APPENDIX V

#### **Future Servicing Assessment**

#### CITY OF TORONTO

#### Southwest Agincourt Transportation Connections Study Environmental Assessment PROPOSED SERVICING ANALYSIS



September 1<sup>st</sup>, 2023



## \\SP

#### Southwest Agincourt Transportation Connections Study PROPOSED SERVICING ANALYSIS

**CITY OF TORONTO** 

PROJECT NO.: 19M-01888-00 DATE: SEPTEMBER 2023

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## **Quality Management**

ISSUE/REVISION FIRST ISSUE REVISION 1 REVISION 2 REVISION 3

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- A SUE INVESTIGATION
- **B** STORMWATER MANAGEMENT CALCULATIONS
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## **1** Introduction

The City of Toronto is initiating the Southwest Agincourt Transportation Connections Study (Herein referred to as the SW Agincourt EA) to study ways to improve and expand transportation connections from Village Green Square (south of the Canadian Pacific Railway corridor) to Sheppard Avenue East and Agincourt GO Station. This connection is identified in the City of Toronto's Official Plan and Council-approved Agincourt Secondary Plan to support anticipated growth in the area. The study's Focus Area is shown in **Figure 1**.

The number of people living and working in this area has grown and will continue to grow as a result of planned developments. As the number of people using the transportation system increases, transportation infrastructure improvements will be needed to ensure that people can drive, walk, and cycle to destinations safely and efficiently.

The study Focus Area is bound by Kennedy Road to the west, Dowry Street to the north, the Stouffville GO Train Line to the east, and Village Green Square to the south.

Study Objectives:

- 1. Provide high quality transportation infrastructure that addresses the needs of this growing area
- 2. Improve street network connectivity to key destinations, particularly the Agincourt GO station, Collingwood Park and schools
- 3. Improve the safety of people walking, cycling, taking public transit, and driving

Under the post-development conditions, new development(s) are being proposed along Cowdry Court and the existing Gordon Avenue will be extended approximately 350 m south, under the existing railways via a grade separation project, to connect to existing Village Green Square. As part of the SW Agincourt EA, this report will analysis the proposed sanitary sewer, storm sewer and water distribution network along the proposed Gordon Avenue extension and how it will impact the surrounding areas. Please note the existing sanitary, storm and watermain on Cowdry Court may be removed or upgraded based on the decisions of the subdivision consultant(s).



#### Figure 1: Map of Southwest Agincourt Transportation Connections Study Focus Area



## 2 SUE Investigation

A Subsurface Utility Engineering (SUE) Investigation of the study area was completed by T2 Utility Engineers between June and August 2020. The investigation included Quality Level 'B', 'C', and 'D'. A summary of the different quality levels of SUE can be seen below;

- Quality Level 'D' Information derived from existing records or verbal recollections.
- Quality Level 'C' Information obtained by surveying and plotting visible above ground utility features and by using professional judgement in correlating this information to the Quality 'D' information.
- Quality Level 'B' Information obtained through the application of appropriate surface geophysical methods to determine the existence and appropriate horizontal position of the utilities.
- Quality Level 'A' Precise horizontal and vertical location of utilities obtained by actual exposure and subsequent measurement of subsurface utilities.

A topographic survey was provided by IBW Surveyors which was the base of the SUE Investigation. Field verifications of utilities were completed using a combination of electromagnetic pipe and cable locate equipment. Inverts of existing sewers were confirmed by field depth measurement. The SUE drawings prepared by T2 Utility Engineers can be found in **Appendix A.** 

## **3** Proposed Sanitary Sewer

#### **3.1 Proposed Conditions**

WSP Canada Inc. (WSP) analyzed the existing conditions of the sanitary sewers in the study area by reviewing the as-built plan and profiles and Digital Map Owners Group (DMOG) mapping information from the City of Toronto. The information from the City records was confirmed in the SUE analysis. The study area for this EA falls under the City Chronic Basement Flooding Study Area 59. The Basement Flooding EA started in 2019 and is currently in progress.

The existing sanitary sewers within the study area all discharges to the existing 1050mm West Highland Creek sanitary trunk sewers which runs from north to south on the existing boundary of the study area.

The proposed underpass along the proposed N-S road will be located within the existing groundwater table, therefore a dewatering system (to be designed by others) may be warranted. At the current stage, the expected pump rate of the dewatering system is not available.

It is also possible to construct a water-tight structure so that no dewatering is required. This may be the preferred option as it removes the need for groundwater treatment and/or groundwater discharge to a municipal sanitary sewer. A recent City of Toronto policy change has prohibited the discharge of groundwater to the municipal sewers from private developments. Therefore, groundwater discharge should be avoided.

There are no new sanitary sewers proposed as part of the road design. The existing sanitary sewers along Cowdry Court may be removed, replaced or upgraded in the future by the subdivision consultant(s) if deemed required as a result of the future development(s) on Cowdry Court. There will be no other changes to the other existing sanitary sewers within the study area. Any proposed sanitary sewers within the study area will be designed by others and will not be part of this EA.

# **3.2** Sanitary Sewer Analysis, Results and Recommendations

WSP completed a sanitary sewer analysis of the sanitary sewer network for the existing condition of the study area. For the analysis and results, please refer to the Existing Servicing Analysis report.

A sanitary sewer analysis was not conducted for the proposed servicing analysis since no new sanitary sewers are proposed as part of the road design and there are no changes to the existing sanitary sewer network within the study area as part of this EA.

## 4 Proposed Storm Sewer

#### **4.1 Proposed Conditions**

WSP analyzed the existing conditions of the storm sewers in the study area by reviewing the as-built plan and profiles and DMOG mapping information from the City of Toronto. The information in the City records was confirmed in the SUE analysis. The existing storm sewers within the study area all discharges to West Highland Creek which is located along of the eastern boundary of the study area.

Under post-development condition, two new storm sewer networks are proposed along the proposed N-S road. The storm sewer network will capture and control the runoff solely from the right-of-way of proposed N-S road for all storm events up to and including the 100-year storm event north of the proposed underpass.

During the detailed design of the N-S road, the consultant for the proposed subdivision should explore the possibility of incorporating the N-S road drainage design into the new subdivision design to avoid having multiple systems draining to West Highland Creek.

The first network will consist of new storm sewers on Cowdry Court and the proposed N-S road. This network will capture runoff from the proposed subdivisions and developments and also runoff from the proposed rights-of-way. Runoff from the proposed N-S road that is north of the underpass will be captured by this system. The design of this storm sewer network shall be designed by the subdivision consultant. The consultants shall ensure that the post-development flows shall be attenuated to pre-developments for all storms up to and including the 100-year storm event by proposing stormwater management (SWM) facilities and that water quality treatment is provided prior to discharging to West Highland Creek, as per the City of Toronto and Toronto and Region Conservation Authority (T.R.C.A) criteria.

The second network will consist of a new subsurface storage tank and new storm sewers within the proposed railroad underpass and along the north side of the existing railroad lines. This network is designed to only capture and convey the runoff from the proposed underpass within the proposed N-S road. Runoff from the underpass will be drained by gravity to West Highland Creek through a proposed headwall.

A backflow preventer valve will be installed upstream of the headwall to ensure the regional flood line in West Highland Creek does not back up into the underpass under a regional storm event or during any cases when the water level in the creek exceeds the invert of the headwall. The low point of the underpass will be above the 100-year flood line in the creek. The tank will be sized assuming a "zero" outflow rate during the 100-year storm as the backflow preventer valve will be activated during a 100-year storm event.

The new subsurface storage tank is designed store the runoff volume from the 100-year storm event. The storm sewer network and the tank will be designed in detail during the detailed design stage of the underpass. Water quantity and quality shall be designed and provided to ensure the post-development discharge adheres to the City of Toronto and T.R.C.A criteria.

The existing storm sewers along Cowdry Court may be removed, replaced or upgraded in the future by the subdivision consultant(s) if deemed required as a result of the future development(s) on Cowdry Court.

#### 4.2 Storm Sewer Analysis

WSP completed a storm sewer analysis of the storm sewer networks for the existing condition. The analysis used the rational method for runoff volume calculation and the IDF curve found in the City of Toronto Design Criteria for Sewers and Watermains, January 2021. The 2-year return frequency storm was analyzed as storm sewers in the City of Toronto are required to convey the 2-year storm without surcharging. For arterial roads, such as Kennedy Road and Sheppard Avenue East, the storm sewers are designed for the 10-year storm without surcharging. Therefore, a storm sewer analysis was also conducted for the Collingwood Street and Sheppard Avenue storm sewer system for the 10-year storm event. The City of Toronto record drawings were used to confirm the lengths, slopes, and sizes of each existing pipes. This information was verified by using the SUE investigation results. For the analysis and results, please refer to the Existing Servicing Analysis report.

The proposed storm sewer networks and SWM facilities shall be designed to capture, convey and control the post-development flows from the proposed road realignment and extension to the allowable release rates as established by the City of Toronto and T.R.C.A criteria while considering the flows from the proposed developments, if applicable.

A preliminary design of the tank has been undertaken. The tank was sized assuming "zero" outflow to address the possibility when the water in West Highland Creek is higher than the underpass and the backflow preventer valve is closed. The tank has been sized to ensure it can store the runoff from the underpass for all storms up to and including the 100-year storm event. This design will ensure no ponding is present and that traffic can continue through the underpass in the cases when the water level in West Highland Creek is high and a storm no greater than the 100-year storm event occurs. Once the water level in West Highland Creek recedes, the backflow preventer valve will be opened, and runoff stored in the tank can drain to the creek via gravity. Please refer to **Appendix B** for the detailed calculations.

Please refer to the subdivision and transportation consultant for more information regarding the design and capacity of the proposed storm sewer networks. Please refer to **Appendix C** for the proposed storm sewer alignments.

#### 4.3 Results and Recommendations

A storm sewer analysis was not conducted for the proposed servicing analysis since the proposed storm sewers has not been finalized and are being designed by the subdivision and transportation consultant as part of the road design. Additionally, there are no changes to the existing storm sewer network within the study area.

#### 4.4 Major System Analysis

As part of the storm system analysis, WSP analyzed the major storm system to confirm that the study area has safe overland flow routes to a watercourse and that the allowable ponding depth as determined in the latest city standards is not exceeded. WSP reviewed in detail the record drawings provided by the City of Toronto and the topographic survey prepared by IBW Surveyors. From the analysis, it was determined that overland flow routes are provided throughout the entire study area north of the existing railway and the majority of the ponding is less than the maximum water depth of 0.30 m. Under a major storm event, runoff from the study area will ultimately flow towards West Highland Creek.

With the new proposed N-S road south of Gordon Avenue, three low points are introduced along the proposed N-S road. The low point south of Collingwood Street has a ponding depth of 0.21 m, and any excess flow will spill over the high point and flow north towards Collingwood Street where runoff will then flow east towards West Highland Creek via overland flow.

The second low point south of Cowdray Court has a ponding depth of 0.31 m, and any excess flow will spill over the high point and flow north toward Collingwood Street or east towards West Highland Creek by overtopping the proposed curbs.

The third low point is the proposed underpass under the existing the railway. It has ponding depth of 2.35 m and excess flow will spill over the high point and flow east towards Highland Creek as well through the outdoor amenity space of the Cowdray Court subdivision.

Although ponding over 0.30 m is expected, since the development of the subdivision on Cowdray Court is still in process, it is still not determined how the ponding and overflow flow routes will be affected under post-development conditions. Additionally, there are no details regarding the future of the easement east of the existing Cowdray Court cul-de-sac. Coordination with the Cowdray Court subdivision consultant(s) will be required at the detailed design stage to ensure the overland flow routes are provided so that runoff from the proposed N-S road will have a safe overland flow route to West Highland Creek and ponding depths do not exceed 0.30 m.

The existing ponding and overland flow routes remain the same for Kennedy Road, Collingwood Street, Gordon Avenue north of Collingwood Street, and Sheppard Avenue East. Please refer to the Existing Servicing Analysis report prepared by WSP for more information.

#### 4.5 Flood Flow Management Study

A technical memo dated September 29, 2020 was prepared by WSP to compare the existing Highland Creek HEC-RAS 1D model obtained from the Toronto and Region Conservation Authority (TRCA) and WSP 1D/2D coupled model for the area upstream of Sheppard Avenue and the area downstream of the railway double crossings. From the analysis, it was determined that a portion of Sheppard Avenue East west of the creek and the north half of Gordon Avenue within the study area are located within the regional floodplain under existing conditions. Please see the memo "Agincourt HEC-RAS Model Update" provided under a separate cover for more information.

A technical memo discussing the analysis of the proposed condition was completed March 29, 2023. This report determined that the impacts of the proposed conditions will have negligible impacts on the adjacent properties compared to the existing conditions. Please see the memo "Floodplain Analysis for Southwest Agincourt Transportation Connection Study" for further details.

## 5 Proposed Water Distribution

#### **5.1 Proposed Conditions**

WSP analyzed the existing conditions of the water distribution networks in the study area by reviewing the as-built plan and profiles and DMOG mapping information from the City of Toronto. The information in the City records was confirmed in the SUE analysis.

The study area is located in Pressure District 4. There is a 1500mm trunk watermain which runs through the study area. A transmission supply point between the transmission watermain and the local network is located at the Sheppard Avenue and Kennedy Road intersection. A 300mm watermain runs along Kennedy Road and Sheppard Road East, which supplies Collingwood Street, Gordon Avenue, Cowdray Court, and Village Green Square. There is also an additional 200mm watermain located on the northeast corner of Village Green Square, to provide more looping and redundancy in the system. In the existing condition analysis, it was noted that Village Green Square is supplied by a dead-end watermain, and that this area does not have sufficient looping and redundancy for such a densely populated area.

Under post-development condition, a new 300mm watermain is proposed along the proposed N-S road south of Gordon Avenue, which will connect to the existing 150mm watermain on Collingwood Street, 300mm watermain on Cowdry Court and 300mm watermain on Village Green Square. The exact layout and design of the water distribution network within Cowdray Court will be determined by the subdivision consultant. This proposed watermain will provide more looping and redundancy in the system which will improve the performance of the water distribution network within the study area. The details of this watermain such as plan and profile design, sizing etc. is to be determined at the detailed design stage. See Figure WM-1 in Appendix D for the conceptual design for the proposed watermain looping.

#### 5.2 Field Investigation

As part of the existing water distribution network analysis, WSP completed a hydraulic field investigation that involved the completion of 7 hydrant flow tests within the study area. The tests were completed at various locations throughout the network that would help create and calibrate a water distribution model. The results of the hydrant flow tests can be seen in **Appendix C.** 

#### **5.3 Water Distribution Analysis**

The computer model used to analyze the existing water distribution system was H20NET, which is an iterative node balancing type program designed to simulate distribution networks. The City of Toronto record drawings were used to confirm the length and sizes of each pipe. This information was verified by using the SUE investigation results. A fictitious pump curve was introduced to the model based on the information obtained from on-site hydrant flow tests.

The modelling criteria used to determine the capabilities of the existing distribution system is based on the City's design criteria. The following criteria was used in the modelling:

- ▶ Peak Hour = 2.48 times average day
- Maximum Day = 1.65 times average day
- Average Consumption Rate =
  - 320 litres/capita/day (Single Family)
  - 191 litres/capita/day (Apartment)
- ► C Factor =
  - 70 (150mm)
  - 80 (200mm or 250mm)
  - 90 (300mm to 600mm)
- Minimum Pressure During Peak Hour = 275kPa
- Minimum Pressure During Max Day + Fire Demand = 140kPa

For the Max Day Plus Fire modelling analysis, required fire flow demand for properties within the study area were conservatively estimated. For some of the proposed developments in Village Green Square, the required fire flow was taken from available Functional Servicing Reports which were found on the City's website.

