles Avenue from Winston Churchill Boulevard to Eighth Line).

Ahead of the anticipated 2025 commissioning of the proposed Eighth Line/Trafalgar Trunk Sewer, there are capacity constraints at the downstream HH#3 WWPS and HH#2 WWPS that must be considered for allocation of proposed development across all PGEA lands (including P2B and previously approved P1B lands).

Wastewater flows from future development west of the GTA West Corridor can be conveyed by local gravity sewer along internal roads to the outlet at the existing HH#3 WWPS. Construction of the planned Steeles Avenue trunk sewer to west of the GTA West Corridor can also be progressed to service the entire PGEA 2B lands west of the GTA West Corridor.

Lands located east of the GTA West Corridor will require the ultimate servicing solution to be constructed by the Region (including the HH#4 WWPS and forcemain or equivalent proposed trunk sewer) or an approved front-ended or interim pumping station and forcemain (that will still require crossing the GTA West Corridor to discharge into local sewers or the component of Steeles Avenue trunk sewer constructed to west of the GTA West Corridor).

An interim pumping station and forcemain to service initial phases of development is feasible and can be located to suit future development phasing in the east. All temporary/interim infrastructure must be approved by Halton Region.

DRAFT

**Halton Region Future Water Pressure Zones, Wastewater Drainage
Areas and Water and Wastewater Capital Implementation Plans**

Appendix A

(2017-2031)

DRAFT

Legend

Water Pressure Zone

- A9G
- B1
- B1A
- B1B
- B2
- B2A
- B3
- B3A
- B3B
- B4
- B4A
- B5A
- B5
- C7G
- G6G
- G7G
- G5G
- G6L
- G5G
- O1
- O2
- O2A
- O2B
- O3
- M5G
- TWL = 211m
- TWL = 223.5m
- TWL = 250m
- TWL = 267m

Other

- Booster/Pumping Station (PS)
- Reservoir (RES)
- Water Purification Plant (WPP)
- Pressure Reducing Valve (PRV)
- Well Field (WELL)
- Elevated Water Storage Tank (TANK)
- Roads
- Municipal Boundary

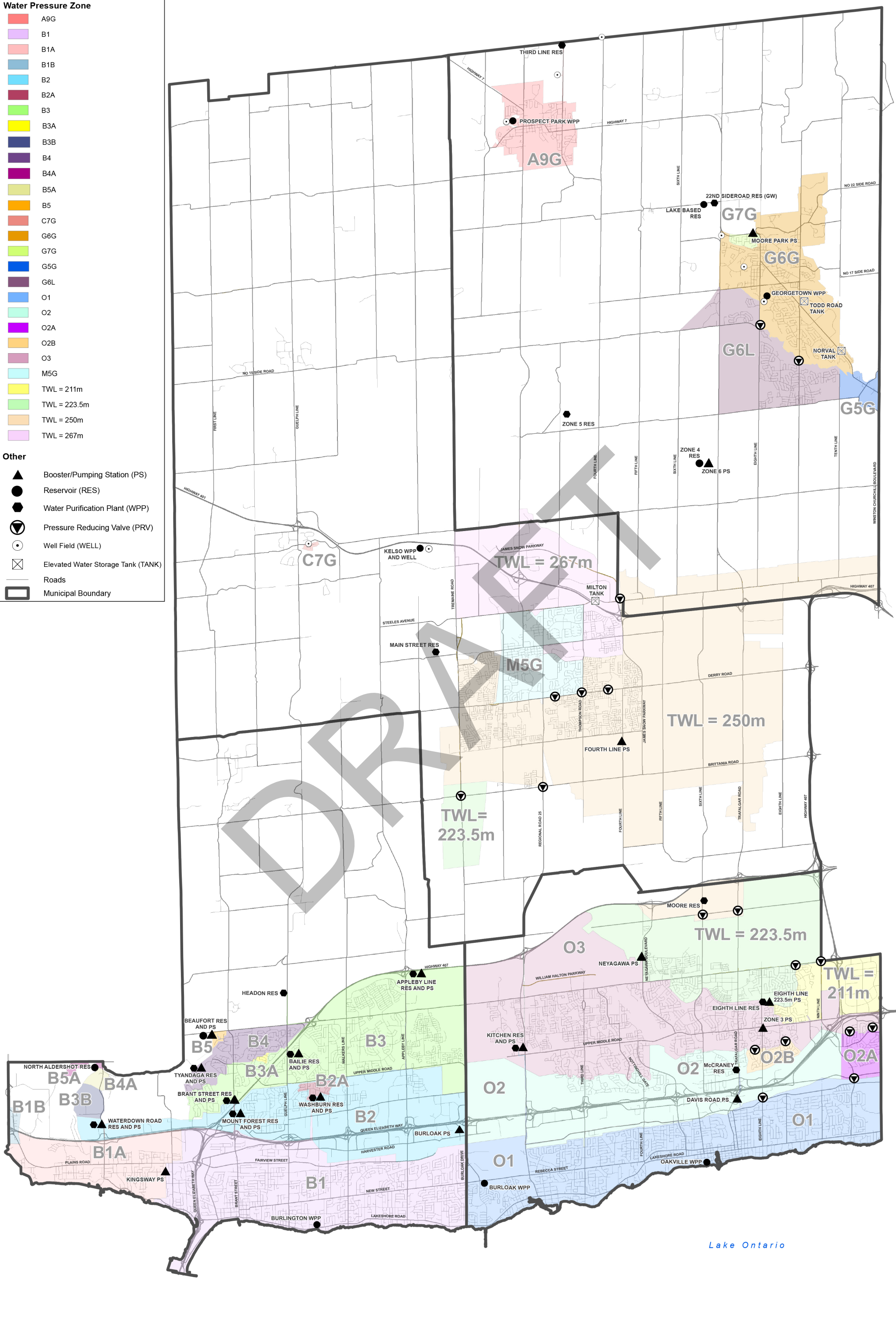
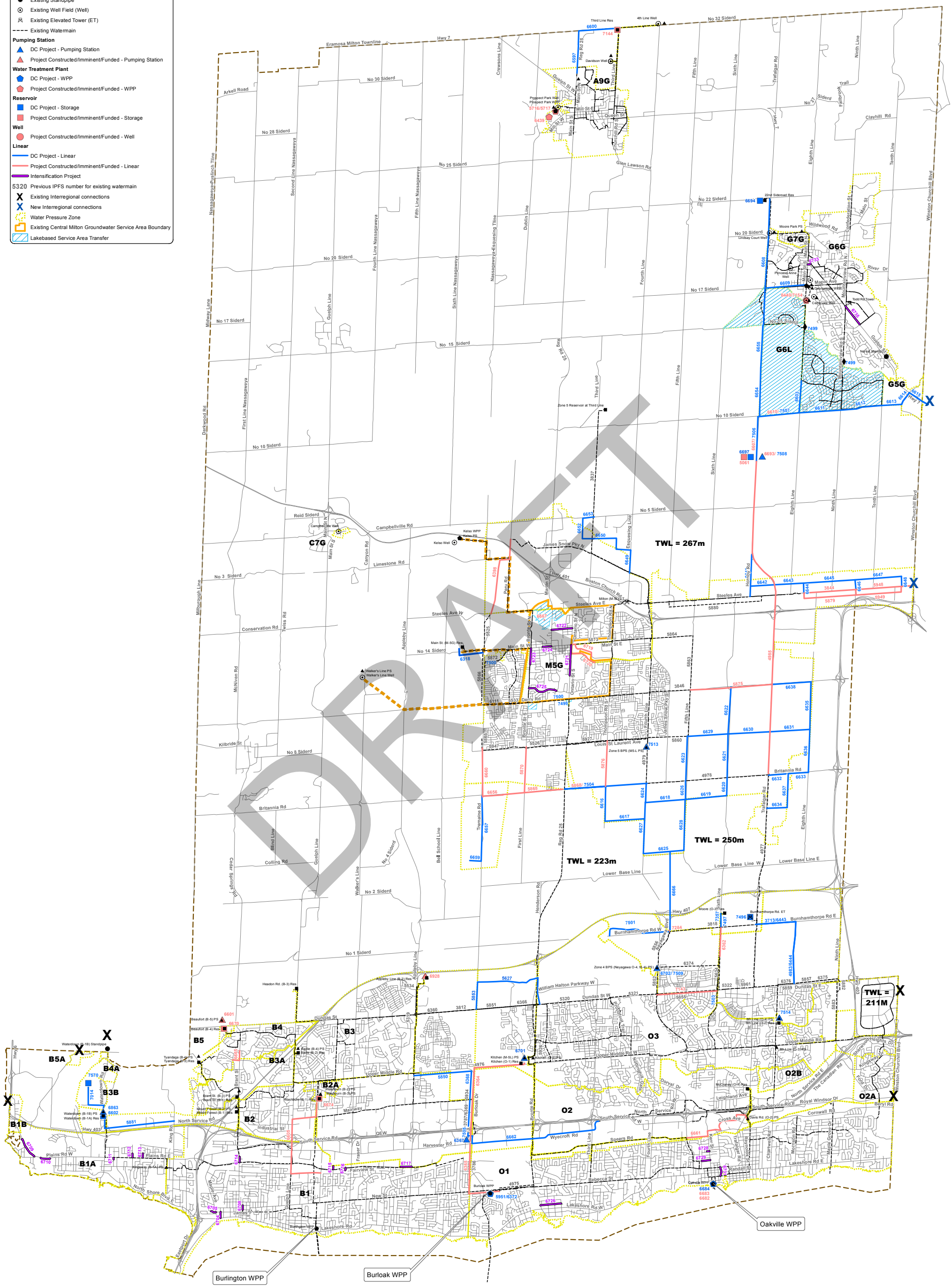


