

November 30, 2022

Brookvalley Developments Ltd.  
137 Bowes Road  
Concord, ON L4K 1H3

Attention: Mr. Frank Filippo, P. Eng.

Dear Mr. Filippo:

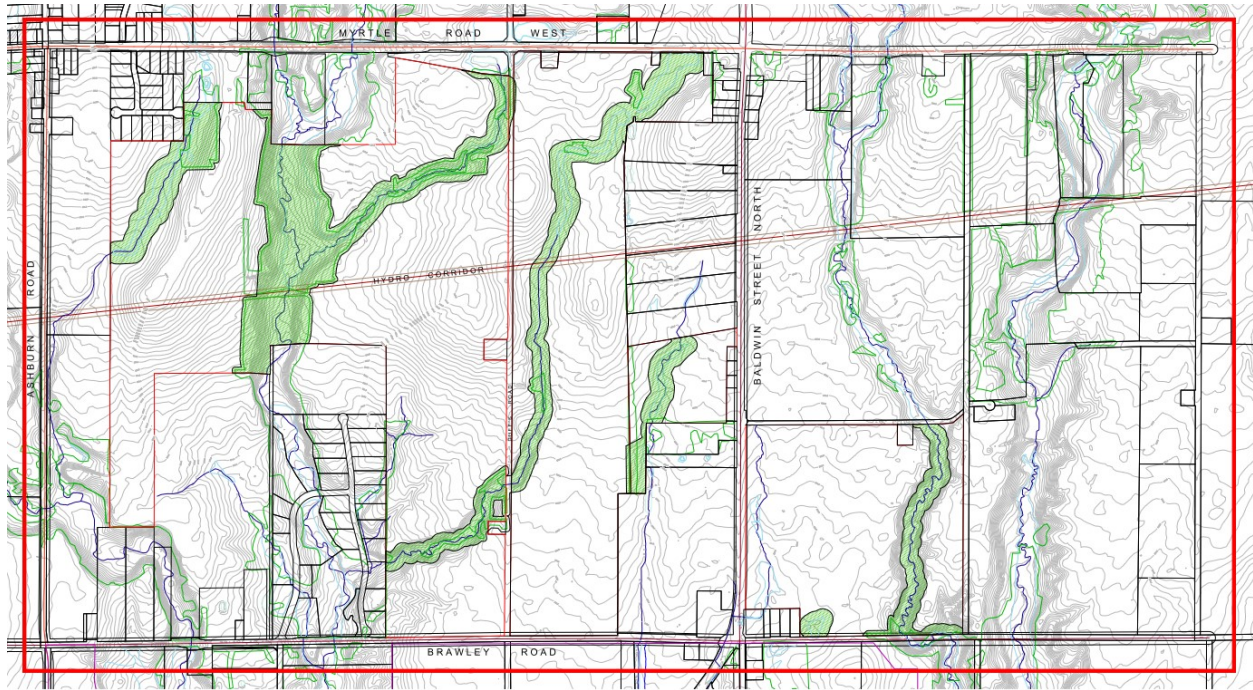
**Re: Servicing Feasibility Review  
Greenbelt Lands - Brooklin North  
Town of Whitby, Region of Durham  
Our Project No. E22013**

We are pleased to provide you with the following servicing feasibility summary for the proposed development area located north of Brawley Road up to Myrtle Road extending from Ashburn Road to east of Baldwin Street, in the Town of Whitby, Region of Durham. An illustration of the approximate study area is provided in **Figure 1**.

The following reports and studies are relevant to the study area:

- Greenbelt Plan (2017)
- Municipal Servicing Overview Report, Brooklin North Secondary Plan Area, Town of Whitby, Region of Durham, prepared by GHD Inc. (October 2014)
- Lynde Creek Master Drainage Plan Update (MDPU) – Municipal Class Environmental Assessment, Master Plan Project File Report - Working Draft, Town of Whitby in Partnership with Central Lake Ontario Conservation Authority, AECOM, February 2020.
- Oshawa Creek Watershed Plan, Central Lake Ontario Conservation Authority, February 2013.
- Brooklin Secondary Plan Report on Watershed Planning, Hazard Lands and Stormwater Management, Stage 3 – Final Report, Candevcon Limited and Stonybrook Consulting, November 2018 (Stage 3 Final Report).

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**Figure 1: Subject Development Area**

Through a desktop review of available information on the study area and our knowledge of local external servicing requirements and constraints, the municipal servicing requirements for the subject area were determined and are outlined below. The preliminary concept plan prepared by Malone Given Parsons is provided in **Figure 2** and illustrates a potential layout for the subject development area.