The flow and pressure in the model were calibrated using the hydrant flow test results. To facilitate the analysis, a Water Distribution Network Plan was created and is located in **Appendix C.** 

#### 5.4 Results and Recommendations

As shown in the results in **Appendix C**, under peak hour scenario the pressure in the study area ranges between 450kPa at node J39 to 300kPa at node J27. The pressures are above the city criteria of 275kPa. For the maximum day plus fire flow scenario, the residual pressures at the required fire flow rates range between 440 kPa at Node J39 and -201kPa at node J36. With the proposed 300mm watermain on the proposed N-S road, the water pressure and flow within Village Green Square (the high-density residential community located in the Study Area) will improve when compared to existing conditions.

For example, the pressure at nodes J52, J60, J62 and J68 are: 239.52, 86.36, 217.23, and 191.06 kPa under existing conditions. With the proposed watermain, the pressures at the same nodes are: 309, 164, 296, and 274 kPa, respectively. Please refer to **Appendix D** for the existing and proposed water model results and Water Distribution Network Plan.

#### 5.5 Pressure District Realignment

As part of this study, WSP reviewed the Hydraulic Analysis and Water Servicing Strategy Update prepared by HydraTek dated 23 March 2020. This study conducted a hydraulic modeling analysis of the Agincourt area considering the intensive redevelopment that is currently proposed for the Agincourt Mall and surrounding areas, including the future redevelopment of Cowdray Court and Village Green Square. The development also proposed a realignment of Pressure Districts 4 and 5 which according to the City of Toronto was completed in November 2022. WSP has reviewed the details of this realignment in the report and conclude that it will have no negative impact on the water distribution network within the study area of this EA. The realignment is achieved by installing a pressure reducing valve on Sheppard Avenue, east of the study area. It is expected to have little to no impact on the flows and pressure shown in the water distribution model.

## 6 Groundwater and Dewatering System

A Soil and Groundwater Contaminant Investigation Report for a portion of the area along West Highland Creek and portion of the alignment of the proposed N-S road has been prepared by WSP Canada Inc. and dated August 28,2020. The report details the soil and groundwater conditions and groundwater quality. Within the study area, topsoil, asphalt, granular base, sand, gravel, gravelly sand, silt and sand, silty clay, sandy silt, and silty sand were identified at various depths. Bedrock and buried structure were not encountered during field investigation.

Based on the monitoring conducted when the report was written, the groundwater level ranged from 1.27 to 3.78 m below the ground surface. From lab analysis of groundwater samples taken from the study area, it was determined that the quality of the groundwater was deemed favourable for discharge to the municipal storm or sanitary/combined sewer systems. However, it will be preferred to discharge to the sanitary sewer system since a few of the samples exceeded certain parameters for discharge to the municipal storm sewer systems.

Along the proposed N-S road, the proposed underpass located under the existing railway lines will be located below the existing groundwater table. The lowest elevation of the proposed underpass is 165.55 m, while the groundwater elevations measured at BH6 and BH7, resulted in a measurement of 165.955 m and 164.795 m respectively. Therefore, a dewatering system will be required for the underpass. Please refer to **Appendix E** for excerpts from the Soil and Groundwater Contaminant Investigation Report prepared by WSP Canada Inc.

As discussed in Section 4.1, a storm sewer network is proposed to capture the storm runoff collected within the underpass. A sanitary sewer system may be proposed to capture the groundwater discharge from the underpass and discharge it to the existing West Highland Creek sanitary trunk sewer. It is important to note that the new city standards do not allow groundwater to be discharged to sewers. If the city accepts this approach, the sanitary sewer would follow a similar alignment to the proposed storm sewer system. The dewatering rates are unknown at the moment and the dewatering and pump design will be coordinated with the mechanical and geotechnical consultants for both the storm and sanitary system for the underpass at the detail design stage.

As discussed in Section 3.1, it may also be possible to construction a water-tight structure so that no dewatering is required. This would eliminate the need for the treatment of groundwater, groundwater discharge, and/or a sanitary sewer system while aligning with the latest city standards regarding groundwater dewatering. This would be the preferred method to deal with the high groundwater levels in the area.

The minimum cover of 2.75 m and 1.70 m for proposed sanitary and storm sewer located within the roadway, respectively, along with all other design guidelines as stated in the City of Toronto Design Criteria for Sewers and Watermains (January 2021) will be followed in the detail design stages.

## 7 Conclusion

In this report the proposed storm, sanitary, and water distribution networks were reviewed and analyzed. Based on our analyses the following was determined.

► Under existing conditions, the sanitary sewer networks within the study area are operating below capacity for both the dry and wet weather conditions. The existing sanitary sewers on Cowdray Court may be modified and removed in the future; this decision will be determined by the subdivision consultant. Due to the proposed underpass along the proposed N-S road being located near the existing groundwater table, a new sanitary sewer system may be proposed to capture the flows from a dewatering system and discharge them to the existing West Highland Creek sanitary trunk sewer. The preferred option would be to proceed with a watertight construction.

► Under existing conditions, the storm sewer networks within the study area are operating below capacity for the 2-year storm. Under the 10-year storm event, there are multiple sewers along the arterial roads in the study area operating above capacity. The existing storm sewers on Cowdray Court may be modified and removed in the future depending on the design by the subdivision consultant(s). Two new storm sewer networks are proposed as part of the project and will be designed by the subdivision and transportation consultants. They are designed to capture and convey runoff from the proposed N-S road, the realigned Cowdray Court and future developments on Cowdray Court. SWM facilities shall be designed and proposed to ensure the City of Toronto and T.R.C.A water quantity and quality criteria are met. Coordination will be required with the subdivision consultant(s) to ensure ponding within the proposed N-S road is less than 0.30 m and that safe overland flow routes to West Highland Creek are provided under the post-development condition.

► Under existing conditions, the water distribution network provides adequate pressure for the peak hour scenario. Under the max day + fire flow scenario, several nodes failed to provide the minimum pressure at the required fire flow. A new 300 mm watermain is proposed along the new Gordon Avenue extension and will connect to the existing watermain on Collingwood Street, Cowdray Court and Village Green Square. A post-development analysis was conducted, and it was determined that the pressure in the overall system has increased as a result of the new watermain providing more looping in the system. However, there is still one node in the network where the max day + fire flow scenario is still not satisfied.

#### WSP CANADA INCORPORATED

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Southwest Agincourt Transportation Connections Study CITY OF TORONTO September 2023 WSP



# A SUE INVESTIGATION



SURVEY(Year)	X-61001675-TOPO-1-0674-V1-2D			
DESIGN				
UTILITY	61001675 - SUE.dgn			
MAPPING				
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			<b>DA</b> TORONTO	Engir	neering and Construc	tion Services	
REVISIONS	INITIAL	SIGNED					

	COLLINGWOOD STREET											
	SUBSURFACE UTILITY ENGINEERING MAPPING INVESTIGATION											
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	DESIGN		DRAWN	J.S.	CHECKED	D.J.	CONTRACT No.

1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO FINAL DESIGN AND CONSTRUCTION.

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE

RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT.

4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA MAY NOT BE SHOWN ON THE DRAWING.

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR

FINDING ALL UNDOCUMENTED UTILITIES. 7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE

UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER

CONFIRMED WITH THE UTILITY OWNER.

NOT RESPONSIBLE FOR IT'S ACCURACY.

THIS DRAWING HAS BEEN PREPARED FOR THE USE OF

T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR

RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE

BY GOVERNMENT REVIEWING AGENCIES. T2UE ACCEPTS

DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT

THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN

ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY

LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION

QUALITY LEVEL "D" - INFORMATION DERIVED FROM EXISTING RECORDS OR

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AN PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D"

NO RESPONSIBILITY, AND DENIES ANY LIABILITY

VERBAL RECOLLECTIONS

ASCE QUALITY LEVELS

INFORMATION.

WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS

ASCE 38-02.

NOTE

OF THE DATA.



RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATION.





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						<b>Intervices</b> Engineering and Construction Services			
SURVEY(Year) X-61001675-TOPO-1-0674-V1-2D									
DESIGN									
UTILITY 61001675 - SUE.dgn									4
MAPPING									
STREETLINE									
DIGITAL INFORMATION	No.	DATE	REVISIONS	INITIAL	SIGNED				

LEGEND G.S. W.S. SAN LAT. STM LAT. O/S T.O.N.

	COLLINGWOOD STREET											
	SUBSURFACE UTILITY ENGINEERING MAPPING INVESTIGATION											
DESIGN		DRAWN	J.S.	CHECKED	D.J.	CONTRACT No.						
 SCALE	HORIZONTAL	1:200										
DATE	JULY 14, 2020	)		51075	2 OF 10							

				QUALITY APPROF UEXISTEN A LQUALITY IUTILITIE T MEASUR Y	' LEVEL "B" - IN 'RIATE SURFA( ICE AND APPR' ' LEVEL "A" - Pf S OBTAINED B' EMENT OF SU	FORMATION OB CE GEOPHYSICA OXIMATE HORIZ RECISE HORIZOI Y THE ACTUAL E BSURFACE UTIL	TAINED THROUGH THE APPLICATION OF AL METHODS TO DETERMINE THE ONTAL POSITION OF THE UTILITIES. NTAL AND VERTICAL LOCATION OF EXPOSURE AND SUBSEQUENT ITIES.
GAS SERVICE WATER SERVICE SANITARY LATERAL	QUALIT QUALIT QUALIT	Y LEVEL "B" Y LEVEL "C" Y LEVEL "D"	TI U A PI BI C	NOTE HE ENGINEER'S TILITIES SHOWN CCORDANCE WI RACTICES. ALL C EEN PROVIDED E ERTIFICATION.	SEAL HEREON HAVE BEEN IN TH STANDARD DTHER INFORM BY OTHERS AN	IS TO CERTIFY IVESTIGATED IN SUE INDUSTRY IATION HEREON ID IS NOT A PAR	THAT THE HAS T OF THIS
OFFSET TOP OF NUT TOP OF PIPE QUALITY LEVEL "A" FLOW ARROW CONTINUATION ARROW END CAP LOSS OF SIGNAL	<ul> <li>NOT SU BASED OBSER</li> <li># NOT SU BASED OBSER</li> </ul>	JRVEYED, LOCAT ON FIELD VATION JRVEYED, LOCAT ON RECORD VATION	ION Tİ ION IN A B	NOTE HE ONTARIO LAN ERTIFY THAT TH IFORMATION PR IDUSTRY STAND LL OTHER INFOF Y OTHERS AND I	ND SURVEYOR E TOPOGRAPH OVIDED IS IN A ARDS, COMPL MATION HERE S NOT A PART	S SEAL HEREON HIC SURVEY CCORDANCE W ETED BY J.D. BA CON HAS BEEN P OF THIS CERTIF	I IS TO ITH RNES ROVIDED FICATION.
		S		DLLINC TO CE UTILITY E	SWOC PRONTO ON NGINEERIN	D STF	REET
	DESIGN		DRAWN	J.S.	CHECKED	D.J.	CONTRACT No.

#### GENERAL NOTES:

1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO FINAL DESIGN AND CONSTRUCTION.

2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

CONFIRMED WITH THE UTILITY OWNER.

NOT RESPONSIBLE FOR IT'S ACCURACY.

THIS DRAWING HAS BEEN PREPARED FOR THE USE OF

T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR

RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY

T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE BY GOVERNMENT REVIEWING AGENCIES. T2UE ACCEPTS

DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT

THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN

ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY

LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION

I QUALITY LEVEL "D" - INFORMATION DERIVED FROM EXISTING RECORDS OR C VERBAL RECOLLECTIONS.

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AN PLOTTING

VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D"

NO RESPONSIBILITY, AND DENIES ANY LIABILITY

ASCE QUALITY LEVELS

INFORMATION.

OF THE DATA.

WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS

ASCE 38-02.

NOTE

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE

RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT. 4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION

OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR

7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD

INVESTIGATION.

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE

UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER







						<b>Intervices</b> Engineering and Construction Services			
SURVEY(Year) X-61001675-TOPO-1-0674-V1-2D									
DESIGN									
UTILITY 61001675 - SUE.dgn									-
MAPPING									
STREETLINE									
DIGITAL INFORMATION	No.	DATE	REVISIONS	INITIAL	SIGNED				



LEGEND G.S.  $\geq$ 



LOSS OF SIGNAL



	GORDON AVENUE TORONTO ONTARIO											
	SUBSURFACE UTILITY ENGINEERING MAPPING INVESTIGATION											
DESIGN		DRAWN	J.S.	CHECKED	D.J.	CONTRACT No.						
 SCALE	HORIZONTAL 1:200			DRAWING 61001675								
DATE	JULY 14, 2020	)		51075	3 OF 10							

# NOT SURVEYED, LOCATION BASED ON RECORD CONTINUATION ARROW OBSERVATION

\* NOT SURVEYED, LOCATION BASED ON FIELD OBSERVATION

NOT THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO CERTIFY THAT THE TOPOGRAPHIC SURVEY

STM LAT. STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D"

QUALITY LEVEL "B" SAN LAT. SANITARY LATERAL - - - - - - QUALITY LEVEL "C"

UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

INFORMATION PROVIDED IS IN ACCORDANCE WITH

NDUSTRY STANDARDS, COMPLETED BY J.D. BARNES

ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED

BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE

NOTE

MEASUREMENT OF SUBSURFACE UTILITIES.

UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT

QUALITY LEVEL "A" - PRECISE HORIZONTAL AND VERTICAL LOCATION OF

EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES.

INFORMATION. QUALITY LEVEL "B" - INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE

VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D"

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AN PLOTTING

QUALITY LEVEL "D" - INFORMATION DERIVED FROM EXISTING RECORDS OR VERBAL RECOLLECTIONS.

OF THE DATA.

THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION

ASCE QUALITY LEVELS

THIS DRAWING HAS BEEN PREPARED FOR THE USE OF T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE BY GOVERNMENT REVIEWING AGENCIES. T2UE ACCEPTS NO RESPONSIBILITY, AND DENIES ANY LIABILITY WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT

NOTE

ASCE 38-02.

CONFIRMED WITH THE UTILITY OWNER. 10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS NOT RESPONSIBLE FOR IT'S ACCURACY.

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER

WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER. UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES. 9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE

INVESTIGATION. 8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED.

OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR FINDING ALL UNDOCUMENTED UTILITIES. 7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA MAY NOT BE SHOWN ON THE DRAWING.

4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT.

1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE

2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO

(N)

FINAL DESIGN AND CONSTRUCTION.







SURVEY(Year)	X-61001675-TOPO-1-0674-V1-2D			
DESIGN				
UTILITY	61001675 - SUE.dgn			
MAPPING				
STREETLINE				
	DIGITAL INFORMATION	No.	DATE	

LOSS OF SIGNAL								
			S			VE W	EST	
		S	SUBSURFAC	E UTILITY E	NGINEERIN	IG MAPPING	INVESTIGATION	
	DESIGN		DRAWN	J.S.	CHECKED	D.J.	CONTRACT No.	
	SCALE	HORIZONTAL	. 1:200		DRAWING	6100	1675	SHEET
	DATE	JULY 14, 2020	)		NUMBER	0100	51075	4 OF 10

UTILITIES SHOWN HAVE BEEN INVESTIGATED IN CCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION. QUALITY LEVEL "B" GAS SERVICE SAN LAT. SANITARY LATERAL - - - - - - - QUALITY LEVEL "C" WATER SERVICE STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D" \* NOT SURVEYED, LOCATION BASED ON FIELD THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO CERTIFY THAT THE TOPOGRAPHIC SURVEY OBSERVATION QUALITY LEVEL "A" NFORMATION PROVIDED IS IN ACCORDANCE WITH # NOT SURVEYED, LOCATION FLOW ARROW IDUSTRY STANDARDS, COMPLETED BY J.D. BARNES BASED ON RECORD ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED CONTINUATION ARROW OBSERVATION Y OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

#### QUALITY LEVEL "D" - INFORMATION DERIVED FROM EXISTING RECORDS OR VERBAL RECOLLECTIONS. QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AN PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D" INFORMATION. APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES. QUALITY LEVEL "A" - PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES.

QUALITY LEVEL "B" - INFORMATION OBTAINED THROUGH THE APPLICATION OF

LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION OF THE DATA.