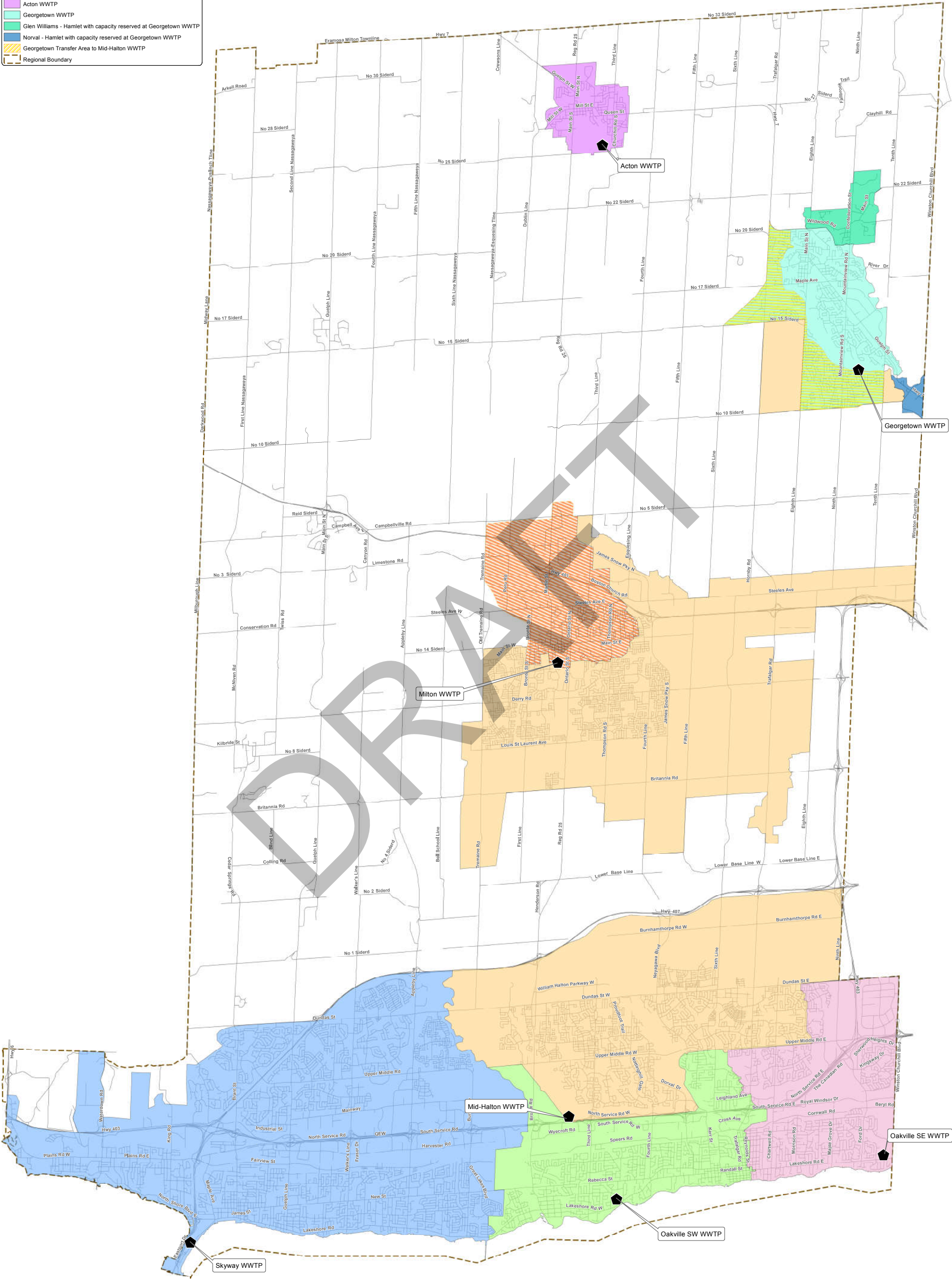
Figure 2: Halton Region Future Water Pressure Zones



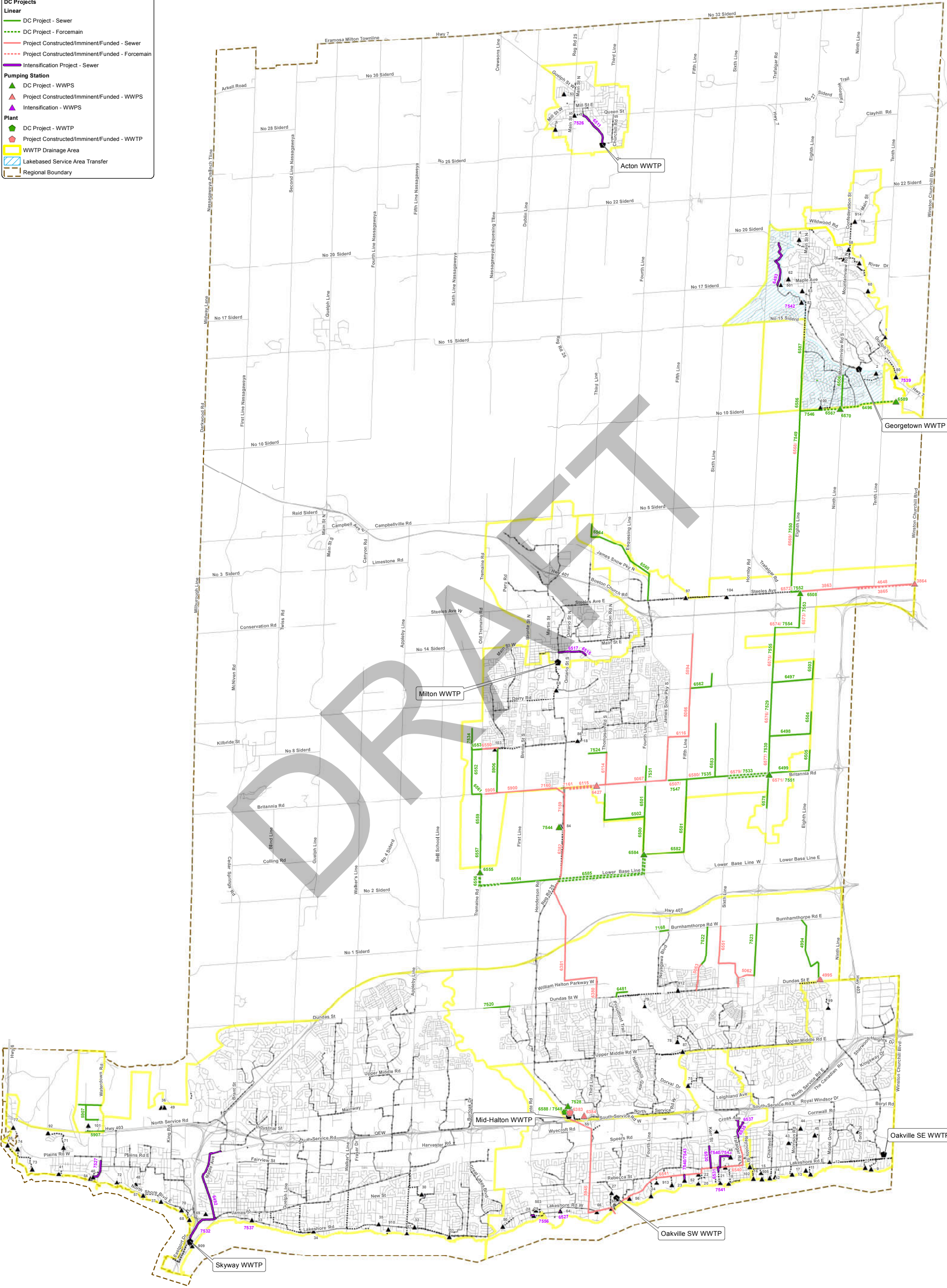
- Legend**
- Existing Infrastructure**
- ▲ Existing Pumping Station (PS)
 - Existing Reservoir (RES)
 - Existing Water Purification Plant (WPP)
 - Existing Standpipe
 - Existing Well Field (Well)
 - ⊕ Existing Elevated Tower (ET)
 - Existing Watermain
- Pumping Station**
- ▲ DC Project - Pumping Station
 - ▲ Project Constructed/Imminent/Funded - Pumping Station
- Water Treatment Plant**
- DC Project - WPP
 - Project Constructed/Imminent/Funded - WPP
- Reservoir**
- DC Project - Storage
 - Project Constructed/Imminent/Funded - Storage
- Well**
- Project Constructed/Imminent/Funded - Well
- Linear**
- DC Project - Linear
 - Project Constructed/Imminent/Funded - Linear
 - Intensification Project
- 5320 Previous IPFS number for existing watermain
- X Existing Interregional connections
 - X New Interregional connections
 - Water Pressure Zone
 - Existing Central Milton Groundwater Service Area Boundary
 - Lakebased Service Area Transfer