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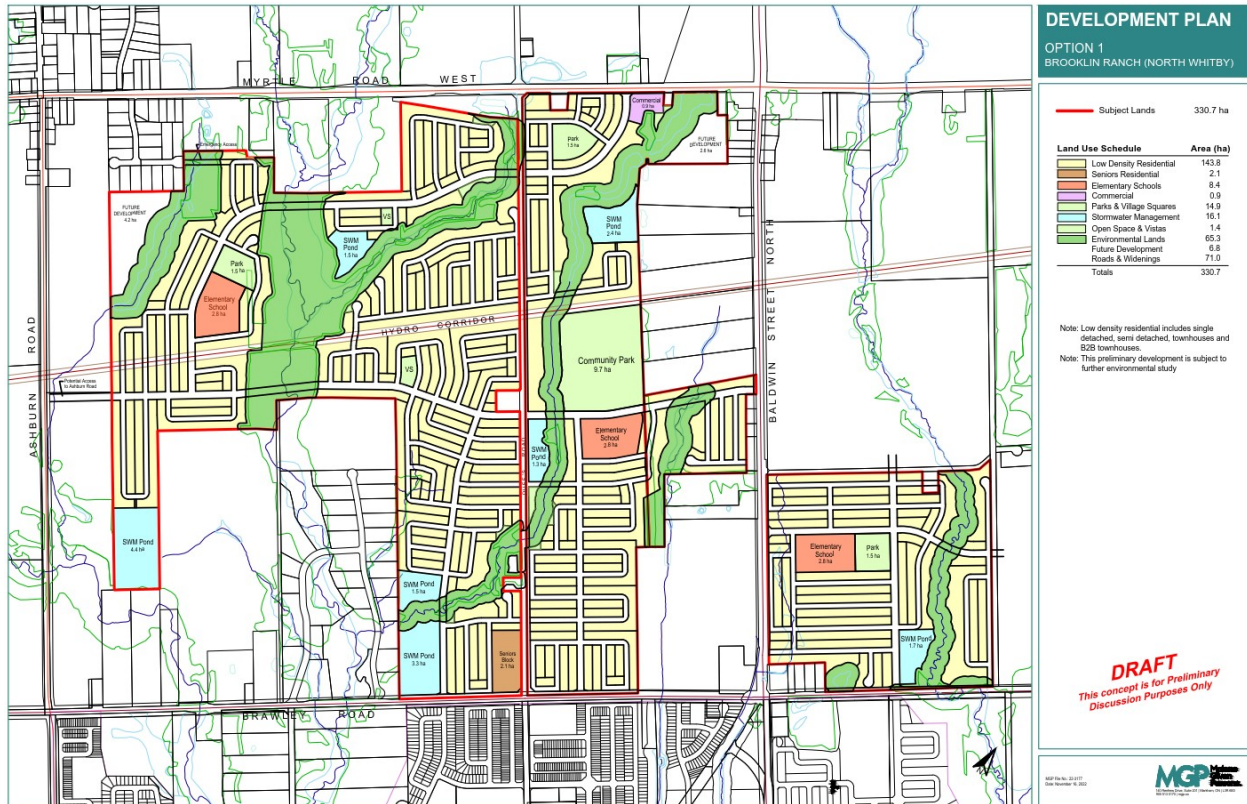


Figure 2: Preliminary Concept Plan

## Municipal Servicing

The means by which the subject development area can be serviced are outlined below. The water distribution and sanitary sewerage (wastewater) services and related infrastructure for this area fall under the jurisdiction of the Region of Durham. A system of Regional trunk sewers, water feeder mains, and local distribution mains will be required to adequately service the proposed development area. The infrastructure required to service the Brooklin North Secondary Plan Area (BNSPA) that is located directly south of Brawley Road and that can be utilized to service the subject area are outlined in the respective sections of the Municipal Servicing Overview Report (MSOR) prepared by GHD Inc. dated October 2014, see **Attachment A**. The MSOR outlines a conceptual system to service the BNSPA that can also sequentially service the subject development area.

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The existing and proposed wastewater servicing systems within the Greater Brooklin North Secondary Plan Area provides key infrastructure that currently services the existing Brooklin urban area. The existing wastewater system provides the ‘backbone’ of services that can be extended with new servicing projects to service planned urban growth within the BNSPA and the subject development lands as follows.

