

Background Review Water and Wastewater – Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study

Water and Wastewater

Project # TPB188126; Client Name: City of Oshawa

Prepared for:

City of Oshawa

50 Centre Street South, Oshawa, ON L1H 3Z7

4/29/2019

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1.0 Introduction

Wood was retained by Macaulay Shiomi Howson Ltd. to prepare a background review report on water and wastewater for the Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study, specifically for the Columbus Part II Planning Area (the subject lands) for the City of Oshawa. The subject lands are shown in **Figure 1**. The Part II Planning Area is located within a greater area known as the Columbus Study Area in the City of Oshawa.

The scope of this report involves the following:

-) Review of the existing water and wastewater services for the subject lands; and
-) Confirmation on how the subject lands will be connected to Region of Durham's (Region) water and wastewater system.

2.0 Planning Context

2.1 Study Area

The Columbus Study Area is bounded by Howden Road to the north, the Oshawa-Whitby boundary to the west, Winchester Road to the south and the east branch of the Oshawa Creek to the east. The Columbus Part II Planning Area (the subject lands) is within this area as shown in **Figure 1**. The land ranges in elevation from approximately 178 to 234 meters above sea level (m.a.s.l.). The subject lands have a total area of 560 ha.

2.2 Municipal Class Environmental Assessment Planning Context

The City of Oshawa has initiated an Integrated Columbus Part II Planning Act and Municipal Class Environmental Assessment Act Study for the Columbus Study Area, which includes the Columbus Part II Planning Area. The Municipal Class Environmental Assessment component of the Study will confirm subwatershed planning guidelines, stormwater management configuration, development limits, and transportation configurations.

Durham Region is the owner of the Water Supply & Transmission System as well as the Wastewater Collection and Treatment System. The Region has a Master Planning and Capital Budgeting process that governs the development of the primary trunk collection infrastructure (sewers and sewage pumping stations) as well as the water supply and transmission infrastructure (transmission mains, storage, elevated storage, pumping and pressurization facilities).

2.3 Proposed Land Use

The proposed land use is currently being determined through the secondary planning process.