- Legend**
- Skyway WWTP
 - Mid-Halton WWTP
 - Oakville SE WWTP
 - Oakville SW WWTP
 - Milton WWTP Decommission and Transfer to Mid-Halton WWTP
 - Acton WWTP
 - Georgetown WWTP
 - Glen Williams - Hamlet with capacity reserved at Georgetown WWTP
 - Norval - Hamlet with capacity reserved at Georgetown WWTP
 - Georgetown Transfer Area to Mid-Halton WWTP
 - Regional Boundary



- Legend**
- Existing Wastewater Infrastructure**
- ▲ Wastewater Pumping Station (WWPS)
 - Wastewater Treatment Plant (WWTP)
 - Gravity Sewer
 - Forcemain
- DC Projects**
- Linear**
- DC Project - Sewer
 - DC Project - Forcemain
 - Project Constructed/Imminent/Funded - Sewer
 - Project Constructed/Imminent/Funded - Forcemain
 - Intensification Project - Sewer
- Pumping Station**
- ▲ DC Project - WWPS
 - ▲ Project Constructed/Imminent/Funded - WWPS
 - ▲ Intensification - WWPS
- Plant**
- DC Project - WWTP
 - Project Constructed/Imminent/Funded - WWTP
- Other**
- ▭ WWTP Drainage Area
 - ▭ Lakebased Service Area Transfer
 - ▭ Regional Boundary

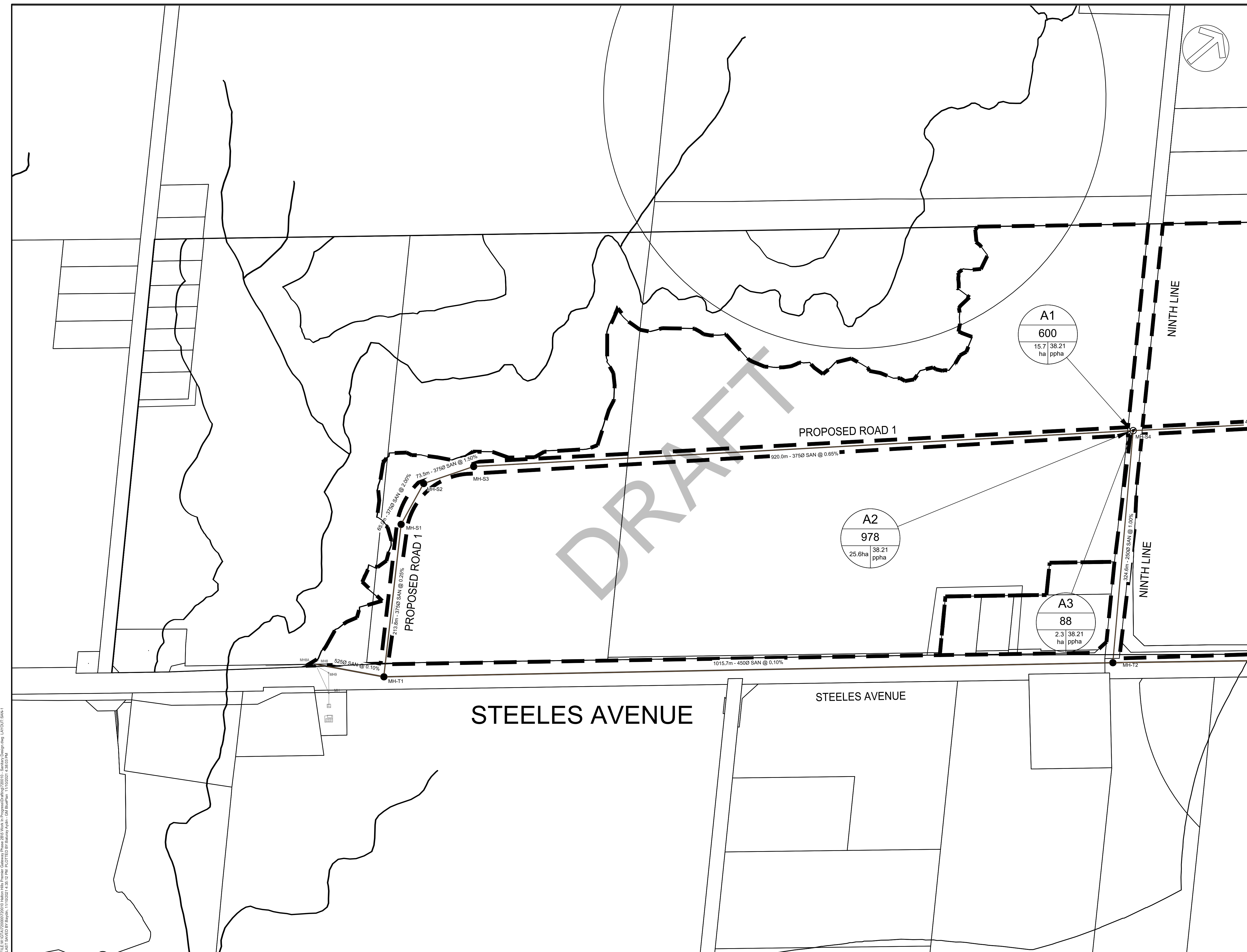


DRAFT

Appendix B

**Halton Hills Premier Gateway Employment Area Phase 2B
Drainage Plans and Sanitary Design Sheets**

DRAFT



LEGEND

--- SUB-CATCHMENT BOUNDARY

SANITARY SUB-CATCHMENT

A12 — AREA LABEL

0.69 — POPULATION

60 — PPHA / PPU

UNITS — AREA / NO. OF UNITS

BENCH MARKS :

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

NO.	DATE	REVISION DESCRIPTION	CHKD

BluePlan
ENGINEERING

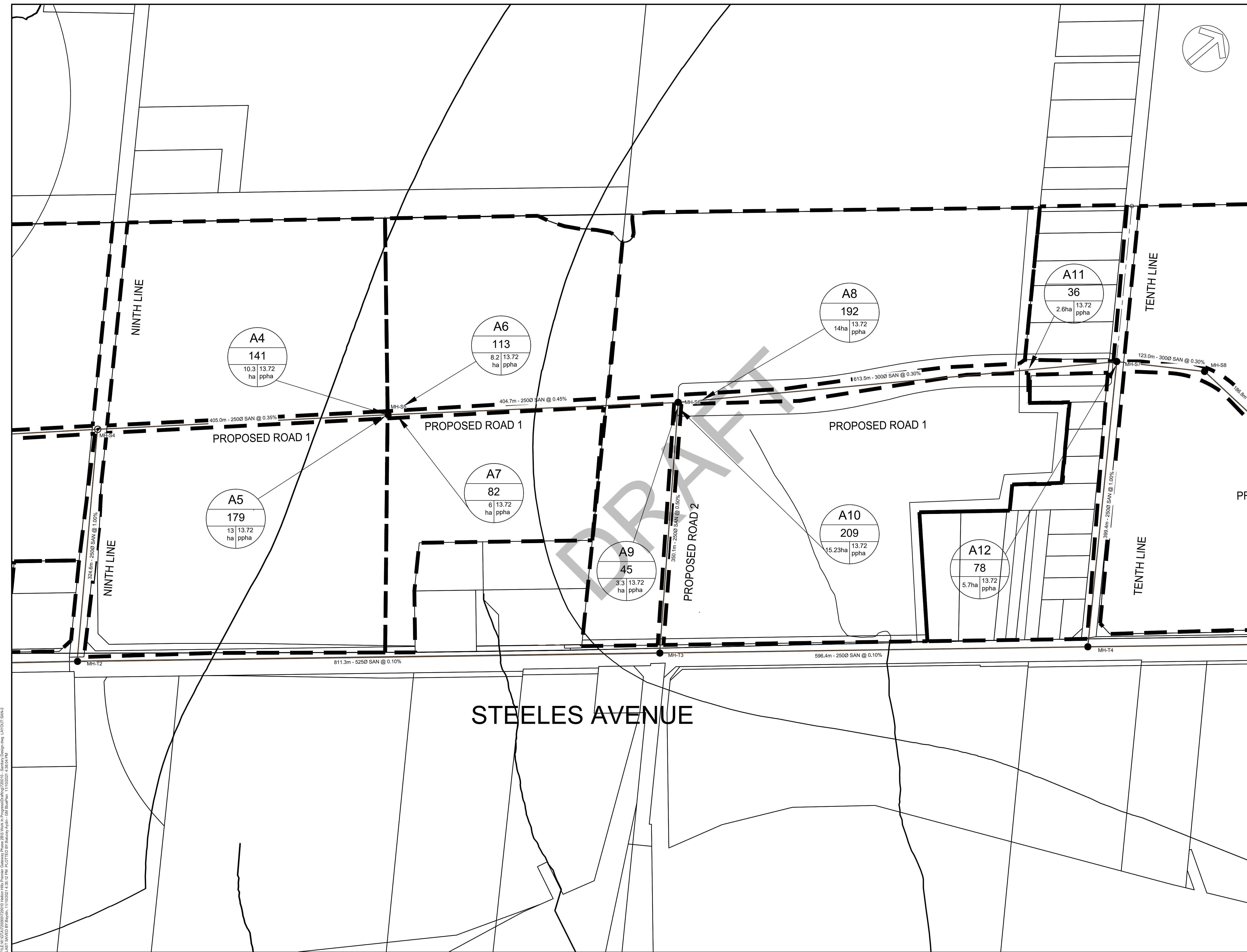
QUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
 ROYAL CENTRE, 3300 HIGHWAY No.7, SUITE 402, VAUGHAN, ON L4K 4M3
 TEL: 416-733-9887 www.griblab.com.ca