ASCE QUALITY LEVELS THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY

THIS DRAWING HAS BEEN PREPARED FOR THE USE OF T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE BY GOVERNMENT REVIEWING AGENCIES. T2UE ACCEPTS NO RESPONSIBILITY, AND DENIES ANY LIABILITY WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT.

THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE

NOT RESPONSIBLE FOR IT'S ACCURACY.

<u>NOTF</u>

NOTE

ASCE 38-02.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE CONFIRMED WITH THE UTILITY OWNER. 10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER. UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

FINDING ALL UNDOCUMENTED UTILITIES. 7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATION.

MAY NOT BE SHOWN ON THE DRAWING. 6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR

OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT. 5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT. 4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION

AS SHOWN ON KEY PLAN.

2. LIMIT OF INVESTIGATION:

SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO FINAL DESIGN AND CONSTRUCTION.

GENERAL NOTES: 1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE

NOT TO SCALE





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					<b>International Engineering and Construct</b>	ction Services			SHEPP	ARD AVE W	/EST	
SURVEY(Year) X-61001675-TOPO-1-0674-V1-2D								SUBSURF	CE UTILITY		G INVESTIGATION	
DESIGN UTILITY 61001675 - SUE.dgn								DESIGN DRAWN	J.S.	CHECKED D.J.	CONTRACT No.	
MAPPING STREETLINE								SCALE HORIZONTAL 1:200		DRAWING 610	01675	SHEET
DIGITAL INFORMATION	No.	DATE	REVISIONS	INITIAL SIGNED				DATE JULY 14, 2020		NUMBER OTO	01075	5 OF 10

GAS SERVICE WATER SERVICE OFFSET T.O.N. TOP OF NUT TOP OF PIPE QUALITY LEVEL "A" FLOW ARROW END CAP

\_\_\_\_\_ QUALITY LEVEL "B" SAN LAT. SANITARY LATERAL - - - - - - - QUALITY LEVEL "C" STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D" NOT SURVEYED, LOCATION BASED ON FIELD THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO OBSERVATION CERTIFY THAT THE TOPOGRAPHIC SURVEY NFORMATION PROVIDED IS IN ACCORDANCE WITH # NOT SURVEYED, LOCATION IDUSTRY STANDARDS, COMPLETED BY J.D. BARNES BASED ON RECORD ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED CONTINUATION ARROW OBSERVATION Y OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

UTILITIES SHOWN HAVE BEEN INVESTIGATED IN CCORDANCE WITH STANDARD SUE INDUSTRY CERTIFICATION.

PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS

NOTE THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE

MEASUREMENT OF SUBSURFACE UTILITIES.

VERBAL RECOLLECTIONS. INFORMATION. QUALITY LEVEL "B" - INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES. QUALITY LEVEL "A" - PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT

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LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION OF THE DATA.

THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY

ASCE QUALITY LEVELS

BY GOVERNMENT REVIEWING AGENCIES T2UE ACCEPTS NO RESPONSIBILITY, AND DENIES ANY LIABILITY WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT.

NOT THIS DRAWING HAS BEEN PREPARED FOR THE USE OF T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE

NOT RESPONSIBLE FOR IT'S ACCURACY.

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER ASCE 38-02.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE CONFIRMED WITH THE UTILITY OWNER. 10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER. UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATION.

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR FINDING ALL UNDOCUMENTED UTILITIES.

MAY NOT BE SHOWN ON THE DRAWING.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA

4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT.

NOT TO SCALE

2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

FINAL DESIGN AND CONSTRUCTION.

GENERAL NOTES:

1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO

![](_page_30_Picture_40.jpeg)

![](_page_31_Picture_0.jpeg)

# **REIDMOUNT AVENUE**

![](_page_31_Figure_2.jpeg)

							S LOSS OF SIGNAL							
					<b>Interview Toronto</b> Engineering and Con	struction Services				S	SHEPF		VEST	
SURVEY(Year) X-61001675-TOPO-1-0674-V1-2D									S	UBSURFA	CE UTILITY	ENGINEERING MAPPIN	G INVESTIGATION	
DESIGN UTILITY 61001675 - SUE.dgn								DESIGN		DRAWN	J.S.	CHECKED D.J.	CONTRACT No.	
MAPPING STREETLINE								SCALE	HORIZONTAL	1:200			01675	SHEET
DIGITAL INFORMATION	No. DATE	REVISIONS	INITIAL	SIGNED				DATE	JULY 14, 2020	)			01075	6 OF 10

![](_page_31_Picture_4.jpeg)

LEGEND G.S. GAS SERVICE W.S. WATER SERVICE O/S OFFSET T.O.N. TOP OF NUT T.O.P. TOP OF PIPE QUALITY LEVEL "A"  $\geq$ FLOW ARROW END CAP (

BASED ON FIELD BASED ON RECORD CONTINUATION ARROW OBSERVATION

OBSERVATION # NOT SURVEYED, LOCATION

\* NOT SURVEYED, LOCATION

SAN LAT. SANITARY LATERAL - - - - - - QUALITY LEVEL "C" STM LAT. STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D"

QUALITY LEVEL "B"

NOTE THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS

CERTIFICATION.

NOT

THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO CERTIFY THAT THE TOPOGRAPHIC SURVEY

NDUSTRY STANDARDS, COMPLETED BY J.D. BARNES

ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED

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INFORMATION PROVIDED IS IN ACCORDANCE WITH

INFORMATION. EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES. QUALITY LEVEL "A" - PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES.

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JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D"

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ASCE QUALITY LEVELS

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NOTE

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER ASCE 38-02

10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS NOT RESPONSIBLE FOR IT'S ACCURACY.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE CONFIRMED WITH THE UTILITY OWNER.

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER. UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATION.

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR FINDING ALL UNDOCUMENTED UTILITIES.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED MAY NOT BE SHOWN ON THE DRAWING.

OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT. FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA

4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT.

2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO FINAL DESIGN AND CONSTRUCTION.

GENERAL NOTES: 1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE

![](_page_31_Picture_51.jpeg)

NOT TO SCALE

![](_page_32_Figure_0.jpeg)

<b>Interview Construction Services</b>		Ç	SHEPI	PARD AVE V		
					IVEOI	
Image: SURVEY(Year)         X-61001675-TOPO-1-0674-V1-2D         Image: Support of the second		SUBSURFA	ACE UTILIT	Y ENGINEERING MAPPI	ING INVESTIGATION	
DESIGN         Image: Constraint of the second	DESIGN	DRAWN	J.S.	CHECKED D.J.	CONTRACT No.	
MAPPING     Image: Constraint of the second se	SCALE	HORIZONTAL 1:200		DRAWING 610		SHEET
DIGITAL INFORMATION No. DATE REVISIONS INITIAL SIGNED	DATE	JULY 14, 2020			JU1075	6 OF 10

![](_page_32_Picture_2.jpeg)

LEGEND G.S. GAS SERVICE W.S. WATER SERVICE O/S OFFSET T.O.N. TOP OF NUT T.O.P. TOP OF PIPE QUALITY LEVEL "A"  $\geq$ FLOW ARROW CONTINUATION ARROW END CAP (

BASED ON RECORD OBSERVATION

OBSERVATION # NOT SURVEYED, LOCATION

\* NOT SURVEYED, LOCATION BASED ON FIELD

SAN LAT. SANITARY LATERAL - - - - - - QUALITY LEVEL "C" STM LAT. STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D"

QUALITY LEVEL "B"

NOTE THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO CERTIFY THAT THE TOPOGRAPHIC SURVEY

CERTIFICATION.

UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS

INFORMATION PROVIDED IS IN ACCORDANCE WITH

NDUSTRY STANDARDS, COMPLETED BY J.D. BARNES

ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED

BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

NOTE THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE

UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES.

QUALITY LEVEL "A" - PRECISE HORIZONTAL AND VERTICAL LOCATION OF

EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES.

INFORMATION. QUALITY LEVEL "B" - INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AN PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D"

 N
 QUALITY LEVEL "D" - INFORMATION DERIVED FROM EXISTING RECORDS OR

 C
 VERBAL RECOLLECTIONS.

LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION OF THE DATA.

ASCE QUALITY LEVELS THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY

THIS DRAWING HAS BEEN PREPARED FOR THE USE OF T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE BY GOVERNMENT REVIEWING AGENCIES. T2UE ACCEPTS NO RESPONSIBILITY, AND DENIES ANY LIABILITY WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT.

NOTE

10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS NOT RESPONSIBLE FOR IT'S ACCURACY. 11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER ASCE 38-02.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE CONFIRMED WITH THE UTILITY OWNER.

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER. UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATION.

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR FINDING ALL UNDOCUMENTED UTILITIES.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA MAY NOT BE SHOWN ON THE DRAWING.

4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT.

2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

GENERAL NOTES: 1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN JUNE 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO FINAL DESIGN AND CONSTRUCTION.

![](_page_32_Figure_72.jpeg)

![](_page_32_Figure_73.jpeg)

![](_page_33_Figure_1.jpeg)

				<b>International Toronto</b> Engi	ineering and Constru	ction Services			COW	DRAY COU	RT	
SURVEY(Year) X-61001675-Gemterra - Cowdray Court-TOPO								SUBSURFA	CE UTILITY E	ENGINEERING MAPPIN	IG INVESTIGATION	
DESIGN UTILITY 61001675 - SUE.dgn							 DESIGN	DRAWN	J.S.	CHECKED D.J.	CONTRACT No.	
MAPPING STREETLINE							 SCALE	HORIZONTAL 1:200			01675	SHEET
DIGITAL INFORMATION	No. DATE	REVISIONS	INITIAL SIGNED				DATE	JULY 14, 2020		NUMBER OIU	01075	8 OF 10

LEGEND G.S. GAS SERVICE W.S. WATER SERVICE STM LAT. STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D" O/S OFFSET T.O.N. TOP OF NUT T.O.P. TOP OF PIPE  $\geq$ 

LOSS OF SIGNAL

![](_page_33_Picture_4.jpeg)

QUALITY LEVEL "A" FLOW ARROW CONTINUATION ARROW OBSERVATION END CAP

OBSERVATION # NOT SURVEYED, LOCATION BASED ON RECORD

\* NOT SURVEYED, LOCATION BASED ON FIELD

QUALITY LEVEL "B" SAN LAT. SANITARY LATERAL - - - - - - - QUALITY LEVEL "C"

NOTE

THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO CERTIFY THAT THE TOPOGRAPHIC SURVEY INFORMATION PROVIDED IS IN ACCORDANCE WITH

ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED

BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

NDUSTRY STANDARDS, COMPLETED BY J.D. BARNES

PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

MEASUREMENT OF SUBSURFACE UTILITIES. NOTE THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY

VERBAL RECOLLECTIONS INFORMATION. QUALITY LEVEL "B" - INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE UTILITIES.

QUALITY LEVEL "C" - INFORMATION OBTAINED BY SURVEYING AN PLOTTING VISIBLE ABOVE GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO THE QUALITY LEVEL "D"

QUALITY LEVEL "A" - PRECISE HORIZONTAL AND VERTICAL LOCATION OF

UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT

QUALITY LEVEL "D" - INFORMATION DERIVED FROM EXISTING RECORDS OR

THE UTILITY INFORMATION SHOWN ON THIS DRAWING WAS COLLECTED IN ACCORDANCE TO ASCE STANDARD 38-02. THE INFORMATION IS SHOWN BY QUALITY LEVEL WHICH INDICATES THE LEVEL OF EFFORT USED TO DETERMINE THE LOCATION OF THE DATA.

ASCE QUALITY LEVELS

RELIED UPON BY THIRD PARTIES, EXCEPT AS AGREED BY T2UE AND ITS CLIENT, AS REQUIRED BY LAW OR FOR USE BY GOVERNMENT REVIEWING AGENCIES. T2UE ACCEPTS NO RESPONSIBILITY, AND DENIES ANY LIABILITY WHATSOEVER, TO ANY PARTY THAT MODIFIES THIS DRAWING WITHOUT T2UE'S EXPRESS WRITTEN CONSENT

NOTE THIS DRAWING HAS BEEN PREPARED FOR THE USE OF

ASCE 38-02.

9. PLANT SHOWN AS "ABANDONED (ABND)" ON THE DRAWINGS ARE BASED ON RECORD INFORMATION PROVIDED. STATUS OF THE UTILITY SHOULD BE CONFIRMED WITH THE UTILITY OWNER. 10. THE TOPOGRAPHIC SURVEY WAS PROVIDED BY IBW SURVEYORS. T2UE IS NOT RESPONSIBLE FOR IT'S ACCURACY.

T2UE'S CLIENT AND MAY NOT BE USED, REPRODUCED OR

UTILITIES WITH UNKNOWN SIZES ARE SHOWN AS SINGLE LINES.

11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER

8. UTILITY WIDTHS SHOWN ON DRAWING ARE BASED ON RECORDS RECEIVED. WIDTHS ARE NOT SHOWN ON UTILITIES 100mm IN DIAMETER/WIDTH OR SMALLER.

7. UTILITY MATERIAL, SIZES AND FLOW SHOWN ON DRAWING ARE BASED ON RECORDS INFORMATION RECEIVED, PROFESSIONAL JUDGEMENT AND FIELD INVESTIGATION.

6. T2UE USED AVAILABLE MEANS IN AN ATTEMPT TO DETERMINE THE LOCATION OF UNDOCUMENTED UTILITIES HOWEVER CANNOT BE RESPONSIBLE FOR FINDING ALL UNDOCUMENTED UTILITIES.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED MAY NOT BE SHOWN ON THE DRAWING.

FACILITIES SUCH AS STREET LIGHT CABLES, WITHIN THE INVESTIGATION AREA

OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT. 4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION

FINAL DESIGN AND CONSTRUCTION. 2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

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NOT TO SCALE

![](_page_33_Figure_76.jpeg)

![](_page_34_Figure_0.jpeg)

						<b>Internation Services</b> Engineering and Construction Services			DWDRAY COURT TORONTO ONTARIO		
								SUBSURFACE UTILITY EN	GINEERING M	IAPPING INVESTIGATION	
SURVEY(Year) X-61001675-Gemterra - Cowdray Court-TOPO											
DESIGN							DESIGN				
UTILITY 61001675 - SUE.dgn							DESIGN	DRAVIN 3.3.		. CONTRACT NO.	
MAPPING STREETLINE							 SCALE HORIZONTA	L 1:200			SHEET
DIGITAL INFORMATION	No.	DATE	REVISIONS	INIT	AL SIGNED		DATE JULY 14, 202	0	NUMBER C	01001675	9 OF 10

![](_page_34_Figure_2.jpeg)

O/S OFFSET T.O.N. TOP OF NUT T.O.P. TOP OF PIPE QUALITY LEVEL "A" # NOT SURVEYED, LOCATION FLOW ARROW CONTINUATION ARROW END CAP

G.S.

 $\geq$ 

LOSS OF SIGNAL

QUALITY LEVEL "B" GAS SERVICE W.S. WATER SERVICE SAN LAT. SANITARY LATERAL - - - - - - - QUALITY LEVEL "C" STM LAT. STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D" \* NOT SURVEYED, LOCATION BASED ON FIELD OBSERVATION

BASED ON RECORD

OBSERVATION

THE ONTARIO LAND SURVEYORS SEAL HEREON IS TO CERTIFY THAT THE TOPOGRAPHIC SURVEY

NOTE

UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

INFORMATION PROVIDED IS IN ACCORDANCE WITH

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OF THE DATA.

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ASCE QUALITY LEVELS

CONFIRMED WITH THE UTILITY OWNER.

NOT RESPONSIBLE FOR IT'S ACCURACY.

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NOTE

ASCE 38-02.

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MAY NOT BE SHOWN ON THE DRAWING.