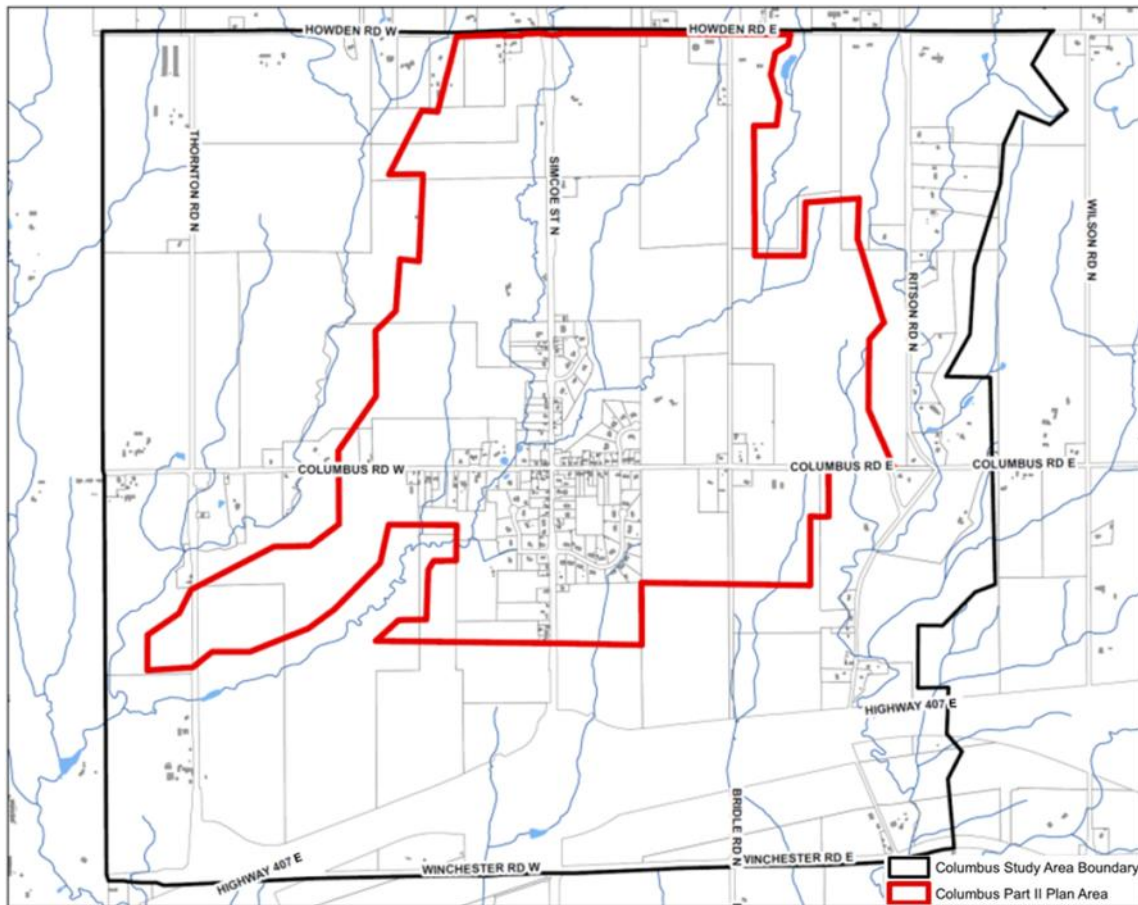


Figure 1. Columbus Part II Planning Area

3.0 Background Information

The report is based on the following information that was provided by the Regional Municipality of Durham:

-) GIS data on water and wastewater system provided by Region of Durham on November 9, 2018;
-) The July 2018 Durham Regionwide Development Charge Background Study by Region of Durham (received on November 5, 2018); and
-) Figures on water supply system by Region of Durham on November 1, 2018.

4.0 Wastewater Servicing Evaluation

4.1 Existing Wastewater System

The subject lands are within a future sewershed which will be serviced by the Durham Region's Courtice Trunk Sanitary sewer and the Courtice Water Pollution Control Plant (W.P.C.P.) as shown in **Figure 2**. The Conlin Road S.P.S. and downstream sanitary system currently do not have capacity to service the projected growth in the Columbus Area. Future sanitary infrastructure is required to provide servicing to the Columbus Area.

Detailed information including sewer alignments for this conveyance strategy is not available at this time, and will be determined through a subsequent Class Environmental Assessment process.

