APPENDIX E

Soil Survey Report for the Proposed TransCanada PipeLines Limited Eastern Mainline Project (Paragon)

November 2015
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PARAGON
soil & environmental consulting

Soil Survey Report for the Proposed TransCanada PipeLines Limited's Eastern Mainline Project

Prepared for:

Golder Associates Limited
16820 107 Avenue
Edmonton, Alberta
T5P 4C3

Prepared by:

Paragon Soil and Environmental Consulting Inc.
14805 119 Avenue
Edmonton AB T5L 2N9

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1 INTRODUCTION

TransCanada PipeLines Limited (TransCanada), is applying to the National Energy Board (NEB) under section 52 of the *National Energy Board Act* (NEB Act) for authorization to construct and operate the Eastern Mainline Project (the Project). The Project consists of the construction of approximately 278.6 km of 914 mm outside diameter (OD) (NPS 36) pipeline divided into four non-continuous sections beginning near the City of Markham, Ontario and ending near the community of Iroquois in the Township of South Dundas (Figure 1), and will generally follow the existing Line 100-2 (Montréal Line). In addition to the pipeline, the Project includes 15 valve sites and nine 11 megawatt (MW) compressor unit additions at five existing compression stations along TransCanada's existing Canadian Mainline (ie., one 11 MW unit addition at Station 134, and two 11 MW unit additions at each of Stations 136, 139, 142 and 144). Other related physical works include launcher and receiver facilities, construction-related temporary infrastructure, cathodic protection, and permanent access roads to new valve sites. Existing electrical power transmission lines and facilities constructed, owned and operated by third-party power providers will be used to operate the new compressor unit additions and cathodic protection sites. Subject to NEB and other regulatory approvals, the proposed start of project construction is Q2 2016, with an in-service date at the end of Q1 2017(Golder 2014).

Paragon Soil and Environmental Consulting Inc. (Paragon) was contracted by Golder Associates Ltd. (Golder) to conduct a soil survey of the Project route and prepare this summary soils report to support the environmental and socio-economic assessment (ESA) submitted as part of the application to the NEB. The proposed Project route is primarily situated parallel to the existing right-of-way (ROW) of TransCanada's Canadian Mainline pipeline. The Project requires a minimum construction ROW of 42 m; where available and practical, the Canadian Mainline ROW will serve as temporary work space (TWS) during construction. In addition to the construction ROW, additional temporary workspace will be required on a site-specific basis at highway, railway, road, pipeline, and watercourse crossings and at other locations to accommodate pipeline construction activities. A permanent easement for pipeline operations will be maintained following construction.

The objectives of the soil survey are to: map the soil resources; provide baseline data; identify areas of potential concern during construction and reclamation; map present land use; and sample soils requiring potential alternate material handling techniques, or as required for soil classification.

Soil survey was conducted intermittently during multiple field visits between June 6th, 2014, and August 19, 2015. The soils and landscapes were described in terms of landform, surficial materials, slope, texture, stoniness, topsoil thickness, B-horizon depth, drainage conditions, profile morphology and soil chemistry. Soils were examined to trench depth (2.2 m) at two inspection sites per 800 meters where possible and to a depth of 30 cm at the remaining sites. A minimum of six inspection sites (two deep and four shallow) were completed per 800 m. Due to limitations imposed by land access, approximately 22.4 km of the 266.1 km (8.4%) has not yet been surveyed. Where land access becomes available, additional soil survey work may be completed.

All soil units mapped along the proposed Project route were assessed for reclamation suitability, agricultural suitability, wind and water erosion risk, compaction risk and trench stability. Results of these assessments are provided in Section 4.

The distribution and extent of the various soils along the completed portion of the proposed route are shown on the accompanying environmental alignment sheets. Average depth of topsoil, topography, present land use, soil handling procedures and reclamation considerations are also indicated on the environmental alignment sheets. The soil-landscape units delineated on the alignment sheets are described in further detail in this report.

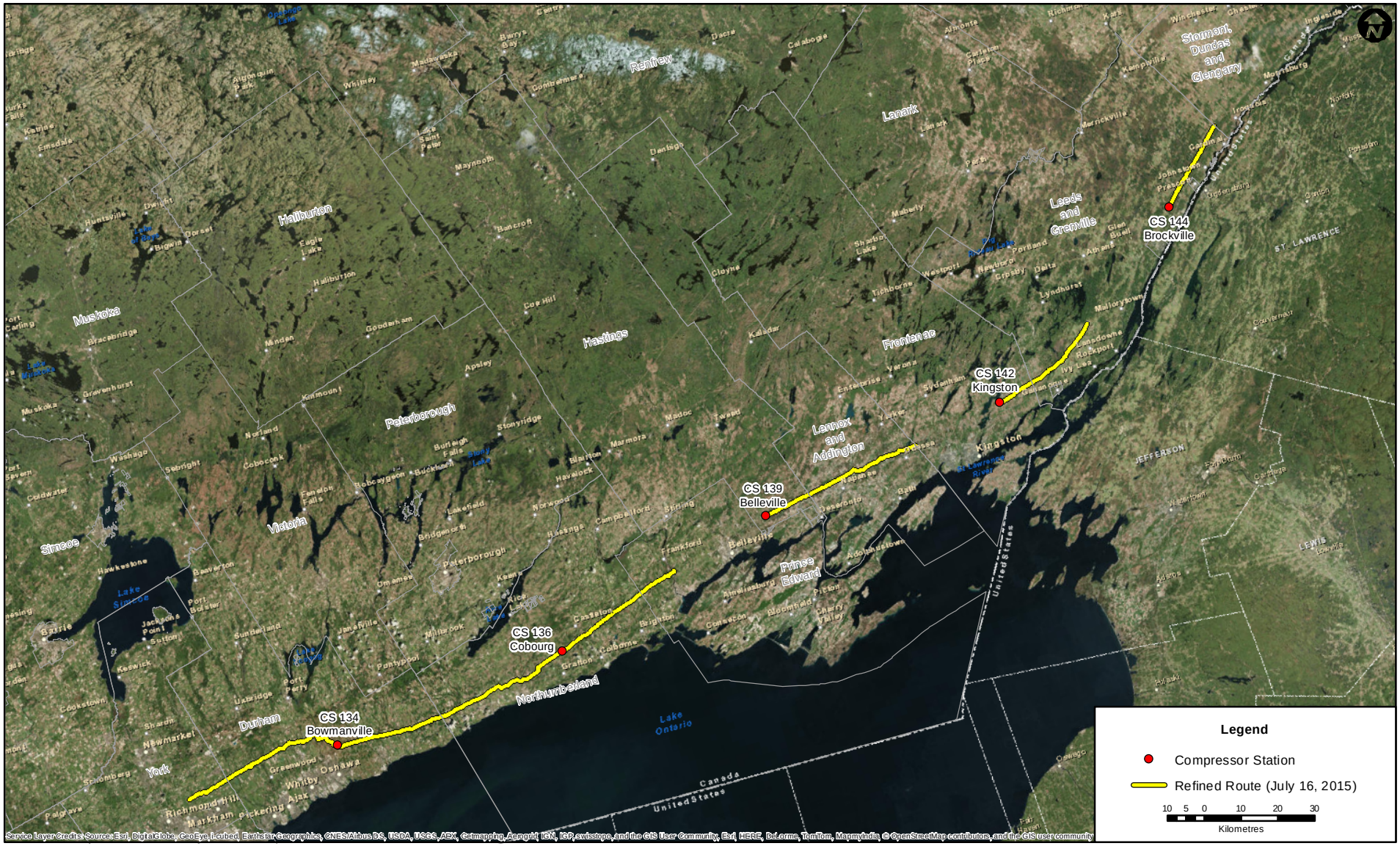
The following sections provide a description of the study area and an explanation of the methods for the soil survey and subsequent soil assessments. They also include summary tables and comments for each soil series mapped along the Project route. Detailed site inspection data, laboratory data, site photographs, and guidelines for alternative handling are included in the appendices.

2 THE STUDY AREA

2.1 Location and Extent

The Project route is located in southern Ontario between the City of Markham and the community of Iroquois, and traverses eight counties and regional municipalities. The Project route starts at Easting 632313 and Northing 4864697 in UTM Zone 17, and ends at Easting 468778 and Northing 4965295 in UTM Zone 18. The study area is currently broken up into four pipeline segments based on the location of existing infrastructure. The total length of the proposed route is approximately 266.1 km. Figure 1 depicts the location and extent of the proposed Project route.

The Local Study Area (LSA) surveyed consists of the Project footprint which encompasses the width of the construction ROW for the entire length of the proposed Project route. Expansions to five existing compressor stations located along the proposed route are also included in the LSA. All inspection sites were completed within 100 m of the centreline of the Project route. According to Chapman et al. (1984), the proposed Project route intersects seven physiographic regions located within three natural divisions of Ontario. Beginning in the South-Central Ontario natural division, the proposed pipeline route intersects four physiographic regions; from west to east, these include the Peel Plains, South Slope, Iroquois Plain, and Napanee Plain regions. Continuing east, the route intersects the Leeds Knobs and Flats physiographic region within the Precambrian Bedrock natural division. The final leg of the proposed route parallels the St. Lawrence River through the Smith Falls Limestone Plains, and Edwardsburg Sand Plain physiographic regions of the St. Lawrence Lowlands natural division. Descriptions of each physiographic region are provided in Table 1.



Path: G:\TCPL\z2015\z15040\MXD\Trillium_ProposedEasternMainlineProject_rev9_v02_20150907_DB.mxd

FIGURE 1. PROPOSED EASTERN MAINLINE PROJECT OVERVIEW MAP

NOTES:

TransCanada

TRANSCANADA PIPELINES LTD.

PROPOSED EASTERN MAINLINE PROJECT
OVERVIEW MAP

PROJECTION	DATUM	CONTRACTOR NAME						
TCPL Lambert	NAD 83	PARAGON SOIL						
DRAWN	CHECK	DESIGN	APPR.	DATE	SCALE	CONTRACTOR MAP NUMBER		REV.
DB	SD	EB	LW	15 09 08	1:1,500,000	15040-150908-01		0

2.2 Surficial Geology and Landforms

While the route traverses multiple parent materials, the greatest percentage is developed on morainal deposits (37%). The rest of the mapped route is comprised of glaciofluvial (13%), morainal deposits overlying bedrock (10%), glaciolacustrine (9%), glaciolacustrine deposits overlying morainal (5%), bedrock (5%), glaciofluvial overlying morainal deposits (4%), fluvial (4%), glaciolacustrine overlying bedrock (2%), and organic deposits (2%). Approximately 1% of the route is classified as disturbed land or open water and thus does not have an associated parent material. An additional 8% remains undetermined due to access limitations at the time of field activities.

According to Chapman et al. (1984) the general topography of the South-Central Ontario natural division is gently rolling, low relief till plains with frequent drumlins, divided by the Oak Ridges Moraine. The Precambrian bedrock natural division is characterized by knobs and ridges of granite and other Precambrian rocks under thin drift. The St. Lawrence Lowlands natural division is characterized as a generally low-relief region with fragmented moraines and extensive areas of Glaciofluvial sands. Drumlins also occur in the area, intervened by clay beds. Examples of surface expressions encountered during the survey are present in Appendix F.

Table 1 Geology and major physiographic regions along the proposed Eastern Mainline Project Route

Natural Divisions	Minor Physiographic Regions	Geomorphology	Bedrock Geology Formations	Major Soils[1]
South-Central Ontario	Peel Plain	Low relief glacial landscapes	Shale Limestone Dolostone Siltstone	GL.GBL GL.MB O.GBL O.MB
	South Slope	Gently rolling, low relief glacial landscapes with frequent drumlins	Limestone Dolostone Shale Sandstone Siltstone	BR.GBL GL.GBL GL.MB O.GBL O.HG O.HR O.MB R.HG ptR.HG T.H
	Iroquois Plain	Glaciolacustrine landscapes	Limestone Dolostone Shale Sandstone Siltstone	BR.GBL GL.GBL GL.MB O.GBL O.HG O.MB ptR.HG T.H

Natural Divisions	Minor Physiographic Regions	Geomorphology	Bedrock Geology Formations	Major Soils[1]
	Napanee Plain	Flat-to-undulating glacial landscape.	Conglomerate Sandstone Shale Dolostone Limestone	BR.GBL GL.GBL GL.MB O.GBL O.HG O.MB R.HG O.HR T.H
Precambrian Bedrock	Leeds Knobs and Flats	Rock knobs and clay flats.	Conglomerate Sandstone Shale Dolostone Limestone Siltstone Chert Quartz Gneiss	BR.GBL O.GBL GL.GBL O.MB GL.MB O.MB O.HG R.HG O.HR T.H
St. Lawrence Lowlands	Edwardsburg Sand Plain	Low relief, glaciofluvial veneers over bedrock.	Dolostone Sandstone	GL.MB O.HG O.HR O.MB R.HG T.H
	Smith Falls Limestone Plain	Low relief, rock knobs and clay flats.	Dolostone Limestone Sandstone	GL.GBL O.MB GL.MB O.HG O.HR T.H

Adapted from Chapman el al. (1984, 2007) and Ontario Geological Survey (2011).
[1]Major soil types defined in Appendix B.

2.3 General Soil Patterns

The soils encountered along the Project route were described according to the *Canadian System of Soil Classification* (Agriculture Canada Expert Committee on Soil Survey 1998) and are correlated with the Soil Landscapes of Canada Working Group (SLC) (2010). The soils described below are grouped according to Great Group and parent material, and are discussed in decreasing order of prevalence. The percentage of the Project route occupied by each soil series is included in the discussion below.

Well to moderately well drained Orthic Melanic Brunisols developed on morainal deposits are the most common soil along the Project route and are characterized by Otonabee (OBE, 18.4%), Farmington (FRM, 1.9%), and Grenville (GVI, 1%) soil series. Orthic Melanic Brunisols developed on morainal deposits with high coarse fragment content are represented by Gravelly Otonabee (OBEgr, 0.7%) and occur infrequently. Orthic Melanic Brunisols developed on thin morainal veneers overlying bedrock are represented by the Farmington-XL (FRMxl, 2.8%), Otonabee-XL (OBExl, 1.6%), Farmington-YL (FRMyl, 0.8%), Grenville-XL (GVIxl, 0.1%), and Otonabee-YL (OBEyl, 0.1%) soil series.

Rapidly drained Orthic Melanic Brunisols developed on moderately coarse to very coarse textured glaciofluvial deposits are common along the proposed route, characterized by the Brighton (BGH, 10.6%), and Achigan-ZZ (AHGzz, 0.6%) soil series. BGH soils developed on glaciofluvial veneers overlying morainal deposits also occur and are represented by Brighton-XT (BGHxt, 2.5%) and Brighton-YT (BGHyt, 0.9%). Brighton-GR (BGHgr, 0.2%) and Brighton-YG (BGHyg, <0.1%) contain high amounts of coarse fragments and occur infrequently.

Imperfectly drained Gleyed Melanic Brunisols developed on morainal deposits occur as minor inclusions and are represented by Matilda (MTD, 1.1%) and Gleyed Otonabee (OBEgl, 0.4%) soil series. Matilda-GR (MTDgr, 0.1%) soils contain high amounts of coarse fragments and occur infrequently. Gleyed Melanic Brunisols developed on fluvial material are represented by Bottom Land (ZAL, 1.7%), while the Gleyed Melanic Brunisols developed on morainal veneers overlying bedrock are limited in extent and represented by Matilda-XL (MTDxl, 0.3%) and Matilda-YL (MTDyl, 0.1%) soils. Gleyed Brighton (BGHgl, 0.5%) and Achigan (AHG, 0.4%) soil series are likewise Gleyed Melanic Brunisols, but are formed on glaciofluvial material.

Morainal, well drained, moderately-fine textured Brunisolic Gray Brown Luvisols are relatively common along the proposed route, characterized by Bondhead (BDH, 3.9%) and Darlington (DGT, 1.3%) soils. Local inclusions of BDH soils developed on shallow, moderately-fine textured morainal deposits overlying bedrock are represented by the Bondhead-XL (BDHxl, 0.1%) series. Glaciofluvial Brunisolic Gray Brown Luvisols are represented by the Newcastle (NWC, 0.9%) soil unit and occur infrequently.

Well drained Orthic Gray Brown Luvisols developed on morainal material are represented by Waupoos (WPO, 2.6%) soils. When bedrock is identified underlying these soils, Waupoos-XL (WPOxl, 1.5%) and Waupoos-YL (WPOyl, 1.3%) units are assigned. Well to moderately well drained Orthic Gray Brown Luvisols developed on medium to moderately-fine textured glaciolacustrine deposits are associated with Schomberg (SMG, 1.2%) soils.

Well to moderately-well drained Orthic Gray Brown Luvisols developed on moderately fine to fine textured glaciolacustrine veneers overlying morainal deposits are represented by Cashel (CSH, 2.9%), Schomberg-XT (SMGxt, 0.1%) and Schomberg-YT (SCHyt, 0.1%) soil series. Very minor inclusions of Orthic Gray Brown Luvisols developed on glaciofluvial veneers overlying morainal material occur and are mapped as Newcastle-XT (NWCxt, 0.2%) soils.

Imperfectly drained Gleyed Gray Brown Luvisols developed on moderately fine textured morainal deposits are represented by Milliken (MLE, 0.5%), Gleyed Waupoos (WPOgl, 0.5%) and Gleyed Bondhead (BDHgl, 0.1%) soil series and are limited in extent. Gleyed Gray Brown Luvisols developed on

glaciolacustrine deposits are uncommon and are represented by Smithfield (SMF, 0.6%), while Gleyed Gray Brown Luvisols developed on glaciolacustrine blanket overlying bedrock are mapped as Solmesville-YL (SMVyl, 0.1%). Gleyed Gray Brown Luvisols developed on glaciofluvial deposits are represented by Gleyed Newcastle (NWCgl, 0.1%) and occur very infrequently.

Imperfectly drained Gleyed Gray Brown Luvisols developed on glaciolacustrine veneers overlying morainal deposits occur as minor inclusions, represented by Landsdowne (LDW, 1.3%), Gleyed Cashel (CSHgl, 0.4%), and Elmbrook-YT (EOKyt, 0.2%) soils. Landsdowne-XL has consolidated bedrock within one metre of the surface and occupies a very minor portion of the Project route (LDWxl, 0.6%).

Poorly drained Orthic Humic Gleysols developed on moderately-fine textured morainal deposits are represented by the Lyons (LYS, 4.4%) soil series and are relatively common along the proposed route in depressions and wetter level areas. Where these soils overlie bedrock they are denoted as Lyons-XL (LYSxl, 1.4%) and Lyons-YL (LYSyl, 0.2%).

Orthic Humic Gleysols developed on glaciolacustrine deposits are characterized by the Granby (GNY, 2.5%), Napanee (NPE, 2.1%), Moscow (MCW, 1.1%), and Sidney (SIY, 0.3%) soil series. Lithic inclusions are represented by Moscow-XL (MCWxl, 0.6%) and Napanee-XL (NPExl, 0.5%) soil series. Rego Humic Gleysols developed on glaciolacustrine deposits are classified as Rego Napanee (NPEzr, 1.1%), Peaty Granby (GNYpt, 0.2%) soils, while lithic inclusions are represented by Sidney-XL (SIYxl, 0.1%). In some cases, the glaciolacustrine Orthic Humic Gleysols overlie morainal material within trench depth and are represented by Napanee-YT (NPEyt, 0.3%).

Orthic and Rego Humic Gleysols comprised of medium to moderately-coarse textured fluvial deposits occur infrequently and the Cheney (CEY, 1.5%), Peaty Cheney (CEYpt, 0.1%), Rego Cheney (CEYzr, 0.1%), Rego Brighton (BGHzr, 0.2%), and Peaty Grandby (GNYpt, 0.2%) soil series are assigned accordingly. Poorly drained Rego Humic Gleysols developed on medium to moderately fine morainal deposits are represented by Rego Lyons (LYSzr, 0.1%) soils.

Well drained Orthic Humic Regosols developed on morainal deposits are found as very limited inclusions and are Rego variants of Otonabee (OBEzr, 0.1%) soils. Poorly drained Rapidly drained Orthic Humic Regosols formed on shallow accumulations of soil over bedrock are aptly named as Rockland (ZRL, 4.8%) soils and are found relatively frequently along the eastern sections of the route.

Muck (ZMK, 1.7%) is used to describe organic soils found along the proposed route, while sections where the soil is disturbed are mapped as Disturbed Land (ZDL, 1%).

Soils were not mapped for 8.4% of the Project route due to restricted land access at the time of field surveys. Large rivers and surface water bodies are identified with the ZWA map unit and occupy 0.2% of the Project route.

All soils are described in greater detail in Section 4 of this report.

2.4 Present Land Use

The present land use along the proposed Eastern Mainline pipeline is approximately 34% cultivation, 30% wooded, 13% pasture, 9% hay land, 2% wetland, with less than 1% each of bush and muskeg. Approximately 0.2% of the current route is open water and less than 2% of the route is situated on previously disturbed land. Due to access restrictions and route revisions since field work completion, soils are not mapped for 22.4 km (8.4%) of the Project route.

Table 2 provides a complete summary of soil unit and land use distribution along the Eastern Mainline Project route. Representative photos of agricultural, wooded, and residential land uses are presented in Appendix F.

Table 2 Extent of land use and soil units along the proposed Eastern Mainline Project route

Soil Units	Bush (km/ %)	Cult. (km/ %)	Dist. Land (km/ %)	Hay (km/ %)	Muskeg (km/ %)	No Access (km/%)	Pasture (km/%)	Water (km/ %)	Wetland (km/%)	Wooded (km/%)	Total (km/%)
AHG	-	0.4/33.2	-	-	-	-	0.5/42.8	-	-	0.3/ 23.9	**1.2/0.4**
AHGzz	-	-	-	-	-	-	-	-	-	1.5/100	**1.5/0.6**
BDH	-	8.1/78.2	-	0.1/1.2	-	-	0.7/7.2	-	-	1.4/13.4	**10.4/3.9**
BDHgl	-	0.3/100	-	-	-	-	-	-	-	-	**0.3/0.1**
BDHxl	-	-	-	-	-	-	-	-	-	0.2/100	**0.2/0.1**
BGH	-	9.2/32.7	0.2/0.8	3.5/12.4	-	-	3.6/12.8	-	-	11.6/41.2	**28.1/10.6**
BGHgl	-	0.4/30.4	-	0.4/32.3	-	-	0.5/37.2	-	-	-	**1.2/0.5**
BGHgr	-	0.3/59.7	-	-	-	-	0.2/40.3	-	-	-	**0.6/0.2**
BGHxt	-	3.6/54	-	1.9/28	-	-	0.2/3	-	-	1/15.1	**6.6/2.5**
BGHyg	-	-	-	0.1/100	-	-	-	-	-	-	**0.1/<0.1**
BGHyt	-	1.3/54.6	-	-	-	-	-	-	-	1.1/45.4	**2.4/0.9**
BGHzr	-	-	-	-	-	-	-	-	-	0.6/100	**0.6/0.2**
CEY	-	-	-	-	-	-	1/26.1	-	0.2/3.8	2.8/70.1	**4/1.5**
CEYpt	-	-	-	-	-	-	-	-	-	0.3/100	**0.3/0.1**
CEYzr	-	-	0.3/10 0	-	-	-	-	-	-	-	**0.3/0.1**
CSH	-	6.2/79.6	-	0.7/8.8	-	-	0.7/9	-	-	0.2/2.5	**7.8/2.9**
CSHgl	-	0.7/68.8	-	-	-	-	-	-	-	0.3/31.2	**1.1/0.4**
DGT	-	2.5/72.5	-	0.7/21.2	-	-	0.1/3.5	-	-	0.1/2.8	**3.4/1.3**
EOKyt	-	0.4/62.9	-	-	-	-	0.2/37.1	-	-	-	**0.6/0.2**
FRM	-	1.5/29.1	-	0.4/8.4	-	-	1/19.5	-	-	2.2/42.9	**5.1/1.9**
FRMxl	-	2.1/28.4	-	0.6/7.8	-	-	2/27	-	-	2.8/36.8	**7.5/2.8**
FRMyl	-	1.5/72.6	0.1/6.5	-	-	-	-	-	-	0.4/20.9	**2.1/0.8**
GNY	-	0.1/1.4	-	0.4/6.2	-	-	1.3/19.2	-	0.3/4.7	4.5/68.6	**6.6/2.5**
GNYpt	-	-	-	-	-	-	-	-	-	0.4/100	**0.4/0.2**
GVI	-	1.6/55.6	-	-	-	-	0.2/7.2	-	-	1/37.3	**2.8/1**
GVIxl	-	-	-	-	-	-	-	-	-	0.2/100	**0.2/0.1**
LDW	-	1.9/53	-	0.8/21.5	-	-	0.7/19.5	-	-	0.2/5.9	**3.5/1.3**
LDWxl	-	0.2/13.9	-	0.6/39.2	-	-	0.3/20.9	-	-	0.4/26.1	**1.5/0.6**
LYS	-	0.7/5.9	0.1/0.7	1.9/16	-	-	1.7/14.4	-	1/8.8	6.3/54.2	**11.7/4.4**
LYSxl	-	1.1/29.6	-	0.4/10.7	-	-	1.1/30.2	-	-	1.1/29.6	**3.8/1.4**
LYSyl	-	0.4/100	-	-	-	-	-	-	-	-	**0.4/0.2**
LYSzr	-	-	-	-	-	-	-	-	0.2/100	-	**0.2/0.1**
MCW	0.1/4.5	0.6/20.3	-	1/32.1	-	-	0.5/15.9	-	-	0.8/27.1	**3/1.1**
MCWxl	0.6/40. 9	-	-	0.4/26.8	-	-	-	-	-	0.5/32.4	**1.6/0.6**
MLE	-	1.1/79.4	-	-	-	-	0.1/8.6	-	-	0.2/11.9	**1.4/0.5**

Soil Units	Bush (km/ %)	Cult. (km/ %)	Dist. Land (km/ %)	Hay (km/ %)	Muskeg (km/ %)	No Access (km/%)	Pasture (km/%)	Water (km/ %)	Wetland (km/%)	Wooded (km/%)	Total (km/%)
MTD	-	1.4/48.8	-	0.2/5.2	-	-	0.8/28.8	-	-	0.5/17.2	2.9/1.1
MTDgr	-	0.1/100	-	-	-	-	-	-	-	-	0.1/0.1
MTDxl	-	0.3/43.1	-	-	-	-	0.4/56.9	-	-	-	0.7/0.3
MTDyl	-	-	-	-	-	-	0.3/100	-	-	-	0.3/0.1
NA	-	-	-	-	-	22.4/100	-	-	-	-	22.4/8.4
NPE	0.1/1	1.1/18.9	-	1/17.7	-	-	2/36.3	-	-	1.5/26.2	5.6/2.1
NPExl	-	0.1/6.8	-	0.3/21.1	-	-	0.8/57	-	-	0.2/15.1	1.4/0.5
NPEyt	-	0.9/100	-	-	-	-	-	-	-	-	0.9/0.3
NPEzr	-	0.5/15.6	-	0.3/9.1	-	-	0.6/19.9	-	1.2/41	0.4/14.5	2.9/1.1
NWC	-	2/86.2	-	0.1/5.8	-	-	-	-	-	0.2/8	2.4/0.9
NWCgl	-	-	-	-	-	-	-	-	-	0.3/100	0.3/0.1
NWCxt	-	0.4/100	-	-	-	-	-	-	-	-	0.4/0.2
OBE	-	24.9/50.8	0.5/1	4/8.2	-	-	5.1/10.5	-	-	14.4/29.5	49/18.4
OBEgl	-	0.7/62.8	-	0.1/12.6	-	-	-	-	-	0.3/24.5	1.2/0.4
OBEgr	-	0.2/10.5	-	0.3/13.6	-	-	0.9/48	-	-	0.5/27.9	2/0.7
OBExl	-	0.3/6.1	-	0.7/16.6	-	-	1.1/26.7	-	-	2.1/50.6	4.1/1.6
OBEzr	-	-	-	-	-	-	-	-	-	0.3/100	0.3/0.1
SIY	0.1/6.5	-	-	-	-	-	0.1/9.9	-	0.2/32.1	0.4/51.4	0.8/0.3
SIYxl	-	-	-	0.2/100	-	-	-	-	-	-	0.2/0.1
SMF	-	1.1/79.5	-	0.1/4	-	-	-	-	-	0.2/16.5	1.4/0.5
SMG	-	2.2/67.7	-	0.2/5.6	-	-	-	-	-	0.9/26.7	3.3/1.2
SMGxt	-	0.2/100	-	-	-	-	-	-	-	-	0.2/0.1
SMGyt	-	0.3/66.9	-	-	-	-	-	-	-	0.1/33.1	0.4/0.1
SMVyl	-	-	-	0.3/100	-	-	-	-	-	-	0.3/0.1
WPO	0.3/4.7	1.8/26.7	0.3/3.8	1.3/19.3	-	-	1.2/16.9	-	-	2/28.6	6.9/2.6
WPOgl	-	0.9/70.9	-	-	-	-	0.2/15	-	-	0.2/14.2	1.3/0.5
WPOxl	0.3/7	0.3/8.4	-	1.1/29.4	-	-	0.3/9	-	-	1.8/46.3	3.9/1.5
WPOyl	-	1.6/44.6	-	0.2/5.9	-	-	1.2/32.8	-	-	0.6/16.7	3.5/1.3
ZAL	-	1.2/26.5	-	0.1/1.7	-	-	0.4/9.2	-	0.1/1.3	2.8/61.3	4.6/1.7
ZDL	-	-	2.6/100	-	-	-	-	-	-	-	2.6/1
ZMK	-	0.4/8.5	-	-	1.5/34.4	-	-	-	2.3/52.4	0.2/4.7	4.5/1.7
ZRL	0.6/4.4	-	-	0.2/1.4	-	-	3.3/26.1	-	-	8.6/68.2	12.7/4.8
ZWA	-	-	-	-	-	-	-	0.5/100	-	-	0.5/0.2
Total (km/%)	**2/0.8**	**89/33.5**	**4.2/1.6**	**24.4/9.2**	**1.5/0.6**	**22.4/8.4**	**35.5/13.3**	**0.5/0.2**	**5.6/2.1**	**81/30.4**	**266.1/100**

3 METHODS

3.1 Soil Investigation Methods

Preliminary inspection site locations were assigned through a review of available satellite imagery and existing soil mapping. If necessary, additional inspection sites were completed during the field program to characterize previously unidentified variation, or to capture soil information along areas where the original route has been refined due to constraints.

In accordance with TransCanada's soil survey protocol, a minimum of six inspection sites were completed per 800 m, including two inspection sites completed to trench depth (2.2 m) where subsurface conditions permitted. Gravel, cobbles and bedrock sometimes precluded reaching trench depth. Soil survey was conducted between June 6th, 2014 and August 19th, 2015 and included a total of 1,796 inspection sites (540 of which were deep). The remaining sites were shallow inspections completed to a maximum depth of 30 cm. Inspection sites were accessed on foot and were completed using a shovel and hand auger. In various instances, inspection site locations were shifted off the proposed right-of-way in order to satisfy ground disturbance policies of third-party utility owners. If a proposed deep inspection site could not be moved to an area representative of the project footprint, it was completed as a shallow inspection site. Relocated inspection sites never exceeded 100 m from the centreline of the Project route.

The number and location of inspection sites at the compressor station additions were determined in advance through a desktop review of the aerial imagery and the compressor station addition footprints. The number and density of inspection sites within each addition varied depending on the complexity of the expected soils and topography. Both shallow and deep inspection sites were completed within the compressor station additions, to 30 cm and 220 cm respectively.

Location description information collected at each inspection site included:

- UTMs (collected using a Trimble Juno GPS Unit);
- surface expression;
- slope position, aspect and gradient;
- drainage regime;
- land use;
- colour change and sod quality (where applicable);
- surface stoniness; and
- parent geologic material.

Soil profiles at each site were described according to soil attributes in the *Manual for Describing Soils in the Field* (Expert Committee on Soil Survey 1983) and were classified to the subgroup level according to the *Canadian System of Soil Classification* (Soil Classification Working Group 1998). Soil attributes described for each horizon include:

- horizon designation;
- depth;
- moisture:

- colour;
- mottling (if present);
- structure;
- consistence;
- texture;
- coarse fragment content;
- depth to bedrock (if present); and
- root abundance.

Soils were then assigned a series name, based on the Soil Names Table produced by Soil Landscapes of Canada (SLC 2010).

Information collected from soil inspections is extrapolated using the principles of geomorphology and surficial geology to delineate individual soil units along the proposed route. Soil is inherently variable and exists as a continuum across the landscape; as a result individual soil units have a range of properties or defining characteristics.

Detailed inspection site data is presented in Appendix A and summarized in Section 4.1 according to soil series.

3.2 Wind Erosion Risk Ratings

Wind erosion risk ratings are estimated for each soil unit mapped along the Project route based on their potential for "maximum instantaneous soil movement by wind", which is known as the Chepil wind erosion index (E) (Coote and Pettapiece 1989).

Wind erosion risk ratings are calculated using the following equation:

$$E = KC(V_*^2 - yW^2)^{1.5}$$

Where:

E = maximum instantaneous soil movement by wind (dimensionless)
K = surface roughness and aggregation factor (dimensionless)
C = factor representing soil resistance to movement by wind (dimensionless)
V_* = drag velocity of wind at the soil surface (cm/s)
Y = soil moisture shear resistance (dimensionless)
W = available moisture of the surface soil (m^3 water/m^3 soil)

To minimize inconsistencies and allow for comparisons of wind erosion risk ratings across different areas, the method utilized by Coote and Pettapiece sets the soil moisture shear resistance at 5,000 for all soil types. Therefore assuming that wind velocity and surface soil available moisture are equal (or similar) for all upland soils encountered along the proposed route, then relative wind erosion risk ratings can be determined by multiplying the dimensionless soil roughness (K) and the soil resistance to erosion (C) constants provided in Coote and Pettapiece (1989). Table 3 provides a range of KC values associated with various soil textures. Each KC range is associated with a range of values for "E" and is assigned a low, moderate or high relative risk rating.

Wind erosion risk ratings for each soil unit encountered along the Project route are based on typical topsoil textures for that unit. Gleysols are automatically assigned a low risk rating regardless of their KC

value due to the high moisture content of these soils. Erosion risk ratings assume bare, unprotected, non-vegetated soils as would be the case during construction and immediately following reclamation.

Table 3 Relative susceptibility of soil to wind erosion based on soil texture

Wind Erosion Risk Rating	KC Range	Associated Soil Texture	E (Dimensionless Index of Wind Erosion Risk)
Low	0.000587 – 0.000722	Loam, silt loam, clay loam, silty clay loam	<100 – 249.9
Moderate	0.00147 – 0.001945	Fine sandy loam, gravelly sandy loam, very fine sandy loam, silty clay, heavy clay, clay	250 – 399.9
High	0.002358	Sand, loamy sand, fine sand, loamy fine sand, gravelly sand, sandy loam	>400

Adapted from Coote and Pettapiece (1989).

Wind erosion risk ratings for each soil unit are discussed in the soil unit summaries contained in Section 4.1 and are presented in the Soil Legend in Appendix D.

3.3 Water Erosion Risk Ratings

The risk of water erosion at a specific location is proportional to the erodibility of the soil, the slope properties (slope length and gradient) and the amount of precipitation at the location. Water erosion risk ratings for the soil units present along the length of the Project route are estimated based on the *Revised Universal Soil Loss Equation for Application in Canada (RUSLEFAC)* as presented in Wall et al. (2002).

Water erosion risk ratings are based on the following equation:

A = R x K x L x S x C x P

Where:

A = the potential long term average soil loss (tonnes/hectare/year)
R = rainfall factor (megajoule*millimeter/hectare/hour) (estimated using isoerodent maps presented in Wall et al. [2002])
K = soil erodibility factor (tonne*hectare/megajoule/millimeter) (based primarily on soil texture)
L = slope length factor (dimensionless) (estimated slope length based on landform)
S = slope steepness factor (dimensionless) (maximum slope gradient for each slope classes)
C = cropping management factor (dimensionless) (assumed to be bare, recently replaced soil with no management)
P = support practice factor (dimensionless) (assumed to be bare, recently replaced soil with no management)

The rainfall factor (R) is derived from an isoerodent map for Ontario and Quebec presented in Wall et al. (2002). These maps indicate average annual R values for an area and are used to calculate average annual soil losses. An adjustment to provide for winter conditions and the high erosivity potential of precipitation falling on frozen or thawing ground is also provided. The soil erodibility factor (K) for each soil unit mapped along the proposed Project route is determined by the typical soil texture of the topsoil within that unit. As shown in Table 4, soil texture plays a significant role in a soil's resistance to water erosion.

Table 4 Relative susceptibility to water erosion based on soil texture

Surface Soil Texture	Relative Susceptibility to	K Ranges	Potential Soil Loss

	Water Erosion		(tonnes ha^{-1} $year^{-1}$)
Heavy clay, sandy loam, loamy fine sand, fine sand, coarse sandy loam, loamy sand, sand	Low	<0.007 – 0.03	<6 – 11
Clay loam, loam, silty clay, clay, sandy clay loam	Moderate	0.03 – 0.04	11 – 22
Very fine sand, loamy fine sand, silt loam, very fine sandy loam, silty clay loam	High	0.04 - >0.05	22 - >33

Adapted from Wall et al. (2002).

Slope gradient (S) and slope length (L) heavily influence the potential long term average soil loss (A). The upper range of slope gradients for each mapped slope class is used when completing the calculations to estimate the maximum potential for soil loss and thus allow for a conservative estimation of the water erosion risk potential. Average slope length is estimated based on slope class and surface expression along the proposed Project route and is correlated with typical slope lengths associated with various parent materials and landforms as presented in Table 5. Average slope length by landform and slope gradient is not available for Ontario, thus data from Alberta was used to estimate LS values for the mapped soil units.

Table 5 Typical LS values associated with various landforms in Alberta

Landform	Slope (%)	Estimated Average Length (m)	Range of LS Values[1]
Undulating or terraced (Mu, Ft, Lu, Lv/Lu)	0-5	25	0.04 – 0.61
Level (Ll, Fl)	0-5	50	0.04 – 0.91
Level to inclined (Ll, Li)	0-5	200	0.05 – 2.00
Hummocky or ridged (Mh, Mr)	>5-10	25	0.72 – 1.19
Rolling or inclined (Mm, Mi, Mb, Rm)	>5-10	100	1.67 – 3.08
Inclined (Mi, Li, Mv/Ri)	>5-10	200	2.54 – 4.94
Hummocky or ridged (Mh, Mr)	>10-15	50	2.66 – 3.28
Rolling or inclined (Mm, Mi)	>10-15	100	4.33 – 5.42
Steeper Slopes	>15%	25	>2.34

Adapted from Alberta Conservation and Reclamation Council (1993) and Wall et al. (2002).
F = fluvial, L = lacustrine, M = morainal, R = rock
b = blanket, h = hummocky, l = inclined, l = level, m = rolling, r = ridged, t = terraced, u = undulating, v = veneer
[1] LS values are taken from Table LS-3 in Wall et al. (2002) and are for highly disturbed soil conditions and recently prepared construction sites, with little or no cover.

The cropping management factor (C) and support practice factor (P) are assumed to equal 1 while determining water erosion risk ratings since the estimates are for a recently disturbed site with little or no cover that is not being actively managed to minimize or reduce erosion. Taking this approach estimates the maximum potential soil loss that may occur given the other assumptions.

Water erosion risk ratings for each soil unit are discussed in the soil unit summaries contained in Section 4.1 and are presented in the Soil Legend in Appendix D.

3.4 Compaction Risk Ratings

In order to estimate compaction risk of soils encountered along the proposed Project route, a generalized rating system was developed using professional judgment and a combination of two compaction systems designed for forestry applications. The two systems used to develop the compaction risk rating matrix presented in Table 6 below include the *Soil Compaction and Puddling Hazard Key* (British Columbia Ministry of Forests 1999) and the table of *Compaction and Rutting Hazard*

for Soil in Ontario (Archibald et al. 1997). The compaction risk rating matrix considers soil texture and drainage regime as wetter soils and soils with higher clay content are more susceptible to compaction.

Soils along the proposed Project route were assessed for compaction potential based on the typical soil texture of the upper subsoil.

Table 6 Compaction risk rating matrix

Drainage Regime	Soil Texture					
	Very Coarse (Sand, Loamy Sand)	Moderately Coarse (Sandy Loam)	Medium (Loam, Silt Loam, Sandy Clay Loam)	Moderately Fine (Clay Loam, Silty Clay Loam)	Fine to Very Fine (Clay, Silty Clay, Heavy Clay)	Organic
Rapid	L	L	-	-	-	-
Well	L	L	M	M	M	-
Imperfect	L	L	H	H	H	-
Poor	M	M	H	H	H	-
Very poor	M	M	H	H	H	H

Adapted from British Columbia Ministry of Forests (1999) and Archibald et al. (1997)
"-" = Not applicable
"L" = Low. Minimal risk of compaction provided the industry accepted procedures are exercised during construction and operations. [a]
"M" = Moderate. Normal construction and operating procedures may cause compaction; however, these effects can be mitigated through management practices. [a]
"H" = High. Normal construction and operating procedures are likely to cause soil degradation through compaction. If possible, it is recommended that construction and operation procedures not commence until conditions change (ie. soils dry out, frozen ground). If this is not possible, effects may be partially mitigated through management practices, however some long term degradation of soils may results. [a]
[a] Definition modified from Archibald et al. (1997).

Soil compaction ratings are discussed in the soil unit summaries in Section 4.1 and in the soil legend in Appendix D.

3.5 Soil Suitability for Reclamation

In the absence of guidelines specific to reclamation of disturbed soil in Ontario, soil suitability for reclamation for the majority of soil units mapped along the proposed Project route are assessed against criteria established in *Soil Quality Criteria Relative to Disturbance and Reclamation* (Alberta Agriculture 1987). Topsoil, upper subsoil and lower subsoil are assigned a rating of Good, Fair, Poor or Unsuitable based on the most limiting parameter according to the criteria. Table 7 presents these four ratings and a brief description of their limitations.

The majority of the proposed route is located within areas predominantly used for agriculture, thus the criteria for the Plains Region of Alberta was used to assess reclamation suitability. The topsoil quality criteria for the Plains region are presented in Table 8, with subsoil quality criteria presented in Table 9.

Table 7 Reclamation suitability ratings

Reclamation Suitability Rating	Degree of Limitation
Good (G)	None to slight soil limitations that affect use as a plant growth medium.
Fair (F)	Moderate soil limitations that affect use but which can be overcome by proper planning and good management.
Poor (P)	Severe soil limitations that make use questionable. Soil remains suitable but careful planning and very good management is required to overcome limitations.
Unsuitable (U)	Chemical or physical properties of the soil are so severe reclamation would not be economically feasible or in some cases impossible.

Adapted from *Soil Quality Criteria Relative to Disturbance and Reclamation* (Alberta Agriculture 1987).

Table 8 Criteria for evaluating suitability of topsoil in the Plains Region

Rating/Property	Good	Fair	Poor	Unsuitable
Soil reaction (pH)	6.5 to 7.5	5.5 to 6.4 7.6 to 8.4	4.5 to 5.4 8.5 to 9.0	<4.5 >9.0
Salinity	<2	2 to 4	4 to 8	>8
Sodicity (SAR)	<4	4 to 8	8 to 12	>12[1]
Saturation (%)	30 to 60	20 to 30 60 to 80	15 to 20 80 to 120	<15 >120
Stoniness Class	S0, S1	S2	S3, S4	S5
Texture[4]	fSL, vfSL, L, SL, SiL	CL, SCL, SiCL	LS, SiC, C[2], S, HC[3]	
Moist Consistency	Very friable, friable	Loose	Firm, very firm	Extremely firm
Organic Carbon (%)	>2	1 to 2	<1	
$CaCO_3$ Equivalent (%)	<2	2 to 20	20 to 70	>10

[1] Materials characterized by an SAR of 12 to 20 may be rated as poor if texture is sandy loam (SL) or coarser and saturation % is less than 100
[2] C – May be upgraded to fair or good in some arid areas
[3] HC – May be upgraded to fair or good in some arid areas
[4] fS = fine sand; SL = sandy loam; vfSL = very fine sandy loam; L = loam; SiL = silt loam; CL = clay loam; SCL = sandy clay loam; SiCL = silty clay loam; S = sand; LS = loamy sand; SiC = silty clay; C = clay; HC = heavy clay
Source : Table 6 in *Soil Quality Criteria Relative to Disturbance and Reclamation* (Alberta Agriculture 1987)

Table 9 Criteria for evaluating suitability of subsoil in the Plains Region

Rating/Property	Good	Fair	Poor	Unsuitable
Soil reaction (pH)	6.5 to 7.5	5.5 to 6.4 7.6 to 8.5	4.5 to 5.4 8.6 to 9.0	<4.5 >9.0
Salinity	<3	3 to 5	5 to 10	>10
Sodicity (SAR)	<4	4 to 8	8 to 12	>12[1]
Saturation (%)	30 to 60	20 to 30 60 to 80	15 to 20 80 to 120	<15 >120
Stone Content (%)	<3	3 to 25	25 to 50	>50
Texture[2]	fSL, vfSL, L, SL, SiL	CL, SCL, SiCL	LS, SiC, C, S, HC	Bedrock
Moist Consistency	Very friable, friable	Loose, firm	Very firm	Extremely firm

[1] Materials characterized by a SAR of 12 to 20 may be rated as poor if texture is SL or coarser and saturation % is less than 100
[2] fS = fine sand; SL = sandy loam; vfSL = very fine sandy loam; L = loam; SiL = silt loam; CL = clay loam; SCL = sandy clay loam; SiCL = silty clay loam; S = sand; LS = loamy sand; SiC = silty clay; C = clay; HC = heavy clay
Source : Table 7 in *Soil Quality Criteria Relative to Disturbance and Reclamation* (Alberta Agriculture 1987)

Chemical and physical properties of the soils were assessed against the guidelines presented in Table 8 and 9 and assigned overall suitability ratings. Where laboratory data is not available the soil ratings are based entirely on soil attributes that are observable in the field. The laboratory data used to assign ratings is presented in Appendix C. Reclamation suitability ratings are meant to predict general suitability of the soil and do not consider the various tolerances of individual plant or crop species or the impacts of various management techniques.

Reclamation suitability ratings for each soil unit mapped along the proposed route are discussed in Section 4.2 and provided in the soil legend in Appendix D.

3.6 Land Suitability Rating System for Agricultural Crops

Mineral soil units mapped along the proposed Project route for which sufficient data is available were assigned an agricultural capability rating determined according to publically available climatic data, field data and lab data and within the framework provided by *Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario* (OMAFRA

2014). Despite the prevalence of wooded land uses along the proposed route the majority of the proposed pipeline is located within agricultural land use areas and thus it is reasonable to assume that the land could potentially be arable in the future. Therefore an agricultural suitability rating was determined for the majority of soils mapped along the Project route. It should be noted that above guidelines do not classify land for horticultural or other specialty crop types.

The guidelines consider climate, soil and terrain factors independently as a result of the potential for each to severely limit the ability of a tract of land to produce crops commonly grown in Ontario. Each rating consists of a "Class" that indicates the severity of the limitations on the land and "Subclasses" that indicate the kinds of limitations. Deductions for climate, soil and landscape are compiled into a final value that corresponds to one of seven land capability classes.

- Classes 1 through 3 are considered prime agricultural land resources,
- Class 4 is considered marginal for cultivated field crops,
- Class 5 is capable of hay production and permanent pasture use,
- Class 6 is capable of sustaining unimproved pasture only
- Class 7 has no agricultural capability

Classes 1 through 7 are further defined in Table 10 below. Table 11 presents the various subclasses and their descriptions.

Table 10 Agricultural suitability classes

Suitability Class	Limitations for Common Crops	Degree of Limitation
1	none to slight	Soils in this class have no significant limitations in use for crops.
2	slight	Soils in this class have moderate limitations that reduce the choice of crops, or require moderate conservation practices.
3	moderate	Soils in this class have moderately severe limitations that reduce the choice of crops or require special conservation practices.
4	severe	Soils in this class have severe limitations that restrict the choice of crops, or require special conservation practices and careful management, or both.
5	very severe	Soils in this class have very severe limitations that restrict their capability to producing perennial forage crops, and improvement practices are feasible.
6	extremely severe	Soils in this class are unsuited for cultivation, but are capable of use for unimproved permanent pasture.
7	unsuitable	Soils in this class have no capability for arable agriculture or permanent pasture.
Ontario Ministry of Agriculture, Food and Rural Affairs (2014).		

Table 11 Agricultural suitability subclasses

Subclasses	Kind of Limitation
C- Climate	This subclass denotes a significant adverse climate for crop production as compared to the "median" climate, which is defined as one with sufficiently high growing-season temperatures to bring common field crops to maturity, and with sufficient precipitation to permit crops to be grown each year on the same land without a serious risk of partial or total crop failures.
D- Undesirable soil structure and/or low permeability	This subclass is used for soils that are difficult to till, or that absorb or release water very slowly, or in which the depth of rooting zone is restricted by conditions other than a high water table or consolidated bedrock. In Ontario this subclass is based on the existence of critical clay contents in the upper soil profile.
E- Erosion	Loss of topsoil and subsoil by erosion has reduced productivity and may in some cases cause difficulties in farming the land e.g., land with gullies.
S- Adverse soil characteristics	This subclass denotes a combination of limitations of equal severity. In Ontario it has often been used to denote a combination of F and M when these are present with a third limitation such as T, E or P.
M- Moisture deficiency	Soils in this subclass have lower moisture holding capacities and are more prone to droughtiness.
F- Low natural fertility	This subclass is made up of soils having low fertility that is either correctable with careful management in the use of fertilizers and soil amendments or is difficult to correct in a feasible way. The limitation may be due to a lack of available plant nutrients, high acidity, low exchange capacity, or presence of toxic compounds.
I- Inundation by lakes or streams	Flooding by streams and lakes causes crop damage or restricts agricultural use.
W- Excess water	This subclass indicates the presence of excess soil moisture due to poor or very poor soil drainage. It is distinguished from Subclass I - water inundation that indicates risk of flooding from adjacent lakes or streams.
R- Consolidated bedrock	The occurrence of consolidated bedrock within 100 cm of the surface restricts rooting depth and limits moisture holding capacity. Conversely, in poorly drained soils the presence of the bedrock may, depending on depth, make artificial drainage impossible.
T- Topography	This subclass denotes limitations due to slope steepness and length. Such limitations may hinder machinery use, decrease the uniformity of crop growth and maturity, and increase water erosion potential.
P- Stoniness	This subclass indicates soils sufficiently stony to hinder tillage, planting, and harvesting operations.
Ontario Ministry of Agriculture, Food and Rural Affairs (2014).	

Land suitability ratings for each soil unit are presented in Section 4.3 and in the soil legend in Appendix D.

3.7 Alternative Soil Handling Requirements

Soil units encountered along the proposed route are assessed against the *Guidelines for Alternative Soil Handling Procedures During Pipeline Construction* (Pettapiece and Dell 1996) to determine whether alternative soil handling procedures are required to maintain soil quality. These guidelines are reproduced in Appendix F. Alternative soil handling options include over-stripping topsoil or three-lift soil handling. Over-stripping topsoil may be considered when the topsoil and upper subsoil are of similar quality, relatively thin and overlie lower subsoil of lesser quality. Three-lift soil handling may be applied to areas where there is a significant decrease in soil quality between the upper and lower subsoil; it prescribes salvaging and replacing soil in three distinct lifts, namely topsoil, upper subsoil and lower

subsoil (spoil). In doing so the suitability of the topsoil and upper subsoil is preserved. The minimum length of a soil map unit requiring alternative soil handling procedures is generally 100 m. Where alternative soil handling techniques may be required additional deep inspection sites to trench depth may be completed such that there is a deep inspection site approximately every 100 m, as per TransCanada protocols. Alternative soil handling procedures are considered for all private land along the proposed route that is currently or may reasonably become arable.

Soil attributes considered while assessing alternative soil handling include:

- topsoil thickness;
- upper subsoil thickness;
- the presence or absence of bedrock;
- the presence or absence of significant gravel inclusions.

Soil units requiring alternative soil handling procedures are identified in the soil unit summaries presented in Section 4.1, the soil mapping legend in Appendix D, and are further discussed in Section 5.2.

4 RESULTS

4.1 Soil Units

Summary tables and relevant comments for individual soil series are presented in the following sections. The summary tables provide typical characteristics and ranges for a number of soil features, including: parent material, soil textures and topsoil depths. Comments are included for issues related to soil handling during pipeline construction, including colour change between topsoil and subsoil, wind and water erosion risk ratings, plus compaction and trench instability potential. A modal soil profile is presented for each soil unit; the site number for each example soil profile can be referenced in Appendix A for additional information. Analytical data for each example soil profile (if available) can be found in Appendix C by referencing the soil series and site number.

4.1.1 Achigan (AHG) and Achigan-ZZ (AHGzz)Soil Units

Achigan (AHG) soils occur very infrequently along the proposed route and are classified as imperfectly drained Gleyed Melanic Brunisols developed on coarse-textured glaciofluvial material. Achigan-ZZ (AHGzz) soils are moderately well to well drained Orthic Melanic Brunisols developed on coarse-textured glaciofluvial deposits. AHGzz soils are present as very minor inclusions. Further details and a typical soil profile are provided in Table 12, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 13 to 30 cm. Mapped topsoil stripping depths range from 15 to 35 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths. Trench stability is a concern due to the coarse textures of the glaciofluvial deposits.
- The risk of wind erosion is high for AHG and AHGzz soils while the water erosion risk is low. Topsoil stripping should be avoided during periods of high winds or drought. Bare, disturbed surfaces may require management to minimize soil loss due to wind erosion. Tackifier application or other erosion mitigation measures may be required for higher risk areas.
- The potential for compaction to occur is low due to the coarse textures of the topsoil and upper subsoil.

Table 12 Achigan (AHG) and Achigan-ZZ (AHGzz) soil units summary

Extent (kilometres / percentage)	AHG: 1.2 km / 0.4% AHGzz: 1.5 km / 0.6%
Soil Classification	AHG:Gleyed Melanic Brunisol AHGzz: Orthic Melanic Brunisol
Parent Material	AHG: Glaciofluvial AHGzz: Glaciofluvial
Texture: (topsoil / upper subsoil)	Loamy sand, sandy loam / sand
Topography class / Percent Slope	AHG: 2 / 0.5% to 2% AHGzz: 3-4 / 2% to 9%
Surface Stoniness	S0 (non-stony)
Drainage Class	Imperfectly drained
Mapped Topsoil Depth / Relationship to Topography	AHG: 20-35 cm / no relationship AHGzz: 15-35 cm / no relationship
Land Use	AHG: 33% cultivation, 43% pasture, 24% wooded AHGzz: 100% wooded
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Very dark gray, very dark brown, very dark grayish brown / brown, dark yellowish brown, light olive brown (distinct change)

PROFILE SITE: 28606BH			**Gleyed Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0 – 28	Very dark grayish brown	Silt loam	Granular	Friable
Bm	28 – 60	Yellowish brown	Very fine sandy loam	Subangular blocky	Loose
IICkgj	60-90	Light brownish gray	Silty clay loam	Massive	Firm
Ckgj	90-150	Gray-	Very fine sandy loam	- Massive	Non sticky

4.1.2 Bondhead (BDH), Gleyed Bondhead (BDHgl) and Bondhead-XL (BDHxl) Soil Units

Bondhead (BDH) soils are relatively common along the Project route and are characterized as well to moderately well drained Brunisolic Gray Brown Luvisols and Orthic Gray Brown Luvisols developed on medium to moderately fine-textured morainal deposits (Photo 1, Appendix F). Bondhead-XL (BDHxl) soils are well to moderately well drained Brunisolic Gray Luvisols and Orthic Gray Brown Luvisols developed on medium to moderately fine-textured morainal deposits with consolidated bedrock between 40 and 100 cm. Gleyed Bondhead (BDHgl) soils are imperfectly drained Gleyed Gray Brown Luvisols developed on medium to moderately fine-textured morainal deposits. BDHxl and BDHgl soils occupy very minor extents of the proposed route. Further details and a typical soil profile are provided in Table 13, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 6 to 38. Mapped topsoil stripping depths range from 10 to 40 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- Three-lift soil handling is required for the lithic phases of BDH soils (BDHxl); specific soil handling instructions are provided on the environmental alignment sheets.
- Trench stability is not a concern due to the fine texture of the soil.
- The risk of wind erosion is low for BDH, BDHgl and BDGxl soils while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.
- The potential for compaction to occur is moderate within BDH and BDHxl soil units. Within BDHgl soil units the compaction potential is high due to the moderately fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help mitigate compaction.

Table 13 Bondhead (BDH), Gleyed Bondhead (BDHgl) and Bondhead-XL (BDHxl) soil units summary

Extent (kilometres / percentage)	BDH: 10.4 km / 3.9% BDHgl: 0.3 km / 0.1% BDHxl: 0.2 km / 0.1%
Soil Classification	BDH, BDHxl: Brunisolic Gray Brown Luvisol, Orthic Gray Brown Luvisol BDHgl: Gleyed Gray Brown Luvisol
Parent Material	BDH, BDHgl: Morainal BDHxl: Morainal over bedrock
Texture: (topsoil / upper subsoil)	Loam, silt loam, sandy loam / sandy loam, clay loam, sandy clay loam, clay
Topography class / Percent Slope	BDH: 2 – 5 / 0.5% to 15% BDHxl, BDHgl: 4 / 5% to 10%
Surface Stoniness	S1 (slightly stony)
Drainage Class	BDH, BDHxl: Well to moderately well drained BDHgl: Imperfectly drained
Mapped Topsoil Depth / Relationship to Topography	BDH: 15-40 cm / no relationship BDHgl: 20-30 cm / no relationship BDHxl: 0-10 cm / no relationship
Land Use	BDH: 78% cultivation, 13% wooded, 7% pasture, 1% hay land BDHgl: 100% cultivation BDHxl: 100% wooded
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Very dark grayish brown, very dark brown, dark grayish brown / brown, dark yellowish brown, yellowish brown (variable colour change)

PROFILE SITE: 0121BH			**Brunisolic Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
LFH	2 – 0	-	-	-	-
Ahe	0 – 18	Very dark brown	Sandy loam	Granular	Friable
Bm	18 – 24	Dark yellowish brown	Sandy loam	Subangular blocky	Friable
Bt	24 – 45	Dark yellowish brown	Clay	Subangular blocky	Friable
Ck	45 – 110	Brown	Clay	Massive	Firm
Ckg	110 – 220	Grayish brown	Clay loam	Massive	Firm

4.1.3 Brighton (BGH), Gleyed Brighton (BGHgl), Brighton-GR (BGHgr), Brighton-XT (BGHxt), Brighton-YT (BGHyt), and Brighton-YG (BGHyg), and Rego Brighton (BGHzr) Soil Units

Brighton (BGH) soils occupy a relatively large portion of the proposed route and are classified as well to rapidly drained Orthic Melanic Brunisols developed on moderately coarse to coarse-textured glaciofluvial material (Photo 2, Appendix F). Gleyed Brighton (BGHgl) are imperfectly drained Gleyed Melanic Brunisols developed on moderately coarse-textured glaciofluvial deposits. Brighton-XT (BGHxt) and Brighton-YT (BGHyt) occur as minor inclusions and are characterized by rapidly to well drained Orthic Melanic Brunisols developed on moderately coarse to very coarse-textured glaciofluvial veneers overlying morainal deposits. Brighton-GR (BGHgr) are Orthic Melanic Brunisols developed on glaciofluvial deposits with high gravel content (Photo's 8 and 9, Appendix F). Similarly, Brighton-YG (BGHyg) soils are Orthic Melanic Brunisols developed on coarse-textured fluvial veneers overlying morainal deposits with high gravel content. Rego Brighton (BGHzr) soils are well to rapidly drained Orthic Humic Regosols developed on moderately coarse to coarse textured glaciofluvial material. BGHzr are found in association with BGH soils . BGHgl, BGHgr ,BGHyg and BGHzr soils occur very infrequently and occupy a very minor portion of the route. Further details and a typical soil profile are provided in Table 14, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 4 to 42. Mapped topsoil stripping depths range from 5 to 40 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- Three-lift soil handling is required for the BGHgr and BGHyg soils due to the high gravel content in the lower subsoil; specific soil handling instructions are provided on the environmental alignment sheets.
- Trench stability is a concern due to the coarse textures of the glaciofluvial deposits.
- The risk of wind erosion is high for all phases of BGH soils while the water erosion risk is low on slopes less than 5% and high on slopes greater than 5%. Topsoil stripping should be avoided during periods of high winds or drought. Bare, disturbed surfaces may require management to minimize soil loss due to wind erosion. Tackifier application or other erosion mitigation measures may be required for high risk areas.
- The potential for compaction to occur is low due to the coarse textures of the topsoil and upper subsoil.

Table 14 Brighton (BGH), Gleyed Brighton (BGHgl), Brighton-GR (BGHgr), Brighton-XT (BGHxt), Brighton-YT (BGHyt), Brighton-YG (BGHyg) and Rego Brighton (BGHzr) soil units summary

Extent (kilometres / percentage)	BGH: 28.1 km / 10.6% BGHgl: 1.2 km / 0.5% BGHgr: 0.6 km / 0.2% BGHxt: 6.6 km / 2.5% BGHyg: 0.1 km / <0.1% BGHyt: 2.4 km / 0.9% BGHzr: 0.6 km / 0.2%
Soil Classification	BGH, BGHgr, BGHxt, BGHyt, BGHyg: Orthic Melanic Brunisol BGHgl: Gleyed Melanic Brunisol BGHzr: Orthic Humic Regosol
Parent Material	BGH, BGHgl, BGHg, BGHzr: Glaciofluvial BGHxt, BGHyt: Glaciofluvial over morainal BGHyg: Fluvial over morainal
Texture: (topsoil / upper subsoil)	Sandy loam, loamy sand, loam / loamy sand, sand, sandy loam
Topography / Percent Slope	BGH: 2 – 7 / 0.5% to 45% BGHxt, BGHgl: 2 – 5 / 0.5% to 15% BGHyt: 2 – 6 / 0.5% to 30% BGHgr: 2 – 4 / 0.5% to 10% BGHyg: 5 / 10% to 15% BGHzr: 2-7 / 0.5%-45%
Surface Stoniness	S0 to S2 (non-stony to moderately stony)
Drainage Class	BGH, BGHgr, BGHxt, BGHyt, BGHzr: Well to rapidly drained BGHgl: Imperfectly drained BGHyg: Moderately well drained
Mapped Topsoil Depth / Relationship to Topography	BGH: 5-40 cm / no relationship to topography BGHgl: 20-40 cm / no relationship to topography BGHxt: 15-40 cm / no relationship to topography BGHyt: 10-40 cm / no relationship to topography BHGyg, BHGgr: 20-30 cm / no relationship to topography BGHzr: 12-20cm / no relationship to topography
Land Use	BGH: 41% wooded, 33% cultivation, 13% pasture, 12% hay land, <1% disturbed land BGHgl: 37% pasture, 32% hayland, 30% cultivation BGHgr: 60% cultivation, 40% pasture BGHxt: 54% cultivation, 28% hayland, 15% wooded, 3% pasture BGHyg: 100% hayland BGHyt: 55% cultivation, 45% wooded BGHzr: 100% wooded
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Dark to very dark greyish brown, dark to very dark brown / dark yellowish brown, yellowish brown, brown (distinct change)

PROFILE SITE 1066BH			**Orthic Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
LF	3 – 0	-	-	-	-
Ah	0 – 32	Very dark brown	Sandy loam	Granular	Very friable
Bm	32 – 57	Dark yellowish brown	Loamy sand	Subangular blocky	Very friable
Ck	57 – 220	Brown	Sand	Single grain	Loose

4.1.4 Cheney (CEY) Peaty Cheney (CEYpt) and Rego Cheney (CEYzr) Soil Units

Cheney (CEY) ,Peaty Cheney (CEYpt) and Rego Cheney (CEYzr) soils occupy a very minor portion of the proposed route and are characterized respectively, by poorly drained Orthic Humic Gleysols, Peaty Rego Humic Gleysols and Rego Humic Gleysols developed on medium to moderately fine-textured fluvial deposits. Further details and a typical soil profile are provided in Table 15, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 4 to 34 cm. Mapped topsoil depths range from 10 to 30 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- The wind erosion risk is low for CEY and CEYzr soils, and low for CEYpt soils, while the water erosion risk is moderate on slopes less than 5% and high on slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.
- CEY ,CEYpt and CEYzr soils are wet year-round and exposed faces are unstable. Trench instability is a concern due to the elevated moisture content of the soil. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased as per TransCanada's excavation procedure.
- Poor trafficability, rutting and compaction are concerns. The potential for compaction to occur is high for CEY and CEYzr soils and moderate for CEYpt soils due to the medium to moderately fine texture and high moisture content of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help mitigate compaction.

Table 15 Cheney (CEY) ,Peaty Cheney (CEYpt) and Rego Cheney (CEYzr) soil units summary

Extent (kilometres / percentage)			CEY: 4 km / 1.5% CEYpt: 0.3 km / 0.1% CEYzr: 0.3 km/ 0.1%		
Soil Classification			CEY: Orthic Humic Gleysol CEYpt: Peaty Rego Humic Gleysol CEYzr: Rego Humic Gleysol		
Parent Material			Fluvial		
Texture: (topsoil / upper subsoil)			Sandy loam, loam, silt loam / loam, sandy loam, silty clay loam		
Topography / Percent Slope			CEY: 1 – 6 / 0% to 30% CEYpt: 4 – 5 / 5% to 15% CEYzr: 1 - 6 / 0% to 30%		
Surface Stoniness			S0 to S1 (non-stony to slightly stony)		
Drainage Class			Poorly drained		
Mapped Topsoil Depth / Relationship to Topography			CEY: 10-30 cm / no relationship CEYpt: 20-30 cm / no relationship CEYzr: 15 cm / no relationship		
Land Use			CEY: 70% wooded, 26% pasture, 4% wetland CEYpt: 100% wooded CEYzr: 100% disturbed land		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Black, very dark brown, very dark gray, very dark grayish brown / light olive brown, very dark grayish brown, dark brown (distinct change)		
PROFILE SITE: 0405BH			**Orthic Humic Gleysol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0-21	Very dark grayish brown	Silt loam	Granular	Friable
Bg	21-68	Dark brown	Silty clay loam	Subangular blocky	Firm
Ckg	68-200+	Light olive brown	Silty clay loam	Massive	Sticky

4.1.5 Cashel (CSH) and Gleyed Cashel (CSHgl) Soil Units

Cashel (CSH) soils occupy a minor extent of the Project route and are classified as moderately well to well drained Orthic Gray Brown Luvisols and Orthic Melanic Brunisols developed on moderately fine textured glaciolacustrine veneers overlying morainal deposits. Gleyed Cashel (CSHgl) soils are the imperfectly drained variants of these soils. Soils are classified as Gleyed Gray Brown Luvisols or Gleyed Melanic Brunisols when the B horizon does not meet the requirements of the Luvisolic order but parent materials are consistent. Further details and a typical soil profile are provided in Table 16, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 10 to 34. Mapped topsoil stripping depths range from 15 to 30 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- The potential for compaction to occur is moderate for CSH soils and high for CSHgl soils due to the moderately fine texture and imperfect soil drainage. Where practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk for CSH and CSHgl soils is low. The water erosion risk for is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 16 Cashel (CSH) and Gleyed Cashel (CSHgl) soil units summary

Extent (kilometres / percentage)	CSH: 7.8 km / 2.9% CSHgl: 1.1 km / 0.4%
Soil Classification	CSH: Orthic Gray Brown Luvisol, Orthic Melanic Brunisols CSHgl: Gleyed Gray Brown Luvisol, Gleyed Melanic Brunisols
Parent Material	Glaciolacustrine over morainal
Texture: (topsoil / upper subsoil)	Clay loam, loam / clay loam, clay
Topography / Percent Slope	CSH: 2 – 4 / 0.5% to 9% CSHgl: 2 – 3 / 0.5% to 5%
Surface Stoniness	S0 to S1 (non-stony to slightly stony)
Drainage Class	CSH: Moderately well to well drained CSHgl: Imperfectly drained
Mapped Topsoil Depth / Relationship to Topography	CSH: 15-30 cm / slightly greater at lower slope positions CSHgl: 20-30 cm / slightly greater at lower slope positions
Land Use	CSH: 80% cultivated, 9% pasture, 9% hayland, 2% wooded CSHgl: 69% cultivation, 31% wooded
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Very dark grayish brown, dark grayish brown, dark brown / brown, dark yellowish brown, yellowish brown, light olive brown (distinct change)

PROFILE SITE: 0046BH				**Orthic Gray Brown Luvisol**	
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-27	Very dark grayish brown	Loam	Granular	Friable
Bt	27-53	Light olive brown	Clay loam	Subangular blocky	Friable
IICk	53-220	Light yellowish brown	Clay loam	Massive	Slightly Sticky

4.1.6 Darlington (DGT) Soil Unit

Darlington (DGT) soils occupy a small portion of the proposed route and are characterized by well drained Brunisolic Gray Brown Luvisols and Orthic Gray Brown Luvisols developed on medium to moderately fine-textured morainal deposits. Further details and a typical soil profile are provided in Table 17, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 3 to 36 cm. Mapped topsoil stripping depths range from 15 to 35 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- The potential for compaction to occur is moderate for DGT soils due to the moderately fine texture of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk is low, while the water erosion risk is high for DGT soils. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 17 Darlington (DGT) soil unit summary

Extent (kilometres / percentage)			3.4 km / 1.3%		
Soil Classification			Brunisolic Gray Brown Luvisol, Orthic Gray Brown Luvisol		
Parent Material			Morainal		
Texture: (topsoil / subsoil)			Loam, silt loam, sandy loam / clay loam, silt loam		
Topography / Percent Slope			2-5/ 2% to 10%		
Surface Stoniness			S1 (slightly stony)		
Drainage Class			Well drained		
Mapped Topsoil Depth / Relationship to Topography			15-35 cm / less topsoil in crest positions		
Land Use			72% cultivation, 21% hayland, 4% pasture, 3% wooded		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / subsoil)			Very dark grayish brown, dark brown, very dark brown / brown, dark yellowish brown, light olive brown, yellowish brown (distinct change)		
PROFILE SITE: 0270BH			**Orthic Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-36	Dark brown	Loam	Subangular blocky	Friable
Bt	36-53	Brown	Clay	Subangular blocky	Firm
Ck	53-170	Light olive brown	Clay	Massive	Firm

4.1.7 Elmbrook-YT (EOKyt) Soil Unit

Elmbrook-YT (EOKyt) soils occupy a very small portion of the proposed route and are classified as imperfectly drained Gleyed Gray Brown Luvisols developed on moderately fine to fine-textured glaciolacustrine veneers overlying morainal deposits. Further details and a typical soil profile are provided in Table 18, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 16 to 28 cm. Mapped topsoil stripping depths range from 15 to 25 cm. Colour change between topsoil and upper subsoil is usually indistinct and thus topsoil stripping should be to the depth indicated on the environmental alignment sheets.
- The soil compaction potential for EOKyt soils is high due to the fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind and water erosion risk for EOKyt soil is low.