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NOT TO SCALE

## FINAL DESIGN AND CONSTRUCTION.

GENERAL NOTES:

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![](_page_34_Picture_72.jpeg)

![](_page_35_Figure_0.jpeg)

SURVEY(Year)	X - 61001675 - TOPO -1-0674-COMB-3D			
DESIGN				
UTILITY	61001675 - SUE.dgn			
MAPPING				
STREETLINE				
	DIGITAL INFORMATION	No.	DATE	

			<b>DA TORONTO</b>	Engir	neering and Construc	tion Services	
REVISIONS	NITIAL	SIGNED					

LOSS OF SIGNAL								
		S	VIL	LAGE TO CE UTILITY E	GREE PRONTO ON NGINEERIN	ITARIO	JARE INVESTIGATION	
	DESIGN		DRAWN	S.G.	CHECKED	D.J.	CONTRACT No.	
	SCALE	HORIZONTAL	. 1:200		DRAWING	6100	11675	SHEET
	DATE	OCTOBER 02	, 2020		NUMBER	0100	51075	10 OF 10

#### O/S OFFSET T.O.N. TOP OF NUT T.O.P. TOP OF PIPE QUALITY LEVEL "A" FLOW ARROW CONTINUATION ARROW END CAP

QUALITY LEVEL "B" G.S. GAS SERVICE SAN LAT. SANITARY LATERAL - - - - - - QUALITY LEVEL "C" W.S. WATER SERVICE STM LAT. STORM LATERAL \_\_\_\_\_ QUALITY LEVEL "D"

# NOT SURVEYED, LOCATION

BASED ON RECORD

OBSERVATION

OBSERVATION

\* NOT SURVEYED, LOCATION BASED ON FIELD

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11. CENTERLINE OF UTILITY SHOWN INDICATES THE QUALITY LEVEL AS PER

NOT TO SCALE

1. T2UE'S SUE FIELD INVESTIGATION WAS COMPLETED IN SEPTEMBER 2020. CHANGES TO UTILITIES THAT OCCURED FOLLOWING OUR INVESTIGATION MAY NOT BE SHOWN. CONSIDERATION SHOULD BE GIVEN TO UPDATING THIS PLAN PRIOR TO FINAL DESIGN AND CONSTRUCTION.

3. STORM AND SEWER ALIGNMENTS ARE SHOWN BASED ON AVAILABLE RECORDS INFORMATION AND PROFESSIONAL JUDGEMENT.

5. EMPTY CONDUITS, SERVICES, LATERALS TO BUILDINGS, ABANDONED

4. FIELD VERIFICATION OF UTILITIES WAS COMPLETED USING A COMBINATION OF ELECTROMAGNETIC PIPE AND CABLE LOCATE EQUIPMENT.

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GENERAL NOTES:

2. LIMIT OF INVESTIGATION: AS SHOWN ON KEY PLAN.

INVESTIGATION.

ASCE 38-02.

OF THE DATA.

CERTIFICATION.

CONFIRMED WITH THE UTILITY OWNER.

NOT RESPONSIBLE FOR IT'S ACCURACY.

ASCE QUALITY LEVELS


### B STORMWATER MANAGEMENT CALCULATIONS

					Project:	Agincourt I	Road EA	No.	19M-01888	
					Ву	Steve		Date	12-09-22 Page	
					Checked	Steve		Checked	12-09-22	1
Subject:	Modified F	Rational Meth	od Storage I	Estimation				-		
				Surface Type=	Mixed Land	use				
				Catchment # 1	01					
		100 Year Ra	infall	Site Parameter	rs					
		IDF Paramet	ers	C =	0.95	3.				
		а	59.7	Q <sub>orifice</sub> =	0.0001	mĭ/s				
		С	-0.8	A =	0.16	ha				
	Time	Intoncity	Poak	T <sub>c</sub> =	10 Triangular	min Storago				
	t.	intensity,	Discharge	Area Vol.	Area Vol.	Volume				
	(min)	(mm/hr)	(m <sup>3</sup> /s)	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )				
	10	250.3	0.106	63	0	63				
	10	250.3	0.106	63	0	63				
	20	143.8	0.061	73	0	73				
	30	103.9	0.044	79	0	79				
	40	82.6	0.035	84	0	84				
	50	69.1	0.029	87	0	87				
	60	59.7	0.025	91	0	91				
	70	52.8	0.022	94	0	93				
	80	47.4	0.020	96	0	96				
	90	43.2	0.018	98	0	98				
	100	39.7	0.017	101	0	100				
	110	36.8	0.016	102	0	102				
	120	34.3	0.014	104	0	104				
	130	32.2	0.014	106	0	105				
	140	30.3	0.013	108	0	107				
	150	28.7	0.012	109	0	109				
	160	27.2	0.012	110	1	110				
	170	25.9	0.011	112	1	111				
	180	24.8	0.010	113	1	112				
	190	23.7	0.010	114	1	114				
	200	22.8	0.010	115	1	115				
	210	21.9	0.009	117	1	116				
	220	21.1	0.009	118	1	117				
	16430	0.7	0.000	279	49	229				
	16440	0.7	0.000	279	49	229				
	16450	0.7	0.000	279	49	230				
	16460	0.7	0.000	279	49	230				
	16470	0.7	0.000	279	49	230				
	16480	0.7	0.000	279	49	230				
	16490	0.7	0.000	279	50	230				
	16500	0.7	0.000	279	50	230				
	22110	0.5	0.000	296	66	230				
	22120	0.5	0.000	296	66	230				
	22130	0.5	0.000	296	66	230				
	22140	0.5	0.000	296	66	230				
	22150	0.5	0.000	296	66	230				
	22160	0.5	0.000	296	67	229				
	22170	0.5	0.000	296	67	229				
	22180	0.5	0.000	296	67	229				
	22190	0.5	0.000	296	67	229				
	22200	0.5	0.000	296	67	229				
	22210	0.5	0.000	296	67	229				
							·			
			Max. Requ	ired Storage	:	230	m			



## PROPOSED GRADE SEPERATION STORMWATER MANAGEMENT DESIGN

### OPTION 1 - 100-YR CAPTURE IN THE UNDERPASS WITH NO RELEASE RATE DURING THE 100-YR STORM

- STORMWATER MANAGMENT TANK BEEN SIZED TO STORE THE 100-YR STORM WITH ZERO DISCHARGE VOLUME - DURING A 100-YR STORM EVENT, THE BACKFLOW VALUE WILL CLOSE DUE TO THE 100-YR HWL IN THE CREEK - THE TANK WILL FILL UP WITH ZERO DISCHARGE UNTIL THE HWL IN THE CREEK DISSIPATES AND THE BACKFLOW VALVE OPENS

- THE EMERGENCY OVERFLOW PIPE HAS BEEN SET AT A 0.3m PONDING INVERT IN THE UNDERPASS. THIS PIPE WILL BE FITTED WITH A CHECK VALVE TO PREVENT BACKFLOW

## LEGEND

GEMTERRA LANDS TO BE DEVELOPED

DRAINAGE AREA TO THE UNDERPASS

• OVERLAND FLOW ROUTE

GEMTERRA STORM SEWERS TO OPERATE INDEPENDENTLY OF UNDERPASS DRAINAGE

UNDERPASS STORM SEWERS TO DISCHARGE DIRECTLY TO THE CREEK







$$NA-A$$



# **APPENDIX**

## WATER DISTRIBUTION NETWORK ANALYSIS





Pipe Input View PIPEHYD->DIAMETER 150mm	CLIENT		- 11 '	5	
200mm	TITLE ROBINSON GLEN COMMUNITY CITY OF MARKHAM	100 Co t: 905.0	ommerce Valley Dr. W 882.1100 f: 905.882	est, Thornhill, 2.0055	, ON Canada L3T 0A1 www.wsp.com
<b>300mm</b>	PROPOSED WATER	Checked	M.M.	Drawn	I.B.
		Date	DEC 2022	Proj. No.	19M-01888
		Scale	N.T.S.	Figure No.	WM-2

# D ON: Wednesday 12/07/2022



Flow Hydrant: HY135737

Area:

N/A

TABLE A: TESTED PRESSURES AND FLOWS

	Timo		Residual		Flo	w Hydran	t (HY135	737)	Total Flow		Velocity	
Point	1 11 1	e	on Residual Hydra		Port	Port 1 (S1)		2 (S2)	TOtal	FIOW	velocity	
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)	
Static	81	134	382	55.4	0.0	0	0.0	0	0.0	0	N/A	
2"	172	202	379	55.0	37.7	598	0.0	0	37.7	598	N/A	
2"	308	338	378	54.8	0.0	0	39.1	620	39.1	620	N/A	
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A	
2" + 2"	240	278	374	54.2	34.6	548	33.3	528	67.9	1076	N/A	

### 3905 SHEPPARD AVE E (HY135743)

HYDRANT FLOW TEST RESULTS

D	ate:	05-A	ug-20	Time:	8:45		Municipality	City of <sup>-</sup>	Toronto	
<b>-</b>			-		(hh/mm)		Operator:	Di	as	
lested	By:	S	Sen				Test No:	1		
	-									-
							1			
Ņ							<u>C</u> Res	idual Hydrant <sup>.</sup>	<u>55 4 nsi</u>	382 kPa
1 Elov	v						Hydrant	that will Flow:	55.4 psi	382 kPa
HY1	3573	37						$\Delta$ pressure:	0.0 psi	0 kPa
						1	Elevation [	Difference:	0.0 ft	0.0 m
					Sheppard	AVEE	(Flow El F	Residual El.)		
				-			Test Notes:			
1	4	chepf	ard Ave E		Resid	ual				
		5000			HY138	5743	·			
	TEST	Need	TEST	LOW	Minimum	Fire Flow at Minimum	Fire Flow at Minimum	2% Pressure Drop		
Port Siz	e	Nozzle Pressure	(USGPM)	(L/s)	Monitoring	Flow Hydrant	Residual P <sub>r</sub> (psi)	Residual, Q <sub>r</sub>	Residual, Q <sub>r</sub>	Achieved?
(in)		(psi)			Hydrant	(Corrected) *		(USGPM)	(L/s)	
STATIC	;	n/a	0	0	55.4	55.4				
Single	e Port	Tests	<b>F</b> 00	6 <b>7</b> 7				600 (	105	
2		14.7	598.0	37.7	55.0	55.0	20	6691	422	NO
2		15.8	620.0	39.1	54.8	54.8	20	5584	352	NO
Two 1	Port	Test								
1							20			
	Port <sup>1</sup>	Test								
2	in one	11.5	528.0	33.3						
2		12.3	548.0	34.6	54.2	54.2	20	6679	421	YES
* Pressure	corr	ection is ed	gual to the ele	evation differ	ence. Colum	n 2 (and Table	A) show the no	zzle pressure v	while flowing.	
		Residual	Pressure vs	Hydrant F	low	,	,	•	Ŭ	
60	T							Res	sults	
	<b>†</b> '	• •					Static P	ressure	Flow at 20	psi (140kPa)*
50	-						(psi)	(kPa)	(gpm)	(L/s)
(ISd. 40							55.4	382	6700	423
) 40 32							* Results carried to n	earest 50 gpm or 10	u gpm if over 1000	gpm
<b>ISS:</b> 30							Lludra	ent Classificat	ion oo nor N	
PRI							Hyura			-PA 291
20					•		Class	AA	Color	BLUE
							Water D	is charged Duri		97001
10	+						Rounded up to close	st 100L	ily l'est.	01001
0	0	200	0 40	000	6000	8000				
			FLOW	/ (GPM)						
				. ,						
DISCLAIMER	RFOR	FIRE FLOW	TESTS							
While WSP n	nakes on dec	every effort to	ensure that the	information co	ntained herein is	accurate and up to	o date, WSP is not r	esponsible for unir	ntended or incorre	ect use of the data
dynamic wate	er syst	em that may o	change over time	e.			as to its accuracy a	na suitability. The l	mormation is repl	
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			,							



Flow Hydrant: HY31391

Test 2 - 4068 SHEPPARD AVE E (HY135747)

TABLE A: TESTED PRESSURES AND FLOWS

N/A

Area:

	Timo		Residual		Flo	w Hydrai	nt (HY313	891)	Total Flow		Velocity	
Point	1111	e	on Residual Hydra		Port	Port 1 (S1)		2 (S2)	TOLA	FIOW	velocity	
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)	
Static	59	116	403	58.5	0.0	0	0.0	0	0.0	0	N/A	
2"	188	216	399	57.9	39.4	625	0.0	0	39.4	625	N/A	
2"	289	312	400	58.0	0.0	0	40.5	642	40.5	642	N/A	
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A	
2" + 2"	248	263	396	57.4	35.3	560	36.5	579	71.8	1138	N/A	

### 4068 SHEPPARD AVE E (HY135747)

HYDRANT FLOW TEST RESULTS

Date: Tested By:	Date: 05-Aug-20 Tested By: Sen			9:13 (hh/mm)	_	Municipality Operator: Test No:	City of <sup>-</sup> Di <b>2</b>	Toronto as				
Residu HY135	ral 747	Sheppard Ave E	cortan Ave	Flow HY31391		Elevation I (Flow El F Test Notes:	idual Hydrant: that will Flow: ∆ pressure: Difference: Residual El.)	58.5 psi 58.5 psi 0.0 psi 0.0 ft	403 kPa 403 kPa 0 kPa 0.0 m			
TEST Port Size (in)	- Nozzle Pressure (psi)	TEST F (USGPM)	ELOW (L/s)	RESIDUAL F Monitoring Hydrant	PRESSURE (psi) Flow Hydrant (Corrected) *	Minimum Residual P <sub>r</sub> (psi)	Fire Flow at Minimum Residual, Q <sub>r</sub> (USGPM)	Fire Flow at Minimum Residual, Q <sub>r</sub> (L/s)	1.6% Pressure Drop Achieved?			
STATIC	n/a	0	0	58.5	58.5							
Single Port	Tests											
2	16.1	625.0	39.4	57.9	57.9	20	6192	391	NO			
2	16.9	642.0	40.5	58	58.0	20	7088	447	NO			
Two Port	Test											
1						20						
2												
Two Port	Test											
2	12.9	560.0	35.3	57.4	57.4	20	7959	502	YES			
* Pressure corr	Residual	qual to the ele Pressure vs	vation diffe	rence. Colum Flow	n 2 (and Table	A) show the no Static P	zzle pressure v Res ressure	while flowing. sults Flow at 20	psi (140kPa)*			
	• •					(psi)	(kPa)	(gpm)	(L/s)			
<b>S</b> 50					_	58.5	403	8000	505			
					_	Hvdra	ant Classificat	ion as per NF	PA 291			
<b>1</b> 30						Class	AA	Color	BLUE			
20					_	Clubb	701					
						Water D	ischarged Duri	ng Test:	8400 L			
10						Rounded up to close	st 100L					
	2000	4000 FLOW	6000 (GPM)	8000	10000							
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	Subject Wa		
Diameter:		Material:	Residual Hydrant: HY135313
Area:	N/A		Flow Hydrant: HY136170

TABLE A:	TESTED	PRESSURES	AND FLOWS
.,			

	Time		Residual		Flo	w Hydran	it (HY136	170)	Total Flow		Velocity
Point			on Residual Hydra		Port	Port 1 (S1)		2 (S2)	TOLA	FIOW	velocity
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)
Static	36	75	387	56.1	0.0	0	0.0	0	0.0	0	N/A
2"	149	185	379	55.0	36.3	575	0.0	0	36.3	575	N/A
2"	281	303	384	55.7	0.0	0	38.2	605	38.2	605	N/A
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A
2" + 2"	208	257	378	54.8	33.4	529	30.5	483	63.9	1013	N/A