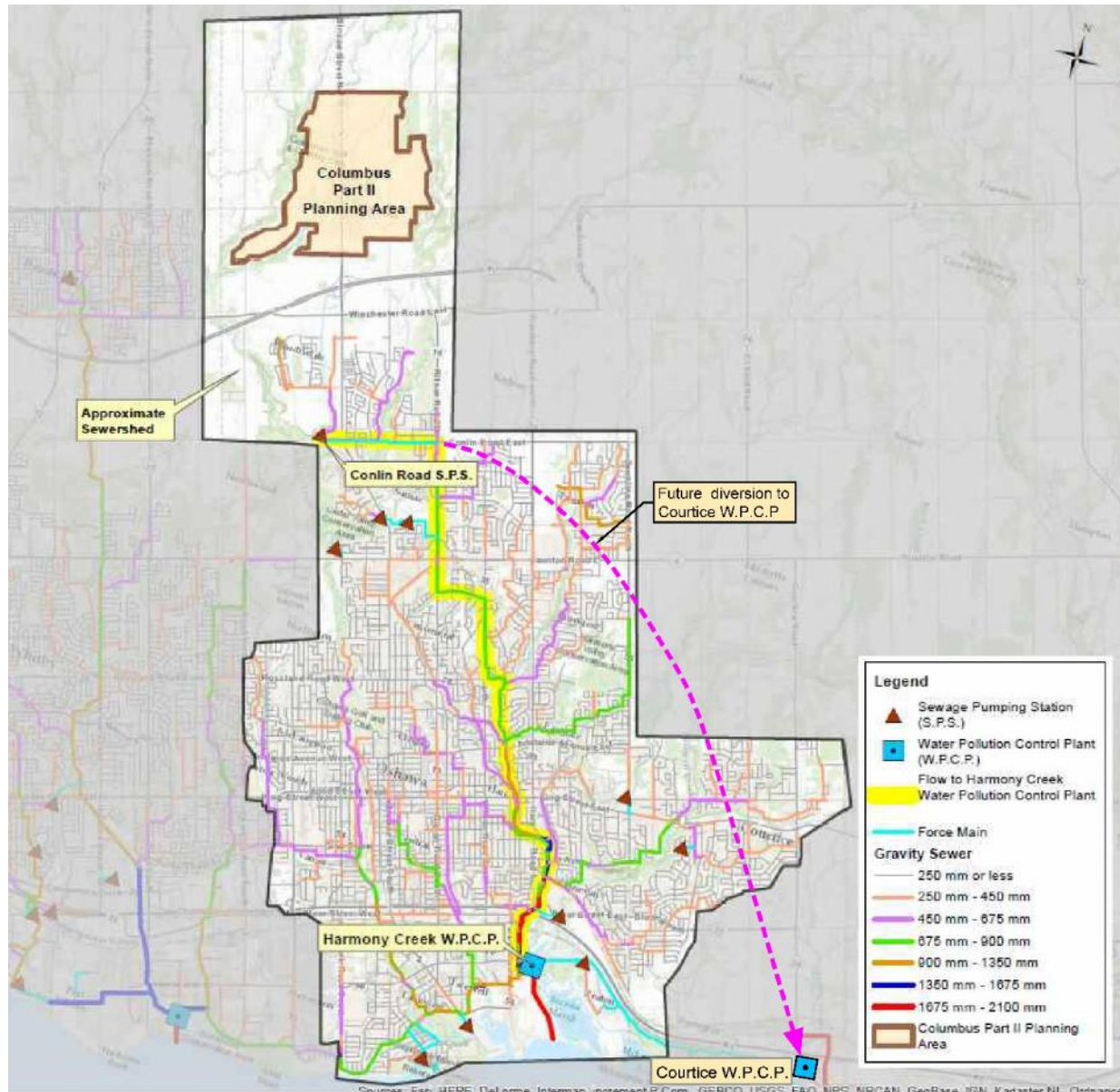


Figure 2. Existing Wastewater System¹

¹ Data provided by Durham Region as described in Section 3.0 Background Information

4.2 Proposed Wastewater System

4.2.1 Trunk Infrastructure

The 2013 Development Charges (D.C.) study identifies a number of municipal sewage infrastructure projects to bring services up to the boundaries of the Columbus Part II Planning Area. This includes new sewers from the Conlin Road Sewage Pumping Station through the Windfields development area and across Highway 407 East and two branches in the east and west portions of the subject lands. The infrastructure is forecast to be available at the Columbus Part II Planning Area boundary by the years 2025 to 2027². The Region also has a plan to increase capacity of the Conlin S.P.S. by 2023; this will allow for shared service with the subject lands.

As part of the Conlin SPS upgrade, the discharge forcemain will need to be extended to the Courtice Trunk Sanitary Sewer (T.S.S.). The Courtice TSS is planned to be constructed in phases, with the last phase forecast for 2024.

Refer to **Figure 3** for an overview of the proposed infrastructure. Information on the timing of future capital works are given in **Table 1**. The figure and information are collected from 2018 Durham Regionwide Development Charge Background Study by Region of Durham. Please refer to **Appendix A** for a clear version of **Figure 3**.

² Budgets for construction of projects 217 and 218 are listed for the years 2024 and 2026 respectively, our projection adds a year to these dates to allow for implementation.