Halton Hills Premier Gateway Phase 2B

TOWN OF HALTON HILLS
 SANITARY CATCHMENT
 AREA - 555.03

DRAWN BY: B.A.	APPROVED BY: M.F.	PROJECT NO.: 720010	DRAWING NO.: SAN-1
DESIGNED BY: B.A.	DATE: June 23, 2021	SCALE: H=1:2500	

FILE: W:\2020\070010 Halton Hills Premier Gateway Phase 2B\Area 555.03 Sanitary Catchment Layout.dwg
 DATE: 2021-06-23 10:00:00 AM
 USER: B.A.
 PLOT: 2021-06-23 10:00:00 AM
 PLOTTER: HP DesignJet T1100e
 PLOTTING: HP DesignJet T1100e
 PLOTTING: HP DesignJet T1100e



LEGEND

--- SUB-CATCHMENT BOUNDARY

SANITARY SUB-CATCHMENT

A12 — AREA LABEL

0.69 — POPULATION

60 | 2.5 ppu — PPHA / PPU

UNITS — AREA / NO. OF UNITS

BENCH MARKS :

PR

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

NO.	DATE	REVISION DESCRIPTION	CHKD

BluePlan
ENGINEERING

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
ROYAL CENTRE, 3300 HIGHWAY No.7, SUITE 402, VAUGHAN, ON L4K 4M3
TEL: 416-733-9887 www.gpbblueplan.ca

Halton Hills Premier Gateway Phase 2B

TOWN OF HALTON HILLS
SANITARY CATCHMENT
AREA - 554.02

DRAWN BY: B.A	APPROVED BY: M.F.	PROJECT NO.: 720010	DRAWING NO.:
DESIGNED BY: B.A	DATE: June 23, 2021	SCALE: H=1:2500	SAN-2

FILE: W:\2020\07\001\Halton Hills Premier Gateway Phase 2B\Area 554.02\Sanitary Catchment Layout SAN2.dwg
 PROJECT: Halton Hills Premier Gateway Phase 2B
 DATE: 2021-06-23
 DRAWN BY: B.A
 CHECKED BY: M.F.
 PROJECT NO.: 720010
 DRAWING NO.: SAN-2



LEGEND

--- SUB-CATCHMENT BOUNDARY

SANITARY SUB-CATCHMENT

A12 — AREA LABEL
0.69 — POPULATION
 60 | 2.5 ppu — PPHA / PPU
 UNITS — AREA / NO. OF UNITS

BENCH MARKS :

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

NO.	DATE	REVISION DESCRIPTION	CHKD

BluePlan
ENGINEERING

GUELPH | OWEN SOUND | LISTOWEL | KITCHENER | LONDON | HAMILTON | GTA
 ROYAL CENTRE, 3300 HIGHWAY No.7, SUITE 402, VAUGHAN, ON L4K 4M3
 TEL: 416-733-0867 www.gpb.ca

Halton Hills Premier Gateway Phase 2B

TOWN OF HALTON HILLS
 SANITARY CATCHMENT
 AREA - 554.04

DRAWN BY: B.A.	APPROVED BY: M.F.	PROJECT NO.: 720010	DRAWING NO.: SAN-3
DESIGNED BY: B.A.	DATE: June 23, 2021	SCALE: H=1:2500	

FILE: W:\2020\07\001\Halton Hills Premier Gateway Phase 2B\Area 554.04\Sanitary Catchment\Sanitary Catchment Layout SAN-3.dwg
 DATE: 2021-06-23 10:00:00 AM
 USER: B.A.
 PLOT: 2021-06-23 10:00:00 AM
 PLOTTER: HP DesignJet 5000 Series
 PLOTTING: 11.0 x 17.0 inches
 PLOT SCALE: 1:1
 PLOT ORIENTATION: Landscape
 PLOT RANGE: All
 PLOT OFFSET: 0.25 inches
 PLOT MARGIN: 0.25 inches
 PLOT TITLE: SAN-3
 PLOT SHEET NO.: 1 of 1
 PLOT TOTAL SHEETS: 1
 PLOT STATUS: Success