### 2250 KENNEDY RD (HY135313)

HYDRANT FLOW TEST RESULTS

Date Tested B	e: 05 y:	-Aug-20 Sen	Time:	Municipality       City of Toronto         Operator:       Dias         Test No:       3         Conditions before Test (STATIC)									
₹	Flo	W 136170	keemed pd	Elevation I (Flow El F Test Notes:	idual Hydrant: that will Flow: ∆ pressure: Difference: Residual El.)	56.1 psi 56.1 psi 0.0 psi 0.0 ft	387 kPa 387 kPa 0 kPa 0.0 m						
TE	ST	TEST	FLOW		Fire Flow at	Fire Flow at							
Port Size (in)	Nozzle Pressure (psi)	(USGPM)	(L/s)	Monitoring Hydrant	Flow Hydrant (Corrected) *	Minimum Residual P <sub>r</sub> (psi)	Minimum Residual, Q <sub>r</sub> (USGPM)	Minimum Residual, Q <sub>r</sub> (L/s)	2.3% Pressure Drop Achieved?				
STATIC	n/a	0	0	56.1	56.1								
Single Po	ort Tests												
2	13.6	575.0	36.3	55.0	55.0	20	3735	236	NO				
2 Two De	15.0	605.0	38.2	55.7	55.7	20	6624	418	NO				
1 2						20							
	ort Test	402.0	20 F										
2	9.6	483.0 529.0	30.5	54.8	54.8	20	6020	380	YES				
* Pressure co	Residua	equal to the ele	evation diffe	rence. Colum	n 2 (and Table	A) show the no Static P (psi) 56.1 * Results carried to r	zzle pressure v Res ressure (kPa) 387 tearest 50 gpm or 10	while flowing. sults Flow at 20 (gpm) 6000	psi (140kPa)* (L/s) 379				
PRI						Class			PA 291				
20 -				•		Class	AA	COIDI	BLUE				
10 -						Water D	ischarged Duri	ng Test:	9200 L				
DISCLAIMER Fr While WSP mak and information	Image: Note of the second s												
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Flow Hydrant: HY135909

Test 4 - 1 GORDON AVE (HY135911)

TABLE A: TESTED PRESSURES AND FLOWS

N/A

Area:

	Timo		Residual		Flo	w Hydran	t (HY135	909)	Total Flow		Velocity	
Point	1111	e	on Residual Hydra		Port	Port 1 (S1)		2 (S2)	TOLA	FIOW	velocity	
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)	
Static	308	346	406	58.9	0.0	0	0.0	0	0.0	0	N/A	
2"	419	446	359	52.1	37.8	599	0.0	0	37.8	599	N/A	
2"	525	542	365	52.9	0.0	0	39.3	623	39.3	623	N/A	
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A	
2" + 2"	476	503	322	46.7	32.3	512	33.3	528	65.6	1040	N/A	

### 1 GORDON AVE (HY135911)

HYDRANT FLOW TEST RESULTS





Flow Hydrant: HY136231

Test 5 - 80 COWDRAY CRT (HY136198)

TABLE A: TESTED PRESSURES AND FLOWS

N/A

Area:

	Timo		Residual		Flo	w Hydran	it (HY136	231)	Total Flow		Velocity	
Point	1 11 1	e	on Residual Hydra		Port	Port 1 (S1)		2 (S2)	TOtal	FIOW	velocity	
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)	
Static	368	419	393	57.0	0.0	0	0.0	0	0.0	0	N/A	
2"	479	503	380	55.1	37.8	599	0.0	0	37.8	599	N/A	
2"	606	626	389	56.4	0.0	0	39.9	632	39.9	632	N/A	
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A	
2" + 2"	547	582	368	53.4	34.2	542	29.4	466	63.6	1008	N/A	

#### 80 COWDRAY CRT (HY136198)

HYDRANT FLOW TEST RESULTS





Flow Hydrant: HY136412

Area: N/A

TABLE A: TESTED PRESSURES AND FLOWS

Time		Residual		Flow Hydrant (HY136412)				Total Flow		Volocity	
Point	Time		on Residual Hydra		Port 1 (S1)		Port 2 (S2)		Total TIOW		velocity
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)
Static	115	195	346	50.2	0.0	0	0.0	0	0.0	0	N/A
2"	240	280	328	47.6	35.3	560	0.0	0	35.3	560	N/A
2"	363	383	335	48.6	0.0	0	37.3	591	37.3	591	N/A
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A
2" + 2"	304	336	306	44.4	31.8	504	32.4	514	64.2	1018	N/A

### Village Green Sq (HY136410)

HYDRANT FLOW TEST RESULTS





Area:

N/A

**Residual Hydrant:** HY31392 Flow Hydrant: HY9990100

#### TABLE A: TESTED PRESSURES AND FLOWS

	Timo		Residual		Flow Hydrant (HY9990100)				Total Flow		Volocity
Point	i inte		on Residual Hydra		Port 1 (S1)		Port 2 (S2)		Total TIOW		velocity
	Start	Finish	(kPa)	(psi)	(L/s)	(GPM)	(L/s)	(GPM)	(L/s)	(GPM)	(m/s)
Static	81	129	378	54.8	0.0	0	0.0	0	0.0	0	N/A
2"	166	189	361	52.4	36.7	582	0.0	0	36.7	582	N/A
2"	281	308	363	52.6	0.0	0	38.8	615	38.8	615	N/A
1" + 2"			0	0.0	0.0	0	0.0	0	0.0	0	N/A
2" + 2"	215	248	337	48.9	32.9	521	34.6	548	67.5	1070	N/A

### 255 Village Green Sq (HY31392)

HYDRANT FLOW TEST RESULTS



#### WATER MODELLING RESULTS - EXISTING

Project: Agincourt EA Job No.: 19M-01888 Date: 2022-02-08

Peak Hour

#### Demand Elevation Pressure Head (m) ID (L/s) (m) (kPa) J12 0 168.89 208.59 389 J14 0 168.37 208.64 395 J16 0 208.59 386 169.23 J17 0 169 208.61 388 J18 0 170 208.59 378 J19 0 174 208.71 340 166 J20 0.62 208.48 416 J21 0 177 208.86 312 J22 26.33 166.3 208.35 412 J23 0 177 208.77 311 0 170 208.35 376 J24 J25 0 171 208.64 369 J26 0.36 171 208.35 366 J27 208.55 0 178 299 2.09 172 J28 208.35 356 J29 0 173 208.51 348 J30 11.55 175 208.35 327 J31 0 167 208.43 406 0.87 170.2 207.84 369 J32 J33 0 170 208.32 376 J34 0.31 167.96 208.06 393 J35 0 167 208.43 406 J36 0.28 166.95 208.06 403 J37 0 165 208.68 428 J38 1.12 173.15 207.08 333 J39 0 163 208.85 449 31.46 381 167.8 206.68 J40 J41 0 178 208.8 302 J42 0.09 167.8 206.68 381 172 J43 0 208.57 358 J44 0 172.65 206.97 336 J45 0 173 208.65 349 J46 0 173 206.91 332 J47 0 170 208.58 378 J48 0.15 170 206.46 357 J49 0 173 208.56 348 J50 2.73 170 206.37 356 J51 13.49 172 205.78 331 169 .152 0 205 47 357 0 319 J53 176 208.59 J54 20.1 169 205.48 357 J55 0 173 208.36 347 169 205.45 357 J56 0 J57 0 173 208.39 347 J58 12.14 169 205.31 356 J59 0 208.55 397 168 205.31 J60 0 169 356 J61 0 171 208.38 366 J62 1.95 170 205.39 347 J63 0 173 208.14 344 12.14 170 205.32 346 .164 205.31 J65 0 170 346 J66 12.14 170 205.3 346 J67 0 175 208.19 325 170 J68 0 205.3 346 J69 0 175 208.3 326 J70 4.51 170 205.3 346 170 205.3 346 J71 0 J73 0 167 208.3 405 J75 0 167 208.3 405 J77 0 167 208.31 405 J79 0 168 208.15 393 169 .181 0 207.96 382 J83 0 170.2 207.74 368 J85 0 170 208.93 382

Max 🛛	Day	plus	Fire
-------	-----	------	------

	Static	Static	Static	Fire-Flow	Residual	Available	Available
ID	Demand	Pressure	Head	Demand	Pressure	Flow at	Flow
	(L/s)	(kPa)	(m)	(L/s)	(kPa)	Hydranit (L/c)	(kPa)
112	0	202	209.01	100	274 17	(L/S)	(KFa)
J1Z	0	392	208.91	100	374.17	751.68	140
J 14 116	0	380	208.94	100	370.32	613.00	140
117	0	303	208.92	100	370.69	400 08	140
.118	0	381	208.92	100	335.01	264 48	140
.119	0	342	208.94	100	321 74	369.40	140
.120	0.46	420	208.86	100	394 46	481.84	140
J21	0	313	208.98	100	303.49	512.01	140
J22	18.2	416	208.78	100	380.31	380.99	140
J23	0	313	208.94	100	289.68	294.84	140
J24	0	380	208.78	100	333.05	269.12	140
J25	0	371	208.88	100	330.01	258.8	140
J26	0.33	370	208.78	100	320.71	253.26	140
J27	0	302	208.83	100	251.41	192.09	140
J28	1.48	360	208.78	100	307.26	236.2	140
J29	0	351	208.81	100	277.67	181.23	140
J30	7.72	331	208.78	100	274.87	215.53	140
J31	0	409	208.77	100	358.17	259.78	140
J32	0.65	376	208.54	100	344.21	391.41	140
J33	0	380	208.78	100	355.48	483.43	140
J34	0.21	399	208.65	100	188.65	112.51	140
J35	0	409	208.77	100	375.15	336.43	140
J36	0.19	409	208.65	100	-356.51	56.67	140
J37	0	430	208.88	100	391.83	311.43	140
J38	0.96	343	208.16	150	269.08	289.84	140
J39	0	450	208.96	100	438.31	802.55	140
J40	21	394	207.97	150	230.18	218.5	140
J41	0	303	208.96	100	269.31	235.58	140
J42	0.08	394	207.97	150	217.75	188.37	140
J43	0	361	208.87	100	306.62	221.84	140
J44	0	347	208.1	100	301.89	275	140
J45	0	352	208.89	100	152.14	103.3	140
J46	0	344	208.07	100	296.57	265.36	140
J47	0	381	208.86	100	111.22	94.02	140
J48	0.14	3/1	207.84	100	313.90	255.31	140
J49	0	351	200.00	100	120.04	95.10	140
J50	2.5	370	207.0	100	207.13	204.00	140
152	9.02	376	207.31	133 33	249.10	101.21	140
153	0	322	207.37	100.00	172.89	111.63	140
154	13.65	376	200.07	133 33	240.84	206.7	140
.155	0	350	208.77	100.00	145.82	101.57	140
J56	0	376	207.36	133.33	232.57	185.44	140
J57	0	351	208.78	100	112.99	93.6	140
J58	8.09	375	207.29	133.33	212.39	178.06	140
J59	0	400	208.84	100	18.23	81.14	140
J60	0	375	207.29	133.33	86.36	117.65	140
J61	0	370	208.78	100	2.22	77.41	140
J62	1.3	366	207.33	133.33	217.23	177.43	140
J63	0	349	208.67	100	179.17	112.19	140
J64	8.09	365	207.3	133.33	209.25	178.22	140
J65	0	365	207.29	133.33	206.15	167.9	140
J66	8.09	365	207.29	133.33	203.96	174.46	140
J67	0	330	208.65	100	284.72	237.62	140
J68	0	365	207.29	133.33	191.06	157.72	140
J69	0	330	208.71	100	286.72	241.05	140
J70	3.01	365	207.29	133.33	202.32	168.19	140
J71	0	365	207.29	133	204.31	166.2	140
J73	0	409	208.71	100	378.51	385.08	140
J75	0	409	208.71	100	378.55	385.88	140
J77	0	409	208.71	100	379.12	386.93	140
J79	0	398	208.64	100	364.04	354.15	140
J81	0	388	208.55	100	351.43	344.07	140
J83	0	375	208.49	100	342.30	377.44	140
J85	0	382	209.01	100	372.95	599.53	140

#### WATER MODELLING RESULTS - PROPOSED

Project: Agincourt EA Job No.: 19M-01888 Date: 2022-02-07

#### Max Dav plus Fire

ounnot				
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
J12	0	168.89	208.47	388
J14	0	168.37	208.51	393
J16	0	169.23	208.47	385
J17	0	169	208.5	387
J18	0	170	208.47	377
J19	0	174	208.65	340
J20	0.62	166	208.32	415
J21	0	177	208.85	312
J22	26.33	166.3	208.2	411
JZ3	0	170	200.77	274
J24	0	170	200.2	260
120	0.36	171	208.00	365
127	0.50	178	200.2	300
.128	2.09	170	208.2	355
.129	0	172	208.6	349
J30	11.55	175	208.21	325
J31	0	167	208.56	407
J32	0.87	170.2	207.69	367
J33	0	170	208.19	374
J34	0.31	167.96	206.82	381
J35	0	167	208.56	407
J36	0.28	166.95	206.82	391
J37	0	165	208.75	429
J38	1.12	173.15	207.21	334
J39	0	163	208.88	450
J40	31.46	167.8	206.74	382
J41	0	178	208.77	302
J42	0.09	167.8	206.7	381
J43	0	172	208.49	358
J44	0	172.65	207.18	338
J45	0	173	208.64	349
J46	0	1/3	207.17	335
J47	0 15	170	208.55	3/8
J40	0.15	170	207.00	240
J49 J50	2 73	173	200.03	363
151	13.49	170	207.03	340
.152	0	169	206.60	369
.153	0	176	208.55	319
J54	20.1	169	206.61	369
J55	0	173	208.31	346
J56	0	169	206.6	368
J57	0	173	208.34	346
J58	12.14	169	206.54	368
J59	0	168	208.53	397
J60	0	169	206.54	368
J61	0	171	208.34	366
J62	1.95	170	206.6	359
J63	0	173	208.07	344
J64	12.14	170	206.6	359
J65	0	170	206.57	358
J66	12.14	170	206.55	358
J67	0	175	208.38	327
J68	0	170	206.55	358
J69	0	175	208.46	328
J70	4.51	170	206.54	358
J71	0	170	206.55	358
J73	0	167	208.46	406
J/5	0	167	208.46	406
J//	0	167	208.47	406
J/9	0	160	208.35	395
163	0	109	200.21	367
103	0	170.2	201.03	307
100	U	170	200.93	30Z

max = uj	01001110						
	Static	Static	Static	Fire-Flow	Residual	Available	Available
П	Demand	Pressure	Head	Demand	Pressure	Flow at	Flow
	(L/s)	(kPa)	(m)	(L/s)	(kPa)	Hydrant	Pressure
	(=)	()	()	(=	()	(L/s)	(kPa)
J12	0	392	208.88	100	374	678.99	140
J14	0	397	208.91	100	380	757.79	140
J16	0	389	208.88	100	370	616.86	140
J17	0	391	208.89	100	370	500.76	140
J18	0	381	208.88	100	335	264.41	140
J19	0.46	342	208.92	100	321	309.31	140
J20	0.46	419	208.8	100	394	488.28	140
JZ I	10.0	313	200.90	100	303	202.07	140
122	10.2	313	200.73	100	200	205.11	140
124	0	380	200.93	100	290	290.11	140
125	0	371	200.75	100	331	209.00	140
126	033	370	200.3	100	320	253.60	140
127	0.00	303	208.87	100	253	193 72	140
.128	148	360	208.73	100	307	236.48	140
.129	0	351	208.86	100	280	183.2	140
.130	7 72	331	208.73	100	274	215.67	140
J31	0	410	208.84	100	362	266.04	140
J32	0.65	375	208.48	100	344	400.36	140
J33	0	380	208.74	100	355	489.29	140
J34	0.21	393	208.05	100	344	290.56	140
J35	0.2.1	410	208.84	100	379	348.11	140
J36	0.19	403	208.05	100	-201	63.3	140
J37	0	430	208.92	100	394	316.47	140
J38	0.96	344	208.24	150	280	322.34	140
J39	0	451	208.98	100	440	822.42	140
J40	21	394	208.01	150	315	341.83	140
J41	0	303	208.95	100	269	235.46	140
J42	0.08	394	207.99	150	311	311.63	140
J43	0	361	208.84	100	306	221.83	140
J44	0	349	208.22	100	308	296.51	140
J45	0	352	208.89	100	152	103.29	140
J46	0	345	208.22	100	304	285.59	140
J47	0	381	208.86	100	111	94.01	140
J48	0.14	374	208.15	100	331	310.56	140
J49	0	351	208.85	100	120	95.17	140
J50	2.5	374	208.14	150	302	325.38	140
J51	9.02	353	207.98	100	277	201.36	140
J52	0	382	207.95	133.33	309	294.11	140
J53	0	322	208.86	100	173	111.61	140
J54	13.65	382	207.95	133.33	309	308.35	140
J55	0	350	208.76	100	146	101.59	140
J56	0	382	207.94	133.33	303	277.81	140
J57	0	351	208.77	100	113	93.61	140
J20	0.09	301	207.91	100	290	200.37	140
128	0	400	200.00	100	164	01.14	140
161	0	370	207.91	100	104	77 /	140
162	13	370	200.77	133 33	206	270.1	140
163	0	349	207.34	100.00	179	112 20	140
.164	8.09	372	200.00	133.33	298	292.21	140
.165	0.00	372	207.93	133.33	200	267.23	140
.166	8.09	372	207.00	133.33	287	265.35	140
J67	0.00	331	208.76	100.00	291	249.32	140
J68	0	372	207.92	133.33	274	231.27	140
J69	0	331	208.79	100	292	251.83	140
J70	3.01	372	207.91	133.33	281	248.66	140
J71	0	372	207.92	133	287	255.86	140
J73	0	410	208.79	100	384	409.40	140
J75	0	410	208.79	100	384	410.50	140
J77	0	410	208.8	100	384	410.81	140
J79	0	399	208.74	100	371	380.61	140
J81	0	389	208.68	100	360	380.12	140
J83	0	375	208.45	100	343	389.22	140
J85	0	382	209.01	100	373	599.66	140