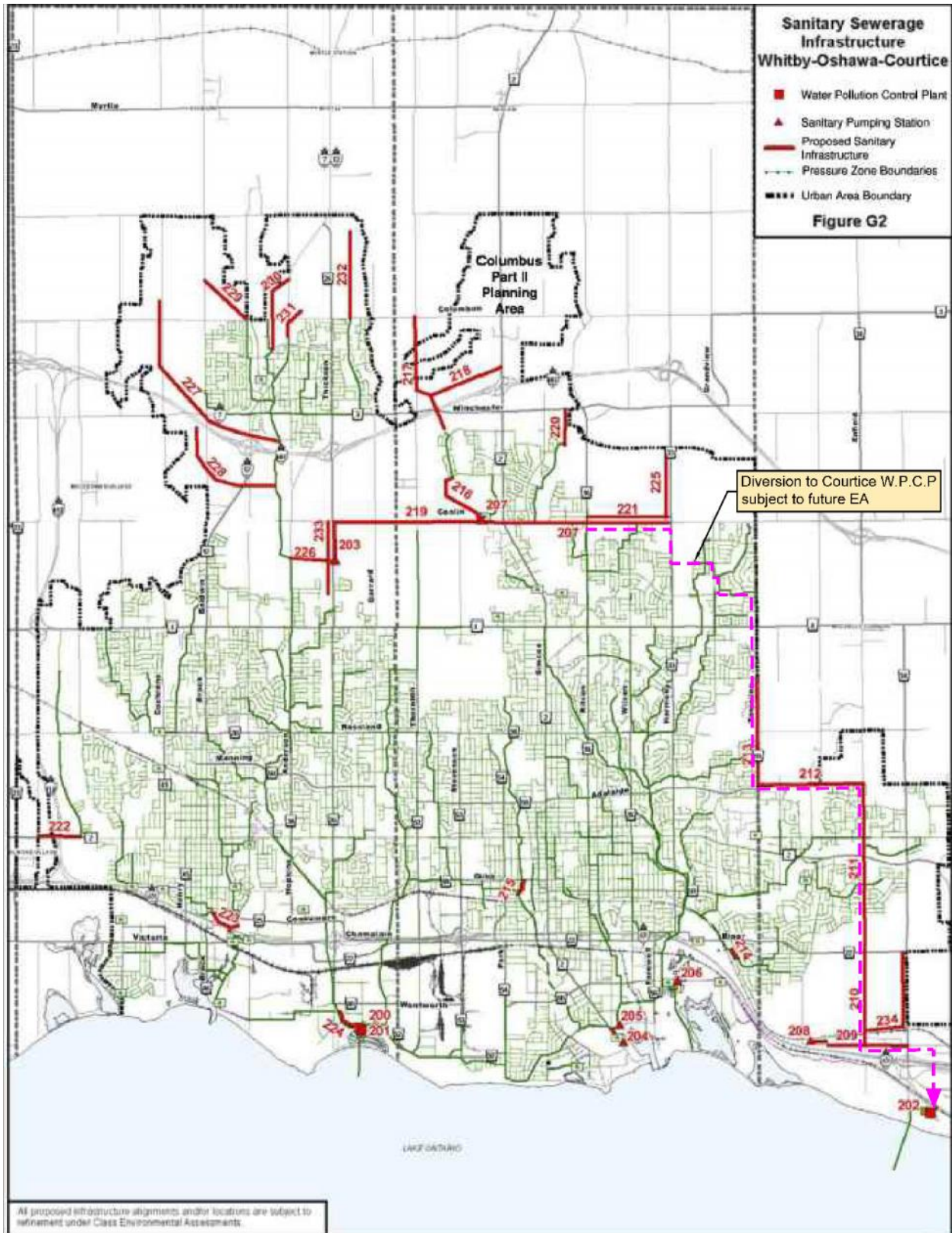


Figure 3. Overview of the Proposed Infrastructure³

Table 1. 2018 DC Study - Capital Cost Summary of Wastewater Infrastructure

ID from 2018 DC Report	Forecast Year	Wastewater Infrastructure	Description	Estimated Cost ⁴
207	2022	S.P.S.	Expansion of Conlin Road S.P.S. and forcemain twinning allowance - Oshawa	\$67.5 M
217	2024	Trunk Sanitary Sewers (T.S.S.)	North Oshawa Creek (West Branch) T.S.S. - south side of Hydro Easement to Columbus Road - Oshawa (Region's Share)	\$15.2 M
218	2026	Trunk Sanitary Sewers (T.S.S.)	North Oshawa Creek (East Branch) T.S.S. on easement - E/S Thornton Road to Simcoe Street - Oshawa (Region's Share)	\$15.6 M
210-213	2018-2024	Courtice T.S.S.	Conveyance System from North Oshawa to Courtice W.P.C. – subject to EA	\$101.3 M
Estimated Total (Rounded) – Cost Estimate done by Others – Provided by Durham Region				\$200M

4.2.2 Local Sanitary Sewers

A local sanitary sewer network will be required for servicing the subject lands. These sanitary sewers will connect to the Region's proposed sanitary sewers. The alignments of these sanitary sewers will be defined according to the proposed subdivision and road layouts that ensue through the planning process.