DRAFT

**Appendix C
Cost Estimates**

DRAFT

A	Water Servicing Infrastructure	Quantity	Unit	Unit Rate	Total Installation Cost	Construction Environment	Construction Environment Uplift Costs	Base Construction Costs	Project Complexity	Project Complexity Construction Uplift Costs	Provisional Allowance (10%)	Total Construction Costs	Geotechnical / Hydrogeological / Materials	Property Requirements	Design Fees (2% Study + 7% Design + 5% Review = Total 14% of Construction Costs)	Construction Fees (6% CA/Inspection + 5% Review = Total 11% of Construction Costs)	Project Contingency (10%)	Total Project Cost	Notes	
A1	Halton Region Project 3844 and Halton Region Project 5948 - 600mm Dia. Watermain along Steeles Avenue (with Crossing of GTA West Corridor)																			
A1.1	600mm Dia. Twin Watermain - Open Cut	4000	m	\$ 1,615	\$ 6,460,000	Suburban	\$ 1,292,000	\$ 7,752,000	High Complexity	\$ 1,550,400	\$ 775,200	\$ 10,077,600	\$ 201,552	\$ 201,552	\$ 1,410,864	\$ 1,108,536	\$ 1,007,760	\$ 14,007,864	Open cut - including bends, thrust restraints, tracer wire etc...	
A1.2	600mm Dia. Twin Watermain - Trenchless	550	m	\$ 9,060	\$ 4,983,000	Suburban	\$ 996,600	\$ 5,979,600	High Complexity	\$ 1,195,920	\$ 597,960	\$ 7,773,480	\$ 155,470	\$ 155,470	\$ 1,088,287	\$ 855,083	\$ 777,348	\$ 10,805,137	Conservative assumption of trenchless crossing GTA West Corridor	
A1.3	600mm Inline Valves	11	Ea.	\$ 67,671	\$ 744,381	Suburban	\$ 148,876	\$ 893,257	High Complexity	\$ 178,651	\$ 89,326	\$ 1,161,234	\$ 23,225	\$ 23,225	\$ 162,573	\$ 127,736	\$ 116,123	\$ 1,614,116		
Sub-Total - A1 - Halton Region Project 3844 and Halton Region Project 5948 - 600mm Dia. Watermain along Steeles Avenue					\$ 12,187,381							\$ 19,012,314							\$ 26,427,117	
A2	Halton Region Project 6644 - 400mm Dia. Watermain on Ninth Line																			
A2.1	400mm Dia. Twin Watermain - Open Cut	330	m	\$ 1,066	\$ 351,780	Suburban	\$ 70,356	\$ 422,136	Low Complexity	\$ 42,214	\$ 42,214	\$ 506,563	\$ 2,533	\$ 5,066	\$ 70,919	\$ 55,722	\$ 50,656	\$ 691,459	Open cut - including bends, thrust restraints, tracer wire etc...	
A2.2	400mm Inline Valves	2	Ea.	\$ 43,063	\$ 86,126	Suburban	\$ 17,225	\$ 103,351	Low Complexity	\$ 10,335	\$ 10,335	\$ 124,021	\$ 620	\$ 1,240	\$ 17,363	\$ 13,642	\$ 12,402	\$ 169,289		
Sub-Total - A2 - Halton Region Project 6644 - 400mm Dia. Watermain on Ninth Line					\$ 437,906							\$ 630,585							\$ 860,748	
A3	Halton Region Project 6645 - 400mm Dia. Watermain Proposed Collector Road 1 (with Crossing of GTA West Corridor)																			
A3.1	400mm Dia. Twin Watermain - Open Cut	1100	m	\$ 1,066	\$ 1,172,600	Suburban	\$ 234,520	\$ 1,407,120	Low Complexity	\$ 140,712	\$ 140,712	\$ 1,688,544	\$ 8,443	\$ 16,885	\$ 236,396	\$ 185,740	\$ 168,854	\$ 2,304,863	Open cut - including bends, thrust restraints, tracer wire etc...	
A3.2	400mm Dia. Twin Watermain - Trenchless	350	m	\$ 8,830	\$ 3,090,500	Suburban	\$ 618,100	\$ 3,708,600	High Complexity	\$ 741,720	\$ 370,860	\$ 4,821,180	\$ 96,424	\$ 96,424	\$ 674,965	\$ 530,330	\$ 482,118	\$ 6,701,440	Conservative assumption of trenchless crossing GTA West Corridor	
A3.3	400mm Inline Valves	8	Ea.	\$ 43,063	\$ 344,504	Suburban	\$ 68,901	\$ 413,405	Low Complexity	\$ 41,340	\$ 41,340	\$ 496,086	\$ 2,480	\$ 4,961	\$ 69,452	\$ 54,569	\$ 49,609	\$ 677,157		
Sub-Total - A3 - Halton Region Project 6645 - 400mm Dia. Watermain Proposed Collector Road 1					\$ 4,607,604							\$ 7,005,810							\$ 9,683,460	
A4	Halton Region Project 6646 - 400mm Dia. Watermain on Tenth Line																			
A4.1	400mm Dia. Twin Watermain - Open Cut	400	m	\$ 1,066	\$ 426,400	Suburban	\$ 85,280	\$ 511,680	Low Complexity	\$ 51,168	\$ 51,168	\$ 614,016	\$ 3,070	\$ 6,140	\$ 85,962	\$ 67,542	\$ 61,402	\$ 838,132	Open cut - including bends, thrust restraints, tracer wire etc...	
A4.2	400mm Inline Valves	2	Ea.	\$ 43,063	\$ 86,126	Suburban	\$ 17,225	\$ 103,351	Low Complexity	\$ 10,335	\$ 10,335	\$ 124,021	\$ 620	\$ 1,240	\$ 17,363	\$ 13,642	\$ 12,402	\$ 169,289		
Sub-Total - A4 - Halton Region Project 6646 - 400mm Dia. Watermain on Tenth Line					\$ 512,526							\$ 738,037							\$ 1,007,421	
A5	300mm Dia. Local Watermain																			
A5.1	300mm Dia. Twin Watermain (2m Cover)	4535	m	\$ 883	\$ 4,004,405	Suburban	\$ 800,881	\$ 4,805,286	Low Complexity	\$ 480,529	\$ 480,529	\$ 5,766,343	\$ 28,832	\$ 57,663	\$ 807,288	\$ 634,298	\$ 576,634	\$ 7,871,058	Open cut - including bends, thrust restraints, tracer wire etc...	
A5.2	Hydrant Sets and Valves	53	Ea.	\$ 5,000	\$ 265,000	Suburban	\$ 53,000	\$ 318,000	Low Complexity	\$ 31,800	\$ 31,800	\$ 381,600	\$ 1,908	\$ 3,816	\$ 53,424	\$ 41,976	\$ 38,160	\$ 520,884	Industrial, Commercial & High Density Residential = 90m	
A5.3	300mm Inline Valves	21	Ea.	\$ 6,767	\$ 142,107	Suburban	\$ 28,421	\$ 170,528	Low Complexity	\$ 17,053	\$ 17,053	\$ 204,634	\$ 1,023	\$ 2,046	\$ 28,649	\$ 22,510	\$ 20,463	\$ 279,326		
Sub-Total - A5 - 300mm Dia. Local Watermain					\$ 4,411,512							\$ 6,352,577							\$ 8,671,268	
Total - A - Water Infrastructure Required to Service PGEA P2B					\$ 22,156,929							\$ 33,739,323							\$ 46,650,014	