Table 18 Elmbrook YT (EOKyt) soil unit summary

Extent (kilometres / percentage)			0.6 km / 0.2%		
Soil Classification			Gleyed Gray Brown Luvisol		
Parent Material			Glaciolacustrine over morainal		
Texture: (topsoil / upper subsoil)			Loam, silty clay loam, clay loam / clay loam, clay		
Topography / Percent Slope			2 – 3 / 0.5% to 5%		
Surface Stoniness			S0 (non-stony)		
Drainage Class			Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			15-25 cm / no relationship		
Land Use			63% cultivation, 37% pasture		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Dark to very dark brown, very dark gray, very dark grayish brown / dark to very dark grayish brown, brown (indistinct change)		
PROFILE SITE: 1689BH			**Gleyed Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-16	Very dark brown	CL	Granular	Slightly sticky
Btgj	16-65	Dark grayish brown	C	Subangular blocky	Sticky
Cgj	65-105	Dark grayish brown	C	Massive	Firm
IICkgj	105-220	Very dark grayish brown	CL	Massive	Slightly sticky

4.1.8 Farmington (FRM), Farmington-XL (FRMxl) and Farmington-YL (FRMyl) Soil Units

Farmington (FRM) soils are relatively common along the proposed route and are characterized by well to moderately well drained Orthic Melanic Brunisols developed on medium to moderately fine-textured morainal material. Farmington-XL (FRMxl) and Farmington-YL (FRMyl) soils occur commonly and are Orthic Melanic Brunisols developed on morainal deposits overlying consolidated bedrock (Photo 3, Appendix F). Further details and a typical soil profile are provided in Table 19, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 3 to 40 cm. Mapped topsoil stripping depths range from 5 to 30 cm. Colour change between topsoil and upper subsoil is usually indistinct and thus topsoil stripping should be to the depth indicated on the environmental alignment sheets.
- Three-lift soil handling is required for the lithic phases of FRM soils (FRMxl and FRMyl); specific soil handling instructions are provided on the environmental alignment sheets.
- The soil compaction potential for FRM, FRMxl and FRMyl soils is moderate due to the moderately fine texture of the soil. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk is low, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 19 Farmington (FRM), Farmington-XL (FRMxl) and Farmington-YL (FRMyl) soil units summary

Extent (kilometres / percentage)	FRM: 5.1 km / 1.9% FRMxl: 7.5 km/ 2.8% FRMyl: 2.1 km / 0.8%
Soil Classification	Orthic Melanic Brunisol
Parent Material	Morainal
Texture: (topsoil / upper subsoil)	Loam, sandy loam, silty clay loam, clay loam / sandy loam, silt loam, loam, clay loam
Topography / Percent Slope	FRM: 2 – 5 / 0.5% to 10% FRMxl: 1 – 5 / 0% to 15% FRMyl: 2 – 4 / 0.5% to 10%
Surface Stoniness	S0 to S1 (non-stony to slightly stony)
Drainage Class	Well to moderately well drained
Mapped Topsoil Depth / Relationship to Topography	FRM: 10-30/ no relationship FRMxl: 5-30 / no relationship FRMyl: 15-30 cm / no relationship
Land Use	FRM: 43% wooded, 29% cultivation, 19% pasture, 8% hayland FRMxl: 37% wooded, 29% cultivation, 27% pasture, 8% hayland FRMyl: 73% cultivation, 21% wooded, 7% disturbed land
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Very dark grayish brown, very dark brown, dark brown / yellowish brown, light yellowish brown, dark yellowish brown, grayish brown dark brown (indistinct change)

PROFILE SITE: 1237BH			**Orthic Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0-20	Very dark grayish brown	Clay loam	Granular	Friable
Bm	20-55	Dark yellowish brown	Fine Sandy loam	Subangular blocky	Friable
Ck	55-110	Grayish brown	Clay loam	Massive	Firm

4.1.9 Granby (GNY) and Peaty Granby (GNYpt) Soil Units

Granby (GNY) soils are occur relatively frequently along the Project route and are classified as poorly drained Orthic Humic Gleysols developed on medium-textured glaciolacustrine material. Peaty Granby (GNYpt) soils occur as very minor inclusions and are poorly drained Peaty Rego Humic Gleysols developed on moderately fine to fine-textured fluvial deposits. Further details and a typical soil profile are provided in Table 20, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 10 to 44. Mapped topsoil stripping depths range from 10 to 30 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- GNY and GNYpt soils are wet year-round and exposed faces are unstable. Trench instability is a concern due to the elevated moisture content of the soil. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure
- Poor trafficability, rutting and compaction are concerns. The potential for compaction to occur is moderate for GNY soils and high for GNYpt soils due to the medium to moderately fine texture and high moisture content of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk is low for GNY and GNYpt soils, while the water erosion risk is low for slopes less than 5% and high slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 20 Granby (GNY) and Peaty Granby (GNYpt) soil units summary

Extent (kilometres / percentage)	GNY: 6.6 km / 2.5% GNYpt: 0.4 km / 0.2%
Soil Classification	GNY: Orthic Humic Gleysol GNYpt: Peaty Rego Humic Gleysol
Parent Material	GNY: Glaciolacustrine GNYpt: Fluvial
Texture: (topsoil / upper subsoil)	Loam, silt loam, sandy loam / clay loam, silty clay loam, loamy sand
Topography / Percent Slope	GNY: 1 – 5 / 0% to 15% GNYpt: 2 – 4 / 0.5% to 10%
Surface Stoniness	S0 to S1 (non-stony to slightly stony)
Drainage Class	GNY: Poorly drained GNYpt: Very poorly drained
Mapped Topsoil Depth / Relationship to Topography	GNY: 10-40 cm / no relationship GNYpt: 20-30 cm / no relationship
Land Use	GNY: 67% wooded, 19% pasture, 6% hayland, 5% wetland, 1% cultivation GNYpt: 100% wooded
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Very dark brown, black, very dark grayish brown, very dark gray / olive brown, light olive brown, dark grayish brown, brown, dark yellowish brown (distinct change)

PROFILE SITE: 0986BH			**Orthic Humic Gleysol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0-35	Very dark brown	Loam	Granular	Friable
Bg	35-85	Olive brown	Clay loam	Subangular blocky	Friable
BCg	85-105	Light olive brown	Clay loam	Subangular blocky	Firm
Ckg	105-220	Light olive brown	Clay loam	Massive	Slightly sticky

4.1.10 Grenville (GVI) and Grenville-XL (GVIxl) Soil Units

Grenville (GVI) soils occur infrequently and are characterized by well drained Orthic Melanic Brunisols developed on moderately fine textured morainal material. Grenville-XL (GVIxl) soils occur very infrequently and are also well drained Orthic Melanic Brunisols, but are developed on moderately fine textured-morainal veneers overlying consolidated bedrock. Further details and a typical soil profile are provided in Table 21, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 8 to 30 cm. Mapped topsoil stripping depths range from 10 to 35 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- Three-lift soil handling is required for GVIxl soils due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- The wind erosion risk is low for GVIxl and GVI. The water erosion risk for GVI is moderate on slopes less than 5%. The water erosion risk for GVIxl is low on slopes less than 5% and high on slopes greater than 5%;. Topsoil stripping should be avoided during periods of high winds or drought. Bare, disturbed surfaces may require management to minimize soil loss due to wind erosion. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.
- The potential for compaction is moderate for GVIxl soils due to the moderately fine texture of the morainal deposits. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
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Table 21 Grenville (GVI) and Grenville-XL (GVIxl) soil unit summary

Extent (kilometres / percentage)			GVI: 2.8 km / 1% GVIxl: 0.2 km / 0.1%		
Soil Classification			Orthic Melanic Brunisol		
Parent Material			Morainal over bedrock		
Texture: (topsoil / upper subsoil)			Clay loam, loam, sandy loam / clay loam, sandy clay loam, sandy loam, sand		
Topography / Percent Slope			GVI: 2 – 5 / 0.5% to 15% GVIxl: 2 / 0.5% to 2%		
Surface Stoniness			S0 to S3 (non-stony to moderately stony)		
Drainage Class			GVI Well drained GVIxl: Well drained		
Mapped Topsoil Depths / Relationship to Topography			GVI: 10-35 cm / no relationship GVIxl: 10-15 cm / no relationship		
Land Use			GVI: 56% cultivated, 37% wooded, 7% pasture GVIxl: 100% wooded		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, dark to very dark brown / yellowish brown, dark yellowish brown, dark brown, brown, light brownish gray (distinct change)		
PROFILE SITE: 2243BH			**Orthic Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0 – 16	Very dark grayish brown	Clay loam	Granular	Friable
Bm	16 – 29	Brown	Clay loam	Subangular blocky	Friable
Ck	29 – 60	Light brownish gray	Sandy clay loam	Massive	Firm
R	60+	-	Bedrock	-	-

4.1.11 Landsdowne (LDW) and Landsdowne-XL (LDWxl) Soil Units

Lansdowne (LDW) soils are imperfectly drained Gleyed Gray Brown Luvisols developed on moderately fine to fine-textured glaciolacustrine material over morainal deposits and represent a minor percentage of the mapped soils. Landsdowne-XL (LDWxl) soils are Gleyed Gray Brown Luvisols developed on moderately fine to fine textured glaciolacustrine veneers overlying consolidated bedrock within 100 cm of the surface; they occur as minor inclusions along the Project route. Further details and a typical soil profile are provided in Table 22, with additional comments in the bulleted list below:

- Topsoil depths range from 10 to 31 cm. Mapped topsoil depth ranges from 20 to 30 cm. Colour change between topsoil and subsoil is highly variable; refer to the environmental alignment sheets for guidance on stripping depths and colour change.
- Three-lift soil handling is required for LDWxl soils due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- The potential for compaction to occur is high for LDW and LDWxl soils due to the fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk for LDW and LDWxl soil is low while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.

Table 22 Landsdowne (LDW) and Landsdowne-XL (LDWxl) soil unit summary

Extent (kilometres / percentage)			LDW: 3.5 km / 1.3% LDWxl: 1.5 km /0.6%		
Soil Classification			Gleyed Gray Brown Luvisol		
Parent Material			LDW: Glaciolacustrine over morainal LDWxl: Glaciolacustrine over bedrock		
Texture: (topsoil / subsoil)			Clay loam, loam, clay / clay, clay loam, silty clay loam		
Topography / Percent Slope			LDW: 2 – 5 / 0.5% to 15% LDWxl: 2 – 4 / 0.5% to 10%		
Surface Stoniness			S0 to S2 (non-stony to moderately stony)		
Drainage Class			Imperfectly drained		
Topsoil Depth / Relationship to Topography			LDW: 10-31 cm / no relationship LDWxl: 10-23 cm / no relationship		
Land Use			LDW: 53% cultivation, 22% hayland, 20% pasture, 6% wooded LDWxl: 39% hayland, 26% wooded, 21% pasture, 14% cultivated		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / subsoil)			Dark to very dark grayish brown, dark to very dark brown / brown, dark grayish brown, olive brown, light olive brown (variable color change)		
PROFILE SITE: 2105BH			**Gleyed Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0-18	Very dark grayish brown	Clay loam	Granular	Slightly sticky
Btgj	18-39	Light olive brown	Clay	Subangular blocky	Sticky
IICgj	39-220	Light olive brown	Clay	Massive	Sticky

4.1.12 Lyons (LYS), Lyons-XL (LYSxl), and Lyons-YL (LYSyl) and Rego Lyons (LYSzr)Soil Units

Lyons (LYS) soils are common along the proposed route and are characterized by poorly drained Orthic Humic Gleysols developed on medium to moderately fine-textured morainal material (Photo 4, Appendix F). Lyons-XL (LYSxl) and Lyons-YL (LYSyl) soils are Orthic Humic Gleysols developed on morainal deposits overlying consolidated bedrock and are present as minor inclusions. Rego Lyons soils are poorly to very poorly drained Rego Humic Gleysols developed on fine textured morainal material and are present as minor inclusions. Further details and a typical soil profile are provided in Table 23, with additional comments in the bulleted list below:

- Topsoil depths range from 6 to 70 cm. Mapped topsoil stripping depths range from 10 to 45 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- Three-lift soil handling is required for lithic phases of LYS (LYSxl and LYSyl) soils due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- The wind erosion risk is low, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.
- LYS, LYSxl, LYSyl and LYSzr soils are wet year-round and exposed faces are unstable. Trench instability is a concern due to the elevated moisture content of the soil. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure.
- Poor trafficability, rutting and compaction are concerns. The potential for compaction to occur is high for LYS, LYSxl, LYSyl and LYSzr soils due to the moderately fine texture and high moisture content of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 23 Lyons (LYS), Lyons-XL (LYSxl),Lyons-YL (LYSyl) and Rego Lyons (LYSzr) soil units summary

Extent (kilometres / percentage)			LYS: 11.7 km / 4.4% LYSxl: 3.8 km / 1.4% LYSyl: 0.4 km /0.2% LYSzr: 0.2 km / 0.1%		
Soil Classification			LYS, LYSxl, LYSyl: Orthic Humic Gleysol LYSzr: Rego Humic Gleysol		
Parent Material			LYS, LYSzr: Morainal LYSxl, LYSyl: Morainal over bedrock		
Texture: (topsoil / upper subsoil)			Loam, silt loam, silty clay loam, clay loam / clay loam, loam, sandy clay loam, clay, heavy clay		
Topography / Percent Slope			LYS, LYSzr: 1 – 5 / 0% to 15% LYSxl, LYSyl: 2 – 5 / 0.5% to 15%		
Surface Stoniness			S0 to S2 (non-stony to moderately stony)		
Drainage Class			Poorly drained		
Mapped Topsoil Depth / Relationship to Topography			LYS: 10-45 cm / no relationship LYSxl: 10-35 cm / no relationship LYSyl: 20 cm / no relationship LYSzr: 30 cm ./ no relationship		
Land Use			LYS: 54% wooded, 16% hayland, 14% pasture, 6% cultivation, 9% wetland, <1% disturbed land LYSxl: 30% cultivated, 30% pasture, 10% wooded, 10% hayland LYSyl: 100% cultivated LYSzr: 100% wetland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, very dark brown, black, dark brown / brown, light olive brown, olive brown, dark yellowish brown, dark grayish brown (variable color change)		
PROFILE SITE: 0222BH			**Orthic Humic Gleysol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0 – 18	Very dark brown	Clay loam	Granular	Friable
Bg	18 – 46	Olive brown	Clay loam	Subangular blocky	Slightly sticky
Ckg	46 – 220	Light olive brown	Clay loam	Massive	Slightly sticky

4.1.13 Moscow (MCW) and Moscow-XL (MCWxl) Soil Units

Moscow (MCW) soils occupy a small portion of the proposed route and are classified as poorly drained Orthic Humic Gleysols developed on moderately fine to fine-textured glaciolacustrine material. Moscow-XL (MCWxl) soils occur infrequently and are Orthic Humic Gleysols that have developed on moderately fine to fine-textured glaciolacustrine veneers overlying consolidated bedrock. Further details and a typical soil profile are provided in Table 24, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 12 to 53 cm. Mapped topsoil stripping depths range from 10 to 30 cm. Colour change between topsoil and subsoil is highly variable; refer to the environmental alignment sheets for guidance on stripping depths and colour change.
- Three-lift soil handling is required for Moscow-XL (MCWxl) soils due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- The wind erosion risk is low, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.
- MCW and MCWxl soils are wet year-round and exposed faces are unstable. Trench instability is a concern due to the elevated moisture content of the soil. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure.
- Poor trafficability, rutting and compaction are concerns. The potential for compaction to occur is high for MCW and MCWxl soils due to the fine texture and high moisture content of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 24 Moscow (MCW) and Moscow-XL (MCWxl) soil unit summary

Extent (kilometres / percentage)			MCW: 3 km / 1.1% MCWxl: 1.6 km / 0.6%		
Soil Classification			Orthic Humic Gleysol		
Parent Material			MCW: Glaciolacustrine MCWxl: Glaciolacustrine over bedrock		
Texture: (topsoil / upper subsoil)			Clay loam, silty clay loam, sandy clay loam, clay / clay, silty clay, sandy clay loam, clay loam, silty clay loam		
Topography / Percent Slope			MCW: 1 – 4 / 0% to 10% MCWxl: 1 – 2 / 0% to 2%		
Surface Stoniness			S0 to S1 (non-stony to slightly stony)		
Drainage Class			Poorly drained		
Mapped Topsoil Depth / Relationship to Topography			MCW: 10-30 cm / no relationship MCWxl: 10-25 cm / no relationship		
Land Use			MCW: 32% hayland, 27% wooded, 20% cultivation, 16% pasture, 5% bush MCWxl: 41% bush, 32% wooded, 27% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, very dark brown, black, very dark grey / Dark grayish brown, very dark grayish brown, grayish brown (variable color change)		
PROFILE SITE: 3321BH			**Orthic Humic Gleysol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-22	Very dark grayish brown	Clay loam	Granular	Friable
Bg	22-60	Very dark grayish brown	Sandy clay loam	Subangular blocky	Slightly sticky
Cg	60-180	Dark grayish brown	Silty clay	Massive	Sticky
Ckg	180-220	Very dark grayish brown	Silty clay	Massive	Sticky

4.1.14 Milliken (MLE) Soil Unit

Milliken (MLE) soils occur infrequently and are imperfectly drained Gleyed Gray Brown Luvisols developed on moderately fine-textured morainal deposits. Further details and a typical soil profile are provided in Table 25, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 13 to 28 cm. Mapped topsoil stripping depths range from 20 to 30 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- The wind erosion risk is low, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. MLE soils were not encountered on slopes greater than 5% thus the water erosion risk is low.
- The potential for compaction to occur is high for MLE soils due to the moderately fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 25 Milliken (MLE) soil unit summary

Extent (kilometres / percentage)			1.4 km / 0.5%		
Soil Classification			Gleyed Gray Brown Luvisol		
Parent Material			Morainal		
Texture: (topsoil / upper subsoil)			Clay loam, loam / clay loam, sandy clay loam, clay		
Topography / Percent Slope			2 – 3 / 0.5% to 5%		
Surface Stoniness			S1 to S2 (slightly stony to moderately stony)		
Drainage Class			Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			20-30 cm / topsoil depth increases in lower slope positions		
Land Use			79% cultivation, 12% wooded, 9% pasture		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Dark to very dark grayish brown, dark to very dark gray / light olive brown, brown, yellowish brown, dark yellowish brown (distinct change)		
PROFILE SITE: 0447BH			**Gleyed Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-24	Very dark grayish brown	Clay loam	Granular	Friable
Bt	24-45	Brown	Clay loam	Subangular blocky	Firm
Ckgj	45-220	Light olive brown	Clay	Massive	Sticky

4.1.15 Matilda (MTD), Matilda-GR, Matilda-XL (MTDxl) and Matilda-YL (MTDyl) Soil Units

Matilda (MTD) soils occupy a small portion of the proposed route and are characterized by imperfectly drained Gleyed Melanic Brunisols developed on medium to moderately fine-textured morainal material. Infrequent occurrences of increased coarse fragments are denoted by Matilda-GR (MTDgr) soils. Matilda-XL (MTDxl) and Matilda-YL (MTDyl) soils are Gleyed Melanic Brunisols developed on medium to moderately fine textured morainal veneers of varying depths overlying consolidated bedrock and occur infrequently. Further details and a typical soil profile are provided in Table 26, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 14 to 30 cm. Mapped topsoil stripping depths range from 15 to 35 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- Three-lift soil handling is required for MTDxl and MTDyl soils due to the presence of consolidated bedrock within trench depth. Similarly, three-lift soil handling is required for MTDgr soils due to increased coarse fragments within trench depth. Specific soil handling instructions are provided on the environmental alignment sheets.
- The wind erosion risk is low for MTD, MTDgr and MTDxl and moderate for MTDyl, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Topsoil stripping should be avoided during periods of high winds or drought. Bare, disturbed surfaces may require management to minimize soil loss due to wind erosion. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.
- The potential for compaction to occur is low for MTDgr soils and high for MTD, MTDxl and MTDyl soils due to the moderately fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 26 Matilda (MTD), Matilda-GR, Matilda-XL (MTDxl) and Matilda-YL (MTDyl) soil unit summary

Extent (kilometres / percentage)			MTD: 2.9 km /1.1% MTDxl: 0.7 km / 0.3% MTDyl: 0.5 km / 0.2% MTDgr: 0.1 km / 0.1%		
Soil Classification			Gleyed Melanic Brunisol		
Parent Material			MTD, MTDgr: Morainal MTDxl, MTDyl: Morainal over bedrock		
Texture: (topsoil / upper subsoil)			Clay loam, loam, sandy loam / loam, sandy clay loam, clay loam, sandy loam		
Topography / Percent Slope			MTD, MTDgr, MTDxl: 2 – 4 / 0.5% to 10% MTDyl: 2 – 3 / 0.5% to 5%		
Surface Stoniness			S0 to S2 (non-stony to moderately stony)		
Drainage Class			Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			MTD: 15-35 cm / topsoil depths increase in lower areas MTDgr: 25-35 cm / topsoil depths increase in lower areas MTDxl: 15-25 cm / topsoil depths increase in lower areas MTDyl: 15 cm / topsoil depths increase in lower areas		
Land Use			MTD: 49% cultivation, 29% pasture, 17% wooded, 5% hayland MTDgr: 100% cultivated MTDxl: 43% cultivated, 57% pasture MTDyl: 100% pasture		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark to dark grayish brown, dark to very dark brown, brown / light olive brown, yellowish brown, olive brown, dark yellowish brown, dark gray (variable colour change)		
PROFILE SITE: 2695BH			**Gleyed Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-28	Brown	Loam	Granular	Friable
Bmgj	28-44	Brown	Sandy loam	Subangular blocky	Loose
Ckgj	44-102	Light olive brown	Sandy loam	Massive	Slightly sticky

4.1.16 Napanee (NPE), Napanee-XL (NPExl), Napanee-YT (NPEyt) and Rego Napanee (NPEzr) Soil Units

Napanee (NPE) and Rego Napanee (NPEzr) are poorly drained Orthic Humic Gleysols and Rego Humic Gleysols, respectively that have developed on moderately fine to fine-textured glaciolacustrine deposits. NPE soils are relatively common along the proposed route. Napanee-YT (NPEyt) are Orthic Humic Gleysols developed on moderately fine to fine-textured glaciolacustrine veneer overlying Morainal deposits. Napanee-XL (NPExl) soils are Orthic Humic Gleysols that have formed on glaciolacustrine veneers overlying consolidated bedrock. Further details and a typical soil profile are provided in Table 27, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 7 to 52 cm. Mapped topsoil depths range from 10 to 50 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- Three-lift soil handling is required for NPExl soils due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- The wind erosion risk for all NPE soils is low, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.
- NPE, NPExl, NPEyt and NPEzr soils are wet year-round and exposed faces are unstable. Trench instability is a concern due to the elevated moisture content of the soil. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure.
- Poor trafficability, rutting and compaction are concerns. The potential for compaction to occur is high for NPE, NPExl, NPEyt and NPEzr soils due to the fine texture and high moisture content of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 27 Napanee (NPE), Napanee-XL (NPExl), Napanee-YT (NPEyt) and Rego Napanee (NPEzr) soil units summary

Extent (kilometres / percentage)			NPE: 5.6 km / 2.1% NPExl: 1.4 km / 0.5% NPEyt: 0.9 km / 0.3% NPEzr:2.9 km / 1.1%		
Soil Classification			NPE, NPExl, NPEyt: Orthic Humic Gleysol NPEzr: Rego Humic Gleysol		
Parent Material			NPE, NPEzr: Glaciolacustrine NPExl: Glaciolacustrine over bedrock NPEyt: Glaciolacustrine over morainal		
Texture: (topsoil / subsoil)			Clay loam, silty clay loam, clay, loam / silty clay, clay, clay loam		
Topography / Percent Slope			NPE: 2 – 5 / 0.5% to 15% NPExl: 2 – 4 / 0.5% to 10% NPEyt: 2 – 3 / 0.5% to 5% NPEzr: 1 – 4 / 0% to 10%		
Surface Stoniness			S0 (non-stony)		
Drainage Class			Poorly drained		
Topsoil Depth / Relationship to Topography			NPE: 10-30 cm / topsoil depths increase in lower slope positions NPExl: 10-40 cm / topsoil depths increase in low areas NPEyt: 15-25 cm / topsoil depths increase in low areas NPEzr: 10-50 cm / topsoil depths increase in low areas		
Land Use			NPE: 36% pasture, 26% wooded, 19% cultivation, 18% hayland, 1% bush NPExl: 57% pasture, 21% hayland, 15% wooded, 7% cultivation NPEyt: 100% cultivation NPEzr: 41% wetland, 20% pasture, 16% cultivation, 15% wooded, 9% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / subsoil)			Very dark grayish brown, very dark brown, very dark gray / dark grayish brown, dark gray, very dark grayish brown, olive brown (variable colour change)		
PROFILE SITE: 2114BH			**Orthic Humic Gleysol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0 – 18	Very dark brown	Silty clay loam	Granular	Slightly sticky
Bg	18 – 75	Dark gray	Silty clay	Subangular blocky	Sticky
Ckg1	75 – 160	Dark grayish brown	Silty clay	Massive	Sticky
Ckg2	160 – 220	Very dark grayish brown	Silty clay	Massive	Sticky

4.1.17 Newcastle (NWC), Gleyed Newcastle (NWCgl) and Newcastle-XT (NWCxt) Soil Units

Newcastle (NWC) soils occupy a minor portion of the Project route and are characterized by well drained Brunisolic Gray Brown Luvisols developed on moderately coarse to moderately fine-textured glaciofluvial deposits. Gleyed Newcastle (NWCgl) soils are imperfectly drained Gleyed Gray Brown Luvisols developed on moderately coarse to moderately fine-textured glaciofluvial deposits. Newcastle-XT (NWCxt) soils are Orthic Gray Brown Luvisols developed on glaciofluvial veneers overlying morainal deposits. Further details and a typical soil profile are provided in Table 28, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 4 to 42 cm. Mapped topsoil depth ranges from 10 to 45 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- The wind erosion risk for all NWC, NWCgl and NWCxt soils is low, while the water erosion risk is moderate for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.
- The potential for compaction to occur is moderate for NWC and NWCxt soils and high for NWCgl soils due to the moderately fine texture of the soils. The risk is elevated for NWCgl soils due to the imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 28 Newcastle (NWC), Gleyed Newcastle (NWCgl) and Newcastle-XT (NWCxt) soil units summary

Extent (kilometres / percentage)			NWC: 2.4 km / 0.9% NWCgl: 0.3 km / 0.1% NWCxt: 0.4 km / 0.2%		
Soil Classification			NWC: Brunisolic Gray Brown Luvisol NWCgl: Gleyed Gray Brown Luvisol NWCxt: Orthic Gray Brown Luvisol		
Parent Material			NWC, NWCgl: Glaciofluvial NWCxt: Glaciofluvial over morainal		
Texture: (topsoil / upper subsoil)			Silt loam, loam, loamy sand, sandy loam, sand / silty clay loam, clay loam, sandy clay loam, loam		
Topography / Percent Slope			NWC: 2 – 4 / 0.5% to 10% NWCgl: 4 – 5 / 5% to 15% NWCxt: 2 / 0.5% to 2%		
Surface Stoniness			S0 – S1 (non-stony to slightly stony)		
Drainage Class			NWC, NWCxt: Well drained NWCgl: Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			NWC: 15-40 cm / no relationship NWCgl: 20 cm / no relationship NWCxt: 25-35 cm/ no relationship		
Land Use			NWC: 86% cultivation, 8% wooded, 6% hayland NWCgl: 100% wooded NWCxt: 100% cultivation		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Dark grayish brown, dark brown, brown, very dark brown, pale brown / dark yellowish brown, yellowish brown, brown, light olive brown (variable colour change)		
PROFILE SITE: 0534BH			**Brunisolic Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0 – 23	Dark grayish brown	Sandy loam	Granular	Friable
Ae	23 – 36	Pale brown	Sand	Single grain	Loose
Bm	36 – 45	Yellowish brown	Loam	Subangular blocky	Friable
Bt	45 – 62	Dark yellowish brown	Clay loam	Subangular blocky	Firm
Ckgj	62-220	Light brownish gray	Clay	Massive	Firm

4.1.18 Otonabee (OBE), Gleyed Otonabee (OBEgl), Otonabee-GR (OBEgr), Otonabee-XL (OBExl) and Rego Otonabee (OBEzr) Soil Units

Otonabee (OBE) soils and Rego Otonabee (OBEzr) soils are well drained Orthic Melanic Brunisols and Orthic Humic Regosols, respectively developed on moderately coarse to moderately fine-textured morainal material (Photo 5, Appendix F). OBE soils occur frequently and are the most common soil along the Project route. Gleyed Otonabee (OBEgl) are imperfectly drained Gleyed Melanic Brunisols that have developed on moderately coarse to moderately fine-textured morainal material. Lithic phases of Otonabee (OBExl) developed on morainal veneers overlying consolidated bedrock and occur commonly along the proposed route. Otonabee-GR (OBEgr) soils developed on morainal deposits containing large amounts of gravel. Further details and a typical soil profile are provided in Table 29, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 6 to 55 cm. Mapped topsoil stripping depths range from 10 to 45 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- Depending on the current and potential land use, three-lift soil handling may be required for lithic phases of Otonabee (OBExl) due to the presence of consolidated bedrock within trench depth, as well as OBEgr due to the presence of gravel; specific soil handling instructions are provided on the environmental alignment sheets.
- The wind erosion risk ranges from moderate to high for OBE soils and is high for OBEzr soils. The wind erosion risk for the remaining phases is low. The water erosion risk for all phases is high for all slopes classes. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.
- The potential for compaction to occur is low for OBE soils, moderate for OBEgr, OBExl and OBEzr and high for OBEgl soils. The risk of compaction is elevated for OBEgr, OBExl, OBEzr and OBEgl due to the moderately fine texture of the soil. The risk is elevated further for OBEgl due to the imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.

Table 29 Otonabee (OBE), Gleyed Otonabee (OBEgl), Otonabee-GR (OBEgr) and Rego Otonabee (OBEzr) soil units summary

Extent (kilometres / percentage)	OBE: 49 km / 18.4% OBEgl: 1.2 km / 0.4% OBEgr: 2.0 km / 0.7% OBExl: 4.1 km / 1.6% OBEzr: 0.3 km / 0.1%
Soil Classification	OBE, OBEgr, OBExl: Orthic Melanic Brunisol OBEgl: Gleyed Melanic Brunisol OBEzr: Orthic Humic Regosol
Parent Material	OBE, OBEgl, OBEgr, OBEzr: Morainal OBExl: Morainal over bedrock
Texture: (topsoil / upper subsoil)	Loam, sandy loam, clay loam / sandy loam, clay loam, sandy clay loam, loam, loamy sand
Topography / Percent Slope	OBE: 1 – 7 / 0% to 45% OBEgr: 3 – 5 / 2% to 15% OBEgl: 2 – 5 / 0.5% to 15% OBExl: 2 – 3 / 0.5% to 5% OBEzr: 2 – 7 / 0.5% to 45%
Surface Stoniness	S0 to S3 (non-stony to very stony)
Drainage Class	OBE, OBEgr, OBExl, OBEzr: Well drained OBEgl: Imperfectly drained
Mapped Topsoil Depth / Relationship to Topography	OBE: 10-45 cm / no relationship OBEgl: 20-35 cm / no relationship OBEgr, OBExl: 10-30 cm / no relationship OBEzr: 10-20 cm / no relationship
Land Use	OBE: 51% cultivation, 30% wooded, 11% pasture, 8% hayland, 1% disturbed land OBEgl: 63% cultivation, 24% wooded, 13% hayland OBEgr: 48% pasture, 28% wooded, 14% hayland, 10% cultivated OBExl: 51% wooded, 27% pasture, 17% hayland, 6% cultivated OBEzr: 100% wooded
Sod Quality (good / poor)	Poor
Colour Transition (topsoil / upper subsoil)	Dark brown, very dark grayish brown, very dark brown / dark yellowish brown, light yellowish brown, brown (variable colour change)

PROFILE SITE: 0140BH			**Orthic Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0 – 24	Dark brown	Loam	Granular	Friable
Bm	24 – 42	Yellowish brown	Sandy loam	Subangular blocky	Friable
Ck	42 – 220	Light yellowish brown	Sandy clay loam	Massive	Firm

4.1.19 Sidney (SIY) and Sidney-XL (SIYxl) Soil Units

Sidney (SIY) soils occupy a very small portion of the proposed route and are characterized by poorly drained Orthic Humic Gleysols developed on moderately fine-textured glaciolacustrine deposits. Sidney-XL (SIYxl) soils also occur very infrequently and are characterized by moderately fine-textured Rego Humic Gleysols developed on glaciolacustrine veneers overlying bedrock. Further details and a typical soil profile are provided in Table 30, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 19 to 30 cm. Mapped topsoil stripping depths range from 20 to 30 cm. Colour change between topsoil and upper subsoil is usually indistinct and thus topsoil stripping should be to the depth indicated on the environmental alignment sheets.
- SIY and SIYxl soils are wet year-round and exposed faces are unstable. Trench instability is a concern due to the elevated moisture content of the soil. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure.
- Poor trafficability, rutting and compaction are concerns. The potential for compaction to occur is high for SIY and SIYxl soils due to the fine texture and high moisture content of the soils. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk for SIY and SIYxl soils is low while the water erosion risk is moderate to high for the slope classes that were encountered. Tackifier application or other erosion mitigation measures may be required for moderate risk areas.

Table 30 Sidney (SIY) and SIY-XL (SIYxl) soil unit summary

Extent (kilometres / percentage)			SIY: 0.8 km / 0.3% SIYxl: 0.2 km / 0.1%		
Soil Classification			Orthic Humic Gleysol		
Parent Material			SIY: Glaciolacustrine SIYxl: Glaciolacustrine over bedrock		
Texture: (topsoil / upper subsoil)			SIY, SIYxl: Clay loam / clay loam, silty clay loam, silty clay		
Topography / Percent Slope			SIY, SIYxl: 2 – 3 / 0.5% to 5%		
Surface Stoniness			SIY, SIYxl: S0 (non-stony)		
Drainage Class			SIY, SIYxl: Poorly drained		
Mapped Topsoil Depth / Relationship to Topography			SIY: 25-30 cm / no relationship SIYxl: 20 cm / no relationship		
Land Use			SIY: 51% wooded, 32% wetland, 10% pasture, 7% bush SIYxl: 100% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark gray, very dark grayish brown, dark brown, dark grayish brown / brown, dark gray, olive brown (indistinct)		
PROFILE SITE: 1582BH			**Orthic Humic Gleysol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0-24	Dark brown	Clay loam	Granular	Friable
Bg	24-42	Brown	Silty clay loam	Subangular blocky	Firm
Ckg1	42-110	Dark gray	Silty clay loam	Massive	Firm
Ckg2	110-220	Dark grayish brown	Silty clay	Massive	Firm

4.1.20 Smithfield (SMF) Soil Unit

Smithfield (SMF) soils occupy a minor extent of the pipeline and are classified as imperfectly drained Gleyed Gray Brown Luvisols developed on medium to moderately fine-textured glaciolacustrine deposits. Further details and a typical soil profile are provided in Table 31, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 8 to 27 cm. Mapped topsoil stripping depths range from 20 to 30 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- The potential for compaction to occur is high for SMF soils due to the moderately fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk for SMF soils is low, while the water erosion risk is moderate for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.

Table 31 Smithfield (SMF) soil unit summary

Extent (kilometres / percentage)			1.4 km / 0.5%		
Soil Classification			Gleyed Gray Brown Luvisol		
Parent Material			Glaciolacustrine		
Texture: (topsoil / upper subsoil)			Loam, silt loam / silty clay loam, clay, heavy clay		
Topography / Percent Slope			2 – 4 / 0.5% to 10%		
Surface Stoniness			S0 to S1 (non-stony to slightly stony)		
Drainage Class			Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			20-30 cm / no relationship		
Land Use			80% cultivated, 16% wooded, 4% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Dark to very dark grayish brown, dark to very dark brown, dark yellowish brown / brown, light olive brown, yellowish brown, dark yellowish brown (variable colour change)		
PROFILE SITE: 0602BH			**Gleyed Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-21	Very dark brown	Loam	Granular	Slightly sticky
Ae	21-27	Dark yellowish brown	Loam	Subangular blocky	Non-sticky
Btgj	27-46	Dark yellowish brown	Silty clay loam	Subangular blocky	Slightly sticky
Ckg1	46-140	Light olive brown	Clay	Massive	Sticky
Ckg2	140-220	Dark grayish brown	Silt loam	Massive	Slightly sticky

4.1.21 Solmesville-YL (SMVyl) Soil Unit

Solmesville-YL (SMVyl) soils occupy a minor extent of the pipeline and are classified as imperfectly drained Gleyed Gray Brown Luvisols developed on fine to moderately fine-textured glaciolacustrine veneers over consolidated bedrock. Further details and a typical soil profile are provided in Table 32, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 23 to 32 cm. Mapped topsoil stripping depths are 20 cm. Colour change between topsoil and subsoil is variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- The potential for compaction to occur is high for SMVyl soils due to the fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- The wind erosion risk for SMV soils is low, while the water erosion risk is moderate for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.

Table 32 Solmesville-YL (SMVyl) soil unit summary

Extent (kilometres / percentage)			0.3 km / 0.1%		
Soil Classification			Gleyed Gray Brown Luvisol		
Parent Material			Glaciolacustrine		
Texture: (topsoil / upper subsoil)			Clay, clay loam, sandy clay / silty clay, clay		
Topography / Percent Slope			1-2 / 2.5%		
Surface Stoniness			S0 (non-stony)		
Drainage Class			Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			20 cm / no relationship		
Land Use			100% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark brown, very dark grayish brown / Very dark gray, very dark grayish brown, light olive brown, olive brown (variable colour change)		
PROFILE SITE: 1606BH			**Gleyed Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-23	Very dark brown	Loam	Granular	Slightly sticky
Bt	23-42	Olive brown	Loam	Subangular blocky	Non-sticky
Cgj	42-100	Light olive brown	Silty clay loam	Subangular blocky	Slightly sticky
IICgj	100-140	Olive brown	Clay	Massive	Sticky
R	140+	-	Bedrock	-	-

4.1.22 Schomberg (SMG), Schomberg-XT (SMGxt) and Schomberg-YT (SMGyt) Soil Units

Schomberg (SMG) soils are well to moderately well drained Orthic Gray Brown Luvisols developed on moderately fine-textured glaciolacustrine material. Schomberg-XT (SMGxt) and Schomberg-YT (SMGyt) are well to moderately well drained Orthic Gray Brown Luvisols developed on glaciolacustrine veneers overlying morainal deposits. SMG, SMGxt and SMGyt soils represent a very small portion of the soils mapped. Further details and a typical soil profile are provided in Table 33, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 13 to 36 cm. Mapped topsoil depth ranges from 15 to 30 cm. Colour change between topsoil and subsoil is highly variable; refer to environmental alignment sheets for guidance on stripping depths and colour change.
- The potential for compaction to occur is moderate for SMG, SMGxt and SMGyt soils due to the moderately fine texture of the soil. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- Wind erosion risk is low for SMG and SMGyt soils and moderate for SMGxt soils. The water erosion risk for SMG, SMGxt and SMGyt soil is moderate for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for moderate and high risk areas.

Table 33 Schomberg (SMG), Schomberg-XT (SMGxt) and Schomberg-YT (SMGyt) soil units summary

Extent (kilometres / percentage)			SMG: 3.3 km / 1.2% SMGxt: 0.2 km / 0.1% SMFyt: 0.4 km / 0.2%		
Soil Classification			SMG, SMGxt, SMGyt: Orthic Gray Brown Luvisol		
Parent Material			SMG: Glaciolacustrine SMGxt, SMGyt: Glaciolacustrine over morainal		
Texture: (topsoil / upper subsoil)			Silt loam, clay loam, loam / silty clay loam, clay loam, clay, sandy clay loam		
Topography / Percent Slope			SMG: 1 – 6 / 0.5% to 30% SMGxt, SMGyt: 4 / 5% to 10%		
Surface Stoniness			S0 – S2 (non-stony to moderately stony)		
Drainage Class			SMG, SMGxt, SMGyt: Well to moderately well drained		
Mapped Topsoil Depth / Relationship to Topography			SMG: 15-30 cm / slight increase in topsoil depths in lower slope positions SMGxt: 25 cm / no relationship SMGyt: 20 cm / no relationship		
Land Use			SMG: 68% cultivation, 28% wooded, 6% hayland SMGxt: 100% cultivation SMGyt: 67% cultivation, 33% wooded		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Dark brown, very dark grayish brown, brown / brown, light olive brown, yellowish brown, dark yellowish brown (variable colour change)		
PROFILE SITE: 0724BH			**Orthic Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-15	Dark brown	Silt loam	Granular	Friable
Bt	15-34	Brown	Silty clay loam	Subangular blocky	Firm
Ck	34-220	Light olive brown	Silty clay	Massive	Firm

4.1.23 Waupoos (WPO), Gleyed Waupoos (WPOgl), Waupoos-XL (WPOxl) and Waupoos-YL (WPOyl) Soil Units

Waupoos (WPO) soils are relatively common along the proposed route and are characterized by well drained Orthic Gray Brown Luvisols developed on moderately fine-textured morainal deposits (Photo 6, Appendix F). Waupoos-XT (WPOxt) and Waupoos-YT (WPOyt) are Orthic Gray Brown Luvisols developed on morainal veneers or blankets of varying thickness overlying consolidated bedrock. Gleyed Waupoos (WPOgl) are imperfectly drained Gleyed Gray Brown Luvisols developed on morainal deposits. Further details and a typical soil profile are provided in Table 34, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 7 to 33 cm,. Mapped topsoil depths range from 10 to 30 cm. Colour change between topsoil and upper subsoil is usually indistinct and thus topsoil stripping should be to the depth indicated on the environmental alignment sheets.
- Three-lift soil handling is required for the lithic phases of Waupoos soils (WPOxl and WPOyl) due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- The potential for compaction to occur is moderate for WPO, WPOxl and WPOyl soils due to the moderately fine texture of the soil. The compaction risk rating for WPOgl is elevated to high due to the moderately fine texture and imperfect soil drainage. When practicable, construction and reclamation should occur during frozen and/or dry soil conditions to reduce the potential for compaction. Subsoiling during dry soil conditions prior to topsoil placement and then discing topsoil will help to mitigate compaction.
- Wind erosion risk is low WPO, WPOgl, WPOxl and WPOyl soils, while the water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 34 Waupoos (WPO), Gleyed Waupoos (WPOgl), Waupoos-XL (WPOxl), Waupoos-YL (WPOyl) soil units summary

Extent (kilometres / percentage)			WPO:6.9 km / 2.6% WPOgl: 1.3 km / 0.5% WPOxl: 3.9 km / 1.5% WPOyl: 3.5 km / 1.3%		
Soil Classification			WPO, WPOxl, WPOyl: Orthic Gray Brown Luvisol WPOgl: Gleyed Gray Brown Luvisol		
Parent Material			WPO, WPOgl: Morainal WPOxl, WPOyl: Morainal over bedrock		
Texture: (topsoil / upper subsoil)			Loam, clay loam, clay / clay, clay loam		
Topography / Percent Slope			WPO: 2 – 7 / 0.5% to 45% WPOxl, WPOyl: 2 – 4 / 0.5% to 10% WPOgl: 1 – 4 / 0% to 10%		
Surface Stoniness			S0 to S1 (non-stony to slightly stony)		
Drainage Class			WPO, WPOxl, WPOyl: Well drained WPOgl: Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			WPO, WPOxl: 10-30 cm / no relationship WPOgl: 15-25 cm / no relationship WPOyl: 15-30 cm / no relationship		
Land Use			WPO: 29% wooded, 27% cultivated, 19% hayland, 17% pasture, 5% bush, 4% disturbed land WPOgl: 71% cultivation, 15% pasture, 14% wooded WPOxl: 46% wooded, 29% hayland, 9% pasture, 8% cultivated, 7% bush WPOyl: 45% cultivated, 33% pasture, 17% wooded, 6% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, dark brown, very dark brown, dark grayish brown / brown, dark yellowish brown, dark brown, olive brown (indistinct change)		
PROFILE SITE: 0194BH			**Orthic Gray Brown Luvisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-24	Dark brown	Loam	Granular	Friable
Bt	24-47	Brown	Clay loam	Subangular blocky	Firm
Ck	47-220	Light olive brown	Clay loam	Massive	Firm

4.1.24 Bottom Land (ZAL) Soil Unit

Bottom Land (ZAL) soils represent a small portion of the soils present and are classified as imperfectly drained Gleyed Melanic Brunisols developed on moderately coarse to moderately fine-textured fluvial deposits (Photo 7, Appendix F). Further details and a typical soil profile are provided in Table 35, with additional comments in the bulleted list below:

- Topsoil depths observed in the field range from 11 to 38 cm. Mapped topsoil stripping depths range from 10 to 35 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- Trench stability is a concern where the fluvial deposits are coarse textured. Trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure.
- Wind erosion risk is low for ZAL soils, while the water erosion risk is moderate on slopes less than 5% and high on slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 35 Bottom Land (ZAL) soil unit summary

Extent (kilometres / percentage)			4.6 km / 1.7%		
Soil Classification			Gleyed Melanic Brunisol		
Parent Material			Fluvial		
Texture: (topsoil / upper subsoil)			Loam, silt loam / sandy loam, loamy sand, clay loam		
Topography / Percent Slope			1 – 6 / 0% to 30%		
Surface Stoniness			S0 to S2 (non-stony to slightly stony)		
Drainage Class			Imperfectly drained		
Mapped Topsoil Depth / Relationship to Topography			10-35 cm / topsoil depths increase in lower slope positions		
Land Use			61% wooded, 27% cultivation, 9% pasture, 2% hayland, 1% wetland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, dark grayish brown, very dark brown, dark brown / dark grayish brown, brown, light olive brown, dark yellowish brown (distinct change)		
PROFILE SITE: 3374BH			**Gleyed Melanic Brunisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0 – 25	Very dark grayish brown	Silt loam	Granular	Friable
Bmgj	25 – 65	Brown	Sandy loam	Subangular blocky	Friable
Cg	65 – 220	Light olive brown	Loamy sand	Single grain	Loose

4.1.25 Disturbed Land (ZDL) Soil Unit

Disturbed Land (ZDL) soils are used to describe soils that have been disturbed through anthropogenic activities. Topsoil and/or subsoil may be disturbed and admixed and soil salvage may not be required; environmental alignment sheets indicate if soil salvage is required and provide guidance on stripping depths. ZDL soils are not classified to the subgroup level. ZDL soils occur on moderately coarse to moderately fine textured morainal and glaciofluvial deposits. Further details and a typical soil profile are provided in Table 36, with additional comments in the bulleted list below:

- Topsoil depths observed in the field are highly variable and range from 5 to 50 cm. Mapped topsoil depths range from 0 to 30 cm. The colour change between topsoil and subsoil is typically distinct thus topsoil stripping is generally recommended to colour change. The environmental alignment sheets provide further guidance regarding stripping depths.
- ZDL soils were not assessed for wind and water erosion risk. Topsoil within ZDL soil units is generally absent or highly degraded due to admixing of topsoil and subsoil. Due to the decreased soil quality, the minor erosion that may occur is not expected to be an issue.
- If coarse textured deposits are encountered within ZDL soil units, trench stability will be a concern. Where necessary, trench walls should be reinforced and excess traffic adjacent to the trench minimized. The distance between the spoil piles and the trench should be increased to reduce the potential for trench failure.

Table 36 Disturbed Land (ZDL) Soil Unit

Extent (kilometres / percentage)			2.6 km / 1%		
Soil Classification			-		
Parent Material			Morainal, glaciofluvial		
Texture: (topsoil / upper subsoil)			Loam, sandy loam, clay loam / clay loam, silty clay loam, sandy clay loam, sandy loam, loamy sand, sand		
Topography / Percent Slope			2 – 6 / 0.5% to 30%		
Surface Stoniness			S0 to S2 (non-stony to moderately stony)		
Drainage Class			Variable		
Mapped Topsoil Depth / Relationship to Topography			0-30 cm / topsoil depths increase in low areas		
Land Use			100% disturbed land		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, dark grayish brown, very dark brown, dark brown / dark grayish brown, brown, light olive brown, dark yellowish brown (distinct change)		
PROFILE SITE: 3950BH			**Disturbed Land**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ap	0-31	Very dark grayish brown	Loam	Granular	Friable
Bmk	31-53	Brown	Sandy loam	Subangular blocky	Loose
Ck	53-70	Light olive brown	Sandy loam	Massive	Friable

4.1.26 Muck (ZMK) Soil Unit

Muck (ZMK) soils occupy a minor portion of the proposed route and are classified as very poorly drained Terric Humisols developed on undifferentiated organic accumulations. Further details and a typical soil profile are provided in Table 37, with additional comments in the bulleted list below:

- Organic horizon depths range from 30 to 80 cm. The surficial organic material is stripped to a depth of 10 to 30 cm and stockpiled for use in reclamation. The colour change is variable and thus organic stripping should be to the depth indicated on the environmental alignment sheets.
- The wind and water erosion risk for ZMK soils is low.
- Trench stability is a serious concern due to the excess wetness and potentially high water table associated with organic soils. Trench faces should be reinforced where necessary and excess traffic adjacent to the trench should be avoided. Reclamation material should not be stockpiled immediately next to the trench.
- Poor trafficability and rutting are also concerns as a result of the excess wetness. When practicable, construction and reclamation should occur during frozen conditions.

Table 37 Muck (ZMK) Soil Unit

Extent (kilometres / percentage)			4.5 km / 1.7%		
Soil Classification			Terric Humisol		
Parent Material			Undifferentiated organic over morainal, glaciofluvial and/or glaciolacustrine		
Texture: (topsoil / upper subsoil)			Organic / sandy loam, loamy sand, heavy clay		
Topography / Percent Slope			1 – 4 / 0% to 10%		
Surface Stoniness			S0 (non-stony)		
Drainage Class			Very poorly drained		
Mapped Organic Horizon Depth / Relationship to Topography			10 - 30 cm / no relationship		
Land Use			52% wetland, 34% muskeg, 9% cultivated, 5% wooded		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Organic / Light olive brown (variable change)		
PROFILE SITE: 2200BH			**Terric Humisol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Oh	0-45	-	Peat	-	-
Cg	45-220	Light olive brown	Heavy clay	Massive	Sticky

4.1.27 Rockland (ZRL) Soil Unit

Rockland (RKL) soils occur commonly along the Project route and are characterized by very rapidly drained Orthic Humic Regosols developed on bedrock (Photo 10, Appendix F). The Rockland soil unit is dominated by surface bedrock outcrops that limit soil development to areas with 10 cm or more of soil material over consolidated rock. Further details and a typical soil profile are provided in Table 38, with additional comments in the bulleted list below:

- Topsoil depths range from 3 to 30 cm. Mapped topsoil depths range from 0 to 30 cm. Where shallow subsoil horizons are present, the colour change between topsoil and subsoil is usually indistinct and thus topsoil stripping should be to the depth indicated on the environmental alignment sheets. Where subsoil is absent, topsoil can be salvaged down to bedrock.
- Three-lift soil handling is required for Rockland soils (ZRL) due to the presence of consolidated bedrock within trench depth; specific soil handling instructions are provided on the environmental alignment sheets.
- Wind erosion risk is low, while water erosion risk is low for slopes less than 5% and high for slopes greater than 5%. Tackifier application or other erosion mitigation measures may be required for high risk areas.

Table 38 Rockland (ZRL) Soil Unit Summary

Extent (kilometres / percentage)			12.7 km / 4.8%		
Soil Classification			Orthic Humic Regosol		
Parent Material			Bedrock		
Texture: (topsoil / upper subsoil)			Loam, clay loam, sandy loam / bedrock		
Topography / Percent Slope			1 – 5 / 0% to 15%		
Surface Stoniness			S0 to S5 (non-stony to excessively stony)		
Drainage Class			Very rapidly drained		
Mapped Topsoil Depth / Relationship to Topography			0-30 cm / no relationship		
Land Use			68% wooded, 26% pasture, 4% bush, 2% hayland		
Sod Quality (good / poor)			Poor		
Colour Transition (topsoil / upper subsoil)			Very dark grayish brown, dark brown, very dark brown, very dark gray / bedrock (indistinct change)		
PROFILE SITE: 1772BH			**Orthic Humic Regosol**		
Horizon	**Depth (cm)**	**Colour**	**Texture**	**Structure**	**Consistence**
Ah	0-19	Very dark grayish brown	Loam	Granular	Friable
R	19+	-	Bedrock	-	-

4.2 Soil Suitability for Reclamation

The topsoil, upper subsoil and lower subsoil of the mapped soil units along the proposed route were assessed for reclamation suitability, using representative soil profiles and associated laboratory data. The lab data is presented in Table C-2 in Appendix C and the assessment is presented in Table D-1 in Appendix D. Where lab data was not available, soil units were assessed using attributes observed in the field. For example, in some cases organic carbon was estimated based on topsoil colour and a table in *Land Suitability Rating System for Agricultural Crops; 1. Spring-seeded small grains* (Agronomic Interpretations Working Group 1995). Minor soil units and certain horizons within minor soil units were not assessed if sufficient data was unavailable. Similarly if topsoil, upper subsoil, lower subsoil or bedrock was not encountered within a soil profile, a rating is not provided. This may be due to auger refusal due to gravel (as indicated by "gr" and "yg" modifiers), the presence of shallow bedrock (as indicated by "xl" and "yl" modifiers) and/or soil morphology (as indicated by "zr" modifier). Reclamation suitability ratings for mapped soil units that were assessed are presented in Table 39.

Table 39 Soil suitability for reclamation assessment by soil series and soil quality parameter

Soil Units	Reclamation Suitability Ratings (Limitations[1])			
	Topsoil	Upper Subsoil	Lower Subsoil	Bedrock
AHG	Fair (5)	Good	Fair (10)	n/a
AHGzz	Good	Poor (10)	Poor (10)	n/a
BDH	Good to Poor (2,10)	Poor (2, 10)	Good to Poor (6, 10)	n/a
BDHgl	Good to Poor (10)	Poor (10)	Fair (6,8,10)	n/a
BDHxl	Fair to Poor	Poor (2)	Poor (6)	Unsuitable (10)
BGH	Fair to Poor (2,10)	Poor (6,10)	Poor (6,10)	n/a
BGHgl	Good	Good	Fair (6,10)	n/a
BGHgr	Good	Poor (8)	Poor (8)	n/a
BGHxt	Good	Poor (10)	Poor (10)	n/a
BGHyg	Good	Poor (10)	Poor (8)	n/a
BGHyt	Good	Poor (10)	Fair (6,10)	n/a
BGHzr	Good	n/a	Poor	n/a
CEY	Good	Fair (6,10)	Fair (6,10)	n/a
CEYpt	n/a	Fair (8)	Fair (8)	n/a
CEYzr	Poor (10)	n/a	Poor (10)	n/a
CSH	Fair (5,10)	Fair (10)	Fair (6,8)	n/a
CSHgl	Fair (5,10)	Poor (10)	Poor (10)	n/a
DGT	Good	Poor (10)	Poor (10)	n/a
EOKyt	Good	Fair (6)	Poor (10)	n/a
FRM	Fair to Poor (2,5)	Fair to Good (8,10)	Fair to Poor (2,6,8,10))	n/a
FRMxl	Fair (10)	Fair (8,10)	Fair (6,8,10)	Unsuitable
FRMyl	Fair (10)	Fair (6,10)	Poor (6,10)	Unsuitable
GNY	Fair (5)	Poor (10)	Fair (6,8,10)	n/a
GNYpt	n/a	Poor (6,10)	Poor (6,10)	n/a
GVI	Poor (10)	Poor (10)	Good	n/a
GVIxl	Fair (7,10)	Fair (8,10)	Fair (6,8,10)	Unsuitable

Soil Units	Reclamation Suitability Ratings (Limitations[1])			
	Topsoil	Upper Subsoil	Lower Subsoil	Bedrock
LDW	Fair (6,10)	Poor (6,10)	Poor (6,10)	n/a
LDWxl	Fair (6,10)	Poor (10)	n/a	Unsuitable
LYS	Good to Fair (5)	Fair (4,8)	Fair (2,4,6,8)	n/a
LYSxl	Fair (10)	Fair (6,10)	Poor (10)	Unsuitable
LYSyl	Fair (6,10)	Fair (6,10)	Fair (6,8,10)	Unsuitable
LYSzr	Good	n/a	Fair (2)	n/a
MCW	Fair (10)	Poor (6,10)	Poor (6,10)	n/a
MCWxl	Fair (10)	Poor (10)	Poor (10)	Unsuitable
MLE	Fair (10)	Fair (6,10)	Poor (10)	n/a
MTD	Fair (7)	Poor (6)	Poor (6)	n/a
MTDxl	Fair (7)	Good	Fair (6,8,10)	Unsuitable
MTDyl	Fair (10)	Fair (10)	Fair (6,10)	Unsuitable
NPE	Poor (6)	Poor (10)	Poor (6)	n/a
NPExl	Fair (6,10)	Poor (6,10)	n/a	Unsuitable
NPEyt	Poor (6,10)	Poor (6,10)	Poor (6,10)	n/a
NPEzr	Good	Poor (6,10)	Poor (6,10)	n/a
NWC	Fair (5)	Fair (6)	Fair (4,6,8)	n/a
NWCgl	Good	Fair (10)	No data	n/a
NWCxt	Good	Fair (6,10)	Fair (6,10)	n/a
OBE	Good to Fair (2,7)	Good	Fair to Poor (6,8)	n/a
OBEgl	Good	Good	Poor (10)	n/a
OBEgr	Fair (7)	Poor (8)	No Data	No Data
OBExl	Fair (7,10)	Fair (8,10)	n/a	Unsuitable
OBEzr	Poor (10)	Poor (10)	Poor (10)	n/a
SIY	Good	Fair (10)	Fair (6,10)	n/a
SMF	Good	Fair (10)	Fair (6,10)	n/a
SMG	Good	Fair (10)	Fair (6,8,10)	n/a
SMGxt	Fair (5,10)	Fair (10)	Poor (10)	n/a
SMGyt	Good	Fair (6,10)	Poor (10)	n/a
SMVyl	Poor (10)	Poor (10)	Poor (10)	Unsuitable
WPO	Poor (4)	Poor (6,10)	Poor (6,10)	n/a
WPOgl	Good	Fair (6,8,10)	Fair (6,8,10)	n/a
WPOxl	Fair (10)	Fair (6)	Fair (6)	Unsuitable
WPOyl	Poor (10)	Poor (10)	Poor (10)	Unsuitable
ZAL	Good	Poor (10)	Fair (8)	n/a
ZRL	Fair (2)	Fair (8,10)	n/a	Unsuitable

[1] Limitations : (1) = EC (dS/m), (2) = pH, (3) = SAR, (4) = Saturation percent (%), (5) = CaCO3 Equivalent (%), (6) = Moist consistence, (7) = Coarse Fragments (%), (8) = Surface stoniness, (9) = Organic carbon (%), (10) = Texture, n/a = horizon not present

Topsoil for the majority of mapped soil units is rated Good, Good to Fair, or Fair for use in reclamation. When topsoil is rated Good to Fair or Fair it is most often due to limitations imposed on the soil by consistence, surface stoniness and structure. There are a few soil units with topsoil that is rated Fair to

Poor, or Poor; the Poor ratings are generally due to very low pH, very coarse textures (loamy sand, sand) and/or very fine textures (clay, silty clay, sandy clay, heavy clay). Poor ratings for topsoil are also occasionally due to unfavourable consistence or saturation percent.

The majority of upper subsoil is rated Fair or Poor for reclamation. Where upper subsoil is rated Fair, the limitations on the soil are most often caused by firm consistence, coarse fragments and texture. Poor ratings for upper subsoil are generally due to pH, consistence, and texture.

The lower subsoil of the mapped soil units is rated Fair, Fair to Poor, or Poor for use in reclamation. Fair ratings are generally due to consistence, coarse fragments and/or texture. Poor ratings are most often the result of very fine (clay, silty clay, sandy clay, heavy clay) and/or very coarse textures (loamy sand, sand); consistence and coarse fragments occasionally impact the reclamation suitability ratings of the lower subsoil as well.

4.3 Agricultural Suitability

Soil units present along the proposed route were assessed according to guidelines in the *Classifying Prime and Marginal Agricultural Soils and Landscapes: Guidelines for Application of the Canada Land Inventory in Ontario* (OMAFRA 2014). Results of the assessment are presented in Table 40. Soil units with minor extents are not included.

Table 40 Agriculture suitability ratings

Soil Series	Soil Series Symbol	Subclass Limitations Identified[1]	Overall Agricultural Capability
Achigan	AHG	2F, 2M	2FM
Achigan-ZZ	AHGzz	2T	2T
Bondhead	BDH	2D, 2M	2DM
Bondhead-GL	BDHgl	2D	2D
Bottomland	ZAL	2F, 2W, 3I,	3I
Brighton	BGH	3F, 3M	3FM
Brighton-GL	BGHgl	2F	2F
Brighton-GR	BGHgr	3F, 3M	3FM
Brighton-XT	BGHxt	2M, 3F	3F
Brighton-YG	BGHyg	3F	3F
Brighton-YT	BGHyt	3F, 2M	3F
Cheney	CEY	5W, 2F	5W
Cheney-PT	CEYpt	7I	7I
Cheney ZR	CEYzr	2F, 2T, 2W	2ST
Cashel	CSH	2D	2D
Cashel-GL	CSHgl	2D	2D
Darlington	DGT	None	1
Elmbrook-YT	EOKyt	2D, 2T	2DT
Farmington	FRM	None	1
Farmington-XL	FRMxl	4R	4R
Farmington-YL	FRMyl	2D, 3W	3W
Granby	GNY	3F, 3T, 5W	5W
Granby-PT	GNYpt	2D, 3W	3W

Soil Series	Soil Series Symbol	Subclass Limitations Identified[1]	Overall Agricultural Capability
Grenville-XL	GVIxl	4R	4R
Landsdowne	LDW	2D, 3F	3F
Landsdowne-XL	LDWxl	2D, 3F, 3R	3FR
Lyons	LYS	2D, 3W	3W
Lyons-XL	LYSxl	2D, 3R, 4W	4W
Lyons-YL	LYSyl	2D, 3W	3W
Lyons-ZR	LYSzr	3W	3W
Matilda	MTD	2P	2P
Matilda-XL	MTDxl	2P, 3R	3R
Matilda-YL	MTDyl	2D	2D
Milliken	MLE	1	1
Moscow	MCW	3W	3W
Moscow-XL	MCWxl	2D, 3R, 4W	4W
Muck	ZMK	7I, 5W	7I
Napanee	NPE	2D, 3T, 3W	3TW
Napanee-XL	NPExl	2D, 3R, 4W	4W
Napanee-YT	NPEyt	2D, 3T, 3W	3TW
Napanee-ZR	NPEzr	2D, 3W	3W
Newcastle	NWC	None	1
Newcastle-GL	NWCgl	None	1
Newcastle-XT	NWCxt	None	1
Otonabee	OBE	2M, 2T	2MT
Otonabee-GL	OBEgl	2P, 2T	2PT
Otonabee-GR	OBEgr	2M, 2T	2MT
Otonabee-XL	OBExl	3P, 3R	3PR
Otanabee-YL	OBEyl	3W	3W
Otonabee-ZR	OBEzr	3T	3T
Rockland	ZRL	5W, 7R	7R
Sidney	SIY	5W	5W
Smithfield	SMF	2D, 2T, 2W	2SW
Schomberg	SMG	3D, 3W	3DW
Schomberg-XT	SMG	2D	2D
Schomberg-YT	SMG	2D, 3T, 3W	3TW
Solmesville YL	SMV	2D, 3W	3W
Waupoos	WPO	2D	2D
Waupoos-GL	WPOgl	2D, 3T, 3W	3TW
Waupoos-XL	WPOxl	2D, 3R, 3W	3RW
Waupoos-YL	WPOyl	2D, 2T	2DT

[1] Subclass limitations defined in section 3.6, Table 11.

Class 1 soils with no significant limitations encountered along the Project route include DGT, FRM, MLE, NWC and NWCxt soils. In total there are 12.2 km (5%) of Class 1 soils.

The majority of soil series present along the proposed route are classified as Class 2 (85.7 km; 34%) or Class 3 (86.5 km; 35%) soils with slight to moderate limitations that may restrict the choice of crop or require conservation practices. These soils are most commonly limited by soil structure and/or low permeability, low natural fertility, excess water and topography.

Class 4 (15.5 km; 6%) and Class 5 (9.1 km; 4%) soils with severe to very severe limitations includes LYSxl, MCWxl, NPExl, CEY, FRMxl, GNY, GVIxl, OGOpt and OGOyl. These soils are all either poorly drained and are limited by the presence of excess water or have consolidated bedrock very near the surface.

Class 7 (14.6 km, 6%) soils are incapable of being used for cultivation or permanent pasture and are limited by inundation by lakes or streams or extremely shallow bedrock. These soil include CEYpt, ZMK and ZRL.

None of the soil units assessed for agricultural capability were rated as Class 4 land. Agricultural ratings were not determined for 25.3 km (10%) of the pipeline, including sections that were not mapped due to access restrictions.

By virtue of location, climatic limitations (subclass C) do not apply to any of the soil series encountered in the Project route.

5 DISCUSSION

5.1 Soil Handling Recommendations

Careful topsoil salvage is required to support successful reclamation along the proposed route. Topsoil stripping depths are highly variable, with specific depths provided on environmental alignment sheets that accompany this report. Where the color change between topsoil and subsoil is distinct, it can be used in conjunction with recorded depth ranges to guide equipment operators to the appropriate salvage depth. When the color change between topsoil and subsoil is indistinct, a specific stripping depth is provided on the environmental alignment sheets. Although rare occurrences of topsoil depths greater than 50 cm were identified, recommended stripping depths do not exceed 50 cm.

Topsoil should be salvaged on all land uses. Whether the entire spoil, ditch and work side of the pipeline requires stripping will depend on the final grade plan. Salvaged topsoil should be windrowed in the most appropriate location (i.e. subject to the lowest risk of disturbance) based on the grade plan. Transition material (i.e. “seconds”) between the topsoil and upper subsoil should also be windrowed next to the topsoil in upland areas. In areas where grade material is removed to provide the correct grade for the pipeline, this material should be stored separately from the topsoil and transition materials.

Within agricultural lands (cultivated, hayland and pasture) the colour change described is generally between the dark, ploughed horizon at the surface that is rich in organic matter (Ap and/or Ah) and the underlying upper subsoil. Within undisturbed wooded and bush land uses the colour change described is generally between the light brownish A horizon (Ae, Aegj, and/or Aeg) and the darker upper subsoil. These light-coloured A horizons may also be overlain by a darker A horizon rich in organic matter (Ah, Ahe, and/or Ahegj); care must be taken to not mistake the colour change between the A horizons for the colour change between the topsoil and upper subsoil. The depths provided on the environmental alignment sheets provide the necessary guidance on stripping depths and a range of depths or approximate depth where the colour change will be encountered.

To prevent overestimating the volume of topsoil, topsoil depths provided on the environmental alignment sheets for wooded and bush areas do not include the LFH (leaf litter). The depth provided is the depth of mineral soil that should be stripped. The LFH - and shallow peat in some cases - should be salvaged along with the topsoil horizons as an organic amendment that will increase water holding capacity and available nutrients, plus provide an important seed and propagule source for revegetation.

Soil compaction and rutting are concerns for many of the medium and finer-textured soils that occur along the proposed route. Finer textures in many of the soils increase the risk of compaction during construction and reclamation. To the extent feasible, construction of the pipeline should not take place on these soils during wet conditions. Prior to replacing topsoil, if conditions are dry these soils should be broken with the appropriate equipment/method to ameliorate compaction during final reclamation. Poorly drained soils are also at high risk for compaction and rutting. Traffic should likewise be minimized on these soils as much as practicable. If the soils are frozen at the time of construction, compaction and rutting will not be as much of a concern.

Trench stability issues are a concern with sandy, organic and Gleysolic soils. Coarse textures and/or high water tables in these areas may cause the trench to collapse. In these cases, ensure that windrowed soils and equipment traffic are kept a safe distance from the trench to mitigate this risk.

The water erosion risk for the majority of the soils present along the Project route is moderate to high. Management practices to reduce associated soil loss may be required within these soil units and in areas with steeper slopes. Although wind erosion risk is low for many of the soils on the Project route, some soils have a moderate or high risk of wind erosion. Coarse-textured soils are highly susceptible to wind erosion and require mitigation measures such as tackifier application to reduce soil loss. Extended periods of drought and strong winds could increase the risk of soil loss. Likewise, topsoil salvage should be minimized in exposed areas during windy conditions and periods of drought. It may also be necessary to apply a tackifier to topsoil in areas that are extremely dry or exposed to strong winds.

Soil characteristics and associated construction considerations are summarized in a soil legend presented in Appendix D.

5.2 Alternative Soil Handling

Soils encountered along the proposed pipeline were assessed for alternative soil handling procedures according to the *Guidelines for Alternative Soil Handling Procedures During Pipeline Construction* (Pettapiece and Dell 1996), reproduced in Appendix F. Areas that require alternative soil handling are identified on the accompanying environmental alignment sheets; a stripping depth for topsoil and the upper subsoil second lift is provided for these soil units.