# GEOTECHNICAL SUPPORTING DOCUMENTS

CITY OF TORONTO REPORT NUMBER: 19M-01888-00

115

### SOIL AND GROUNDWATER CONTAMINANT INVESTIGATION

SOUTHWEST AGINCOURT TRANSPORTATION CONNECTIONS STUDY MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT STUDY

DRAFT





SOIL AND GROUNDWATER CONTAMINANT INVESTIGATION SOUTHWEST AGINCOURT TRANSPORTATION CONNECTIONS STUDY MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT STUDY

CITY OF TORONTO

DRAFT

PROJECT NO.: 19M-01888-00 CLIENT REF:19M-01888-00 DATE: AUGUST 28, 2020

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CITY OF TORONTO 100 Queen Street West Toronto, Ontario M5H 2N2

#### Attention: Niki Siabanis, Project Manager

#### Subject: Draft Soil and Groundwater Contaminant Investigation - Agincourt Municipal Class Environmental Assessment Study Client ref.: 19M-01888-00

We are pleased to submit this Draft Soil and Groundwater Contaminant Investigation for the Agincourt North-South Street and Grade Separation Environmental Assessment Study.

The report was completed to determine soil and groundwater quality within the proposed alignment of the north-south road and associated grade separation extending from Sheppard Avenue East to Village Green Square. The report describes the interpreted environmental conditions and provides recommendations for further environmental investigations.

If you have any questions or comments on the report, please contact the undersigned below.

Yours sincerely,

DRAFT

DRAFT

Valyn Bernard, P.Eng. Project Engineer Derek Stewart, M.Sc., P. Geo., QPESA Senior Project Manager, Environment

cc: Katherine Kung WSP ref.: 19M-01888-00

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SOIL AND GROUNDWATER CONTAMINANT INVESTIGATION Project No. 19M-01888-00 CITY OF TORONTO
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# EXECUTIVE SUMMARY

WSP Canada Group Limited (WSP), was retained by the City of Toronto (the City) to conduct a Soil and Groundwater Contaminant Investigation as a component of the Southwest Agincourt Transportation Connections Municipal Class Environmental Assessment (EA) Study. The Study will evaluate options for: a potential new north-south road extending from the current terminus of Village Green Square, associated grade separation under the Canadian Pacific (CP) Rail corridor, a multi-use trail, and improvements to the existing roads in the project-focus area. The Focus Area is bounded, generally, by Dowry Street to the north, the Metrolinx Stouffville Rail Corridor to the east, Highway 401 to the south, and Kennedy Road to the west, and also includes Sheppard Avenue East from Birchmount Road to Brimley Road.

The Soil and Groundwater Contaminant Investigation was carried out in response to recommendations included in the Phase One ESA report completed by WSP (June 2020) and for the purposes of assessing the quality of soil and groundwater to provide a framework for management during construction of the north-south road and associated grade separation. The focus of this Soil and Groundwater Contaminant Investigation are properties inferred to be impacted by construction of the proposed alignment of the north-south road extending from Sheppard Avenue East, east of Kennedy Road, towards the current terminus of Village Green Square.

A total of eight (8) boreholes were drilled as part of the program, all completed as monitoring wells. A summary of the findings from soil and groundwater investigation are as follows:

- Stratigraphy encountered at the boreholes consisted of a thin layer of asphalt or topsoil followed by granular base underlayer the asphalt varying to depths between 0.37 and 0.61 metres below ground surface (mbgs). Fill consisting of sand and gravel, gravelly sand, silty sand, sand and silt, silty clay was encountered between depths of 0.10 mbgs and 1.52 mbgs at six of the eight boreholes (BH1, BH2, BH3, BH4, BH5 and BH7). Native sandy silt, silty sand, sand and silt was encountered between depths of 1.52 and 12.19 mbgs.
- A total of 21 soil samples, including duplicates, were submitted to the laboratory for analysis of one or more of the following parameter packages: metals and inorganics (M&I), polycyclic aromatic hydrocarbons (PAH), petroleum hydrocarbons (PHC) fractions 1-4 (F1-F4), benzene, toluene, ethylbenzene and xylenes (BTEX) and volatile organic compounds (VOC).
- Results of laboratory analysis indicate the fill material at BH6 contains levels of SAR exceeding the MECP Table 3 SCS and the fill material at BH8 contains levels of EC and pH and concentrations of benzo(a)pyrene exceeding the Table 3 SCS. Impacted fill material from BH6 and BH8 was identified in the upper 0.6 m of soil stratigraphy. Soil samples analyzed from the native material at BH6 (1.5-2.1 mbgs) and BH8 (2.3-2.9 mbgs) met the Table 3 SCS for parameters which exceeded the Table 3 SCS within the fill material. In addition, all soil samples from BH1, BH2, BH3, BH4, BH5, and BH7 met the applicable Table 3 or Table 9 SCS.
- Groundwater was intercepted between 1.27 to 3.78 mbgs across the Project Limits. Groundwater at BH2 contained concentrations of chloride exceeding the Table 3 SCS. All other groundwater samples met the Table 3 SCS or Table 9 SCS, as applicable.

#### Recommendations

Groundwater generated during construction may be managed through the municipal storm or sanitary system, pending results of groundwater analysis as compared to the City of Toronto Storm and Sanitary and Combined Sewer Use By-law criteria, and application to the City of Toronto for a discharge permit or agreement.

Based on the soil chemical results, shallow fill material within the vicinity of BH8 and BH6 is considered impacted exceeding the Table 3 SCS. WSP recommends planning for the management and disposal of excess impacted soil in the vicinity of BH8 and BH6 to include additional sampling to delineate the extent of impacted fill material. Details of such delineation should be reviewed during the detail design process to facilitate management of soil within the construction footprint.

#### Excess and On-Site Soil Management Regulation (Ontario Regulation 406/19)

In addition, it is anticipated that the project will generate a significant quantity of excess soil which will need to be appropriately managed both on-site and off-site. An excess soil regulation is currently being implemented by Ontario (Excess and On-Site Soil Management Regulation - Ontario Regulation 406/19). The regulation will come into effect in January 2021 with the planning requirements being implemented in January 2022. Planning requirements would include an assessment of past uses, excess soil characterization report, and a destination assessment report. These is generally required for sites that generate greater than 2,000 m<sup>3</sup> of soil or sites that have potentially contaminating activities (PCAs) associated with them. A tracking and record keeping system will be required. Soil sample frequency requirements are also mandated as part of the Regulation and are based on the volume of excess soil. New excess soil standards have also been developed.

WSP recommends that during detailed design, a strategy for excess soil management pursuant to O. Reg. 406/19 should be developed and implemented. This strategy should include a comprehensive in-situ excess sampling program in coordination with the geotechnical program to fully characterize soil quality and identify off-site management options including a tracking and record keeping system. This strategy would form part of the construction tender for implementation by the Contractor under the supervision of a Qualified Person.

# **1 INTRODUCTION**

#### 1.1 BACKGROUND

WSP Canada Group Limited (WSP), was retained by the City of Toronto (the City) to conduct a Soil and Groundwater Contaminant Investigation as a component of the Southwest Agincourt Transportation Connections Municipal Class Environmental Assessment (EA) Study. The Study will evaluate options for: a potential new north-south road extending from the current terminus of Village Green Square, associated grade separation under the Canadian Pacific (CP) Rail corridor, a multi-use trail, and improvements to the existing roads in the project-focus area. The Focus Area is bounded, generally, by Dowry Street to the north, the Metrolinx Stouffville Rail Corridor to the east, Highway 401 to the south, and Kennedy Road to the west, and also includes Sheppard Avenue East from Birchmount Road to Brimley Road.

The Contaminant Investigation was carried out in response to recommendations included in the Phase One ESA report completed by WSP (June 2020) and for the purposes of assessing the quality of soil and groundwater to provide a framework for management during construction of the north-south road and associated grade separation. The focus of this Contaminant Investigation are properties inferred to be impacted by construction of the proposed alignment of the north-south road extending from Sheppard Avenue East, east of Kennedy Road, towards the current terminus of Village Green Square.

The current land use of the properties within the limits of the proposed north-south road alignment include a mix of residential, parkland, commercial, institutional and community land use. The associated Project Limits are made up of multiple private and public properties extending from Sheppard Avenue East to Village Green Square. The investigated properties associated with the proposed road alignment are shown on **Figure 1**.

#### **1.2 APPLICABLE SITE CONDITION STANDARDS**

The applicable site condition standards used for the Focus Area are as follows:

For all lands within 30 m of the West Highland Creek, the Ministry of the Environment, Conservation and Parks (MECP) Table 9: Generic Site Condition Standards (SCS) for Use within 30 m of a Water Body in a Non-Potable Groundwater Condition for "coarse textured soils" under Part XV.1 of the Environmental Protection Act, 2011 are applied. The lands for which the Table 9 SCS apply included in the 30 m buffer from West Highland Creek are outlined on **Figure 2**.

For lands beyond the 30 m buffer of West Highland Creek, the MECP Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition for Industrial, Commercial, Community Property Use for "coarse textured soils" under Part XV.1 of the Environmental Protection Act, 2011 are applicable.

The SCS were chosen based on the following set of criteria:

- The lands within the Focus Area are not classified as a "Shallow Soil Property" under Section 43.1 of O. Reg. 153/04 (as amended);
- The West Highland Creek flows approximately northwest to southeast within the Focus Area;
- There are no drinking water wells or wellhead protection areas within the Focus Area. Municipal water is sourced from Lake Ontario;
- The pH values of the soil were measured at values between 5 and 9 in the surface soils and 5 and 11 in the subsurface soils; therefore, classification as "environmentally sensitive" as per O. Reg. 153/04 does not apply;
- Field observations and results of the grain size analysis indicate that at least two-thirds of the soil at the Subject Property is consistent with the definition of "coarse textured soil" in O. Reg. 153/04; and
- Stratified site conditions were not used for evaluating laboratory results.

# **2 BACKGROUND INFORMATION**

### 2.1 PHYSICAL SETTING

The topography of the Focus Area ranges from approximately 162 metres above sea level (masl) to 170 masl (National Resources Canada, 2020). In general, topography slopes from west to east with local topographic lows following West Highland Creek. The Focus Area falls within the Highland Creek Watershed, which drains to Lake Ontario. An engineered floodplain flanks West Highland Creek within the Focus Area. Within the Focus Area the West Highland Creek flows to the southeast and crosses beneath Kennedy Road, Sheppard Ave E, and Highway 401.

The Focus Area falls within the South Slope physiographic region, consisting of successive sequences of glacial sands, silts and clays (glacial till deposits) (Singer, 2003). The South Slope refers to the southern slope of the Oak Ridges Moraine. Within this physiographic region, the Quaternary deposits ranging from oldest to youngest are: the Scarborough and Don Formation, the Sunnybrook Formation, the Thorncliffe Formation, and the Halton Formation. North of Lake Ontario, the Halton Till is primarily a sandy silt to silt till (Singer, 2003).

#### 2.2 PAST INVESTIGATIONS

WSP completed a Phase One ESA in June 2020 (WSP 2020a) for the Southwest Agincourt Transportation Connections Study as part of the Municipal Class Environmental Assessment process for Schedule 'C'. The Phase One ESA included a review of land use, aerial photography, fire insurance plans, previous environmental investigations, and environmental records within the study Focus Area bounded by Kennedy Road to the west, Dowry Street to the north, the Stouffville GO Train Line to the east, and Village Green Square to the south. Significant findings of the Phase One ESA relevant to this Contaminant Investigation include:

- WSP reviewed a Phase One and Two ESA completed by Terraprobe Inc. in November 2018 for the properties located at 20 100 Cowdray Court. The identified APECs included:
  - The historical placement of imported fill of unknown quality during the development of the Focus Area between 1968 and 2002, and a large stockpile observed during the site reconnaissance at 50 Cowdray Court;
  - The on-going presence of an auto dealership with service garage at 20 Cowdray Court since the mid-1990s;
  - The on-going presence and use of a waste oil AST and oil/grit separator at 20 Cowdray Court since the mid 1990s;
  - o The presence of a paint booth within the autobody shop at 20 Cowdray Court;
  - The historical use of fuel storage tanks northwest of the property at 2223 Kennedy Road in the early 1960s (off-site PCA); and
  - o The ongoing presence of the CP railway tracks 20 m south of the property since the mid-1940s
  - o (offsite PCA).

The Phase Two ESA conducted for 20-100 Cowdray Court included drilling of thirty-six (36) boreholes, and installation of thirty (30) monitoring wells. In addition, nine (9) existing wells from a previous investigation by Terraprobe in 2017 were also sampled. The results of the investigation identified concentrations of sodium adsorption ratio (SAR), electrical conductivity (EC), and cyanide in the soil, and concentrations of chloride and sodium in the groundwater exceeding the Table 3 Site Condition Standards for residential / parkland / institutional land use.

- Several Areas of Potential Environmental Concern (APECs) with moderate to high potential for contamination were identified within the Focus Area and surrounding Study Area based on current or historical Potentially Contaminating Activities (PCAs). The APECs within the Project Limits of this Contaminant Investigation include:
  - o 4051 Sheppard Avenue East Dry Cleaner;
  - 4061 Sheppard Avenue East Transportation depot / Historical Gas Station / Historical Manufacturing;
  - o 2223 Kennedy Road Historical Manufacturing;
  - o 40 Cowdray Court Historical Manufacturing;
  - o 2065/2075 Kennedy Road Transportation Depot / Historical Manufacturing;
  - o 4097 Sheppard Avenue East Historical Automotive Service Centre; and
  - o CP Railway.
- A Contaminant Investigation was recommended for the proposed north-south alignment to facilitate the detail design process. In addition, WSP recommended that property specific Phase One ESA(s) (and Phase Two ESAs as applicable) be completed for property acquisitions within areas highlighted as high or moderate APECs.

#### 2.3 POTENTIAL CONTAMINANTS OF CONCERN

As summarized in **Section 2.2**, the Phase One ESA identified several APECs relating to PCAs in association with the current and historical land use within the Focus Area. A list of contaminants of potential concern (COPCs) associated with the APECs are included in **Table 1**.

PROPERTY	M&I	PAH	PHC	VOC	BTEX
4051 Sheppard Avenue East	NA	NA	NA	Х	NA
4061 Sheppard Avenue East	Х	Х	Х	NA	Х
4097 Sheppard Avenue East	Х	Х	Х	NA	Х
2223 Kennedy Road	Х	Х	Х	NA	Х
2075 Kennedy Road	Х	Х	Х	NA	Х
40 Cowdray Court	Х	Х	Х	NA	NA
CP Railway	Х	Х	Х	Х	Х

#### Table 2-1 Potential Contaminants of Concern

Notes:

1. M&I – metals and inorganics

2. PAH – polycyclic aromatic hydrocarbons

- 3.
- 4.
- PHC petroleum hydrocarbons Fractions F1-F4 VOC volatile organic compounds BTEX benzene, toluene, ethylbenzene, and xylenes 5.