5.0 Water Servicing Evaluation

5.1 Existing Water System

The subject lands are located in North Oshawa and are within the planned service areas for Durham Region Pressure Zones 4 and 5. Pressure Zone 2 is currently serviced by 2 reservoirs (Thickson Road Reservoir & Grandview Street Reservoir) which operate at a hydraulic grade line (H.G.L.) of 187.5 m.a.s.l. Pressure Zone 4 is currently operated via two pumping stations drawing from each of the Zone 2 Reservoirs. There is currently no storage in Pressure Zone 4 operating H.G.L. levels.

³ Data provided by Durham Region as described in Section 3.0 Background Information

⁴ Cost Estimates by Others – Supplied by Durham Region

Infrastructure to service the planned Pressure Zone 5 is not built at this time. Refer to **Figure 4** for the existing water system.

Information on the existing and proposed population, demand, as well as the storage capacity of the Region's water system is not available for this report.

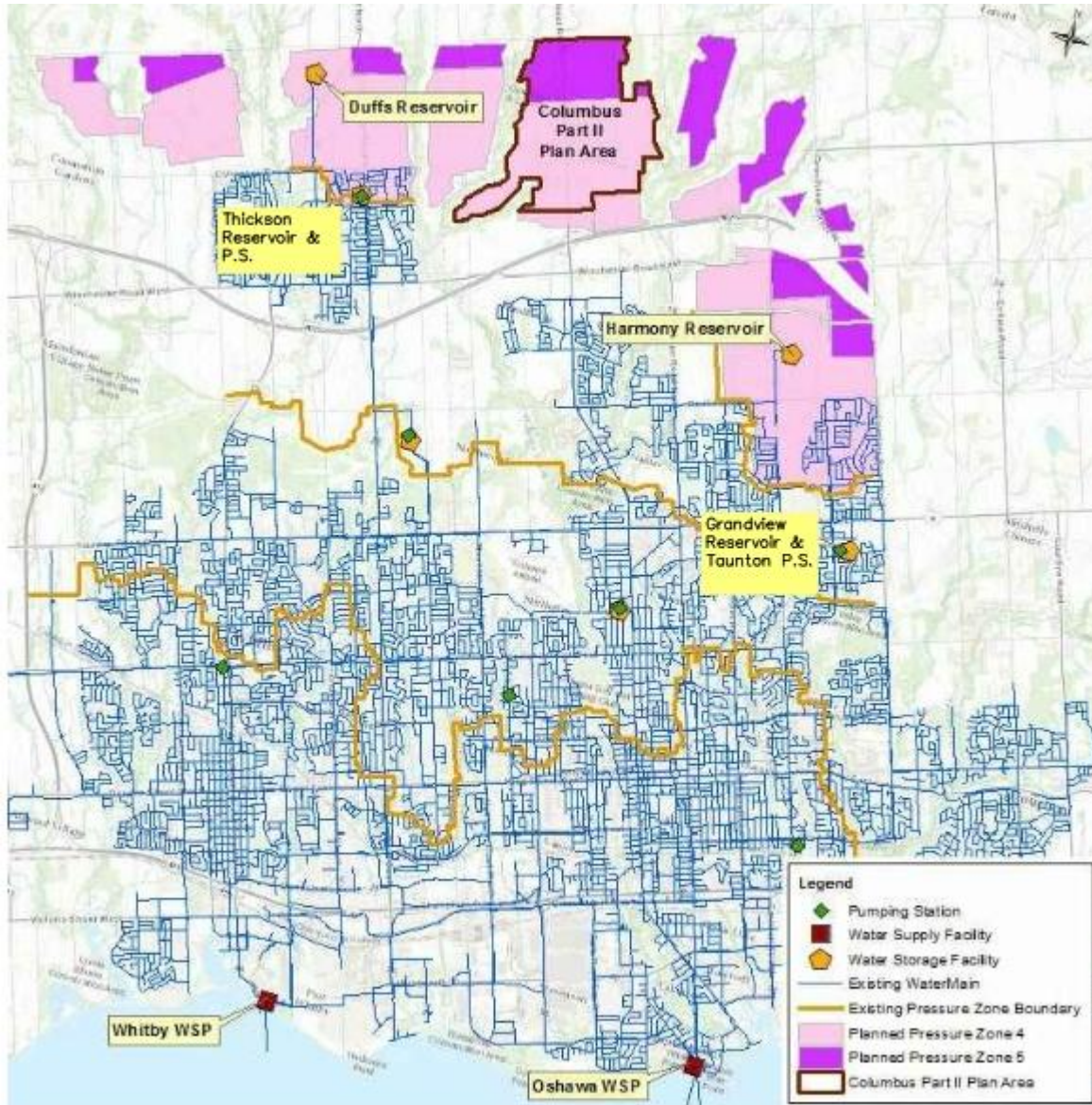


Figure 4. Existing Water System⁵

⁵ Data provided by Durham Region as described in Section 3.0 Background Information

5.2 Proposed Water System

5.2.1 Supply, Storage and Transmission Infrastructure

The Region of Durham has a number of planned system components that will improve the reliability and hydraulic capacity of Zone 4 and that will allow for implementation of Zone 5. These upgrades are required in order to service an expanded urban population service area. These upgrades include:

Pressure Zone 4

-) New Zone 4 storage facility in North East Oshawa to be determined through a Class EA;
-) New Zone 4 storage facility in Whitby which is expected to be in service by 2022;
-) New feeder mains along Winchester Road East from Ritson Road North to Harmony Road North, forecast for 2026;
-) New feeder mains along Ritson Road North from Winchester Road East to Columbus Road East forecast for in 2026;
-) New feeder mains along Columbus Road East from Thicksen Road to Ritson Road forecast for 2027.

Pressure Zone 5

-) New pumping stations for Pressure Zone 5 from existing or planned reservoirs with timing, location and design details subject to a Class EA;

All projects noted are subject to Class Environmental Assessments and project dates are a forecast and subject to Durham Region Council Approval.

Note that the Region's Capital Plan does not identify any piped connections from the Zone 5 pumping stations to the subject lands. There will need to be a connection from one of the Zone 5 pumping stations to the subject lands as shown Figure 5.

Refer to **Figure 5** and **Table 2** for an overview of the proposed watermain infrastructure and information on timing of future capital works respectively. The figure and information are collected from 2018 Durham Regionwide Development Charge Background Study by Region of Durham. Please refer to **Appendix B** for a clear version of **Figure 5**.