Where soils do not require three-lift soil handling, standard two-lift handling can be applied, though TransCanada best practices include salvaging the transition zone between topsoil and upper subsoil as “seconds”, effectively adding another lift. Topsoil should be salvaged and windrowed separately from the “seconds” and upper and lower subsoil. For these areas, upper subsoil and lower subsoil (spoil) can be salvaged and windrowed together as one lift. Where space allows, one metre separation should be maintained between windrows to prevent accidental material mixing.

Due to the nature of parent material along the route, no saline or sodic subsoil was identified, thus alternative handling is only required for portions of the proposed route where bedrock or high gravel contents were encountered within trench depth (see photos 11, 12, and 20 in Appendix F for examples of shallow bedrock). Since gravel was rarely found, the majority of alternative soil handling is due to the presence of consolidated bedrock; these areas are identified with the modifiers “xl” or “yl” or by the series ZRL. In order to maintain soil quality in the rooting zone, three-lift soil handling is recommended

for these areas. This includes all land uses that are currently used for agriculture as well as areas that may reasonably be converted to an agricultural land use at some point in the future. Three lift handling is not recommended for soil units where steep slopes or wet areas preclude agriculture.

Three-lift soil handling is also recommended for soil units where large amounts of gravel were found within trench depth. These soil units are identified with the modifiers “gr” and “yg”, with specific soil handling recommendations provided on the environmental alignment sheets.

To preserve soil quality, care should be taken to not overstrip topsoil or upper subsoil in areas requiring three-lift handling. As with standard handling practices, topsoil, upper subsoil and spoil should be salvaged and windrowed separately. One metre separation should be maintained between windrows where space allows, to prevent accidental mixing of material.

Where bedrock is present within trench depth, backfilling the trench typically includes using sand instead of the bedrock shards to cover the pipe. This may result in excess spoil that will have to be removed from the site.

Based on current mapping, approximately 25.6 km (10%) of the proposed route requires three-lift handling, comprised of the following soil units:

- BGHgr (0.34 km) and BGHyg (0.12 km);
- FRMxl (6.22 km) and FRMyl (1.64 km);
- LDWxl (1.09 km)
- LYSxl (3.28 km) and LYSyl (0.42 km);
- MCWxl (0.73 km)
- MTDgr (0.14 km), MTDxl (0.69 km) and MTDyl (0.29 km);
- NPExl (1.22 km)
- OBEgr (0.67 km) and OBExl (2.73 km)
- SIYxl (0.18 km)
- SMVyl (0.25 km);
- WPOxl (1.80 km) and WPOyl (3.11 km); and
- ZRL (0.67 km)

Refer to the accompanying environmental alignment sheets for further information regarding stripping depths for the affected soil units.

Soil characteristics and associated construction considerations are summarized in a soil legend presented in Appendix D.

5.3 Soil Suitability for Reclamation

While the guidelines presented in *Soil Quality Criteria Relative to Disturbance and Reclamation* (Alberta Agriculture, Food and Rural Development 1987) are not currently used to identify soils requiring alternative soil handling methods, the reclamation suitability ratings can be used to assess the efficacy of the alternative soil handling guidelines and provide additional information to help focus reclamation monitoring efforts.

Along the Project route, topsoil is generally rated Good to Fair, with minor extents of Poor ratings. Fair topsoil ratings are most commonly the result of moderately fine textures (clay loam, silty clay loam, sandy clay loam), low pH values, surface stoniness, $CaCO_3$ equivalence and consistence. Poor topsoil ratings are most commonly due to coarse textures (loamy sand, sand) and very low pH. Topsoil is salvaged separately from subsoil within all soil units so the range in topsoil suitability ratings for the

mapped soils does not impact soil handling; salvaging topsoil separately from upper subsoil maintains the quality of the topsoil and minimizes reclamation risk.

The reclamation suitability of the upper subsoil and lower subsoil generally ranges from Fair to Poor. Fair ratings for the upper and lower subsoil are most commonly due to consistence, coarse fragments and texture. Where upper and lower subsoil were rated Poor, the limitation is most related to texture and consistence. All bedrock encountered within trench depth is rated Unsuitable for reclamation, resulting in alternative handling recommendations.

6 CLOSURE

We trust the contents of this report of this report meet your requirements. Please do not hesitate to contact the undersigned should you have any questions or require further assistance.

Report Prepared by:

Steven Murchison, B.Sc., P.Ag., Soil Specialist

Eldon Borgen, RT Ag., Soil Specialist

Scott Boorman, B.Sc., P.Ag., Soil Specialist

PARAGON SOIL & ENVIRONMENTAL CONSULTING INC.

PER _____

Scott Boorman, B.Sc., P.Ag.

OIA Registration Number 3533

Soil Specialist

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Appendix A Site Inspection List

Inspection site data for all sites completed along the Project route is presented in Table A-1. Definitions for each parameter are provided in Appendix B in the site inspection list key.

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Appendix A Site Inspection List

Table A-1. Site Inspection Data

Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0001	CSH	O.MB	GLLC/M	Mid	2	S0	W	C	u	25	-	C	SCL	-
0002	CSHgl	GL.MB	GLLC/M	Mid	3	S1	I	C	u	25	-	CL	CL	-
0003	ZALxt	O.MB	FLUV/M	Mid	2	S0	W	C	u	11	-	L	fS/CL	-
0004BH	CSH	O.GBL	GLLC/M	Mid	3	S1	MW	C	u	34	58	CL	CL	CL/SL
0005	CSH	O.GBL	GLLC/M	Mid	4	S1	W	C	u	19	-	SCL	CL	-
0006	BDH	O.GBL	M	Mid	3	S2	W	C	u	22	-	L	CL	-
0007BH	GVI	O.MB	M	Mid	3	S1	W	C	u	13	63	L	SL	CL/SCL
0008	CSH	O.GBL	GLLC/M	Lower	4	S1	W	C	u	28	-	CL	CL	-
0009	-	-	M	Lower	3	S1	-	W	u	30+	-	L	-	-
0010BH	CSH	O.GBL	GLLC/M	Upper	3	S1	MW	C	u	23	55	CL	CL	C
0011	CSH	O.MB	GLLC/M	Mid	2	S0	W	C	u	27	-	SCL	SCL	-
0012	ZAL	O.MB	FLUV	Crest	2	S0	W	C	u	29	-	L	SiL	-
0013BH	ZALxt	GL.MB	FLUV/M	Lower	3	S0	MW	C	u	32	80	L	SiL	LfS/C
0014	-	-	FLUV	Lower	3	S0	-	W	u	30+	-	SiL	-	-
0015	CSH	O.GBL	GLLC/M	Mid	3	S1	MW	C	u	28	-	CL	C	-
0016BH	CSH	O.GBL	GLLC/M	Mid	2	S1	MW	C	u	18	60	CL	C	C
0017	MLE	GL.GBL	M	Upper	2	S1	MW	C	u	13	22	CL	C	C
0018	-	-	M	Lower	3	S1	-	C	u	30+	-	CL	-	-
0019BH	ZDL	O.R	TILL	Crest	4	S0	MW	DL	u	9	-	SCL	-	SCL/C
0020	ZDL	R.G	TILL	Lower	3	S0	P	DL	u	8	-	CL	-	-
0021BH	ZDL	GL.R	TILL	Mid	4	S0	I	DL	h	5	-	CL	-	C/SCL/C
0022	ZDL	O.HR	TILL	Mid	3	S0	MW	DL	u	12	-	CL	-	SCL
0023	ZDL	O.HR	TILL	Lower	3	S0	W	DL	h	30+	-	CL	-	-
0024	ZDL	O.HR	TILL	Lower	3	S0	MW	DL	u	30+	-	CL	-	-
0025BH	ZDL	O.R	TILL	Lower	2	S0	MW	DL	u	5	-	CL	-	C
0026	ZDL	O.HR	TILL	Mid	5	S0	W	DL	h	19	-	CL	-	C
0027	MLE	GL.GBL	M	Lower	2	S1	I	W	u	20	-	CL	CL	-
0028BH	MLExs	GL.GBL	M	Mid	2	S2	I	C	u	20	35	CL	CL	S

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0029	MLE	GL.GBL	M	Mid	2	S1	I	C	u	23	-	CL	CL	-
0030	MLE	GL.GBL	M	Mid	2	S1	I	C	u	28	-	CL	SCL	-
0031BH	MLE	GL.GBL	M	Depression	2	S1	I	C	u	24	45	CL	SCL	S
0032	-	-	GLLC	Mid	2	S1	-	C	u	30+	-	L	-	-
0033	-	-	M	Mid	2	S1	-	C	u	30+	-	CL	-	-
0034BH	CSHgl	GL.GBL	GLLC/M	Lower	2	S1	I	C	u	24	56	CL	SCL	C
0035	-	-	FLUV	Lower	2	S1	-	C	u	30+	-	L	-	-
0036	CSH	O.GBL	GLLC/M	Lower	3	S1	MW	C	u	28	-	CL	SCL	-
0037BH	LYS	R.HG	M	Depression	4	S1	P	W	u	70	-	CL	-	CL
0038	CSH	O.GBL	GLLC/M	Upper	3	S0	W	P	u	23	-	CL	SCL	-
0039	CSH	O.GBL	GLLC/M	Mid	4	S0	MW	P	u	26	-	CL	C	-
0040BH	CSH	O.GBL	GLLC/M	Mid	3	S0	MW	C	u	27	36	CL	C	C
0041	CSH	O.GBL	GLLC/M	Crest	2	S0	MW	C	u	20	-	CL	C	-
0042	CSH	O.GBL	GLLC/M	Lower	4	S1	MW	P	h	23	-	SiCL	SiL	-
0043	CSH	O.MB	M	Mid	4	S1	W	P	h	10	-	CL	CL	-
0046BH	CSH	O.GBL	GLLC/M	Upper	2	S1	W	C	u	27	53	L	CL	CL
0047	CSH	O.GBL	GLLC/M	Upper	3	S1	W	C	u	22	29	L	CL	CL
0048	CSH	O.GBL	GLLC/M	Mid	3	S1	W	C	u	25	-	L	CL	-
0049BH	CSH	O.GBL	GLLC/M	Upper	3	S1	W	C	u	32	-	CL	-	CL/fS
0050	CSH	O.GBL	GLLC/M	Mid	3	S1	MW	C	u	27	-	CL	C	-
0051	CSH	O.GBL	GLLC/M	Upper	3	S0	W	C	u	27	-	CL	CL	-
0052BH	CSH	O.GBL	GLLC/M	Mid	3	S1	MW	C	u	20	40	CL	C	C/SiCL
0053	ZAL	O.MB	FLUV	Lower	3	S0	W	C	u	28	-	SiL	S	-
0054	CSH	O.GBL	GLLC/M	Mid	4	S0	MW	C	u	25	-	CL	C	-
0055BH	LYSxt	O.HG	M	Depression	6	S1	P	P	h	60	-	SiCL	-	C/SiCL
0056	-	-	M	Mid	2	S2	-	DL	u	30+	-	SCL	-	-
0057	-	-	M	Upper	4	S1	-	DL	u	30+	-	SCL	-	-
0058BH	ZDL	DL	M	Upper	3	S2	MW	DL	u	50	-	SCL	-	SiCL/SiC
0059	-	-	M	Upper	3	S3	-	DL	u	30+	-	CL	-	-
0060	-	-	M	Mid	3	S1	-	DL	u	30+	-	CL	-	-
0061BH	OBE	O.MB	M	Mid	2	S2	MW	DL	u	15	60	CL	CL	SCL/LS/CL
0062	WPO	O.GBL	M	Mid	3	S1	W	DL	u	17	-	L	SCL	-

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0063BH	CSH	O.MB	GLLC/M	Mid	3	S0	MW	P	u	23	40	CL	CL	SiCL/C
0064	CSH	O.GBL	GLLC	Mid	3	S0	W	C	u	27	-	SiL	CL	-
0065BH	CSH	O.GBL	GLLC/M	Mid	3	S0	MW	C	u	29	50	SiL	CL	C
0066	CSHgl	GL.GBL	GLLC/M	Mid	4	S0	I	C	u	29	-	SiL	C	-
0067	CSH	O.MB	GLLC/M	Upper	3	S1	MW	C	u	27	-	SiL	CL	-
0068	-	-	GLLC/M	Mid	4	S0	-	C	u	30+	-	SiL	-	-
0069BH	CSHgl	GL.GBL	M	Mid	3	S1	MW	C	u	29	-	SiCL	-	C/SiCL
0070	SIY	O.HG	GLLC	Lower	3	S0	P	W	u	25	-	L	SiCL	-
0071	CSH	O.MB	GLLC/M	Lower	3	S0	W	C	u	29	-	L	SCL	-
0072	CSH	O.MB	GLLC/M	Mid	3	S0	W	C	u	28	-	L	CL	-
0073	CSH	O.GBL	GLLC/M	Mid	3	S0	W	C	u	29	-	L	C	-
0074BH	GVI	O.MB	M	Mid	3	S1	W	C	u	17	50	CL	C	SL
0075	CSH	O.MB	GLLC/M	Mid	3	S1	W	C	u	28	-	L	CL	-
0076	CSH	O.MB	GLLC	Mid	3	S1	W	C	u	22	-	L	SCL	-
0077	CSH	O.MB	GLLC	Mid	3	S1	W	C	u	22	-	L	SCL	-
0078BH	CSH	O.MB	GLLC/M	Mid	3	S1	W	C	u	19	44	L	CL	CL
0079	CSH	O.GBL	GLLC/M	Lower	3	S0	MW	C	u	20	-	L	C	-
0080	-	-	GLLC	Lower	2	S0	-	C	l	30+	-	SiCL	-	-
0081BH	GVI	O.MB	M	Mid	3	S1	W	C	u	25	38	L	SL	C
0082	CSH	O.MB	GLLC/M	Upper	3	S1	W	C	u	20	-	L	SiCL	-
0083	CSH	O.MB	GLLC/M	Mid	3	S1	W	C	u	24	-	L	CL	-
0084BH	OBEgl	GL.MB	M	Mid	3	S1	I	C	u	25	43	CL	S	C
0085	OBE	O.MB	M	Mid	3	S1	W	C	u	25	-	L	SL	-
0086	OBE	O.MB	M	Mid	2	S1	W	C	u	27	-	L	S	-
0087BH	OBEgl	GL.MB	M	Mid	3	S1	I	H	u	35	50	L	L	L/LS/HC
0088	CSH	O.GBL	GLLC/M	Mid	3	S0	MW	H	u	10	-	CL	CL	-
0089BH	CSH	O.GBL	GLLC/M	Mid	2	S0	W	H	u	17	38	L	CL	SCL
0090	CSH	O.GBL	GLLC/M	Mid	2	S0	W	H	u	19	-	L	CL	-
0091	CSH	O.MB	GLLC/M	Mid	3	S0	W	H	u	23	-	CL	CL	-
0101	ZAL	-	FLUV	Level	1	S0	I	W	l	30+	-	SL	-	-
0102BH	OBE	O.MB	M	Upper	3	S1	MW	C	u	27	60	SL	LS	S
0103	OBE	O.MB	M	Mid	3	S1	W	W	u	23	-	SL	SL	-

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0104	LYS	O.HG	M	Level	1	S1	P	W	u	27	-	SL	LS	-
0105	-	-	M	Mid	2	S1	-	W	u	30+	-	L	-	-
0106BH	LYS	R.HG	M	Lower	3	S1	P	W	u	40	-	SiL	-	CL
0107	LYS	O.HG	M	Level	1	S1	P	W	l	23	-	L	L	-
0108	CSH	O.GBL	GLLC/M	Lower	2	S0	W	H	u	21	-	L	CL	-
0109BH	BGHyc	O.MB	FLUV/GLLC	Lower	3	S0	W	C	u	27	65	L	LfS	LfS/SiC
0110	BGH	O.MB	FLUV	Mid	3	S0	W	C	u	22	-	SL	SL	-
0111BH	BGHyt	O.MB	FLUV/M	Lower	3	S0	MW	C	u	30	50	SiL	LfS	LS/CL
0112	BGH	O.MB	FLUV	Toe	2	S0	R	C	u	22	-	SL	S	-
0113BH	BGHyt	O.MB	FLUV/M	Crest	3	S0	W	C	u	26	63	SL	S	SL/CL
0114	BGH	O.MB	FLUV	Upper	3	S0	W	C	u	23	-	SL	LS	-
0115	BGH	O.HR	M	Crest	3	S1	W	C	u	18	-	LS	-	SiCL
0116BH	BGHyg	O.MB	FLUV/M	Mid	5	S0	MW	H	h	23	70	SL	LS	SL
0117	CEY	O.HG	FLUV	Mid	3	S0	P	W	u	15	-	SiL	vfSL	-
0118BH	BGHxt	O.MB	FLUV/M	Lower	2	S0	W	H	u	19	63	SL	LS	C
0119	-	-	FLUV	Upper	3	S0	-	C	v	30+	-	SiL	-	-
0120	BGH	O.MB	FLUV	Mid	2	S0	W	C	u	20	-	SL	SL	-
0121BH	BDH	BR.GBL	M	Mid	6	S1	MW	W	t	18	45	SL	SL/C	C/CL
0122	CEY	O.HG	FLUV	Depression	4	S0	P	W	u	20	-	SL	SL	-
0123	BGH	O.MB	FLUV	Mid	5	S0	W	W	u	22	-	SL	LS	-
0124BH	BGH	O.MB	GLFL	Upper	3	S0	R	C	u	25	90	SL	LS	S
0125	-	-	FLUV	Mid	2	S0	-	W	u	30+	-	SiL	-	-
0126	CEY	O.HG	FLUV	Depression	2	S0	P	W	l	4	-	SiL	SiCL	-
0127BH	CSH	O.GBL	GLLC/M	Mid	2	S0	MW	C	u	22	46	L	CL	C/SiCL
0128	OBEgl	GL.MB	M	Mid	3	S1	I	C	u	26	-	SiL	L	-
0129	OBE	O.MB	M	Mid	2	S1	W	C	u	12	-	SL	SL	-
0130BH	OBEgl	GL.MB	M	Mid	2	S1	I	C	u	24	55	SL	SL	CL/SiCL
0131	OBE	O.MB	M	Upper	3	S1	W	C	u	20	-	L	L	-
0132	OBE	O.MB	M	Mid	2	S1	W	C	u	25	-	SiL	L	-
0133BH	MTD	GL.MB	M	Mid	2	S1	MW	C	u	22	58	L	SCL	HC
0134	-	-	M	Mid	3	S3	MW	C	u	30+	-	CL	-	-
0135	OBE	O.MB	M	Crest	3	S2	W	C	v	28	-	SiL	SiCL	-

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0136	CSH	O.GBL	GLLC/M	Upper	2	S0	W	C	u	26	-	SiL	CL	-
0138	OBE	O.MB	M	Mid	2	S1	W	C	v	27	-	SL	L	-
0139	OBE	O.MB	M	Mid	2	S1	W	C	v	20	-	SiL	SiL	-
0140BH	OBE	O.MB	M	Mid	3	S2	W	C	u	24	42	L	SL	SCL
0141	-	-	M	Mid	3	S1	-	W	u	30+	-	SiL	-	-
0142	-	-	M	Mid	2	S1	-	C	u	30+	-	SiL	-	-
0143BH	LYSzr	R.HG	M	Lower	3	S1	P	W	l	31	-	L	-	SL
0144	ZAL	O.MB	FLUV	Mid	2	S0	W	W	u	28	-	L	SL	-
0145	LYS	O.HG	M	Depression	2	S1	P	W	l	30+	-	SiL	-	-
0146	WPO	O.GBL	M	Mid	3	S1	W	C	v	19	-	SiL	CL	-
0147BH	BGHxt	O.MB	FLUV/M	Level	1	S1	W	C	u	24	55	SL	LS	SL/C
0148	-	-	FLUV	Upper	3	S0	-	W	v	30+	-	SiL	-	-
0149BH	BGH	O.MB	FLUV	Mid	2	S0	W	C	u	28	46	SL	LS	LS
0170	OBE	O.MB	TILL	Mid	3	S1	W	C	u	28	-	L	L	-
0171	OBE	O.MB	TILL	Mid	3	S1	W	C	u	30+	-	L	-	-
0172	OBE	O.MB	M	Upper	3	S1	W	H	u	22	-	SL	-	SCL
0173BH	BGHxt	O.MB	FLUV/M	Upper	5	S0	W	H	h	22	57	SL	LS	CL
0174	OBE	O.MB	M	Upper	4	S1	W	H	m	22	-	SL	SL	-
0175	CEY	O.HG	FLUV	Mid	5	S0	W	P	r	20	-	SL	LS	-
0176BH	BGH	O.MB	FLUV	Upper	6	S0	W	P	h	11	24	SL	SL	LS
0177	BGH	O.MB	FLUV	Upper	4	S0	W	H	m	22	-	SL	SL	-
0178BH	MTD	GL.MB	M	Upper	3	S2	I	C	u	19	62	L	L	L
0179	BGH	O.MB	M	Mid	3	S1	W	C	u	25	-	SCL	CL	-
0180	LYS	O.HG	M	Depression	3	S1	P	W	u	30+	-	CL	-	-
0181	-	-	M	Toe	3	S1	-	W	u	30+	-	CL	-	-
0182BH	LYS	O.HG	M	Lower	3	S1	P	W	u	20	55	SCL	L	C/SiCL
0183	WPO	O.GBL	M	Level	1	S1	W	C	u	29	-	L	CL	-
0184	WPO	O.GBL	M	Lower	3	S1	W	C	u	21	-	L	SCL	-
0186	-	-	M	Upper	4	S1	-	C	m	30+	-	L	-	-
0187	OBE	O.MB	M	Lower	4	S1	W	C	m	23	-	L	L	-
0188BH	OBE	O.MB	M	Lower	4	S1	MW	C	m	22	40	SL	LS	CL
0191BH	WPOxs	O.GBL	M	Mid	3	S1	W	C	u	28	65	L	CL	cS/CL

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0192	LYS	O.HG	M	Lower	4	S1	P	W	u	10	-	L	L	-
0193	WPO	O.GBL	M	Lower	4	S1	MW	W	m	7	-	SL	SiL	-
0194BH	WPO	O.GBL	M	Crest	5	S1	W	H	r	24	47	L	CL	CL
0195	BGH	O.MB	FLUV	Lower	5	S0	W	W	m	23	-	SiL	SL	-
0196	-	-	FLUV	Lower	3	S0	-	p	b	30+	-	L	-	-
0197	-	-	FLUV	Lower	5	S0	-	W	m	30+	-	SiL	-	-
0198	-	-	FLUV	Upper	6	S0	-	W	m	30+	-	SiL	-	-
0199BH	BGH	O.MB	GLFL	Crest	4	S1	R	C	m	29	55	SL	SL	S
0200	-	-	GLFL	Lower	4	S1	-	H	m	30+	-	vfSL	-	-
0201	BGH	O.MB	GLFL	Upper	4	S0	W	H	m	27	-	L	SL	-
0202BH	BGHyt	O.MB	GLFL/M	Upper	4	S1	W	H	m	30	70	fSL	S	fSL/CL
0203	-	-	GLFL	Mid	4	S0	-	H	m	30+	-	L	-	-
0204	BGH	O.MB	GLFL	Upper	4	S1	W	P	m	24	-	L	SL	-
0205	ZMK	T.H	O	Depression	2	S0	VP	WT	b	-	-	-	-	-
0206BH	BDH	BR.GBL	M	Upper	5	S1	MW	P	m	20	43	SiL	CL	SC
0207	-	-	M	Mid	4	S1	W	P	m	30+	-	SiL	-	-
0208	BDH	BR.GBL	M	Upper	5	S1	W	P	m	28	-	L	CL	-
0209BH	BDH	O.GBL	M	Mid	4	S1	W	P	m	24	57	L	SCL	SCL
0210	LYS	O.HG	M	Lower	3	S1	P	P	u	25	15	SiL	CL	-
0211	-	-	M	Depression	2	S1	-	DL	l	30+	-	L	-	-
0212	-	-	M	Lower	2	S1	-	W	u	30+	-	SiL	-	-
0214	-	-	M	Mid	2	S1	-	C	v	30+	-	L	-	-
0215	-	-	M	Mid	3	S1	-	DL	u	30+	-	SiL	-	-
0216BH	LYS	O.HG	M	Lower	3	S1	P	P	u	23	59	L	SL	C
0217	WPO	O.GBL	M	Mid	3	S1	MW	B	v	24	-	SiL	CL	-
0218	-	-	M	Mid	5	S1	-	B	u	30+	-	SiL	-	-
0219BH	WPO	O.GBL	M	Upper	3	S1	W	H	u	32	55	L	CL	CL
0220	LYS	O.HG	M	Lower	2	S1	P	W	u	30+	-	CL	-	-
0221	OBE	O.MB	M	Mid	3	S2	W	C	u	23	-	L	SL	-
0222BH	LYS	O.HG	M	Mid	3	S2	P	C	u	18	46	CL	CL	CL
0223	OBE	O.MB	M	Lower	3	S1	W	C	u	25	-	L	SL	-
0224	WPO	O.GBL	M	Mid	3	S2	W	C	u	25	-	L	CL	-

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0225BH	LYS	O.HG	M	Mid	2	S1	P	C	u	23	45	L	L	L
0226	OBE	O.MB	M	Lower	3	S1	W	C	u	23	-	L	vfS	-
0227	OBE	O.MB	M	Level	1	S2	W	C	u	17	-	L	-	SCL
0228BH	CEYxt	O.HG	FLUV/M	Mid	3	S0	P	H	u	26	47	L	fSL	CL/C
0229	LYS	O.HG	M	Lower	5	S1	I	P	m	29	-	SiL	SiCL	-
0230	MLE	GL.GBL	M	Depression	2	S1	I	W	I	20	-	L	SiCL	-
0231	-	-	FLUV	Mid	4	S0	-	W	u	30+	-	L	-	-
0232BH	BGHxt	O.MB	GLFL/M	Mid	4	S0	W	H	h	13	34	SL	S	SCL
0233	BGH	O.MB	GLFL	Upper	3	S0	W	H	u	28	-	SL	SL	-
0234	BGH	O.MB	GLFL	Lower	3	S0	W	H	u	17	-	SL	SL	-
0235	LYS	O.HG	M	Toe	4	S1	P	W	m	17	-	L	L	-
0236	OBE	O.MB	M	Mid	4	S2	W	C	m	25	-	L	SL	-
0237BH	OBE	O.MB	M	Lower	3	S2	MW	C	u	23	47	SL	SL	cLS
0238	OBE	O.MB	M	Mid	3	S2	W	C	u	27	-	SL	L	-
0239	-	-	M	Mid	3	S2	-	C	u	30+	-	SL	-	-
0240	OBE	O.MB	M	Mid	3	S1	W	C	u	29	-	SL	L	-
0241BH	OBE	O.MB	M	Mid	3	S1	W	C	u	22	41	L	SL	SCL
0242	OBE	O.MB	M	Lower	2	S1	MW	C	u	22	-	SCL	SCL	-
0243BH	LYS	O.HG	M	Lower	3	S1	P	P	u	18	42	SCL	SCL	SCL
0244	CEY	O.HG	FLUV	Mid	3	S0	P	W	u	28	-	SL	L	-
0245BH	BGH	O.MB	FLUV	Mid	3	S1	W	W	u	27	-	SL	SL	-
0259	FRMer	O.MB	M	Mid	4	S1	W	C	m	22	-	LS	-	SCL
0260BH	FRM	GL.MB	M	Mid	3	S1	I	C	b	20	30	SL	SL	SL
0261	-	-	M	Mid	3	S2	-	C	u	30+	-	L	-	-
0262	-	-	M	Lower	3	S1	-	C	u	30+	-	L	-	-
0267	WPO	O.GBL	M	Mid	3	S1	W	H	u	26	-	L	CL	-
0268	OBE	O.MB	M	Mid	3	S1	W	H	u	29	-	CL	CL	-
0269	-	-	M	Lower	3	S1	-	H	u	30+	-	L	-	-
0270BH	DGT	O.GBL	M	Mid	3	S1	MW	H	u	36	53	L	C	C
0271	CEYzr	R.HG	FLUV	Lower	6	S0	P	P	t	20	-	L	-	-
0272	OBEgl	GL.MB	M	Upper	2	S1	I	C	u	24	-	CL	CL	CL
0294BH	FRM	O.MB	M	Mid	3	S1	MW	C	u	30	86	SiL	SiL	SCL

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0295	DGT	BR.GBL	M	Mid	2	S1	W	C	u	30+	-	SiL	-	-
0296	DGT	BR.GBL	M	Upper	3	S1	MW	C	u	25	-	L	CL	-
0297BH	DGTgl	GLBR.GBL	M	Depression	3	S1	I	C	u	27	50	SiL	SiL	SCL/C
0309	ZAL	GL.MB	FLUV	Lower	4	S1	I	W	m	21	-	L	LS	-
0311	OBE	O.MB	M	Upper	3	S1	W	C	b	23	-	SiL	SiL	-
0312	OBE	O.MB	M	Upper	4	S1	W	C	m	25	-	SiL	SiL	-
0314	-	-	M	Upper	4	S1	-	C	m	30+	-	CL	-	-
0315	OBE	O.MB	M	Mid	4	S1	W	C	m	16	-	CL	LS	-
0316	BDHgl	GL.MB	M	Upper	4	S1	MW	C	m	25	-	SiL	CL	-
0318	OBE	O.MB	M	Mid	4	S1	W	W	u	20	-	SiL	L	-
0319	ZAL	GL.MB	FLUV	Mid	3	S2	I	W	b	24	-	SiL	SL	-
0320	BGH	O.MB	GLFL	Upper	4	S1	W	W	m	18	-	SiL	L	-
0321	-	-	GLFL	Upper	4	S1	-	W	m	30+	-	L	-	-
0322BH	OBE	O.MB	M	Mid	4	S1	MW	C	m	42	60	L	CL	CL
0323	-	-	FLUV	Toe	4	S1	-	C	m	30+	-	SiL	-	-
0324BH	OBE	O.MB	M	Upper	5	S1	MW	DL	m	25	38	SCL	SCL	SCL
0325	CEY	O.HG	FLUV	Depression	1	S0	P	W	b	30+	-	CL	-	-
0326	CEY	O.HG	GLFL	Depression	4	S0	VP	C	u	20	-	CL	SCL	-
0361BH	BDH	O.GBL	M	Upper	2	S1	W	C	u	26	58	L	CL	CL
0362	BDH	O.GBL	M	Mid	3	S1	W	C	u	18	-	L	CL	-
0363	BDH	O.GBL	M	Mid	2	S1	W	C	u	25	-	L	SiL	-
0364BH	OBEgl	GL.MB	M	Lower	3	S1	I	C	u	22	36	L	L	CL
0387BH	WPO	O.GBL	M	Mid	4	S1	W	C	m	28	56	L	CL	S/SCL
0388	OBE	O.MB	M	Mid	4	S1	W	C	m	30	-	L	-	-
0389	OBE	O.MB	M	Mid	4	S1	W	C	m	26	-	L	SCL	-
0390BH	OBE	O.MB	M	Mid	4	S1	W	C	m	42	80	L	SCL	SCL
0391	-	-	M	Upper	4	S1	-	C	m	30+	-	L	-	-
0392	OBE	O.MB	M	Upper	2	S1	W	C	u	25	-	L	L	-
0393BH	BDH	Br.GBL	M	Mid	2	S1	W	C	u	29	65	L	CL	SL
0394	-	-	M	Mid	3	S1	-	C	u	30+	-	L	-	-
0395	-	-	M	Lower	2	S1	-	C	u	30+	-	L	-	-
0396BH	LYSxs	O.HG	M	Upper	3	S1	P	C	u	32	70	L	SL	SL

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0397	BGH	O.MB	GLFL	Upper	3	S0	W	C	u	25	-	L	SCL	-
0398	ZALgl	GL.MB	GLFL	Lower	3	S0	I	C	u	25	-	L	SCL	-
0399BH	LYSzr	R.HG	M	Lower	3	S1	P	C	u	18	-	SL	-	SCL
0400	OBE	O.MB	M	Mid	4	S1	W	C	m	25	-	L	SiL	-
0401BH	OBExt	O.MB	M	Lower	3	S2	MW	C	u	22	48	SL	SL	SCL
0402	OBE	O.MB	M	Lower	3	S1	W	C	u	24	-	SL	SCL	-
0403BH	OBE	O.MB	M	Lower	3	S2	W	C	u	26	65	L	SL	SL
0404	ZMK	T.H	O	Depression	2	S0	VP	W	u	-	-	-	-	-
0405BH	CEY	O.HG	FLUV	Level	1	S0	I	W	l	21	68	SiL	SiCL	SiCL
0406	CEY	O.HG	FLUV	Lower	3	S1	P	C	u	22	-	SL	LS	-
0407	OBE	O.MB	M	Mid	3	S1	W	C	u	26	-	SCL	SCL	-
0408BH	OBE	O.MB	M	Upper	2	S2	W	C	u	18	40	L	SL	S
0409	WPO	O.GBL	M	Mid	4	S1	W	P	u	19	-	SL	CL	-
0410	WPO	O.GBL	M	Lower	4	S1	MW	P	u	25	-	SiL	SiCL	-
0418	OBE	O.MB	M	Lower	3	S1	MW	C	u	21	-	SiL	SiL	-
0419BH	OBE	O.MB	M	Lower	4	S1	W	P	m	23	44	L	L	SL
0420	OBE	O.MB	M	Mid	4	S1	W	H	m	24	-	L	SL	-
0421	-	-	M	Upper	4	S1	-	C	m	30+	-	SiL	-	-
0422BH	OBE	O.MB	M	Mid	3	S1	W	C	u	29	46	L	L	CL
0423	-	-	M	Mid	4	S1	-	C	m	30+	-	L	-	-
0424	OBE	O.MB	M	Mid	4	S1	W	C	m	28	-	L	CL	-
0425BH	OBE	O.MB	M	Level	1	S1	W	C	l	25	65	L	L	CL
0426	LYS	O.HG	M	Lower	3	S1	P	C	b	26	-	L	L	-
0427	OBE	O.MB	M	Upper	3	S1	W	C	b	24	-	SL	SCL	-
0428	OBE	O.MB	M	Lower	3	S1	W	C	b	18	-	SL	SL	-
0429BH	BGHxt	O.MB	GLFL/M	Upper	4	S1	W	C	m	18	49	SL	SL	SCL
0430	OBE	O.MB	TILL	Upper	5	S1	W	C	m	20	-	SL	SCL	-
0431	OBE	O.MB	TILL	Mid	5	S1	W	C	m	20	-	SL	SL	-
0432	OBE	O.MB	TILL	Mid	5	S1	W	C	m	30+	-	SL		-
0433	OBE	O.MB	TILL	Mid	3	S3	W	DL	m	17	-	SL	SL	-
0434	ZAL	O.HG	FLUV	Lower	4	S2	I	W	m	30+	-	L	-	-
0440	OBE	O.MB	M	Level	1	S1	W	C	l	25	-	L	L	-

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0441BH	OBE	O.MB	M	Level	1	S1	W	C	l	22	55	L	SCL	SCL
0442	CEYptzr	R.G	FLUV	Depression	2	S0	P	W	b	-	-	-	-	SiL
0443	OBE	O.MB	M	Lower	4	S1	W	C	m	20	-	SL	SL	-
0444	-	-	M	Mid	4	S1	-	C	u	30+	-	SL	-	-
0445	-	-	M	Mid	4	S1	-	C	m	30+	-	SiCL	-	-
0446BH	LYSzr	R.HG	M	Upper	2	S1	P	DL	b	36	-	SiL	-	C
0447BH	MLE	GL.GBL	M	Lower	3	S1	I	DL	b	24	45	CL	CL	C
0448	-	-	M	Upper	3	S1	-	DL	b	30+	-	L	-	-
0458	BGH	O.MB	TILL	Mid	1	S1	W	DL	u	22	-	SL	SL	-
0461	-	-	FLUV	Mid	2	S0	-	W	u	30+	-	SL	-	-
0462BH	ZAL	GL.MB	GLFL	Lower	3	S0	I	C	u	11	26	L	LS	SiS
0463	BGH	O.MB	FLUV	Mid	2	S0	R	C	u	28	-	SL	LS	-
0464	BGH	O.MB	FLUV	Mid	2	S0	R	C	u	22	-	SL	LS	-
0465BH	BGHyt	O.MB	GLFL/M	Upper	4	S0	R	C	u	23	57	LS	S	S/C
0466	BGH	O.MB	GLFL	Mid	3	S0	R	H	u	28	-	SL	LS	-
0467	-	-	GLLC	Mid	5	S0	-	W	t	30+	-	SL	-	-
0468	ZAL	GL.MB	FLUV	Mid	6	S0	I	W	t	18	-	SL	SL	-
0469BH	CEY	O.HG	GLFL	Upper	3	S1	P	H	u	20	36	LS	LS	S
0470	CEY	O.HG	GLFL	Mid	3	S0	P	H	u	27	-	SL	LS	-
0471BH	CEY	O.HG	GLFL	Upper	3	S0	P	H	u	31	65	SL	LS	S
0472	CEY	O.HG	GLFL	Upper	4	S0	P	H	t	30+	-	SL	-	-
0473	-	-	FLUV	Mid	3	S0	-	W	u	30+	-	LS	-	-
0474BH	BGH	O.MB	GLFL	Mid	3	S0	R	C	b	32	47	LS	S	S
0475	BGH	O.MB	GLFL	Upper	3	S0	W	C	u	17	-	SL	SL	-
0476BH	BGHxt	O.MB	GLFL/M	Upper	4	S0	R	C	m	25	70	SL	S	S/SCL
0477	BGH	O.MB	GLFL	Mid	2	S0	R	H	u	29	-	fSL	LS	-
0478	BGH	O.MB	GLFL	Mid	2	S0	W	C	u	28	-	L	LfS	-
0479BH	BGHxt	O.MB	GLFL/M	Mid	3	S0	MW	C	u	24	60	L	LS	CL/C
0480	BGH	O.MB	GLFL	Mid	2	S0	W	C	u	27	-	L	LfS	-
0481BH	BDH	BR.GBL	M	Mid	3	S1	W	C	u	24	72	L	SCL/CL	CL
0482	BGH	O.MB	GLFL	Mid	3	S0	R	C	u	17	-	SL	LS	-
0483	BGHgl	GL.MB	GLFL	Lower	3	S0	I	C	u	17	27	SL	LS	LS

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0484	-	-	GLFL	Mid	3	S1	-	C	u	30+	-	SL	-	-
0486	BGH	O.MB	GLFL	Mid	3	S0	R	H	u	23	-	SL	LS	-
0487BH	BGHyt	O.MB	GLFL/M	Level	1	S0	W	C	l	25	100	L	L/SL	SCL
0488	ZMK	T.H	O	Level	1	S0	VP	W	l	-	-	-	-	-
0489	BGHta	O.MB	GLFL	Lower	4	S0	R	W	h	8	-	S	S	-
0491	-	-	GLFL	Mid	2	S0	-	W	u	30+	-	SL	-	-
0492	CEY	O.HG	GLFL	Level	1	S0	P	W	l	30+	-	SL	-	-
0493BH	BDH	BR.GBL	M	Level	1	S1	W	W	l	25	-	L	SL/SCL	-
0494BH	CEY	R.HG	GLFL	Depression	2	S1	P	W	b	21	32	L	L	S
0495	-	-	GLFL	Mid	2	S0	-	W	u	30+	-	LS	-	-
0496	BGH	O.MB	GLFL	Mid	2	S0	W	C	u	27	-	SL	SL	-
0497BH	BGHxt	O.MB	GLFL/M	Mid	3	S0	W	P	b	25	57	SL	SL	LS/C
0498	BGH	O.MB	GLFL	Crest	2	S1	W	H	u	25	-	SL	SL	-
0499	BGH	O.MB	GLFL	Mid	3	S1	R	H	u	28	-	LS	LS	-
0500BH	BGH	O.MB	TILL	Lower	5	S1	W	DL	h	29	63	L	SL	SL/LS
0505	BGH	O.MB	GLFL	Mid	2	S0	R	P	u	23	-	LS	LS	-
0506	BGH	O.MB	GLFL	Upper	4	S0	R	C	m	17	-	LS	LS	-
0508	BGH	O.MB	GLFL	Mid	3	S0	-	W	b	30+	-	L	-	-
0509	CEY	O.HG	FLUV	Upper	1	S0	P	W	l	30+	-	SiL	-	-
0510BH	ZMK	T.H	GLFL	Lower	4	S0	P	W	m	-	-	-	-	LfS
0511	BGH	O.MB	GLFL	Mid	4	S0	W	W	m	19	-	L	SL	-
0512	BGH	O.MB	GLFL	Mid	5	S0	R	W	m	22	-	LS	LS	-
0513	BGH	O.MB	GLFL	Mid	4	S0	R	H	m	23	-	LS	S	-
0514BH	BGH	O.MB	GLFL	Mid	3	S0	R	H	u	24	55	LfS	fS	LfS
0515	BGH	O.MB	GLFL	Mid	3	S0	R	W	u	17	-	LS	S	-
0516	CEY	O.HG	GLFL	Depression	3	S0	P	W	u	20	-	SL	S	-
0517	BGH	O.MB	GLFL	Mid	3	S0	R	W	u	12	-	SL	LS/S	-
0518BH	BGH	O.MB	GLFL	Mid	3	S0	W	H	u	24	55	LS	S	S
0519	BGH	O.MB	GLFL	Mid	4	S0	R	H	u	17	-	LS	S	-
0520	BGHgl	GL.MB	GLFL	Lower	6	S0	I	W	h	19	-	SL	S	-
0521	CEYptzr	ptR.G	GLFL	Depression	5	S0	P	W	h	-	-	-	-	SCL
0522BH	BGH	O.MB	GLFL	Mid	3	S0	W	W	u	17	65	LS	S	S

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0523	BGH	O.MB	GLFL	Mid	5	S0	R	W	h	20	-	LS	LS	-
0524	BGH	O.MB	GLFL	Mid	5	S0	R	W	h	19	-	LS	S	-
0525BH	BGH	O.MB	GLFL	Mid	5	S0	R	W	h	14	42	SL	LS	S
0526	CEY	O.HG	GLFL	Lower	2	S0	P	W	t	16	27	SiL	SiCL	S
0527	BGH	O.MB	GLFL	Upper	5	S0	R	W	h	22	-	LS	S	-
0528BH	BGH	O.MB	GLFL	Mid	3	S1	R	C	b	27	47	LS	S	S
0529	CEYzr	R.HG	GLFL	Level	1	S0	P	W	l	15	-	fSL	-	S
0530	BGH	O.MB	GLFL	Upper	6	S0	R	W	h	17	-	SL	LS	-
0531BH	BGHxt	O.MB	GLFL/M	Mid	3	S0	MW	C	u	22	70	SL	LS/CL	C
0532	BGH	O.MB	GLFL	Upper	3	S0	R	C	u	21	-	LS	LS	-
0533	NWC	O.GBL	GLFL	Upper	3	S0	W	C	u	16	-	L	-	-
0534BH	NWC	BR.GBL	GLFL	Mid	3	S0	MW	C	u	36	62	SL/fS	L/CL	C
0535	NWC	O.GBL	GLFL	Mid	3	S0	W	C	v	19	-	SL	CL	-
0543BH	BDH	O.GBL	M	Lower	4	S1	W	C	u	26	90	L	CL	CL/LS
0544	CEY	O.HG	GLFL	Depression	2	S0	P	W	l	30+	-	SL	-	-
0545	-	-	M	Lower	3	S1	-	W	r	30+	-	SiL	-	-
0546	GNY	O.HG	M	Depression	4	S1	P	W	m	30+	-	SiL	-	-
0547BH	LYSxg	O.HG	M	Lower	5	S1	P	W	m	29	47	SiL	SCL	SiS
0548	BGH	O.MB	GLFL	Lower	4	S0	W	W	m	25	-	SiL	CL	-
0551	NWC	O.GBL	GLFL	Upper	3	S0	W	C	u	24	-	SL	SCL	-
0552BH	NWC	BR.GBL	GLFL	Lower	2	S0	W	C	u	29	60	L/LS	L	SCL/L
0553	BGH	O.MB	GLFL	Upper	3	S0	W	C	u	29	-	SL	SL	-
0554	NWC	O.GBL	GLFL	Upper	3	S0	W	C	u	26	-	L/SL	SCL	-
0555BH	BDH	O.GBL	M	Level	1	S1	MW	C	l	22	46	L	CL	C/CL
0556BH	NWCxt	O.GBL	GLFL/M	Mid	2	S1	W	C	u	42	70	L	CL	CL
0557	-	-	GLLC	Mid	2	S0	-	C	u	30+	-	SiL	-	-
0558	NWC	O.GBL	GLFL	Mid	2	S0	W	C	u	27	-	SiL	SiL	-
0559BH	BGH	O.MB	GLFL	Mid	2	S0	W	C	u	35	72	SiL	SL	LS
0560	ZAL	GL.MB	FLUV	Mid	3	S0	I	C	u	22	-	SL	LS	-
0561	ZAL	GLCU.HR	FLUV	Lower	2	S0	I	W	t	13	-	SL	-	SCL
0562BH	BGHxt	O.MB	GLFL/M	Upper	3	S1	W	C	u	34	47	SL	L	CL
0563	BGH	O.MB	GLFL	Upper	2	S0	R	C	u	27	-	LS	LS	-

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0564	BGH	O.MB	GLFL	Mid	3	S0	R	C	u	28	-	LS	LS	-
0565BH	BGHgl	GL.MB	GLFL	Mid	3	S0	I	P	u	32	55	LS	S	S/fS
0566	BGH	O.MB	GLFL	Mid	4	S0	W	P	m	27	-	LS	LfS	-
0567BH	BGH	O.MB	GLFL	Mid	4	S0	MW	W	m	20	55	SL	SL	LfS
0568	BGHgl	GL.MB	GLFL	Mid	3	S0	I	C	u	12	-	SL	SiL	-
0569	-	-	M	Lower	2	S1	-	W	u	30+	-	L	-	-
0570	-	-	M	Lower	2	S1	P	W	u	29+	-	L	-	-
0571BH	LYS	O.HG	M	Lower	2	S1	P	W	u	24	37	SL	LS	LS
0572BH	BGH	O.MB	GLFL	Mid	2	S1	W	W	u	27	-	L	SL	-
0573BH	BGH	O.MB	GLFL/M	Lower	2	S1	W	W	u	24	73	L	SL	SL
0574BH	BGH	O.MB	GLFL/M	Lower	2	S2	MW	W	u	38	85	SL	SL	SCL
0575	LYS	O.HG	M	Level	1	S1	P	W	l	14	-	L	SCL	-
0576BH	LYS	O.HG	M	Lower	3	S2	P	W	u	26	67	SiL	SCL	SCL
0577	LYS	O.HG	GLFL	Lower	2	S0	P	W	u	24	-	L	LS	-
0578	BGH	O.MB	GLFL	Lower	3	S1	MW	W	u	21	-	L	SCL	-
0579BH	LYS	O.HG	M	Level	1	S1	P	P	l	22	70	CL	CL	S/C
0580	LYS	O.HG	M	Level	1	S1	P	P	l	19	-	L	CL	-
0581	BGH	O.MB	GLFL	Level	1	S1	W	W	l	17	-	SL	LS	-
0582BH	BGH	O.MB	GLFL	Mid	2	S0	R	C	u	26	124	LS	S	S
0583BH	BGH	O.MB	GLFL	Mid	3	S0	R	C	u	22	145	LS	S	S
0584	ZAL	GL.MB	FLUV	Lower	4	S0	I	W	r	23	-	SL	SL	-
0585	BGH	O.MB	GLFL	Mid	5	S0	R	W	r	15	-	SL	LS	-
0586	BGH	O.MB	GLFL	Upper	3	S0	R	W	b	22	-	LS	S	-
0587	BGH	O.MB	GLFL	Upper	4	S0	R	W	m	21	-	L	SL	-
0588BH	BGH	O.MB	GLFL/M	Mid	4	S1	W	W	m	27	85	SL	SL	SCL
0589	ZMK	T.H	O	Depression	4	S0	P	W	r	-	-	-	-	-
0590	LYSzr	R.HG	M	Lower	4	S1	I	W	u	24	-	SiL	-	SL
0591BH	LYS	O.HG	M	Depression	2	S1	I	W	l	25	65	SiL	CL	fS
0592	LYSzr	R.HG	M	Mid	3	S1	I	W	b	26	-	L	-	SL
0593	ZAL	GL.MB	GLFL	Toe	5	S0	I	W	m	21	-	L	SCL	-
0594	NWCgl	O.GBL	GLFL	Mid	4	S0	MW	P	u	22	-	L	SCL	-
0595BH	BGH	E.MB	GLFL	Crest	4	S0	R	C	m	28	85	SL/fSL	LS	LfS/fSL

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0596	BGH	O.MB	GLFL	Mid	2	S0	W	W	u	23	-	SL	LS	-
0597	BGH	O.MB	GLFL	Mid	2	S0	R	W	u	22	-	L	LS	-
0598BH	BGH	O.MB	GLFL	Lower	3	S0	W	W	u	28	55	LS	SL	LS/L/SL
0599	BDH	BR.GBL	M	Mid	4	S1	W	W	u	8	25	L	SL	-
0600	LYSzr	R.HG	FLUV	Lower	5	S0	P	W	t	26	-	CL	-	SiCL
0601	BGH	O.MB	GLFL	Mid	5	S0		H	h	20	-	LS	fS	-
0602BH	SMF	GL.GBL	GLLC	Mid	5	S0	I	H	h	27	46	L	SiCL	C/SiL
0603	-	-	GLFL	Lower	5	S0	-	W	h	30+	-	L	-	-
0604	BGH	O.MB	GLFL	Upper	5	S0	R	W	h	22	-	LS	LS	-
0605BH	CEY	O.HG	GLFL	Depression	5	S0	P	W	h	29	55	L	SL	S
0610	BGH	O.MB	GLFL	Mid	3	S1	R	W	u	24	-	SL	LS	-
0611BH	GNY	O.HG	FLUV	Lower	4	S0	P	P	m	22	40	SiL/SCL	LS	LS
0612	ZAL	GL.MB	GLFL	Lower	5	S2	I	W	m	19	-	SL	LS	-
0613BH	BGH	O.MB	GLFL	Lower	5	S0	W	P	m	29	43	SL	LS	SL
0614	BGH	O.MB	GLFL	Lower	4	S0	W	P	m	30+	-	SL	-	-
0615BH	BGH	O.MB	GLFL	Lower	4	S0	R	P	m	25	65	SL	S	S/fS
0616	BGH	O.MB	GLFL	Lower	5	S0	R	C	m	21	-	LS	LS	-
0617	-	-	FLUV	Lower	5	S0	-	W	t	30+	-	L	-	-
0618BH	BGHyc	E.MB	GLFL/GLLC	Upper	6	S0	MW	W	t	26	55	SL/LS	LS	S/C
0619	BGH	O.MB	GLFL	Upper	6	S0	R	W	t	18	-	LS	LS	-
0620	BGH	O.MB	GLFL	Mid	5	S0	W	W	h	30+	-	L	-	-
0621	GNYzr	R.HG	GLFL	Depression	4	S0	P	W	h	19	-	L	-	LS
0622BH	OBE	O.MB	M	Mid	6	S1	W	H	m	55	150	SL	LS	SL
0623	-	-	M	Mid	4	S1	-	H	m	29+	-	LS	-	-
0624BH	BDHzr	O.HR	M	Mid	4	S1	W	P	m	29	-	SL	-	CL/C
0625	-	-	M	Mid	4	S1	-	P	u	29+	-	SL	-	-
0626BH	OBEgl	GL.MB	M	Mid	4	S1	I	C	u	45	80	L	LS	SCL/SC
0627	OBE	O.MB	M	Mid	3	S1	W	W	u	26	-	SL	SL	-
0628	OBE	O.MB	M	Mid	4	S1	W	W	u	30	-	CL	SL	-
0629BH	CEY	O.HG	GLFL	Mid	3	S0	P	P	u	22	40	L	LS	S/LS
0630	GNYzr	R.HG	GLFL	Lower	3	S0		P	u	27	-	L	-	S
0631	GNYzr	R.HG	GLFL	Lower	2	S0	P	P	u	25	-	SL	-	LS

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0632BH	BGH	O.MB	GLFL	Mid	3	S0	R	P	u	23	70	fS	S	S
0633	ZMK	T.H	O	Lower	3	S0	P	W	u	-	-	-	-	-
0634	ZDL	O.MB	GLFL	Mid	3	S0	W	P	u	30+	-	CL	-	-
0635BH	BGH	O.MB	GLFL	Mid	2	S0	W	P	u	17	85	SL	S	S
0636	BGH	O.MB	GLFL	Lower	4	S0	R	C	m	30+	-	LS	-	-
0637BH	BGHxt	O.MB	GLFL/M	Lower	4	S0	W	H	m	35	90	SL	SL	SCL
0638	BGH	O.MB	GLFL	Mid	4	S0	W	H	m	26	-	L	L	-
0643	OBE	O.MB	M	Mid	4	S1	W	H	u	30	-	SL	-	-
0644	OBE	O.MB	M	Mid	3	S1	W	C	u	21	-	fSL	fSL	-
0645BH	OBE	O.MB	M	Mid	3	S1	W	C	u	28	53	fSL	fSL	SCL
0646	-	-	M	Mid	4	S1	-	C	u	29+	-	L	-	-
0647BH	OBE	O.MB	M	Upper	5	S1	W	C	u	16	24	fSL	SL	SCL
0648	OBE	O.MB	M	Mid	3	S1	W	C	u	16	-	LfS	LfS	-
0649	BDH	O.GBL	M	Mid	3	S1	W	C	u	23	-	L	SCL	-
0650BH	BDH	BR.GBL	M	Mid	3	S1	W	C	u	19	54	fSL	fSL/SCL	SL
0651	BDH	BR.GBL	M	Mid	4	S2	W	C	u	16	-	SL	SL	-
0652	BDH	BR.GBL	M	Mid	3	S1	W	C	u	19	-	fSL	SL	-
0653BH	BDH	BR.GBL	M	Mid	4	S1	W	C	u	19	50	LfS	vfS/CL	SC
0654	BDH	BR.GBL	M	Mid	3	S1	W	C	u	28	-	L	L	-
0655	-	-	M	Mid	3	S1	-	H	u	29+	-	L	-	-
0656	BGH	O.MB	GLFL	Mid	3	S0	R	C	u	30+	-	LS	-	-
0658	-	-	GLFL	Mid	2	S0	-	C	u	30+	-	SL	-	-
0660	BGH	O.MB	GLFL	Lower	3	S0	R	C	u	30+	-	fSL	-	-
0661	BGH	O.MB	GLFL	Mid	2	S0	W	C	u	27	-	SL	SiS	-
0662	ZMK	T.H	O	Depression	2	S0	VP	W	l	-	-	-	-	-
0663BH	ZDL	DL	M	Upper	4	S2	W	C	m	39	-	SL	-	SiL
0664	-	-	GLFL	Lower	4	S0	-	C	m	30+	-	LS	-	-
0677BH	BGH	O.MB	GLFL	Upper	3	S0	W	P	u	22	43	LS	S	S
0678	GNY	O.HG	GLLC	Mid	3	S0	P	W	u	25	-	L	LS	-
0679	GNY	R.HG	GLLC	Depression	2	S0	P	W	u	-	-	-	-	S
0680	ZAL	GL.MB	FLUV	Mid	3	S0	I	W	u	23	-	L	LS	-
0681BH	GNY	O.HG	GLLC	Depression	1	S0	VP	W	l	11	65	SCL	CL	fSL/SiL/C

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0682	BGH	O.MB	GLFL	Lower	2	S0	W	W	l	19	-	L	SL	-
0683	ZAL	GL.MB	GLFL	Mid	4	S1	I	W	m	26	-	SL	SL	-
0684BH	BGHxt	O.MB	GLFL/M	Upper	3	S1	W	C	b	23	67	LfS	LfS	SCL
0685	BGH	O.MB	GLFL	Mid	3	S1	W	C	b	25	-	LfS	LfS	-
0686	-	-	M	Lower	3	S1	-	W	u	29+	-	SiL	-	-
0687BH	BDHgl	GL.MB	GLFL/M	Mid	2	S0	I	C	u	15	85	LS	S	L
0688	BGH	O.MB	GLFL	Lower	3	S0	W	C	u	25	-	SL	LS	-
0689BH	BGH	O.MB	GLFL	Upper	3	S1	W	C	u	25	65	SL	SL	CL
0690	BGH	O.MB	GLFL	Mid	3	S0	W	C	u	24	-	SiL	SiL	-
0691	NWCgl	GL.GBL	GLFL	Mid	3	S0	I	C	u	29+	-	SiL	-	-
0692	NWC	BR.GBL	GLFL	Mid	3	S0	W	C	u	17	-	SiL	CL	-
0693	NWC	O.GBL	GLFL	Crest	4	S1	W	H	r	18	-	SiL	SiL	-
0694	BGH	O.MB	GLFL	Lower	3	S0	W	W	u	22	-	L	L	-
0695	BGH	O.MB	GLFL	Crest	4	S0	W	H	m	21	-	L	SL	-
0696BH	NWC	BR.GBL	GLFL/M	Upper	4	S0	W	C	r	35	72	SiL	SiCL	SiCL/SiC
0697	NWC	O.GBL	GLFL	Mid	3	S0	W	C	u	22	-	SiL	SiCL	-
0698	NWC	O.GBL	GLFL	Mid	3	S0	W	C	u	21	-	SiL	SiCL	-
0699	-	-	GLFL	Mid	3	S0	-	H	u	29+	-	SiL	-	-
0700	NWC	O.GBL	GLFL	Upper	3	S0	W	C	u	22	-	SiL	CL	-
0701	NWC	BR.GBL	GLFL	Lower	3	S0	W	C	u	19	-	SiCL	SiC	-
0702BH	BDH	O.GBL	M	Mid	4	S1	W	C	m	22	42	CL	CL	C
0703	BDH	O.GBL	M	Level	1	S1	W	C	l	18	-	L	CL	-
0704	BDH	O.GBL	M	Lower	5	S1	MW	C	u	18	-	L	CL	-
0705BH	BDH	O.GBL	M	Upper	4	S1	MW	C	m	18	45	L	SCL	SiL
0706	BGH	O.MB	GLFL	Upper	5	S1	W	C	r	17	-	L	SiL	-
0707	BGH	O.MB	GLFL	Mid	4	S0	W	C	m	18	-	L	L	-
0708BH	BDH	O.GBL	M	Crest	6	S1	W	C	m	16	46	SL	CL	SCL
0709	BGH	O.MB	M	Mid	4	S1	W	C	m	18	-	SL	SL	-
0710	BDH	O.GBL	M	Lower	4	S1	W	C	m	19	-	L	CL	-
0711BH	BDH	O.GBL	M	Mid	4	S1	W	C	m	16	50	L	CL	SL
0712	BDH	O.GBL	M	Mid	4	S1	MW	C	m	25	-	L/SL	CL	-
0713	BDH	O.GBL	M	Level	1	S1	W	C	l	24	-	L	CL	-

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0714BH	SMG	O.GBL	GLLC	Lower	3	S0	MW	C	u	21	55	L	CL	C
0715	NWC	O.GBL	GLFL	Upper	2	S1	W	C	u	25	-	SiL	SiCL	-
0716	-	-	M	Upper	2	S1	-	W	u	30+	-	L	-	-
0717	SMF	GL.GBL	GLLC	Lower	2	S0	MW	W	u	20	-	SiL	SiCL	-
0718BH	SMF	GL.GBL	GLLC	Mid	2	S1	I	W	u	19	70	SiL	SiCL	SiCL
0719	SMG	O.GBL	GLLC	Mid	2	S0	W	C	u	30+	-	SiL	-	-
0720	SMF	GL.GBL	GLLC	Mid	2	S1	MW	C	u	26	-	SiL	SiCL	-
0721BH	SMG	O.GBL	GLLC	Mid	2	S0	W	C	u	21	50	SiL	SiCL	SiC
0722	SMG	O.GBL	GLLC	Mid	2	S1	MW	C	u	25	-	SCL	SiC	-
0723	GNY	O.HG	GLLC	Depression	2	S1	P	W	u	29+	-	SiL	-	-
0724BH	SMG	O.GBL	GLLC	Upper	2	S1	W	C	u	15	34	SiL	SiCL	SiC
0725	SMG	O.GBL	GLLC	Mid	2	S0	W	C	u	30+	-	SiL	-	-
0726	SMG	O.GBL	GLLC	Mid	3	S1	W	C	u	29+	-	L	-	-
0727	SMG	O.GBL	GLLC	Mid	3	S1	W	C	u	19	-	SiL	SiCL	-
0728BH	SMGxt	O.GBL	GLLC/M	Upper	4	S0	W	C	m	25	52	L	SiCL	SCL
0729	-	-	GLLC	Mid	4	S0	-	C	u	30+	-	CL	-	-
0730	SMG	O.GBL	GLLC	Lower	2	S0	W	C	u	21	-	CL	CL	-
0732	OBE	O.MB	M	Mid	4	S1	W	C	m	24	-	SL	SL	-
0733	OBE	O.MB	M	Mid	4	S1	W	C	m	19	-	SL	SL	-
0734	BDH	O.GBL	M	Mid	4	S1	W	C	m	24	-	L	CL	-
0735BH	BDH	O.GBL	M	Lower	4	S1	W	C	m	38	85	L	C	C
0736	LYS	O.HG	M	Depression	2	S1	P	W	u	20	-	L	CL	-
0737	BDH	O.GBL	M	Mid	3	S1	W	W	u	23	-	L	CL	-
0738	BDH	O.GBL	M	Mid	3	S1	W	P	u	24	-	L	CL	-
0743	SMG	O.GBL	GLLC	Mid	4	S1	W	C	m	17	-	CL	C	-
0744BH	BGHxt	O.MB	GLFL/M	Mid	4	S1	MW	C	u	20	46	SL	SL	C
0745	-	-	M	Mid	4	S2	-	C	m	30+	-	SL	-	-
0746	-	-	GLFL	Mid	4	S1	-	C	u	30+	-	L	-	-
0747BH	ZAL	GL.MB	GLFL	Lower	3	S1	I	C	u	21	56	LS	S	S
0748	BGH	O.MB	GLFL	Lower	4	S1	W	C	m	28	-	L	SL	-
0749BH	SMGyt	O.GBL	GLLC/M	Crest	4	S1	MW	C	m	19	68	SiL	SiCL	SiC
0750	SMGgl	GL.GBL	GLLC	Mid	4	S0	MW	C	m	17	-	SiCL	SiC	-

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0751BH	SMG	O.GBL	GLLC	Lower	4	S0	MW	C	m	24	50	SiL	SiC	C
0752	BDH	BR.GBL	M	Mid	4	S2	W	C	m	23	-	L	SCL	-
0753	BDH	BR.GBL	M	Upper	4	S1	MW	C	m	26	-	SiL	SiCL	-
0755	BDH	BR.GBL	M	Mid	4	S1	W	C	m	19	-	SiL	SCL	-
0756	BDH	BR.GBL	M	Upper	4	S1	W	C	m	20	-	SiL	SCL	-
0757BH	SMGxt	O.GBL	GLLC/M	Mid	4	S0	MW	C	u	23	83	CL	CL	C
0758	SMGxt	O.GBL	GLLC/M	Mid	4	S1	MW	C	m	28	-	CL	C	-
0790BH	OBEer	O.MB	M	Mid	5	S1	W	C	h	20	28	SL	SL	LS
0791	-	-	M	Mid	5	S2	-	C	m	30+	-	L	-	-
0793	-	-	M	Mid	4	S1	-	C	m	30+	-	CL	-	-
0795	-	-	M	Mid	3	S1	-	C	b	30+	-	L/SiL	-	-
0796	OBE	O.MB	M	Mid	4	S1	W	C	u	30+	-	SL/L	-	-
0797BH	OBE	O.MB	M	Mid	5	S1	W	C	m	43	95	SiL/SL	SL	SCL/SiL
0798	OBE	O.MB	M	Upper	4	S2	W	C	u	28	-	SL	LfS	-
0799	OBE	O.MB	M	Upper	6	S1	R	P	m	21	-	SL	SiL	-
0800BH	OBE	O.MB	M	Lower	4	S1	R	C	u	29	78	SL	LS	LS
0801	ZAL	GL.MB	FLUV	Lower	4	S1	I	C	m	22	-	SiL	SL	-
0802	ZAL	GL.MB	FLUV	Lower	4	S0	I	C	m	30+	-	SiL	-	-
0803BH	ZAL	GL.MB	GLFL	Toe	4	S1	I	C	m	25	65	SiL	SL	LS
0804	-	-	GLFL	Mid	4	S0	-	P	m	30+	-	SiL	-	-
0805	-	-	GLFL	Mid	4	S1	-	H	m	29+	-	SL	-	-
0806BH	BGHxt	O.MB	GLFL/M	Mid	4	S1	W	P	m	28	45	L	SL	SCL
0807	BDH	BR.GBL	M	Mid	4	S1	W	P	m	26	-	L	SCL	-
0816	SMG	O.GBL	GLLC	Lower	3	S1	W	W	b	29+	-	SiL	-	-
0817BH	SMG	O.GBL	GLLC/M	Lower	4	S0	MW	C	m	27	56	SiL	SiCL	SiC
0818	BDH	BR.GBL	M	Mid	4	S1	W	C	m	24	-	L	L	-
0819	BGH	O.MB	GLFL	Upper	4	S1	W	C	m	30+	-	LS	-	-
0820	BDH	BR.GBL	M	Crest	4	S1	W	C	m	24	-	L	L	-
0821BH	OBE	O.MB	M	Upper	4	S1	W	C	m	43	90	SL	SL	SCL
0822	OBEzr	O.HR	M	Mid	3	S2	W	C	u	20	-	SL	-	S
0823	OBEzr	O.HR	GLFL	Mid	3	S2	W	C	u	19	-	LS	-	LS
0824BH	OBE	O.MB	M	Mid	4	S1	W	C	m	21	46	LS	SL	SCL

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0825	BDH	BR.GBL	M	Mid	4	S1	W	C	m	24	-	SiL	CL	-
0826	BDH	O.GBL	M	Mid	4	S1	W	C	m	27	-	SiL	SCL	-
0827	BDH	BR.GBL	M	Lower	4	S1	W	W	m	18	-	L	SCL	-
0828BH	BGHyt	O.MB	GLFL/M	Mid	3	S0	W	H	u	29	105	SL	SL	SL/C
0829	BGH	O.MB	GLFL	Depression	2	S0	W	H	u	30+	-	vfSL	-	-
0830	BGH	O.MB	GLFL	Lower	3	S0	R	H	u	27	-	LS	LS	-
0831BH	BGHxt	O.MB	GLFL/M	Upper	4	S0	R	H	m	29	90	LS	LS	cS
0832	OBEzr	O.HR	M	Upper	5	S1	W	P	m	23	-	SL	-	SiL
0834	OBE	O.MB	M	Mid	3	S1	W	P	u	21	-	L	L	-
0835	OBE	O.MB	M	Mid	3	S1	W	P	u	25	-	L	L	-
0836BH	OBE	O.MB	M	Mid	3	S1	W	C	u	16	45	SL	LS	SCL
0837	OBEer	O.MB	M	Upper	3	S1	W	C	u	19	-	SL	-	SiC
0838	OBE	O.MB	M	Mid	3	S1	W	C	u	27	-	SL	SL	-
0839BH	OBE	O.MB	M	Mid	3	S1	W	C	u	21	50	L	LS	CL
0840	OBE	O.MB	M	Mid	3	S1	W	C	u	23	-	L	L	-
0841BH	OBE	O.MB	M	Mid	3	S1	W	C	u	21	25	L	L	L
0842	LYS	R.HG	GLFL	Mid	2	S2	P	W	u	28	-	SiL	-	s
0843	BGH	O.MB	GLFL	Mid	3	S1	R	W	u	22	-	S	S	-
0844	OBE	O.MB	TILL	Mid	3	S1	R	W	u	22	-	S	S	-
0845BH	OBEzrgl	GL.HR	TILL	Lower	3	S2	I	W	u	19	-	CL	-	CL
0846	OBE	O.MB	M	Mid	3	S1	W	W	u	20	-	L	SL	-
0847	OBE	O.MB	M	Mid	2	S1	W	W	u	28	-	SL	LS	-
0848BH	OBE	O.MB	M	Mid	3	S1	W	W	u	19	55	L	LS	CL
0849	OBE	O.MB	M	Mid	4	S1	W	W	m	29	-	L	-	-
0850	OBEer	O.MB	M	Mid	4	S1	W	W	m	9	-	SL	fS	-
0851	OBE	O.MB	M	Mid	4	S1	R	W	m	29	-	LS	-	-
0852BH	OBE	O.MB	GLFL	Mid	4	S0	W	C	m	28	63	L	SL	S
0853	GNYzr	R.HG	FLUV	Depression	4	S0	P	W	m	27	-	fSL	-	S
0854	GNY	O.HG	M	Toe	4	S1	P	W	m	30+	-	L	-	-
0855	GNY	O.HG	M	Lower	5	S1	P	P	m	-	-	-	cS	-
0856	BGH	O.MB	GLFL	Lower	5	S0	R	P	m	19	-	LfS	S	-
0857BH	BGH	O.MB	GLFL	Mid	5	S1	R	P	m	12	29	S	S	S