# **3 SCOPE OF THE INVESTIGATION**

#### 3.1 OVERVIEW OF SITE INVESTIGATION

The scope of work for the Soil and Groundwater Contaminant Investigation was carried out in accordance to current best practices. Field methods and protocols were completed in general accordance with the requirements of O. Reg. 153/04, as amended, and the Ministry of the Environment, Conservation and Parks (MECP) Guidance on Sampling and Analytical Methods for Use at Contaminated Site in Ontario. The tasks completed for the Contaminant Investigation included:

- Preparation of a sampling and analysis plan (SAP) to document the purpose, rationale and location of samples to be recovered as part of the Contaminant Investigation;
- In conjunction with the Geotechnical Investigation, drilling of eight (8) boreholes to a maximum depth of 20.4 metres below ground surface (mbgs) by a MECP licensed environmental driller, under the supervision of WSP staff;
- Installation of monitoring wells in all eight (8) of the boreholes;
- Submission of soil and groundwater samples for laboratory analysis of COPCs, including quality control duplicates (blind field duplicates);
- Submission of one soil sample (representing worst-case conditions) for the O. Reg. 347 toxicity characteristic leaching procedure (TCLP) analysis of metals and inorganics, PAHs, PCBs and VOCs to determine suitability of soil for off- site disposal (i.e. hazardous versus non-hazardous);
- Surveying of the boreholes / monitoring wells ground surface and top of riser pipe elevations to determine water table elevations.
- Comparative analysis of the results of soil and groundwater results to the analysis to the applicable MECP Table 3 and Table 9 Site Condition Standards (SCS); and
- Documentation of the field and analytical programs into a Soil and Groundwater Contaminant Investigation Report.

#### 3.2 MEDIA INVESTIGATED

Soil and groundwater quality were investigated as part of this Soil and Groundwater Contaminant Investigation. Soil and groundwater samples were collected in laboratory prepared bottles and were submitted to ALS Canada Ltd. (ALS), in Waterloo, Ontario, a laboratory accredited with the Canadian Association for Laboratory Accreditation (CALA). The collected soil and groundwater samples were analyzed in accordance with the COPCs, as identified in **Section 2.3**.

#### 3.3 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

The SAP is included in **Appendix A**. The plan was followed during the investigation to ensure that soil and groundwater quality was adequately characterized at the Subject Property. The following deviations to the SAP were undertaken in the field in response to field conditions and analytical results:

- Groundwater sampling was not completed at BH/MW8 as the monitoring well was found to be dry upon completion.

### 3.4 IMPEDIMENTS

No impediments were encountered in executing the soil and groundwater investigations.

# **4 INVESTIGATION METHOD**

#### 4.1 GENERAL

The soil and groundwater quality within the Focus Area were investigated at the locations shown on **Figure 2**, through the advancement of eight (8) boreholes which were all installed with monitoring wells using 51 mm PVC riser pipes. Four (4) monitoring wells were installed with flush mount casing protective covers, and the other four (4) monitoring wells were installed with aboveground steel monument casings. Investigation methods followed Standard Operating Procedures (SOPs) prepared by WSP for the completion of environmental borehole investigations. The investigation methods are described in the following sections.

#### 4.2 DRILLING PROGRAM

The drilling was completed in conjunction with the Geotechnical Investigation from June 3<sup>rd</sup> to June 9<sup>th</sup>, 2020 by Pontil Drilling, a licenced drilling contractor based in Mount Albert, Ontario, and was completed under the direction and supervision of a member of WSP staff.

The investigation program focused on overburden geology within 20.4 m of the ground surface. The boreholes were advanced using a CME 75 track mounted drill rig equipped with hollow and solid stem augers while completing Standard Penetration Tests (SPT). Soil samples were collected from the ground surface to the borehole terminus with stainless steel split spoon samplers. Split spoons were washed with a potable water and detergent rinse between samples to prevent cross-contamination of the recovered soil samples.

### 4.3 SOIL SAMPLING

Soil samples were collected from 0.6 m long split spoon cores that were retrieved during drilling procedures. Geological conditions were observed in the soil samples and recorded into borehole logs (**Appendix B**) by WSP personnel indicating the colour, odour, texture, soil type and moisture. Soil samples were collected and handled in accordance with best practices used in the environmental consulting industry and WSP's SOPs.

Soil samples were recovered with dedicated nitrile gloves to prevent cross contamination between sampling locations as per the SAP (**Appendix A**) and were directly placed in labeled polyethylene bags for screening. A portion of each sample was maintained in an undisturbed condition and the balance of the sample was broken up to release soil vapours. The vapour readings were measured, and selected samples were jarred in laboratory prepared bottles for submission for chemical analysis. For samples considered for VOC and PHC fraction F1 analysis, a core was recovered in the field from the undisturbed portion of the bag and placed in a laboratory prepared vial containing a measured amount of methanol.

In addition to the above, two composite samples were submitted to the laboratory for leachate analyses under Reg 347 Schedule 4 for metals and inorganics, VOC, PCBs, and PAHs. The borehole logs are presented in **Appendix B** and test pit locations are presented in **Figure 2**.

### 4.4 FIELD SCREENING MEASUREMENTS

Soil samples collected in the polyethylene bags were used for screening using a RKI Eagle II, which operates as both a photoionization detector (PID) and a combustible gas indicator (CGI). The PID detects VOCs that emit below an ionization potential of 10.6 eV, which includes a wide range of chemicals such as solvents and fuels. The PID provides an indication of organic impacts in soil but does not measure concentrations of individual chemical parameters/compounds. The CGI detects combustible vapours such as those associated with fuels. As with the PID,

it provides an indication of potential environmental impacts but not chemical specific concentrations. The accuracy and precision of the PID and CGI will depend on soil characteristics, Subject Property conditions and weather, which can be difficult to quantify. The instruments are considered to be an accurate and precise indicator of gross contamination in soil vapour.

#### 4.5 GROUNDWATER MONITORING WELL INSTALLATION

Groundwater monitoring wells were installed in all eight boreholes. The monitoring wells were installed by Pontil Drilling in accordance with Regulation 903: Wells, as amended, under the *Ontario Water Resources Act*, with the following construction details:

- Each monitoring well was constructed using 51 mm diameter well screens and polyvinyl chloride (PVC) riser pipe;
- The screened interval was 3.05 m long with a No. 10 slot size screen;
- Sand pack, consisting of No. 3 silica sand, was placed around the well screen and the sand pack was extended approximately 0.3 m above the top of the screen;
- A bentonite seal was then placed around the PVC riser pipe up to within 0.3 m of the ground surface; and
- Four monitoring wells were completed with flush mount protective covers and four monitoring wells were completed with steel monument casings which were cemented into place.
- Monitoring wells were developed a minimum of three well volumes, or until the monitoring well was dry, with low density polyethylene (LDPE) Waterra tubing and foot valves. Groundwater within the monitoring wells was allowed to recover at least 24 hours prior to sampling.

The locations of the monitoring wells are shown on **Figure 2**. The monitoring well locations were chosen to target the APECs identified in the Phase 1 ESA (summarized in **Section 2.2**) that may have contributed to groundwater impacts within the construction footprint of the proposed north-south road.

### 4.6 GROUNDWATER FIELD MEASUREMENTS OF WATER QUALITY PARAMETERS

Groundwater levels and any measurable free phase light non-aqueous phase liquid product ("free product") were measured in each of the eight monitoring wells on June 17<sup>th</sup> and 18<sup>th</sup>, 2020 using a Solinst interface probe. No measureable levels of free product were recorded at any of the monitoring wells. An RKI Eagle II portable gas detector was used to measure vapour concentrations within the monitoring well riser pipes at each monitoring well prior to obtaining groundwater measurements

Groundwater samples were collected from the monitoring wells on June 18<sup>th</sup> and 19<sup>th</sup>, 2020. Water quality parameters were monitored during the purging of monitoring wells using a YSI 556 water quality meter, until the consecutive readings of water quality parameters varied by less than 10%. A YSI unit is able to detect water quality parameters such as temperature, pH, conductivity, dissolved oxygen and oxidation reduction potential (ORP). The water quality parameters and subsurface vapour concentrations are recorded in **Table 1**.

Monitoring Well ID	Temperature (ºC)	E erature Conductivity C) (mS/cm) <sup>1</sup>		рН <sup>3</sup>	ORP (mV) <sup>4</sup>	Vapour Concentration CGI/PID (ppm) <sup>5</sup>
BH1	14.22	4.425	4.71	7.28	-81.5	30/3

#### Table 4-1 Water Quality Parameter Results

Monitoring Well ID	Temperature (ºC)	Conductivity (mS/cm) <sup>1</sup>	Dissolved Oxygen (mg/L) <sup>2</sup>	рН <sup>3</sup>	ORP (mV) <sup>4</sup>	Vapour Concentration CGI/PID (ppm)⁵
BH2	15.01	5.873	2.19	7.16	-72.1	0/1
BH3	11.76	0.729	0.90	7.80	-77.6	0/0
BH4	11.0	1.090	5.99	7.31	-73.8	45/2
BH5	12.93	0.789	6.47	7.29	-58.3	5/1
BH6	14.85	2.88	8.31	6.61	-53.0	45/1
BH7	9.59	1.543	6.12	6.96	-67.6	0/4
BH8	NA	NA	NA	NA	NA	5/1

Notes:

1. mS/cm - millisiemens/centimeter

 $2. \quad mg/L-milligram/litre$ 

3. pH is the negative logarithm of the hydrogen ion activity, and is measured based on a pH scale which ranges from 0-14.

4. *mV* - *millivolts* 

The groundwater depths were measured in monitoring wells BH1, BH2, BH3, BH4, BH5 and BH6 on June 17<sup>th</sup>, 2020, and in BH7 on June 18<sup>th</sup>, 2020. As discussed in **Section 3.1**, monitoring well BH8 was found to be dry on June 17<sup>th</sup> and June 18<sup>th</sup>, 2020. The depth to groundwater measurements are displayed in **Table 2** in **Section 5.2**.

#### 4.7 GROUNDWATER SAMPLING

Prior to groundwater sampling, a minimum of three well volumes were purged using low density polyethylene (LDPE) Waterra tubing to remove static groundwater within the filter pack (development of the well). Monitoring wells BH1, BH2, BH3, BH4, BH5, and BH6 were developed June 17<sup>th</sup> and BH7 was developed June 18<sup>th</sup>. Monitoring wells BH3, BH4, and BH6 were purged and sampled on January 18th, 2020, and BH1, BH2, BH5 and BH7 were purged and sampled on June 19<sup>th</sup>, 2020. Groundwater samples were conveyed directly into laboratory supplied containers. The groundwater samples were collected using low-flow sampling techniques with a Geotech peristaltic pump and LDPE Waterra tubing to minimize the inclusion of sediment and disturbing any potential volatilizing contaminants within the water column. Samples submitted for metals analysis were filtered in the field. All groundwater samples were placed in a cooler with ice prior to submission to ALS.

Groundwater samples from each monitoring well were submitted for analysis of the parameters included in **Table 4-3** below.

Monitoring Well ID	METALS AND	PAHS	PHCS F1-F4	VOCS (INCLUDING BTEX)	SANITARY AND STORM SEWER USE <sup>1</sup>
BH1	Х	Х	Х	Х	Х

#### Table 4-2 Groundwater Laboratory Analyses

MONITORING WELL ID	METALS AND	PAHS	PHCS F1-F4	VOCS (INCLUDING BTEX)	SANITARY AND STORM SEWER USE <sup>1</sup>
BH2	Х	Х	Х	Х	Х
ВН3	Х	Х	Х	Х	Х
BH4	Х	X*		X*	Х
BH5	х	X*		X*	х
BH6	х	Х	Х	Х	х
BH7	х	Х	Х	Х	х
Trip Blank				Х	

Notes:

1. City of Toronto Storm and Sanitary and Combined Sewers Discharge Sewer Use By-law criteria.

\* Selected parameters only as included in Sewer Use By-law criteria

-- Not Analyzed.

#### 4.8 ANALYTICAL TESTING

Soil and groundwater samples were analyzed by ALS Environmental laboratory in Waterloo, Ontario, a Canadian Association of Laboratory Accreditation (CALA) laboratory and meets the requirements of Section 47 of O.Reg. 153/04, as amended, certifying that the analytical laboratory be accredited in accordance with the International Standard ISO/IEC 17025 and with standards developed by the Standards Council of Canada. Laboratory Certificates of Analyses are included in **Appendix C**.

#### 4.9 RESIDUE MANAGEMENT PROCEDURES

Excess soil cuttings from drilling operations were collected and contained in sealed drums along with the purge water collected from the groundwater sampling event. Drums with soil cuttings were disposed by the drilling contractor, Pontil Drilling. Drums containing purged groundwater remain onsite until such time as they are no longer sampling. As discussed in **Section 5.7**, the TCLP soil sample analytical results have identified the impacted soil at the Subject Property is classified as non-hazardous. The TCLP analytical results are provided in the Laboratory Certificates of Analysis in **Appendix C**.

#### 4.10 ELEVATION SURVEYING

Elevation surveying of ground surface and riser pipes of all eight monitoring wells was completed on July 9, 2020. Surveying was completed with a Sokkia GCX GNSS Receiver, using NAD 83 reference system by a member of WSP staff. The geodetic elevations of the top of riser and ground surface were recorded as meters above sea level (masl). The measured groundwater elevations are shown on **Figure 2**.

## 4.11 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

Quality assurance (QA) and quality control (QC) of the soil samples was monitored and maintained in a number of ways:

- The field investigation was completed using WSP's standard operating procedures for soil and groundwater sampling;
- Samples were given unique identifications as they were collected, typically identifying the project number, date, sample location and depth. The sample numbers were recorded in field notes for each location;
- All non-dedicated sampling and monitoring equipment (e.g. interface probe) was cleaned using Alconox<sup>™</sup> and distilled water following each use;
- A chain-of-custody form was filled out for the samples prior to submitting the samples to the laboratory. The chain-of-custody documented sample movement from collection to receipt at the laboratory and provided sample identification, requested analysis and conditions of samples upon arrival at the laboratory (e.g., temperature, container status, etc.);
- Soil samples were randomly selected by the WSP field staff for duplicate testing. The number of QC samples submitted is equivalent to a minimum of 10% of the total number of samples submitted; and,
- Samples were randomly selected by the laboratory for QA checks. Generally, one sample for every ten samples submitted is checked. For each parameter, there is an acceptable upper and lower limit for the measured concentration of the parameter. Measured concentrations of analysed samples must fall within the upper and lower acceptable limits in order for the sample to be valid. If a result exceeds the upper or lower acceptable limits, the sample must be re-analysed.

# **5 REVIEW AND EVALUATION**

### 5.1 GEOLOGY

The general subsurface stratigraphy within the Focus Area is generally characterized as follows:

- Thin layer of topsoil up to 0.19 m thick in six of the eight boreholes (BH1, BH2, BH3, BH4, BH5 and BH7).
- Thin layer of asphalt up to 0.10 m thick in two of the eight boreholes (BH6 and BH8).
- Granular base underlayer the asphalt varying to depths between 0.37 and 0.61 mbgs.
- Fill consisting of sand and gravel, gravelly sand, silty sand, sand and silt, silty clay between depths of 0.10 and 1.52 mbgs at six of the eight boreholes (BH1, BH2, BH3, BH4, BH5 and BH7).
- Sandy silt, silty sand, sand and silt between depths of 1.52 and 12.19 mbgs.
- Bedrock or buried structures were not encountered during drilling.