## **Sanitary Services**

Based on the analyses conducted as part of the preparation of the MSOR, the spine sanitary (wastewater) systems required to service the BNSPA and subject development area were determined. The existing and proposed wastewater servicing systems are conceptually shown on Drawing SAN-1 provided here in **Attachment B**.

The trunk sanitary systems labelled from A to F are shown schematically on Drawing SAN-1 to follow the overall drainage pattern and generally have been aligned within proposed arterial, collector and local road systems. Each of the trunk sewers are designed to accommodate the projected flows from the residential, commercial, institutional and employment areas tributary to that section of the system.

Based on a review of trunk sanitary systems C-2, D-1 and E-2 the subject development area can be serviced as follows.

### ***Sub-Trunk Sewer C-2***

Sub trunk sewer C-2 is designed to outlet into the existing 525 mm diameter sanitary trunk sewer located at Montgomery Street and Columbus Road. The existing 525 mm diameter trunk sewer was designed to accommodate a ‘theoretical’ design flow from a drainage area of 130 ha and an estimated population of 7,200 persons.

Based on the average population projected for the tributary area within the BNSPA between Columbus Road and Brawley Road of 90 ha and an estimated population of 5,455 persons, a residual capacity of approximately 40 ha and an estimated population of 2,400 is available to service the lands directly north of Brawley Road, as conceptually shown on Drawing SAN-1.

### ***Sub-Trunk Sewer D-1***

Sub trunk sewer D-1 is designed to outlet into the existing 525 mm diameter sanitary trunk sewer located at Camber Court and Columbus Road. The existing 525 mm

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diameter trunk sewer was designed to accommodate a ‘theoretical’ design flow from a drainage area of 178 ha and an estimated population of 10,680 persons.

Based on the average population projected for the tributary area within the BNSPA between Columbus Road and Brawley Road of 86 ha and an estimated population of 5,150 persons, a residual capacity of approximately 92 ha and an estimated population of 5,520 is available to service the lands directly north of Brawley Road, as conceptually shown on Drawing SAN-1.

### ***Sub-Trunk Sewer E-2***

Sub trunk sewer E-1 is designed to outlet into the existing 450 mm diameter sanitary trunk sewer located at Cachet Boulevard and Columbus Road. The existing 450 mm diameter trunk sewer was designed to accommodate a ‘theoretical’ design flow from a drainage area of 140 ha and an estimated population of 8,400 persons.

Based on the average population projected for the tributary area within the BNSPA between Columbus Road and Brawley Road of 95 ha and an estimated population of 4,285 persons, a residual capacity of approximately 45 ha and an estimated population of 2,700 is available to service the lands directly north of Brawley Road as conceptually shown on Drawing SAN-1.

### **Actual Flows Versus Theoretical Design Flows**

The theoretical design flows for the sub-trunk sewers outlined above and the Corbet Creek Sanitary Trunk Sewer (CCSTS) were calculated utilizing the Region of Durham’s design criteria of 1.04 L/s (90.0m<sup>3</sup>/ha/day) for Employment Areas (dry flow) and 0.0042 L/p/s (360 L/d per capita) for Living Area plus an infiltration allowance of 22.5m<sup>3</sup>/gross ha/day. Based on theoretical design flows sub-trunks C-2, D-1 and E-2 can service an area of approximately 177ha and estimated population of 10,620 within the subject area.

Based on our experience in monitoring sewage flows, it has been determined that the average per capita flows for sewage systems constructed within the last 15-25 years are generally in the order of 0.0037 L/p/s (320 L/d per capita) including infiltration for newly designed systems. With the current Building Code requirements for water saving devices, we anticipate that further reductions in per capita residential flows will be observed over time. It is our opinion that sub-trunk sewer systems C-2, D-1 and E-2 can accommodate a significantly greater area than 177ha and estimated total

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population of 10,620 based on actual design flows. A flow monitoring program can be implemented for the existing sub-trunk systems to confirm the above; however, should it be determined that additional sanitary flow conveyance is required to service the subject development area, additional capacity is available in sub-trunk B-1. Sub-trunk B-1 outlets directly into the West Brooklin Sanitary Trunk Sewer (WBSTS) that conveys to the CCSTS connecting at a location immediately north of Hwy No. 407, as conceptually shown on Drawing SAN-1. The WBSTS is designed to convey flows southerly and around the existing Brooklin urban area and can be upsized to convey any balance of additional flows to service the subject development area, if required.