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0879	OBE	O.MB	M	Upper	5	S1	R	W	i	23	-	SL	LS	-
0880BH	OBE	O.MB	M	Crest	5	S1	W	W	i	31	65	SL	SL	SL
0881	OBE	O.MB	M	Crest	5	S1	W	C	i	14	-	SL	L	-
0882	OBEzr	O.HR	M	Mid	7	S1	W	W	i	26	-	SL	-	SCL
0883BH	OBE	O.MB	M	Lower	5	S1	W	C	i	19	51	L	L	SCL
0884	-	-	FLUV	Depression	2	S2	-	W	r	29+	-	L	-	-
0885	OBEzr	O.HR	M	Mid	4	S1	W	C	m	21	-	LS	-	LS
0886BH	OBE	O.MB	TILL	Mid	4	S1	MW	DL	h	19	43	L	L	SL
0899	-	-	M	Mid	5	S1	-	H	m	29+	-	L	-	-
0900	-	-	M	Mid	4	S1	-	W	m	29+	-	L	-	-
0901BH	OBE	O.MB	M	Mid	4	S1	R	W	m	28	85	L	LS	LS
0902	OBE	O.MB	M	Mid	3	S1	W	C	u	17	-	SL	SL	-
0903	OBE	O.MB	M	Mid	4	S1	W	C	m	19	-	SL	SL	-
0904BH	OBEgl	O.MB	M	Mid	5	S1	W	C	m	23	70	SL	LfS	S
0905	OBE	O.MB	M	Mid	4	S1	W	C	m	20	-	LS	LS	-
0906	OBE	O.MB	M	Mid	4	S1	W	C	m	20	-	SL	LS	-
0907BH	OBE	O.MB	M	Mid	4	S1	W	C	m	31	80	SL	LS	LS
0908	OBE	O.MB	M	Mid	4	S1	R	C	m	23	-	SL	LS	-
0909BH	OBE	O.MB	M	Mid	4	S1	W	C	m	20	76	SL	LS	SCL
0910	OBE	O.MB	M	Lower	4	S1	R	W	m	22	-	LS	LS	-
0911	OBE	O.MB	M	Upper	3	S1	W	W	u	14	-	SL	SL	-
0912	-	-	M	Mid	4	S1	-	W	m	29+	-	SL	-	-
0913	OBE	O.MB	M	Mid	5	S1	W	W	m	21	-	SL	LS	-
0914BH	OBE	O.MB	M	Mid	4	S1	R	W	m	21	73	LS	S	LS
0916	OBE	O.MB	M	Mid	4	S1	R	C	m	21	-	SL	S	-
0918	OBE	O.MB	M	Mid	3	S1	R	C	b	22	-	LS	LS	-
0919	ZMK	T.H	O	Lower	4	S1	P	W	m	-	-	-	-	-
0920BH	OBE	O.MB	M	Mid	3	S1	W	P	b	14	43	L	SL	fS/LfS
0921	ZMK	T.H	O	Lower	4	S1	P	P	m	-	-	-	-	-
0922BH	OBE	O.MB	M	Mid	4	S1	W	P	m	22	90	SL	SL/LfS	SL/SCL
0923	OBE	O.MB	M	Upper	4	S1	W	P	m	13	-	SL	SL	-
0924	OBE	O.MB	M	Crest	5	S1	W	P	m	26	-	LS	LS	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0925BH	OBE	O.MB	M	Mid	3	S1	W	P	b	27	85	L	L	SL
0926	OBE	O.MB	M	Upper	4	S1	W	C	m	23	-	L	L	-
0927	OBE	O.MB	M	Crest	4	S1	W	C	m	28	-	L	SL	-
0928BH	OBE	O.MB	M	Lower	4	S1	W	C	m	25	55	L	L	L/SiCL
0929	OBE	O.MB	M	Lower	4	S1	W	H	m	21	-	L	SiL	-
0930	OBE	O.MB	M	Upper	4	S1	W	H	m	26	-	L	SL	-
0931BH	OBEzr	O.HR	M	Crest	4	S1	W	C	m	31	-	LS	-	SiL
0932	OBE	O.MB	M	Upper	3	S1	W	H	b	27	-	L	SL	-
0933	OBE	O.MB	M	Lower	4	S1	R	H	m	23	-	LS	LS	-
0934BH	OBE	O.MB	M	Mid	2	S1	W	H	b	24	70	SL	SL	SL/LS
0935	OBE	O.MB	M	Mid	4	S1	R	W	m	24	-	L	LS	-
0936	OBE	O.MB	M	Mid	4	S1	R	W	m	26	-	L	LS	-
0937BH	OBE	O.MB	M	Upper	5	S1	W	H	m	27	51	L	SL	SCL
0938	OBEer	O.MB	M	Upper	4	S1	R	H	m	18	-	SL	-	LS
0939	OBEer	O.MB	M	Mid	4	S1	W	C	m	23	-	SL	-	LS
0940	OBE	O.MB	M	Mid	4	S1	W	H	m	23	-	L	LS	-
0941BH	OBE	O.MB	M	Mid	4	S1	W	H	m	26	43	SL	SL	SL
0942	OBE	O.MB	M	Mid	4	S2	W	C	m	27	-	L	L	-
0943	ZDL	DL	M	Mid	4	S2	W	C	m	16	-	L	-	-
0948	BGH	O.MB	GLFL	Upper	5	S0	W	W	m	19	-	LS	fSL	-
0949BH	BGHgr	O.MB	GLFL	Mid	6	S0	R	W	m	17	32	LfS	LS	S
0950	BGH	O.MB	GLFL	Lower	4	S2	W	W	m	25	-	SiL	SiL	-
0951	ZAL	GL.MB	GLFL	Lower	5	S1	I	W	m	21	-	SL	LS	-
0952	ZMK	T.H	O	Level	1	S0	VP	W	I	-	-	-	-	-
0953	GNY	O.HG	FLUV	Depression	2	S0	I	P	b	19	-	fSL	LS	-
0954BH	GNYzr	R.HG	FLUV	Lower	4	S0	P	P	m	16	-	L	-	SiCL
0957BH	OBE	O.MB	M	Lower	4	S1	W	C	m	22	53	SL	SL	S
0958	OBE	O.MB	M	Lower	4	S1	R	C	m	24	-	L	LS	-
0959BH	OBE	O.MB	M	Mid	4	S2	R	C	m	23	55	L	LS	cS
0960	-	-	M	Mid	4	S1	-	C	m	29+	-	SL	-	-
0961	OBE	O.MB	M	Mid	4	S1	R	C	m	20	-	L	LS	-
0962BH	OBEgl	GL.MB	M	Upper	4	S1	I	C	m	23	54	L	L	LS

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
0963	ZMK	T.H	O	Depression	1	S0	VP	W	b	-	-	-	-	-
0964	GNY	O.HG	GLLC	Depression	2	S0	P	W	u	27	-	L	SiCL	-
0965BH	GNY	O.HG	M	Mid	3	S1	I	C	u	24	48	L	CL	SiCL
0966	-	-	GLFL	Mid	3	S0	-	W	u	30+	-	L	-	-
0967	BGH	O.MB	GLFL	Mid	2	S0	W	P	u	26	-	SL	SL	-
0968	BGHer	O.MB	GLFL	Mid	3	S0	W	P	u	9	-	L	SL	-
0969a	-	-	FLUV	Lower	2	S0	-	W	l	30+	-	L	-	-
0970	WPO	O.GBL	M	Lower	3	S1	W	W	b	21	-	L	CL	-
0971	CEYfi	O.HG	FLUV	Mid	5	S0	P	W	t	26	-	L	L	-
0972	-	-	FLUV	Toe	3	S0	-	W	t	30+	-	L	-	-
0973BH	BGHgl	GL.MB	M	Lower	5	S1	I	P	h	22	65	SL	SL	LS/S
0974	BGH	O.MB	M	Upper	5	S1	W	H	h	21	-	SL	SL	-
0975	BGHgl	GL.MB	M	Mid	5	S1	I	W	h	24	-	SL	LS	-
0976BH	BGH	O.MB	GLFL	Upper	5	S1	W	H	h	19	34	SL	LS	SCL
0984	BGH	O.MB	GLFL	Lower	3	S1	W	W	u	28	-	SL	LS	-
0985	GNY	O.HG	GLLC	Depression	1	S0	P	W	b	23+	-	SiCL	-	-
0986BH	GNY	O.HG	GLLC	Lower	3	S0	I	W	u	35	85	L	CL	CL
0987	-	-	GLFL	Lower	3	S0	-	P	u	30+	-	SL	-	-
0988	BGH	O.MB	GLFL	Upper	3	S1	W	P	u	25	-	L	SL	-
0989BH	BGHgl	GL.MB	GLFL	Mid	3	S0	MW	P	b	21	55	L	SL	SiCL
0990	BGH	O.MB	GLFL	Lower	4	S1	R	C	m	22	-	LS	cS	-
0991	BGH	O.MB	GLFL	Crest	4	S0	W	C	m	21	-	SL	SL	-
0992	-	-	GLFL	Mid	4	S0	-	H	m	30+	-	SL	-	-
0993	BGH	O.MB	GLFL	Upper	4	S0	W	H	m	30	-	SL	SL	-
0994	-	-	GLFL	Upper	3	S0	-	C	u	30+	-	LS	-	-
0995BH	BGHxt	O.MB	GLFL/M	Upper	2	S0	MW	C	u	25	48	LS	LS	CL/LS/C
0996	BGHgl	GL.MB	GLFL	Mid	2	S0	I	C	u	25	-	SL	LS	-
0997BH	BGHzr	O.HR	GLFL	Mid	5	S1	R	P	m	19	-	S	-	cS
0998	BGH	O.MB	GLFL	Crest	5	S0	R	P	m	16	-	LS	LS	-
0999BH	BGH	O.MB	GLFL	Lower	4	S0	R	H	m	28	58	S	LS	SL/S
1000	BGH	O.MB	GLFL	Mid	3	S1	R	H	u	23	-	S	S	-
1001	ZMK	T.H	O	Level	1	S0	P	W	l	-	-	-	-	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
1002BH	-	-	M	Lower	3	S1	-	W	u	30+	-	L	-	-
1003	BDH	BR.GBL	M	Mid	3	S1	W	H	u	13	-	SCL	SCL	-
1004BH	ZDL	DL	M	Mid	3	S1	I	C	u	35	-	SL	-	SCL
1005	LYSglzr	GL.HR	M	Lower	3	S1	I	C	u	13	-	L	-	SCL
1012	-	-	M	Mid	4	S1		P	m	29+	-	SiL	-	-
1013	BGHglzr	GL.HR	M	Mid	3	S1	I	P	u	28	-	SCL	-	SCL
1017	-	-	M	Level	1	S1	-	W	b	29+	-	L	-	-
1018BH	LYS	O.HG	M	Lower	2	S1	P	W	u	42	75	SL	fSL	LS
1019	OBE	O.MB	M	Mid	3	S1	W	W	u	23	-	SL	fSL	-
1020	GVI	O.MB	M	Mid	5	S1	W	DL	i	17	-	SL	SL	-
1021BH	OBE	O.MB	M	Mid	6	S1	W	W	i	29	85	SL	LS	SCL
1036BH	LYS	O.HG	M	Lower	4	S1	P	W	m	30	75	SiL	S	CL
1037	-	-	GLFL	Lower	4	S0	-	C	m	30+	-	SL	-	-
1038	BGH	O.MB	GLFL	Lower	4	S1	R	C	m	27	-	LS	LS	-
1039BH	BGH	O.MB	GLFL	Lower	4	S0	R	C	m	17	41	S	fS	S
1040	BGH	O.MB	GLFL	Lower	4	S0	W	C	m	27	-	LS	LS	-
1041	BGH	O.MB	GLFL	Lower	4	S1	R	C	m	25	-	SL	S	-
1042	BGH	O.MB	GLFL	Depression	4	S0	W	W	m	24	-	LS	SL	-
1043BH	BGH	O.MB	GLFL	Lower	4	S0	MW	W	m	22	60	fSL	vfSL	L/LS
1044	GNY	O.HG	GLLC	Lower	3	S0	P	W	u	30	-	L	-	-
1045	-	-	GLFL	Upper	3	S0	-	W	s	29+	-	LS	-	-
1046BH	BGH	O.MB	GLFL	Mid	3	S1	W	W	u	32	53	SL	LS	S
1047	-	-	GLFL	Depression	2	S0	P	W	u	29+	-	L	-	-
1048	-	-	GLFL	Lower	3	S0	P	W	u	29+	-	SL	-	-
1049BH	BGHze	E.MB	GLFL	Mid	4	S0	R	W	u	10	40	L	LS	fS/vfS
1050	BGH	E.MB	GLFL	Mid	4	S1	R	W	m	8	-	L	S	-
1051	BGH	O.MB	GLFL	Mid	4	S1	R	W	m	9	-	LfS	LfS	-
1052BH	BGHer	O.MB	GLFL	Mid	5	S1	R	C	m	8	21	LS	S	S/fS
1053	ZDL	DL	M	Mid	6	S1	R	DL	m	-	-	-	S	-
1054	BGHer	O.MB	GLFL	Mid	4	S1	W	C	m	8	-	SL	SL	-
1055	CEY	O.R	FLUV	Lower	2	S0	R	W	l	9	-	SL	-	cS
1056BH	BGH	O.MB	GLFL	Mid	4	S1	R	W	m	21	53	LS	LS	LfS/S

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
1057	BGH	O.MB	GLFL	Upper	4	S1	R	W	m	6	-	LS	LS	-
1058BH	BGH	O.MB	GLFL	Mid	4	S0	R	W	m	10	38	LS	S	vfS
1059	BGH	O.MB	GLFL	Mid	4	S1	R	W	m	10	-	LS	LS	-
1060BH	BGH	O.MB	GLFL	Crest	4	S1	R	W	m	27	65	LS	LS	LS
1061	BGH	O.MB	GLFL	Crest	4	S0	W	W	m	22	-	SL	SiL	-
1062	BGH	O.MB	GLFL	Mid	3	S0	R	W	u	22	-	S	S	-
1063BH	BGH	O.MB	GLFL	Mid	3	S0	VR	W	b	-	75	-	cS	S
1064	BGH	O.MB	GLFL	Mid	4	S0	R	W	m	23	-	fS	fS	-
1065	BGH	O.MB	GLFL	Mid	6	S0	R	W	h	28	-	LS	S	-
1066BH	BGH	O.MB	GLFL	Mid	4	S0	R	W	h	32	57	SL	LS	S
1067	BGH	O.MB	GLFL	Mid	6	S0	R	W	h	15	-	LS	S	-
1068	BGHzr	O.HR	GLFL	Mid	5	S1	R	W	m	20	-	SL	-	S
1069BH	CEYpt	R.HG	FLUV	Level	1	S0	P	W	l	-	-	-	-	SL
1070	BGH	O.MB	GLFL	Lower	4	S2	R	C	m	28	-	LS	S	-
1071BH	BGHgr	O.MB	GLFL	Upper	4	S1	R	C	m	15	39	LS	LfS	LfS/S
1072	BGHzr	O.HR	GLFL	Upper	4	S2	W	C	m	22	-	LS	-	SL
1073	LYS	R.HG	M	Depression	3	S1	P	W	b	22	-	L	-	SCL
1074	-	-	M	Mid	4	S1	-	W	m	30+	-	SL	-	-
1075BH	OBE	O.MB	M	Lower	4	S1	W	C	u	29	53	LS	fS	SCL
1076	-	-	M	Mid	5	S3	-	C	m	29+	-	SL	-	-
1077	OBE	O.MB	M	Mid	4	S1	W	C	m	29	-	LS	-	-
1078	OBE	O.MB	M	Mid	4	S1	W	C	m	18	-	SL	SL	-
1079	OBE	O.MB	M	Mid	4	S1	W	C	m	19	-	SL	LS	-
1080	OBE	O.MB	M	Mid	4	S2	W	C	m	23	-	L	L	-
1081BH	OBE	O.MB	M	Mid	4	S1	R	H	m	34	57	SL	LS	LS
1082	-	-	M	Lower	7	S1	-	P	r	29+	-	SL	-	-
1083	OBE	O.MB	M	Mid	5	S1	W	C	m	21	-	LS	LS	-
1084BH	OBE	O.MB	M	Mid	7	S1	W	P	m	28	110	LS	LS	CL
1085	OBEzr	O.HR	M	Mid	5	S1	W	P	m	22	-	CL	-	CL
1086BH	OBE	O.MB	M	Mid	5	S1	W	W	m	13	95	SL	SL	SCL/LS
1087	OBE	O.MB	M	Lower	4	S1	W	W	m	9	-	SL	LS	-
1088	OBE	O.MB	M	Mid	4	S1	W	W	m	10	-	L	LfS	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
1089	OBE	O.MB	M	Mid	5	S1	R	W	m	7	23	LS	LS	S
1090BH	OBE	E.MB	M	Mid	4	S1	R	W	m	19	78	SL	SL	SL
1091	BGH	O.MB	GLFL	Mid	4	S1	R	W	m	8	-	LS	LS	-
1092	-	-	GLFL	Mid	5	S0	-	W	m	29+	-	LS	-	-
1093	BGHzr	O.R	GLFL	Mid	4	S0	R	W	m	-	-	-	-	LfS
1094BH	BGHgr	O.MB	GLFL	Mid	3	S3	R	C	u	18	41	LS	SL	cS
1095	BGH	O.MB	GLFL	Mid	3	S0	R	W	u	-	28	-	S	S
1096	BGHzr	O.HR	GLFL	Mid	2	S1	R	W	u	18	-	LS	-	S
1097BH	BGHze	E.MB	GLFL	Mid	3	S0	R	C	u	27	72	S	LS	LfS/S
1098	BGH	O.MB	GLFL	Mid	3	S0	R	C	u	23	-	LS	fSL	-
1099	BGH	O.MB	GLFL	Upper	4	S1	W	H	m	27	-	fSL	fSL	-
1100BH	BGH	O.MB	GLFL	Upper	4	S0	W	H	r	15	95	fSL	fSL/LfS	LS
1101	BGH	O.MB	GLFL	Mid	3	S0	R	C	u	29	-	LS	LS	-
1102BH	BGHyt	O.MB	GLFL/M	Mid	3	S0	R	W	u	42	65	LS	LS	fS/SCL
1103	BGH	O.MB	GLFL	Upper	3	S0	R	W	u	23	-	LS	LS	-
1104	BGH	O.MB	GLFL	Upper	6	S0	R	W	s	10	28	SL	LS	SL
1105	BGH	O.MB	GLFL	Mid	6	S1	R	W	s	12	-	SL	LS	-
1106BH	BGHxt	O.MB	GLFL/M	Upper	3	S0	W	H	u	28	44	LS	SL	LS/SCL
1108	BGHer	O.MB	GLFL	Mid	7	S1	I	W	s	7	-	LS	LS	-
1109BH	BGHtayt	O.EB	GLFL/M	Upper	7	S0	R	W	s	4	26	SL	LS	LS/SCL
1110	BGH	O.MB	GLFL	Upper	5	S0	R	W	m	6	-	L	LfS	-
1111	BGH	O.MB	GLFL	Mid	6	S1	W	W	m	13	-	fSL	L	-
1112	BGH	O.MB	GLFL	Lower	5	S1	R	W	m	8	-	LfS	fSL	-
1113BH	BGH	O.MB	GLFL	Depression	5	S1	W	W	m	-	70	-	SL	SL
1114	BGHzr	O.HR	GLFL	Upper	6	S1	W	W	r	12	-	L	-	fSL
1115	BGHcb	O.MB	GLFL	Mid	6	S2	R	W	m	23	-	L	LS	-
1116BH	BGHgr	O.MB	GLFL	Mid	5	S2	W	W	m	12	-	SL	SL	-
1117	BGH	O.MB	GLFL	Mid	4	S1	W	W	m	17	-	SL	LS	-
1118	BGH	O.MB	GLFL	Mid	5	S0	W	W	m	13	-	LS	LS	-
1120	BGH	O.MB	GLFL	Lower	3	S1	R	P	u	26	-	LS	LS	-
1121BH	BGHgr	O.MB	GLFL	Upper	4	S1	W	H	h	22	44	SL	SL	LS
1124BH	BGH	O.MB	GLFL	Upper	6	S1	R	W	m	16	26	SL	LS	S

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1125	BGH	O.MB	GLFL	Mid	5	S1	R	P	m	15	27	SL	LfS	LS
1126	BGHzr	O.HR	GLFL	Lower	6	S2	W	P	m	12	-	SL	-	LS
1127	BGHgrzr	O.HR	GLFL	Crest	5	S0	R	P	m	19	-	cS	-	cS
1128	BGHgr	O.HR	GLFL	Level	1	S2	R	P	l	26	-	SL	-	cS
1129	-	-	GLFL	Mid	3	S2	-	H	u	30+	-	LS	-	-
1130BH	OBEgr	O.MB	M	Mid	4	S1	W	W	u	18	50	SL	SL	cS
1131	OBE	O.MB	M	Mid	3	S1	W	P	u	21	-	L	SL	-
1132	ZDLgr	DL	M	Mid	4	S1	-	P	m	29+	-	L	-	-
1133	OBEgr	O.MB	M	Mid	3	S1	W	P	u	24	-	SL	L	-
1134	OBEgr	O.MB	M	Mid	4	S2	W	H	m	23	-	L	L	-
1135	-	O.MB	M	Upper	3	S1	-	H	u	29+	-	SL	-	-
1136BH	SMGxt	O.GBL	GLLC/M	Mid	4	S0	W	P	m	32	70	L	SCL	CL/SCL
1137	-	-	M	Mid	5	S1	-	C	m	29+	-	L	-	-
1138	BGHzr	O.HR	GLFL	Mid	7	S1	W	P	s	15	-	SL	-	CL
1140	BGH	O.MB	GLFL	Mid	4	S1	W	C	u	24	-	L	L	-
1141	BGH	O.MB	GLFL	Mid	4	S1	W	C	m	18	-	L	SL	-
1143	BGH	O.MB	GLFL	Mid	6	S0	W	C	m	26	-	L	SL	-
1144BH	BGHxt	O.MB	GLFL/M	Upper	4	S0	W	H	m	21	39	L	SiL	SiL/SiCL
1145	LYS	R.HG	M	Lower	5	S1	P	W	m	23	-	SiL	-	SCL
1146	OBE	O.MB	M	Mid	4	S1	W	C	m	30+	-	SL	-	-
1148	-	-	M	Mid	5	S1	-	C	m	30+	-	SiCL	-	-
1150	OBEzr	O.HR	M	Lower	4	S1	W	W	m	20	-	L	-	SiCL
1151	OBE	O.MB	M	Upper	5	S1	W	W	m	15	-	fSL	SL	-
1152	OBE	O.MB	M	Upper	4	S1	W	W	m	19	-	SL	SL	-
1153BH	OBE	O.MB	M	Lower	5	S1	W	W	m	30+	-	L	-	-
1154BH	OBE	O.MB	M	Upper	6	S1	W	W	m	27	92	fSL	vfSL/SCL	CL
1155	OBE	O.MB	M	Mid	4	S1	W	W	m	20	-	SL	SL	-
1156	OBE	O.MB	M	Mid	6	S1	R	H	m	22	-	LS	LS	-
1157BH	OBE	O.MB	M	Crest	5	S1	W	C	m	32	45	L	L	L
1158	OBE	O.MB	M	Mid	5	S1	W	W	m	14	-	L	L	-
1159	OBE	O.MB	M	Lower	5	S1	W	W	m	27	-	SiCL	LS	-
1160BH	OBEer	O.MB	M	Upper	6	S2	W	C	m	11	-	SCL	-	SCL

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1161	OBEzr	O.HR	M	Mid	5	S1	W	W	m	17	-	CL	-	CL
1162	-	-	M	Mid	4	S1	-	C	m	29+	-	L	-	-
1163BH	OBE	O.MB	M	Mid	4	S1	R	H	m	28	57	SL	LS	cS
1164	OBE	O.MB	M	Mid	3	S1	W	C	b	17	-	L	SL	-
1165	GNYzr	R.G	GLLC	Lower	4	S1	I	W	m	-	-	-	-	LS
1166BH	BGHyt	O.MB	GLFL/M	Mid	4	S0	R	C	u	25	55	LS	LS	LS/SCL
1167	BGH	O.MB	GLFL	Lower	4	S1	W	C	m	23	-	LS	LS	-
1168	BGH	O.MB	GLFL	Mid	5	S2	W	C	m	22	-	L	LfS	-
1170	BGHcbzr	O.HR	GLFL	Mid	4	S2	R	C	m	19	-	LS	-	cS
1171	OBE	O.MB	M	Mid	5	S1	W	P	m	28	-	L	CL	-
1172	OBE	O.MB	M	Mid	5	S2	W	C	m	19	-	SiCL	CL	-
1173BH	OBE	O.MB	M	Mid	4	S1	W	C	m	16	63	L	SL	SCL
1174	OBE	O.MB	M	Upper	6	S1	W	H	m	18	-	fSL	SL	-
1175BH	OBE	O.MB	M	Lower	4	S1	W	H	m	35	51	fSL	SiL	SL/fSL
1176	OBE	O.MB	M	Mid	6	S1	W	W	m	18	-	SL	SCL	-
1177	OBEgr	O.MB	M	Mid	5	S2	W	C	m	23	-	CL	SCL	-
1178BH	OBEzr	O.HR	M	Crest	6	S2	W	C	m	14	-	CL	-	CL
1179BH	OBEer	O.MB	M	Crest	5	S1	R	W	m	6	-	LfS	cS	-
1180	OBEcb	O.MB	M	Mid	5	S1	W	W	m	18	-	SL	LS	-
1181BH	OBEgl	GL.MB	M	Mid	4	S1	I	W	m	24	38	SL	LS	SCL/LfS
1182	-	-	M	Lower	3	S1	-	W	v	29+	-	L	-	-
1183	OBE	O.MB	M	Mid	4	S1	W	W	m	19	-	LS	LS	-
1184BH	OBE	O.MB	GLFL	Mid	3	S1	R	W	u	12	45	SL	S	S
1185	BDH	O.GBL	M	Upper	4	S1	W	W	r	16	-	L	CL	-
1186	OBE	O.MB	M	Mid	7	S1	W	W	r	25	-	fSL	LS	-
1187BH	BGH	O.MB	GLFL	Mid	4	S1	W	H	m	37	70	LS	LS	S
1188	CEYzr	R.HG	FLUV	Mid	4	S0	P	P	u	28	-	L	-	S
1189BH	CEYzr	R.HG	GLFL	Mid	3	S1	P	P	t	26	-	L	-	LS
1190	CEYzr	R.HG	GLFL	Mid	3	S0	P	W	t	29	-	SiL	-	LS
1191	-	-	FLUV	Lower	2	S0	-	W	t	30+	-	L	-	-
1192	CEYzr	R.HG	FLUV	Level	1	S0	P	W	l	30+	-	L	-	-
1200	BGH	O.MB	GLFL	Mid	4	S0	R	C	m	22	-	S	S	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
1201BH	WPO	O.GBL	M	Mid	4	S1	MW	C	m	32	57	L	C	C/SiCL
1202	ZDL	DL	GLFL	Lower	5	S0	-	DL	m	30+	-	S	-	-
1203BH	BGH	O.MB	GLFL	Lower	4	S0	R	P	m	35	70	S/LS	S	cS
1204	BGH	O.MB	GLFL	Upper	5	S0	R	C	m	21	-	LS	S	-
1205	BGH	O.MB	GLFL	Crest	5	S0	R	C	m	13	-	fS	S	-
1206BH	BGHxt	O.MB	GLFL/M	Mid	5	S0	W	W	m	27	65	LS	S	S/SCL
1207	BGH	O.MB	GLFL	Upper	6	S0	R	W	m	23	-	LS	S	-
1208	BGHgr	O.MB	M	Crest	5	S1	R	C	m	23	-	fS	S	-
1209BH	OBE	O.MB	M	Upper	4	S1	R	W	m	29	55	fS	S	S/cS
1210	OBE	O.MB	M	Upper	5	S1	R	W	m	20	-	LS	LS	-
1211BH	OBE	O.MB	M	Crest	5	S1	W	W	m	17	48	SL	SL	SL/cS
1212	OBE	O.MB	M	Mid	3	S1	R	C	u	21	-	LS	S	-
1213BH	OBE	O.MB	M	Mid	4	S1	W	C	m	26	44	LS	LS	LS/fSL
1214	OBE	O.MB	M	Mid	3	S1	R	W	u	21	-	LS	LS	-
1215	WPO	O.GBL	M	Mid	3	S3	W	W	u	15	-	L	SCL	-
1216	WPO	O.GBL	M	Lower	3	S3	W	W	u	18	-	L	SCL	-
1217	WPO	O.GBL	M	Mid	4	S2	W	W	h	19	-	L	CL	-
1218	OBE	O.MB	M	Mid	4	S3	W	W	u	24	-	L	SL	-
1219BH	OBE	O.GBL	M	Upper	5	S3	W	W	m	19	85	L	L	CL
1220	-	-	M	Upper	5	S2	-	C	m	29+	-	L	-	-
1221	WPO	O.GBL	M	Mid	7	S2	W	W	m	20	-	L	CL	-
1222BH	GNYytzr	R.HG	GLLC/M	Lower	4	S0	P	W	m	44	-	L	-	SiC
1223	-	-	M	Lower	4	S1	-	C	m	29+	-	SiCL	-	-
1224BH	WPOzr	O.HR	M	Mid	4	S1	W	C	m	23	-	SiC	-	SiC
1225	OBE	O.MB	M	Upper	5	S2	W	W	m	23	-	L	SL	-
1226	OBE	O.MB	M	Mid	5	S1	W	W	m	21	-	CL	L	-
1227	WPOzr	O.HR	M	Mid	3	S1	W	C	b	28	-	SiC	-	SiC
1229	OBE	O.MB	M	Crest	6	S1	W	W	m	22	-	L	L	-
1230	WPO	O.GBL	M	Upper	6	S2	W	W	m	25	-	fSL	CL	-
1231BH	OBEcb	O.MB	M	Mid	6	S1	W	W	m	19	35	L	SL	SiL
1232	LYSzr	R.HG	M	Level	1	S1	P	W	l	16	-	SiCL	-	C
1233	WPOgl	GL.GBL	M	Level	1	S1	I	W	l	22	-	CL	C	-

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1234BH	WPOzr	O.HR	M	Lower	4	S1	W	DL	m	29	-	CL	-	C
1235	LYS	O.HG	TILL	Level	1	S0	P	WT	l	30+	-	CL	-	-
1236	LYS	O.HG	TILL	Mid	3	S0	I	WT	u	13	-	CL	CL	-
1237BH	FRM	O.MB	TILL	Upper	5	S2	W	W	u	20	55	CL	fSL	CL
1238	WPO	O.GBL	TILL	Crest	5	S0	MW	W	u	25	-	CL	CL	-
1239BH	WPOzr	O.HR	GLFL	Toe	6	S0	MW	W	u	25	-	CL	-	CL
1240	WPO	O.GBL	Till	Lower	4	S0	MW	W	u	30+	-	CL	-	-
1241	SIY	O.HG	TILL	Level	1	S0	I	WT	l	30+	-	CL	-	-
1242	SIY	O.HG	TILL	Level	1	S0	I	WT	l	30+	-	CL	-	-
1243BH	WPO	O.GBL	TILL	Level	1	S2	MW	DL	u	24	70	CL	CL	SCL
1244	WPO	O.GBL	TILL	Level	1	S0	W	W	l	18	-	L	CL	-
1245	WPO	O.GBL	TILL	Level	2	S1	W	W	l	25	-	L	CL	-
1246	WPO	O.GBL	TILL	Level	1	S0	MW	W	l	25	-	L	CL	-
1247BH	FRM	O.MB	TILL	Toe	8	S1	MW	W	m	28	100	SiL	SiL	SCL
1248	FRM	O.MB	TILL	Level	1	S0	W	DL	l	27	-	SCL	SL	-
1249	SMG	O.GBL	GLLC	Level	1	S0	MW	W	l	22	-	SiL	SiCL	-
1250BH	SIY	O.HG	GLFL/TILL	Level	1	S0	P	W	l	30	-	L	-	SL/SiL
1251	SMG	O.GBL	TILL	Level	1	S0	MW	DL	l	24	-	L	SCL	-
1252	FRM	O.MB	TILL	Crest	4	S0	W	DL	u	25	-	SIL	SIL	-
1255	SMG	O.GBL	TILL	Lower	5	S1	W	W	u	20	-	L	SiCL	-
1256	SMG	O.GBL	TILL	Lower	6	S2	W	W	u	13	-	SL	SCL	-
1257BH	SMG	O.GBL	TILL	Level	1	S0	MW	W	l	20	45	SiL	SiCL	CL
1501BH	LYS	O.HG	M	Lower	2	S1	P	H	l	19	39	CL	C	CL
1502	LYS	O.HG	M	Lower	2	S1	P	H	l	18	-	C	C	-
1503	LYS	R.HG	M	Level	1	S0	P	WT	l	25	-	CL	SiCL	SiCL
1504	SIY	R.HG	M	Level	1	S0	P	DL	l	28	-	CL	-	SCL
1505BH	SIYxl	R.HG	M	Level	1	S0	P	DL	l	20	-	SiCL	-	SiCL
1506	CSH	O.MB	M	Mid	2	S1	MW	W	u	19	-	C	C	-
1507	SMV	GL.GBL	GLLC	Mid	2	S0	I	W	u	27	-	C	SiC	-
1508BH	SMVyt	GL.GBL	GLLC/M	Mid	2	S0	I	C	u	32	55	SiC	SiC	SiCL/C/CL
1509	OBE	O.MB	M	Upper	4	S1	W	C	h	14	-	CL	SCL	-
1510	OBEgl	GL.MB	M	Lower	4	S1	I	C	h	19	-	CL	CL	-

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1511BH	OBEgl	GL.MB	M	Mid	3	S1	I	C	u	24	50	CL	CL	CL/SCL
1512	LYS	O.HG	M	Lower	2	S1	P	W	l	20	-	CL	SCL	-
1513	-	-	M	Mid	2	S1	-	W	u	30+	-	SCL	-	-
1514	OBE	O.MB	M	Mid	4	S1	W	W	u	22	-	SCL	SCL	-
1515BH	OBExl	O.MB	M/BRUN	Upper	3	S2	W	W	v	14	40	SCL	SCL	-
1516	OBE	O.MB	M	Mid	3	S1	W	C	u	26	-	CL	SCL	-
1517BH	OBEgl	GL.MB	M	Mid	3	S1	I	C	u	23	46	CL	SCL	SCL
1518	ZRL	O.R	BRUN	Mid	2	S0	VR	W	v	8	-	L	-	-
1519	OBEgl	GL.MB	M	Lower	3	S1	I	W	u	24	-	CL	CL	-
1520	LYS	O.HG	M	Lower	3	S1	P	W	u	30+	-	SiCL	-	-
1522BH	OBE	O.MB	M	Lower	3	S1	W	H	l	32	-	L	CL	-
1523	OBE	O.MB	M	Mid	3	S1	W	H	u	30+	-	CL	-	-
1524	OBE	O.MB	M	Lower	2	S1	W	H	l	21	-	CL	CL	-
1525BH	OBE	O.MB	M	Mid	3	S2	W	H	u	28	38	CL	CL	SCL
1526	OBE	O.MB	M	Mid	4	S2	W	P	u	21	-	CL	CL	-
1527	MTD	GL.MB	M	Mid	3	S1	I	P	u	21	-	SCL	SCL	-
1528BH	GVIxl	O.MB	M/BRUN	Mid	3	S2	W	P	v	16	29	CL	CL	SCL
1529	SIY	O.HG	GLLC	Level	1	S0	P	W	t	30+	-	CL	-	-
1530	SIY	O.HG	GLLC	Depression	2	S1	P	W	l	19	-	SiCL	SiCL	-
1531BH	SIYzr	R.HG	GLLC	Depression	2	S0	P	W	l	28	-	SiC	-	SiC
1532	SIY	O.HG	GLLC	Lower	3	S0	P	P	u	23	-	CL	CL	-
1533	OBE	O.MB	M	Mid	3	S1	W	P	u	17	-	CL	CL	-
1534BH	OBEgl	GL.MB	M	Mid	2	S1	I	W	u	19	43	SCL	SCL	SiCL
1535	OBE	O.MB	M	Mid	2	S3	W	W	u	12	-	CL	SCL	-
1536	OBE	O.MB	M	Mid	3	S1	W	W	u	21	-	CL	CL	-
1537	ZRL	O.HR	BRUN	Mid	3	S1	VR	W	v	13	-	CL	-	-
1538	ZRLgl	R.HG	BRUN	Lower	2	S0	P	W	v	27	-	SiL	-	-
1539BH	SMFxtyl	O.GBL	GLLC/M	Upper	3	S1	I	P	b	8	65	L	HC	C
1540	ZRL	O.HR	BRUN	Mid	2	S1	VR	W	v	12	-	CL	-	-
1541	OBE	O.MB	M	Mid	3	S1	W	H	u	20	-	CL	CL	-
1542BH	GVI	O.MB	M	Mid	3	S1	W	H	u	12	31	CL	SiCL	SCL
1543	ZAL	O.MB	FLUV	Mid	3	S0	W	W	t	30+	-	CL	-	-

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1544	ZAL	GL.MB	FLUV	Lower	2	S0	I	W	t	23	-	L	CL	-
1545BH	GVI	O.MB	GLLC	Mid	4	S1	MW	C	h	22	44	CL	CL	SiCL/CL
1546	BGH	O.MB	GLFL	Lower	5	S0	W	H	h	15	-	SL	LS	-
1547	OBExl	O.MB	M/BRUN	Mid	3	S1	W	W	v	26	-	L	L	-
1548BH	OBExl	O.MB	M/BRUN	Mid	3	S3	W	W	v	10	60	L	SL	-
1549	ZRL	O.R	BRUN	Mid	3	S3	VR	W	v	-	-	-	-	-
1550	ZRL	O.R	BRUN	Mid	3	S3	VR	W	v	-	-	-	-	-
1551BH	ZRL	O.HR	BRUN	Mid	3	S3	VR	W	v	18+	-	L	-	-
1552	ZRL	O.R	BRUN	Mid	3	S3	VR	W	v	3	-	L	-	-
1553	ZRL	O.MB	BRUN	Mid	3	S0	VR	W	v	13	23	L	CL	-
1554BH	ZRL	O.MB	BRUN	Mid	3	S0	VR	W	v	10	26	L	CL	-
1555	MCW	O.HG	GLLC	Depression	3	S0	P	W	b	19	-	C	C	-
1556	MCW	O.HG	GLLC	Depression	2	S0	P	W	u	29	-	SiC	C	-
1557BH	MCWyt	O.HG	GLLC/M	Mid	3	S0	P	C	u	20	60	SiCL	CL	CL
1558	MCW	O.HG	GLLC	Mid	2	S0	P	C	u	19	-	C	SiC	-
1559	MCW	O.HG	GLLC	Upper	2	S0	P	C	u	27	-	SiC	SiC	-
1560BH	FRMglxl	GL.MB	GLLC/M	Mid	2	S0	I	C	v	25	60	C	C	C/SiCL
1561	MCW	O.HG	GLLC	Mid	3	S0	P	H	u	24	-	C	C	-
1562	WPO	O.GBL	M	Mid	2	S1	MW	C	u	22	-	CL	C	-
1564	WPOgl	GL.GBL	M	Lower	2	S1	I	C	u	27	-	CL	C	-
1565	CSH	O.MB	GLLC	Level	1	S0	MW	W	l	22	-	SiCL	CL	-
1566BH	CSHgl	GL.MB	GLLC/M	Level	1	S1	I	W	l	21	53	C	CL	SCL
1567	MCW	O.HG	GLLC	Lower	2	S0	P	W	l	18	-	C	C	-
1572BH	OBEglxl	GL.MB	M	Mid	3	S2	I	W	v	21	36	SCL	SCL	SCL
1573	OBE	O.MB	M	Upper	4	S2	W	W	h	28	-	L	CL	-
1574	OBE	O.MB	M	Mid	3	S1	W	W	u	17	-	L	SL	-
1575BH	OBE	O.MB	M	Mid	4	S1	W	H	m	24	49	CL	CL	CL
1576BH	OBE	O.MB	M	Mid	4	S1	W	H	m	21	42	CL	CL	CL
1577	MCW	O.HG	GLLC	Level	1	S0	P	H	l	12	-	SiC	SiC	-
1578	MCW	O.HG	GLLC	Level	1	S0	P	H	l	14	-	C	C	-
1579BH	MCWxl	O.HG	GLLC	Lower	2	S0	P	H	v	19	41	SiCL	SiC	C/SiCL
1580	SMV	GL.MB	GLLC	Level	1	S0	I	H	l	23	-	C	C	-

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1581	SMV	GL.GBL	GLLC	Upper	2	S0	I	H	l	24	-	C	C	-
1582BH	SIY	O.HG	GLLC	Lower	2	S0	P	H	l	24	42	CL	SiCL	SiCL/SiC
1583	MCW	O.HG	GLLC	Lower	3	S0	P	H	u	24	-	C	C	-
1584	MCW	O.HG	GLLC	Upper	2	S0	P	H	l	16	-	C	C	-
1585BH	SIY	O.HG	GLLC	Lower	3	S0	P	H	u	26	41	L	CL	CL
1586	FRM	O.MB	GLLC	Mid	4	S0	W	P	h	24	-	C	C	-
1587	OBE	O.MB	M	Mid	3	S1	W	P	u	17	-	CL	CL	-
1588BH	OBE	O.MB	M	Mid	4	S1	W	H	m	25	65	SCL	SCL	SCL
1589	OBE	O.MB	M	Upper	5	S1	W	H	m	17	-	SCL	SCL	-
1590	OBE	O.MB	M	Upper	5	S1	W	H	m	23	-	SCL	SCL	-
1591BH	OBE	O.MB	M	Lower	5	S1	W	H	m	22	42	SL	SCL	CL
1592	LYS	O.HG	M	Lower	4	S1	P	W	m	14	29	L	CL	SCL
1593	OBE	O.MB	M	Lower	5	S1	W	W	m	25	-	SCL	CL	-
1594BH	OBExl	O.MB	M/BRUN	Mid	3	S1	W	W	v	18	33	L	SiL	-
1595	LYS	O.HG	M	Lower	3	S1	P	W	b	26	-	CL	SCL	-
1596	ZRL	O.MB	BRUN	Upper	3	S2	VR	W	v	13	26	CL	SCL	-
1597	OBE	O.MB	M	Lower	3	S1	W	P	u	29	-	SCL	SCL	-
1598BH	MTD	GL.MB	M	Mid	3	S1	I	C	u	22	52	CL	SCL	SCL
1599	-	-	M	Mid	2	S1	-	C	u	30+	-	L	-	-
1600BH	WPO	O.GBL	M	Lower	3	S1	W	C	v	30	48	L	CL	CL
1601	OBE	O.MB	M	Mid	4	S1	W	C	m	29	-	SCL	SCL	-
1602	OBE	O.MB	M	Mid	4	S1	W	C	m	26	-	SCL	SCL	-
1606BH	SMVyl	GL.GBL	GLLC/M	Mid	2	S0	I	H	b	23	42	CL	C	SiC/SCL
1607	OBE	O.MB	M	Lower	3	S1	W	H	u	25	-	CL	CL	-
1608	GVI	O.MB	M	Mid	2	S1	W	P	u	23	-	L	L	-
1609BH	OBExl	O.MB	M	Mid	3	S1	W	H	v	27	46	CL	CL	CL
1610	OBE	O.MB	M	Lower	3	S1	W	H	u	20	-	L	L	-
1611	OBE	O.MB	M	Lower	3	S1	W	P	u	26	-	L	SCL	-
1612BH	ZRL	O.HR	BRUN	Mid	3	S2	VR	P	v	28	-	L	-	-
1613	OBExl	O.MB	M	Mid	3	S2	W	P	v	14	-	SCL	SCL	-
1614	OBE	O.MB	M	Lower	3	S2	W	P	b	16	-	CL	CL	-
1615BH	LYSxl	O.HG	M	Mid	2	S2	P	P	b	21	53	CL	SCL	SCL

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1616	ZRL	O.R	BRUN	Mid	3	S1	VR	W	v	10	-	SCL	-	-
1617	OBEtaxl	O.MB	M/BRUN	Lower	3	S3	R	W	v	7	28	L	SL	-
1618BH	WPO	O.GBL	M	Upper	2	S1	MW	W	u	21	51	SCL	SiC	SiC/SCL
1619	MCW	O.HG	GLLC	Depression	2	S0	P	P	u	14	-	L	SiC	-
1620	MCW	O.HG	GLLC	Mid	2	S0	P	H	u	17	-	CL	CL	-
1621BH	LDWxt	GL.GBL	GLLC/M	Lower	2	S0	I	H	u	23	56	CL	SiC	SCL
1622	ZRL	O.MB	BRUN	Mid	2	S1	VR	W	v	10	28	L	SCL	-
1623	FRM	O.MB	M	Mid	3	S1	W	W	b	22	-	SCL	SL	-
1624BH	ZRL	O.HR	BRUN	Mid	3	S1	VR	W	v	11	-	CL	-	-
1625	WPO	O.GBL	M	Mid	3	S1	W	W	u	11	-	L	CL	-
1626	WPO	O.GBL	M	Upper	3	S1	W	W	u	21	-	L	SCL	-
1627BH	WPOglxl	GL.GBL	M	Lower	2	S1	I	H	v	26	53	L	SCL	SCL
1628	MTD	GL.MB	M	Mid	3	S2	I	H	u	29	-	L	SCL	-
1629	OBE	O.MB	M	Mid	3	S2	W	W	u	19	-	L	SL	-
1630BH	FRMxl	O.MB	M	Mid	3	S1	MW	H	v	27	52	CL	SCL	SCL
1631	FRM	O.MB	M	Lower	3	S1	W	P	b	27	-	CL	CL	-
1632BH	FRMxl	O.MB	M	Mid	2	S1	MW	P	v	17	55	CL	CL	Si
1633	SMG	O.GBL	GLLC	Lower	2	S0	MW	W	b	24	-	CL	C	-
1634	MCW	O.HG	GLLC	Level	1	S0	P	W	l	12	-	SiCL	C	-
1635	MCW	O.HG	GLLC	Upper	2	S0	P	P	b	13	-	SiCL	C	-
1636BH	OBExl	O.MB	M	Mid	3	S1	W	W	v	22	45	L	SL	SCL
1637	WPO	O.GBL	M	Mid	3	S1	W	W	b	19	-	L	SiCL	-
1638	OBE	O.MB	M	Mid	2	S1	W	W	b	16	-	L	SCL	-
1639	OBEta	O.MB	M	Mid	3	S1	W	W	b	8	-	SCL	SCL	-
1640BH	LDW	GL.GBL	M	Level	1	S0	MW	DL	l	21	50	CL	SCL	SCL
1641	LDW	O.GBL	M	Level	1	S0	MW	C	l	17	-	CL	SCL	-
1642	-		M	Level	1	S0	MW	C	l	30	-	SiCL	-	-
1643BH	LDW	O.GBL	M	Level	1	S0	MW	DL	l	22	-	SiCl	CL	-
1644	LDW	O.GBL	M	Level	1	S0	MW	DL	l	20	-	CL	SCL	-
1645BH	LDW	O.GBL	M	Level	1	S0	MW	DL	l	20	-	CL	SCL	-
1646	OBE	O.MB	M	Mid	2	S1		W	u	26+	-	SL	-	-
1647	WPO	O.GBL	M	Mid	2	S1	W	W	u	19	-	SiL	CL	-

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1649BH	OBE	O.MB	M	Upper	3	S1	W	W	u	23	54	L	SL	SCL
1650	OBE	O.MB	M	Mid	3	S1	W	C	u	17	-	L	SCL	-
1651	OBE	O.MB	M	Mid	3	S1	W	C	u	19	-	L	SCL	-
1652BH	WPOgl	GL.GBL	M	Mid	3	S1	I	C	u	27	65	SiL	SCL	SCL
1653	WPOgl	GL.GBL	M	Mid	2	S1	I	C	b	16	-	CL	C	-
1654	WPOgl	GL.GBL	M	Lower	2	S1	I	C	u	16	-	CL	C	-
1655	EOK	GL.GBL	GLLC	Mid	2	S0	I	P	u	17	-	CL	C	-
1656	LYS	O.HG	M	Upper	2	S1	P	H	b	24	-	SiCL	SiC	-
1657BH	FRMyl	O.MB	M/BRUN	Mid	2	S1	MW	H	b	19	46	CL	CL	C
1658	FRM	O.MB	M	Mid	2	S1	W	C	b	27	-	SiCL	CL	-
1659	FRM	O.MB	M	Mid	2	S1	W	C	b	30+	-	CL	-	-
166	OBE	O.MB	TILL	Mid	4	S1	W	W	h	27	-	SL	SL	-
1660	FRM	O.MB	M	Mid	2	S1	W	DL	b	19	-	SCL	SCL	-
1661BH	WPOyl	O.GBL	M/BRUN	Mid	3	S2	W	C	b	19	35	L	C	C
1662	ZRL	O.MB	BRUN	Lower	3	S0	VR	C	v	16	28	L	CL	-
1663	FRM	O.MB	M	Mid	3	S2	W	C	b	24	-	L	CL	-
1664	FRM	O.MB	M	Mid	3	S1	W	C	b	21	-	CL	CL	-
1665BH	FRMglxl	GL.MB	M/BRUN	Mid	2	S1	I	C	v	20	55	SiCL	CL	SCL
1666	FRMgl	GL.MB	M	Mid	2	S1	I	C	b	21	-	CL	CL	-
1667BH	FRMxl	O.MB	M/BRUN	Mid	2	S1	W	C	v	34	45	CL	SiCL	-
1668	WPO	O.GBL	M	Upper	3	S1	W	P	b	19	-	CL	C	-
1669	ZRL	O.R	BRUN	Upper	2	S4	VR	H	v	3	-	-	-	-
1670	ZRL	O.R	BRUN	Lower	4	S3	VR	P	m	5	-	L	-	-
1671	ZRL	O.HR	BRUN	Lower	2	S2	VR	P	v	28	-	L	-	-
1672	LYS	O.HG	M	Lower	3	S1	P	P	b	27	-	SCL	SCL	-
1673	FRMxl	O.MB	M/BRUN	Mid	2	S1	W	P	v	13	-	CL	SCL	-
1674BH	WPO	O.GBL	M	Crest	4	S1	W	H	u	21	43	CL	C	SiCL
1675	WPO	O.GBL	M	Lower	3	S1	W	H	u	17	-	CL	C	-
1676	WPO	O.GBL	M	Upper	4	S1	W	H	u	15	-	CL	C	-
1677BH	WPO	O.GBL	M	Lower	3	S1	MW	H	u	20	39	CL	C	C/SiCL
1678	WPO	O.GBL	M	Mid	4	S1	W	H	u	14	-	CL	C	-
1679	WPO	O.GBL	M	Lower	3	S1	W	C	u	14	-	CL	C	-

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1680BH	WPOgl	GL.GBL	M	Lower	4	S1	I	C	u	18	36	CL	C	C
1681	WPOgl	GL.GBL	M	Lower	3	S1	I	H	u	18	-	CL	C	-
1683BH	WPO	O.GBL	M	Lower	3	S2	W	C	u	21	75	CL	C	C/HC
1684	EOK	GL.GBL	GLLC	Upper	3	S0	I	P	u	23	-	SiCL	C	-
1685BH	EOKyt	GL.GBL	GLLC/M	Mid	3	S0	I	P	u	28	65	L	CL	SiCL/SCL
1687	MCW	O.HG	GLLC	Upper	2	S0	P	H	u	22	-	CL	CL	-
1688	MCW	O.HG	GLLC	Upper	2	S0	P	H	u	18	-	CL	CL	-
1689BH	EOKyt	GL.GBL	GLLC/M	Mid	3	S0	I	C	u	16	65	CL	C	C/CL
1690	EOK	GL.GBL	GLLC	Upper	2	S0	I	C	u	24	-	CL	C	-
1692	EOK	GL.GBL	GLLC	Lower	4	S0	I	C	u	21	-	CL	C	-
1699	FRM	O.MB	GLLC	Upper	3	S0	W	C	u	16	-	C	C	-
1700	FRMgl	GL.MB	GLLC	Mid	3	S0	I	C	u	14	-	C	C	-
1701BH	FRM	O.MB	M	Upper	3	S1	MW	C	u	16	60	C	CL	C
1702	FRM	O.MB	M	Upper	3	S1	W	C	b	23	-	C	C	-
1703	WPO	O.GBL	M	Lower	3	S1	W	C	b	21	-	SiL	CL	-
1704BH	FRMyl	O.MB	M/BRUN	Mid	4	S1	W	C	m	16	43	CL	CL	CL/C
1705	FRM	O.MB	M	Upper	5	S1	W	C	m	25	-	L	L	-
1719	FRM	O.MB	M	Upper	2	S1	W	C	b	27	-	SCL	SCL	-
1720	WPO	O.GBL	M	Mid	3	S1	W	H	b	17	-	SL	CL	-
1721BH	WPOyl	O.GBL	M/BRUN	Mid	3	S1	W	H	b	25	72	L	CL	CL
1722	WPO	O.GBL	M	Lower	3	S1	W	C	b	30+	-	CL	-	-
1723BH	FRMxl	O.MB	M	Lower	3	S1	W	C	v	27	65	CL	CL	SCL
1724	FRM	O.MB	M	Lower	3	S2	W	C	b	21	-	CL	SCL	-
1725	LYSzr	R.HG	M	Lower	3	S1	I	W	b	20	-	SiCL	-	C
1726BH	LYSxl	O.HG	M/BRUN	Lower	3	S1	I	P	v	17	38	CL	CL	SC
1727	LYS	O.HG	M	Mid	4	S1	P	P	u	23	-	CL	CL	-
1728BH	MCWzr	R.HG	GLLC	Lower	2	S0	P	P	u	27	-	SiL	-	C
1729	MCWzr	R.HG	GLLC	Lower	2	S0	P	P	u	27	-	CL	-	C
1730	WPO	O.GBL	M	Mid	4	S1	W	P	m	23	-	CL	C	-
1736BH	ZRLgl	GL.HR	BRUN	Lower	3	S0	I	P	v	13	-	CL	-	CL
1737	-	-	M	Lower	2	S1	-	P	b	30+	-	L	-	-
1738	FRMxl	O.MB	M/BRUN	Level	1	S1	W	P	v	18	-	CL	CL	-

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1739	FRM	O.MB	M	Level	1	S1	W	P	b	16	-	CL	CL	-
1740BH	WPOglyl	GL.GBL	M/BRUN	Upper	3	S1	I	C	b	23	58	CL	CL	C
1741	WPOgl	GL.GBL	M	Lower	3	S1	I	C	b	19	-	CL	C	-
1742	WPO	O.GBL	M	Mid	3	S1	W	C	b	22	-	L	CL	-
1743BH	ZRL	O.MB	BRUN	Lower	3	S2	VR	C	v	14	28	L	CL	-
1744	ZRL	O.HR	BRUN	Upper	3	S0	VR	P	v	30	-	L	-	-
1745	WPO	O.GBL	M	Lower	3	S1	W	C	b	19	-	CL	C	-
1746	WPOxl	O.GBL	M/BRUN	Mid	3	S1	W	H	v	23	37	CL	C	C
1747	WPO	O.GBL	M	Lower	3	S1	W	H	b	21	-	L	C	-
1748	-	-	M	Lower	3	S1	-	C	u	30+	-	L	-	-
1749BH	FRMxl	O.MB	M/BRUN	Mid	4	S1	W	C	m	21	49	L	SL	SL
1750	WPO	O.GBL	M	Mid	4	S1	W	C	m	17	-	L	SCL	-
1751	FRM	O.MB	M	Mid	4	S1	W	C	m	30+	-	SiL	-	-
1752BH	WPOyl	O.GBL	M/BRUN	Mid	4	S1	W	C	m	21	52	L	C	C
1753	FRM	O.MB	M	Lower	4	S1	W	C	m	21	-	L	SCL	-
1754	FRM	O.MB	M	Lower	3	S1	W	C	b	25	-	CL	C	-
1755	WPOyl	O.GBL	M/BRUN	Mid	3	S1	W	C	b	21	80	CL	C	C
1756	WPO	O.GBL	M	Mid	3	S1	W	C	b	24	-	CL	C	-
1757	WPO	O.GBL	M	Mid	3	S2	W	C	b	15	-	CL	C	-
1758BH	WPOyl	O.GBL	M/BRUN	Lower	3	S1	W	C	b	17	39	CL	C	C
1759	FRM	O.MB	M	Lower	4	S1	W	C	m	30+	-	L	-	-
1760	ZRL	O.HR	BRUN	Upper	4	S3	VR	C	m	16	-	L	-	-
1761BH	WPOxl	O.GBL	M/BRUN	Mid	3	S2	MW	W	v	18	31	CL	C	C
1762	ZRL	O.HR	BRUN	Lower	3	S1	VR	W	v	30+	-	L	-	-
1763	WPO	O.GBL	M	Mid	3	S1	W	W	b	18	-	L	C	-
1764	FRMgr	O.MB	M	Mid	4	S1	W	W	m	23	-	CL	CL	-
1765	FRM	O.MB	M	Lower	3	S1	W	W	b	17	-	CL	CL	-
1766BH	WPOxl	O.GBL	M/BRUN	Upper	3	S1	MW	P	v	14	33	CL	C	C
1767	WPO	O.GBL	M	Mid	2	S1	W	W	b	8	-	CL	C	-
1768BH	WPOxl	O.GBL	M/BRUN	Mid	3	S2	W	W	v	11	40	L	C	-
1769	WPO	O.GBL	M	Mid	3	S1	W	W	b	24	-	L	C	-
1770	WPOxl	O.GBL	M/BRUN	Mid	3	S1	W	W	v	22	-	SL	CL	-

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1771	ZRL	O.GBL	BRUN	Mid	3	S2	VR	W	v	12	23	SL	CL	-
1772BH	ZRL	O.HR	BRUN	Mid	3	S1	VR	W	v	19	-	L	-	-
1773	WPO	O.GBL	M	Mid	3	S2	W	W	b	13	-	L	C	-
1774	WPO	O.GBL	M	Mid	3	S2	W	W	b	11	-	L	CL	-
1775BH	WPOxl	O.GBL	M/BRUN	Mid	3	S1	W	W	v	18	40	L	C	-
1776	ZRL	O.HR	BRUN	Mid	3	S1	VR	W	v	16	-	CL	-	C
1777	ZRL	O.HR	BRUN	Mid	2	S1	VR	W	v	16	-	CL	-	C
1778BH	FRMxl	O.MB	M/BRUN	Mid	3	S3	W	W	v	14	29	L	L	L
1779	ZRL	O.R	BRUN	Mid	3	S4	VR	W	v	6	-	L	-	-
1780	WPO	O.GBL	M	Lower	2	S1	W	W	b	19	-	CL	C	-
1781BH	WPOxl	O.GBL	M/BRUN	Lower	2	S1	W	W	v	19	46	CL	C	C
1782	WPO	O.GBL	M	Lower	2	S2	W	W	b	19	-	L	C	-
1783BH	MCW	O.HG	GLLC	Level	1	S0	I	W	I	17	50	CL	C	C
1784	WPO	O.GBL	M	Lower	2	S1	MW	C	u	22	-	CL	C	-
1785	FRM	O.MB	M	Mid	4	S2	W	C	m	30+	-	L	-	-
1786BH	FRM	O.MB	M/BRUN	Mid	4	S2	W	C	m	21	44	CL	SCL	CL
1787	FRM	O.MB	M	Mid	4	S1	W	C	m	30+	-	L	-	-
1788BH	WPOyl	O.GBL	M/BRUN	Mid	2	S1	W	C	b	23	48	CL	C	C/CL
1789	FRMgl	GL.MB	M	Mid	3	S1	I	C	b	11	-	C	C	-
1790	WPO	O.GBL	M	Mid	3	S1	W	P	b	11	-	CL	C	-
1791BH	FRMxl	O.GBL	M/BRUN	Mid	3	S1	W	H	v	10	34	C	C	C/SiC
1792	FRM	O.MB	M	Mid	3	S1	W	H	b	11	-	C	C	-
1793	WPO	O.GBL	M	Mid	2	S1	W	P	b	19	30	L	CL	-
1794	ZRL	O.MB	BRUN	Mid	3	S1	VR	P	v	13	27	L	L	-
1795BH	FRMxl	O.MB	M/BRUN	Upper	3	S1	R	P	v	14	32	SL	SCL	-
1796	FRM	O.MB	M	Upper	1	S1	W	P	b	22	-	SL	SL	-
1797	FRM	O.MB	M	Mid	3	S2	W	P	b	19	-	CL	CL	-
1798	ZRL	O.R	BRUN	Mid	2	S0	VR	W	v	7	-	L	-	-
1799BH	LYS	O.HG	M	Lower	3	S1	P	H	u	22	90	L	SCL	SiCL/SiL
1800	FRM	O.MB	GLLC	Mid	3	S0	W	H	u	19	-	SiCL	SiCL	-
1801	LYS	O.HG	M	Mid	3	S1	P	H	u	30+	-	SiL-L	-	-
1802BH	LYS	O.HG	M	Mid	3	S1	P	P	u	34	68	SCL	SCL	SiCL/SCL

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1803	LYS	O.HG	M	Level	1	S1	P	W	u	30+	-	SCL	-	-
1804	MCW	O.HG	GLLC	Level	1	S0	P	P	l	24	-	SiCL	CL	-
1805BH	MCWtkzr	R.HG	FLUV	Lower	2	S0	P	W	t	53	-	SL	-	SL/CL/SiL
1806	FRM	O.MB	M	Upper	3	S1	W	W	b	26	-	CL	SL	-
1808	FRM	O.MB	M	Upper	3	S1	W	W	b	18	-	CL	SCL	-
1809BH	LYSxl	O.HG	M/BRUN	Lower	3	S2	P	W	v	23	58	CL	SCL	SCL
1810	WPO	O.GBL	M	Mid	2	S1	W	P	b	22	-	CL	C	-
1811	WPOgl	GL.MB	M	Upper	3	S1	I	P	b	20	-	CL	C	-
1812BH	LYSylzr	R.HG	M/BRUN	Lower	2	S1	I	P	b	19	-	CL	-	C
1813	FRMgl	GL.MB	M	Mid	2	S1	I	W	b	30+	-	CL	-	-
1814	WPO	O.GBL	M	Lower	2	S1	W	P	b	22	-	CL	C	-
1815BH	ZRL	O.HR	BRUN	Mid	3	S1	VR	W	v	15	21	SCL	SCL	-
1816	ZRL	O.MB	BRUN	Mid	3	S2	VR	W	v	12	27	L	CL	-
1817	ZRL	O.MB	BRUN	Mid	2	S1	VR	W	v	15	30	CL	CL	-
1818	FRM	O.MB	M	Lower	2	S1	I	C	u	22	-	CL	CL	-
1819	LYS	O.HG	M	Mid	2	S2	P	C	u	22	-	CL	SCL	-
1820	WPO	O.GBL	M	Mid	2	S1	MW	W	u	22	-	CL	C	-
1827	ZRL	O.HR	BRUN	Mid	2	S1	VR	W	v	18	-	L	-	-
1827a	FRM	O.MB	M	Mid	3	S1	W	W	u	16	-	SL	SL	-
1828	ZRL	O.R	BRUN	Mid	1	S2	VR	W	v	6	-	L	-	-
1829BH	ZRL	O.R	BRUN	Mid	1	S2	VR	W	v	9	-	L	-	-
1830	ZRL	O.MB	BRUN	Upper	2	S1	VR	W	v	14	25	L	L	-
1833BH	LDWxl	GL.GBL	M/BRUN	Upper	2	S1	I	B	v	23	56	SiCL	SiC	-
1834	MCW	O.HG	GLLC	Lower	2	S0	P	B	b	22	-	CL	C	-
1835	MCWzr	R.HG	GLLC	Depression	2	S0	P	B	b	27	-	SiL	-	C
1836BH	MCWyl	O.HG	GLLC/BRUN	Mid	2	S0	P	W	b	23	78	SiCL	C	C
1837	FRM	O.MB	M	Mid	2	S1	W	W	b	22	-	CL	SCL	-
1838	FRMgl	GL.MB	M	Mid	3	S1	I	P	b	17	-	CL	CL	-
1839BH	FRM	O.MB	M	Upper	3	S2	W	P	u	33	60	SCL	SCL	SCL
1840	FRM	O.MB	M	Mid	3	S1	W	W	u	28	-	L	SL	-
1841	FRM	O.MB	M	Mid	2	S1	W	W	u	15	-	SL	SCL	-
1842	FRM	O.MB	M	Upper	2	S1	W	W	u	22	-	SL	SL	-

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1843BH	WPOyl	O.GBL	M/BRUN	Upper	2	S1	W	W	b	22	48	L	CL	C
1844	LDW	GL.GBL	GLLC	Lower	2	S1	I	W	u	19	-	L	CL	-
1850BH	LYSxl	O.HG	M/BRUN	Mid	3	S1	P	W	v	18	45	SiC	SiCL	SiCL
1851	LYS	O.HG	M	Mid	2	S1	P	W	b	27	-	C	C	-
1852	LYS	O.HG	M	Mid	2	S1	P	W	b	17	-	CL	CL	-
1853BH	LDW	GL.GBL	M	Mid	2	S1	I	H	b	17	48	SiCL	C	SCL
1854	LYS	O.HG	M	Mid	2	S1	P	H	b	21	-	SiCL	SCL	-
1855BH	WPOxl	O.GBL	M/BRUN	Mid	2	S3	W	H	v	19	42	L	CL	-
1856	ZRL	O.HR	BRUN	Mid	2	S1	VR	W	v	19	-	CL	-	C
1857	FRMxlzr	GL.HR	M	Mid	2	S1	I	W	b	21	-	CL	-	C
1858	OBExl	O.HR	M	Mid	2	S1	W	P	b	19	-	CL	-	C
1859BH	WPOyl	O.GBL	M/BRUN	Lower	2	S1	MW	P	b	21	52	L	CL	C
1860	WPO	O.GBL	M	Mid	2	S1	W	P	u	16	-	CL	C	-
1861	ZRL	O.HR	BRUN	Mid	2	S1	VR	P	v	17	24	CL	CL	-
1862	ZRL	O.HR	BRUN	Mid	2	S1	VR	P	v	21	-	CL	-	-
1863	ZRL	O.HR	BRUN	Mid	2	S2	VR	H	v	18	-	SL	-	-
2072	LYS	O.HG	M	Lower	4	S1	P	H	m	25	-	CL	SL	-
2073BH	ZRL	O.HR	BRUN	Lower	2	S1	VR	W	v	21	-	L	-	-
2074	ZRL	O.HR	BRUN	Mid	2	S2	VR	W	v	22	-	L	-	-
2075	ZRL	O.HR	BRUN	Upper	2	S2	VR	W	v	15	-	L	-	-
2076	NPEzr	R.HG	M	Depression	2	S2	I	W	b	10	-	SL	-	SCL
2077BH	NPEzr	R.HG	M	Depression	3	S1	P	P	b	23	-	L	-	CL
2078	ZRL	O.HR	BRUN	Mid	5	S2	VR	P	m	19	-	CL	-	-
2079	FRM	O.MB	M	Crest	5	S2	W	P	m	16	-	SL	SL	-
2080BH	ZRL	O.HR	BRUN	Crest	5	S2	VR	P	m	23	-	L	-	-
2081	FRM	O.MB	M	Upper	4	S2	W	P	m	23	-	L	L	-
2082	ZRL	O.HR	BRUN	Upper	3	S2	VR	P	v	13	-	SL	-	-
2083BH	WPOxl	O.GBL	M/BRUN	Mid	3	S2	W	P	v	9	39	L	SCL	SCL
2084	FRM	O.MB	M	Mid	3	S2	W	P	b	12	-	SCL	SCL	-
2085	WPO	O.GBL	M	Mid	4	S2	W	P	m	14	-	L	CL	-
2086BH	FRMxl	O.MB	M/BRUN	Mid	3	S2	W	P	v	12	48	L	L	SCL
2087	-	-	M	Upper	3	S2	-	W	b	30+	-	L	-	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
2088	ZRL	O.R	BRUN	Mid	3	S2	VR	W	v	5	-	L	-	-
2089BH	ZRL	O.HR	BRUN	Upper	2	S3	VR	W	v	11	-	L	-	-
2090	LYSzr	R.HG	M	Toe	5	S1	P	P	m	19	-	CL	-	CL
2092	LDW	GL.GBL	M	Lower	3	S1	I	C	b	22	-	CL	C	-
2093	NPEzr	R.HG	GLLC	Upper	2	S0	P	C	b	21	-	CL	-	C
2095	LDW	GL.GBL	M	Mid	2	S1	I	H	b	12	24	SiCL	CL	SiC
2096	LDW	GL.GBL	M	Mid	2	S1	I	H	b	22	-	CL	C	-
2097BH	LDWxl	GL.GBL	M/BRUN	Mid	2	S1	I	H	v	18	65	CL	C	SCL
2098	LDW	GL.GBL	M	Lower	2	S1	I	P	u	27	-	CL	CL	-
2102	NPEzr	R.HG	GLLC	Lower	2	S0	P	P	u	19	-	C	-	C
2103BH	LDW	GL.GBL	GLLC	Lower	2	S0	I	H	u	19	53	CL	C	C
2104	NPE	O.HG	GLLC	Depression	2	S0	P	H	u	11	-	CL	C	-
2105BH	LDW	GL.GBL	GLLC	Lower	3	S0	I	H	u	18	39	CL	C	C
2106	LYS	O.HG	M	Mid	2	S2	P	W	u	21	-	CL	SiCL	-
2107	FRMxl	O.MB	M	Mid	3	S2	W	W	v	19	-	CL	CL	-
2108BH	ZRL	O.R	BRUN	Upper	3	S3	VR	W	v	8	-	L	-	-
2109	LYS	O.HG	M	Mid	3	S1	P	W	u	27	-	CL	CL	-
2110	LYS	O.HG	M	Lower	3	S1	P	W	u	21	-	CL	C	-
2111	LYS	O.HG	M	Mid	2	S1	P	W	u	29	-	C	C	-
2112BH	LYSyg	O.HG	M	Mid	3	S1	P	P	u	33	55	CL	CL	CL/LS
2113	LYSzr	R.HG	M	Level	2	S1	P	WT	l	22	-	SiL	-	SiCL
2114BH	NPE	O.HG	GLLC	Lower	3	S0	P	P	u	18	75	SiCL	SiC	SiC
2115	NPE	O.HG	GLLC	Upper	3	S0	P	P	u	22	-	CL	CL	-
2116	LYS	O.HG	M	Upper	4	S1	P	C	h	21	-	SiC	SiC	-
2117BH	LDW	GL.GBL	M	Lower	2	S1	I	C	b	14	56	CL	C	HC
2118	LYS	O.HG	M	Mid	4	S1	P	C	h	19	-	CL	SiCL	-
2119	LYS	O.HG	M	Upper	4	S1	P	C	m	19	-	CL	CL	-
2120	-	-	M	Depression	4	S1	P	C	m	30+	-	CL	-	-
2121BH	LYSxl	O.HG	M/BRUN	Mid	4	S1	P	C	m	21	54	CL	CL	SCL
2122	WPO	O.GBL	M	Upper	3	S2	W	H	b	24	-	L	SiCL	-
2123	LYS	O.HG	M	Depression	4	S1	P	P	m	20	-	CL	CL	-
2124BH	LYS	O.HG	M	Mid	3	S1	P	P	b	24	75	SiCL	CL	C/SiC