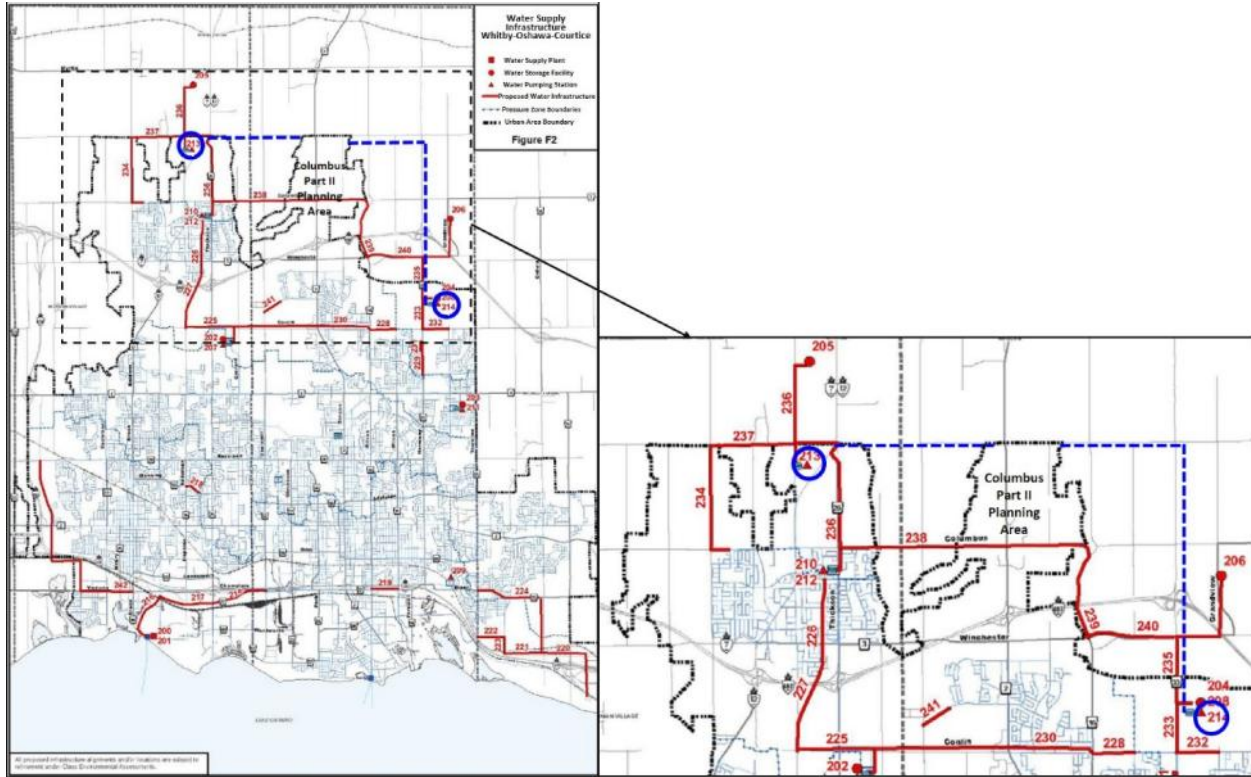


Figure 5. Overview of the Proposed Watermain Infrastructure

Table 2. 2018 DC Study - Capital Cost Summary of Water Infrastructure

ID from 2018 DC Report	Forecast Year	Type	Description	Cost Estimate ⁶
Pressure Zone 4				
205	2021	storage facility	New Zone 4 storage facility 11 MLD - Whitby	\$12M
206	2021	storage facility	New Zone 4 storage facility 11 MLD - Oshawa	\$12M
208	2021	Booster Pumps	New Zone 4 P.S. at Harmony Zone 3 Reservoir - Oshawa	\$7M
210	2025	Booster Pumps	Expansion of Thickson Road Zone 3 P.S. to 22.7 MLD - Brooklin	\$12.2M
212	2021	Booster Pumps	Expansion of Zone 4 P.S. at Thickson Road Zone 2 Reservoir - Brooklin	\$6.9M
225	2020	Feeder mains	Zone 3 feeder main on Conlin Road from Garrard Road P.S. to Anderson Street - Whitby	\$4.5M
226	2023	Feeder mains	Zone 3 feeder main on Anderson Street & Watford Street from Clair Avenue to Carnwith Drive - Whitby	\$7.2M
227	2020	Feeder mains	Zone 3 feeder main on Anderson Street from Conlin Road to Clair Avenue - Whitby	\$5.8M
228	2019	Feeder mains	Zone 3 feeder main on Conlin Road from Ritson Road to Wilson Road - Oshawa	\$3.8M
230	2019	Feeder mains	Zone 3 feeder main on Conlin Road from Ritson Road to Garrard Road Zone 3 P.S. - Oshawa/Whitby	\$19.4M
232	2023	Feeder mains	Zone 4 feeder main on Conlin Road from Harmony Road to Grandview Street - Oshawa (Region's Share)	\$1.5M