### 5.2 GROUNDWATER ELEVATIONS AND FLOW DIRECTION

Groundwater measurements collected on June 17<sup>th</sup> and June 18<sup>th</sup>, 2020 are included in **Table 5-1**. In general groundwater elevations appear to range between 165.96 and 162.82 masl, with the lowest groundwater elevations measured in the vicinity of West Highland Creek. The monitoring wells were installed as a linear feature to obtain soil and groundwater quality information for the proposed north-south alignment. As a result, groundwater flow direction could not be established based on the principle of triangulation and hydraulic heads. Regional groundwater flow is anticipated to drain south towards Lake Ontario.

Monitoring Well ID	Ground Surface Elevation (MASL)	Top of Riser Elevation (MASL)	Groundwater Measurement June 17 <sup>th</sup> , 2020 (MBGS)	Groundwater Measurement June 17 <sup>th</sup> , 2020 (MASL)	Groundwater Measurement June 18 <sup>th</sup> , 2020 (MBGS)	Groundwater Measurement June 18 <sup>th,</sup> 2020 (MASL)
BH1	166.71	166.57	2.60	164.115		
BH2	166.59	166.44	3.78	162.815		
BH3	165.07	165.83	1.27	163.797		
BH4	166.90	167.84	2.64	164.262		
BH5	166.82	167.77	1.82	164.995		
BH6	167.60	167.48	1.65	165.955		
BH7	168.18	168.07			3.39	164.795

#### Table 5-1 Monitoring well and groundwater elevations

Monitoring Well ID	Ground Surface Elevation (MASL)	Top of Riser Elevation (MASL)	Groundwater Measurement June 17 <sup>th</sup> , 2020 (MBGS)	Groundwater Measurement June 17 <sup>th</sup> , 2020 (MASL)	Groundwater Measurement June 18 <sup>th</sup> , 2020 (MBGS)	Groundwater Measurement June 18 <sup>th,</sup> 2020 (MASL)
BH8	168.80	168.59	NA	NA	NA	NA
Notes:						

-- Not measured.

NA Monitoring well was dry.

### 5.3 SOIL FIELD SCREENING

The purpose of field screening soil samples is to evaluate whether combustible (e.g., petroleum) or volatile (e.g., solvents) compounds may be present in the collected samples; field screening of soil samples is a tool which assists in determining which samples should be submitted to the laboratory for chemical analysis. The total organic vapour (TOV) measurements of the soil samples submitted for laboratory analysis are included in **Table 5-1** and shown on borehole logs in **Appendix B**.

#### Table 5-2 Summary of Vapour Measurements and Soil Analyses

SAMPLE ID	SAMPLE DEPTH (mbgs) <sup>1</sup>	TOV (ppm)	METALS AND INORGANICS	PAHS	PHCS F1-F4	VOCS <sup>2</sup>	BTEX	TCLP	GRAIN SIZE
BH1-SS1	0.10-0.61	10/0	Х	Х		-			
BH1-SS3	1.52-2.13	5/0			Х	Х			
BH2-SS2	0.75-1.36	0/1	х	Х					
BH2-SS3	1.52-2.13	0/0			Х	Х			
BH3-SS2	0.75-1.36	0/0	Х	Х					
BH3-SS14	4.57-5.18	0/0			Х	Х			
BH4-SS1	0.13-0.61	0/5	Х	Х					
BH4-SS3	1.52-2.13	105/0				Х			
BH4-SS6	3.81-4.42	25/0			Х		Х		
BH5-SS1	0.19-0.61	0/0	Х						
BH5-SS2	0.75-1.36	70/0	Х	Х					

SAMPLE ID	SAMPLE DEPTH (mbgs) <sup>1</sup>	TOV (ppm)	METALS AND INORGANICS	PAHS	PHCS F1-F4	VOCS <sup>2</sup>	BTEX	TCLP	GRAIN SIZE
BH5-SS6	3.81-4.42	40/0			Х		Х		
BH6-SS1-2	0.37-0.61	20/0	Х	Х					
BH6-SS3	1.52-2.13	20/1	Х	Х				Х	Х
BH6-SS4	2.27-2.89	95/0			Х	Х			
BH6-SS5-1	3.05-3.66	35/0			Х	Х		Х	
BH7-SS1	0.39-0.57	10/0	Х	Х					
BH7-SS3	1.52-2.13	100/0			X <sup>3</sup>		Х		
BH7-SS5	3.05-3.66	60/0			Х		Х		
BH8-SS1	0.09-0.61	0/6	х	Х					
BH8-SS5	3.05-3.66	0/1			Х		Х	Х	
DUP4 Duplicate pair of BH6-SS4	2.27-2.89	95/0			X		X		

Notes:

1. mbgs – metres below ground surface.

2. Including BTEX parameters.

3. Analyzed for PHC F1 only.

- 4. Field vapour readings are reported in parts per million (ppm) for total organic vapours showing CGI followed by PID readings.
- -- Not analyzed.

## 5.4 SOIL QUALITY

Based on field screening and observations, up to four (4) soil samples from each of the eight borehole locations (plus a field duplicate) were submitted to ALS to identify the presence of chemical impacts in the subsurface fill and native material.

Analytical results were compared to the MECP Table 3 and Table 9 SCS, as applicable based on the distance of the West Highland Creek from the sampling location. Parameters exceeding the Table 3 SCS (i.e. impacts) were identified for electrical conductivity (EC) at BH6; and Sodium Adsorption Ratio (SAR), pH and benzo(a)pyrene at BH8. All identified impacts were restricted to the fill material. All other collected soil samples met the applicable SCS. A summary of the soil samples exceeding the applicable MECP SCS is included in **Table 5-2**.

SAMPLE ID	SAMPLE DEPTH (MBGS)	PARAMETER	MECP TABLE 3 SCS	RESULTS
BH6-SS1-2	0.37-0.61	Sodium Adsorption Ratio	12 (unitless)	12.8 (unitless)
BH8-SS1	0.09-0.61	рН	5 to 9 pH Units	11.81 (pH Units)
		Electrical Conductivity	1.4 (mS/cm)	1.82 (mS/cm)
		Benzo(a)pyrene	0.3 μg/g	0.346 μg/g

#### Table 5-3 Summary of Soil Analytical Results Exceeding the MECP Table 3 SCS

Elevated EC and SAR in the fill material at BH6 and BH8 are inferred to be a result of road salt used in winter maintenance of public and private property, as these boreholes are located in areas with regular vehicular traffic. The elevated pH and benzo(a)pyrene in BH8 is attributed to impacts associated with poor quality fill material.

All samples met the Table 3 or Table 9 SCS for metals, PHC and VOC (including BTEX) parameters. The locations of chemical parameters exceeding the applicable MECP SCS are shown on **Figure 2.** 

Two soil samples were submitted for toxicity characteristic leachate procedure (TCLP) analysis of metals and inorganics, VOC, PCBs, and PAHs. All TCLP samples met the Schedule 4, Leachate Quality Criteria under Regulation 347: General – Waste Management, as amended, of the *Environmental Protection Act*, and as such, is considered non-hazardous.

Laboratory COAs of soil results are included in Appendix C.

#### 5.5 GROUNDWATER QUALITY

Analytical results from the Jun 18 and 19, 2020 groundwater sampling event indicated concentrations chloride at BH2 exceeded the Table 9 SCS. All other M&I, PAH, PHC, and VOC (including BTEX) parameters met the applicable Table 3 or Table 9 SCS. **Table 6** summarizes the groundwater results exceeding the applicable SCS.

#### Table 5-4 Summary of Analytical Groundwater Samples Exceeding Applicable SCS

SAMPLE ID	MONITORING WELL SCREEN INTERVAL	PARAMETER	MECP TABLE 9 SCS	RESULTS
BH2	1.5 – 4.5 mbgs	Chloride	1,800,000 µg/L	3,560,000 μg/L

The location of the groundwater sample exceeding the Table 9 SCS is shown on **Figure 2**. Laboratory COAs of groundwater results are included in **Appendix C**.

### 5.6 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

ALS completed a variety of quality assurance/quality control (QA/QC) measures on the soil and groundwater samples submitted as part of the sampling program. These QA/QC measures include: sample replicates, matrix spiked laboratory blanks, and process blanks. The reported QA/QC results from ALS indicate the results are considered reliable. The laboratory QC reports are included in the laboratory COAs in **Appendix C**.

In addition, WSP submitted one duplicate soil sample for analysis of PHCs F1 and BTEX, and one duplicate groundwater sample for the analysis of M&I, PHCs, PAHs and VOCs. The duplicate sample analytical results for soil and groundwater are included in the tables following the text. The submission of these samples demonstrated the accuracy and reliability of the laboratory procedures and instruments. Relative percent difference (RPD) for analyses in duplicate samples were evaluated for this investigation. The RPD calculation is only applicable when both original and duplicate concentrations are greater than five times the laboratory reporting detection limit (RDL).

Acceptable RPD limits in accordance with the MECP Alert Criteria are as follows:

- Metals and inorganics 20% water; 30-40% soil (exception of conductivity at 10%)
- PAHs 30% water; 40% soil
- VOCs 30% water; 50% soil
- PHCs 30% water; 30% soil

Results of soil analysis RPD between parent and duplicate pair BH6-SS4 and DUP 4 were not calculable as all parent and duplicate sample results were below the RDL.

The results of the groundwater duplicate analysis indicated that the RPDs between the parent and the duplicate samples BH7 and DUP01 were within the acceptable limits. The results of the RPD calculations for soil and groundwater are included in the tables following the text.

# 6 CONCLUSIONS

### 6.1 SUMMARY OF SOIL AND GROUNDWATER CONTAMINANT INVESTIGATION FINDINGS

A total of 21 soil samples, including duplicates, were submitted to the laboratory for analysis of one or more of the following parameter packages: M&I, PAH, PHC (F1-F4), BTEX and VOC. Results of laboratory analysis indicate the fill material at BH6 contains levels of SAR exceeding the MECP Table 3 SCS and the fill material at BH8 contains levels of EC and pH and concentrations of benzo(a)pyrene exceeding the Table 3 SCS. Impacted fill material from BH6 and BH8 was identified in the upper 0.6 m of soil stratigraphy. Soil samples analyzed from the native material at BH6 (1.5-2.1 mbgs) and BH8 (2.3-2.9 mbgs) met the Table 3 SCS for parameters which exceeded the Table 3 SCS within the fill material. In addition, all soil samples from BH1, BH2, BH3, BH4, BH5, and BH7 met the applicable Table 3 or Table 9 SCS. The locations of the soil samples exceeding the applicable SCS are shown on **Figure 2**.

Groundwater was intercepted between 1.27 to 3.78 mbgs across the Project Limits. Groundwater at BH2 contained concentrations of chloride exceeding the Table 3 SCS. All other groundwater samples met the Table 3 SCS or Table 9 SCS, as applicable. The locations of the groundwater sample exceeding the applicable SCS is shown on **Figure 2**.

#### 6.2 RECOMMENDATIONS

Groundwater at BH2 was found to contain chloride exceeding the MECP Table 3 SCS, however all other groundwater samples met the applicable MECP SCS. Salt-related impacts, including elevated concentrations of chloride, do not pose environmental concern where groundwater is not used for drinking water or agricultural / planting purposes. The results indicate groundwater generated during construction may be managed through the municipal storm or sanitary system, pending results of groundwater analysis as compared to the City of Toronto Storm and Sanitary and Combined Sewer Use By-law criteria, and application to the City of Toronto for a discharge permit or agreement.

Based on the soil chemical results from the borehole investigation undertaken in June 2020, shallow fill material within the vicinity of BH8 and BH6 is considered impacted exceeding the Table 3 SCS. WSP recommends planning for the management and disposal of excess impacted soil in the vicinity of BH8 and BH6 to include additional sampling to delineate the extent of impacted fill material. Details of such delineation should be reviewed during the detail design process to facilitate management of soil within the construction footprint.

#### Excess and On-Site Soil Management Regulation (Ontario Regulation 406/19)

In addition, it is anticipated that the project will generate a significant quantity of excess soil which will need to be appropriately managed both on-site and off-site. An excess soil regulation is currently being implemented by Ontario (Excess and On-Site Soil Management Regulation - Ontario Regulation 406/19). The regulation will come into effect in January 2021 with the planning requirements being implemented in January 2022. Planning requirements would include an assessment of past uses, excess soil characterization report, and a destination assessment report. These is generally required for sites that generate greater than 2,000 m<sup>3</sup> of soil or sites that have potentially contaminating activities (PCAs) associated with them. A tracking and record keeping system will be required. Soil sample frequency requirements are also mandated as part of the Regulation and are based on the volume of excess soil. New excess soil standards have also been developed.

WSP recommends that during detailed design, a strategy for excess soil management pursuant to O. Reg. 406/19 should be developed and implemented. This strategy should include a comprehensive in-situ excess sampling program in coordination with the geotechnical program to fully characterize soil quality and identify off-site

management options including a tracking and record keeping system. This strategy would form part of the construction tender for implementation by the Contractor under the supervision of a Qualified Person.

# 7 QUALIFICATIONS OF ASSESSORS

### 7.1 WSP CANADA GROUP LIMITED

As one of the world's leading professional services firms, WSP provides technical expertise and strategic advice to clients in the Transportation & Infrastructure, Property & Buildings, Environment, Industry, Resources (including Mining and Oil & Gas) and Energy sectors, as well as offering project and program delivery and advisory services. Our experts include engineers, advisors, technicians, scientists, architects, planners, surveyors and environmental specialists, as well as other design, program and construction management professionals. With approximately 48,000 talented people in 550 offices across 40 countries—more than 8,000 in Canada and 9,500 in the U.S.—we are uniquely positioned to deliver successful and sustainable projects, wherever our clients need us. www.wsp.com

### 7.2 QUALIFIED PERSON

**Mr. Derek Stewart, M.Sc., P.Geo., QP**<sub>ESA</sub> is a Contaminant Specialist/Senior Project Manager with WSP and has more than 29 years' experience managing contaminant and groundwater investigations in support of transportation infrastructure and land redevelopment projects. Mr. Stewart's work includes project technical support for both regional planning and local scale impact assessment studies supporting transportation route planning for municipal, provincial and federal Environmental Assessments (EAs); transportation infrastructure preliminary and detail designs; land redevelopment; and property acquisitions/dispositions. In addition, Mr. Stewart provides groundwater and contaminant support for road, rail and transit infrastructure construction projects. Derek is a Qualified Person (QP<sub>ESA</sub>) as defined under Ontario Regulation 153/04, as amended. Derek provided quality control this Soil and Groundwater Contaminant Investigation.

#### 7.3 TECHNICAL SUPPORT

**Ms. Valyn Bernard, B.A.Sc., P.Eng.** is a Project Engineer with the Environmental Management Department and has been working with WSP Canada Group Limited for over five years. She conducts Phase One and Two Environmental Site Assessments including document research, site visits, interviews, as well as implementing field investigations, including soil sampling through drilling and test pitting and groundwater monitoring and sampling. Additional tasks include carrying out Designated Substance Surveys and contaminant support for construction projects, through general overseeing of contractor companies during the management of contaminated soil and groundwater during construction activities. Valyn managed and reviewed the Soil and Groundwater Contaminant Investigation report.

**Ms. Anne Pattison, B.Sc., G.I.T.** is an Environmental Scientist with WSP, with over four years of experience in environmental and geotechnical science. She conducts Environmental Site Assessments and contaminant investigations including document research, site visits, interviews, report writing as well as implementing field investigations, including soil sampling through drilling and test pitting and groundwater monitoring and sampling. Additional responsibilities include carrying out hydrogeological assessments, and providing contaminant support for construction projects through planning of soil and groundwater investigations, and ongoing construction advising on excess materials management. Ms. Pattison oversaw the completion of the field program and completed the reporting for the Soil and Groundwater Contaminant Investigation report.

# **8 LIMITATIONS**

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Design recommendations given in this report are applicable only to the project and areas as described in the text and then only if constructed in accordance with the details stated in this report. The comments made in this report on potential construction issues and possible methods are intended only for the guidance of the designer. The number of testing and/or sampling locations may not be sufficient to determine all the factors that may affect construction methods and costs. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

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This limitations statement is considered an integral part of this report.

## 9 REFERENCES

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