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2125	LYS	O.HG	M	Upper	3	S1	P	P	b	17	-	CL	C	-
2126	ZRL	O.HR	BRUN	Mid	3	S2	VR	W	v	12	-	SL	-	-
2127	NPE	O.HG	GLLC	Lower	2	S0	P	W	b	30+	-	SiC	-	-
2128BH	LYSxl	O.HG	M/BRUN	Upper	4	S1	P	H	m	36	68	SiCL	SCL	-
2129	LYS	O.HG	M	Mid	4	S2	P	H	m	29	-	CL	CL	-
2130BH	LDW	GL.GBL	GLLC	Lower	3	S0	I	H	u	31	65	CL	C	C
2131	ZRL	O.HR	BRUN	Lower	3	S0	VR	H	v	16	-	L	-	-
2132	NPE	O.HG	GLLC	Lower	2	S0	P	W	u	22	-	CL	CL	-
2133	NPEzr	R.HG	GLLC	Level	1	S0	P	W	l	-	-	-	-	HC
2134	ZRL	O.HR	BRUN	Upper	2	S1	VR	W	v	16	-	L	-	-
2135BH	NPEzr	ptR.G	GLLC	Level	1	S0	P	P	l	-	-	-	-	C
2136	NPEzr	R.HG	GLLC	Lower	2	S0	I	H	u	23	-	CL	-	SiC
2137	NPEzr	R.HG	GLLC	Lower	2	S0	I	W	u	29	-	L	-	C
2138	LDW	GL.GBL	GLLC	Lower	3	S0	I	C	u	11	-	L	C	-
2139	WPO	O.GBL	M	Mid	2	S1	W	W	u	14	-	L	C	-
2140	FRM	O.MB	M	Crest	4	S1	W	W	h	14	-	L	SL	-
2141	ZMK	T.H	O	Level	1	S0	VP	W	l	-	-	-	-	-
2142BH	ZMK	T.H	O/GLLC	Level	1	S0	VP	C	l	-	-	-	-	C
2143	ZMK	T.H	O	Level	1	S0	VP	C	l	-	-	-	-	-
2144	ZMK	T.H	O	Level	1	S0	VP	C	l	-	-	-	-	-
2145BH	NPEzr	R.HG	GLLC	Level	1	S0	P	C	l	37	-	SiL	-	C
2146	NPEzr	R.HG	GLLC	Level	1	S0	I	C	l	21	-	L	-	C
2147	LYS	O.HG	M	Mid	4	S1	P	C	h	21	-	SiC	C	-
2148BH	LYSyl	O.HG	M/BRUN	Crest	4	S1	P	C	m	18	56	SiCL	C	HC
2149	LYS	O.HG	M	Lower	4	S1	P	C	h	22	-	CL	CL	-
2150	LYS	O.HG	M	Mid	3	S1	P	C	u	30	-	CL	-	-
2151BH	LYS	O.HG	M	Lower	5	S1	P	C	h	31	62	CL	CL	C
2152	LYS	O.HG	M	Mid	3	S3	P	C	u	21	-	SiC	SiC	-
2153	LYS	O.HG	M	Mid	2	S1	P	H	u	17	-	C	SiC	-
2154	LDW	GL.GBL	M	Upper	2	S1	P	H	u	20	-	CL	C	-
2155BH	NPExtyl	O.HG	GLLC/M	Mid	2	S0	P	H	b	17	70	SiCL	C	SiC
2156	-	-	M	Mid	2	S1	-	C	b	30+	-	CL	-	-

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2157	NPE	O.HG	GLLC	Mid	3	S0	P	H	b	18	-	SiC	SiC	-
2158BH	NPEyt	O.HG	GLLC/M	Mid	3	S0	P	C	b	17	75	SiC	C	SiC
2159	LYS	O.HG	M	Mid	2	S1	P	H	b	22	-	C	C	-
2160	LYS	O.HG	M	Mid	2	S1	P	C	b	23	-	C	CL	-
2161BH	NPExl	O.HG	GLLC/BRUN	Mid	3	S0	P	C	v	17	57	SCL	SiC	-
2162	NPE	O.HG	GLLC	Upper	3	S0	P	H	u	20	-	C	C	-
2163	-	-	GLLC	Mid	3	S0		H	u	30+	-	C	-	-
2165	NPE	O.HG	GLLC	Mid	3	S0	P	C	u	24	-	C	C	-
2166	-	-	GLLC	Mid	3	S0	P	C	u	30+	-	C	-	-
2168	WPO	O.GBL	GLLC	Mid	2	S0	W	W	u	12	-	L	CL	-
2169	LDW	GL.GBL	M	Mid	3	S1	I	H	u	22	-	CL	C	-
2170	LDWxl	GL.GBL	M/BRUN	Lower	4	S2	I	W	m	17	-	L	C	-
2171BH	NPEzr	R.HG	GLLC	Lower	4	S0	P	H	m	52	-	CL	-	HC
2172	ZRL	O.R	BRUN	Mid	4	S2	VR	W	m	8	-	L	-	-
2173	GVIxl	O.MB	M/BRUN	Upper	4	S2	W	W	m	17	-	L	CL	-
2182	WPO	O.GBL	M	Mid	4	S1	W	C	h	14	-	CL	C	-
2183	LDW	GL.GBL	M	Upper	3	S1	I	H	h	13	-	CL	C	-
2184BH	LDW	GL.GBL	GLLC	Upper	4	S0	I	H	m	16	34	CL	C	C
2185	NPE	O.HG	GLLC	Upper	4	S0	P	H	h	22	-	CL	CL	-
2186	ZRL	O.HR	BRUN	Crest	4	S3	VR	P	m	15	-	L	-	-
2187BH	LYSxl	O.G	M/BRUN	Mid	4	S1	P	P	m	8	48	CL	C	C
2188	LYS	O.HG	M	Mid	4	S1	P	P	h	15	-	CL	C	-
2189BH	LYSxlzr	O.HG	M/BRUN	Depression	2	S2	P	P	v	22	-	C	-	C
2190	MTD	GL.MB	M	Upper	4	S1	I	P	h	21	-	C	C	-
2191	ZRL	O.HR	BRUN	Crest	4	S3	VR	P	m	24	-	CL	-	-
2192BH	LDW	GL.GBL	M	Upper	4	S1	I	P	h	28	39	C	C	C
2193	ZRL	O.HR	BRUN	Crest	4	S3	VR	W	m	21	-	L	-	-
2194	ZRL	O.R	BRUN	Mid	5	S4	VR	W	m	-	-	-	-	-
2195	ZMK	O.HG	O	Level	1	S0	P	W	l	-	-	-	-	-
2196	ZRL	O.MB	BRUN	Upper	5	S2	VR	W	m	10	22	SL	LS	-
2197BH	NPE	O.HG	GLLC	Depression	4	S0	P	W	u	21	62	L	C	SiCL
2198	LDW	GL.GBL	GLLC	Lower	4	S0	I	W	h	15	-	CL	C	-

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2199	ZRL	O.R	BRUN	Mid	5	S3	VR	W	m	-	-	-	-	-
2200BH	ZMK	T.H	O/GLLC	Depression	2	S0	VP	W	b	-	-	-	-	HC
2203BH	NPE	O.HG	GLLC	Lower	5	S1	P	P	m	21	65	CL	C	C
2204	NPE	O.HG	GLLC	Upper	4	S0	P	H	m	25	-	CL	CL	-
2205	NPE	O.HG	GLLC	Lower	4	S0	P	H	m	30+	-	SiCL	-	-
2206BH	NPE	O.HG	GLLC	Lower	4	S0	P	H	t	26	65	SiCL	SiC	SiC
2207	NPE	O.HG	GLLC	Lower	3	S0	P	W	t	14	-	SiCL	C	-
2208BH	FRMxl	O.EB	M/BRUN	Upper	3	S3	R	W	v	3	35	SiL	L	-
2209	NPE	O.HG	GLLC	Lower	3	S2	P	W	b	20	-	SiCL	HC	-
2210	NWC	BR.GBL	M	Lower	3	S3	W	W	b	4	-	L	L/SiC	-
2211BH	LYSxl	O.HG	M/BRUN	Lower	5	S2	P	W	m	24	55	L	CL	CL
2212	ZRL	O.R	BRUN	Mid	6	S5	VR	W	m	-	-	-	-	-
2213	ZRL	O.R	BRUN	Upper	6	S5	VR	W	m	4	-	L	-	-
2214BH	ZRL	O.R	BRUN	Upper	5	S5	VR	W	m	4	-	L	-	-
2215	ZRL	O.R	BRUN	Mid	5	S5	VR	W	m	-	-	-	-	-
2216BH	ZRL	O.HR	BRUN	Upper	5	S5	VR	W	m	12	18	L	SL	-
2217	NPE	O.HG	GLLC	Lower	3	S2	P	H	b	18	-	SiCL	C	-
2218	ZRL	O.HR	BRUN	Upper	3	S5	VR	W	v	17	-	L	-	-
2219BH	NPExl	O.HG	GLLC/BRUN	Lower	3	S0	P	W	v	11	50	CL	SiC	SiC
2220	NPE	O.HG	GLLC	Lower	3	S2	P	W	b	27	-	SiC	SiC	-
2221	NPE	O.HG	GLLC	Depression	2	S0	P	W	u	25	-	SiCL	SiC	-
2222BH	LYS	O.HG	M	Mid	5	S1	P	W	h	31	58	CL	CL	CL
2223	LYS	O.HG	M	Mid	5	S1	P	W	h	14	-	SiC	SiC	-
2224	LYSta	O.G	M	Mid	5	S1	P	W	h	6	29	SiCL	SiC	SiC
2225BH	LDWzb	GLBR.GBL	M	Mid	5	S1	I	W	h	14	65	CL	CL/C	CL
2226	NPE	O.HG	M	Mid	5	S1	P	W	h	24	-	C	C	-
2227	ZRL	O.R	BRUN	Mid	5	S2	VR	W	m	-	-	-	-	-
2232	NPEzr	R.HG	GLLC	Lower	2	S0	P	W	b	19	-	C	-	C
2233	NPEzr	R.HG	GLLC	mid	2	S0	P	W	b	16	-	C	-	C
2234	GVIxl	O.MB	M/BRUN	Mid	3	S2	W	W	v	12	30	L	SL	-
2235BH	LYSzr	R.HG	M/BRUN	Depression	2	S1	P	W	b	16	-	CL	-	C
2236	BDH	BR.GBL	M	Lower	4	S2	W	W	m	6	-	SL	LS/CL	-

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2237	LYSzr	R.HG	M	Depression	4	S1	P	W	m	16	-	CL	-	C
2238BH	ZRL	O.R	BRUN	Upper	4	S0	VR	W	m	3	-	L	-	-
2243BH	GVIxl	O.GBL	M/BRUN	Upper	5	S1	W	P	m	17	48	L	L	SCL
2244	ZRL	O.R	BRUN	Crest	6	S3	VR	P	m	9	13	L	L	-
2245BH	NPE	O.HG	GLLC	Lower	5	S0	P	P	m	23	55	CL	C	SiCL
2246	GVI	O.MB	M	Upper	5	S2	W	W	m	8	-	SL	SL	-
2247	ZRLgl	R.HG	BRUN	Lower	5	S3	P	P	m	24	-	CL	-	-
2248BH	NPE	O.HG	GLLC	Lower	5	S0	P	H	m	19	64	SiC	SiC	SiC
2249	NPEzr	R.HG	GLLC	Depression	5	S0	P	H	m	30+	-	SiC	-	-
2250	NPE	O.HG	GLLC	Lower	5	S0	P	H	m	21	-	CL	CL	-
2251BH	NPE	O.HG	GLLC	Lower	5	S0	P	W	m	33	55	SiCL	SiC	SiCL
2252	NPEzr	R.HG	GLLC	Level	1	S0	VP	WT	l	10	-	SiCL	-	HC
2253	NPEzr	R.HG	GLLC	Level	1	S0	VP	WT	l	27	-	SiCL	-	SiC
2254BH	NPExt	O.HG	GLLC/M	Lower	2	S0	P	P	l	15	53	HC	CL	C
2255	NPEzr	R.HG	GLLC	Level	1	S0	P	W	i	30+	-	HC	-	-
2256	ZMKxl	T.M	O/BRUN	Level	1	S0	VP	W	v	-	-	-	-	-
2257	ZMK	T.H	O	Depression	3	S0	VP	W	u	-	-	-	-	-
2258BH	NPExl	O.HG	GLLC/BRUN	Lower	3	S1	P	P	v	14	44	CL	C	C
2259	OBExlzr	O.HR	M/BRUN	Mid	3	S1	W	P	v	30+	-	CL	-	-
2260	ZRL	O.MB	BRUN	Mid	4	S3	VR	P	m	9	29	SL	SL	-
2261	ZRL	O.HR	BRUN	Mid	3	S2	VR	P	v	15	-	L	-	-
2262	LYS	O.HG	M	Lower	4	S1	P	P	m	19	-	CL	C	-
2263BH	LYS	O.HG	M	Mid	4	S1	P	P	m	26	57	CL	CL	SiCL
2264	MTD	GL.MB	M	Mid	4	S1	I	H	m	20	-	C	C	-
2265BH	LYS	O.HG	M	Lower	5	S1	P	H	m	26	65	CL	CL	SiCL
2266	LDW	GL.GBL	M	Mid	3	S2	I	C	u	19	-	CL	C	-
2267	GVI	O.MB	GLFL	Upper	3	S0	R	W	u	12	-	SL	LS	-
2268BH	MTD	GL.MB	GLLC/M	Mid	2	S0	I	H	h	14	47	C	C	C
2269	MTD	GL.MB	GLLC	Upper	3	S0	I	C	u	24	-	C	C	-
2270BH	NPExt	O.HG	GLLC/M	Lower	2	S0	P	C	u	15	42	C	C	HC
2271	NPEzr	R.HG	GLLC	Depression	2	S0	P	H	u	14	-	C	-	C
2272	MTD	GL.MB	GLLC	Mid	2	S0	I	H	u	21	-	C	C	-

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2273BH	NPEytzr	R.HG	GLLC/M	Depression	2	S0	P	C	u	14	-	C	-	C/CL
2274	NPE	O.HG	GLLC	Lower	2	S0	P	C	h	19	-	C	C	-
2275	LDW	GL.GBL	GLLC	Lower	3	S0	I	C	u	20	-	CL	C	-
2276BH	MTD	GL.MB	GLLC	Lower	2	S0	I	C	u	14	43	C	C	C
2277	WPO	O.GBL	M	Lower	2	S1	W	C	u	16	-	L	C	-
2278	NPE	O.HG	GLLC	Lower	2	S0	P	C	u	22	-	CL	C	-
2279BH	NPEyt	O.HG	GLLC/M	Upper	3	S0	P	C	u	28	60	C	C	C/SiCL
2280	NPE	O.HG	GLLC	Mid	2	S0	P	C	u	23	-	C	C	-
2281	MTD	GL.MB	GLLC	Mid	2	S0	I	C	u	24	-	C	C	-
2282BH	NPEyt	O.HG	GLLC/M	Mid	3	S0	P	C	u	35	60	C	C	SiC/CL
2283	LDW	GL.GBL	GLLC	Mid	3	S0	I	C	u	18	-	CL	C	-
2284	WPO	O.GBL	GLLC	Upper	3	S0	W	P	u	16	-	CL	C	-
2285BH	WPOyl	O.GBL	M/BRUN	Mid	3	S1	MW	P	b	19	38	C	C	C
2286	WPO	O.GBL	M	Crest	4	S1	W	P	h	16	-	CL	C	-
2287	LDW	GL.GBL	M	Upper	4	S1	I	P	u	22	-	CL	C	-
2288BH	LYSzr	R.HG	M	Lower	4	S1	P	P	h	24	-	C	-	C
2289	NPE	O.HG	GLLC	Lower	2	S0	P	P	u	27	-	CL	C	-
2290	NPE	O.HG	GLLC	Mid	3	S0	P	P	u	22	-	CL	CL	-
2291BH	LDWxl	GL.GBL	GLLC	Upper	3	S0	I	P	v	10	30	L	CL	C
2292	NPE	O.HG	GLLC	Depression	3	S0	P	P	u	22	-	SiCL	CL	-
2293	-	-	GLLC	Lower	3	S0	-	P	u	30+	-	CL	-	-
2294BH	LDW	GL.GBL	GLLC	Mid	3	S0	I	P	u	25	45	L	CL	C
2295	-	-	GLLC	Mid	3	S0	-	P	u	30+	-	CL	-	-
2296BH	WPO	O.GBL	GLLC	Mid	3	S0	MW	H	h	23	42	CL	C	C
2297	WPO	O.GBL	M	Lower	3	S1	W	H	h	22	-	CL	C	-
2298	WPO	O.GBL	M	Upper	4	S1	W	H	h	17	-	CL	C	-
2299BH	ZRL	O.HR	BRUN	Lower	2	S2	VR	P	v	16	-	CL	-	-
2300	ZRL	O.R	BRUN	Lower	4	S2	VR	P	m	6	-	SL	-	-
2301	NPEzr	R.HG	M	Lower	3	S2	P	P	h	26	-	L	-	CL
2302BH	NPExlzr	O.HG	M/BRUN	Mid	4	S2	P	P	m	19	-	L	-	CL
2303	NPEzr	R.HG	M	Depression	3	S1	P	P	l	19	-	C	-	C
2304BH	NPEzr	R.HG	GLLC	Depression	2	S0	P	P	h	22	-	C	-	C

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
2305	NPEzr	R.HG	GLLC	Depression	3	S0	P	W	u	26	-	CL	-	C
2306	NPEzr	R.HG	M	Depression	2	S1	P	P	h	26	-	CL	-	SiC
2307BH	NPE	O.HG	GLLC	Lower	3	S0	P	W	u	14	68	CL	C	C
2308	FRM	O.MB	M	Mid	4	S1	W	C	h	23	-	CL	CL	-
2310	ZRL	O.R	BRUN	Upper	4	S3	VR	C	m	-	-	-	-	-
2311	MTD	GL.MB	M	Upper	3	S3	I	W	u	20	-	CL	CL	-
2312BH	MTD	GL.MB	GLLC	Mid	4	S1	I	P	h	19	43	CL	C	C
2313	ZRL	O.R	BRUN	Lower	4	S3	VR	W	m	-	-	-	-	-
2314BH	FRMxl	O.MB	M/BRUN	Upper	4	S2	W	W	m	12	36	CL	SiCL	SiCL
2320BH	ZRLgl	GL.HR	GLLC/BRUN	Mid	3	S2	I	W	u	22	-	C	-	CL
2321	ZRL	O.HR	BRUN	Upper	6	S4	W	W	v	30	-	L	-	R
2322	ZRL	O.HR	BRUN	Mid	5	S4	W	W	v	11	-	L	-	R
2323	ZRL	O.HR	BRUN	Upper	4	S4	W	W	v	15	-	CL	-	R
2324	MTDyl	GL.MB	M/BRUN	Upper	2	S1	I	P	b	21	45	CL	CL	CL
2325	MTD	GL.MB	GLLC	Mid	3	S0	I	P	u	14	-	CL	CL	-
2326	MTD	GL.MB	GLLC	Mid	2	S1	I	C	u	20	-	CL	SiCL	-
2327	MTD	GL.MB	GLLC	Mid	2	S0	I	C	u	19	-	CL	SiCL	-
2639BH	MTD	GL.MB	TILL	Mid	3	S0	I	W	u	27	-	SCL	SCL	-
2640	MTD	GL.MB	TILL	Lower	3	S0	I	W	u	30	-	CL	-	-
2648BH	MTD	GL.MB	GLLC	Lower	2	S1	I	P	u	26	-	SiCL	LS	-
2649	MTD	GL.MB	GLLC	Lower	3	S1	I	C	u	30	-	SiCL	-	-
2650	MTD	GL.MB	GLLC	Lower	2	S1	I	W	u	22	-	CL	C	-
2651BH	NPE	O.HG	GLLC	Lower	3	S0	P	P	u	21	41	SiCL	SiC	SiC/C
2652	MTD	GL.MB	GLLC	Lower	2	S1	I	P	u	25	-	CL	LS	-
2655BH	FRM	O.MB	TILL	Mid	4	S1	W	DL	u	24	-	L	L	-
2656	FRM	O.MB	TILL	Mid	3	S1	W	DL	u	21	-	L	L	-
2657	FRM	O.MB	TILL	Lower	3	S2	W	DL	u	22	-	L	L	-
2658BH	FRM	O.MB	TILL	Lower	3	S1	W	DL	u	24	-	SL	SL	-
2662BH	FRM	O.MB	TILL	Mid	3	S2	W	C	u	19	27	L	L	L
2663	FRMxl	O.MB	TILL	Lower	3	S2	W	DL	u	19	-	SL	SL	-
2664	FRMzr	O.HR	TILL	Lower	3	S1	MW	W	u	20	-	L	-	SL
2665BH	MTDxl	GL.MB	TILL	Lower	3	S1	I	DL	u	24	40	SCL	LS	fSL

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
2666	MTDzz	O.MB	TILL	Lower	3	S1	W	W	u	17	-	SL	SL	-
2667	MTDzz	O.MB	TILL	Mid	3	S1	W	W	u	30	-	L	-	-
2668BH	MTDzzxl	O.MB	TILL	Mid	3	S1	W	W	u	15	42	L	L	SiL
2682BH	GVI	O.MB	TILL	Level	1	S0	R	DL	l	17	-	SiS	SL	-
2683	GVI			Level	1	S0	W	DL	l	30	-	SL	-	-
2684	GVI	O.MB	TILL	Level	1	S0	R	CL	l	20	-	SL	SL	-
2685	GVI	O.MB	TILL	Lower	3	S0	W	DL	u	10	-	SL	SL	-
2687	GNY	O.HG	GLFL	Level	1	S0	VP	W	l	10	-	SiL	SL	-
2688	GVI	O.MB	TILL	Level	1	S0	R	DL	l	27	-	SL	SL	-
2689BH	GVI	O.MB	TILL	Upper	3	S0	R	DL	u	30	65	SL	SL	LS
2690	GVI		Till	Lower	2	S0	R	DL	u	30	-	-	-	-
2691	GVI	O.MB	TILL	Level	1	S0	W	P	l	25	-	SIL	SIL	-
2692BH	GVI	O.MB	TILL	Upper	3	S0	W	P	u	27	70	CL	SCL	SCL
2693	GVI		Till	Level	1	S0	W	C	l	30	-	SiL	-	-
2694	GVI	O.MB	TILL	Level	1	S0	W	C	l	27	-	Sil	SL	-
2695BH	MTDgr	GL.MB	TILL	Mid	2	S0	I	C	u	28	44	L	SL	SL
2696	FRM	O.MB	TILL	Level	1	S0	MW	W	l	28	-	SiL	SL	-
2697	FRM	O.MB	TILL	Level	1	S0	W	W	l	20	-	SL	SL	-
2698BH	ZRL	R.HG	BRUN	Level	1	S1	W	W	l	10	-	SL	-	R
2699	LYS	O.G	TILL	Level	1	S0	P	W	l	7	-	fSL	LS	-
2700	LYS	O.HG	TILL	Level	1	S0	P	CL	l	30	-	L	-	-
2701	FRM	O.MB	TILL	Level	1	S0	R	W	l	28	-	L	LS	-
2702	FRM	O.MB	Till	Mid	3	S0	R	W	u	25	-	SL	LS	-
2703	FRM		TILL	Upper	2	S0	W	DL	u	30	-	SL	-	-
2703BH	ZRL	O.HR	BRUN	Mid	1	S0	P	W	u	17	-	SiL	-	R
2704	FRM	O.MB	Till	Level	1	S0	W	DL	l	8	-	fSL	SL	-
2705	GNY	O.HG	GLLC	Lower	2	S0	I	W	u	30	-	fSL	-	-
2706BH	FRMxl	O.MB	BRUN	Level	1	S0	W	W	l	13	26	C	C	R
2707	FRM	O.MB	TILL	Level	1	S0	W	DL	l	18	-	vfSL	Fsl	-
2708BH	ZRL	R.HG	BRUN	Level	1	S0	VP	WT	l	15	-	SiL	-	LS/R
2710	FRM	O.MB	TILL	Depression	2	S0	MW	W	u	18	-	L	SL	-
2718	FRM	O.MB	TILL		1	S0		DL	l	25	-	SL	SL	-

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2719	LYS	O.HG	GLFL	Level	1	S0	VP	WT	l	30+	-	LS	-	-
2748BH	AHGzz	O.MB	GLFL/TILL	Mid	4	S0	MW	W	u	15	39	LS	LS	SC
2749	AHGzz	O.MB	EOLI	Mid	4	S1	W	W	u	24	-	SL	LS	-
2753BH	CEYzr	R.HG	GLFL/TILL	Lower	4	S0	P	DL	u	32	-	SL	LS	C
2754	CEYzr	R.HG	GLFL	Lower	3	S0	P	DL	u	19	-	L	SL	SL
2755	CEYzr	R.HG	GLFL	Mid	3	S0	P	DL	u	25	-	L	LS	LS
2756BH	GVIxt	GL.MB	GLFL/TILL	Mid	4	S0	I	DL	u	22	51	SL	LS	C
2757	CEY	O.HG	GLFL	Lower	3	S0	P	W	u	28	-	SL	LS	-
2758	GVI	O.MB	GLFL	Mid	4	S0	W	W	u	13	-	SL	LS	-
2759BH	GVIgl	GL.MB	GLFL	Lower	2	S0	I	W	u	16	-	SL	SL	-
2760	NPEzr	R.G	LACU	Depression	3	S0	P	WT	u	7	-	SL	SL	SL
2761	NPEzr	R.G	LACU	Depression	3	S0	P	WT	u	10	-	C	C	C
2784	LYS	O.HG	TILL	Lower	4	S1	P	W	u	26	-	L	LS	-
2785	LYS	O.HG	TILL	Lower	4	S1	P	DL	u	16	-	L	SiCL	-
2786BH	LYS	O.HG	TILL	Lower	3	S1	P	DL	u	23	-	CL	SiC	-
2787	AHG	GL.MB	FLUV	Mid	4	S1	I	W	u	23	-	SL	fSL	-
2788	AHGzz	O.MB	FLUV	Mid	3	S0	W	W	u	22	-	FSL	fSL	-
2789	LYS	O.HG	TILL	Lower	3	S0	P	W	u	28	-	L	SCL	-
2792BH	AHGxt	GL.MB	GLFV/TILL	Mid	2	S0	W	P	u	13	22	SiL	SiL	S/C
2793	AHG	GL.MB	GLFL	Lower	2	S1	MW	W	u	18	27	SiL	SL	SiS
2794	AHG	GL.MB	GLFL	Mid	2	S1	MW	W	u	23	-	L	SL	-
2795	AHGzz	E.MB	FLUV	Mid	3	S1	MW	W	u	24	52	SL	SL	LfS
2796	AHG		GLFL	Mid	3	S1	W	W	u	20	-	SiS	S	-
2797	AHG		GLFL	Upper	3	S1	MW	W	u	25	-	SiL	S	-
2798	AHG	GL.MB	GLFL	Mid	3	S1	MW	W	u	30+	-	SL	-	-
2799BH	ZGW	R.HG	FLUV/TILL	Lower	3	S0	P	DL	u	32	-	SL	-	LfS/C
2805	AHG	GL.MB	GLFL	Level	1	S0	MW	DL	l	23	-	SiL	L	-
2806BH	AHG	GL.MB	GLFL/GLLC/GLFL	Level	1	S0	MW	DL	l	28	60	SiL	vfSL	SiCL/Fsl
2807	AHG		GLFL	Mid	2	S0	MW	DL	u	30	-	Fsl	-	-
2809BH	GNY	O.HG	GLFL	Level	1	S0	VP	WT	l	30	50	SL	S	cS
2810	GNY	O.HG	GLFL	Level	1	S0	VP	WT	l	30+	-	SL	-	-
2811	GVI	O.MB	GLFL	Level	1	S0	W	W	l	25	-	SL	LS	-

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2812BH	GVI	O.MB	TILL	Level	1	S0	W	DL	l	25	-	SL	SL	-
2813	MTD	GL.MB	GLFL	Level	1	S0	I	DL	l	27	-	SL	SL	-
2814	GVI	O.MB	TILL	Upper	2	S0	W	W	u	12	-	SL	SL	-
2815BH	GVI	O.MB	TILL	Level	1	S0	W	W	l	17	37	SL	SL	SiCL
2816	ZAL		GLFL	Lower	3	S0	MW	W	u	30	-	SL	-	-
2818	ZAL	GL.MB	FLUV	Mid	4	S1	W	DL	u	18	-	SL	LS	-
2819BH	AHG	O.MB	TILL	Level	1	S0	W	DL	l	23	30	L	LS	S
2820	AHG	O.MB	GLFL	Mid	3	S1	MW	DL	u	22	-	SL	LS	-
2821	AHG	O.SB	GLFL	Mid	3	S1	W	W	u	27	-	LS	S	-
2822BH	GNY	O.HG	GLFL/GLLC	Level	1	S0	VP	WT	l	30	75	cS	L	SiL/SiC
2824	GNY	O.HG		Mid	2	S0	P	W	h	30+	-	LS	-	-
2825BH	GVI	O.MB	GLFL/GLLC	Level	4	S0	MW	W	l	25	80	LS	S	vfSL/SiCL
2839	GVI	O.MB	TILL	Level	1	S0	MW	W	l	25	-	Fsl	SL	-
2840BH	MTD	GL.MB	GLLC	Lower	2	S0	I	H	u	28	42	SL	SCL	SiCL
3136	BGH	O.MB	GLFL	Upper	4	S0	W	P	u	17	-	SL	SCL	-
3145	BGH	O.MB	GLFL	Lower	2	S0	W	P	l	23	-	SL	SL	-
3155	BGH	O.MB	GLFL	Upper	4	S0	W	P	h	28	-	L	L	-
3156BH	BGH	O.MB	GLFL	Upper	4	S0	W	P	u	29	90	L	vfSL	S
3157	BGH	O.MB	GLFL	Mid	3	S0	W	P	u	28	-	L	vfSL	-
3158	BGH	O.MB	GLFL	Mid	5	S0	W	W	t	19	-	L	vfSL	-
3177	WPO	O.GBL	M	Mid	2	S1	W	DL	u	20	-	SiCL	SiCL	-
3181BH	OBE	O.MB	M	Mid	3	S1	W	C	u	30	45	L	L	L/CL
3182	-	-	M	Upper	3	S1	-	C	u	30+	-	L	-	-
3183	OBE	O.MB	M	Upper	3	S1	W	C	u	29	-	L	SCL	-
3185	OBE	O.MB	M	Upper	4	S1	W	C	u	29	-	SL	LS	-
3206	OBE	O.MB	M	Mid	3	S1	W	W	u	20	-	SiCL	SiL	-
3207	OBE	O.MB	M	Mid	2	S1	W	W	u	23	-	CL	CL	-
3208	DGT	BR.GBL	M	Upper	3	S1	W	W	u	20	-	L	SiCL	-
3209BH	BDHgl	GL.GBL	M	Crest	3	S3	I	C	u	14	45	L	CL	SCL
3210	DGT	BR.GBL	M	Lower	3	S3	MW	C	u	20	-	L	SiL	-
3211	DGT	BR.GBL	M	Mid	3	S2	W	C	u	14	-	L	SiL	-
3213	BDH	BR.GBL	M	Upper	5	S2	W	W	t	23	-	SL	SiCL	-

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3214	BDH	O.MB	M	Mid	4	S1	W	C	m	30+	-	L	-	-
3215BH	BDH	O.MB	M	Upper	2	S1	MW	W	u	24	53	SiL	SiL	SiL
3216	OBE	O.MB	M	Mid	3	S2	W	W	u	20	-	SiL	SiL	-
3224	OBE	O.MB	M	Mid	3	S1	W	C	u	27	-	L	CL	-
3225	OBE	O.MB	M	Upper	3	S1	W	C	u	27	-	L	CL	-
3227	-	-	M	Toe	4	S1	-	C	m	30+	-	CL	-	-
3228BH	ZALxt	GL.MB	GLFL/M	Level	1	S0	I	W	l	20	53	L	CL	SiL/SiCL
3229	BDH	O.GBL	M	Lower	3	S1	W	W	b	15	-	L	L/CL	-
3230	BDH	O.GBL	M	Mid	3	S1	W	W	b	21	-	L	L/CL	-
3248	-	-	M	Lower	4	S1	-	C	m	30+	-	SL	-	-
3250	BDH	-	M	Mid	4	S1	-	C	m	30+	-	SL	-	-
3251	BDH	O.GBL	M	Mid	4	S1	W	C	m	29	-	SL	CL	-
3252BH	BGHxt	O.MB	GLFL/M	Upper	4	S1	W	C	m	32	85	SL	SL	CL
3253	OBE	O.MB	M	Mid	4	S1	W	C	m	24	-	SL	SL	-
3254	-	-	M	Mid	4	S1	-	C	m	30+	-	LS	-	-
3256	OBE	O.MB	M	Mid	5	S1	R	C	m	25	-	LS	LS	-
3257	OBE	O.MB	M	Lower	3	S1	R	W	u	7	19	S	S	cS
3258BH	OBEzr	O.HR	M	Mid	4	S1	W	H	u	21	-	SL	-	CL
3259	BGH	O.MB	GLFL	Mid	3	S0	R	P	u	18	-	S	cS	-
3260	WPO	O.GBL	M	Mid	4	S1	W	C	u	24	-	SiCL	C	-
3261	SMF	GL.GBL	GLLC	Lower	3	S0	I	C	b	21	-	SiL	SiCL	-
3261BH	WPO	O.GBL	M	Mid	4	S1	MW	C	m	28	65	CL	C	C
3262	-	-	M	Upper	5	S1	-	C	m	30+	-	SL	-	-
3263	WPO	O.GBL	M	Mid	4	S1	W	C	m	23	-	L	SCL	-
3265	-	-	M	Mid	5	S1	-	H	m	30+	-	SiL	-	-
3266	SMF	GL.GBL	GLLC	Mid	4	S0	MW	H	m	18	-	SiL	SiCL	-
3267BH	SMF	GL.GBL	GLLC	Mid	4	S1	I	C	m	19	48	SiL	SiL	SL/SiL/SiC
3269	-	-	GLLC	Mid	4	S0	-	C	m	30+	-	SiL	-	-
3270BH	SMF	GL.GBL	GLLC	Lower	3	S0	I	C	u	24	48	SiL	SiCL	CL/SiS/SiCL
3271	OBEgl	GL.MB	M	Mid	4	S1	I	C	m	21	-	CL	SL	-
3272	GNY	O.HG	GLLC	Lower	4	S0	P	C	u	30+	-	SiL	-	-
3274	-	-	GLLC	Lower	4	S0	-	C	m	30+	-	CL	-	-

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3276	SMG	O.GBL	GLLC	Mid	3	S0	MW	C	u	26	-	SiL	SiCL	-
3277	SMF	GL.GBL	GLLC	Mid	4	S0	MW	C	m	23	-	L	CL	-
3279	SMF	GL.GBL	GLLC	Mid	3	S0	MW	C	b	17	-	L	CL	-
3280	-	-	GLLC	Mid	4	S0	-	C	m	30+	-	L	-	-
3282	CEY	O.HG	GLFL	Lower	3	S0	P	W	u	19	-	SL	S	-
3283	ZAL	GL.MB	GLFL	Mid	1	S0	I	W	u	22	-	SiL	SL	-
3284BH	BGH	O.MB	FLUV	Lower	4	S0	MW	W	u	19	50	L	SiL	SiL/SiS
3285	-	-	GLFL	Mid	2	S0	-	W	u	30+	-	SiL	-	-
3286	BGH	O.MB	GLFL	Mid	3	S0	W	C	u	30	-	SL	-	-
3287	BDH	BR.GBL	M	Upper	3	S1	W	W	u	28	-	SiL	CL	-
3288BH	BDHgl	GL.GBL	M	Mid	3	S1	W	C	u	16	32	SiL	SiCL	SiL/C
3291	-	-	FLUV	Lower	4	S0	-	C	m	30+	-	SL	-	-
3292BH	OBE	O.MB	M	Mid	5	S1	W	C	h	18	28	SL	SL	LS
3293	OBE	O.MB	M	Mid	4	S1	W	C	m	30	-	L	-	-
3311	BGH	O.MB	GLFL	Mid	3	S1	W	C	u	25	-	SL	LS	-
3316	MCW	O.HG	GLLC	Mid	2	S1	P	C	u	28	-	CL	C	-
3317	FRM	O.MB	GLLC	Upper	3	S1	W	C	u	19	-	C	C	-
3318	FRMyl	E.MB	GLLC/M	Upper	3	S0	MW	C	b	33	60	L/SiL	L	SCL
3319	ZRL	O.HR	BRUN	Upper	3	S2	VR	P	v	13	-	SiL	-	-
3320	FRM	O.MB	GLFL	Mid	3	S0	W	W	t	30+	-	SL	-	-
3321BH	MCW	O.HG	GLLC	Upper	3	S0	P	C	u	22	60	CL	SCL	SiC
3322	MCW	O.HG	GLLC	Depression	4	S0	P	W	h	23	-	CL	C	-
3323	FRM	O.MB	GLLC	Upper	4	S0	W	C	h	24	-	CL	CL	-
3325BH	ZRL	O.MB	BRUN	Mid	2	S1	VR	H	v	13	27	L	SCL	-
3326	WPO	O.GBL	M	Mid	2	S1	W	H	u	19	-	L	CL	-
3327	WPO	O.GBL	M	Mid	2	S1	MW	H	u	17	-	L	C	-
3328BH	MCWxl	O.HG	M/BRUN	Lower	2	S1	P	W	v	19	52	SiCL	C	-
3329	MCWxl	O.HG	M	Lower	2	S1	P	W	v	22	-	SiC	C	-
3330	ZRL	O.MB	BRUN	Mid	2	S1	VR	W	v	16	26	L	SiL	-
3332	ZRL	O.GBL	BRUN	Upper	2	S2	VR	W	v	12	25	L	CL	-
3333BH	ZMK	T.H	O/GLLC	Level	1	S0	VP	W	l	-	-	-	-	C
3335BH	ZRL	O.HR	BRUN	Crest	3	S1	VR	H	v	16	23	L	L	-

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3337	DGT	O.MB	M	Lower	3	S1	W	C	u	30+	-	L	-	-
3343	BDH	O.MB	M	Upper	3	S1	W	C	b	30+	-	L	-	-
3344BH	BDH	O.GBL	M	Upper	4	S1	MW	C	m	23	62	L	CL	CL
3345	-	-	M	Mid	4	S2	-	C	m	29+	-	L	-	-
3346	-	-	M	Mid	4	S1	-	C	m	29+	-	L	-	-
3347BH	LYS	O.HG	FLUV/M	Mid	4	S1	P	C	m	47	105	CL	CL	CL/LS
3348	-	-	M	Mid	3	S1	-	W	u	29+	-	L	-	-
3349	OBE	O.MB	M	Mid	4	S1	W	C	m	22	-	L	L	-
3350	BDH	O.GBL	M	Lower	4	S1	W	W	m	19	-	L	CL	-
3359	-	-	M	Mid	3	S1	-	P	b	30+	-	SL	-	-
3360	BDH	BR.GBL	M	Upper	4	S1	W	P	m	23	-	CL	CL	-
3361BH	OBE	O.MB	M	Lower	4	S1	MW	P	m	36	72	CL	CL	CL/SC
3362	OBE	O.MB	M	Lower	3	S1	W	P	b	28	-	fSL	L	-
3364BH	OBE	O.MB	M	Mid	4	S1	W	W	m	22	50	SL	LS	SCL
3365	OBE	O.MB	M	Mid	2	S1	-	W	u	30+	-	L	-	-
3366	OBE	O.MB	TILL	Level	2	S1	W	C	u	30	-	L	-	-
3367	OBE	O.MB	TILL	Mid	3	S1	W	C	u	27	-	SL	SCL	-
3368BH	ZAL	GL.MB	FLUV	Lower	4	S2	I	W	t	38	50	L	SiCL	fS
3369	DGT	O.MB	M	Upper	3	S1	W	C	u	28	-	SiL	CL	-
3370	DGT	O.MB	M	Lower	3	S1	W	C	u	20	-	SiCL	CL	-
3371BH	OBE	O.MB	M	Upper	4	S1	W	C	h	20	45	CL	CL	C
3372	FRM	O.MB	M	Crest	4	S1	W	H	h	20	-	SiL	CL	-
3373	-	-	FLUV	Lower	2	S0	-	W	I	30+	-	SiL	-	-
3374BH	ZAL	GL.MB	FLUV/M	Mid	4	S0	I	W	t	24	73	SiL	CL	CL
3375	-	-	M	Upper	4	S1	-	C	m	30+	-	SiL	-	-
3376	DGT	O.MB	M	Mid	4	S1	W	C	m	24	-	SiL	L	-
3377BH	BDH	O.GBL	M	Upper	4	S1	W	C	m	23	68	SiL	CL	C
3378	DGT	BR.GBL	M	Mid	4	S1	MW	C	m	21	-	SiL	C	-
3379BH	OBE	O.MB	M	Upper	4	S1	W	C	m	24	63	CL	CL	C
3381	OBE	O.MB	M	Upper	4	S1	W	P	u	20	-	SiL	CL	-
3382	OBE	O.MB	M	Upper	4	S1	W	P	m	27	-	SL	SL	-
3383	OBE	O.MB	M	Upper	5	S1	W	P	m	14	-	SCL	SCL	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
3384BH	LYSpt	O.G	M	Depression	2	S1	P	P	l	-	30	-	SiL	SCL
3385	CEYzr	R.HG	FLUV	Lower	4	S0	P	W	m	26	-	L	-	CL
3386	ZMK	T.H	M	Lower	4	S1	P	W	m	-	-	-	-	-
3387BH	OBE	O.MB	M	Upper	4	S1	W	C	m	19	33	L	SiL	SCL
3388	OBE	O.MB	M	Crest	5	S1	W	C	m	28	-	L	fSL	-
3389	-	-	M	Mid	5	S1	-	C	h	30+	-	SL	-	-
3390BH	OBE	O.MB	M	Mid	5	S1	W	C	h	30	70	fSL	SL	CL
3391	-	-	M	Mid	5	S1	-	C	m	30+	-	SL	-	-
3392BH	OBE	O.MB	M	Upper	4	S1	MW	C	m	27	45	CL	CL	SCL
3393	OBE	O.MB	M	Upper	4	S1	W	C	m	25	-	L	SL	-
3394	OBE	O.MB	M	Mid	5	S1	W	C	h	27	-	L	L	-
3395BH	DGT	O.MB	M	Crest	5	S1	W	C	m	30	65	L	L	CL
3396	OBEzr	O.HR	M	Upper	6	S1	W	P	r	21	-	L	-	SCL
3397	ZAL	GL.MB	FLUV	Toe	6	S0	I	P	r	30+	-	L	-	-
3398	OBE	O.MB	M	Crest	5	S1	W	C	m	23	-	L	L	-
3399BH	OBExs	O.MB	M	Mid	2	S1	W	C	u	23	43	L	L	CL/S
3400	OBE	O.MB	M	Lower	3	S1	W	C	b	29	-	L	L	-
3401	FRM	O.MB	M	Mid	4	S1	W	C	m	24	-	L	CL	-
3402	FRM	O.MB	M	Mid	4	S1	W	H	h	26	-	L	CL	-
3403BH	BGHgl	GL.MB	M	Mid	4	S1	I	P	h	26	80	SL	SL	SCL
3404	GNYzr	R.HG	GLFL	Lower	2	S0	P	W	l	17	-	L	-	LS
3407	BGH	O.MB	GLFL	Lower	3	S0	W	W	u	29	-	L	S	-
3413BH	OBE	O.MB	M	Mid	3	S1	W	C	u	18	50	L	SL	CL
3414	OBE	O.MB	M	Mid	2	S1	W	H	u	29	-	L	SL	-
3415	-	-	M	Mid	2	S1	-	H	u	30+	-	L	-	-
3416	OBE	O.MB	M	Mid	2	S1	MW	H	u	18	-	L	SL	-
3419	OBE	O.MB	TILL	Crest	5	S2	W	P	m	21	-	SL	LS	-
3420	OBE	O.MB	TILL	Upper	4	S2	W	P	m	30	-	SL	-	-
3421	OBEgr	O.MB	TILL	Upper	5	S2	R	W	m	28	65	LS	S	SL
3422	ZDLgl	O.MB	TILL	Lower	4	S0	I	DL	m	26	-	SL	S	-
3423	ZDL	O.MB	TILL	Lower	4	S0	W	DL	m	30	-	SL	-	-
3424	OBE	O.MB	TILL	Upper	5	S0	R	DL	m	30	-	S	-	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
3425	OBE	O.MB	TILL	Lower	4	S1	R	W	m	10	-	S	S	-
3426	OBE	O.MB	TILL	Lower	4	S0	R	W	u	12	-	S	S	-
3427BH	OBE	O.MB	TILL	Mid	3	S0	R	W	u	32	72	S	S	-
3429	OBE	O.MB	TILL	Mid	3	S0	W	DL	u	30	-	LS	-	-
3430	OBE	O.MB	TILL	Upper	4	S0	R	W	m	30	-	LS	-	-
3462	OBE	O.MB	TILL	Mid	3	S1	W	C	u	21	-	LS	S	-
3463	OBE	O.MB	TILL	Lower	3	S1	R	C	u	30	-	LS	-	-
3477	OBE	O.MB	TILL	Mid	5	S1	W	DL	h	30+	-	SL	-	-
3479	LYSzr	R.HG	TILL	Depression	2	S0	VP	WT	u	30+	-	L	-	-
3486	ZMK	R.HGpt	O	Depression	2	S0	VP	WT	m	30+	-	-	-	-
3487	BGH	O.MB	GLFL	Mid	3	S0	W	DL	m	20	-	fSL	fSL	-
3488BH	BGH	O.MB	GLFL	Mid	3	S0	W	DL	m	14	-	fSL	fSL	-
3489	BGH	O.MB	GLFL	Mid	3	S0	W	DL	m	30+	-	fSL	-	-
3490	BGH	O.MB	GLFL	Upper	3	S0	W	DL	m	22	-	fSL	fSL	-
3497	FRMxlfi	O.EB	TILL/BRUN	Mid	3	S4	W	W	v	9	22	SiCL	SiCL	SiCL
3498	FRMzzfi	O.EB	TILL	Lower	5	S4	W	W	u	7	25	SiC	SiC	SiC
3499BH	ZRL	O.MB	TILL/BRUN	Mid	4	S3	W	W	h	14	32	SiL	fSL	fSL
3500	LYSzrxl	R.HG	TILL/BRUN	Depression	5	S0	P	W	v	22	-	SiC	-	SiC
3506	ZRL	O.HR	TILL	Mid	3	S0	W	W	u	11	-	C	-	C
3513			TILL	Level	1	S0	W	W	l	30	-	CL	-	-
3514	FRM	O.MB	TILL	Level	1	S0	W	W	l	25	-	L	SL	-
3947BH	CSH	O.MB	TILL	Lower	3	S1	W	C	u	33	58	L	L	C
3948	ZDL	O.MB	TILL	Mid	2	S0	W	DL	u	22	-	L	SCL	-
3949	ZDL	O.MB	TILL	Upper	3	S0	W	DL	h	24	-	L	SL	-
3950BH	ZDL	O.MB	TILL	Level	2	S0	W	DL	u	31	53	L	SL	SL
3951	ZMK	O.HG	FLUV	Level	1	S0	P	WT	l	30	-	SCL	-	-
3954	CEY	O.HG	FLUV	Lower	3	S0	I	WT	u	30	-	SCL	-	-
3955	OBE	O.MB	TILL	Mid	3	S0	W	DL	u	24	-	SL	SCL	-
3956BH	OBE	O.MB	TILL	Upper	3	S0	W	DL	u	23	55	SL	CL	CL
3957	OBE	O.MB	TILL	Lower	3	S0	W	DL	u	26	-	SL	CL	-
3965	OBE	O.MB	TILL	Lower	3		W	DL	h	30	-	LS	-	-
3968	OBE	O.MB	TILL	Lower	4	S2	W	P	m	30	-	L	-	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
3969	OBEgr	O.MB	TILL	Mid	4	S2	W	P	m	17	-	L	SCL	SCL
3970BH	CEY	O.HG	FLUV	Toe	4	S0	P	W	m	34	80	SiL	L	SiCL
3971	CEY	R.HG	FLUV	Toe	2	S0	P	W	m	15	30	SiL	SiCL	SiCL
3972	OBE	O.GBL	TILL	Level	2	S1	W	C	u	26	-	L	CL	-
3973BH	OBE	O.MB	TILL	Mid	2	S1	W	C	h	26	-	SL	SL	-
3974	OBE	O.MB	TILL	Mid	3	S1	W	C	u	30	-	L	-	-
3975	OBE	O.MB	TILL	Mid	4	S1	W	C	u	30	-	CL	-	-
3976BH	OBE	O.MB	TILL	Mid	4	S1	W	C	u	34	57	CL	CL	C
3977	OBE	O.MB	TILL	Mid	4	S1	W	C	m	30	-	L	-	-
3978	OBE	O.MB	TILL	Lower	4	S1	W	C	m	30	-	L	-	-
3981BH	CEYzr	R.HG	FLUV	Lower	4	S2	P	W	h	11	-	SCL	-	SCL/SL
3982	CEYzr	R.G	FLUV	Depression	2	S0	VP	WT	h	-	-	-	-	SCL
3983	CEYzr	R.HG	GLFL	Lower	4	S2	P	DL	h	20	-	L	-	SL
3984BH	BGH	O.MB	GLFL	Lower	4	S1	MW	W	h	26	46	SL	LS	SL/LS
4011	OBE		TILL	Level	1	S0	W	P	l	30	-	SiCL	-	-
4012	OBE		TILL	Level	1	S0	W	P	l	30	-	CL	-	-
4019	OBE	O.MB	TILL	Level	2	S1		C	u	30	-	L	-	-
4020	OBE	O.MB	TILL	Level	2	S1	W	C	u	30	-	L	-	-
4021BH	OBE	O.MB	TILL	Upper	4	S1	W	DL	h	23	47	L	CL	CL
4022	OBE	O.MB	TILL	Upper	5	S1	W	DL	m	20	-	CL	CL	-
4023	ZAL	GL.MB	FLUV	Lower	3	S2	W	W	m	19	-	L	LS	-
4024BH	OBE	O.MB	TILL/GLFL	Lower	5	S1	W	DL	m	18	-	CL	SiL	LS
4025	OBE	O.MB	TILL	Level	2	S1	W	C	u	30	-	CL	-	-
4029	OBE	O.MB	TILL	Mid	4	S0	W	DL	u	30+	-	L	-	-
4030	OBE	O.MB	TILL	Mid	4	S1	W	DL	u	25	-	L	L	-
4031BH	OBE	O.MB	TILL	Mid	4	S0	W	DL	u	32	68	SL	SL	SCL/SiCL
4032BH	OBE	O.MB	TILL	Lower	4	S1	W	DL	u	25	47	L	SL	LfS/SL
4034	ZDL			Upper	3			DL	m	30	-	-	-	-
4035	OBE	O.MB	TILL	Mid	3	S1	W	C	m	24	-	L	L	-
4040	ZGW	O.HG	EOLI	Lower	5	S0	P	M	r	12	-	LS	LS	-
4045	FRM	O.MB	TILL	Level	1	S0	R	W	l	22	-	vFSL	fSL	-
4046	FRM	O.MB	TILL	Level	1	S0	W	DL	l	20	-	SiL	fSL	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
4047BH	MTD	GL.MB	GLFL/TILL	Level	1	S0	I	DL	l	27	60	SiL	SL	SiCL
4048	ZRL	R.HG	BRUN	Level	1	S0	VP	WT	l	15	-	L	-	R
4049	GNY	O.HG	GLFL	Level	1	S0	VP	WT	l	25	-	-	vfSL	-
4050BH	MTDxt	GL.MB	GLFL	Level	1	S0	I	DL	l	30	50	SiL	SL	SCL
4051	FRM	O.M	TILL	Lower	1	S0	W	W	l	10	-	SiL	fSL	-
4056BH	NPE	O.HG	GLLC	Depression	4	S2	VP	W	u	15	45	C	C	C
4057	FRMglfi	GL.MB	GLLC	Lower	4	S0	I	DL	u	30	-	C	-	-
4058	NPE	O.HG	GLLC	Depression	4	S0	P	DL	u	30	-	C	-	-
4059	NPE	O.HG	GLLC	Depression	4	S0	VP	DL	u	10	-	C	C	-
4060BH	NPE	O.HG	GLLC	Depression	4	S0	P	DL	u	11	30	C	C	C
4061	FRMfi	O.MB	GLLC	Mid	4	S0	MW	DL	u	12	-	C	C	-
4062BH	NPE	O.HG	GLLC	Depression	3	S0	P	DL	u	33	40	C	C	C
4063	FRMfi	O.MB	GLLC	Lower	4	S0	MW	DL	u	30+	-	C	-	-
4064	SMG	O.GBL	TILL	Upper	4	S0	W	C	u	28	-	SL	SCL	-
4067	SMG	O.GBL	TILL	Mid	3	S0	W	DL	u	27	-	CL	SCL	-
4070	BDH		TILL	Mid	4	S0	W	C	u	30+	-	fSL	-	-
4082			TILL	Mid	2	S0	W	W	u	30+	-	CL	-	-
4083BH	FRMxl	O.MB	TILL	Level	1	S1	W	W	l	40	65	L	SL	SL
4084BH	ZRL	O.HR	BRUN	Depression	2	S1	MW	P	l	30	-	SiCL	-	R
4087	ZRL	O.HR	BRUN	Mid	3	S2	W	W	u	13	-	L	-	R
4088	ZRL	O.MB	BRUN	Mid	3	S4	W	DL	u	13	-	L	-	R
4089BH	ZRL	O.R	BRUN	Level	1	S1	MW	DL	l	15	-	SiL	-	R
4090	MTD			Level	1	S0	MW	C	l	30	-	SiL	-	-
4091BH	LDW	GL.MB	GLLC	Level	1	S0	MW	DL	l	16	42	SiL	SiL	SiCL/SiL
4092	GNY	O.HG	GLLC	Level	1	S0	P	DL	l	21	-	SiL	vfSL	-
4093	GNY	O.HG	GLFL	Level	1	S0	P	W	l	23	-	-	LS	-
4094BH	GNY	GL.HR	GLFL	Level	0	S0	I	W	l	15	-	SL	-	S
4095	GNY	O.HG	GLLC	Level	1	S0	VP	WT	l	30+	-	Si	-	-
4096	GVI	O.MB	TILL	Lower	3	S0	W	CL	l	17	-	SL	SL	-
4097	GVI		Till	Level	3	S0	W	CL	u	30	-	SL	-	LvfS
4098BH	GVI	O.MB	TILL	Level	1	S0	R	DL	l	27	-	SL	SL	-
4099	GVI	O.MB	GLFL	Level	2	S0	R	DL	l	22	-	SiS	SL	-

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Site ID	Series	Subgroup	Parent Material	Slope Position	Slope Class	Stoniness	Drainage	Land Use	Surface Expression	TS Depth (cm)	B Horizon Depth (cm)	TS Texture	US Texture	LS Texture
4103	BGH	O.MB	GLFL	Mid	2	S0	W	P	u	30	-	LS	-	-
4104	BGH	O.MB	GLFL	Lower	3	S0	W	P	u	30	-	SCL	-	-
4105	BGH	O.MB	GLFL	Lower	2	S0	W	P	u	30	-	SL	-	-
4106BH	BGHfi	O.MB	GLFL	Mid	2	S0	W	DL	u	31	-	SiCL	SiCL	SiC
4107	OBE	O.MB	TILL	Mid	2	S1	W	C	u	30	-	SL	-	-
4109	OBE	O.MB	TILL	Upper	5	S0	W	DL	h	30+	-	SL	-	-
501	OBE	O.MB	TILL	Mid	3	S3	W	C	u	25	-	LS	LS	-
502	OBE	O.MB	TILL	Mid	3	S1	W	C	u	20	-	SL	SL	-

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Appendix B Site Inspection List Key

SOIL SERIES:	
AHG - Achigan	MTD- Matilda
BDH- Bondhead	NPE - Napanee
BGH -Brighton	NWC - Newcastle
CEY - Cheney	OBE - Otanabee
CSH - Cashel	SIY - Sidney
DGT - Darlington	SMF - Smithfield
EOK - Elmbrook	SMG - Schomberg
FRM - Farmington	SMV - Solmesville
GNY - Granby	WPO - Waupoos
GVI - Grenville	ZAL - Bottomland
LDW - Landsdowne	ZGW - Miscellaneous gleysol
LYS - Lyons	ZMK - Muck
MCW - Moscow	ZDL - Disturbed Land
MLE - Milliken	ZRL – Rockland
	blank - not enough information in a shallow pit to determine series

SOIL CLASSIFICATION (Subgroup):	
Brunisolic Order	**Luvisolic Order**
E.EB - Eluviated Eutric Brunisol	BR.GBL - Brunisolic Gray Brown Luvisol
E.MB - Eluviated Melanic Brunisol	GL.GBL - Gleyed Gray Brown Luvisol
GL.MB - Gleyed Melanic Brunisol	GLBR.GBL - Gleyed Brunisolic Gray Brown Luvisol
O.EB - Orthic Eutric Brunisol	O.GBL - Orthic Gray Brown Luvisol
O.MB - Orthic Melanic Brunisol	**Regosolic Order**
Gleysolic Order	O.R - Orthic Regosol
O.G – Orthic Gleysol	O.HR – Orthic Humic Regosol
O.HG - Orthic Humic Gleysol	GL.HR - Gleyed Humic Regosol
R.G – Rego Gleysol	GLCU.HR - Gleyed Cumulic Humic Regosol
R.HG – Rego Humic Gleysol	
Organic Order	**Disturbed Land**
T.H - Terric Humisol	DL – Disturbed Land
T.M –Terric Mesisol	

MODIFIERS:	
cb - cobbly	xs - sand at 30-99 cm
er - eroded	xt - till at 30-99 cm
fi - fine	yc - clay at 100-200 cm
gl - gleyed	yg – gravel at 100-200cm
gr - gravelly	yl - lithic at 100-200cm
pt - peaty	yt - till at 100-200 cm
ta - thin A horizon	zb - brunisolic
tk - thick A horizon	ze - eluviated
xc - clay at 30-99 cm	zr - regosolic
xg - gravel at 30-99	zz - atypical subgroup
xl - lithic at 30-99 cm	

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PARENT MATERIAL:	SLOPE CLASS:
BRUN - bedrock	1 - 0-0.5% level
FLUV - fluvial	2 - >0.5-2% nearly level
GLFL – glaciofluvial	3 - >2-5% very gentle slopes
GLLC - glaciolacustrine	4 - >5-10% gentle slopes
M – morainal (till)	5 - >10-15% moderate slopes
O - organic	6 - >15-30% strong slopes
	7 - >30-45% very strong slopes
SURFACE STONINESS:	**DRAINAGE:**
S0 - non-stony	VR – very rapid
S1 - slightly stony (stones 10-30 m apart)	R - rapidly
S2 - moderately stony (stones 2-10 m apart)	W - well
S3 - very stony (stones 1-2 m apart)	MW - moderately well
S4 - exceedingly stony (stones .01-1 m apart)	I - imperfectly
S5 - excessively stony (stones <.01 m apart)	P - poorly
	VP - very poorly
LAND USE:	**SURFACE EXPRESSION:**
B – bush	b - blanket
C – cultivated	h - hummocky
DL – disturbed land	i - inclined
H – hayland	l - level
P – pasture	m - rolling
W – wooded	r - ridged
WT – wetland	s - steep
	t - terraced
	u - undulating
	v – veneer
TEXTURE:	
S - sand	SiCL - silty clay loam
LS - loamy sand	SC - sandy clay
SiS - silty sand	SiC - silty clay
SL - sandy loam	C – clay
L - loam	HC – heavy clay
SiL - silt loam	***Modifiers:***
Si - silt	v – very
SCL - sandy clay loam	c – coarse
CL - clay loam	f - fine
	vf - very fine

Appendix C Laboratory Results for the Eastern Mainline Project route

Soil samples were collected from all major horizons to trench depth (2.2 m), at predefined intervals along the proposed trenchline. Laboratory analysis of physical and chemical parameters was carried out in accordance with standard soil investigation methods, as outlined by McKeague (1978). Samples were analyzed for texture class, total organic carbon, and calcium carbonate equivalent, and select samples were additionally analyzed for electrical conductivity (EC), saturation percentage (SAT%), soluble cations, sodium adsorption ratio (SAR), and soil reaction (pH).

Composite topsoil samples were collected to represent each arable land use occurring within 40 km increments along the proposed route. Each composite sample is composed of a minimum of ten subsamples from within each respective land use for cultivated, pasture and hay land. All composite topsoil samples were analyzed for total organic carbon (TOC), which was used in determining total organic matter (TOM). Additionally, all cultivated land use composite samples were analyzed for available nitrogen, phosphorus, and potassium (NPK).

All samples were submitted to various Maxxam Analytics locations in Ontario, and shipped to Maxxam Analytics in Edmonton, Alberta for all analysis. Laboratory results from sampled soils are presented in tables C-1 and C-2.