DRAFT

B	Wastewater Servicing Infrastructure	Quantity	Unit	Unit Rate	Total Installation Cost	Construction Environment	Construction Environment Uplift Costs	Base Construction Costs	Project Complexity	Project Complexity Construction Uplift Costs	Provisional Allowance (10%)	Total Construction Costs	Geotechnical / Hydrogeological / Materials	Property Requirements	Design Fees (2% Study + 7% Design + 5% Review = Total 14% of Construction)	Construction Fees (6% CA/Inspection + 5% Review = Total 11% of Construction Costs)	Project Contingency (10%)	Total Project Cost	Notes
B1	Halton Region Project 3863 – 450mm Dia. Trunk Sewer on Steeles Avenue from East of Ninth Line to Eighth Line (HH #3 WWPS / 7553 – Eighth Line Trunk Sewer)	635	m	\$ 883	\$ 560,793	Suburban	\$ 112,159	\$ 672,952	High Complexity	\$ 134,590	\$ 67,295	\$ 874,838	\$ 17,497	\$ 17,497	\$ 122,477	\$ 96,232	\$ 87,484	\$ 1,216,024	Sized only based on PGEA P2B (2031) projected flows. Region is updating servicing strategy for area
B2	Halton Region Project 3864 - Halton Hills (HH) #4 WWPS at intersection of Steeles Avenue and Winston Churchill Boulevard (Estimated firm capacity of 73 L/s to service PGEA P2B East of GTA West Corridor) Cost = \$19,420.36 x Capacity (L/s) + \$1,982,631	1	L.S.	\$ 3,395,268	\$ 3,395,268	Suburban	\$ 679,054	\$ 4,074,322	High Complexity	\$ 814,864	\$ 407,432	\$ 5,296,618	\$ 105,932	\$ 105,932	\$ 741,527	\$ 582,628	\$ 529,662	\$ 7,362,299	Sized only based on PGEA P2B (2031) projected flows. Region is updating servicing strategy for area
B3	Halton Region Project 3865 - 300mm Dia. Forcemain on Steeles Avenue from East of Ninth Line HH#4 WWPS (Project 3863)	1986	m	\$ 883	\$ 1,753,285	Suburban	\$ 350,657	\$ 2,103,942	High Complexity	\$ 420,788	\$ 210,394	\$ 2,735,124	\$ 54,702	\$ 54,702	\$ 382,917	\$ 300,864	\$ 273,512	\$ 3,801,823	Sized only based on PGEA P2B (2031) projected flows. Region is updating servicing strategy for area
B4	Halton Region Project 3865 – 450mm Dia. Trunk Sewer on Steeles Avenue from East of Ninth Line HH#4 WWPS (Project 3864) (Estimated firm capacity of 71 L/s to service PGEA P2B East of GTA West Corridor)	1016	m	\$ 883	\$ 896,863	Suburban	\$ 179,373	\$ 1,076,236	High Complexity	\$ 215,247	\$ 107,624	\$ 1,399,106	\$ 27,982	\$ 27,982	\$ 195,875	\$ 153,902	\$ 139,911	\$ 1,944,758	Sized only based on PGEA P2B (2031) projected flows. Region is updating servicing strategy for area
B5	Local Sanitary Sewer																		
B5.1	250mm Dia. Sanitary Sewer																		
	SAN MH-S5 to SAN MH-S4 (Avg. Cover - 3.4 m)	405	m	\$ 764	\$ 309,420	Suburban	\$ 61,884	\$ 371,304	Low Complexity	\$ 37,130	\$ 37,130	\$ 445,565	\$ 2,228	\$ 4,456	\$ 62,379	\$ 49,012	\$ 44,556	\$ 608,196	Greenfield construction
	SAN MH-S5 to SAN MH-S6 (Avg. Cover - 4.7 m)	405	m	\$ 764	\$ 309,420	Suburban	\$ 61,884	\$ 371,304	Low Complexity	\$ 37,130	\$ 37,130	\$ 445,565	\$ 2,228	\$ 4,456	\$ 62,379	\$ 49,012	\$ 44,556	\$ 608,196	Greenfield construction
	SAN MH-S4 to SAN MH-T2 (Avg. Cover - 5.1 m)	325	m	\$ 3,209	\$ 1,042,925	Suburban	\$ 208,585	\$ 1,251,510	Medium Complexity	\$ 187,727	\$ 125,151	\$ 1,564,388	\$ 23,466	\$ 23,466	\$ 219,014	\$ 172,083	\$ 156,439	\$ 2,158,855	Construction on Ninth Line and connection to Steeles Avenue trunk sewer
	SAN MH-S6 to SAN MH-T3 (Avg. Cover - 4.3 m) on Proposed Collector Road 2	350	m	\$ 764	\$ 267,400	Suburban	\$ 53,480	\$ 320,880	Low Complexity	\$ 32,088	\$ 32,088	\$ 385,056	\$ 1,925	\$ 3,851	\$ 53,908	\$ 42,356	\$ 38,506	\$ 525,601	Greenfield construction and connection to Steeles Avenue trunk sewer
	SAN MH-S7 to SAN MH-T4 (Avg. Cover - 3.7 m) on Tenth Line	400	m	\$ 764	\$ 305,600	Suburban	\$ 61,120	\$ 366,720	Medium Complexity	\$ 55,008	\$ 36,672	\$ 458,400	\$ 6,876	\$ 6,876	\$ 64,176	\$ 50,424	\$ 45,840	\$ 632,592	Construction on Tenth Line and connection to Steeles Avenue trunk sewer
	SAN MH-S13 to SAN MH-S14 (Avg. Cover - 3.2 m) on Proposed Collector Road 1	150	m	\$ 764	\$ 114,600	Suburban	\$ 22,920	\$ 137,520	Low Complexity	\$ 13,752	\$ 13,752	\$ 165,024	\$ 825	\$ 1,650	\$ 23,103	\$ 18,153	\$ 16,502	\$ 225,258	Greenfield construction with MH in Winston Churchill Blvd.
	SAN MH-S14 to SAN MH-T6 (Avg. Cover - 4.4 m) on Winston Churchill Boulevard	257	m	\$ 764	\$ 196,348	Suburban	\$ 39,270	\$ 235,618	High Complexity	\$ 47,124	\$ 23,562	\$ 306,303	\$ 6,126	\$ 6,126	\$ 42,882	\$ 33,693	\$ 30,630	\$ 425,761	Construction on Winston Churchill Blvd.
B5.2	300mm Dia. Sanitary Sewer																		
	SAN MH-S6 to SAN MH-S7 (Avg. Cover - 6.7 m) on Proposed Collector Road 1	614	m	\$ 3,209	\$ 1,970,326	Suburban	\$ 394,065	\$ 2,364,391	Low Complexity	\$ 236,439	\$ 236,439	\$ 2,837,269	\$ 14,186	\$ 28,373	\$ 397,218	\$ 312,100	\$ 283,727	\$ 3,872,873	Greenfield construction
	SAN MH-S7 to SAN MH-S8 (Avg. Cover - 6.2 m) on Proposed Collector Road 1	123	m	\$ 3,209	\$ 394,707	Suburban	\$ 78,941	\$ 473,648	Low Complexity	\$ 47,365	\$ 47,365	\$ 568,378	\$ 2,842	\$ 5,684	\$ 79,573	\$ 62,522	\$ 56,838	\$ 775,836	Greenfield construction
	SAN MH-S8 to SAN MH-S9 (Avg. Cover - 6.9 m) on Proposed Collector Road 1	187	m	\$ 3,209	\$ 600,083	Suburban	\$ 120,017	\$ 720,100	Low Complexity	\$ 72,010	\$ 72,010	\$ 864,120	\$ 4,321	\$ 8,641	\$ 120,977	\$ 95,053	\$ 86,412	\$ 1,179,523	Greenfield construction
	SAN MH-S9 to SAN MH-S10 (Avg. Cover - 7.9 m) on Proposed Collector Road 1	99	m	\$ 3,209	\$ 317,691	Suburban	\$ 63,538	\$ 381,229	Low Complexity	\$ 38,123	\$ 38,123	\$ 457,475	\$ 2,287	\$ 4,575	\$ 64,047	\$ 50,322	\$ 45,748	\$ 624,453	Greenfield construction
	SAN MH-S12A to SAN MH-S12 (Avg. Cover - 2.75 m) on Proposed Collector Road 3	373	m	\$ 764	\$ 284,972	Suburban	\$ 56,994	\$ 341,966	Low Complexity	\$ 34,197	\$ 34,197	\$ 410,360	\$ 2,052	\$ 4,104	\$ 57,450	\$ 45,140	\$ 41,036	\$ 560,141	Greenfield construction
	SAN MH-T3 to SAN MH-T4 (Avg. Cover - 5.2 m) on Steeles Avenue	596	m	\$ 3,209	\$ 1,913,848	Suburban	\$ 382,770	\$ 2,296,617	High Complexity	\$ 459,323	\$ 229,662	\$ 2,985,602	\$ 59,712	\$ 59,712	\$ 417,984	\$ 328,416	\$ 298,560	\$ 4,149,987	Greenfield construction
	SAN MH-T4 to SAN MH-T5 (Avg. Cover - 4.5 m) on Steeles Avenue	754	m	\$ 764	\$ 576,132	Suburban	\$ 115,226	\$ 691,359	High Complexity	\$ 138,272	\$ 69,136	\$ 898,767	\$ 17,975	\$ 17,975	\$ 125,827	\$ 98,864	\$ 89,877	\$ 1,249,285	Greenfield construction

B5.3 375mm Dia. Sanitary Sewer																					
	SAN MH-S4 to SAN MH-S3 (Avg. Cover - 3.2 m) on Proposed Collector Road 1	920	m	\$ 764	\$ 702,880	Suburban	\$ 140,576	\$ 843,456	Low Complexity	\$ 84,346	\$ 84,346	\$ 1,012,147	\$ 5,061	\$ 10,121	\$ 141,701	\$ 111,336	\$ 101,215	\$ 1,381,581		Greenfield construction	
	SAN MH-S3 to SAN MH-S2 (Avg. Cover - 2.8 m) on Proposed Collector Road 1	74	m	\$ 764	\$ 56,536	Suburban	\$ 11,307	\$ 67,843	Low Complexity	\$ 6,784	\$ 6,784	\$ 81,412	\$ 407	\$ 814	\$ 11,398	\$ 8,955	\$ 8,141	\$ 111,127		Greenfield construction	
	SAN MH-S2 to SAN MH-S1 (Avg. Cover - 2.75 m) on Proposed Collector Road 1	65	m	\$ 764	\$ 49,660	Suburban	\$ 9,932	\$ 59,592	Low Complexity	\$ 5,959	\$ 5,959	\$ 71,510	\$ 358	\$ 715	\$ 10,011	\$ 7,866	\$ 7,151	\$ 97,612		Greenfield construction	
	SAN MH-S1 to SAN MH-T1 (Avg. Cover - 3.5 m) on Proposed Collector Road 1	214	m	\$ 764	\$ 163,496	Suburban	\$ 32,699	\$ 196,195	Low Complexity	\$ 19,620	\$ 19,620	\$ 235,434	\$ 1,177	\$ 2,354	\$ 32,961	\$ 25,898	\$ 23,543	\$ 321,368		Greenfield construction with connection to Steeles Ave. Trunk Sewer	
	SAN MH-S10 to SAN MH-S11 (Avg. Cover - 7.7 m) on Proposed Collector Road 1	172	m	\$ 3,209	\$ 551,948	Suburban	\$ 110,390	\$ 662,338	Low Complexity	\$ 66,234	\$ 66,234	\$ 794,805	\$ 3,974	\$ 7,948	\$ 111,273	\$ 87,429	\$ 79,481	\$ 1,084,909		Greenfield construction	
	SAN MH-S11 to SAN MH-S12 (Avg. Cover - 5.7 m) on Proposed Collector Road 1	214	m	\$ 3,209	\$ 686,726	Suburban	\$ 137,345	\$ 824,071	Low Complexity	\$ 82,407	\$ 82,407	\$ 988,885	\$ 4,944	\$ 9,889	\$ 138,444	\$ 108,777	\$ 98,889	\$ 1,349,829		Greenfield construction	
	SAN MH-S12 to SAN MH-T5 (Avg. Cover - 3.8 m) on Proposed Collector Road 3	238	m	\$ 764	\$ 181,832	Suburban	\$ 36,366	\$ 218,198	Low Complexity	\$ 21,820	\$ 21,820	\$ 261,838	\$ 1,309	\$ 2,618	\$ 36,657	\$ 28,802	\$ 26,184	\$ 357,409		Greenfield construction with connection to Steeles Ave. Trunk Sewer	
Sub-Total - B5 - Local Sanitary Sewer					\$ 10,996,550			\$ 13,195,860				\$ 16,238,303								\$ 22,300,392	
Total - B - Wastewater Infrastructure Required to Service PGEA P2B					\$ 17,602,759			\$ 21,123,311				\$ 26,543,989								\$ 36,625,296	
ALT-1	Equivalent Steeles Avenue trunk sewer from Winston Churchill Blvd., crossing the GTA West Corridor, and outletting at the Ex. HH#3 WWPS / Proposed Eighth Line Trunk Sewer (Assumed 600mm Dia. to align with smallest diameter available microtunnelling boring machine (MTBM))	3813	m	\$ 9,060	\$ 34,542,156	Suburban	\$ 6,908,431	\$ 41,450,587	High Complexity	\$ 8,290,117	\$ 4,145,059	\$ 53,885,763	\$ 1,077,715	\$ 1,077,715	\$ 7,544,007	\$ 5,927,434	\$ 5,388,576	\$ 74,901,211		Sized only based on PGEA P2B (2031) projected flows. Region is updating servicing strategy for area	