⁶ Cost Estimates by Others – Supplied by Durham Region



ID from 2018 DC Report	Forecast Year	Type	Description	Cost Estimate ⁶
233	2022	Feeder mains	Zone 4 feeder main on Harmony Road from Conlin Road to New Zone 4 P.S. - Oshawa	\$4.5M
234	2025	Feeder mains	Zone 4 feeder main on Ashburn Road from Columbus Road to Brawley Road and Columbus Road - Whitby (Region's Share)	\$7.6M
235	2021	Feeder mains	Zone 4 feeder main from New Zone 4 P.S. at Harmony Reservoir to New Oshawa Zone 4 Reservoir - Oshawa	\$16.0M
236	2021	Feeder mains	Zone 4 feeder main from Thickson Road Zone 4 Pumping Station to Zone 4 reservoir - Whitby	\$17.4M
237	2021	Feeder mains	Zone 4 feeder main on Brawley Road from Duffs Road to Ashburn Road - Whitby	\$5.8M
238	2026	Feeder mains	Zone 4 feeder main on Columbus Road from Thickson Road to Ritson Road - Whitby/Oshawa	\$15.4M
239	2025	Feeder mains	Zone 4 feeder main on Ritson Road from Columbus Road to Winchester Road - Oshawa	\$6.6M
240	2025	Feeder mains	Zone 4 feeder main on Winchester Road from Ritson Road to Harmony Road - Oshawa	\$6.3M
Pressure Zone 5				
213	2027	New P.S.	Zone 5 P.S. at Duffs Road Zone 3 Reservoir and feeder main allowance - Whitby	\$12.5M

ID from 2018 DC Report	Forecast Year	Type	Description	Cost Estimate ⁶
214	2027	New P.S.	Zone 5 P.S. at Harmony Road Zone 3 Reservoir and feedermain allowance - Oshawa ⁷	\$9.7M
Estimated Total (Rounded) – Cost Estimate done by Others – Provided by Durham Region				\$185M

5.2.1.1 Pressure Zone Suitability

As per Region’s plan, future planned top water levels for zone 4 and zone 5 will be 250 m and 280 m respectively. The topography of the subject lands is such that they can be serviced by Pressure Zone 4 and Pressure Zone 5. The preferred service ground elevation range for the Pressure Zones is given in **Table 3** below.

Table 3. Pressure Zone Suitability (subject to review under Class EA)

	Required Ministry of Environment, Conservation and Parks & Durham Region Criteria
Minimum Operating Pressure	275 kPa (28.0 m)
Maximum Operating Pressure	690 kPa (70.0 m)
Pressure Zone 4 Characteristics	
Minimum Suitable Ground Service Elevation	180.0 m
Maximum Suitable Ground Service Elevation	217.0 m
Minimum H.G.L.	245.0 m.a.s.l.
Maximum H.G.L.	250.0 m.a.s.l
Pressure Zone 5 Characteristics	
Minimum Suitable Ground Service Elevation	210.0 m
Maximum Suitable Ground Service Elevation	247.0 m
Minimum H.G.L.	275.0 m.a.s.l.

7 Information presented in this table was obtained from 2018 Durham Region wide DC Background Study.



	Required Ministry of Environment, Conservation and Parks & Durham Region Criteria
Maximum H.G.L.	280.0 m.a.s.l. ⁸

5.2.2 Local Watermains

A looped watermain network that connects to the proposed watermains at Columbus Road will be required for servicing the subject lands in Pressure Zone 4. The alignments of these watermains will be defined according to the proposed subdivision and road layouts throughout the planning process.

6.0 Summary

The Columbus Part II Planning Area lands are to be serviced via the expansion of the Durham Region Water and Wastewater System listed as follows:

-) Wastewater Services are expected to reach the boundary of the subject lands by 2023-2027;
-) Water services will be provided via expansions of Pressure Zone 4 and implementation of Pressure Zone 5;
-) Pressure Zone 4's trunk watermains will be available around 2022-2028; and
-) Pressure Zone 5 will have pumping stations available in 2028 and additional transmission is required to service the subject lands.

All projects noted are subject to Class Environmental Assessments and project dates are a forecast and subject to Durham Regional Council approval on an annual basis.

⁸ Reservoir details and model information were not available for this report. 5 m operating range is assumed.



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APPENDIX A





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APPENDIX B