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Table C-1. Available nutrients by land use

Chainage	Land use	Total Organic Carbon (%)	Total Organic Matter (%)	Available N (mg/kg)	Available P (mg/kg)	Available K (mg/kg)
132+0km-133+17km	Hay	2.7	4.6	-	-	-
132+0km-133+17km	Cultivated	2.5	4.3	55	10	73
133+17km-134B+9km	Cultivated	1.4	2.5	31	21	54
133+17km-134B+9km	Pasture	0.89	1.5	-	-	-
134B+9km-135A+20km	Cultivated	5.1	8.9	8.9	15	61
134B+9km-135A+20km	Hay	4.4	7.6	-	-	-
134B+9km-135A+20km	Pasture	1.3	2.2	-	-	-
135A+20km-137+14.544km	Pasture	1.2	2.1	-	-	-
135A+20km-137+14.544km	Cultivated	1.4	2.4	11	12	44
135A+20km-137+14.544km	Hay	1.3	2.3	-	-	-
139+0km-140A+17.166km	Hay	2.8	4.8	-	-	-
139+0km-140A+17.166km	Cultivated	3	5.1	49	12	240
139+0km-140A+17.166km	Pasture	3.6	6.2	-	-	-
142+0km-142A+22.577km	Hay	2.2	3.8	-	-	-
142+0km-142A+22.577km	Pasture	2.6	4.4	-	-	-
142+0km-142A+22.577km	Cultivated	3.4	5.8	37	6.5	220
142+0km-142A+22.577km	Cultivated	1.9	3.3	17	6	100
142+0km-142A+22.577km	Pasture	3.9	6.6	-	-	-
144+0km-145+25.501km	Hay	2.9	4.9	-	-	-
144+0km-145+25.501km	Cultivated	1.5	2.6	5	7.7	54

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Table C-2. Chemical and physical properties of sampled soils

Series	SiteID	Horizon	Depth	Total Organic Carbon (%)	Total Organic Matter (%)	Soluble Conductivity (dS/m)	Soluble (CaCl2) pH	Sodium Adsorption Ratio	Calcium Carbonate Equivalent (%)	Saturation (%)	Soluble Magnesium (Mg)	Soluble Potassium (K)	Soluble Sodium (Na)	Soluble Calcium (Ca)	Texture
AHG	2806BH	Ah	0-28	2.4	-	-	-	-	2.3	-	-	-	-	-	Sandy Loam
		Bm	28-60	-	-	-	-	-	1.1	-	-	-	-	-	Sandy Loam
		IICkg	60-90	-	-	-	-	-	24	-	-	-	-	-	Silty Clay Loam
		IIICkg	90-150	-	-	-	-	-	17	-	-	-	-	-	Silt Loam
AHGxt	2792BH	Ap	0-13	2.4	-	-	-	-	0.74	-	-	-	-	-	Sandy Loam
		Bm	13-22	-	-	-	-	-	0.60	-	-	-	-	-	Sandy Loam
		C/BC	22-140	-	-	-	-	-	0.92	-	-	-	-	-	Sandy Loam
		IICk	140-220	-	-	-	-	-	13	-	-	-	-	-	Clay
BDH	0735BH	Ap	0-38	2.4	4.2	-	-	-	0.95	-	-	-	-	-	Loam
		Bt	38-85	-	-	-	-	-	0.84	-	-	-	-	-	Clay
		C	85-220	-	-	-	-	-	19	-	-	-	-	-	Clay
	0121BH	Ahe	0-18	2.2	3.8	-	-	-	1	-	-	-	-	-	Sandy Loam
		Bm	18-24	-	-	-	-	-	<0.60	-	-	-	-	-	Sandy Loam
		Bt	24-45	-	-	-	-	-	4	-	-	-	-	-	Clay
		Ckg	45-220	-	-	-	-	-	33	-	-	-	-	-	Clay Loam
	3215BH	Ah	0-24	-	-	0.51	5.4	0.23	0.76	57	6.5	35	7.8	77	Silt Loam
		Bm	24-53	-	-	0.12	5.27	0.45	0.63	49	2	7.1	7.1	15	Silt Loam
		Cgj	53-220	-	-	0.42	7.06	0.3	14	37	3.5	3.5	10	81	Silt Loam
BDHgl	0687BH	Ap	0-15	2.6	4.4	2.2	5.92	0.27	<0.60	48	38	51	18	300	Loamy Sand
		Bgj	15-85	-	-	0.9	6.84	0.28	<0.60	38	8.7	4.3	12	120	Sand
		IICkgj	85-220	-	-	0.52	7.38	0.5	30	34	6	<1.3	17	77	Loam
BGH	0857BH	Ah	0-12	3.5	6	0.52	7.14	0.2	8.5	36	2.3	28	6.5	74	Sand
		Bm	12-29	-	-	0.22	7.12	0.39	1.2	33	<1.0	2.1	8.1	32	Sand
		BC	29-60	-	-	-	-	-	<0.60	-	-	-	-	-	Sand
		Ck	60-220	-	-	0.2	7.45	0.34	25	27	<1.0	<1.3	7.1	32	Sand
	0598BH	LFH	2-0	18	31	-	-	-	-	-	-	-	-	-	-
		Ah	0-28	2	3.4	-	-	-	<0.60	-	-	-	-	-	Loamy Sand
		Bm	28-55	-	-	-	-	-	<0.60	-	-	-	-	-	Sandy Loam
		BC	55-100	-	-	-	-	-	0.74	-	-	-	-	-	Loamy Sand
		Ck1	100-165	-	-	-	-	-	21	-	-	-	-	-	Loam
		Ck2	165-220	-	-	-	-	-	26	-	-	-	-	-	Sandy Loam
	0124BH	Ap	0-25	0.47	0.8	1.1	6.32	0.25	0.62	32	7.1	14	12	150	Sandy Loam
		Bm	25-90	-	-	0.29	7.16	0.39	<0.60	30	<1.0	<1.3	9.1	41	Loamy Sand
		Ck	90-220	-	-	0.27	7.66	0.37	23	29	<1.0	1.5	9	45	Sand
	0149BH	Ap	0-28	1.3	2.3	-	-	-	0.63	-	-	-	-	-	Sandy Loam
		Bm	28-46	-	-	-	-	-	1.5	-	-	-	-	-	Loamy Sand
		Ck	46-220	-	-	-	-	-	22	-	-	-	-	-	Loamy Sand

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Series	SiteID	Horizon	Depth	Total Organic Carbon (%)	Total Organic Matter (%)	Soluble Conductivity (dS/m)	Soluble (CaCl2) pH	Sodium Adsorption Ratio	Calcium Carbonate Equivalent (%)	Saturation (%)	Soluble Magnesium (Mg)	Soluble Potassium (K)	Soluble Sodium (Na)	Soluble Calcium (Ca)	Texture
BGH	1113BH	Bmk	0-70	-	-	-	-	-	12	-	-	-	-	-	Sandy Loam
		Ck	70-120	-	-	-	-	-	9.5	-	-	-	-	-	Sandy Loam
BGHyt	0828BH	Ap	0-9	-	-	0.35	5.64	0.61	0.64	47	3.7	2.3	16	44	Sandy Loam
		Bm	9-105	-	-	0.14	5.98	0.52	<0.60	41	<1.0	<1.3	7.7	17	Sandy Loam
		C	105-180	-	-	0.078	7.31	1.6	<0.60	27	<1.0	<1.3	10	3	Sandy Loam
		IICk	180-220	-	-	0.18	6.94	0.95	0.8	53	1.5	<1.3	13	13	Clay
CEYpt	1069BH	Oh	25-0	2.6	4.5	-	-	-	-	-	-	-	-	-	-
		Ckg	0-65	-	-	-	-	-	21	-	-	-	-	-	Sandy Loam
CEYzr	2753BH	Ah	0-32	1.2	-	-	-	-	<0.60	-	-	-	-	-	Loamy Sand
		Cg	32-78	-	-	-	-	-	<0.60	-	-	-	-	-	Sandy Loam
		IICkg	78-220	-	-	-	-	-	15	-	-	-	-	-	Clay
CSH	0004BH	Ap	0-34	1.1	1.8	1.4	7.01	0.23	2	46	6.1	2.3	12	220	Clay Loam
		Bt	34-58	-	-	0.94	7.08	0.33	1.1	44	4.6	<1.3	14	140	Clay Loam
		IIBC	58-94	-	-	-	-	-	0.96	-	-	-	-	-	Clay Loam
		IICk	94-220	-	-	0.6	7.31	0.4	25	35	3.2	<1.3	14	90	Sandy Loam
	0040BH	Ap	0-27	1.8	3.2	-	-	-	1.2	-	-	-	-	-	Clay Loam
		Bt	27-36	-	-	-	-	-	1	-	-	-	-	-	Clay
		Ck	36-170	0.41	0.71	-	-	-	3.5	-	-	-	-	-	Clay
FRM	0260BH	Ap	0-20	-	-	1.5	7.03	0.17	2.2	43	5.8	4.3	9.6	240	-
		Bm	20-30	-	-	0.5	7.25	0.28	-	35	2.6	2	9.2	79	-
		Ckgj	30-92	-	-	0.25	7.56	0.43	-	29	1.6	1.8	11	46	-
FRMxl	1778BH	Ah	0-14	4	6.9	-	-	-	1.8	-	-	-	-	-	Loam
		Bt	14-29	-	-	-	-	-	3.1	-	-	-	-	-	Loam
		Ck	29-45	-	-	-	-	-	16	-	-	-	-	-	Loam
FRMxl	2706BH	Ah	0-13	3.6	-	-	-	-	1.2	-	-	-	-	-	Sandy Loam
		Bm	13-26	-	-	-	-	-	2.0	-	-	-	-	-	Sandy Loam
FRMyl	1657BH	Ap	0-19	2.4	4.1	-	-	-	1.4	-	-	-	-	-	Clay Loam
		Bt	19-46	-	-	-	-	-	1.3	-	-	-	-	-	Clay
		BCgj	46-90	-	-	-	-	-	2.1	-	-	-	-	-	Clay Loam
		Ckgj	90-145	-	-	-	-	-	28	-	-	-	-	-	Clay
GNY	4094BH	Ah	0-15	3.8	-	-	-	-	3.1	-	-	-	-	-	Loamy Sand
		Cgj	15-42	-	-	-	-	-	1.6	-	-	-	-	-	Loamy Sand
		Cg	99-220	-	-	-	-	-	12	-	-	-	-	-	Loam
GVI	0074BH	Ap	0-17	1.5	2.6	-	-	-	1.3	-	-	-	-	-	Clay Loam
		Bm	17-50	-	-	-	-	-	3.5	-	-	-	-	-	Clay
		Ck	50-180	-	-	-	-	-	31	-	-	-	-	-	Sandy Loam
	2825BH	Ah	0-25	2.8	-	-	-	-	0.71	-	-	-	-	-	Loamy Sand
		Bm	25-80	-	-	-	-	-	<0.60	-	-	-	-	-	Loamy Sand
		Cgj	80-190	-	-	-	-	-	14	-	-	-	-	-	Loam
		IICkg	190-220	-	-	-	-	-	18	-	-	-	-	-	Silt Loam

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Series	SiteID	Horizon	Depth	Total Organic Carbon (%)	Total Organic Matter (%)	Soluble Conductivity (dS/m)	Soluble (CaCl2) pH	Sodium Adsorption Ratio	Calcium Carbonate Equivalent (%)	Saturation (%)	Soluble Magnesium (Mg)	Soluble Potassium (K)	Soluble Sodium (Na)	Soluble Calcium (Ca)	Texture
GVIxl	2243BH	Ah	0-17	2.1	3.6	0.19	5.23	0.42	0.76	57	3.5	24	6.6	13	Loam
		Bt	17-48	-	-	0.17	5.56	0.87	0.66	39	3.2	26	11	7	Loam
		C	48-70	-	-	0.4	5.42	0.58	<0.60	38	7.4	36	12	22	Sandy Clay Loam
LYS	0216BH	Ah	0-23	2.3	4	-	-	-	4.1	-	-	-	-	-	Loam
		Bg	23-59	-	-	-	-	-	27	-	-	-	-	-	Sandy Loam
		Ckg	59-180	-	-	-	-	-	41	-	-	-	-	-	Clay
	0225BH	Apk	0-23	1.2	2.1	-	-	-	11	-	-	-	-	-	Loam
		Bgk	23-45	-	-	-	-	-	36	-	-	-	-	-	Loam
		Ckg	45-150	-	-	-	-	-	39	-	-	-	-	-	Loam
	1036BH	Ah	0-30	-	-	0.71	6.93	0.5	2.0	49	4.5	3.3	20	110	-
		Bgk	30-75	-	-	0.42	7	1.2	-	36	2.3	<1.3	30	48	-
		IICkgj	75-160	-	-	0.31	7.19	1.4	-	36	2.2	1.9	31	32	-
LYSxs	0396BH	Apk	0-32	2.6	4.5	1.4	7.19	1.1	8.5	43	6.9	3.8	55	190	Loam
		Bgk	32-70	-	-	0.61	7.36	0.79	18	29	2.4	1.7	28	89	Sandy Loam
		Ckg	70-160	-	-	0.45	7.62	0.78	21	25	2.3	1.9	26	78	Sandy Loam
LYSyl	2148BH	Ap	0-18	2.4	4.1	-	-	-	<0.60	-	-	-	-	-	Silty Clay Loam
		Bg	18-56	-	-	-	-	-	0.75	-	-	-	-	-	Heavy Clay
		Ckg	56-165	-	-	-	-	-	12	-	-	-	-	-	Clay
LYSzr	0143BH	Ah	0-31	1.7	2.9	1.2	6.97	0.21	1.6	49	7.8	3	11	200	Loam
		Ckg	31-220	-	-	0.41	7.57	0.41	35	29	2.8	1.8	12	64	Sandy Loam
MTD	0178BH	Apk	0-19	1.3	2.2	1.3	7.09	0.17	1.7	43	5.2	2.2	9.2	210	Loam
		Bmk	19-62	-	-	0.37	7.31	0.32	7.4	41	1.8	1.7	9	57	Loam
		Ckg	62-250	-	-	0.35	7.56	0.41	38	37	2.5	2.3	12	65	Loam
	4047BH	Ah	0-27	2.3	-	-	-	-	0.82	-	-	-	-	-	Sandy Loam
		Bm	27-60	-	-	-	-	-	<0.60	-	-	-	-	-	Sandy Loam
		Ckgj	60-120	-	-	-	-	-	3.6	-	-	-	-	-	Loam
MTDgr	2695BH	Ap	0-28	2.1	-	-	-	-	1.7	-	-	-	-	-	Sandy Loam
		Bm	28-44	-	-	-	-	-	2.4	-	-	-	-	-	Sandy Loam
		Ck	44-120	-	-	-	-	-	4.7	-	-	-	-	-	Sandy Loam
NPE	2197BH	Ah	0-21	2.5	4.3	0.54	6.06	0.38	0.75	63	21	3.4	14	73	Loam
		Bg	21-62	-	-	0.28	6.41	0.63	0.72	49	9.1	1.4	14	22	Clay
		Ck	62-220	-	-	0.19	7.37	0.72	17	47	7.3	1.7	15	19	Silty Clay Loam
NWC	0552BH	Ap	0-21	1.9	3.2	1.2	7.1	0.17	3.5	41	7.3	8.9	9.1	200	Loam
		Ck	110-200	-	-	0.52	7.25	0.31	30	30	2.3	1.3	11	87	Loam
		Bt	29-60	-	-	0.37	7.13	0.35	<0.60	31	1.7	1.9	9.7	54	Loam
		BC	60-110	-	-	-	-	-	0.78	-	-	-	-	-	Sandy Clay Loam

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Series	SiteID	Horizon	Depth	Total Organic Carbon (%)	Total Organic Matter (%)	Soluble Conductivity (dS/m)	Soluble (CaCl2) pH	Sodium Adsorption Ratio	Calcium Carbonate Equivalent (%)	Saturation (%)	Soluble Magnesium (Mg)	Soluble Potassium (K)	Soluble Sodium (Na)	Soluble Calcium (Ca)	Texture
OBE	0403BH	Ap	0-26	-	-	0.86	6.49	0.21	0.82	45	5.7	7.1	9.1	130	-
		Bm	26-65	-	-	0.35	7.02	0.46	-	42	1.7	<1.3	12	51	-
		Ck	65-80	-	-	0.75	7.27	0.29	-	36	2.8	2.1	11	120	-
	0622BH	Ah	0-55	1.3	2.3	-	-	-	15	-	-	-	-	-	Sandy Loam
		Bm	55-150	-	-	-	-	-	<0.60	-	-	-	-	-	Loamy Sand
		Ck	150-175	-	-	-	-	-	25	-	-	-	-	-	Sandy Loam
	0880BH	Ah	0-22	2	3.4	-	-	-	5.3	-	-	-	-	-	Sandy Loam
		Ae	22-31	0.34	0.59	-	-	-	29	-	-	-	-	-	Sandy Loam
		Bm	31-65	-	-	-	-	-	9.4	-	-	-	-	-	Sandy Loam
		Ck	65-220	-	-	-	-	-	33	-	-	-	-	-	Sandy Loam
	0928BH	Ap	0-25	1.9	3.3	-	-	-	8.9	-	-	-	-	-	Loam
		Bm	25-55	-	-	-	-	-	3.8	-	-	-	-	-	Loam
		BC	55-170	-	-	-	-	-	1.5	-	-	-	-	-	Loam
		Ck	175-220	-	-	-	-	-	23	-	-	-	-	-	Silty Clay Loam
	1090BH	LFH	2-0	15	25	-	-	-	-	-	-	-	-	-	-
		Ahe	0-19	1.1	1.9	-	-	-	<0.60	-	-	-	-	-	Sandy Loam
		Bm	19-78	-	-	-	-	-	<0.60	-	-	-	-	-	Sandy Loam
		Ck	78-220	-	-	-	-	-	18	-	-	-	-	-	Sandy Loam
	1184BH	Ah	0-12	-	-	0.5	4.87	0.25	<0.60	50	6.1	5.5	8.7	84	-
		Bm	12-45	-	-	0.082	5.03	0.61	-	36	<1.0	<1.3	5.7	6.6	-
		Ck1/Ck2	45-220	-	-	0.43	7.27	0.23	-	31	1.3	<1.3	7.2	72	-
	1211BH	Ah	0-17	4.2	7.2	-	-	-	0.61	-	-	-	-	-	Sandy Loam
		Bm	17-48	-	-	-	-	-	0.65	-	-	-	-	-	Sandy Loam
	1591BH	Apk	0-22	1.7	2.9	-	-	-	2.8	-	-	-	-	-	Sandy Loam
		Bmk	22-42	-	-	-	-	-	2	-	-	-	-	-	Sandy Clay Loam
		Ck	42-74	-	-	-	-	-	30	-	-	-	-	-	Clay Loam
	4031BH	Ah/Ap	0-40	1.4	-	-	-	-	1.2	-	-	-	-	-	Sandy Loam
		BC/Ck	40-68	-	-	-	-	-	14	-	-	-	-	-	Sandy Clay Loam
		Bm	68-135	-	-	-	-	-	0.93	-	-	-	-	-	Sandy Loam
	3181BH	Ap	0-30	-	-	0.28	6.76	0.37	0.96	41	1.1	1.4	9.1	43	Loam
		Bm	30-45	-	-	0.16	6.84	0.42	0.79	42	1.4	1.4	8	26	Loam
		BC	45-100	-	-	0.33	7.09	0.46	0.96	38	<1.0	<1.3	10	39	Loam
		BC/Ck	45-220	-	-	0.46	7.24	0.33	-	43	1.8	1.6	11	81	-
		Ck	100-220	-	-	0.28	7.48	0.49	51	39	2.6	3	15	63	Clay
OBEer	1160BH	Apk	0-11	1.1	1.9	-	-	-	19	-	-	-	-	-	Sandy Clay Loam
		Ck	11-60	-	-	-	-	-	27	-	-	-	-	-	Sandy Clay Loam
OBEgl	0087BH	Ap	0-35	1.3	2.2	-	-	-	1.3	-	-	-	-	-	Loam
		Bm	35-50	-	-	-	-	-	0.88	-	-	-	-	-	Loam
		Ck1	50-130	-	-	-	-	-	1.7	-	-	-	-	-	Loam
		IICk	140-220	-	-	-	-	-	43	-	-	-	-	-	Heavy Clay

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Series	SiteID	Horizon	Depth	Total Organic Carbon (%)	Total Organic Matter (%)	Soluble Conductivity (dS/m)	Soluble (CaCl2) pH	Sodium Adsorption Ratio	Calcium Carbonate Equivalent (%)	Saturation (%)	Soluble Magnesium (Mg)	Soluble Potassium (K)	Soluble Sodium (Na)	Soluble Calcium (Ca)	Texture
SMFxtyl	1539BH	Ap	0-8	3.3	5.7	-	-	-	0.67	-	-	-	-	-	Loam
		Bt	8-65	-	-	-	-	-	0.93	-	-	-	-	-	Heavy Clay
		IICkgj	65-118	-	-	-	-	-	29	-	-	-	-	-	Clay
SMGxt	0757BH	Ap	0-23	-	-	0.54	6.96	0.4	3.5	54	7.5	13	15	88	-
		Bt	23-83	-	-	0.33	7.11	0.73	-	57	2.2	<1.3	17	37	-
		IICk	83-200	-	-	0.38	7.26	0.78	-	53	2.4	<1.3	20	46	-
	1136BH	Ap	0-32	-	-	0.4	7.01	0.59	0.95	45	2.4	2.1	17	62	-
		Bt	32-70	-	-	0.26	6.97	0.79	-	35	1.3	<1.3	17	31	-
		Ck1/Ck2	70-170	-	-	0.54	7.28	1.2	-	32	2.2	<1.3	35	61	-
WPO	1243BH	Ah	0-24	2.5	-	-	-	-	0.90	-	-	-	-	-	Loam
		Btj	24-70	-	-	-	-	-	1.3	-	-	-	-	-	Sandy Loam
		Ck	70-120	-	-	-	-	-	4.5	-	-	-	-	-	Sandy Loam
WPOgl	1680BH	Ap	0-18	3.7	6.4	1.2	6.36	0.51	1.9	84	40	16	28	170	Clay Loam
		Bt	18-36	-	-	1	6.15	0.51	1.1	67	24	4.1	24	130	Clay
		BCg/Ckgj	36-220	-	-	0.44	7.16	0.64	-	65	6.6	2.5	19	58	-
		BCg	36-95	-	-	-	-	-	0.91	-	-	-	-	-	Clay
		Ckgj	95-220	-	-	-	-	-	5.5	-	-	-	-	-	Clay
WPOyl	2285BH	Ah	0-19	-	-	0.34	5.98	0.48	0.87	56	11	3.8	15	52	Clay
		Bt	19-38	-	-	0.18	5.74	1.2	0.77	55	4.5	1.6	20	14	Clay
		BC/Ck	38-170	-	-	0.44	6.89	0.59	-	58	16	1.8	19	54	-
		BC	38-73	-	-	-	-	-	0.93	-	-	-	-	-	Clay
		Ck	73-170	-	-	-	-	-	7.5	-	-	-	-	-	Clay
ZRL	3325BH	Ap	0-13	3.1	5.4	0.26	6.22	0.4	0.88	56	2.1	<1.3	9.8	42	Loam
		Bm	13-27	-	-	0.17	6.51	0.41	0.9	55	1.4	<1.3	8.3	29	Sandy Clay Loam
	2073BH	Ah	0-21	-	-	-	-	-	5	-	-	-	-	-	Loam

Appendix D Reclamation Suitability Ratings

The topsoil, upper subsoil and lower subsoil of the mapped soil units along the proposed route were assessed for reclamation suitability, using representative soil profiles and associated laboratory data. Where lab data was not available, soil units were assessed using attributes observed in the field. For example, in some cases organic carbon was estimated based on topsoil colour and a table in *Land Suitability Rating System for Agricultural Crops; 1. Spring-seeded small grains* (Agronomic Interpretations Working Group 1995). The results of the reclamation suitability assessment for each soil unit are present in Table D-1.

Table D-1 Soil suitability for reclamation assessment by soil series and soil quality parameter

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
AHG[3]	2806BH	Ah	_	-	_	-	**F**	G	G	-	G	G	F (5)
		Bm	_	-	_	-	-	G	G	-	-	G	G
		IICkg	_	-	_	-	-	**F**	G	-	-	**F**	F (6, 10)
		IIICkg	_	-	_	-	-	-	G	-	-	G	G
AHGxt[3]	2792BH	Ap	_	-	_	-	G	G	G	**F**	G	G	F (7)
		Bm	_	-	_	-	-	G	G	**F**	-	G	F (7)
		C/BC	_	-	_	-	-	G	G	-	-	G	G
		IICk	_	-	_	-	-	G	G	-	-	**P**	P (10)
BDH[3]	0121BH	Ahe	_	-	_	-	G	G	G	G	G	G	G
		Bm	_	-	_	-	-	G	G	G	-	G	G
		Bt	_	-	_	-	-	G	G	G	-	**P**	P (10)
		Ckg	_	-	_	-	-	**F**	G	G	-	**F**	F (6, 10)
BDH[3]	0735BH	Ap	_	-	_	-	G	G	G	-	G	G	G
		Bt	_	-	_	-	-	F	G	-	-	**P**	P (10)
		C	_	-	_	-	-	F	G	G	-	**P**	P (10)
BDH	3215BH	Ah	G	**P**	G	G	G	G	G	G	-	G	P (2)
	3215BH	Bm	G	**P**	G	G	-	G	G	G	-	G	P (2)
	3215BH	Cgj	G	G	G	G	-	G	G	G	-	G	G
BDHgl	0687BH	Ap	F	F	G	G	G	G	G	-	G	**P**	P (10)
		Bgj		G		G	-	G	G	-	-	**P**	P (10)

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
			G		G								
		IICkgj	G	G	G	G	-	G	G	-	-	G	G
BGH	0124BH	Ap	G	F	G	G	G	G	G	-	**P**	G	P (9)
		Bm	G	G	G	F	-	F	G	-	-	**P**	P (10)
		Ck	G	F	G	F	-	F	G	-	-	**P**	P (10)
BGH[3]	0149BH	Ap	_	-	_	-	G	G	G	-	**F**	G	F (9)
			_	-	_	-	-	F	G	F	-	**P**	P (10)
			_	-	_	-	-	F	G	F	-	**P**	P (10)
BGH[3]	0598BH	LFH	_	-	_	-	-	-	G	-	G	-	G
		Ah	_	-	_	-	G	G	G	-	G	**P**	P (10)
		Bm	_	-	_	-	-	**F**	G	-	-	G	F (6)
		BC	_	-	_	-	-	G	G	-	-	**P**	P (10)
		Ck1	_	-	_	-	-	**F**	G	-	-	G	F (6)
		Ck2	_	-	_	-	-	**F**	G	G	-	G	F (6)
BGH[3]	0857BH	Ah	G	G	G	G	F	F	G	-	G	**P**	P (10)
		Bm	G	G	G	G	-	F	G	-	-	**P**	P (10)
		BC	_	-	_	-	-	F	G	-	-	**P**	P (10)
		Ck	G	G	G	F	-	F	G	G	-	**P**	P (10)
BGH	1113BH	Bmk	_	-	_	-	-	G	G	**F**	-	G	F (7)
		Ck	_	-	_	-	-	**F**	G	-	-	G	F (6)
BGHyt	0828BH	Ap	G	**F**	G	G	G	G	G	-	-	G	F (2)
		Bm	G	**F**	G	G	-	G	G	-	-	G	F (2)
		C	G	G	G	**F**	-	**F**	G	-	-	G	F (4, 6)
		IICk	G	G	G	G	-	F	G	G	-	**P**	P (10)

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
CEYpt[3]	1069BH	Oh	_	-	_	-	-	-	-	-	-	-	-
		Ckg	_	-	_	-	-	**F**	G	**F**	-	G	F (6,7)
CEYzr[3]	2753BH	Ah	_	-	_	-	G	G	G	-	F	**P**	P (10)
		Cg	_	-	_	-	-	**F**	G	-	-	G	F (6)
		IICkg	_	-	_	-	-	F	G	-	-	**P**	P (10)
CSH	0004BH	Ap	G	G	G	G	**F**	G	G	G	**F**	**F**	F (5, 9, 10)
		Bt	G	G	G	G	-	G	G	G	-	**F**	F (10)
		IIBC	_	-	_	-	-	**F**	G	G	-	**F**	F (6, 10)
		IICk	G	G	G	G	-	**F**	G	**F**	-	G	F (6, 7)
CSH[3]	0040BH	Ap	_	-	_	-	G	G	G	-	**F**	**F**	F (9, 10)
		Bt	_	-	_	-	-	F	G	-	-	**P**	P (10)
		Ck	_	-	_	-	-	**P**	G	F	**P**	**P**	P (6, 9, 10)
FRM	0260BH	Ap	G	G	G	G	**F**	G	G	**F**	-	-	F (5, 7)
		Bm	G	G	G	G	-	G	G	**F**	-	-	F (7)
		Ckgj	G	G	G	**F**	-	**F**	G	**F**	-	-	F (4, 6, 7)
FRMxl[3]	1778BH	Ah	_	-	_	-	G	G	**P**	**P**	G	G	P (8, 7)
		Bt	_	-	_	-	-	G	**P**	F	-	G	P (8)
		Ck	_	-	_	-	-	F	**P**	F	-	G	P (8)
		R	_	-	_	-	-	-	-	-	-	U	U (10)
FRMxl[3]	2706BH	Ah	_	-	_	-	G	G	G	-	G	G	G
		Bm	_	-	_	-	-	G	G	**F**	-	G	F (7)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)
FRMyl[3]	1657BH	Ap	_	-	_	-	G	G	G	G	G	**F**	F (10)
		Bt	_	-	_	-	-	F	G	-	-	**P**	P (10)
		BCgj	_	-	_	-	-	**P**	G	G	-	F	P (6)
		Ckgj	_	-	_	-	-	**U**	G	-	-	P	U (6)
		R		-		-	-	-	-	-	-	**U**	U (10)

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
			-		-								
GVI[3]	0074BH	Ap	_	-	_	-	G	G	G	G	**F**	**F**	F (9, 10)
		Bm	_	-	_	-	-	G	G	G	-	**P**	P (10)
		Ck	_	-	_	-	-	G	G	**F**	-	G	F (7)
GVI[3]	2825BH	Ah	_	-	_	-	G	G	G	-	G	**P**	P (10)
		Bm	_	-	_	-	-	F	G	-	-	**P**	P (10)
		Cgj	_	-	_	-	-	G	G	-	-	G	G
		IICkg	_	-	_	-	-	G	G	-	-	G	G
GVIxl	2243BH	Ah	G	**P**	G	G	G	G	G	G	G	G	P (2)
		Bt	G	**F**	G	G	-	G	G	G	-	G	F (2)
		C	G	**P**	G	G	-	F	G	F	-	F	P (2)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)
LYS[3]	0216BH	Ah	_	-	_	-	**F**	G	G	**F**	G	G	F (5, 7)
		Bg	_	-	_	-	-	G	G	**F**	-	G	F (7)
		Ckg	_	-	_	-	-	F	G	F	-	**P**	P (10)
LYS[3]	0225BH	Apk	_	-	_	-	**F**	G	G	**F**	**F**	G	F (5, 7, 9)
		Bgk	_	-	_	-	-	**F**	G	**F**	-	G	F (6, 7)
		Ckg	_	-	_	-	-	G	G	**F**	-	G	F (7)
LYS	1036BH	Ah	G	G	G	G	**F**	G	G	-	-	-	F (5)
		Bgk	G	G	G	G	-	**F**	G	**F**	-	-	F (6, 7)
		IICkgj	G	G	G	G	-	**F**	G	**F**	-	-	F (6, 7)
LYSxs	0396BH	Apk	G	G	G	G	**F**	G	G	**F**	G	G	F (5,7)
		Bgk	G	G	G	**F**	-	**F**	G	**F**	-	G	F (4, 6, 7)
		Ckg	G	**F**	G	**F**	-	**F**	G	**F**	-	G	F (2, 4, 6, 7)
LYSyl[3]	2148BH	Ap	_	-	_	-	G	G	G	G	G	**F**	F (10)

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
		Bg	_	-	_	-	-	G	G	-	-	**P**	P (10)
		Ckg	_	-	_	-	-	G	G	-	-	**P**	P (10)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)
LYSzr	0143BH	Ah	G	G	G	G	G	G	G	G	**F**	G	F (9)
		Ckg	G	G	G	**F**	-	**F**	G	**F**	-	G	F (4, 6, 7)
MTD	0178BH	Apk	G	G	G	G	G	G	**F**	**F**	**F**	G	F (7, 8, 9)
		Bmk	G	G	G	G	-	G	**F**	**F**	-	G	F (7, 8)
		Ckg	G	G	G	G	-	G	**F**	**F**	-	G	F (7, 8)
MTD[3]	4047BH	Ah	_	-	_	-	G	G	G	**F**	G	G	F (7)
		Bm	_	-	_	-	-	**F**	G	**F**	-	G	F (6, 7)
		Ckgj	_	-	_	-	-	G	G	**F**	-	G	F (7)
MTDgr[3]	2695BH	Ap	_	-	_	-	G	G	G	G	G	G	G
		Bm	_	-	_	-	-	**F**	G	G	-	G	F (6)
		Ck	_	-	_	-	-	**F**	G	-	-	G	F (6)
NPE	2197BH	Ah	G	**F**	G	**F**	G	G	G	G	G	G	F (2, 4)
		Bg	G	F	G	G	-	F	G	G	-	**P**	P (10)
		Ck	G	G	G	G	-	**F**	G	G	-	**F**	F (6, 10)
NWC	0552BH	Ap	G	G	G	G	**F**	G	G	-	**F**	G	F (5, 9)
		Ck	G	G	G	**F**	-	**F**	G	-	-	G	F (4, 6)
		Bt	G	G	G	G	-	**F**	G	-	-	G	F (6)
		BC	_	-	_	-	-	**F**	G	-	-	**F**	F (6, 10)
OBE	0403BH	Ap	G	F	G	G	G	G	**F**	G	-	-	F (8)
		Bm	G	G	G	G	-	G	**F**	G	-	-	F (2, 8)

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
		Ck	G	G	G	G	-	G	**F**	**F**	-	-	F (7,8)
OBE[3]	0622BH	Ah	_	-	_	-	**F**	G	G	**F**	**F**	G	F (5, 7, 9)
		Bm	_	-	_	-	-	G	G	G	-	**P**	P (10)
		Ck	_	-	_	-	-	**F**	G	**F**	-	G	F (6, 7)
OBE[3]	0880BH	Ah	_	-	_	-	**F**	G	G	**F**	G	G	F (5, 7)
		Ae	_	-	_	-	**P**	G	G	F	**P**	G	P (5, 9)
		Bm	_	-	_	-	-	G	G	-	-	G	G
		Ck	_	-	_	-	-	G	G	**F**	-	G	F (7)
OBE[3]	0928BH	Ap	_	-	_	-	**F**	G	G	G	**F**	G	F (5, 9)
		Bm	_	-	_	-	-	G	G	G	-	G	G
		BC	_	-	_	-	-	G	G	G	-	G	G
		Ck	_	-	_	-	-	**F**	G	G	-	**F**	F (6, 10)
OBE[3]	1090BH	LFH	_	-	_	-	-	-	G	-	G	-	G
		Ahe	_	-	_	-	G	G	G	**F**	**F**	G	F (7, 9)
		Bm	_	-	_	-	-	G	G	**F**	-	G	F (7)
		Ck	_	-	_	-	-	F	G	G	-	G	F (6)
OBE	1184BH	Ah	G	P	G	G	G	G	G	G	-	-	P (2)
		Bm	G	P	G	G	-	F	G	G	-	-	P (2)
		Ck1/Ck2	G	G	G	G	-	**F**	G	G	-	-	F (6)
OBE[3]	1211BH	Ah	_	-	_	-	G	**F**	G	**F**	G	G	F (6, 7)
		Bm	_	-	_	-	-	F	G	**P**	-	G	P (7)
		Apk	_	-	_	-	**F**	G	G	**F**	**F**	G	F (5, 7, 9)
		Bmk	_	-	_	-	-	**F**	G	**F**	-	**F**	F (6, 7, 9)
		Ck	_	-	_	-	-	**F**	G	**F**	-	**F**	F (6, 7, 9)
OBE	3181BH	Ap	G	G	G	G	G	G	G	G	-	G	G
		Bm	G	G	G	G	-	G	G	G	-	G	G
		BC		G		G	-	G	G	G	-	G	G

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
			G		G								
		BC/Ck	G	G	G	G	-	**P**	G	F	-	-	P (6)
		Ck	G	G	G	G	-	**P**	G	F	-	**P**	P (6, 10)
OBE[3]	4031BH	Ah/Ap	_	-	_	-	G	G	G	G	**F**	G	F (9)
		Bm	_	-	_	-	-	G	G	**F**	-	G	F (7)
		BC/Ck	_	-	_	-	-	**F**	G	**F**	-	**F**	F (6, 7, 10)
OBEer	1160BH	Apk	_	-	_	-	**F**	G	**F**	**F**	**F**	**F**	F (5, 7, 8, 9, 10)
		Ck	_	-	_	-	-	**F**	**F**	**F**	-	**F**	F (6, 7, 8, 10)
OBEgl	0087BH	Ap	_	-	_	-	G	G	G	-	**F**	G	F (9)
		Bm	_	-	_	-	-	G	G	G	-	G	G
		Ck1	_	-	_	-	-	**F**	G	G	-	G	F (6)
		IICk	_	-	_	-	-	G	G	-	-	**P**	P (10)
OGO	4094BH	Ah	_	-	_	-	F	G	G	-	G	**P**	P (10)
		Cgj	_	-	_	-	-	F	G	-	-	**P**	P (10)
		Cg	_	-	_	-	-	**F**	G	-	-	G	F (6)
SMFxtyl[3]	1539BH	Ap	_	-	_	-	G	G	G	-	G	G	G
		Bt	_	-	_	-	-	F	G	-	-	**P**	P (10)
		IICkgj	_	-	_	-	-	F	G	F	-	**P**	P (10)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)
SMGxt	0757BH	Ap	G	G	G	G	**F**	G	G	-	-	-	F (5)
		Bt	G	G	G	G	-	G	G	-	-	-	G
		IICk	G	G	G	G	-	**F**	G	**F**	-	-	F (6, 7)
SMGxt	1136BH	Ap	G	G	G	G	G	G	G	-	-	-	G
		Bt	G	G	G	G	-	G	G	-	-	-	G
		Ck1/Ck2	G	G	G	G	-	**F**	G	**F**	-	-	F (6,7)
WPO[3]	1243BH	Ah		-		-	G	G	**F**	G	G	G	F (8)

Series	Site ID	Horizon	EC	pH	SAR	Sat. (%)	$CaCO_3$ Equiv. (%)	Moist Consistence	Surface Stoniness	Coarse Frag. (%)	Org. C (%)	Text.	Overall Suitability[1] and Limiting Factors[2]
			-		-								
		Btj	_	-	_	-	-	G	**F**	**F**	-	G	F (7,8)
		Ck	_	-	_	-	-	**F**	**F**	**F**	-	G	F (6,7,8)
WPOgl	1680BH	Ap	G	**F**	G	P	G	G	G	G	G	**F**	P (4)
		Bt	G	F	G	F	-	F	G	-	-	**P**	P (10)
		BCg/ Ckgj	G	G	G	**F**	-	**F**	G	**F**	-	-	F (4, 6, 7)
		BCg	_	-	_	-	-	F	G	F	-	**P**	P (10)
		Ckgj	_	-	_	-	-	F	G	G	-	**P**	P (10)
WPOyl	2285BH	Ah	G	F	G	G	G	G	G	F	-	**P**	P (10)
		Bt	G	F	G	G	-	G	G	G	-	**P**	P (10)
		BC	_	-	_	-	-	G	G	G	-	**P**	P (10)
		Ck	_	-	_	-	-	F	G	F	-	**P**	P (10)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)
ZRL[3]	2073BH	Ah	_	-	_	-	**F**	G	G	**F**	-	G	F (5, 7)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)
ZRL	3325BH	Ap	G	**F**	G	G	G	G	G	G	G	G	F (2)
		Bm	G	G	G	G	-	G	G	**F**	-	**F**	F (7, 10)
		R	_	-	_	-	-	-	-	-	-	**U**	U (10)

[1] G = Good, F = Fair, P = Poor, U = Unsuitable

[2] Limitations : (1) = EC (dS/m), (2) = pH, (3) = SAR, (4) = Saturation percent (%), (5) = CaCO3 Equivalent (%), (6) = Moist consistence, (7) = Coarse Fragments (%), (8) = Surface stoniness,(9) = Organic carbon (%), (10) = Texture

[3] Full suite of analytical data not available.

[4] Estimated based on Table 4.6 in Agronomic Interpretations Working Group (1995).

Appendix E Soil Legend for the Eastern Mainline Project route

Table E-1 Soil legend for the Eastern Mainline Project route – Local Study Area

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Achigan	AHG	Gleyed Melanic Brunisol	Glaciofluvial	Imperfectly drained	LS, SL /S	25-35	Distinct	2-lift	High	Low	Low	Unstable	0.5 - 2	S0	Fair Good Fair -	1.2 km / 0.4%
Achigan-ZZ	AHGzz	Orthic Melanic Brunisol	Glaciofluvial	Moderately well to well drained		15-25		2-lift					2 - 9		Good Poor Poor -	1.5 km / 0.6%
Bondhead	BDH	Brunisolic Gray Brown Luvisol Orthic Gray Brown Luvisol	Morainal	Well to moderately well drained	L / CL, SCL	10-40	Variable	2-lift	Low	Low to high	Moderate	Stable	0.5 - 15	S1	Good to Poor Poor Good to Poor -	10.4 km / 3.9%
Bondhead-XL	BDHxl	Brunisolic Gray Brown Luvisol Orthic Gray Brown Luvisol	Morainal over bedrock	Well to moderately well drained		0-10		2-lift 3-lift[4]		High			5 - 10		Fair to Poor Poor Poor Unsuitable	0.2 km / 0.1%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Gleyed Bondhead	BDHgl	Gleyed Gray Brown Luvisol	Morainal	Imperfectly drained	L, SiL / CL, SCL	20-30		2-lift		High	High		5 - 10		Good to Poor Poor Fair -	0.3 km / 0.1%
Brighton	BGH	Orthic Melanic Brunisol	Glaciofluvial	Well to rapidly drained	SL, LS / LS, S	5-40	Distinct	2-lift	High	Low to high	Low	Unstable	0.5 - 45	S0 - S2	Fair to Poor Poor Poor -	28.1 km / 10.6%
Gleyed Brighton	BGHgl	Gleyed Melanic Brunisol		Imperfectly drained	SL / SL, LS	20-40		2-lift		Low to high			0.5 - 15		Good Good Fair -	1.2 km / 0.5%
Brighton-GR	BGHgr	Orthic Melanic Brunisol		Well to rapidly drained	SL / SL	20-30		2-lift 3-lift[4]		Low to high			0.5 - 10		Good Poor Poor -	0.6 km / 0.2%
Brighton-XT	BGHxt		Glaciofluvial over morainal	Well to rapidly drained	SL / SL, LS	15-40		2-lift		Low to high			0.5 - 15		Good Poor Poor -	6.6 km / 2.5%
Brighton-YT	BGHyt			Well to rapidly drained	LS / S, LS	10-40		2-lift		Low to high			0.5 - 30		Good Poor Fair -	2.4 km / 0.9%
Brighton-YG	BGHyg		Fluvial over morainal	Moderately well drained	SL / LS, SL	20-30		3-lift[4]		High			10 - 15		Good Poor Poor -	0.1 km / 0.1%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Rego Brighton	BGHzr	Orthic Humic Regosol	Glaciofluvial	Well to rapidly drained	SL, LS / S, SL, LS			2-lift		Low to High			0.5 – 45	S0 – S2	Good - Poor -	0.6 km / 0.2%
Cheney	CEY	Orthic Humic Gleysol	Fluvial	Poorly drained	SL, SiL / SiCL	10-30	Distinct	2-lift	Low	Low to high	High	Unstable	0 - 30	S0 - S1	Good Fair Fair -	3.7 km / 1.4%
Peaty Cheney	CEYpt	Peaty Rego Humic Gleysol	Fluvial	Poorly drained	- / SL	20-30	Distinct	2-lift	Low	High	Moderate	Unstable	5 - 15	S0 - S1	- Fair Fair -	0.3 km / 0.1%
Rego Cheney	CEYzr	Rego Humic Gleysol	Fluvial	Very poor to poorly drained	L / Sl, LS	10-30	Indistinct	2-lift	Low	Low to high	High	Unstable	0 - 9	S0 - S2	Poor - Poor -	0.3 km / 0.1%
Cashel	CSH	Orthic Gray Brown Luvisol Orthic Melanic Brunisol	Glaciolacustrine over morainal	Moderately well to well drained	CL, L / CL, C	15-30	Distinct	2-lift	Low	Low to high	Moderate	Stable	0.5 - 10	S0 - S1	Fair Fair Fair -	7.8 km / 2.9%
Gleyed Cashel	CSHgl	Gleyed Gray Brown Luvisol Gleyed Melanic Brunisol		Imperfectly drained	CL / C	15-30		2-lift		Low	High		0.5 - 5		Fair Poor Poor -	1.1 km / 0.4%
Darlington	DGT	Brunisolic Gray Brown Luvisol Orthic Gray Brown Luvisol	Morainal	Well drained	L, SiL, SL / CL, SiL	15-35	Distinct	2-lift	Low	High	Moderate	Stable	2 - 10	S1	Good Poor Poor -	3.4 km / 1.3%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Elmbrook-YT	EOKyt	Gleyed Gray Brown Luvisol	Glaciolacustrine over morainal	Imperfectly drained	L, SiCL, CL / CL, C	15-25	Indistinct	2-lift	Low	Low	High	Stable	0.5 - 5	S0	Good Fair Poor -	0.6 km / 0.2%
Farmington	FRM	Orthic Melanic Brunisol	Morainal	Well to moderately well drained	CL, L, SL / CL, SCL	10-30	Indistinct	2-lift	Low	Low to high	Moderate	Stable	0.5 - 10	S0 - S1	Fair Good Fair -	5.1 km / 1.9%
Farmington-XL	FRMxl	Orthic Melanic Brunisol	Morainal over bedrock	Well to moderately well drained	CL / CL, SiCL , L	5-30	Indistinct	2lift 3-lift[4]	Low	Low to high	Moderate	Stable	0 - 15	S0 - S1	Fair Fair Fair Unsuitable	7.5 km / 2.8%
Farmington-YL	FRMyl	Orthic Melanic Brunisol	Morainal over bedrock	Well to moderately well drained	CL, L / CL,C	15-30	Indistinct	2-lift 3-lift[4]	Low	Low to high	Moderate	Stable	0.5 - 10	S0 - S1	Fair Fair Poor Unsuitable	2.1 km / 0.8%
Granby	GNY	Orthic Humic Gleysol	Glaciolacustrine	Poorly drained	L, SiL / LS	10-40	Distinct	2-lift	Low	Low to high	Moderate	Unstable	0 - 15	S0 - S1	Fair Poor Fair -	6.6 km / 2.5%
Peaty Granby	GNYpt	Peaty Rego Humic Gleysol	Fluvial	Very poorly drained	L, SL / SiC	20-30		2-lift		Low to high	High	Unstable	0.5 - 10		- Poor Poor -	0.4 km / 0.2%
Grenville	GVI	Orthic Melanic Brunisol	Morainal	Well drained	SL, L / CL, SL	10-30	Distinct	2-lift	Low	Moderate	Low	Stable	0.5 - 15	S0 - S2	Poor Poor Good -	2.8 km / 1.0%
Grenville-XL	GVIxl		Morainal over bedrock		CL, L / SL, CL, SCL	10-20		2-lift 3-lift[4]	Low	Low to high	Moderate	Stable	0.5 - 15	S0 - S3	Fair Fair Fair Unsuitable	0.2 km / 0.1%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Landsdowne	LDW	Gleyed Gray Brown Luvisol	Glaciolacustrine over morainal	Imperfectly drained	CL / C	10-40	Variable	2-lift	Low	Low to high	High	Stable	0.5 – 15	S0 - S2	Fair Poor Poor -	3.5 km / 1.3%
Landsdowne-XL	LDWxl		Glaciolacustrine over bedrock		L / C	10-30		2-lift 3-lift[4]		Low to high			0.5 - 10		Fair Poor - Unsuitable	1.5 km / 0.6%
Lyons	LYS	Orthic Humic Gleysol	Morainal	Poorly drained	L, CL / CL	10-45	Variable	2-lift	Low	Low to high	High	Unstable	0 – 15	S0 - S2	Good to Fair Fair Fair -	11.7 km / 4.4%
Lyons-XL	LYSxl	Orthic Humic Gleysol	Morainal over bedrock	Poorly drained	CL / C,CL	10-35	Variable	2-lift 3-lift[4]	Low	Low to high	High	Unstable	0.5 - 15	S0 - S2	Fair Fair Poor Unsuitable	3.8 km / 1.4%
Lyons-YL	LYSyl		Morainal over bedrock	Poorly drained	SiCL / C, HC	20-30	Variable	2-lift 3-lift[4]	Low	Low to high	High	Unstable	0.5 - 15	S0 - S2	Fair Fair Fair Unsuitable	0.4 km / 0.2%
Rego Lyons	LYSzr	Rego Humic Gleysol	Morainal	Poor to very poorly drained	L, CL /	20 - 30	Variable	2-lift	Low	Low to high	High	Unstable	0 - 15	S0 - S1	Good - Fair -	0.2 km / 0.1%
Moscow	MCW	Orthic Humic Gleysol	Glaciolacustrine	Poorly drained	CL, C / C	10-30	Variable	2-lift	Low	Low to high	High	Unstable	0 - 10	S0 - S1	Fair Poor Poor -	3 km / 1.1%
Moscow-XL	MCWxl		Glaciolacustrine over bedrock		SiCL / C	10-25		2-lift 3-lift[4]		Low			0 - 2		Fair Poor Poor Unsuitable	1.6 km / 0.6%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Milliken	MLE	Gleyed Gray Brown Luvisol	Morainal	Imperfectly drained	CL / CL, SCL	20-30	Distinct	2-lift	Low	Low	High	Stable	0.5 - 5	S1 - S2	Fair Fair Poor -	1.4 km / 0.5%
Matilda	MTD	Gleyed Melanic Brunisol	Morainal	Imperfectly drained	CL, L, SL / L, SL, SCL, CL	15-35	Variable	2-lift	Low	Low to high	High	Stable	0.5 - 10	S0 - S2	Fair Poor Poor -	2.9 km/1.1%
Matilda-XL	MTDxl		Morainal over bedrock			15-30		2-lift 3-lift[4]					0.5 - 10		Fair Good Fair Unsuitable	1.6km/0.6%
Matilda-YL	MTDyl					15-25		2-lift 3-lift[4]	Moderate	Low			0.5 - 5		Fair Fair Fair Unsuitable	0.3km/0.1%
Matilda-GR	MTDgr	Gleyed Melanic Brunisol	Morainal	Imperfectly drained	L / SL	30	Distinct	3-lift[4]	Low	Moderate	Low	Stable	0.5 - 2.5	S0	Good Good Poor	0.1 km / 0.1%
Napanee	NPE	Orthic Humic Gleysol	Glaciolacustrine	Poorly drained	CL, SiCL, / C	10-30	Variable	2-lift	Low	Low to high	High	Unstable	0.5 - 15	S0	Poor Poor Poor -	5.6 km / 2.1%
Napanee-XL	NPExl		Glaciolacustrine over bedrock		CL / SiC	10-40		2-lift 3-lift[4]					0.5 - 10		Fair Poor - Unsuitable	1.4 km / 0.5%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Napanee-YT	NPEyt	Orthic Humic Gleysol	Glaciolacustrine over morainal	Poorly drained	C, SiCL / C	15-25		2-lift		Low			0.5 - 5		Poor Poor Poor -	0.9 km / 0.3%
Rego Napanee	NPEzr	Rego Humic Gleysol	Glaciolacustrine		C, CL, L / C	10-50	Variable	2-lift	Low	Low to high			0 - 10		Good Poor Poor -	2.9 km / 1.1%
Newcastle	NWC	Brunisolic Gray Brown Luvisol	Glaciofluvial	Well drained	SiL, L / SiCL, CL	15-40	Variable	2-lift	Low	Moderate to high	Moderate	Stable	0.5 - 10	S0 - S1	Fair Fair Fair -	2.4 km / 0.9%
Gleyed Newcastle	NWCgl	Gleyed Gray Brown Luvisol		Imperfectly drained	SiL / SCL	20		2-lift		High	High		5 - 15		Good Fair - -	0.3 km / 0.1%
Newcastle-XT	NWCxt	Orthic Gray Brown Luvisol	Glaciofluvial over morainal	Well drained	L / CL	25-35		2-lift		Moderate	Moderate		0.5 - 2		Good Fair Fair -	0.4 km / 0.2%
Otonabee	OBE	Orthic Melanic Brunisol	Morainal	Well drained	L, SL / SL, LS	10-45	Variable	2-lift	Moderate to high	High	Low	Unstable	0 - 45	S0 - S3	Good to Fair Good Fair to Poor -	49.0 km / 18.4%
Gleyed Otonabee	OBEgl	Gleyed Melanic Brunisol	Morainal	Imperfectly drained	CL / CL, SCL	20-30	Variable	2-lift	Low	High	High	Stable	0 - 10	S0 - S3	Good Good Poor -	1.2 km / 0.4%
Otonabee-GR	OBEgr	Orthic Melanic Brunisol	Morainal	Well drained	L / L	10-30		2-lift 3-lift[4]	Low	High	Moderate		2 - 30		Fair Poor - -	2.0 km / 0.7%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Otonabee-XL	OBExl	Orthic Melanic Brunisol	Morainal over bedrock	Well drained	L / SCL, SL	10-30		2-lift 3-lift[4]	Low	High	Moderate		0.5 - 10		Fair Fair - Unsuitable	4.1 km / 1.6%
Rego Otonabee	OBEzr	Orthic Humic Regosol	Morainal		SL / CL	10-20		2-lift	High	High			10 - 30		Poor Poor Poor -	0.3 km / 0.1%
Sidney	SIY	Orthic Humic Gleysol	Glaciolacustrine	Poorly drained	CL / SiCL, CL	25-30	Indistinct	2-lift	Low	Moderate	High	Unstable	0.5 - 5	S0	Good Fair Fair -	0.8 km / 0.3%
Sidney-XL	SIYxl	Rego Humic Gleysol	Glaciolacustrine over bedrock	Poorly drained	SiCL / SiCL	20	Distinct	2-lift 3-lift[4]	Low	Moderate	High	Unstable	0.5 – 2.5	S0	Good - Fair Unsuitable	0.2 km / 0.1%
Smithfield	SMF	Gleyed Gray Brown Luvisol	Glaciolacustrine	Imperfectly drained	L, SiL / SiCL	20-30	Variable	2-lift	Low	Moderate to high	High	Stable	0.5 - 10	S0 - S1	Good Fair Fair -	1.4 km / 0.5%
Schomberg	SMG	Orthic Gray Brown Luvisol	Glaciolacustrine	Well to moderately well drained	SiL / SiCL	15-30	Variable	2-lift	Low	Moderate to high	Moderate	Stable	0.5 - 10	S0 - S1	Good Fair Fair -	3.3 km / 1.2%
Schomberg-XT	SMGxt		Glaciolacustrine over morainal		L, CL / C, CL, SiCL, SCL	25		2-lift	Moderate	High			5 - 10		Fair Fair Poor -	0.2 km / 0.1%
Schomberg-YT	SMGyt				SiL / SiCL	20		2-lift	Low	High			5 – 10		Good Fair Poor -	0.4 km / 0.1%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Solmesville-YL	SMVyl	Gleyed Gray Brown Luvisol	Glaciolacustrine over bedrock	Imperfectly drained	C, CL, SC / C, SiC	25-30	Variable	2-lift 3-lift[4]	Low	Moderate to high	High	Stable	0.5 – 2.5	S0	Poor Poor Poor -	0.3 km / 0.1%
Waupoos	WPO	Orthic Gray Brown Luvisol	Morainal	Well drained	L, CL / C, CL	10-30	Indistinct	2-lift	Low	Low to high	Moderate	Stable	0.5 - 45	S0 - S1	Poor Poor Poor -	6.9 km / 2.6%
Gleyed Waupoos	WPOgl	Gleyed Gray Brown Luvisol		Imperfectly drained	CL / C	15-25		2-lift			High		0 - 10		Good Fair Fair -	1.3 km / 0.5%
Waupoos-XL	WPOxl	Orthic Gray Brown Luvisol	Morainal over bedrock	Well drained	L, CL, C / C, CL	10-30		2-lift 3-lift[4]			Moderate		0.5 - 10		Fair Fair Fair Unsuitable	3.9 km / 1.5%
Waupoos-YL	WPOyl	Orthic Gray Brown Luvisol	Morainal over bedrock	Well drained	L, CL, C / C, CL	15-30	Indistinct	2-lift 3-lift[4]	Low	Low to high	Moderate	Stable	0.5 - 10	S0 - S1	Poor Poor Poor Unsuitable	3.5 km / 1.3%
Bottom Land	ZAL[3]	Gleyed Melanic Brunisol	Fluvial	Imperfectly drained	L, SiL / SL, LS	10-30	Distinct	2-lift	Low	Moderate to high	Low	Unstable	0 - 30	S0 - S2	Good Poor Fair -	4.6 km / 1.7%
Disturbed Land	ZDL[3]	-	Morainal, glaciofluvial	Variable	L, SL, CL / CL, SiCL, SCL, SL, LS, S	0-30	Distinct	2-lift	-	-	-	-	0.5 - 5	S0 - S2	- - - -	2.6 km / 1.0%
Muck	ZMK[3]	Terric Humisol	Undifferentiated organic	Very poorly drained	Organic / SL, LS, HC	30	Variable	2-lift	Low	Low	High	Unstable	0 - 10	S0	- - - -	4.5 km / 1.7%

Soil Unit	Soil Symbol	Dominant/ Significant Soil	Parent Material	Drainage Class	Texture Topsoil / Subsoil (Textural Change)	Topsoil Depth (cm)	Colour differentiation between topsoil and subsoil (distinct / indistinct)	Soil Handling	Wind Erosion Hazard[1]	Water Erosion Hazard[2]	Soil Compaction Potential[1]	Trench Instability Potential[1]	Slope (%)	Surface Stoniness	Reclamation Suitability Rating Topsoil Upper Subsoil Lower Subsoil Bedrock	Extent of Project Footprint (km/%)
Rockland	ZRL[3]	Orthic Humic Regosol	Bedrock	Very rapidly drained	L, CL, SL / bedrock	0-20	Indistinct	2-lift 3-lift[4]	Low	Low to high	-	-	0 - 15	S0 - S5	Fair Fair - Unsuitable	12.7 km / 4.8%
Open Water	ZWA[3]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5 km / 0.2%

Above information based on rev06_Jan25, 2015

[1] Wind erosion, soil compaction potential and trench instability potential are determined using soil series information from the *Soil Series Information for Reclamation Planning in Alberta Volume 2 (Pedocan Land Evaluation Ltd., 1993)*

[2] Water erosion *potential - Revised Universal Soil Loss Equation for Application in Canada. (Wall et al, 2002)*

[3] Classified as non-mineral soil - *Land Information Ontario Data Description. (Soil Survey Complex (v.4), 2013)*

[4] Soil handling recommendations dependant on bedrock or gravel occurring above trench depth on potentially arable land use, and subject to TransCanada review.

Appendix F Photos

Photo 1. BDH soil profile on cultivated land use

Photo 2. BGH soil profile on cultivated land use

Photo 3. FRMxl soil profile on pasture land use

Photo 4. LYS soil profile on pasture land use

Photo 5. OBE soil profile on cultivated land use

Photo 6. WPO soil profile on cultivated land use

Photo 7. ZAL soil profile on cultivated land use

Photo 8. BGHgr soil profile on pasture land use

Photo 9. BGHgr soil on pasture land use

Photo 10. ZRL soil profile on wooded land use

Photo 11. Bedrock outcrop on pasture land use

Photo 12. Exposed bedrock on wooded land use

Photo 13. Undulating surface expression, cultivated land use

Photo 14. Undulating surface expression, hay land use

Photo 15. Rolling surface expression, cultivated land use

Photo 16. Rolling surface expression, wooded land use

Photo 17. Hummocky surface expression, hay land use

Photo 18. Veneer surface expression, residential land use

Photo 19. Terraced surface expression, wooded land use

Photo 20. Veneer surface expression and bedrock outcroppings, pasture land use

Appendix G Guidelines for Alternative Soil Handling procedures During Pipeline Construction

Guidelines for alternatives to standard two-lift handling by Pettapiece and Dell (1995) are reproduced below.

Soil Handling Unit

The soil handling unit is the soil map unit. All units identified on a map with a particular symbol (soil map unit delineation) should be handled in the same manner.

Soil Handling Unit Length

A soil handling unit length is equivalent to one soil map unit delineation at a map scale of 1:10,000. Except for situations where there are strongly contrasting soils or topographic features (e.g. bedrock ridge, stream channels, pot holes) the soil handling length would normally be a minimum of 100 m. The minimum soil handling length and the minimum soil map unit size are assumed to be equal.

Soil Sampling Criteria for Problem Soil Management

Sufficient soil sampling (based on professional judgment) should be completed to determine if the map unit delineation should be considered for alternative soil handling. If problem soils are anticipated, there should be at least one sample every 400 m.

Additional soil investigations or sampling may be required at a later time to better define a problem soil area identified by the pedologist in the initial survey. If an alternative soil handling candidate map unit delineation is less than or equal to 400 m in length and there are no soil chemistry data for that unit, the entire map unit delineation should be considered for alternative soil handling.

Further soil investigations or sampling is suggested as necessary to reduce the length of alternative handling procedures as requested or suggested by the field pedologist.

Topsoil Thickness Criteria

For topsoil stripping, the average topsoil thickness in a map unit delineation must be between 10 cm and 35 cm, and must be of “better quality” than the upper subsoil. Actual stripping depths can be modified during construction by on-site inspection. Again, special situations might suggest consideration of <10 cm.

Upper Subsoil Thickness Criteria

The average thickness of the upper subsoil of the soil map must be greater than 15 cm before separate subsoil lift handling is considered.

Maximum aggregate thickness of topsoil and upper subsoil to be separately handled is 50 cm. Therefore, the maximum amount of upper subsoil to be separately salvaged is 40 cm. This limit is set to allow for better planning of right-of-way width requirements.

Actual stripping depths can be modified during construction by on-site inspection.

Stone or Gravel Content (Coarse Fragments) Criteria

Alternate soil handling procedures will be considered when the upper subsoil is non-gravelly or non-stony material and:

- the lower subsoil (50 cm to trench depth) has a coarse fragment (>2 mm in diameter) content of >35% if gravelly and >20% if cobbly
- consolidated bedrock is encountered that would break into hard fragments with trenching.

Salinity Criteria for Three-Lift

Three-lift procedures should be considered when the upper subsoil has an EC of less than 8 dS/m and the following conditions for salinity are met:

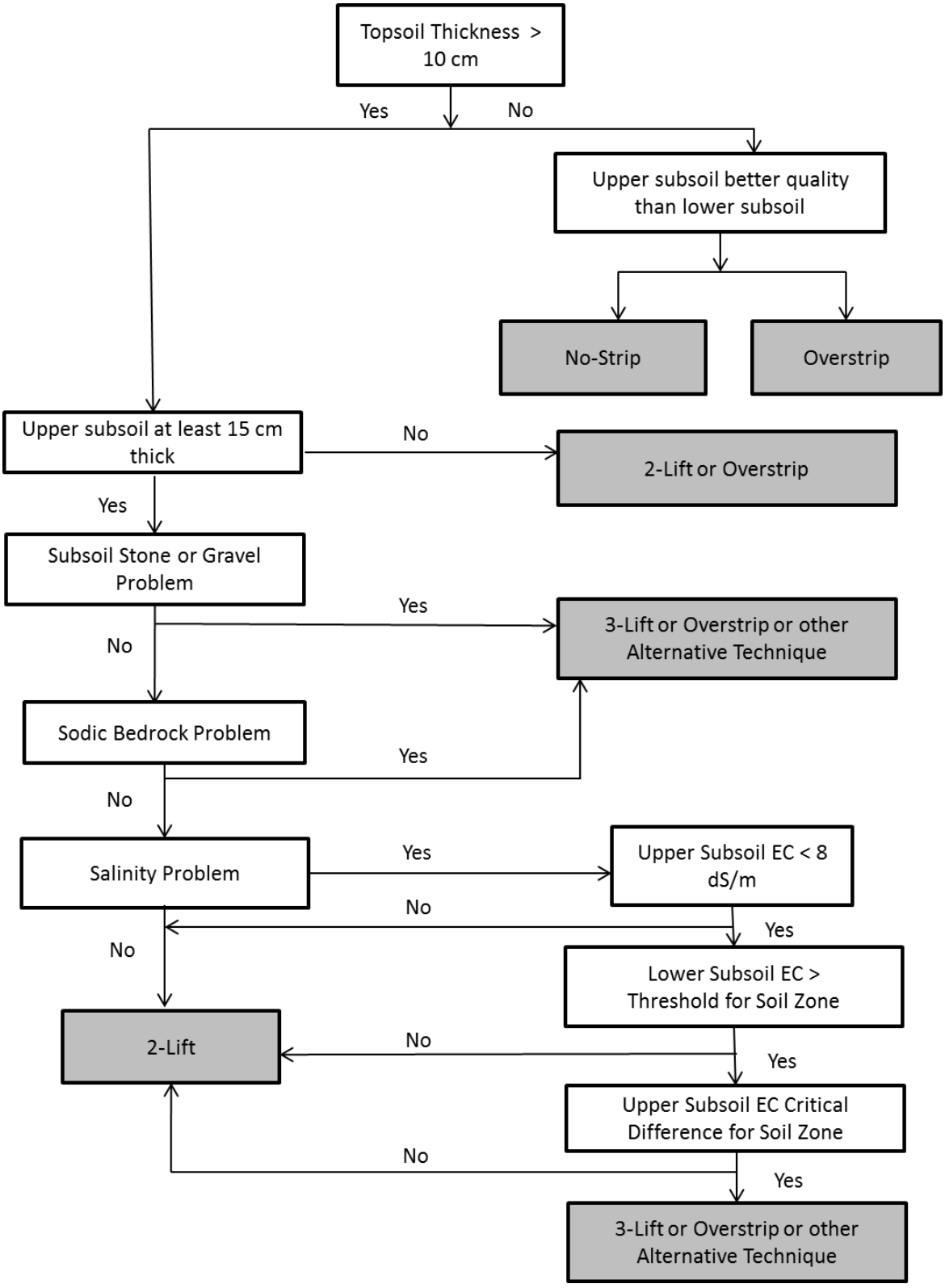
- pre-construction EC of the upper subsoil must be less than 8 dS/m,
- Threshold EC of lower subsoil must be exceeded (see table below), and
- critical difference EC (lower subsoil minus upper subsoil) must be greater than or equal to 4 dS/m

Table F-1 Salt affected soil criteria for different soil zones

Soil Zone	Upper Subsoil EC (dS/m)	Lower Subsoil Threshold EC (dS/m)	Critical Difference EC (dS/m)
Brown	<8	>5	≥4
Dark Brown	<8	>6	≥4
Other	<8	>8	≥4

The flowchart provided in the guidelines for determining if alternative soil handling procedures are required is reproduced in Figure F-1.

Figure F-1 Problem soil handling procedure decision chart



APPENDIX F

Potentially Contaminated Properties

The following information relating to potential contamination is based on the results of the Limited Phase 1 Environmental Site Assessment conducted by Golder Associated Ltd. (Golder) for the Eastern Mainline Project. Four potentially contaminating properties (PCP) were identified to represent medium or high risk, while the other PCPs were identified to represent no or low risk in the Limited Phase I Environmental Site Assessment Study Area (site assessment study area) (Table F-1). The environmental site assessment study area included the pipeline and the five compressor stations along the Canadian Mainline, plus the surrounding lands within 250 m of the pipeline centreline. The identified PCPs were associated with current or potentially contaminating activities that may have affected the environmental site assessment study area in the past.

Table F-1: Potential Contaminating Properties

Name on Figure	Potentially Contaminating Property (PCP) and Location	Source of Information	Potential Contaminant Risk in Relation to the Project	Approximate Kilometre Post [KP]	Approximate Distance from the Project [m]	Direction from the Project
PCP 1	Markham airport, an airplane “graveyard” and a reported spill in the area of the Markham Airport on farm land due to a helicopter crash in 1994.	Google Earth images from 2002 to 2012, Ecolog ERIS report, site visit	None	MLV 132 + KP 8	200	South
PCP 2	Pickering Landscaping & Sod yard is located on adjacent lands north of the pipeline at 4830 Sideline 12 at Claremont, ON	Google Earth images from 2005 and 2012, site visit	Low	MLV 132 + KP 23	60	North
PCP 3	Commercial site occupied by number of trucks is located south of Conlin Road East in Mitchell’s Corners, Ontario, west of Langmaid Road	Google Earth images from 2005 and 2009, site visit	None	MLV 132 + KP 51	100	West
PCP 4	A farm house, barns, farm equipment, drums filled with scrap metal, old tires, wood material, empty pails, empty old AST were observed on a farm property located west of Green Road in Hampton, Ontario.	2005 Google Earth image, site visit	Low	MLV 132 + KP 58	30	South
PCP 5	Auto repair/maintenance garage and yard occupied by various vehicles, machinery, parts and materials, ASTs are present west of County Road 57 in Hampton, Ontario. It was noted that the housekeeping practices at this property are poor.	Google Earth images from 2005 to 2013, Ecolog ERIS report, site visit	Medium	MLV 132 + KP 60	75	South

Table F-1: Potential Contaminating Properties

Name on Figure	Potentially Contaminating Property (PCP) and Location	Source of Information	Potential Contaminant Risk in Relation to the Project	Approximate Kilometre Post [KP]	Approximate Distance from the Project [m]	Direction from the Project
PCP 6	Pipeline alignment crosses immediately south of or through the closed Clarington Waste Processing Centre Ltd. landfill site with cancelled C of A # A390305, located at Lots 11-12, Concession 3, Municipality of Clarington. (East of Stapleton Road in Clarington, Ontario).	Google Earth images from 2005 and 2009, MOE database inventory of CofA issued for waste disposal sites, MOE Waste Disposal Site Inventory, June 1991, site visit	High	MLV 132 + KP 77	Adjacent	North
PCP 7	Baltimore landfill closed waste disposal site (A311801) located at Lot 7-8, Concession 2 Township of Hamilton, approximately 400 m south of the pipeline, Based on the review of Google Earth images and the site visit, no evidence of a landfill was observed in the area. A quarry was noted to be located in the general area during the site visit.	MOE Waste Disposal Site Inventory, Google Earth images, site visit	None	MLV 132 + KP 111	400	South
PCP 10	Richmond closed waste disposal site (CofA #A371203) is located at 1271 Beechwood Road; Part of Lots 1-3, Concession 4, geographic Township of Richmond, Town of Greater Napanee. (Northeast quadrant of the intersection of Beechwood Road and Deseronto Road in Empey Hill, Ontario).	Google Earth images from 2009 and MOE Waste Disposal Site Inventory, June 1991, site visit	Medium	MLV 139 + KP 14	250	North
PCP 11	Petro Canada retail fuel outlet. (Northwest corner of the intersection of County Road 41 and Community Road in Greater Napanee, Ontario).	Google Earth images from 2007 to 2011 and Ecolog ERIS report, site visit	Medium	MLV 139 + KP 22	150	South
PCP 12	Pipeline passes through the back yard of an auto glass and auto garage located south of the pipeline corridor. (Community Road in Greater Napanee, Ontario).	Google Earth images from 2007 to 2011 and Ecolog ERIS report, site visit	Low	MLV 139 + KP 22	50	South

Table F-1: Potential Contaminating Properties

Name on Figure	Potentially Contaminating Property (PCP) and Location	Source of Information	Potential Contaminant Risk in Relation to the Project	Approximate Kilometre Post [KP]	Approximate Distance from the Project [m]	Direction from the Project
PCP 13	A small area that appears to be used as a dump for construction debris is located west of Old Wilton Road in Odessa, Ontario. No evidence of dumping was noted during the site visit[	Google Earth images from 2007 to 2011, site visit	None	MLV 139 + KP 41	100	South
PCP 15	An auto scrap yard is located at 3 Marble Road in Maple Grove, Ontario. During the site visit it was noted that the scrap yard is located downgradient of the pipeline and is separated by agricultural land.	Google Earth images from 2005 to 2009 and Ecolog ERIS report, site visit	Low	MLV 142 + KP 14	150	South
PCP 18	C of A for waste disposal site was issued to Conagra Ltd. During the site visit, the area was observed to be vacant and agricultural lands.	MOE database inventory of CofA issued for waste disposal sites, site visit	None	MLV 132 + KP 96	350	North
PCP 19	Cancelled CofA # A130510 for Mccoy Foundry Landfill for Archie McCoy (Hamilton) Ltd. located at Lot 17-18, Concession 2, City of Hamilton. During the site visit, the area was observed to be occupied by forested lands.	MOE database inventory of CofA issued for waste disposal sites, site visit	None	MLV 132 + KP 105	375	South
PCP 20	CofA (No. 3197-7UDHRT) for waste disposal site was issued to 2126085 Ontario Inc., Hamilton, ON. During the site visit, the area was observed to be occupied by residential houses and grassed lands.	MOE database inventory of CofA issued for waste disposal sites, site visit	None	MLV 132 + KP 107	340	North
PCP 23	CofA for WDS was returned for 1059817 Ontario Inc. for a site located at 1425 Lazier Road in Tyendinaga. During the site visit, the area was observed to be forested lands.	MOE database inventory of CofA issued for waste disposal sites, site visit	None	MLV 139 + KP 4	130	North
PCP 24	CofA for waste disposal site was cancelled for Emerson Electric Canada Limited, 375 Centre Street, Greater Napanee.	MOE database inventory of CofA issued for waste disposal sites, Google Earth images	None	MLV 139 + KP 22	1,500	South

Table F-1: Potential Contaminating Properties

Name on Figure	Potentially Contaminating Property (PCP) and Location	Source of Information	Potential Contaminant Risk in Relation to the Project	Approximate Kilometre Post [KP]	Approximate Distance from the Project [m]	Direction from the Project
PCP 25	CofA for waste disposal site was issued to Corporation of the Township of Glackmeyer for a facility located at Lot 28 Concession I in Glackmeyer. During the site visit, the area was occupied by forested and agricultural lands. No evidence of a municipal landfill was observed.	MOE database inventory of CofA issued for waste disposal sites, site visit	None	MLV 139 + KP 27	400	South
PCP 26	CofA for waste disposal site was issued to Lafarge Canada Inc.	MOE database inventory of CofA issued for waste disposal sites, 2012 Google Earth image	None	MLV 139 + KP 30	1,000	South
PCP 27	CofA for waste disposal site was issued to Smith's Septic Tank Service Limited for a facility located at 1402 Switzerville Rd, Loyalist, ON.	MOE database inventory of CofA issued for waste disposal sites, 2011 Google Earth image, site visit	None	MLV 139 + KP 36	400	North
PCP 30	CofA # A442002 for waste disposal site was issued to The Corporation of the Township of Leeds and the Thousand Islands for a facility (closed) located at Lot 11, Concession 3, Township of Leeds and Thousand Islands.	MOE database inventory of CofA issued for waste disposal sites, MOE Waste Disposal Site Inventory, June, 1991, site visit	None	MLV 142 + KP 15	1,000	North
PCP 32	CofA for waste disposal site was issued to Third High Farms Limited located in South Dundas, south of Haddo Road and west of Carman Road. During the site visit it was noted that the facility is a farm (Third High Farms).	MOE database inventory of CofA issued for waste disposal sites, 2013 Google Earth image, site visit	None	MLV 145 + KP 4	1,000	North

Table F-1: Potential Contaminating Properties

Name on Figure	Potentially Contaminating Property (PCP) and Location	Source of Information	Potential Contaminant Risk in Relation to the Project	Approximate Kilometre Post [KP]	Approximate Distance from the Project [m]	Direction from the Project
PCP 33	CofA for waste disposal site was cancelled for D.E.S. Environmental Services Inc. for a facility located at 12 Bath Rd Lot Part of Lot 10, Conc. Plan 50, Part 1,2,3, Reference Plan 8R-130 in South Dundas.	MOE database inventory of CofA issued for waste disposal sites, 1997 to 2013 Google Earth images	None	MLV 145 + KP 6	1,700	South
PCP 34	Closed waste disposal site (X7095). No evidence of landfill observed. Reportedly topsoil was placed in the swampy area and there has never been a landfill.	MOE Waste Disposal Site Inventory, June, 1991, site visit	None	MLV 132 + KP 3	350	North
PCP 35	Closed waste disposal site (A363002). No evidence of landfill or dump was observed in the area during the site visit.	MOE Waste Disposal Site Inventory, June, 1991, site visit	None	MLV 132 + KP 151	900	North
PCP 37	Closed waste disposal site (X1072). No evidence of landfill or dump was observed in the area during the site visit.	MOE Waste Disposal Site Inventory, June, 1991, site visit	None	MLV 139 + KP 9	600	North
PCP 38	Closed waste disposal site (X9106). During the site visit it was noted that the area is occupied by residential houses and forested land.	MOE Waste Disposal Site Inventory, June, 1991, site visit	None	MLV 139 + KP 44	500	South
PCP 40	Closed waste disposal site (X4016) is located at County of Northumberland	MOE Waste Disposal Site Inventory, site visit	None	MLV 132 + KP 107	1,000	South
PCP 42 (CS134 Bowmanville)	Hydraulic oil spilled to the ground in October 2012 at CS134 Bowmanville compressor station located at 5617 Langmaid Road Bowmanville, ON. It was indicated that the spill was cleaned up and that environmental impact due to the spill was confirmed. No information was provided regarding the volume of the hydraulic oil spilled. During the site visit, no evidence of spill, staining or odours was noted at the compressor station yard.	Ecolog ERIS report, site visit	Low	MLV 132 + KP 52	At the compressor station on the pipeline	North

Table F-1: Potential Contaminating Properties

Name on Figure	Potentially Contaminating Property (PCP) and Location	Source of Information	Potential Contaminant Risk in Relation to the Project	Approximate Kilometre Post [KP]	Approximate Distance from the Project [m]	Direction from the Project
PCP 43	8300 Baldwin Street N, Whitby, ON. The property appears to be a lawn sprinklers/irrigation retailer with an equipment storage work yard and scrap and old boats storage. No records were identified in the Ecolog ERIS report for the property and surrounding lands within 250 m other than records of 3 water supply wells located on surrounding lands	Google Erth images, Ecolog ERIS report	Low	MLV133 + KP 12	60	North
PCP 44	3217 Harmony Rd. N, Oshawa (Harmony Road Porsche Parts and Services). A number of old cars parked on the grassed areas are visible on this property on the Google Earth images. No records were identified in the Ecolog ERIS report for the property and surrounding lands within 250 m other than records of 3 water supply wells and a licence for pesticide register for Greenbarn Groundscare Inc. located on surrounding lands.	Google Erth images, Ecolog ERIS report	Low	MLV133, between KP21 and KP22	60	South
PCP 45	1507 Winchester Rd. E, Oshawa. The property appears to be used as a work yard and as storage of scrap material. Old cars and various materials are noted to be stored in the yard of the property on Google Earth images. no records were identified in the Ecolog ERIS report for the property and surrounding lands within 250 m other than records of 2 water supply wells located on surrounding lands.	Google Erth images, Ecolog ERIS report	Low	MLV 133 + KP24	150	East