DRAFT



The Regional Municipality of Halton

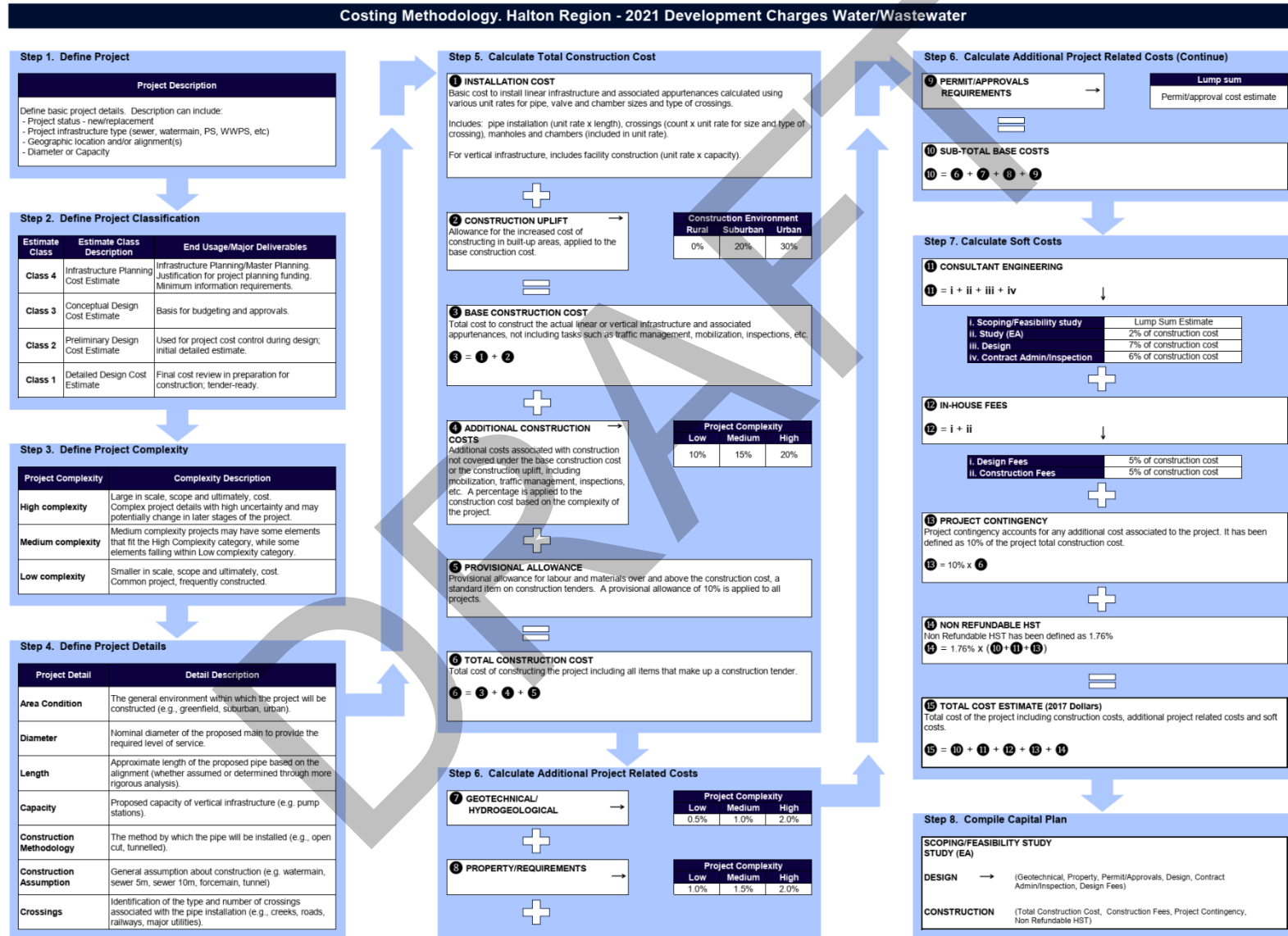
2022 Development Charges Update – Water/Wastewater

**Cost Estimation Approaches
Technical Memorandum**

GMBP File: 720084

October 2021

Figure 1 – Cost Estimation Process Flow Diagram



Gravity Sewer Open Cut Unit Rate Comparison

Diameter (mm)	Gravity Sewer (5m Depth)		Gravity Sewer (10m Depth)	
	Unit Rate (2016\$/m)	Unit Rate (2022\$/m)	Unit Rate (2016\$/m)	Unit Rate (2022\$/m)
250*	-	\$646	-	\$1,034
300	\$618	\$764	\$2,609	\$3,209
375	\$659	\$808	\$2,686	\$3,306
450	\$715	\$883	\$2,782	\$3,424
525	\$769	\$948	\$2,871	\$3,532
600	\$990	\$1,217	\$3,139	\$3,865
675	\$1,208	\$1,486	\$3,452	\$4,242
750	\$1,331	\$1,637	\$3,613	\$4,447
825	\$1,428	\$1,755	\$3,752	\$4,619
900	\$1,680	\$2,067	\$4,105	\$5,050
975	\$1,804	\$2,218	\$4,253	\$5,233
1050	\$1,995	\$2,455	\$4,554	\$5,599
1200	\$2,239	\$2,756	\$4,870	\$5,997
1350	\$2,454	\$3,015	\$5,186	\$6,385
1500	\$2,752	\$3,381	\$5,506	\$6,773
1800	\$3,496	\$4,296	\$6,396	\$7,871
2100	\$4,322	\$5,319	\$7,438	\$9,152
2400	\$5,323	\$6,546	\$8,585	\$10,563
3000	\$7,424	\$9,131	\$10,947	\$13,470

Note:

*Unit rate not available during the 2017 DC Update. Project of this size were either indexed or costed with the unit for the closest diameter available.

Pressure Pipe Open Cut Unit Rate Comparison

Diameter (mm)	Watermain/Forcemain (5m Depth)	
	Unit Rate (2016\$/m)	Unit Rate (2022\$/m)
150*	-	\$441
200*	-	\$592
250*	-	\$743
300*	-	\$883
350*	-	\$1,034
400	\$868	\$1,066
450	\$968	\$1,195
500	\$1,104	\$1,357
600	\$1,309	\$1,615
750	\$1,565	\$1,927
900	\$1,944	\$2,390
1050	\$2,248	\$2,767
1200	\$2,655	\$3,262
1350	\$3,216	\$3,962
1500	\$3,562	\$4,382
1650	\$4,131	\$5,082
1800	\$4,605	\$5,664
2100	\$5,253	\$6,460

Note:

*Unit rate not available during the 2017 DC Update. Project of this size were either indexed or costed with the unit for the closest diameter available