### **Corbett Creek Sanitary Trunk Sewer & Courtice-Oshawa-Whitby Diversion Sewer**

From a review of the Region's original infrastructure planning designs, the CCSTS north of Trans-Northern Oil Pipeline Corridor was designed to service a total population of approximately 80,000 persons including commercial and institutional uses, plus allowances for industrial lands generally along the alignment of Hwy. 407 within the Greater Brooklin Study Area (GBSA). The ultimate build-out population within the current boundary including 'urbanization' is projected to total approximately 19,500 persons. The Region design anticipated an ultimate population of approximately 23,500 persons over the same urban area.

Utilizing the Greater Brooklin Study Area Land Budget prepared by Malone Given Parson Ltd. the total population within the GBSA would be in the order of 37,700 persons. When combined with the projected build-out population within the current urban boundary (19,500), a total population of 57,200 would result. Under the assumed densities and yields, it can be shown that there is sufficient 'theoretical' capacity within the CCSTS north of the Hydro One Corridor to service the development area; however, when analyzing the CCSTS south of the Trans Northern Oil Pipeline Corridor, it was determined there are restrictions in the existing system based on theoretical design flows and the Corbett Creek Water Pollution Control Plant that effectively would only permit an initial phase of development. In order to facilitate the build-out of the balance of the subject development area the implementation of the Courtice-Oshawa-Whitby Diversion Trunk Sewer System (COWDTSS) and related facilities that conveys flows easterly to the South Courtice Water Pollution Control Plant will be required. The Region of Durham has commenced the Brooklin Sanitary Pumping Station Diversion Environmental Assessment that will determine the location of the sewage pumping station and appurtenances to facilitate the diversion of flows to the COWDTSS.

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## **Watermain Distribution**

The ground elevations within the proposed development lands range from approximately  $\pm 220.0\text{m}$  at the south limit (Brawley Road) to  $\pm 255.0\text{m}$  to the north limit (Myrtle Road). As a result, the area will need to be serviced within two (2) water pressure zones beginning with Pressure Zone V generally defined as Brawley Road, as conceptually shown on Drawing WTR-1 in **Attachment C**.

The existing and proposed water distribution systems consist of reservoirs, booster pumping stations and feeder mains. Existing development in Brooklin and the NBSPA has been facilitated within three (3) pressure zones, Zones III, Zone IV and Zone V. The existing Garrard Road Zone I Reservoir and water pumping station and associated infrastructure, located south of Conlin Road, supply pressure Zones III, IV and V. Zones III and IV are supported by booster pumping stations located at the Thickson Road Zone II Reservoir and by the Duffs Road Zone III Reservoir via gravity. The existing Zone II and III reservoirs and proposed Zone IV reservoir and Zone V and VI water pumping stations, with the construction of secondary water transmission main to Brooklin, can be implemented to service the subject development area up to Myrtle Road. The exact sizes and locations of the Zone IV reservoir and potentially a Zone V reservoir, and Zone V and VI water pumping stations and feeder mains will need to be designed and coordinated with the Region of Durham.

## **Storm Drainage Systems**

Storm drainage systems for the proposed development area will be under the jurisdiction of the Town of Whitby. The management of storm drainage will be provided through major and minor conveyance systems (dedicated overland flow routes, generally within municipal road allowances and underground storm sewers and appurtenances). The location and details of the major and minor systems will be provided in the Functional Servicing Reports for the various development areas.

## **Stormwater Management**

The subject lands are located within the Lynde Creek and Oshawa Creek watersheds. Both watersheds have been studied and reported on in the Lynde Creek MDP (AECOM, 2020) and Oshawa Creek Watershed Plan (CLOCA, 2013), respectively. These documents provide general criteria for stormwater management (SWM) including

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the need for post to pre quantity controls, water quality and erosion control, as well as post to pre water balance.

A series of stormwater management facilities (SWMFs) and Low Impact Development (LID) measures will be required as part of the storm drainage system to service the development area under the Town's jurisdiction. Further hydrologic study will be required to augment the existing analysis completed for the NBSPA as part of the Stage 3 Final Report (Candevcon Limited and Stonybrook Consulting, 2018). The study will confirm the need for flood controls for regulatory storms, as well as the location of SWMF's.

We trust this provides a satisfactory summary of the servicing, grading and SWM requirements for the potential development of the Greenbelt lands. Please do not hesitate to contact this office should you have any questions.

Yours truly,

**CANDEVCON EAST LIMITED**



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Associate, Land Development

BR/MF/ak

c.c. Malone Given Parson, Attn.: Mr. Matt Cory



Andrea Keeping, P.Eng.  
Associate, Water Resources



# ATTACHMENT A

# ATTACHMENT B

# ATTACHMENT C