APPENDIX G

Field Study Areas and Ecological Land Classification

Table G1: Field Study Areas and Ecological Land Classification

Scientific Name	English Common Name	Taxon Group Common	Exotic Status	S Rank	G Rank	SARO Status	Treed Alvar (ALT1)	Cultural Meadow (CUM)	Plantation (CUP)	Cultural Savannah (CUS)	Cultural Thicket (CUT)	Cultural Woodland (CUW)	Coniferous Forest (FOC)	Deciduous Forest (FOD)	Mixed Forest (FOM)	Meadow Marsh (MAM)	Shallow Marsh (MAS)	Deciduous Swamp (SWD)	Mixed Swamp (SWM)	Thicket Swamp (SWT)	Treed Swamp/Meadow Marsh Complex (SWT2-2/MAM2)	Mixed Swamp/Coniferous Forest Complex (SWM/FOC4-1)	Deciduous Forest/Deciduous Swamp Complex (FOD5-6/SWD3-3)	Deciduous Forest/Mixed Forest Complex (FOD5-8/FOM)	Cultural Plantation/Cultural Savannah Complex (CUP3-1 /CUS)	Cultural Savannah/Cultural Wetland/Alvar Complex (CUS/CUW/ALT)
Trees (37 Taxa)																										
Abies balsamea	Balsam Fir	Vascular Plants		S5	G5										X											
Acer negundo	Manitoba Maple	Vascular Plants		S5	G5			X			X		X	X		X		X	X		x			X		
Acer nigrum	Black Maple	Vascular Plants		S4?	G5									X												
Acer rubrum	Red Maple	Vascular Plants		S5	G5			X									X	X	X				X			
Acer saccharinum	Silver Maple	Vascular Plants		S5	G5						X		X	X				X		X						
Acer saccharum	Sugar Maple	Vascular Plants		S5	G5					X			X	X	X						X	X	X	X		
Acer x freemanii	Freeman's Maple	Vascular Plants		SNA	GNA													X					X			
Betula alleghaniensis	Yellow Birch	Vascular Plants		S5	G5								X	X	X			X								
Betula papyrifera	White Birch	Vascular Plants		S5	G5								X	X	X				X					X		
Carpinus caroliniana	Blue-beech	Vascular Plants		S5	G5													X								
Fagus grandifolia	American Beech	Vascular Plants		S4	G5									X	X								X	X		
Fraxinus americana	White Ash	Vascular Plants		S4	G5					X		X	X	X	X									X		
Fraxinus nigra	Black Ash	Vascular Plants		S4	G5															X		X				
Fraxinus pennsylvanica	Green Ash	Vascular Plants		S4	G5		X		X			X	X	X	X		X		X	X	X	X	X	X		X
Juglans cinerea	Butternut	Vascular Plants		S3?	G4	END							X													
Larix decidua	European Larch	Vascular Plants	SE2	SNA	G5																X					
Larix laricina	Tamarack	Vascular Plants		S5	G5														X							
Malus pumila	Common Apple	Vascular Plants	SE4	SNA	G5			X	X						X					X						
Ostrya virginiana	Eastern Hop-hornbeam	Vascular Plants		S5	G5								X	X	X								X	X		
Picea abies	Norway Spruce	Vascular Plants	SE3	SNA	G5									X												
Picea glauca	White Spruce	Vascular Plants		S5	G5										X											X
Picea pungens	Blue Spruce	Vascular Plants	SE1	SNA	G5										X											
Pinus resinosa	Red Pine	Vascular Plants		S5	G5																X				X	
Pinus strobus	Eastern White Pine	Vascular Plants		S5	G5		X		X	X			X	X					X	X	X					
Pinus sylvestris	Scotch Pine	Vascular Plants	SE5	SNA	GNR				X				X						X	X						
Populus balsamifera	Balsam Poplar	Vascular Plants		S5	G5					X								X	X	X						
Populus deltoides ssp. deltoides	Eastern Cottonwood	Vascular Plants		S5	G5T5					X																
Populus grandidentata	Large-tooth Aspen	Vascular Plants		S5	G5								X													

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Scientific Name	English Common Name	Taxon Group Common	Exotic Status	S Rank	G Rank	SARO Status	Treed Alvar (ALT1)	Cultural Meadow (CUM)	Plantation (CUP)	Cultural Savannah (CUS)	Cultural Thicket (CUT)	Cultural Woodland (CUW)	Coniferous Forest (FOC)	Deciduous Forest (FOD)	Mixed Forest (FOM)	Meadow Marsh (MAM)	Shallow Marsh (MAS)	Deciduous Swamp (SWD)	Mixed Swamp (SWM)	Thicket Swamp (SWT)	Treed Swamp/Meadow Marsh Complex (SWT2-2/MAM2)	Mixed Swamp/Coniferous Forest Complex (SWM/FOC4-1)	Deciduous Forest/Deciduous Swamp Complex (FOD5-6/SWD3-3)	Deciduous Forest/Mixed Forest Complex (FOD5-8/FOM)	Cultural Plantation/Cultural Savannah Complex (CUP3-1 /CUS)	Cultural Savannah/Cultural Wetland/Alvar Complex (CUS/CUW/ALT)
Populus tremuloides	Trembling Aspen	Vascular Plants		S5	G5						X		X		X				X							
Pyrus communis	Common Pear	Vascular Plants	SE4	SNA	G5			X				X														
Quercus alba	White Oak	Vascular Plants		S5	G5									X												
Quercus macrocarpa	Bur Oak	Vascular Plants		S5	G5		X							X												X
Quercus rubra	Northern Red Oak	Vascular Plants		S5	G5								X	X	X											
Quercus velutina	Black Oak	Vascular Plants		S4	G5									X											X	
Thuja occidentalis	Eastern White Cedar	Vascular Plants		S5	G5		X		X	X			X	X	X	X	X	X	X	X		X		X		
Tilia americana	American Basswood	Vascular Plants		S5	G5		X						X	X	X			X	X			X	X			
Tsuga canadensis	Eastern Hemlock	Vascular Plants		S5	G5									X	X											
Small Trees, Shrubs and Woody Vines (60 Taxa)																										
Acer spicatum	Mountain Maple	Vascular Plants		S5	G5								X		X									X		
Amelanchier laevis	Smooth Serviceberry	Vascular Plants		S5	G4G5Q										X						X					
Carya cordiformis	Bitternut Hickory	Vascular Plants		S5	G5								X	X										X		
Celastrus scandens	Climbing Bittersweet	Vascular Plants		S5	G5								X	X	X			X								
Clematis virginiana	Virgin's-bower	Vascular Plants		S5	G5																			X		
Cornus alternifolia	Alternate-leaved Dogwood	Vascular Plants		S5	G5								X	X	X			X					X	X	X	
Cornus racemosa	Gray Dogwood	Vascular Plants		S5	G5?		X					X														
Cornus rugosa	Round-leaved Dogwood	Vascular Plants		S5	G5								X													
Cornus stolonifera	Red-osier Dogwood	Vascular Plants		S5	G5		X			X	X						X	X	X	X						
Crataegus sp.	Hawthorn spp.	Vascular Plants		-	-			X											X	X	X	X				
Diervilla lonicera	Northern Bush-honeysuckle	Vascular Plants		S5	G5									X												
Dirca palustris	Eastern Leatherwood	Vascular Plants		S4?	G4										X											
Frangula alnus	Glossy Buckthorn	Vascular Plants	SE5	SNA	GNR						X						X	X		X						
Juniperus communis	Common Juniper	Vascular Plants		S5	G5		X	X		X		X	X	X	X											X
Juniperus	Eastern Red	Vascular Plants		S5	G5		X			X	X	X		X											X	X

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virginiana	Cedar																									
Lonicera canadensis	Canada Fly Honeysuckle	Vascular Plants		S5	G5														X							
Lonicera hirsuta	Hairy Honeysuckle	Vascular Plants		S5	G4G5								X	X										X		
Lonicera tatarica	Tartarian Honeysuckle	Vascular Plants	SE5	SNA	GNR			X		X			X							X	X					
Mitchella repens	Partridge-berry	Vascular Plants		S5	G5																		X			
Parthenocissus inserta	Thicket Creeper	Vascular Plants		S5	G5			X		X	X		X													
Parthenocissus quinquefolia	Virginia Creeper	Vascular Plants		S4?	G5								X	X					X		X		X	X		
Physalis heterophylla	Clammy Ground-cherry	Vascular Plants		S4	G5										X											
Physocarpus opulifolius var. opulifolius	Eastern Ninebark	Vascular Plants		S5	GNR						X									X						
Prunus nigra	Canada Plum	Vascular Plants		S4	G4G5		X																			X
Prunus serotina	Wild Black Cherry	Vascular Plants		S5	G5								X	X	X									X		
Prunus virginiana	Choke Cherry	Vascular Plants		S5	G5								X	X	X				X	X	X	X	X			X
Rhamnus cathartica	Common Buckthorn	Vascular Plants	SE5	SNA	GNR		X	X	X			X	X	X	X			X	X		X	X	X			X
Rhus aromatica	Fragrant Sumac	Vascular Plants		S5	G5		X			X	X			X												X
Rhus radicans	Poison-ivy	Vascular Plants		S5	G5T5			X		X			X	X	X					X		X		X		
Rhus typhina	Staghorn Sumac	Vascular Plants		S5	G5		X	X		X	X										X			X		X
Ribes cynosbati	Prickly Gooseberry	Vascular Plants		S5	G5								X	X					X		X			X		X
Ribes triste	Swamp Red Currant	Vascular Plants		S5	G5														X							
Robinia pseudoacacia	Black Locust	Vascular Plants	SE5	SNA	G5					X																
Rosa acicularis	Prickly Rose	Vascular Plants		S5	G5										X											
Rubus allegheniensis	Common Blackberry	Vascular Plants		S5	G5									X												
Rubus idaeus ssp. idaeus	Common Red Raspberry	Vascular Plants	SE1	SNA	G5T5			X						X					X	X			X			
Rubus idaeus ssp. strigosus	Wild Red Raspberry	Vascular Plants		S5	G5T5					X	X		X													
Rubus occidentalis	Black Raspberry	Vascular Plants		S5	G5								X													
Rubus odoratus	Purple-flowering Raspberry	Vascular Plants		S5	G5								X	X									X			

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Rubus pubescens	Dwarf raspberry	Vascular Plants		S5	G5									X			X	X	X							
Salix alba	White Willow	Vascular Plants	SE4	SNA	G5													X	X							
Salix bebbiana	Bebb's Willow	Vascular Plants		S5	G5														X							
Salix discolor	Pussy Willow	Vascular Plants		S5	G5						X						X		X		X	X				
Salix nigra	Black Willow	Vascular Plants		S4?	G5					X								X			X					
Salix petiolaris	Slender Willow			S5	G5														X							
Salix sp.	Willow sp.	Vascular Plants		-	-					X	X						X			X						
Sambucus nigra	Black Elderberry	Vascular Plants	SEH	SNA	G5T5											X										
Sambucus racemosa	Red Elderberry	Vascular Plants		S5	G5									X	X				X							
Sorbus aucuparia	European Mountain-ash	Vascular Plants	SE4	SNA	G5																		X			
Spiraea alba	White Meadowsweet	Vascular Plants		S5	G5						X						X									
Staphylea trifolia	American Bladdernut	Vascular Plants		S4	G5									X												
Syringa vulgaris	Common Lilac	Vascular Plants	SE5	SNA	GNR		X	X		X																
Toxicodendron radicans	Climbing Poison Ivy	Vascular Plants		S5	G5			X		X	X			X			X									
Ulmus americana	American Elm	Vascular Plants		S5	G5?				X	X	X		X	X	X		X	X	X	X		X	X			
Viburnum acerifolium	Maple-leaf Viburnum	Vascular Plants		S5	G5								X	X	X				X		X		X			
Viburnum lentago	Nannyberry	Vascular Plants		S5	G5									X					X							
Viburnum opulus ssp. trilobum	Highbush Cranberry	Vascular Plants		S5	GNR													X	X							
Viburnum rafinesquianum	Downy Arrowwood	Vascular Plants		S5	G5									X												X
Vitis riparia	Riverbank Grape	Vascular Plants		S5	G5			X	X	X			X	X	X		X		X		X	X		X		
Zanthoxylum americanum	Prickley Ash	Vascular Plants		S5	G5				X		X			X												
Ferns and Allies (22 Taxa)																										
Athyrium filix-femina	Lady fern			S5	G5T5								X	X								X	X			
Athyrium filix-femina var. angustum	Northeastern Lady Fern	Vascular Plants		S5	G5T5									X												
Celtis occidentalis	Common Hackberry	Vascular Plants		S4	G5		X							X												
Dendrolycopodium dendroideum	Ground Pine	Vascular Plants		S5	G5								X													
Dryopteris	Spinulose Wood	Vascular Plants		S5	G5								X	X	X											

Table G1: Field Study Areas and Ecological Land Classification

Scientific Name	English Common Name	Taxon Group Common	Exotic Status	S Rank	G Rank	SARO Status	Treed Alvar (ALT1)	Cultural Meadow (CUM)	Plantation (CUP)	Cultural Savannah (CUS)	Cultural Thicket (CUT)	Cultural Woodland (CUW)	Coniferous Forest (FOC)	Deciduous Forest (FOD)	Mixed Forest (FOM)	Meadow Marsh (MAM)	Shallow Marsh (MAS)	Deciduous Swamp (SWD)	Mixed Swamp (SWM)	Thicket Swamp (SWT)	Treed Swamp/Meadow Marsh Complex (SWT2-2/MAM2)	Mixed Swamp/Coniferous Forest Complex (SWM/FOC4-1)	Deciduous Forest/Deciduous Swamp Complex (FOD5-6/SWD3-3)	Deciduous Forest/Mixed Forest Complex (FOD5-8/FOM)	Cultural Plantation/Cultural Savannah Complex (CUP3-1 /CUS)	Cultural Savannah/Cultural Wetland/Alvar Complex (CUS/CUW/ALT)
carthusiana	Fern																									
Dryopteris intermedia	Evergreen Wood Fern	Vascular Plants		S5	G5										X						X					
Dryopteris marginalis	Marginal Wood Fern	Vascular Plants		S5	G5								X	X										X		
Drypoteris sp.	Woodfern	Vascular Plants		-	-								X											X		
Equisetum arvense	Field Horsetail	Vascular Plants		S5	G5														X		X					
Equisetum fluviatile	Water Horsetail	Vascular Plants		S5	G5						X		X	X			X									
Equisetum hyemale	Common Scouring-rush	Vascular Plants		S5	G5									X												
Equisetum palustre	Marsh Horsetail	Vascular Plants		S5	G5								X		X	X		X		X		X				
Equisetum pratense	Meadow Horsetail	Vascular Plants		S5	G5				X				X	X				X	X				X			
Equisetum scirpoides	Dwarf Scouring-rush	Vascular Plants		S5	G5								X		X				X							
Gymnocarpium dryopteris	Common Oak Fern	Vascular Plants		S5	G5								X		X											
Matteuccia struthiopteris	Ostrich Fern	Vascular Plants		S5	G5								X	X	X	X		X	X	X		X	X	X		
Onoclea sensibilis	Sensitive Fern	Vascular Plants		S5	G5								X	X	X		X	X	X	X		X				
Osmorhiza claytonii	Hairy Sweet Cicely	Vascular Plants		S5	G5								X								X					
Osmunda regalis	Royal Fern	Vascular Plants		S5	G5										X											
Osmundastrum cinnamomeum	Cinnamon Fern	Vascular Plants		S5	G5										X											
Polystichum acrostichoides	Christmas Fern	Vascular Plants		S5	G5								X	X										X		
Pteridium aquilinum	Bracken Fern	Vascular Plants		S5	G5								X	X												
Graminoids (38 Taxa)																										
Agrostis gigantea	Redtop	Vascular Plants	SE5	SNA	G4G5			X												X						
Agrostis hyemalis	Winter Bentgrass	Vascular Plants		S1	G5														X							
Bromus hordeaceus	Soft Brome	Vascular Plants	SE2?	SNA	GNR		X																			
Bromus inermis	Smooth Brome	Vascular Plants	SE5	SNA	G5TNR			X		X	X	X			X					X	X					
Carex aurea	Golden-fruited Sedge	Vascular Plants		S5	G5		X					X								X						
Carex bebbii	Bebb's Sedge	Vascular Plants		S5	G5		X					X		X					X	X						

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Carex gracillima	Graceful Sedge	Vascular Plants		S5	G5									X	X				X		X				
Carex intumescens	Bladder Sedge	Vascular Plants		S5	G5														X						
Carex lupulina	Hop Sedge	Vascular Plants		S5	G5													X				X			
Carex pedunculata	Long-stalked Sedge	Vascular Plants		S5	G5									X											
Carex plantaginea	Plantain-leaved Sedge	Vascular Plants		S5	G5									X										X	
Carex prasina	Drooping Sedge	Vascular Plants		S4	G4									X											
Carex pseudocyperus	Cyperus-like Sedge	Vascular Plants		S5	G5													X		X					
Carex sp.	Sedge sp.	Vascular Plants		-	-		X				X	X	X	X	X		X		X	X		X	X		
Carex stipata	Awl-fruited Sedge	Vascular Plants		S5	G5												X	X							
Carex stricta	Tussock Sedge	Vascular Plants		S5	G5												X								
Carex vulpinoidea	Fox Sedge	Vascular Plants		S5	G5		X					X							X						
Dactylis glomerata	Orchard Grass	Vascular Plants	SE5	SNA	GNR			X																	
Danthonia spicata	Poverty Oatgrass	Vascular Plants		S5	G5					X	X														
Dichanthelium sp.	Panic grass	Vascular Plants		-	-			X		X															
Eleocharis sp.	Clubrush sp.	Vascular Plants		-	-		X				X	X					X		X						
Festuca rubra ssp. rubra	Red Fescue	Vascular Plants	SE5	SNA	G5T5					X															
Festuca sp.	Fescue sp.	Vascular Plants		-	-			X												X					
Glyceria striata	Fowl Mannagrass	Vascular Plants		S5	G5								X	X		X		X	X			X			
Hordeum jubatum ssp. jubatum	Foxtail Barley	Vascular Plants		S5	G5T5		X																		
Juncus effusus	Soft Rush	Vascular Plants		S5	G5						X						X								
Juncus sp.	Rush sp.	Vascular Plants		-	-		X	X			X	X					X		X	X			X		X
Leersia oryzoides	Rice Cutgrass	Vascular Plants		S5	G5													X							
Panicum virgatum	Old Switch Panicgrass	Vascular Plants		S4	G5					X															
Phalaris arundinacea	Reed Canary Grass	Vascular Plants		S5	G5			X			X		X			X	X	X	X	X	X	X			
Phleum pratense	Common Timothy	Vascular Plants	SE5	SNA	GNR		X	X		X	X	X					X			X					
Phragmites australis ssp. americanus	American Reed	Vascular Plants		S4?	G5T4			X																	
Poa sp.	Grass sp.	Vascular Plants		-	-			X		X					X		X							X	

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Scirpus atrocinctus	Wool-grass	Vascular Plants		S5	G5		X					X							X							
Scirpus atrovirens	Dark-green Bulrush	Vascular Plants		S5	G5?		X					X					X									
Scirpus cyperinus	Cottongrass Bulrush	Vascular Plants		S5	G5						X						X									
Sporobolus heterolepis	Prairie Dropseed	Vascular Plants		S3	G5		X																			
Undidentified Grass	Grass sp.	Vascular Plants		-	-									X						X						
Forbs (226 Taxa)																										
Achillea millefolium	Common Yarrow	Vascular Plants	SE	SNA	G5		X	X												X	X					X
Actaea pachypoda	White Baneberry	Vascular Plants		S5	G5								X	X	X								X			
Actaea racemosa	Black Cohosh	Vascular Plants		S2	G4									X												
Actaea rubra	Red Baneberry	Vascular Plants		S5	G5								X	X										X		
Actaea x ludovici	(Actaea pachypoda X Actaea rubra)	Vascular Plants		SNA	GNA																		X			
Aegopodium podagraria	Goutweed	Vascular Plants	SE5	SNA	GNR								X													
Agrimonia gryposepala	Agrimony	Vascular Plants		S5	G5			X												X	X					
Alisma subcordatum	Southern Water-plantain	Vascular Plants		S4?	G4G5																X					
Allium canadense	Canada Garlic	Vascular Plants		S5	G5									X												
Ambrosia artemisiifolia	Annual Ragweed	Vascular Plants		S5	G5		X																			
Ambrosia trifida	Giant Ragweed	Vascular Plants		S5	G5																X					
Amphicarpaea bracteata	American Hog-peanut	Vascular Plants		S5	G5								X	X	X	X			X			X				
Anemone acutiloba	Sharp-lobed Hepatica	Vascular Plants		S5	G5									X												
Anemone canadensis	Canada Anemone	Vascular Plants		S5	G5					X				X	X					X						
Anemone cylindrica	Long-fruited Anemone	Vascular Plants		S4	G5														X							X
Anemone sp.	Anemone sp.	Vascular Plants		-	-										X											
Antennaria neglecta	Field Pussytoes	Vascular Plants		S5	G5																					X
Antennaria parvifolia	Small-leaved Pussytoes	Vascular Plants		S1	G5																					X
Antennaria sp.	Pussytoes	Vascular Plants		-	-							X														

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Apocynum androsaemifolium	Spreading Dogbane	Vascular Plants		S5	G5							X														
Apocynum cannabinum	Hemp Dogbane	Vascular Plants		S5	G5		X																			
Aquilegia canadensis	Wild Columbine	Vascular Plants		S5	G5								X	X				X						X		
Aralia nudicaulis	Wild Sarsaparilla	Vascular Plants		S5	G5					X			X	X	X				X					X		
Aralia racemosa	American Spikenard	Vascular Plants		S5	G4G5								X													
Arctium minus	Common Burdock	Vascular Plants	SE5	SNA	GNR								X	X		X				X						
Arisaema triphyllum	Jack-in-the-pulpit	Vascular Plants		S5	G5								X	X	X							X	X			
Artemisia absinthium	Common Wormwood	Vascular Plants	SE3?	SNA	GNR					X																
Aruncus dioicus	Common Goatsbeard	Vascular Plants	SE1	SNA	G5			X																		
Asarum canadense	Canada Wild-ginger	Vascular Plants		S5	G5								X										X			
Asclepias incarnata	Swamp Milkweed	Vascular Plants		S5	G5		X									X	X	X				X				
Asclepias syriaca	Common Milkweed	Vascular Plants		S5	G5		X	X	X			X			X	X			X	X	X					
Asparagus officinalis	Garden Asparagus	Vascular Plants	SE5	SNA	G5?															X						
Bidens frondosa	Devil's Beggarticks	Vascular Plants		S5	G5												X			X						
Bidens sp.	Beggar's ticks sp.	Vascular Plants		-	-																X					
Brasenia schreberi	Watershield	Vascular Plants		S5	G5						X						X									
Caltha palustris	Marsh Marigold	Vascular Plants		S5	G5													X								
Campanula rotundifolia	Harebell	Vascular Plants		S5	G5				X																	
Cardamine concatenata	Cut-leaved Toothwort	Vascular Plants		S5	G5									X												
Caulophyllum thalictroides	Blue Cohosh	Vascular Plants		S5	G4G5								X	X	X							X	X	X		
Centaurea stoebe	Spotted Knapweed	Vascular Plants	SE5	SNA	GNR			X		X																
Chelone glabra	White Turtlehead	Vascular Plants		S5	G5								X													
Chenopodium album	Lamb's quarters	Vascular Plants	SE5	SNA	G5											X										
Cichorium intybus	Chicory	Vascular Plants	SE5	SNA	GNR			X													X					
Cicuta bulbifera	Bulb-bearing	Vascular Plants		S5	G5												X									

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	Water-hemlock																									
Cicuta maculata var. maculata	Spotted Water-hemlock	Vascular Plants		S5	G5T5		X				X					X										
Circaea canadensis	Broad-leaved Enchanter's Nightshade	Vascular Plants		S5	G5T5									X				X								
Circaea lutetiana	Enchanter's nightshade	Vascular Plants		S5	G5								x	X	X			X	X		X	X	X	X		
Cirsium arvense	Canada Thistle	Vascular Plants	SE5	SNA	GNR			X								X				X						
Cirsium muticum	Swamp Thistle	Vascular Plants		S5	G5								X													
Cirsium vulgare	Bull Thistle	Vascular Plants	SE5	SNA	GNR								X													
Clinopodium vulgare	Wild Basil	Vascular Plants		S5	G5			X		X																X
Clintonia borealis	Blue Bead-lily	Vascular Plants		S5	G5									X												
Coptis trifolia	Goldthread	Vascular Plants		S5	G5									X												
Cuscuta sp.	Field dodder sp.	Vascular Plants		-	-											X										
Cynanchum rossicum	Dog-strangling vine	Vascular Plants	SE5	SNA	GNR			X	X	X			X		X				X		X		X	X		
Cynanchum vincetoxicum	White Swallow-wort	Vascular Plants	SE1	SNA	G5		X																			X
Cypripedium reginae	Showy Lady's-slipper	Vascular Plants		S4	G4														X							
Cystopteris bulbifera	Bulblet Fern	Vascular Plants		S5	G5								X	X	X									X		
Dasiphora fruticosa	Shrubby Cinquefoil	Vascular Plants		S5	G5		X																			X
Daucus carota	Wild Carrot	Vascular Plants	SE5	SNA	GNR		X	X		X									X	X	X					
Desmodium canadense	Showy Tick-trefoil	Vascular Plants		S4	G5					X																
Desmodium sp.	Pink flowered tick trefoil	Vascular Plants		-	-								X	X										X		
Echinocystis lobata	Wild Cucumber	Vascular Plants		S5	G5													X								
Echium vulgare	Common Viper's-bugloss	Vascular Plants	SE5	SNA	GNR		X	X		X							X									
Epilobium hirsutum	Hairy Willowherb	Vascular Plants	SE5	SNA	GNR																X					
Epilobium leptophyllum	Linear-leaved Willowherb	Vascular Plants		S5	G5		X																			
Epilobium sp.	Willow-herb sp.	Vascular Plants		-	-		X																			
Epipactis helleborine	Eastern Helleborine	Vascular Plants	SE5	SNA	GNR								X	X	X			X	X		X		X	X		

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Erigeron annuus	Annual Fleabane	Vascular Plants		S5	G5		X																			
Erigeron hyssopifolius	Daisy Fleabane	Vascular Plants		S5	G5			X		X			X													
Erigeron philadelphicus	Philadelphia Fleabane	Vascular Plants		S5	G5		X			X							X		X							
Erigeron strigosus	Rough Fleabane	Vascular Plants		S5	G5																					X
Eupatorium perfoliatum	Common Boneset	Vascular Plants		S5	G5								X						X							
Eurybia macrophylla	Large-leaved Aster	Vascular Plants		S5	G5								X													
Euthamia graminifolia	Grass-leaved Goldenrod	Vascular Plants		S5	G5															X						
Eutrochium maculatum var. maculatum	Spotted Joe Pye Weed	Vascular Plants		S5	G5T5											X	X	X	X	X	X					
Fallopia convolvulus	Black Bindweed	Vascular Plants	SE5	SNA	GNR						X															
Fragaria vesca	Woodland Strawberry	Vascular Plants		S5	G5								X	X	X				X			X	X			
Fragaria virginiana	Wild Strawberry	Vascular Plants		S5	G5		X	X		X	X							X			X					
Galium asprellum	Rough Bedstraw	Vascular Plants		S5	G5																			X		
Galium circaezans	Wild Licorice	Vascular Plants		S5	G5									X												
Galium palustre	Marsh Bedstraw	Vascular Plants		S5	G5						X						X				X					
Galium sp.	Bedstraw sp.	Vascular Plants		-	-									X					X							
Galium triflorum	Fragrant Bedstraw	Vascular Plants		S5	G5								X						X		X				X	
Geranium robertianum	Herb Robert	Vascular Plants		S5	G5			X						X	X							X	X	X		
Geum aleppicum	Yellow Avens	Vascular Plants		S5	G5											X			X					X		
Geum canadense	White Avens	Vascular Plants		S5	G5								X	X				X			X		X			
Geum macrophyllum	Large-leaved Avens	Vascular Plants		S5	G5																X					
Gratiola neglecta	Clammy Hedge-hyssop	Vascular Plants		S4	G5			X																		
Heracleum maximum	Cow parsnip	Vascular Plants		S5	G5												X	X								
Hesperis matronalis	Dame's Rocket	Vascular Plants	SE5	SNA	G4G5																X					
Heuchera richardsonii	Richardson's Alumroot	Vascular Plants		S4	G5																					
Houstonia longifolia	Longl-eaved Bluets	Vascular Plants		S4?	G4G5		X																			X

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Hydrophyllum virginianum	Virginia Waterleaf	Vascular Plants		S5	G5									X							X		X			
Hypericum canadense	Canadian St. John's-wort	Vascular Plants		S4?	G5													X								
Hypericum perforatum	Common St. John's-wort	Vascular Plants	SE5	SNA	GNR		X	X																		
Hypericum punctatum	Common St. John's-wort	Vascular Plants		S5	G5		X	X													X					
Hypopitys monotropa	American Pinesap	Vascular Plants		S4	G5				X				X													
Impatiens capensis	Spotted Jewelweed	Vascular Plants		S5	G5						X		X	X	X	X	X	X	X	X	X	X				
Impatiens pallida	Pale Jewelweed	Vascular Plants		S5	G5																		X			
Inula helenium	Elecampane	Vascular Plants	SE5	SNA	GNR		X				X						X			X	X					
Iris pseudacorus	Yellow Iris	Vascular Plants	SE3	SNA	GNR						X															
Lactuca biennis	Tall Blue Lettuce	Vascular Plants		S5	G5														X					X		
Lactuca canadensis	Canada Lettuce	Vascular Plants		S5	G5													X								
Lactuca sp.	White lettuce sp.	Vascular Plants		-	-								X	X									X	X		
Laportea canadensis	Wood Nettle	Vascular Plants		S5	G5								X		X	X						X	X			
Lemna minor	Lesser Duckweed	Vascular Plants		S5	G5								X													
Lemna trisulca	Star Duckweed	Vascular Plants		S5	G5								X													
Leonurus cardiaca	Common Motherwort	Vascular Plants	SE5	SNA	GNR								X													
Leucanthemum vulgare	Oxeye Daisy	Vascular Plants	SE5	SNA	GNR		X	X				X	X								X					
Linaria vulgaris	Butter-and-eggs	Vascular Plants	SE5	SNA	GNR			X												X						
Lobelia inflata	Indian-tobacco	Vascular Plants		S5	G5																			X		
Lotus corniculatus	Garden Bird's-foot Trefoil	Vascular Plants	SE5	SNA	GNR		X	X		X		X								X						
Lycopus americanus	American Water-horehound	Vascular Plants		S5	G5													X								
Lycopus sp.	Bugleweed	Vascular Plants		-	-		X												X							
Lycopus uniflorus	Northern Water-horehound	Vascular Plants		S5	G5						X						X	X	X							
Lysimachia ciliata	Fringed Loosestrife	Vascular Plants		S5	G5								X	X		X			X	X	X					
Lysimachia sp.	Loosestrife sp.	Vascular Plants		-	-								X													
Lysimachia thyrsiflora	Water Loosestrife	Vascular Plants		S5	G5												X									

Table G1: Field Study Areas and Ecological Land Classification

Scientific Name	English Common Name	Taxon Group Common	Exotic Status	S Rank	G Rank	SARO Status	Treed Alvar (ALT1)	Cultural Meadow (CUM)	Plantation (CUP)	Cultural Savannah (CUS)	Cultural Thicket (CUT)	Cultural Woodland (CUW)	Coniferous Forest (FOC)	Deciduous Forest (FOD)	Mixed Forest (FOM)	Meadow Marsh (MAM)	Shallow Marsh (MAS)	Deciduous Swamp (SWD)	Mixed Swamp (SWM)	Thicket Swamp (SWT)	Treed Swamp/Meadow Marsh Complex (SWT2-2/MAM2)	Mixed Swamp/Coniferous Forest Complex (SWM/FOC4-1)	Deciduous Forest/Deciduous Swamp Complex (FOD5-6/SWD3-3)	Deciduous Forest/Mixed Forest Complex (FOD5-8/FOM)	Cultural Plantation/Cultural Savannah Complex (CUP3-1 /CUS)	Cultural Savannah/Cultural Wetland/Alvar Complex (CUS/CUW/ALT)
Lythrum salicaria	Purple Loosestrife	Vascular Plants	SE5	SNA	G5			X			X	X					X	X	X		X					
Maianthemum canadense	Canada Mayflower	Vascular Plants		S5	G5								X	X	X			X	X				X	X		
Maianthemum racemosum	False Solomon's-seal	Vascular Plants		S5	G5								X	X	X								X	X		
Maianthemum stellatum	Star-flowered False Solomon's-seal	Vascular Plants		S5	G5								X	X							X		X			
Malva neglecta	Dwarf Cheeseweed	Vascular Plants	SE5	SNA	GNR															X						
Medicago lupulina	Black Medic	Vascular Plants	SE5	SNA	GNR			X																		X
Medicago sativa	Alfalfa	Vascular Plants	SE5	SNA	GNR		X	X		X							X									
Melilotus alba	White sweet clover	Vascular Plants	I	SNA	G5			X		X																
Melilotus officinalis	Yellow Sweet-clover	Vascular Plants	SE5	SNA	GNR					X		X														X
Menispermum canadense	Canada Moonseed	Vascular Plants		S4	G5									X												
Mentha arvensis	Field Mint	Vascular Plants		S5	G5											X	X		X	X						
Micranthes virginiensis	Virginia Saxifrage	Vascular Plants		S5	G5		X																			X
Mimulus ringens	Square-stemmed Monkeyflower	Vascular Plants		S5	G5											X										
Minuartia michauxii	Michaux's Stitchwort	Vascular Plants		S5	G5		X																			X
Monarda fistulosa var. fistulosa	Wild Bergamot	Vascular Plants		S5	G5T5?					X																X
Monotropa uniflora	Indian-pipe	Vascular Plants		S5	G5								X													
Myosotis scorpioides	True Forget-me-not	Vascular Plants	SE5	SNA	G5								X													
Najas flexilis	Slender Naiad	Vascular Plants		S5	G5						X						X									
Nasturtium officinale	Watercress	Vascular Plants	SE	SNA	GNR								X						X							
Nepeta cataria	Catnip	Vascular Plants	SE5	SNA	GNR								X													
Nuphar variegata	Variegated Pond-lily	Vascular Plants		S5	G5T5						X						X									
Nymphaea odorata ssp. odorata	Fragrant Water-lily	Vascular Plants		S5?	G5T5						X															
Oenothera biennis	Common Evening	Vascular Plants		S5	G5			X																		

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Scientific Name	English Common Name	Taxon Group Common	Exotic Status	S Rank	G Rank	SARO Status	Treed Alvar (ALT1)	Cultural Meadow (CUM)	Plantation (CUP)	Cultural Savannah (CUS)	Cultural Thicket (CUT)	Cultural Woodland (CUW)	Coniferous Forest (FOC)	Deciduous Forest (FOD)	Mixed Forest (FOM)	Meadow Marsh (MAM)	Shallow Marsh (MAS)	Deciduous Swamp (SWD)	Mixed Swamp (SWM)	Thicket Swamp (SWT)	Treed Swamp/Meadow Marsh Complex (SWT2-2/MAM2)	Mixed Swamp/Coniferous Forest Complex (SWM/FOC4-1)	Deciduous Forest/Deciduous Swamp Complex (FOD5-6/SWD3-3)	Deciduous Forest/Mixed Forest Complex (FOD5-8/FOM)	Cultural Plantation/Cultural Savannah Complex (CUP3-1 /CUS)	Cultural Savannah/Cultural Wetland/Alvar Complex (CUS/CUW/ALT)
	Primrose																									
Orchidaceae sp.	Orchid sp.	Vascular Plants		-	-														X							
Oxalis montana	Common Wood-sorrell	Vascular Plants		S5	G5			X					X													
Packera paupercula var. paupercula	Balsam Groundsel	Vascular Plants		S5	G5T5		X																			X
Pastinaca sativa	Wild Parsnip	Vascular Plants	SE5	SNA	GNR			X		X						X					X					
Penstemon hirsutus	Hairy Beardtongue	Vascular Plants		S4	G4		X																			
Phryma leptostachya	Lopseed	Vascular Plants		S4S5	G5								X													
Pilosella aurantiaca	Orange Hawkweed	Vascular Plants	SE5	SNA	GNR			X			X															X
Pilosella caespitosa	Meadow Hawkweed	Vascular Plants	SE5	SNA	GNR																					X
Plantago lanceolata	English Plantain	Vascular Plants	SE5	SNA	G5					X																
Plantago major	Common Plantain	Vascular Plants		S5	G5								X						X		X					
Podophyllum peltatum	May-apple	Vascular Plants		S5	G5								X	X	X							X				
Polygala senega	Seneca Snakeroot	Vascular Plants		S4	G4G5					X																
Polygonatum biflorum var. commutatum	Giant Solomon's Seal	Vascular Plants		S4	G5T5								X	X										X		
Polygonatum pubescens	Hairy Solomon's Seal	Vascular Plants		S5	G5								X													
Pontederia cordata	Pickerel Weed	Vascular Plants		S5	G5						X						X									
Potamogeton sp.	Pond weed sp.	Vascular Plants		-	-															X						
Potentilla argentea	Silvery Cinquefoil	Vascular Plants	SE5	SNA	GNR						X															
Potentilla norvegica	Rough Cinquefoil	Vascular Plants		S5	G5		X	X													X					
Potentilla recta	Rough-fruited Cinquefoil	Vascular Plants	SE5	SNA	GNR		X					X			X											
Potomogeton spp.		Vascular Plants		-	-						X						X									
Prunella vulgaris ssp. lanceolata	Heal-all	Vascular Plants		S5	G5T5		X		X	X		X							X	X	X					
Prunella vulgaris ssp. vulgaris	Self-heal	Vascular Plants	SE3	SNA	G5TU					X			X													
Pyrola elliptica	Shinleaf	Vascular Plants		S5	G5														X							

Table G1: Field Study Areas and Ecological Land Classification

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Ranunculus abortivus	Kidney-leaved Buttercup	Vascular Plants		S5	G5									X					X				X			
Ranunculus acris	Common Buttercup	Vascular Plants	SE5	SNA	G5							X							X		X					
Ranunculus fascicularis	Early Buttercup	Vascular Plants		S4	G5		X																			
Ranunculus hispidus var. hispidus	Bristly Buttercup	Vascular Plants		S3	G5T5													X								
Ranunculus repens	Creeping Buttercup	Vascular Plants	SE5	SNA	GNR								X							X	X					
Ranunculus sp.	Buttercup sp.	Vascular Plants		-	-																			X		
Rubia sp.	Madder sp.	Vascular Plants		-	-									X												
Rudbeckia hirta var. hirta	Black-eyed Susan	Vascular Plants		SU	G5T4T5			X		X	X															
Rumex acetosella	Sheep Sorrel	Vascular Plants	SE5	SNA	GNR										X					X						
Rumex crispus	Curly Dock	Vascular Plants	SE5	SNA	GNR			X		X							X									
Rumex occidentalis	Western Dock	Vascular Plants		S5	G5						X						X									
Rumex orbiculatus	Water Dock	Vascular Plants		S4S5	G5								X													
Sanguinaria canadensis	Bloodroot	Vascular Plants		S5	G5									X										X		
Sanicula marilandica	Black snakeroot	Vascular Plants		S5	G5								X													
Saponaria officinalis	Bouncing-bet	Vascular Plants	SE5	SNA	GNR					X														X		
Scutellaria parvula var. parvula	Small Skullcap	Vascular Plants		S4	G4T4		X																			X
Setaria pumila	Yellow Foxtail	Vascular Plants	SE5	SNA	GNR			X																		
Shepherdia canadensis	Canada Buffalo-berry	Vascular Plants		S5	G5										X											
Sicyos angulatus	One-seed Bur-cucumber	Vascular Plants		S5	G5								X		X					X						
Silene latifolia	Evening lychnis	Vascular Plants		-	-											X										
Silene vulgaris	Bladder Campion	Vascular Plants	SE5	SNA	GNR					X																
Sisyrinchium angustifolium	Narrow-leaved Blue-eyed-grass	Vascular Plants		S4	G5		X																			
Sisyrinchium montanum var. montanum	Strict Blue-eyed-grass	Vascular Plants		S5	G5T4T5							X														
Sium suave	Hemlock Water-parsnip	Vascular Plants		S5	G5															X						

Table G1: Field Study Areas and Ecological Land Classification

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Smilax herbacea	Herbaceous Carrionflower	Vascular Plants		S4	G5									X												
Solanum dulcamara	Climbing Nightshade	Vascular Plants	SE5	SNA	GNR			X		X	X		X				X									
Solidago canadensis var. canadensis	Canada Goldenrod	Vascular Plants		S5	G5T5			X		X						X			X	X	X					
Solidago flexicaulis	Zigzag Goldenrod	Vascular Plants		S5	G5								X	X	X								X			
Solidago juncea	Early Goldenrod	Vascular Plants		S5	G5			X		X																
Solidago sp.	Goldenrod	Vascular Plants		-	-		X	X		X		X	X	X		X				X	X					
Streptopus lanceolatus var. lanceolatus	Eastern Rose Twisted-stalk	Vascular Plants		S5?	G5T5								X	X									X			
Symphyotrichum cordifolium	Heart-leaved Aster	Vascular Plants		S5	G5								X													
Symphyotrichum ericoides var. ericoides	White Heath Aster	Vascular Plants		S5	G5T5			X		X																
Symphyotrichum sp.	Aster sp.	Vascular Plants		-	-			X		X		X	X						X	X	X					
Symphyotrichum urophyllum	Arrow-leaved Aster	Vascular Plants		S4	G4G5																					X
Symphytum officinale	Common Comfrey	Vascular Plants	SE5	SNA	GNR													X								
Taraxacum officinale	Common Dandelion	Vascular Plants	SE5	SNA	G5			X		X			X				X			X	X					
Thalictrum dioicum	Early Meadow-rue	Vascular Plants		S5	G5												X						X	X		
Thalictrum pubescens	Tall Meadow-rue	Vascular Plants		S5	G5								X	X	X	X										
Thlaspi arvense	Field Penny-cress	Vascular Plants	SE5	SNA	GNR											X										
Tiarella cordifolia	Heart-leaved Foam-flower	Vascular Plants		S5	G5									X												
Tragopogon dubius	Yellow Goat's-beard	Vascular Plants	SE5	SNA	GNR		X																			X
Trichostema brachiatum	False Pennyroyal	Vascular Plants		S4	G5		X																			X
Trientalis borealis	Starflower	Vascular Plants		S5	G5								X	X											X	
Trifolium hybridum	Alsike Clover	Vascular Plants	SE5	SNA	GNR			X		X																
Trifolium medium	Zigzag Clover	Vascular Plants	SEH	SNA	GNR									X												
Trifolium pratense	Red Clover	Vascular Plants	SE5	SNA	GNR		X	X				X														
Trillium erectum	Red Trillium	Vascular Plants		S5	G5								X	X	X									X		

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Trillium grandiflorum	White Trillium	Vascular Plants		S5	G5								X	X	X								X			
Triosteum aurantiacum	Orange-fruited Horse-gentian	Vascular Plants		S5	G5									X												
Tussilago farfara	Colt's-foot	Vascular Plants	SE5	SNA	GNR								X													
Typha angustifolia	Narrow-leaved Cattail	Vascular Plants	SE5	SNA	G5													X			X					
Typha latifolia	Broad-leaved Cattail	Vascular Plants		S5	G5												X		X	X	X					
Urtica dioica ssp. dioica	European Stinging Nettle	Vascular Plants	SE2	SNA	G5T5?			X					X	X		X			X							
Urtica dioica ssp. gracilis	Slender Stinging Nettle	Vascular Plants		S5	G5T5												X									
Verbascum thapsus	Common Mullein	Vascular Plants	SE5	SNA	GNR					X																
Verbena hastata	Blue Vervain	Vascular Plants		S5	G5			X									X			X	X					
Verbena simplex	Narrow-leaved Vervain	Vascular Plants		S4	G5					X																X
Verbena urticifolia	White Vervain	Vascular Plants		S5	G5								X					X								
Vicia cracca	Cow Vetch	Vascular Plants	SE5	SNA	GNR		X	X		X						X			X	X						
Viola pubescens var. pubescens	Downy Yellow Violet	Vascular Plants		S5	G5T5																X					
Viola sp.	Violet sp.	Vascular Plants		-	-			X					X					X						X	X		
Liverworts (1 Taxon)																										
Marchantia sp.	Liverwort sp.	Liverwort		-	-								X													
Lichen (1 Taxon)																										
Cladonia rangiferina	Reindeer Lichen	Lichen		-	-										X											
Fungi (3 Taxa)																										
Fomes fomentarius	tinder polypore	Fungus		-	-										X											
Polyporus squamosus	Dryad's Saddle	Fungus		-	-									X					X							
Piptoporus betulinus	birch polypore	Fungus		-	-										X											

APPENDIX H

Hydrological Characteristics of Water Crossings of Water Crossings, Estimated Flood Discharges at Water Crossings, and Estimated Mean Monthly Flows at Water Crossings

November 2015
Report No. 1311260045/501/1

Golder Associates

Table H-1: Hydrological Characteristics of Water Crossings Within the Permanent Right-of-Way for the Project

Water Crossing Identification (ID)[a]	Watercourse Name[b]	Conservation Authority[c]	Conservation Authority Watershed/ Sub-watershed[d]	Drainage Area [ha]	Surveyed Parameters (June 4 to November 24, 2014 and ongoing since July 14, 2015)				Coordinates (Datum: WGS84)	
					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
Pipeline Segment MLV 132 – 133										
E10.00-WC-MLV 132+1.098	Tributary to Bruce Creek	TRCA	Rouge River / Main Rouge River	224	1.15	0.13	1.48	0.30	43.925880	-79.340825
E20.00-WC-MLV 132+1.709	Bruce Creek	TRCA	Rouge River / Main Rouge River	2,202	2.68	0.51	4.28	0.98	43.927545	-79.333596
E30.00-WC-MLV 132+2.476	Unnamed	TRCA	Rouge River / Little Rouge River	Pond	32.25	> 1.50	33.50	0.50	43.930152	-79.325232
E40.00-WC-MLV 132+2.557	Tributary to Little Rouge Creek	TRCA	Rouge River / Little Rouge River	254	0.63	0.15	3.50	0.60	43.930336	-79.324437
E50.00-WC-MLV 132+2.759	Unnamed	TRCA	Rouge River / Little Rouge River	80.0	1.00	0.10	1.50	0.35	43.930848	-79.322066
E60.00-WC-MLV 132+3.954	Unnamed	TRCA	Rouge River / Little Rouge River	91.2	Dry	Dry	Undefined / Poorly Defined Channel	Undefined / Poorly Defined Channel	43.930639	-79.309104
E70.00-WC-MLV 132+4.937	Tributary to Little Rouge Creek	TRCA	Rouge River / Little Rouge River	609	1.93	0.14	3.05	0.32	43.932845	-79.297303
E80.00-WC-MLV 132+5.828	Little Rouge Creek	TRCA	Rouge River / Little Rouge River	5,849	10.00	0.28	12.00	0.43	43.929428	-79.288792
E90.00-WC-MLV 132+7.009	Tributary to Little Rouge Creek	TRCA	Rouge River / Little Rouge River	212	0.72	0.16	1.03	0.34	43.933723	-79.277013
E100.00-WC-MLV 132+9.232	Unnamed	TRCA	Rouge River / Little Rouge River	144	2.10	0.19	3.35	1.40	43.938635	-79.251860
E105.00-WC-MLV 132+10.777	Katabokokonk Creek	TRCA	Rouge River / Little Rouge River	139	No field visit. Watercourse crossing not confirmed.				43.942422	-79.233594
E110.00-WC-MLV 132+12.359	Stouffville Creek	TRCA	Duffins Creek / West Duffins Creek	1,355	2.25	0.11	5.25	1.40	43.947660	-79.216181
E120.00-WC-MLV 132+12.799	Unnamed	TRCA	Duffins Creek / West Duffins Creek	1.3	1.00	0.09	2.48	0.21	43.948812	-79.210896
E130.00-WC-MLV 132+12.849	Reesor Creek	TRCA	Duffins Creek / West Duffins Creek	1,743	Dry	Dry	Undefined Channel	Undefined Channel	43.948945	-79.210309
E140.00-WC-MLV 132+12.977	Tributary to Reesor Creek	TRCA	Duffins Creek / West Duffins Creek	4.0	Dry	Dry	Undefined Channel	Undefined Channel	43.949280	-79.208774
E150.00-WC-MLV 132+14.019	Unnamed	TRCA	Duffins Creek / West Duffins Creek	59.2	Dry	Dry	1.00	0.15	43.952010	-79.196326
E160.00-WC-MLV 132+14.898	West Duffins Creek	TRCA	Duffins Creek / West Duffins Creek	3,205	4.20	0.22	7.30	0.66	43.954753	-79.186134
E170.00-WC-MLV 132+15.36	Wixon Creek	TRCA	Duffins Creek / West Duffins Creek	1,127	3.00	0.37	4.00	0.85	43.956312	-79.180804
E180.00-WC-MLV 132+15.791	Unnamed	TRCA	Duffins Creek / West Duffins Creek	58.9	Dry	Dry	1.70	0.12	43.957431	-79.175600
E190.00-WC-MLV 132+16.381	Unnamed	TRCA	Duffins Creek / West Duffins Creek	34.1	Dry	Dry	2.20	0.10	43.958652	-79.168532
E200.00-WC-MLV 132+16.648	Unnamed	TRCA	Duffins Creek / West Duffins Creek	115	Marsh – wet ground, some pooling of water	Marsh – wet ground, some pooling of water	Undefined Channel	Undefined Channel	43.959160	-79.165273
E210.00-WC-MLV 132+18.073	Tributary to Michell Creek	TRCA	Duffins Creek / East Duffins Creek	13.7	Dry	Dry	Undefined channel – wide, flat marsh	Undefined channel – wide, flat marsh	43.962287	-79.148309
E220.00-WC-MLV 132+18.301	Michell Creek	TRCA	Duffins Creek / East Duffins Creek	352	0.93	0.48	1.80	0.60	43.962975	-79.145586
E230.00-WC-MLV 132+18.601	Tributary to Michell Creek	TRCA	Duffins Creek / East Duffins Creek	300	1.24	0.44	1.45	0.60	43.963841	-79.142055
E240.00-WC-MLV 132+18.896	Unnamed	TRCA	Duffins Creek / East Duffins Creek	719	No field visit. Watercourse crossing not confirmed.				43.964700	-79.138579
E250.00-WC-MLV 132+19.211	Unnamed	TRCA	Duffins Creek / East Duffins Creek	77.7	Dry	Dry	Undefined channel – flat cattail marsh	Undefined channel – wide, flat marsh	43.965779	-79.135002
E260.00-WC-MLV 132+19.453	Unnamed	TRCA	Duffins Creek / East Duffins Creek	6.4	Dry	Dry	No defined channel – flat cattail marsh	Undefined channel – flat cattail marsh	43.965495	-79.132347
E270.00-WC-MLV 132+19.527	Unnamed	TRCA	Duffins Creek / East Duffins Creek	3.3	Dry	Dry	No defined channel – flat cattail marsh	Undefined channel – flat cattail marsh	43.965016	-79.131951
E280.00-WC-MLV 132+20.034	Unnamed	TRCA	Duffins Creek / East Duffins Creek	79.9	0.37	0.11	0.65	0.50	43.962690	-79.127076
E290.00-WC-MLV 132+20.038	Tributary to Michell Creek	TRCA	Duffins Creek / East Duffins Creek	96.5	Dry	Dry	2.00	0.18	43.962000	-79.127000
Pipeline Segment MLV 133 – 134										
E340.00-WC-MLV 133+0.863	Unnamed	TRCA	Duffins Creek / East Duffins Creek	691	1.30	0.18	4.10	1.00	43.974647	-79.087000
E350.00-WC-MLV 133+1.391	Tributary to Duffins Creek	TRCA	Duffins Creek / East Duffins Creek	2,344	5.94	0.31	7.40	0.91	43.976291	-79.081499
E360.00-WC-MLV 133+1.754	Tributary to Duffins Creek	TRCA	Duffins Creek / East Duffins Creek	2.4	Dry	Dry	Undefined Channel	Undefined Channel	43.975	-79.077000
E370.00-WC-MLV 133+2.156	Tributary to Duffins Creek	TRCA	Duffins Creek / East Duffins Creek	32.0	0.90	0.10	2.20	0.40	43.977517	-79.072166

Table H-1: Hydrological Characteristics of Water Crossings Within the Permanent Right-of-Way for the Project

Water Crossing Identification (ID)[a]	Watercourse Name[b]	Conservation Authority[c]	Conservation Authority Watershed/ Sub-watershed[d]	Drainage Area [ha]	Surveyed Parameters (June 4 to November 24, 2014 and ongoing since July 14, 2015)				Coordinates (Datum: WGS84)	
					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
E380.00-WC-MLV 133+2.372	Tributary to Duffins Creek	TRCA	Duffins Creek / East Duffins Creek	177	0.80	0.12	1.00	0.34	43.977724	-79.069443
E390.00-WC-MLV 133+2.929	Unnamed	TRCA	Duffins Creek / East Duffins Creek	14.4	Dry	Dry	Undefined Channel	Undefined Channel	43.978000	-79.062000
E400.00-WC-MLV 133+3.528	Unnamed	CLOCA	Lynde Creek / Heber Down	401	Dry	Dry	Undefined Channel	Undefined Channel	43.988036	-79.010000
E410.00-WC-MLV 133+5.429	Unnamed	CLOCA	Lynde Creek / Heber Down	391	3.80	0.24	4.80	0.62	43.985801	-79.033227
E420.00-WC-MLV 133+7.320	Unnamed	CLOCA	Lynde Creek / Heber Down	124	1.30	0.09	3.40	0.32	43.988001	-79.010495
E430.00-WC-MLV 133+8.506	Lynde Creek	CLOCA	Lynde Creek / Ashburn	1,149	4.30	0.18	4.88	0.70	43.990137	-78.998811
E440.00-WC-MLV 133+8.642	Tributary to Lynde Creek	CLOCA	Lynde Creek / Ashburn	104	No field visit. Watercourse crossing not confirmed.				43.990781	-78.997370
E450.00-WC-MLV 133+9.022	Tributary to Lynde Creek	CLOCA	Lynde Creek / Ashburn	276	No field visit. Watercourse crossing not confirmed.				43.992630	-78.993511
E460.00-WC-MLV 133+9.039	Unnamed	CLOCA	Lynde Creek / Ashburn	276	No field visit. Watercourse crossing not confirmed.				43.992743	-78.993363
E480.00-WC-MLV 133+9.231	Tributary to Lynde Creek	CLOCA	Lynde Creek / Ashburn	67.6	No field visit. Watercourse crossing not confirmed.				43.993618	-78.991357
E490.00-WC-MLV 133+10.045	Unnamed	CLOCA	Lynde Creek / Myrtle Station	1,224	5.10	0.15	8.50	0.56	43.996523	-78.982041
E500.00-WC-MLV 133+11.163	Unnamed	CLOCA	Lynde Creek / Myrtle Station	96.0	1.40	0.07	3.00	0.12	43.995613	-78.969645
E510.00-WC-MLV 133+11.739	Unnamed	CLOCA	Lynde Creek / Lynde Main	47.1	0.86	0.19	3.06	0.70	43.993512	-78.963810
E530.00-WC-MLV 133+12.124	Unnamed	CLOCA	Oshawa Creek / Raglan	34.4	Dry	Dry	Undefined Channel	Undefined Channel	43.994493	-78.959201
E540.00-WC-MLV 133+12.680	Unnamed	CLOCA	Oshawa Creek / Raglan	326	0.68	0.10	4.19	0.60	43.995896	-78.952556
E550.00-WC-MLV 133+13.305	Oshawa Creek	CLOCA	Oshawa Creek / Raglan	431	2.67	0.30	4.19	0.60	43.993935	-78.946757
E560.00-WC-MLV 133+13.834	Tributary to Oshawa Creek	CLOCA	Oshawa Creek / Raglan	42.8	1.37	0.05	Undefined Channel	Undefined Channel	43.995341	-78.940457
E570.00-WC-MLV 133+15.256	Oshawa Creek	CLOCA	Oshawa Creek / Raglan	854	3.90	0.48	9.00	1.18	43.993427	-78.927226
E580.00-WC-MLV 133+16.140	Unnamed	CLOCA	Oshawa Creek / Raglan	478	1.00	0.14	2.20	0.70	43.994139	-78.917527
E590.00-WC-MLV 133+16.878	Unnamed	CLOCA	Oshawa Creek / Raglan	55.6	Dry	Dry	Undefined Channel	Undefined Channel	43.996000	-78.909000
E600.00-WC-MLV 133+17.380	Unnamed	CLOCA	Oshawa Creek / Raglan	151.2	No field visit. Watercourse crossing not confirmed.				43.998767	-78.903773
E610.00-WC-MLV 133+17.822	Tributary to East Oshawa Creek	CLOCA	Oshawa Creek / Enfield	70.1	0.50	0.10	2.20	0.64	44.000570	-78.898927
E620.00-WC-MLV 133+18.092	East Oshawa Creek	CLOCA	Oshawa Creek / Enfield	1,080	3.93	0.27	5.17	0.71	44.001296	-78.895709
E630.00-WC-MLV 133+18.458	Unnamed	CLOCA	Oshawa Creek / Enfield	1.8	No field visit. Watercourse crossing not confirmed.				44.001621	-78.891359
E650.00-WC-MLV 133+20.403	Unnamed	CLOCA	Oshawa Creek / Enfield	588	2.45	0.14	6.00	0.82	43.988741	-78.881138
E660.00-WC-MLV 133+21.764	Unnamed	CLOCA	Oshawa Creek / Enfield	1,100	2.23	0.16	2.60	0.32	43.990632	-78.865250
E670.00-WC-MLV 133+24.860	Unnamed	CLOCA	Harmony Creek / Grandview	284	Dry	Dry	1.30	0.55	43.974715	-78.842092
E680.00-WC-MLV 133+25.231	Unnamed	CLOCA	Harmony Creek / Grandview	22.7	Dry	Dry	3.30	0.85	43.973666	-78.838089
E690.00-WC-MLV 133+26.632	Unnamed	CLOCA	Harmony Creek / Taunton	160	0.70	0.08	4.50	1.57	43.965418	-78.829628
Pipeline Segment MLV 134 - 134B										
E700.00-WC-MLV 134+0.266	Tributary to Harmony Creek	CLOCA	Harmony Creek / Mitchell	16.3	Dry	Dry	4.90	0.26	43.959138	-78.816122
E710.00-WC-MLV 134+0.495	Tributary to Harmony Creek	CLOCA	Harmony Creek / Mitchell	25.3	Dry	Dry	Undefined Channel	Undefined Channel	43.957525	-78.814629
E740.00-WC-MLV 134+2.800	Farewell Creek	CLOCA	Farewell Creek / Farewell	1,683	No field visit. Watercourse crossing not confirmed.				43.959460	-78.787133
E750.00-WC-MLV 134+3.952	Black Creek	CLOCA	Black Creek / Black	520	1.80	0.20	3.10	1.20	43.960152	-78.772785
E760.00-WC-MLV 134+5.385	Tributary to Black Creek	CLOCA	Black Creek / Black	158	No field visit. Watercourse crossing not confirmed.				43.960078	-78.756923
E770.00-WC-MLV 134+5.921	Tributary to Black Creek	CLOCA	Black Creek / Black	54.2	Dry	Dry	4.1[e]	0.76[e]	43.960332	-78.750261
E780.00-WC-MLV 134+7.023	Bowmanville Creek	CLOCA	Bowmanville Creek / Hampton Branch	3,742	4.90	0.46	7.70	1.38	43.960380	-78.736569
E790.00-WC-MLV 134+7.558	Tributary to Bowmanville Creek	CLOCA	Bowmanville Creek / Haydon Branch	3,683	4.45	0.35	10.6	3.094	43.960584	-78.730091
E800.00-WC-MLV 134+8.125	Tributary to Bowmanville Creek	CLOCA	Bowmanville Creek / Bowmanville Creek Main Branch	20.3	Dry	Dry	Undefined Channel	Undefined Channel	43.960653	-78.722840

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Water Crossing Identification (ID)[a]	Watercourse Name[b]	Conservation Authority[c]	Conservation Authority Watershed/ Sub-watershed[d]	Drainage Area [ha]	Surveyed Parameters (June 4 to November 24, 2014 and ongoing since July 14, 2015)				Coordinates (Datum: WGS84)	
					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
E810.00-WC-MLV 134+9.253	Unnamed	CLOCA	Bowmanville Creek / Bowmanville Creek Main Branch	32.8	> 50 Extensive cattail marsh / wetland	0.47 Extensive cattail marsh / wetland	Undefined Channel	Undefined Channel	43.961038	-78.709726
E820.00-WC-MLV 134+9.750	Unnamed	CLOCA	Soper Creek / Soper Creek Main Branch	185	1.90	0.23	3.10	0.24	43.960928	-78.703535
E830.00-WC-MLV 134+10.230	Unnamed	CLOCA	Soper Creek / Soper Creek Main Branch	20.6	Dry	Dry	11.0	0.43	43.960825	-78.697630
E840.00-WC-MLV 134+10.642	Unnamed	CLOCA	Soper Creek / Soper Creek Main Branch	227	2.14	0.13	2.40	0.16	43.960825	-78.692269
E850.00-WC-MLV 134+11.266	Unnamed	CLOCA	Soper Creek / Soper Creek Main Branch	8.3	No field visit. Watercourse crossing not confirmed.				43.959656	-78.685387
E860.00-WC-MLV 134+11.871	Soper Creek	CLOCA	Soper Creek / Soper Creek Main Branch	3,957	6.15	0.34	7.62	1.38	43.958974	-78.678305
E870.00-WC-MLV 134+13.993	Unnamed	CLOCA	Soper Creek / Soper Creek East Branch	90.9	0.47	0.06	3.30	0.60	43.958514	-78.652541
E890.00-WC-MLV 134+15.996	Unnamed	GRCA	Wilmot Creek / na	41.4	Dry	Dry	1.13	0.25	43.958712	-78.627955
E900.00-WC-MLV 134+16.365	Wilmot Creek	GRCA	Wilmot Creek / na	3,752	3.00	0.29	20.00	0.85	43.958657	-78.623598
E905.00-WC-MLV 134+16.444	Unnamed	GRCA	Wilmot Creek / na	24.3	1.35	0.26	1.80	0.70	43.958712	-78.622636
E910.00-WC-MLV 134+16.490	Tributary to Wilmot Creek	GRCA	Wilmot Creek / na	23.1	0.80	0.38	1.40	0.54	43.958817	-78.622067
E920.00-WC-MLV 134+16.680	Orono Creek	GRCA	Wilmot Creek / na	1,777	4.30	0.23	8.50	1.75	43.958675	-78.620046
E930.00-WC-MLV 134+18.490	Hunter Creek	GRCA	Wilmot Creek / na	593	2.10	0.07	7.00	1.11	43.958861	-78.599818
Pipeline Segment MLV 134B - 135										
E950.00-WC-MLV 134B+1.781	Tributary to Stalker Creek	GRCA	Wilmot Creek / na	240	> 25 Lowland marsh with wide wetted area	0.09	Undefined Channel	Undefined Channel	43.958366	-78.576265
E960.00-WC-MLV 134B+2.252	Stalker Creek	GRCA	Wilmot Creek / na	632	1.10	0.32	1.50	0.75	43.957828	-78.570864
E970.00-WC-MLV 134B+2.830	Unnamed	GRCA	Graham Creek / na	23.5	1.10	0.12	3.50	0.60	43.956719	-78.564524
E980.00-WC-MLV 134B+3.629	Unnamed	GRCA	Graham Creek / na	46.4	0.60	0.05	3.60	0.60	43.958461	-78.554894
E990.00-WC-MLV 134B+4.542	Unnamed	GRCA	Graham Creek / na	202	1.40	0.25	2.90	0.60	43.960499	-78.543832
E1000.00-WC-MLV 134B+4.795	Unnamed	GRCA	Graham Creek / na	15.1	0.33	0.005	11.0	2.40	43.960753	-78.540542
E1010.00-WC-MLV 134B+4.885	Tributary to Graham Creek	GRCA	Graham Creek / na	27.2	0.42	0.05	2.80	0.40	43.960925	-78.539607
E1020.00-WC-MLV 134B+5.646	Graham Creek	GRCA	Graham Creek / na	5,156	7.00	0.23	10.00	1.53	43.961474	-78.530210
E1030.00-WC-MLV 134B+6.476	Unnamed	GRCA	Graham Creek / na	34.0	na – water dispersed across land	0.05	Undefined Channel – low area in valley with defined channel upstream and downstream	Undefined Channel – low area in valley with defined channel upstream and downstream	43.962430	-78.520270
E1040.00-WC-MLV 134B+7.134	Graham Creek	GRCA	Graham Creek / na	2,646	3.90	0.41	6.00	1.47	43.963133	-78.511917
E1050.00-WC-MLV 134B+7.347	Unnamed	GRCA	Graham Creek / na	34.1	0.25	0.01	2.50	0.83	43.963475	-78.509459
E1060.00-WC-MLV 134B+7.527	Unnamed	GRCA	Graham Creek / na	27.0	0.45	0.02	3.15	0.55	43.963474	-78.507344
E1070.00-WC-MLV 134B+7.580	Unnamed	GRCA	Graham Creek / na	24.1	0.35	0.03	4.30	0.23	43.963723	-78.506440
E1080.00-WC-MLV 134B+9.396	Graham Creek	GRCA	Graham Creek / na	1,740	4.35	0.61	4.80	1.11	43.966249	-78.486713
Pipeline Segment MLV 135 - 135A										
E1100.00-WC-MLV 135+0.661	Unnamed	GRCA	West Lake Ontario / na	149	3.95	0.41	5.50	0.81	43.976785	-78.391091
E1110.00-WC-MLV 135+0.725	Unnamed	GRCA	West Lake Ontario / na	1,540	3.40	0.22	4.50	0.88	43.976937	-78.390344
E1120.00-WC-MLV 135+1.699	Unnamed	GRCA	West Lake Ontario / na	125	0.48	0.06	0.82	0.50	43.979130	-78.378596
E1160.00-WC-MLV 135+4.528	Unnamed	GRCA	Ganaraska River / na	509	0.65	0.12	0.90	0.25	43.984559	-78.344424
E1170.00-WC-MLV 135+4.716	Unnamed	GRCA	Ganaraska River / na	16.5	Dry	Dry	1.80	na – data loss	43.984723	-78.342087
E1180.00-WC-MLV 135+6.212	Unnamed	GRCA	Ganaraska River / na	32.1	Dry	Dry	2.40	0.50	43.986575	-78.323621