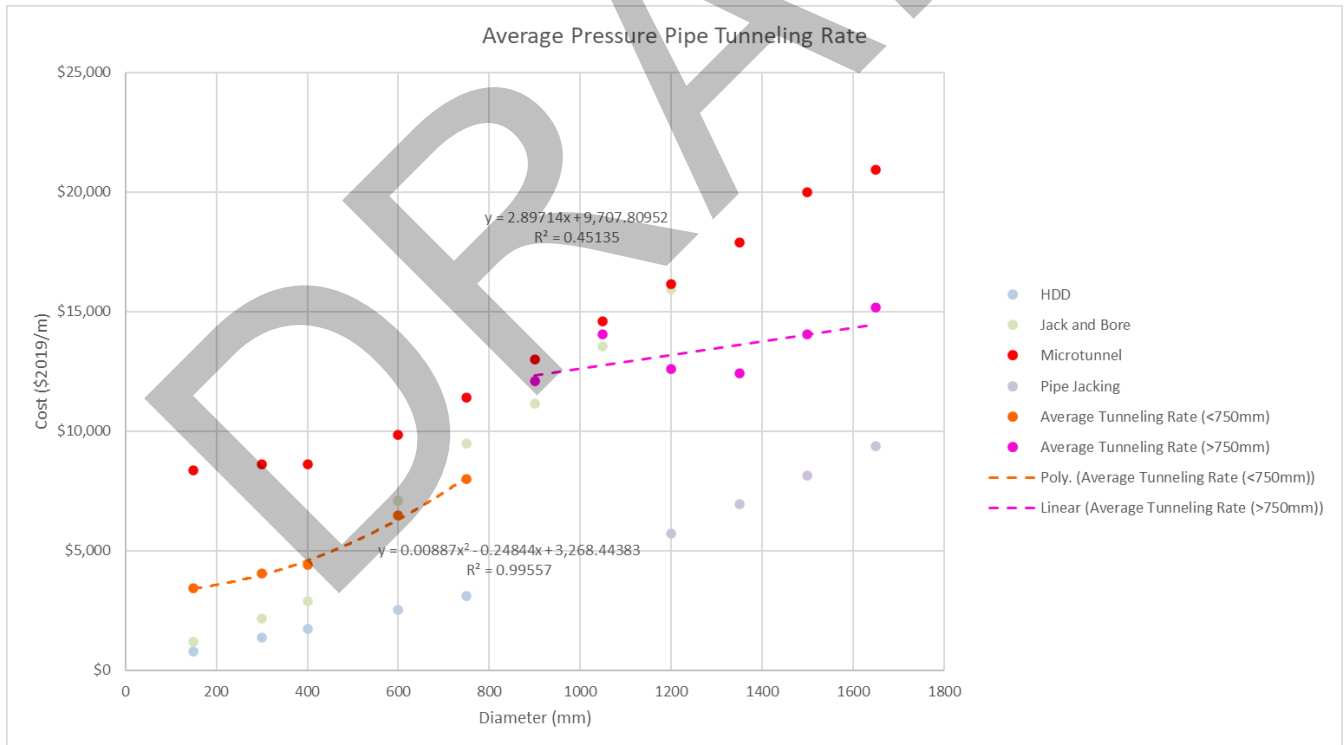
Gravity Sewer Tunnelling Unit Rates

Diameter	Jack and Bore	Microtunnel	Pipe Jacking	TBM	Average	Selected Tunnelling Rate
(mm)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)
250	\$2,090	\$8,530	-	-	\$5,310	\$8,530
300	\$2,170	\$8,600	-	-	\$5,385	\$8,600
375	\$3,390	\$8,720	-	-	\$6,055	\$8,720
450	\$4,610	\$8,830	-	-	\$6,720	\$8,830
525	\$4,720	\$8,950	-	-	\$6,835	\$8,950
600	\$7,050	\$9,060	-	-	\$8,055	\$9,060
675	\$8,270	\$7,870	-	-	\$8,070	\$7,870
750	\$8,390	\$7,870	-	-	\$8,130	\$7,870
825	\$9,610	\$7,870	-	-	\$8,740	\$7,870
900	\$9,720	\$7,870	-	-	\$8,795	\$7,870
975	\$10,950	\$7,870	-	-	\$9,410	\$7,870
1050	\$11,060	\$7,870	\$4,640	\$8,800	\$8,093	\$7,870
1200	\$12,400	\$7,870	\$5,730	\$9,540	\$8,885	\$7,870
1350	-	\$8,530	\$6,940	\$9,900	\$8,457	\$8,530
1500	-	\$9,190	\$8,140	\$10,640	\$9,323	\$9,190
1650	-	\$9,850	\$9,380	\$11,370	\$10,200	\$9,850
1800	-	\$10,510	\$10,730	\$11,370	\$10,870	\$10,510
1950	-	\$11,310	\$12,040	\$12,100	\$11,817	\$11,310
2100	-	\$12,490	\$13,380	\$12,470	\$12,780	\$12,490
2250	-	\$12,490	\$14,760	\$13,200	\$13,483	\$12,490
2400	-	\$13,590	\$16,360	\$13,940	\$14,630	\$13,590

Pressure Pipe Tunnelling Unit Rates

Diameter	HDD	Jack and Bore	Microtunnel	Pipe Jacking	TBM	Average	Selected Tunnelling Rate
(mm)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)	Unit Rate (2022\$/m)
150	\$790	\$1,200	\$8,370	-	-	\$3,450	\$8,370
300	\$1,364	\$2,170	\$8,600	-	-	\$4,040	\$8,600
400	\$1,749	\$2,900	\$8,600	-	-	\$4,420	\$8,600
600	\$2,520	\$7,090	\$9,840	-	-	\$6,480	\$9,840
750	\$3,097	\$9,480	\$11,420	-	-	\$8,000	\$11,420
900	-	\$11,150	\$13,010	-	-	\$12,080	\$13,010
1050	-	\$13,540	\$14,590	-	-	\$14,070	\$14,590
1200	-	\$15,940	\$16,170	\$5,730	-	\$12,610	\$16,170
1350	-	-	\$17,890	\$6,940	-	\$12,420	\$17,890
1500	-	-	\$20,000	\$8,140	\$11,370	\$14,070	\$20,000
1650	-	-	\$20,930	\$9,380	\$12,470	\$15,160	\$20,930
1800	-	-	\$22,950	\$10,730	\$13,570	\$15,020	\$22,950

Pressure Pipe Tunnelling Cost Curve



Crossings Unit Rate Analysis

Properties				Wastewater Crossings			Water Crossings			Total Program		
Options	Tunnelling Rate	Shaft Rate	Shaft Depth (m)	2017 Indexed	Updated Cost	Difference	2017 Indexed	Updated Cost	Difference	2017 Indexed	Updated Cost	Difference
1	Average	Microtunnel	10	\$10 M	\$79 M	690%	\$22 M	\$188 M	755%	\$32 M	\$267 M	1047%
2	Average	Microtunnel	5		\$43 M	330%		\$104 M	373%			
3	Average	J&B/Micro	10		\$33 M	230%		\$61 M	177%			
4	Average	J&B/Micro	5		\$25 M	150%		\$41 M	86%			
5	Average	J&B	10		\$28 M	180%		\$61 M	177%			
6	Average	J&B	5		\$17 M	70%		\$41 M	50%			
7	2017 Indexed Rate					\$12 M		20%			\$25 M	14%

Note: The purpose of this table was for decision making only. It helped determine which crossing cost approach should be used. The table does not contain updated costs and it only shows crossings costs, not full project costs.

Sewer Unit Cost – 5m Depth

Diameter	Total Unit Cost
(mm)	(2022\$/m)
250	\$646
300	\$764
375	\$808
450	\$883
525	\$948
600	\$1,217
675	\$1,486
750	\$1,637
825	\$1,755
900	\$2,067
975	\$2,218
1050	\$2,455
1200	\$2,756
1350	\$3,015
1500	\$3,381
1800	\$4,296
2100	\$5,319
2400	\$6,546
3000	\$9,131

Sewer Unit Cost – 10 Depth

Diameter	Total Unit Cost
(mm)	(2022\$/m)
250	\$1,034
300	\$3,209
375	\$3,306
450	\$3,424
525	\$3,532
600	\$3,865
675	\$4,242
750	\$4,447
825	\$4,619
900	\$5,050
975	\$5,233
1050	\$5,599
1200	\$5,997
1350	\$6,385
1500	\$6,773
1800	\$7,871
2100	\$9,152
2400	\$10,563
3000	\$13,470

Watermain & Forcemain Unit Costs

Diameter	Total Unit Cost
(mm)	(2022\$/m)
150	\$441
200	\$592
250	\$743
300	\$883
350	\$1,034
400	\$1,066
450	\$1,195
500	\$1,357
600	\$1,615
750	\$1,927
900	\$2,390
1050	\$2,767
1200	\$3,262
1350	\$3,962
1500	\$4,382
1650	\$5,082
1800	\$5,664
2100	\$6,460

Gravity Sewer Tunnelling Construction Costs

Diameter	Total Unit Cost
(mm)	(2022\$/m)
250	\$8,530
300	\$8,600
375	\$8,720
450	\$8,830
525	\$8,950
600	\$9,060
675	\$7,870
750	\$7,870
825	\$7,870
900	\$7,870
975	\$7,870
1050	\$7,870
1200	\$7,870
1350	\$8,530
1500	\$9,190
1650	\$9,850
1800	\$10,510
2100	\$11,310
2400	\$12,490

Pressure Pipe Tunnelling Construction Costs

Diameter	Total Unit Cost
(mm)	(2022\$/m)
150	\$8,370
300	\$8,600
400	\$8,600
600	\$9,840
750	\$11,420
900	\$13,010
1050	\$14,590
1200	\$16,170
1350	\$17,890
1500	\$20,000
1650	\$20,930
1800	\$22,950

Shaft Tunnelling Construction Costs

$$\text{Cost} = \$12,500 \times \text{Depth (m)} \times \text{Inside Shaft Diameter (m)}$$

Facilities

Facility	Total Unit Cost	Unit
Reservoirs - New Construction	\$900,000	(\$/ML)
New Sewer Pumping Stations	Cost = \$19,420.36 x Capacity (L/s) + \$1,982,631	(\$/L/s)
Notes:		
<ul style="list-style-type: none"> Unit rate is intended to provide the base construction cost for a basic pumping facility. These costs are not assumed to account for forcemains (for WWPS) or overflow storage tanks (WWPS) or unique items such as deep wet wells (WWPS), extensive architectural features or extensive site works. 		