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					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
E1200.00-WC-MLV 135+7.590	Ganaraska River	GRCA	Ganaraska River / na	26,827	18.9	0.47	22.6	2.49	43.989047	-78.306646
E1210.00-WC-MLV 135+10.450	Unnamed	GRCA	East of Gage Creek / na	480	1.66	0.22	2.10	0.72	43.999548	-78.274905
E1220.00-WC-MLV 135+11.851	Gage Creek	GRCA	East of Gage Creek / na	1,974	3.50	0.23	10.70	1.12	44.002623	-78.257983
Pipeline Segment MLV 135A – 136										
E1230.00-WC-MLV 135A+0.859	Tributary to Gage Creek	GRCA	East of Gage Creek / na	469	1.65	0.37	4.50	1.71	43.999221	-78.232730
E1240.00-WC-MLV 135A+1.716	Unnamed	GRCA	Cobourg Creek / na	3,135	4.00	0.40	6.40	1.40	43.998792	-78.223286
E1250.00-WC-MLV 135A+4.015	Unnamed	GRCA	Cobourg Creek / na	216	0.80	0.08	1.20	0.53	44.005094	-78.199049
E1260.00-WC-MLV 135A+7.122	Cobourg Brook	GRCA	Cobourg Creek / na	7,348	9.60	0.43	11.20	0.82	44.003523	-78.166674
E1270.00-WC-MLV 135A+8.259	Unnamed	GRCA	East Lake Ontario / na	94.3	2.10	0.13	2.45	0.51	44.002636	-78.154864
E1280.00-WC-MLV 135A+9.987	Unnamed	GRCA	East Lake Ontario / na	370	1.75	0.24	1.80	0.84	44.007012	-78.134691
E1290.00-WC-MLV 135A+11.483	Unnamed	GRCA	East Lake Ontario / na	145	0.68	0.13	1.75	0.40	44.011726	-78.117989
E1300.00-WC-MLV 135A+12.056	Unnamed	GRCA	East Lake Ontario / na	20.8	No field visit. Watercourse crossing not confirmed.				44.013189	-78.111056
E1310.00-WC-MLV 135A+16.191	Unnamed	LTRCA	Barnum House-Shelter Valley / na	648	1.80	0.41	4.50	0.76	44.030490	-78.078049
E1320.00-WC-MLV 135A+16.956	Unnamed	LTRCA	Barnum House-Shelter Valley / na	16.9	0.70	0.10	7.30	1.00	43.930115	-79.325181
E1330.00-WC-MLV 135A+20.617	Shelter Valley Creek	LTRCA	Barnum House-Shelter Valley / na	2,300	3.90	0.20	4.50	0.51	44.043252	-78.025819
E1340.00-WC-MLV 135A+20.845	Unnamed	LTRCA	Barnum House-Shelter Valley / na	271	No field visit. Watercourse crossing not confirmed.				44.043943	-78.023143
E1350.00-WC-MLV 135A+21.991	Unnamed	LTRCA	Barnum House-Shelter Valley / na	48.4 (Pond with outlet channel)	Approx. 25	> 1.5	> 25	> 1.5	44.046799	-78.011211
Pipeline Segment MLV 136 – 137										
E1360.00-WC-MLV 136+0.148	Unnamed	LTRCA	Barnum House-Shelter Valley / na	62.2	0.78	0.11	1.55	0.55	44.047056	-78.004116
E1361.00-WC-MLV 136+0.177	Unnamed	LTRCA	Barnum House-Shelter Valley / na	67.6	0.90	0.01	3.30	0.12	44.046909	-78.003869
E1370.00-WC-MLV 136+0.267	Unnamed	LTRCA	Barnum House-Shelter Valley / na	3.8	0.45	0.06	0.65	0.10	44.047644	-78.002628
E1380.00-WC-MLV 136+0.432	Unnamed	LTRCA	Barnum House-Shelter Valley / na	31.5	0.62	0.03	5.00	1.28	44.047822	-78.000955
E1390.00-WC-MLV 136+1.305	Unnamed	LTRCA	Barnum House-Shelter Valley / na	1,607	No field visit. Watercourse crossing not confirmed.				44.050040	-77.990462
E1400.00-WC-MLV 136+4.373	Unnamed	LTRCA	Cold Creek / na	448	No field visit. Watercourse crossing not confirmed.				44.061546	-77.957088
E1410.00-WC-MLV 136+5.548	Unnamed	LTRCA	Cold Creek / na	41.7	No field visit. Watercourse crossing not confirmed.				44.066155	-77.944076
E1420.00-WC-MLV 136+7.704	Unnamed	LTRCA	Cold Creek / na	1,344	No field visit. Watercourse crossing not confirmed.				44.070848	-77.919347
E1430.00-WC-MLV 136+7.950	Unnamed	LTRCA	Cold Creek / na	1,352	2.50	0.20	2.50	0.30	44.071442	-77.916438
E1440.00-WC-MLV 136+8.008	Unnamed	LTRCA	Cold Creek / na	1,354	4.20	0.32	4.20	0.37	44.071627	-77.915846
E1450.00-WC-MLV 136+8.012	Unnamed	LTRCA	Cold Creek / na	1,354	5.00	0.10	Undefined channel	Undefined channel	44.071691	-77.915645
E1460.00-WC-MLV 136+8.025	Unnamed	LTRCA	Cold Creek / na	1,354	3.60	0.39	3.60	0.44	44.071693	-77.915510
E1470.00-WC-MLV 136+8.103	Unnamed	LTRCA	Cold Creek / na	1,355	6.70	0.62	6.70	0.67	44.071899	-77.914580
E1480.00-WC-MLV 136+8.489	Cold Creek	LTRCA	Cold Creek / na	2,541	9.41	0.64	14.40	0.36	44.072890	-77.909992
E1490.00-WC-MLV 136+11.297	Unnamed	LTRCA	Cold Creek / na	325	0.80	0.16	Undefined channel	Undefined channel	44.083548	-77.880801
E1500.00-WC-MLV 136+11.327	Unnamed	LTRCA	Cold Creek / na	326	1.80	0.09	Undefined channel	Undefined channel	44.083694	-77.880443
E1510.00-WC-MLV 136+11.790	Cold Creek	LTRCA	Cold Creek / na	7,128	13.8	0.95	15.5	2.05	44.085515	-77.875551
E1520.00-WC-MLV 136+13.732	Cold Creek	LTRCA	Cold Creek / na	11,828	16.0	0.25	21.00	1.45	44.092262	-77.854132
E1570.00-WC-MLV 136+19.441	Unnamed	LTRCA	Cold Creek / na	120	Dry	Dry	Undefined Channel	Undefined Channel	44.110205	-77.787406
Pipeline Segment MLV 137 - 138										
E1580.00-WC-MLV 137+0.610	Breakaway Creek	LTRCA	Cold Creek / na	656	1.97	0.14	2.93	1.21	44.113970	-77.770915
E1600.00-WC-MLV 137+2.850	Unnamed	LTRCA	Cold Creek / na	32.3	Dry	Dry	Undefined Channel	Undefined Channel	44.120565	-77.744451

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E1610.00-WC-MLV 137+3.113	Unnamed	LTRCA	Cold Creek / na	74.9	4.80	0.17	7.70	1.21	44.114063	-77.770950
E1620.00-WC-MLV 137+3.758	Unnamed	LTRCA	Cold Creek / na	74.6	1.80	0.13	4.00	0.35	44.123808	-77.734080
E1630.00-WC-MLV 137+4.128	Unnamed	LTRCA	Cold Creek / na	239	Dry	Dry	Undefined Channel	Undefined Channel	44.125154	-77.729859
E1640.00-WC-MLV 137+4.896	Unnamed	LTRCA	Cold Creek / na	13.5	Dry	Dry	3.00	0.90	44.128171	-77.721078
E1690.00-WC-MLV 137+7.491	Unnamed	LTRCA	Cold Creek / na	76.9	Dry	Dry	0.92	0.45	44.137966	-77.691793
E1700.00-WC-MLV 137+9.109	Unnamed	LTRCA	Cold Creek / na	1,419	2.60	0.12	3.80	0.45	44.143798	-77.673243
E1710.00-WC-MLV 137+9.173	Unnamed	LTRCA	Cold Creek / na	18.3	2.90	0.18	3.20	0.45	44.143956	-77.672585
E1750.00-WC-MLV 137+13.471	Unnamed	LTRCA	na / Trent River Corridor Tributaries	Pond	21.00	0.60	23.40	1.84	44.154130	-77.622302
E1760.00-WC-MLV 137+13.493	Unnamed	LTRCA	na / Trent River Corridor Tributaries	2.4	0.12	0.05	0.47	0.07	44.154099	-77.622083
E1770.00-WC-MLV 137+13.527	Unnamed	LTRCA	na / Trent River Corridor Tributaries	813	2.21	0.24	3.20	0.28	44.154145	-77.621970
E1780.00-WC-MLV 137+13.985	Unnamed	LTRCA	na / Trent River Corridor Tributaries	58.0	Low lying cattail marsh – flooded from heavy rain	0.75	No defined channel	No defined channel	44.155479	-77.616236
E1790.00-WC-MLV 137+14.840	Unnamed	LTRCA	na / Trent River Corridor Tributaries	Pond	60.0	1.40	65.0	1.6.0	44.156255	-77.606015
E1800.00-WC-MLV 137+14.856	Unnamed	LTRCA	na / Trent River Corridor Tributaries	499	0.52	0.10	1.10	0.10	44.156192	-77.605826
E1810.00-WC-MLV 137+16.906	Trent River	LTRCA	na / Trent River Corridor Tributaries	1,252,759	212.0	5.75	216.0	7.13	44.161060	-77.586342
Pipeline Segment MLV 138 - 138A										
E1811.00-WC-MLV 137+18.054	Unnamed	LTRCA	na / Trent River Corridor Tributaries	89.9	No field visit. Watercourse crossing not confirmed.				44.164560	-77.571474
E1812.00-WC-MLV 137+19.289	Unnamed	LTRCA	na / Trent River Corridor Tributaries	34.3	No field visit. Watercourse crossing not confirmed.				44.170111	-77.560951
E1813.00-WC-MLV 137+20.12	Unnamed	LTRCA	na / Trent River Corridor Tributaries	150	No field visit. Watercourse crossing not confirmed.				44.173017	-77.551382
E1814.00-WC-MLV 137+20.29	Unnamed	LTRCA	na / Trent River Corridor Tributaries	Lake	No field visit. Watercourse crossing not confirmed.				44.173595	-77.549406
E1815.00-WC-MLV 137+20.862	Unnamed	LTRCA	na / Trent River Corridor Tributaries	137	No field visit. Watercourse crossing not confirmed.				44.174906	-77.542512
E1816.00-WC-MLV 137+21.458	Unnamed	LTRCA	na / Bay of Quinte Tributaries	105	No field visit. Watercourse crossing not confirmed.				44.176076	-77.535237
Pipeline Segment MLV 139 - 139A										
E1820.00-WC-MLV 139+2.718	Unnamed	QCA	Salmon River / Shannonville	25.9	0.38	0.10	1.50	0.18	44.237915	-77.195604
E1830.00-WC-MLV 139+2.959	Unnamed	QCA	Salmon River / Shannonville	37.9	0.37	0.10	2.20	0.2	44.237909	-77.195593
E1840.00-WC-MLV 139+3.749	Unnamed	QCA	Salmon River / Shannonville	1,008	3.04	0.34	2.40	0.20	44.239704	-77.186210
E1841.00-WC-MLV 139+4.944	Unnamed	QCA	Salmon River / Shannonville	225	0.90	0.10	2.50	0.50	44.242371	-77.171514
E1850.00-WC-MLV 139+5.020	Unnamed	QCA	Salmon River / Shannonville	280	0.47	0.01	0.75	0.04	44.242635	-77.170672
E1860.00-WC-MLV 139+5.737	Salmon River	QCA	Salmon River / Shannonville	85,784	31.5	0.70	42.0	3.45	44.242770	-77.161885
E1870.00-WC-MLV 139+7.180	Unnamed	QCA	Napanee River / Lower Napanee	228	1.41	0.10	4.60	40.0	44.244841	-77.144572
E1880.00-WC-MLV 139+8.150	Unnamed	QCA	Napanee River / Lower Napanee	Pond	24.5	>1.50	approx. 32	High banks – not measured	44.242621	-77.170678
E1890.00-WC-MLV 139+10.920	Unnamed	QCA	Napanee River / Lower Napanee	67.0	0.50	0.04	6.80	0.22	44.252044	-77.098877
E1900.00-WC-MLV 139+12.388	Marysville Creek	QCA	Napanee River / Lower Napanee	744	1.70	0.06	10.80	0.13	44.254355	-77.080775
E1910.00-WC-MLV 139+13.606	Unnamed	QCA	Napanee River / Lower Napanee	56.1	Dry	Dry	2.50	0.40	44.255526	-77.066365
Pipeline Segment MLV 139A – 140										
E1930.00-WC-MLV 139A+5.125	Unnamed	QCA	Napanee River / Lower Napanee	25.2	Dry	Dry	2.70	0.32	44.264742	-77.001044
Pipeline Segment MLV 140 - 140A										
E1940.00-WC-MLV 140+0.429	Sucker Creek	QCA	Napanee River / Lower Napanee	6,096	4.27	0.26	10.0	1.50	44.270778	-76.961590
E1950.00-WC-MLV 140+0.477	Unnamed	QCA	Napanee River / Lower Napanee	5.1	>20.0	>1.00	>20.0	>1.00	44.270680	-76.960825
E1960.00-WC-MLV 140+1.675	Unnamed	QCA	Napanee River / Lower Napanee	202	Dry	Dry	2.00	0.14	44.273518	-76.946503
E1980.00-WC-MLV 140+3.285	Napanee River	QCA	Napanee River / Upper Napanee	79,665	62.0	2.80	66.0	4.61	44.277156	-76.927607

Table H-1: Hydrological Characteristics of Water Crossings Within the Permanent Right-of-Way for the Project

Water Crossing Identification (ID)[a]	Watercourse Name[b]	Conservation Authority[c]	Conservation Authority Watershed/ Sub-watershed[d]	Drainage Area [ha]	Surveyed Parameters (June 4 to November 24, 2014 and ongoing since July 14, 2015)				Coordinates (Datum: WGS84)	
					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
E1990.00-WC-MLV 140+3.430	Tributary to Napanee River	QCA	Napanee River / Upper Napanee	124	1.10	0.13	3.40	1.21	44.277343	-76.926027
E2000.00-WC-MLV 140+6.250	Unnamed	CRCA	Lake Ontario / Little Creek	48.5	Dry	Dry	16.0	0.33	44.281086	-76.896904
E2020.00-WC-MLV 140+7.862	Unnamed	CRCA	Lake Ontario / Little Creek	514	2.7	0.13	4.00	0.31	44.281086	-76.896904
Pipeline Segment MLV 140A – 141										
E2030.00-WC-MLV 140A+0.749	Little Creek	CRCA	Lake Ontario / Little Creek	2,586	Dry	Dry	4.00	1.50	44.277113	-76.870315
E2040.00-WC-MLV 140A+2.437	Unnamed	CRCA	Lake Ontario / Spring Creek	195	Dry	Dry	3.40	0.45	44.282861	-76.851436
E2050.00-WC-MLV 140A+4.040	Unnamed	CRCA	Lake Ontario / Spring Creek	88.3	0.64	0.04	0.88	0.204	44.285367	-76.832014
E2060.00-WC-MLV 140A+6.889	Spring Creek	CRCA	Lake Ontario / Spring Creek	578	0.70	0.20	1.44	0.26	44.290940	-76.801918
E2070.00-WC-MLV 140A+9.523	Wilton Creek	CRCA	Lake Ontario / Wilton Creek	8,259	5.75	0.45	10.00	0.92	44.293113	-76.769147
E2080.00-WC-MLV 140A+13.614	Unnamed	CRCA	Lake Ontario / Millhaven Creek	100	1.00	0.03	4.40	0.19	44.295886	-76.722870
E2090.00-WC-MLV 140A+13.755	Unnamed	CRCA	Lake Ontario / Millhaven Creek	116	Dry	Dry	5.00	0.23	44.295989	-76.721089
E2100.00-WC-MLV 140A+15.134	Millhaven Creek	CRCA	Lake Ontario / Millhaven Creek	12,091	37.5	2.40	No bank survey – extensive, thick marsh	> 3.0 m No bank survey – extensive, thick marsh	44.297169	-76.703737
Pipeline Segment MLV 142 - 142A										
E2110.00-WC-MLV 142+0.734	Unnamed	CRCA	Great Cataraqui River / Great Cataraqui River	34.7	No field visit. Watercourse crossing not confirmed.				44.341946	-76.354535
E2130.00-WC-MLV 142+3.500	Unnamed	CRCA	St. Lawrence River / St. Lawrence Direct	5.8	Dry	Dry	Undefined Channel – large wetland/marsh area	Undefined Channel – large wetland/marsh area	44.349000	-76.321488
E2140.00-WC-MLV 142+3.879	Unnamed	CRCA	St. Lawrence River / St. Lawrence Direct	87.1	1.70	0.09	4.00	0.551	44.350188	-76.316918
E2150.00-WC-MLV 142+5.017	Unnamed	CRCA	Gananoque River / Gananoque River	17.6	Dry	Dry	2.50	0.16	44.354768	-76.304187
E2210.00-WC-MLV 142+7.616	Unnamed	CRCA	Gananoque River / Gananoque River	71.5	Dry	Dry	0.95	0.15	44.361349	-76.272992
E2220.00-WC-MLV 142+7.960	Mud Creek	CRCA	Gananoque River / Gananoque River	1,100	1.45	0.28	8.80	1.43	44.362095	-76.268832
E2230.00-WC-MLV 142+8.100	Unnamed	CRCA	Gananoque River / Gananoque River	1,297	2.00	0.31	8.00	1.52	44.362396	-76.267123
E2240.00-WC-MLV 142+9.175	Unnamed	CRCA	Gananoque River / Gananoque River	452	2.40	0.37	6.20	1.26	44.364763	-76.254051
Pipeline Segment MLV 142A – 143										
E2260.00-WC-MLV 142A+0.338	Unnamed	CRCA	Gananoque River / Gananoque River	57.2	Dry	Dry	9.20	0.87	44.368227	-76.233873
E2270.00-WC-MLV 142A+1.942	Unnamed	CRCA	Gananoque River / Gananoque River	41.9	Dry	Dry	3.20	0.20	44.372026	-76.214463
E2280.00-WC-MLV 142A+2.040	Unnamed	CRCA	Gananoque River / Gananoque River	43.9	Dry	Dry	4.50	0.50	44.372165	-76.213417
E2290.00-WC-MLV 142A+2.980	Sucker Brook	CRCA	Gananoque River / Gananoque River	2,377	12.0	0.60	19.6	1.58	44.373173	-76.202925
E2310.00-WC-MLV 142A+4.533	Unnamed	CRCA	Gananoque River / Gananoque River	14.6	Dry	Dry	4.70	0.46	44.380357	-76.186374
E2320.00-WC-MLV 142A+5.075	Unnamed	CRCA	Gananoque River / Gananoque River	84.7	0.30	0.05	1.70	0.24	44.381351	-76.180081
E2340.00-WC-MLV 142A+6.407	Unnamed	CRCA	Gananoque River / Gananoque River	16.6	Dry	Dry	2.23	0.55	44.385508	-76.165339
E2350.00-WC-MLV 142A+6.579	Gananoque River	CRCA	Gananoque River / Gananoque River	93,298	58.0	3.70	64.9	4.20	44.385675	-76.163677
E2360.00-WC-MLV 142A+7.944	Unnamed	CRCA	Gananoque River / Gananoque River	22.8	0.47	0.02	1.30	0.21	44.389424	-76.147577
E2370.00-WC-MLV 142A+9.814	Unnamed	CRCA	Gananoque River / Gananoque River	351	na – saturated soil, some ponding	na – saturated soil, some ponding	na – low lying marsh between two larger water bodies	na – low lying marsh between two larger water bodies	44.396563	-76.126937
E2390.00-WC-MLV 142A+12.152	Unnamed	CRCA	Gananoque River / Gananoque River	2.5	1.30	0.10	3.30	0.24	44.407887	-76.103677
E2400.00-WC-MLV 142A+13.016	Unnamed	CRCA	Gananoque River / Gananoque River	1,842	17.0	0.85	19.0	0.95	44.414122	-76.097464
E2410.00-WC-MLV 142A+14.922	Unnamed	CRCA	Gananoque River / Wiltse Creek	27.4	Dry	Dry	5.10	1.05	44.423112	-76.077053
E2420.00-WC-MLV 142A+14.940	Unnamed	CRCA	Gananoque River / Wiltse Creek	19.4	Dry	Dry	4.30	0.97	44.423232	-76.076903
E2430.00-WC-MLV 142A+15.026	Unnamed	CRCA	Gananoque River / Wiltse Creek	26.6	Dry	Dry	5.50	0.16	44.423611	-76.075948

Table H-1: Hydrological Characteristics of Water Crossings Within the Permanent Right-of-Way for the Project

Water Crossing Identification (ID)[a]	Watercourse Name[b]	Conservation Authority[c]	Conservation Authority Watershed/ Sub-watershed[d]	Drainage Area [ha]	Surveyed Parameters (June 4 to November 24, 2014 and ongoing since July 14, 2015)				Coordinates (Datum: WGS84)	
					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
E2440.00-WC-MLV 142A+15.080	Unnamed	CRCA	Gananoque River / Wiltse Creek	23.8	Dry	Dry	6.00	0.23	44.423876	-76.075383
E2450.00-WC-MLV 142A+17.307	Unnamed	CRCA	Gananoque River / Wiltse Creek	253	1.30	0.22	4.00	0.75	44.435627	-76.052798
E2460.00-WC-MLV 142A+17.711	Black Creek	CRCA	Gananoque River / Wiltse Creek	2,481	7.50	0.69	15.50	2.04	44.437878	-76.048820
E2470.00-WC-MLV 142A+18.818	Unnamed	CRCA	Gananoque River / Wiltse Creek	513	1.68	0.33	8.20	1.78	44.442893	-76.037915
E2490.00-WC-MLV 142A+19.578	Unnamed	CRCA	Gananoque River / Wiltse Creek	479	1.25	0.15	3.70	0.85	44.447348	-76.031657
E2500.00-WC-MLV 142A+19.951	Unnamed	CRCA	Gananoque River / Wiltse Creek	88.0	1.28	0.05	4.13	1.35	44.449558	-76.028848
E2510.00-WC-MLV 142A+20.142	Unnamed	CRCA	Gananoque River / Wiltse Creek	8.7	Dry	Dry	0.90	0.08	44.450539	-76.026845
E2520.00-WC-MLV 142A+21.040	Unnamed	CRCA	Gananoque River / Wiltse Creek	11.1	No field visit. Watercourse crossing not confirmed.				44.455816	-76.018311
E2530.00-WC-MLV 142A+21.348	Unnamed	CRCA	Gananoque River / Wiltse Creek	3.8	No field visit. Watercourse crossing not confirmed.				44.457786	-76.015614
Pipeline Segment MLV 143A – 144										
E2531.00-WC-MLV 143A+1.167	Butler's Creek	CRCA	Upper St. Lawrence-Thousand Islands / na	2,205	No field visit. Watercourse crossing not confirmed.				44.643082	-75.685836
E2532.00-WC-MLV 143A+3.208	Unnamed	CRCA	Upper St. Lawrence-Thousand Islands / na	15.2	No field visit. Watercourse crossing not confirmed.				44.652658	-75.664738
E2533.00-WC-MLV 143A+4.878	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	22.1	No field visit. Watercourse crossing not confirmed.				44.660594	-75.648405
E2534.00-WC-MLV 143A+5.325	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	46.8	No field visit. Watercourse crossing not confirmed.				44.663664	-75.644763
E2535.00-WC-MLV 143A+5.843	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	49.4	No field visit. Watercourse crossing not confirmed.				44.667219	-75.640539
E2536.00-WC-MLV 143A+6.511	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	55.8	No field visit. Watercourse crossing not confirmed.				44.671829	-75.635122
E2537.00-WC-MLV 143A+8.180	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	397	No field visit. Watercourse crossing not confirmed.				44.683039	-75.622058
Pipeline Segment MLV 144 - 145										
E2540.00-WC-MLV 144+0.868	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	277	2.70	0.24	6.65	1.02	44.689517	-75.613470
E2550.00-WC-MLV 144+1.506	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	24.8	0.96	0.03	3.80	0.33	44.693715	-75.608343
E2560.00-WC-MLV 144+4.973	Unnamed	SNCA	South Nation River / na	85.6	> 100.0	0.20	Undefined channel – low-lying flat flooded bush	Undefined channel – low-lying flat flooded bush	44.716586	-75.578669
E2570.00-WC-MLV 144+6.005	Unnamed	SNCA	South Nation River / na	1,000	4.20	1.31	Undefined channel – cattail marsh	Undefined channel– cattail marsh	44.722686	-75.569363
E2580.00-WC-MLV 144+8.675	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	80.3	1.00	0.10	Undefined channel	Undefined channel	44.739395	-75.545039
E2590.00-WC-MLV 144+9.089	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	136	> 100	> 0.20	2.90	0.20	44.739852	-75.540277
E2600.00-WC-MLV 144+10.173	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	1,057	No field visit. Watercourse crossing not confirmed.				44.747089	-75.532441
E2610.00-WC-MLV 144+13.442	Unnamed	SNCA	Upper St. Lawrence-Thousand Islands / na	14.2	No field visit. Watercourse crossing not confirmed.				44.766027	-75.502587
E2620.00-WC-MLV 144+17.420	Unnamed	SNCA	South Nation River / na	430	No field visit. Watercourse crossing not confirmed.				44.790422	-75.465789
E2630.00-WC-MLV 144+18.822	Unnamed	SNCA	South Nation River / na	1,370	8.10	0.61	13.0	1.61	44.799036	-75.452782
E2640.00-WC-MLV 144+20.095	Unnamed	SNCA	South Nation River / na	81.4	2.10	0.11	5.00	0.53	44.807664	-75.442129
E2650.00-WC-MLV 144+20.583	Unnamed	SNCA	South Nation River / na	10.4	No field visit. Watercourse crossing not confirmed.				44.811006	-75.439162
E2660.00-WC-MLV 144+21.570	Unnamed	SNCA	South Nation River / na	28.6	No field visit. Watercourse crossing not confirmed.				44.816428	-75.430007
E2670.00-WC-MLV 144+21.628	Unnamed	SNCA	South Nation River / na	30.4	No field visit. Watercourse crossing not confirmed.				44.816786	-75.429484
E2680.00-WC-MLV 144+21.780	Unnamed	SNCA	South Nation River / na	40.2	No field visit. Watercourse crossing not confirmed.				44.817734	-75.428100
E2690.00-WC-MLV 144+22.150	Unnamed	SNCA	South Nation River / na	49.9	No field visit. Watercourse crossing not confirmed.				44.820049	-75.424721
E2700.00-WC-MLV 144+22.696	Unnamed	SNCA	South Nation River / na	2,426	14.0	0.77	21.7	1.22	44.823487	-75.419665
E2710.00-WC-MLV 144+22.827	Unnamed	SNCA	South Nation River / na	20.9	1.05	0.15	4.10	0.40	44.824364	-75.419202
E2720.00-WC-MLV 144+23.404	Unnamed	SNCA	South Nation River / na	114	24.0	0.60	Undefined channel – flooded wetland	Undefined channel – flooded wetland	44.827301	-75.414159
E2730.00-WC-MLV 144+23.584	Unnamed	SNCA	South Nation River / na	11.5	> 25.0	1.20	Undefined channel – cattail wetland	Undefined channel – cattail wetland	44.828408	-75.412562

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Water Crossing Identification (ID)[a]	Watercourse Name[b]	Conservation Authority[c]	Conservation Authority Watershed/ Sub-watershed[d]	Drainage Area [ha]	Surveyed Parameters (June 4 to November 24, 2014 and ongoing since July 14, 2015)				Coordinates (Datum: WGS84)	
					Wetted Width [m]	Wetted Depth [m]	Bankfull Width [m]	Bankfull Depth [m]	Latitude (deg)	Longtitude (deg)
E2740.00-WC-MLV 144+24.100	Unnamed	SNCA	South Nation River / na	127	No field visit. Watercourse crossing not confirmed.				44.831622	-75.407824
E2750.00-WC-MLV 144+25.321	Unnamed	SNCA	South Nation River / na	46.0	1.70	0.10	Undefined channel – trampled by livestock	Undefined channel – trampled by livestock	44.839216	-75.396679

(a) Water Crossing Identification (ID) naming based on the pipeline alignment, dated September 28, 2015.

(b) Based on conservation authority watercourse mapping data, where available. Where conservation authority watercourse mapping data were not available, based on MNRF LIO geospatial data mapping (MNRF 2013a; MNRF 2014a).

(c) TRCA = Toronto and Region Conservation Authority
CLOCA = Central Lake Ontario Conservation Authority
GRCA = Ganaraska Region Conservation Authority
LTRCA = Lower Trent Region Conservation Authority
QCA = Quinte Conservation Authority
CRCA = Cataraqui Region Conservation Authority
SNCA = South Nation Conservation Authority

(d) Watershed/subwatershed data within the TRCA, CLOCA and CRCA areas of jurisdiction were provided electronically by the respective conservation authorities. All other watershed/subwatershed data within the GRCA, LTRCA, QCA and SNCA areas of jurisdiction were obtained from maps shown on the respective conservation authority websites or from maps contained within reports available on the respective conservation authority websites.

(e) Man-made agricultural drainage ditch. Bankfull width and depth not measured at the crossing. The average bankfull width and bankfull depth based on measurements taken 95 m upstream and 90 m downstream is assumed to be representative of the crossing.

na = not available.

Note: No field visit. Watercourse crossing not confirmed: This is a potential watercourse crossing identified through the desktop study; however, its existence cannot be confirmed at this time because a field visit was not completed due to land access constraints.
Information provided regarding measurements other than wetted width, wetted depth, bankfull width or bankfull depth (e.g., distance along a watercourse / waterbody) is based on approximate measurements.

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[(a)]	Watercourse Name[(b)]	Conservation Authority[(c)]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
Pipeline Segment MLV 132 - 133					
E10.00-WC-MLV 132+1.098	Unnamed	TRCA	224	1.5	3.0
E20.00-WC-MLV 132+1.709	Bruce Creek	TRCA	2,204	8.2	16.6
E30.00-WC-MLV 132+2.476	Unnamed	TRCA	Pond	n/a	n/a
E40.00-WC-MLV 132+2.557	Unnamed	TRCA	254	1.6	3.3
E50.00-WC-MLV 132+2.759	Unnamed	TRCA	80.1	0.68	1.4
E60.00-WC-MLV 132+3.954	Unnamed	TRCA	91.3	0.75	1.5
E70.00-WC-MLV 132+4.937	Unnamed	TRCA	610	3.1	6.4
E80.00-WC-MLV 132+5.828	Little Rouge Creek	TRCA	5,810	17.0	34.4
E90.00-WC-MLV 132+7.009	Unnamed	TRCA	212	1.4	2.9
E100.00-WC-MLV 132+9.232	Unnamed	TRCA	144	1.1	2.2
E105.00-WC-MLV 132+10.777	Katabokokonk Creek	TRCA	139	1.03	2.09
E110.00-WC-MLV 132+12.359	Stouffville Creek	TRCA	1,398	5.8	11.8
E120.00-WC-MLV 132+12.799	Unnamed	TRCA	1.3	0.03	0.06
E130.00-WC-MLV 132+12.849	Reesor Creek	TRCA	1,638	6.6	13.3
E140.00-WC-MLV 132+12.977	Unnamed	TRCA	4.0	0.07	0.15
E150.00-WC-MLV 132+14.019	Unnamed	TRCA	59.3	0.44	1.1
E160.00-WC-MLV 132+14.898	West Duffins Creek	TRCA	3,214	8.8	22.6
E170.00-WC-MLV 132+15.36	Wixon Creek	TRCA	1,128	4.0	10.3
E180.00-WC-MLV 132+15.791	Unnamed	TRCA	59.0	0.44	1.1
E190.00-WC-MLV 132+16.381	Unnamed	TRCA	34.2	0.29	0.75
E200.00-WC-MLV 132+16.648	Unnamed	TRCA	115	0.72	1.9
E210.00-WC-MLV 132+18.073	Unnamed	TRCA	13.7	0.15	0.38
E220.00-WC-MLV 132+18.301	Michell Creek	TRCA	352	1.7	4.3
E230.00-WC-MLV 132+18.601	Unnamed	TRCA	300	1.5	3.8
E240.00-WC-MLV 132+18.896	Unnamed	TRCA	721	2.8	7.4
E250.00-WC-MLV 132+19.211	Unnamed	TRCA	77.8	0.54	1.4
E260.00-WC-MLV 132+19.453	Unnamed	TRCA	6.4	0.08	0.21
E270.00-WC-MLV 132+19.527	Unnamed	TRCA	3.3	0.05	0.13
E280.00-WC-MLV 132+20.034	Unnamed	TRCA	80.0	0.55	1.4
E290.00-WC-MLV 132+20.038	Unnamed	TRCA	96.6	0.63	1.6
E300.00-WC-MLV 132+21.555	Unnamed	TRCA	19.0	0.27	1.1
E320.00-WC-MLV 132+22.054	Unnamed	TRCA	6.2	0.12	0.46
E330.00-WC-MLV 132+22.505	Unnamed	TRCA	6.2	0.12	0.46
Pipeline Segment MLV 133 - 134					
E340.00-WC-MLV 133+0.863	Unnamed	TRCA	686	4.0	15.6
E350.00-WC-MLV 133+1.391	Unnamed	TRCA	2,347	10.2	39.2
E360.00-WC-MLV 133+1.754	Unnamed	TRCA	2.4	0.06	0.22
E370.00-WC-MLV 133+2.156	Unnamed	TRCA	32.0	0.41	1.6
E380.00-WC-MLV 133+2.372	Unnamed	TRCA	177	1.5	5.7
E390.00-WC-MLV 133+2.929	Unnamed	TRCA	14.4	0.22	0.86
E400.00-WC-MLV 133+3.528	Unnamed	CLOCA	401	2.7	10.4
E410.00-WC-MLV 133+5.429	Unnamed	CLOCA	392	2.6	10.2
E420.00-WC-MLV 133+7.320	Unnamed	CLOCA	124	1.1	4.3
E430.00-WC-MLV 133+8.506	Lynde Creek	CLOCA	1,151	5.0	11.1

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[(a)]	Watercourse Name[(b)]	Conservation Authority[(c)]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
E440.00-WC-MLV 133+8.642	Unnamed	CLOCA	104	0.82	1.8
E450.00-WC-MLV 133+9.022	Unnamed	CLOCA	277	1.7	3.8
E460.00-WC-MLV 133+9.039	Unnamed	CLOCA	277	1.7	3.8
E480.00-WC-MLV 133+9.231	Unnamed	CLOCA	67.7	0.60	1.3
E490.00-WC-MLV 133+10.045	Unnamed	CLOCA	1,226	5.2	11.6
E500.00-WC-MLV 133+11.163	Unnamed	CLOCA	96.2	0.78	1.7
E510.00-WC-MLV 133+11.739	Unnamed	CLOCA	47.2	0.46	1.0
E530.00-WC-MLV 133+12.124	Unnamed	CLOCA	34.5	0.36	0.80
E540.00-WC-MLV 133+12.680	Unnamed	CLOCA	321	1.9	4.2
E550.00-WC-MLV 133+13.305	Oshawa Creek	CLOCA	438	2.4	5.4
E560.00-WC-MLV 133+13.834	Unnamed	CLOCA	42.9	0.42	0.94
E570.00-WC-MLV 133+15.256	Unnamed	CLOCA	855	4.0	8.9
E580.00-WC-MLV 133+16.140	Unnamed	CLOCA	478	3.3	17.7
E590.00-WC-MLV 133+16.878	Unnamed	CLOCA	55.7	0.65	3.5
E600.00-WC-MLV 133+17.380	Unnamed	CLOCA	151	1.4	7.5
E610.00-WC-MLV 133+17.822	Unnamed	CLOCA	70.2	0.78	4.2
E620.00-WC-MLV 133+18.092	East Oshawa Creek	CLOCA	1,082	6.0	32.7
E630.00-WC-MLV 133+18.458	Unnamed	CLOCA	1.8	0.05	0.27
E650.00-WC-MLV 133+20.403	Unnamed	CLOCA	589	3.8	20.7
E660.00-WC-MLV 133+21.764	Unnamed	CLOCA	1,102	6.1	33.2
E670.00-WC-MLV 133+24.860	Unnamed	CLOCA	285	2.2	12.0
E680.00-WC-MLV 133+25.231	Unnamed	CLOCA	22.8	0.33	1.8
E690.00-WC-MLV 133+26.632	Unnamed	CLOCA	161	1.4	7.8
Pipeline Segment MLV 134 - 134B					
E700.00-WC-MLV 134+0.266	Unnamed	CLOCA	16.3	0.26	1.4
E710.00-WC-MLV 134+0.495	Unnamed	CLOCA	25.4	0.36	2.0
E730.00-WC-MLV 134+1.801	Unnamed	CLOCA	51.3	0.61	3.3
E740.00-WC-MLV 134+2.800	Farewell Creek	CLOCA	1,686	7.0	18.2
E750.00-WC-MLV 134+3.952	Black Creek	CLOCA	521	2.9	7.6
E760.00-WC-MLV 134+5.385	Unnamed	CLOCA	159	1.2	3.1
E770.00-WC-MLV 134+5.921	Unnamed	CLOCA	54.4	0.54	1.4
E780.00-WC-MLV 134+7.023	Bowmanville Creek	CLOCA	3,749	12.8	33.2
E790.00-WC-MLV 134+7.558	Unnamed	CLOCA	3,690	12.7	32.8
E800.00-WC-MLV 134+8.125	Unnamed	CLOCA	20.3	0.26	0.66
E810.00-WC-MLV 134+9.253	Unnamed	CLOCA	32.9	0.37	0.95
E820.00-WC-MLV 134+9.750	Unnamed	CLOCA	186	1.4	3.5
E830.00-WC-MLV 134+10.230	Unnamed	CLOCA	20.6	0.26	0.67
E840.00-WC-MLV 134+10.642	Unnamed	CLOCA	227	1.6	4.0
E850.00-WC-MLV 134+11.266	Unnamed	CLOCA	8.3	0.18	0.38
E860.00-WC-MLV 134+11.871	Soper Creek	CLOCA	3,964	18.9	38.7
E870.00-WC-MLV 134+13.993	Unnamed	CLOCA	91.1	1.1	2.3
E880.00-WC-MLV 134+15.471	Unnamed	CLOCA	26.7	0.28	0.99
E890.00-WC-MLV 134+15.996	Unnamed	GRCA	41.4	0.39	1.4
E900.00-WC-MLV 134+16.365	Wilmot Creek	GRCA	3,758	11.5	40.6
E905.00-WC-MLV 134+16.444	Unnamed	GRCA	24.3	0.26	0.92

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[(a)]	Watercourse Name[(b)]	Conservation Authority[(c)]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
E910.00-WC-MLV 134+16.490	Unnamed	GRCA	23.2	0.25	0.89
E920.00-WC-MLV 134+16.680	Orono Creek	GRCA	1,781	6.6	23.2
E930.00-WC-MLV 134+18.490	Hunter Creek	GRCA	594	2.9	10.2
Pipeline Segment MLV 134B - 135					
E940.00-WC-MLV 134B+0.465	Unnamed	GRCA	19.5	0.22	0.78
E950.00-WC-MLV 134B+1.781	Unnamed	GRCA	240	1.5	5.2
E960.00-WC-MLV 134B+2.252	Stalker Creek	GRCA	633	3.0	10.7
E970.00-WC-MLV 134B+2.830	Unnamed	GRCA	23.6	0.26	0.90
E980.00-WC-MLV 134B+3.629	Unnamed	GRCA	46.5	0.43	1.5
E990.00-WC-MLV 134B+4.542	Unnamed	GRCA	203	1.3	4.5
E1000.00-WC-MLV 134B+4.795	Unnamed	GRCA	15.1	0.18	0.65
E1010.00-WC-MLV 134B+4.885	Unnamed	GRCA	27.2	0.29	1.0
E1020.00-WC-MLV 134B+5.646	Graham Creek	GRCA	5,168	14.6	51.5
E1040.00-WC-MLV 134B+7.134	Graham Creek	GRCA	2,652	8.8	31.2
E1050.00-WC-MLV 134B+7.347	Unnamed	GRCA	34.2	0.34	1.2
E1060.00-WC-MLV 134B+7.527	Unnamed	GRCA	27.0	0.28	1.0
E1070.00-WC-MLV 134B+7.580	Unnamed	GRCA	24.1	0.26	0.92
E1080.00-WC-MLV 134B+9.396	Graham Creek	GRCA	1,743	6.4	22.8
Pipeline Segment MLV 135 - 135A					
E1100.00-WC-MLV 135+0.661	Unnamed	GRCA	150	1.0	2.4
E1110.00-WC-MLV 135+0.725	Unnamed	GRCA	1,543	5.8	13.7
E1120.00-WC-MLV 135+1.699	Unnamed	GRCA	126	0.88	2.1
E1130.00-WC-MLV 135+3.652	Unnamed	GRCA	42.5	0.39	0.92
E1160.00-WC-MLV 135+4.528	Unnamed	GRCA	510	2.5	6.0
E1170.00-WC-MLV 135+4.716	Unnamed	GRCA	16.5	0.19	0.45
E1180.00-WC-MLV 135+6.212	Unnamed	GRCA	32.2	0.32	0.75
E1200.00-WC-MLV 135+7.590	Ganaraska River	GRCA	26,881	49.1	116
E1210.00-WC-MLV 135+10.450	Unnamed	GRCA	481	2.4	5.7
E1220.00-WC-MLV 135+11.851	Gage Creek	GRCA	1,979	6.9	16.5
Pipeline Segment MLV 135A - 136					
E1230.00-WC-MLV 135A+0.859	Unnamed	GRCA	470	2.4	5.6
E1240.00-WC-MLV 135A+1.716	Unnamed	GRCA	3,142	9.8	23.3
E1250.00-WC-MLV 135A+4.015	Unnamed	GRCA	217	1.3	3.1
E1260.00-WC-MLV 135A+7.122	Cobourg Brook	GRCA	7,365	18.6	44.1
E1270.00-WC-MLV 135A+8.259	Midtown Creek	GRCA	94.5	0.71	1.7
E1280.00-WC-MLV 135A+9.987	Unnamed	GRCA	371	2.0	4.7
E1290.00-WC-MLV 135A+11.483	Unnamed	GRCA	145	0.98	2.3
E1300.00-WC-MLV 135A+12.056	Unnamed	GRCA	20.8	0.23	0.54
E1310.00-WC-MLV 135A+16.191	Unnamed	LTRCA	649	3.0	7.1
E1330.00-WC-MLV 135A+20.617	Shelter Valley Creek	LTRCA	2,306	4.9	9.8
E1340.00-WC-MLV 135A+20.845	Unnamed	LTRCA	272	0.98	2.0
E1350.00-WC-MLV 135A+21.991	Unnamed	LTRCA	48.5	0.27	0.54
Pipeline Segment MLV 136 - 137					
E1360.00-WC-MLV 136+0.148	Unnamed	LTRCA	62.4	0.33	0.66
E1361.00-WC-MLV 136+0.177	Unnamed	LTRCA	67.6	0.35	0.70

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[(a)]	Watercourse Name[(b)]	Conservation Authority[(c)]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
E1370.00-WC-MLV 136+0.267	Unnamed	LTRCA	3.8	0.04	0.08
E1380.00-WC-MLV 136+0.432	Unnamed	LTRCA	31.6	0.20	0.39
E1390.00-WC-MLV 136+1.305	Unnamed	LTRCA	1,611	3.7	7.5
E1400.00-WC-MLV 136+4.373	Unnamed	LTRCA	449	1.4	2.9
E1410.00-WC-MLV 136+5.548	Unnamed	LTRCA	41.8	0.24	0.49
E1420.00-WC-MLV 136+7.704	Unnamed	LTRCA	1,347	3.3	6.6
E1430.00-WC-MLV 136+7.950	Unnamed	LTRCA	1,355	3.3	6.6
E1440.00-WC-MLV 136+8.008	Unnamed	LTRCA	1,357	3.3	6.6
E1450.00-WC-MLV 136+8.012	Unnamed	LTRCA	1,357	3.3	6.6
E1460.00-WC-MLV 136+8.025	Unnamed	LTRCA	1,357	3.3	6.6
E1470.00-WC-MLV 136+8.103	Unnamed	LTRCA	1,358	3.3	6.6
E1480.00-WC-MLV 136+8.489	Unnamed	LTRCA	2,548	5.3	10.6
E1490.00-WC-MLV 136+11.297	Unnamed	LTRCA	326	1.1	2.3
E1500.00-WC-MLV 136+11.327	Unnamed	LTRCA	326	1.1	2.3
E1510.00-WC-MLV 136+11.790	Cold Creek	LTRCA	7,146	11.4	23.0
E1520.00-WC-MLV 136+13.732	Cold Creek	LTRCA	11,857	16.7	33.6
E1530.00-WC-MLV 136+13.813	Unnamed	LTRCA	2.3	0.03	0.05
E1570.00-WC-MLV 136+19.441	Unnamed	LTRCA	120	0.53	1.1
Pipeline Segment MLV 137 - 138					
E1580.00-WC-MLV 137+0.610	Breakaway Creek	LTRCA	657	1.9	3.8
E1600.00-WC-MLV 137+2.850	Unnamed	LTRCA	32.4	0.20	0.40
E1610.00-WC-MLV 137+3.113	Unnamed	LTRCA	75.1	0.38	0.75
E1620.00-WC-MLV 137+3.758	Unnamed	LTRCA	74.8	0.37	0.75
E1630.00-WC-MLV 137+4.128	Unnamed	LTRCA	240	0.90	1.8
E1640.00-WC-MLV 137+4.896	Unnamed	LTRCA	13.6	0.10	0.21
E1700.00-WC-MLV 137+9.109	Unnamed	LTRCA	1,423	3.4	6.8
E1710.00-WC-MLV 137+9.173	Unnamed	LTRCA	18.4	0.13	0.26
E1720.00-WC-MLV 137+9.414	Unnamed	LTRCA	7.0	0.06	0.13
E1730.00-WC-MLV 137+9.496	Unnamed	LTRCA	2.6	0.03	0.06
E1740.00-WC-MLV 137+12.375	Unnamed	LTRCA	77.3	0.38	0.77
E1750.00-WC-MLV 137+13.471	Unnamed	LTRCA	Pond	n/a	n/a
E1760.00-WC-MLV 137+13.493	Unnamed	LTRCA	2.4	0.02	0.04
E1770.00-WC-MLV 137+13.527	Unnamed	LTRCA	815	1.2	3.0
E1780.00-WC-MLV 137+13.985	Unnamed	LTRCA	58.1	0.17	0.42
E1790.00-WC-MLV 137+14.840	Unnamed	LTRCA	Pond	n/a	n/a
E1800.00-WC-MLV 137+14.856	Unnamed	LTRCA	500	0.90	2.1
E1810.00-WC-MLV 137+16.906	Trent River	LTRCA	1,253,234	305	741
Pipeline Segment MLV 138 - 138A					
E1811.00-WC-MLV 137+18.054	Unnamed	LTRCA	89.9	0.24	0.58
E1812.00-WC-MLV 137+19.289	Unnamed	LTRCA	34.3	0.12	0.28
E1813.00-WC-MLV 137+20.12	Unnamed	LTRCA	150	0.35	0.85
E1814.00-WC-MLV 137+20.29	Unnamed	LTRCA	Lake	n/a	n/a
E1815.00-WC-MLV 137+20.862	Unnamed	LTRCA	137	0.33	0.79
E1816.00-WC-MLV 137+21.458	Unnamed	LTRCA	105	0.27	0.65

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[(a)]	Watercourse Name[(b)]	Conservation Authority[(c)]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
Pipeline Segment MLV 139 - 139A					
E1820.00-WC-MLV 139+2.718	Unnamed	QCA	26.0	0.09	0.23
E1830.00-WC-MLV 139+2.959	Unnamed	QCA	38.0	0.12	0.30
E1840.00-WC-MLV 139+3.749	Unnamed	QCA	1,011	1.5	3.6
E1841.00-WC-MLV 139+4.944	Unnamed	QCA	225	0.47	1.15
E1850.00-WC-MLV 139+5.020	Unnamed	QCA	281	0.56	1.4
E1860.00-WC-MLV 139+5.737	Salmon River	QCA	85,911	94.0	174
E1870.00-WC-MLV 139+7.180	Unnamed	QCA	228	1.1	2.0
E1880.00-WC-MLV 139+8.150	Unnamed	QCA	Pond	n/a	n/a
E1890.00-WC-MLV 139+10.920	Unnamed	QCA	67.2	0.44	0.81
E1900.00-WC-MLV 139+12.388	Marysville Creek	QCA	746	2.7	5.0
E1910.00-WC-MLV 139+13.606	Unnamed	QCA	56.2	0.38	0.71
Pipeline Segment MLV 139A - 140					
E1920.00-WC-MLV 139A+1.706	Unnamed	QCA	433	1.8	3.3
E1930.00-WC-MLV 139A+5.125	Unnamed	QCA	25.3	0.21	0.39
Pipeline Segment MLV 140 - 140A					
E1940.00-WC-MLV 140+0.429	Sucker Creek	QCA	6,111	12.9	24.0
E1950.00-WC-MLV 140+0.477	Unnamed	QCA	5.1	0.06	0.12
E1960.00-WC-MLV 140+1.675	Unnamed	QCA	202	1.0	1.9
E1970.00-WC-MLV 140+1.698	Unnamed	QCA	32.6	0.26	0.47
E1980.00-WC-MLV 140+3.285	Napanee River	QCA	79,814	88.9	165
E1990.00-WC-MLV 140+3.430	Unnamed	QCA	124	0.70	1.3
E2000.00-WC-MLV 140+6.250	Unnamed	CRCA	48.6	0.34	0.64
E2010.00-WC-MLV 140+7.458	Unnamed	CRCA	382	1.6	3.0
E2020.00-WC-MLV 140+7.862	Unnamed	CRCA	515	2.0	3.8
Pipeline Segment MLV 140A - 141					
E2030.00-WC-MLV 140A+0.749	Little Creek	CRCA	2,593	6.8	12.6
E2040.00-WC-MLV 140A+2.437	Unnamed	CRCA	195	0.98	1.8
E2050.00-WC-MLV 140A+4.040	Unnamed	CRCA	88.5	0.54	1.0
E2060.00-WC-MLV 140A+6.889	Spring Creek	CRCA	580	2.2	4.1
E2070.00-WC-MLV 140A+9.523	Wilton Creek	CRCA	8,278	16.2	30.1
E2080.00-WC-MLV 140A+13.614	Unnamed	CRCA	101	0.75	1.8
E2090.00-WC-MLV 140A+13.755	Unnamed	CRCA	117	0.84	2.0
E2100.00-WC-MLV 140A+15.134	Millhaven Creek	CRCA	12,118	27.4	66.0
Pipeline Segment MLV 142 - 142A					
E2110.00-WC-MLV 142+0.734	Unnamed	CRCA	34.8	0.34	0.82
E2130.00-WC-MLV 142+3.500	Unnamed	CRCA	5.9	0.09	0.22
E2140.00-WC-MLV 142+3.879	Unnamed	CRCA	87.4	0.68	1.6
E2150.00-WC-MLV 142+5.017	Unnamed	CRCA	17.6	0.20	0.49
E2190.00-WC-MLV 142+7.006	Unnamed	CRCA	45.1	0.41	0.99
E2200.00-WC-MLV 142+7.476	Unnamed	CRCA	64.6	0.54	1.3
E2210.00-WC-MLV 142+7.616	Unnamed	CRCA	71.7	0.58	1.4
E2220.00-WC-MLV 142+7.960	Mud Creek	CRCA	1,102	4.5	10.9
E2230.00-WC-MLV 142+8.100	Unnamed	CRCA	1,300	5.1	12.4
E2240.00-WC-MLV 142+9.175	Unnamed	CRCA	454	2.3	5.6

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[(a)]	Watercourse Name[(b)]	Conservation Authority[(c)]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
E2250.00-WC-MLV 142+9.895	Unnamed	CRCA	9.4	0.13	0.31
Pipeline Segment MLV 142A - 143					
E2260.00-WC-MLV 142A+0.338	Unnamed	CRCA	57.4	0.49	1.2
E2270.00-WC-MLV 142A+1.942	Unnamed	CRCA	42.0	0.39	0.94
E2280.00-WC-MLV 142A+2.040	Unnamed	CRCA	44.0	0.41	0.98
E2290.00-WC-MLV 142A+2.980	Sucker Brook	CRCA	2,383	8.2	15.0
E2300.00-WC-MLV 142A+4.039	Unnamed	CRCA	19.3	0.22	0.40
E2310.00-WC-MLV 142A+4.533	Unnamed	CRCA	14.6	0.18	0.33
E2320.00-WC-MLV 142A+5.075	Unnamed	CRCA	84.9	0.68	1.2
E2330.00-WC-MLV 142A+6.350	Unnamed	CRCA	15.5	0.19	0.34
E2340.00-WC-MLV 142A+6.407	Unnamed	CRCA	16.7	0.20	0.36
E2350.00-WC-MLV 142A+6.579	Gananoque River	CRCA	93,478	129	235
E2360.00-WC-MLV 142A+7.944	Unnamed	CRCA	22.9	0.25	0.46
E2370.00-WC-MLV 142A+9.814	Unnamed	CRCA	352	2.0	3.6
E2380.00-WC-MLV 142A+11.669	Unnamed	CRCA	11.3	0.15	0.27
E2390.00-WC-MLV 142A+12.152	Unnamed	CRCA	2.5	0.05	0.09
E2400.00-WC-MLV 142A+13.016	Unnamed	CRCA	1,846	6.8	12.4
E2410.00-WC-MLV 142A+14.922	Unnamed	CRCA	27.5	0.29	0.53
E2420.00-WC-MLV 142A+14.940	Unnamed	CRCA	19.4	0.22	0.41
E2430.00-WC-MLV 142A+15.026	Unnamed	CRCA	26.7	0.28	0.52
E2440.00-WC-MLV 142A+15.080	Unnamed	CRCA	23.8	0.26	0.47
E2450.00-WC-MLV 142A+17.307	Unnamed	CRCA	253	1.5	2.8
E2460.00-WC-MLV 142A+17.711	Black Creek	CRCA	2,487	8.5	15.5
E2470.00-WC-MLV 142A+18.818	Unnamed	CRCA	514	2.6	4.7
E2480.00-WC-MLV 142A+18.945	Unnamed	CRCA	2.9	0.05	0.10
E2490.00-WC-MLV 142A+19.578	Unnamed	CRCA	480	2.5	4.5
E2500.00-WC-MLV 142A+19.951	Unnamed	CRCA	88.2	0.69	1.3
E2520.00-WC-MLV 142A+21.040	Unnamed	CRCA	11.2	0.15	0.27
E2530.00-WC-MLV 142A+21.348	Unnamed	CRCA	3.8	0.07	0.12
Pipeline Segment MLV 143A – 144					
E2531.00-WC-MLV 143A+1.167	Butler's Creek	CRCA	2,205	7.77	14.13
E2532.00-WC-MLV 143A+3.208	Unnamed	CRCA	15.2	0.18	0.42
E2533.00-WC-MLV 143A+4.878	Unnamed	SNCA	22.1	0.23	0.56
E2534.00-WC-MLV 143A+5.325	Unnamed	SNCA	46.8	0.41	0.98
E2535.00-WC-MLV 143A+5.843	Unnamed	SNCA	49.4	0.43	1.02
E2536.00-WC-MLV 143A+6.511	Unnamed	SNCA	55.8	0.47	1.12
E2537.00-WC-MLV 143A+8.180	Unnamed	SNCA	397	2.05	4.86
Pipeline Segment MLV 144 - 145					
E2540.00-WC-MLV 144+0.868	Unnamed	SNCA	278	1.6	3.7
E2550.00-WC-MLV 144+1.506	Unnamed	SNCA	24.9	0.26	0.61
E2560.00-WC-MLV 144+4.973	Unnamed	SNCA	85.7	0.65	1.5
E2570.00-WC-MLV 144+6.005	Unnamed	SNCA	1,002	4.1	9.7
E2580.00-WC-MLV 144+8.675	Unnamed	SNCA	80.4	0.62	1.5
E2590.00-WC-MLV 144+9.089	Unnamed	SNCA	136	0.92	2.2
E2600.00-WC-MLV 144+10.173	Unnamed	SNCA	1,058	4.3	10.1

Table H-2: Estimated Flood Discharges at Watercourse Crossings

Water Crossing ID[a]	Watercourse Name[b]	Conservation Authority[c]	Drainage Area [ha]	2-Year Discharge [m^3/s]	100-Year Discharge [m^3/s]
E2610.00-WC-MLV 144+13.442	Unnamed	SNCA	14.2	0.17	0.40
E2620.00-WC-MLV 144+17.420	Unnamed	SNCA	431	2.2	5.2
E2630.00-WC-MLV 144+18.822	Unnamed	SNCA	1,372	5.2	12.3
E2640.00-WC-MLV 144+20.095	Unnamed	SNCA	81.5	0.62	1.5
E2650.00-WC-MLV 144+20.583	Unnamed	SNCA	10.4	0.13	0.32
E2660.00-WC-MLV 144+21.570	Unnamed	SNCA	28.6	0.28	0.68
E2670.00-WC-MLV 144+21.628	Unnamed	SNCA	30.5	0.30	0.71
E2680.00-WC-MLV 144+21.780	Unnamed	SNCA	40.2	0.37	0.87
E2690.00-WC-MLV 144+22.150	Unnamed	SNCA	50.0	0.43	1.0
E2700.00-WC-MLV 144+22.696	Unnamed	SNCA	2,430	8.0	18.9
E2710.00-WC-MLV 144+22.827	Unnamed	SNCA	20.9	0.22	0.53
E2720.00-WC-MLV 144+23.404	Unnamed	SNCA	114	0.80	1.9
E2730.00-WC-MLV 144+23.584	Unnamed	SNCA	11.5	0.14	0.34
E2740.00-WC-MLV 144+24.100	Unnamed	SNCA	127	0.87	2.1
E2750.00-WC-MLV 144+25.321	Unnamed	SNCA	46.1	0.41	0.97

[a] Water Crossing Identification (ID) naming based on the pipeline alignment, dated September 28, 2015.

[b] Based on conservation authority watercourse mapping data, where available. Where conservation authority watercourse mapping data were not available, based on MNRF LIO geospatial data mapping (MNRF 2013a, MNRF 2014a)[c]

Note: TRCA = Toronto and Region Conservation Authority
CLOCA = Central Lake Ontario Conservation Authority
GRCA = Ganaraska Region Conservation Authority
LTRCA = Lower Trent Region Conservation Authority
QCA = Quinte Conservation Authority
CRCA = Cataraqui Region Conservation Authority
SNCA = South Nation Conservation Authority
n/a = not applicable

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[a]	Conservation Authority[c]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pipeline Segment MLV 132 - 133													
E10.00-WC-MLV 132+1.098	TRCA	0.02	0.03	0.06	0.05	0.02	0.01	<0.01	<0.01	0.01	0.01	0.03	0.03
E20.00-WC-MLV 132+1.709	TRCA	0.22	0.29	0.61	0.49	0.20	0.11	0.09	0.09	0.11	0.13	0.25	0.26
E30.00-WC-MLV 132+2.476 [b]	TRCA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E40.00-WC-MLV 132+2.557	TRCA	0.03	0.03	0.07	0.06	0.02	0.01	0.01	0.01	0.01	0.02	0.03	0.03
E50.00-WC-MLV 132+2.759	TRCA	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E60.00-WC-MLV 132+3.954	TRCA	<0.01	0.01	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E70.00-WC-MLV 132+4.937	TRCA	0.06	0.08	0.17	0.13	0.06	0.03	0.03	0.03	0.03	0.04	0.07	0.07
E80.00-WC-MLV 132+5.828	TRCA	0.59	0.77	1.6	1.3	0.54	0.28	0.25	0.24	0.28	0.35	0.66	0.69
E90.00-WC-MLV 132+7.009	TRCA	0.02	0.03	0.06	0.05	0.02	0.01	<0.01	<0.01	0.01	0.01	0.02	0.03
E100.00-WC-MLV 132+9.232	TRCA	0.01	0.02	0.04	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02
E105.00-WC-MLV 132+10.777	TRCA	0.01	0.02	0.04	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02
E110.00-WC-MLV 132+12.359	TRCA	0.14	0.18	0.39	0.31	0.13	0.07	0.06	0.06	0.07	0.09	0.16	0.17
E120.00-WC-MLV 132+12.799	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E130.00-WC-MLV 132+12.849	TRCA	0.17	0.22	0.46	0.36	0.15	0.08	0.07	0.07	0.08	0.10	0.19	0.19
E140.00-WC-MLV 132+12.977	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E150.00-WC-MLV 132+14.019	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E160.00-WC-MLV 132+14.898	TRCA	0.19	0.21	0.41	0.39	0.19	0.14	0.12	0.13	0.13	0.16	0.20	0.23
E170.00-WC-MLV 132+15.36	TRCA	0.07	0.07	0.15	0.14	0.07	0.05	0.04	0.05	0.05	0.06	0.07	0.08
E180.00-WC-MLV 132+15.791	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E190.00-WC-MLV 132+16.381	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E200.00-WC-MLV 132+16.648	TRCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E210.00-WC-MLV 132+18.073	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E220.00-WC-MLV 132+18.301	TRCA	0.02	0.02	0.05	0.04	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.03
E230.00-WC-MLV 132+18.601	TRCA	0.02	0.02	0.04	0.04	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02
E240.00-WC-MLV 132+18.896	TRCA	0.04	0.05	0.09	0.09	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.05
E250.00-WC-MLV 132+19.211	TRCA	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E260.00-WC-MLV 132+19.453	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E270.00-WC-MLV 132+19.527	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E280.00-WC-MLV 132+20.034	TRCA	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E290.00-WC-MLV 132+20.038	TRCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E300.00-WC-MLV 132+21.555	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E320.00-WC-MLV 132+22.054	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E330.00-WC-MLV 132+22.505	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pipeline Segment MLV 133 - 134													
E340.00-WC-MLV 133+0.863	TRCA	0.09	0.11	0.18	0.15	0.08	0.06	0.05	0.05	0.06	0.06	0.08	0.09
E350.00-WC-MLV 133+1.391	TRCA	0.29	0.37	0.60	0.50	0.28	0.20	0.18	0.18	0.19	0.21	0.28	0.30
E360.00-WC-MLV 133+1.754	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E370.00-WC-MLV 133+2.156	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E380.00-WC-MLV 133+2.372	TRCA	0.02	0.03	0.05	0.04	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02
E390.00-WC-MLV 133+2.929	TRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E400.00-WC-MLV 133+3.528	CLOCA	0.05	0.06	0.10	0.08	0.05	0.03	0.03	0.03	0.03	0.04	0.05	0.05
E410.00-WC-MLV 133+5.429	CLOCA	0.05	0.06	0.10	0.08	0.05	0.03	0.03	0.03	0.03	0.03	0.05	0.05
E420.00-WC-MLV 133+7.320	CLOCA	0.02	0.02	0.03	0.03	0.01	0.01	<0.01	<0.01	0.01	0.01	0.01	0.02
E430.00-WC-MLV 133+8.506	CLOCA	0.09	0.13	0.23	0.20	0.09	0.05	0.04	0.04	0.04	0.05	0.09	0.10
E440.00-WC-MLV 133+8.642	CLOCA	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E450.00-WC-MLV 133+9.022	CLOCA	0.02	0.03	0.06	0.05	0.02	0.01	<0.01	<0.01	0.01	0.01	0.02	0.02
E460.00-WC-MLV 133+9.039	CLOCA	0.02	0.03	0.06	0.05	0.02	0.01	<0.01	<0.01	0.01	0.01	0.02	0.02
E480.00-WC-MLV 133+9.231	CLOCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E490.00-WC-MLV 133+10.045	CLOCA	0.09	0.13	0.25	0.21	0.10	0.05	0.04	0.04	0.05	0.06	0.09	0.11
E500.00-WC-MLV 133+11.163	CLOCA	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E510.00-WC-MLV 133+11.739	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E530.00-WC-MLV 133+12.124	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E540.00-WC-MLV 133+12.680	CLOCA	0.02	0.03	0.06	0.06	0.03	0.01	0.01	0.01	0.01	0.01	0.02	0.03
E550.00-WC-MLV 133+13.305	CLOCA	0.03	0.05	0.09	0.08	0.04	0.02	0.02	0.01	0.02	0.02	0.03	0.04
E560.00-WC-MLV 133+13.834	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E570.00-WC-MLV 133+15.256	CLOCA	0.07	0.09	0.17	0.15	0.07	0.04	0.03	0.03	0.03	0.04	0.07	0.08
E580.00-WC-MLV 133+16.140	CLOCA	0.05	0.07	0.11	0.10	0.05	0.04	0.03	0.03	0.03	0.04	0.05	0.05
E590.00-WC-MLV 133+16.878	CLOCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E600.00-WC-MLV 133+17.380	CLOCA	0.02	0.02	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E610.00-WC-MLV 133+17.822	CLOCA	<0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E620.00-WC-MLV 133+18.092	CLOCA	0.12	0.15	0.25	0.22	0.12	0.09	0.08	0.07	0.08	0.08	0.11	0.11
E630.00-WC-MLV 133+18.458	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E650.00-WC-MLV 133+20.403	CLOCA	0.06	0.08	0.14	0.12	0.07	0.05	0.04	0.04	0.04	0.04	0.06	0.06
E660.00-WC-MLV 133+21.764	CLOCA	0.12	0.15	0.26	0.22	0.13	0.09	0.08	0.07	0.08	0.08	0.11	0.12
E670.00-WC-MLV 133+24.860	CLOCA	0.03	0.04	0.07	0.06	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03
E680.00-WC-MLV 133+25.231	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E690.00-WC-MLV 133+26.632	CLOCA	0.02	0.02	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02
Pipeline Segment MLV 134 - 134B													
E700.00-WC-MLV 134+0.266	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E710.00-WC-MLV 134+0.495	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E730.00-WC-MLV 134+1.801	CLOCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E740.00-WC-MLV 134+2.800	CLOCA	0.20	0.24	0.43	0.36	0.20	0.13	0.12	0.12	0.13	0.15	0.20	0.22
E750.00-WC-MLV 134+3.952	CLOCA	0.06	0.07	0.13	0.11	0.06	0.04	0.04	0.04	0.04	0.05	0.06	0.07
E760.00-WC-MLV 134+5.385	CLOCA	0.02	0.02	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.02
E770.00-WC-MLV 134+5.921	CLOCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E780.00-WC-MLV 134+7.023	CLOCA	0.44	0.53	0.96	0.80	0.44	0.29	0.27	0.26	0.29	0.34	0.44	0.48
E790.00-WC-MLV 134+7.558	CLOCA	0.44	0.52	0.94	0.78	0.43	0.28	0.26	0.26	0.28	0.33	0.43	0.47
E800.00-WC-MLV 134+8.125	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E810.00-WC-MLV 134+9.253	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E820.00-WC-MLV 134+9.750	CLOCA	0.02	0.03	0.05	0.04	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.02
E830.00-WC-MLV 134+10.230	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E840.00-WC-MLV 134+10.642	CLOCA	0.03	0.03	0.06	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03
E850.00-WC-MLV 134+11.266	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E860.00-WC-MLV 134+11.871	CLOCA	0.33	0.47	0.86	0.86	0.37	0.22	0.18	0.19	0.22	0.24	0.37	0.40
E870.00-WC-MLV 134+13.993	CLOCA	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E880.00-WC-MLV 134+15.471	CLOCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E890.00-WC-MLV 134+15.996	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E900.00-WC-MLV 134+16.365	GRCA	0.42	0.49	0.78	0.70	0.40	0.28	0.24	0.23	0.26	0.30	0.39	0.43
E905.00-WC-MLV 134+16.444	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E910.00-WC-MLV 134+16.490	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E920.00-WC-MLV 134+16.680	GRCA	0.20	0.23	0.37	0.33	0.19	0.13	0.11	0.11	0.12	0.14	0.18	0.20
E930.00-WC-MLV 134+18.490	GRCA	0.07	0.08	0.12	0.11	0.06	0.04	0.04	0.04	0.04	0.05	0.06	0.07
Pipeline Segment MLV 134B - 135													
E940.00-WC-MLV 134B+0.465	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E950.00-WC-MLV 134B+1.781	GRCA	0.03	0.03	0.05	0.04	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.03
E960.00-WC-MLV 134B+2.252	GRCA	0.07	0.08	0.13	0.12	0.07	0.05	0.04	0.04	0.04	0.05	0.07	0.07
E970.00-WC-MLV 134B+2.830	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E980.00-WC-MLV 134B+3.629	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E990.00-WC-MLV 134B+4.542	GRCA	0.02	0.03	0.04	0.04	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.02
E1000.00-WC-MLV 134B+4.795	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1010.00-WC-MLV 134B+4.885	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1020.00-WC-MLV 134B+5.646	GRCA	0.58	0.67	1.1	0.96	0.55	0.39	0.33	0.32	0.35	0.41	0.53	0.59
E1040.00-WC-MLV 134B+7.134	GRCA	0.30	0.35	0.55	0.49	0.28	0.20	0.17	0.16	0.18	0.21	0.27	0.30
E1050.00-WC-MLV 134B+7.347	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1060.00-WC-MLV 134B+7.527	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1070.00-WC-MLV 134B+7.580	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1080.00-WC-MLV 134B+9.396	GRCA	0.19	0.23	0.36	0.32	0.19	0.13	0.11	0.11	0.12	0.14	0.18	0.20
Pipeline Segment MLV 135 - 135A													
E1100.00-WC-MLV 135+0.661	GRCA	0.02	0.02	0.04	0.04	0.02	0.01	0.01	<0.01	0.01	0.01	0.02	0.02
E1110.00-WC-MLV 135+0.725	GRCA	0.20	0.23	0.42	0.39	0.21	0.13	0.11	0.10	0.10	0.13	0.17	0.19
E1120.00-WC-MLV 135+1.699	GRCA	0.02	0.02	0.03	0.03	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02
E1130.00-WC-MLV 135+3.652	GRCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1160.00-WC-MLV 135+4.528	GRCA	0.07	0.08	0.14	0.13	0.07	0.04	0.03	0.03	0.03	0.04	0.06	0.06
E1170.00-WC-MLV 135+4.716	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1180.00-WC-MLV 135+6.212	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1200.00-WC-MLV 135+7.590	GRCA	3.4	4.1	7.2	6.8	3.7	2.3	1.8	1.7	1.8	2.2	2.9	3.2
E1210.00-WC-MLV 135+10.450	GRCA	0.06	0.07	0.13	0.12	0.07	0.04	0.03	0.03	0.03	0.04	0.05	0.06
E1220.00-WC-MLV 135+11.851	GRCA	0.25	0.30	0.53	0.50	0.27	0.17	0.14	0.12	0.13	0.16	0.21	0.24

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pipeline Segment MLV 135A - 136													
E1230.00-WC-MLV 135A+0.859	GRCA	0.06	0.07	0.13	0.12	0.06	0.04	0.03	0.03	0.03	0.04	0.05	0.06
E1240.00-WC-MLV 135A+1.716	GRCA	0.40	0.48	0.85	0.80	0.43	0.27	0.22	0.20	0.21	0.26	0.34	0.38
E1250.00-WC-MLV 135A+4.015	GRCA	0.03	0.03	0.06	0.06	0.03	0.02	0.01	0.01	0.01	0.02	0.02	0.03
E1260.00-WC-MLV 135A+7.122	GRCA	0.94	1.1	2.0	1.9	1.0	0.63	0.50	0.46	0.50	0.61	0.80	0.89
E1270.00-WC-MLV 135A+8.259	GRCA	0.01	0.01	0.03	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E1280.00-WC-MLV 135A+9.987	GRCA	0.05	0.06	0.10	0.09	0.05	0.03	0.03	0.02	0.03	0.03	0.04	0.04
E1290.00-WC-MLV 135A+11.483	GRCA	0.02	0.02	0.04	0.04	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.02	0.02
E1300.00-WC-MLV 135A+12.056	GRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1310.00-WC-MLV 135A+16.191	LTRCA	0.08	0.10	0.17	0.17	0.09	0.06	0.04	0.04	0.04	0.05	0.07	0.08
E1330.00-WC-MLV 135A+20.617	LTRCA	0.30	0.31	0.53	0.52	0.31	0.22	0.18	0.15	0.17	0.22	0.29	0.32
E1340.00-WC-MLV 135A+20.845	LTRCA	0.04	0.04	0.06	0.06	0.04	0.03	0.02	0.02	0.02	0.03	0.03	0.04
E1350.00-WC-MLV 135A+21.991	LTRCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pipeline Segment MLV 136 - 137													
E1360.00-WC-MLV 136+0.148	LTRCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1361.00-WC-MLV 136+0.177	LTRCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1370.00-WC-MLV 136+0.267	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1380.00-WC-MLV 136+0.432	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1390.00-WC-MLV 136+1.305	LTRCA	0.21	0.22	0.37	0.36	0.21	0.15	0.12	0.11	0.12	0.15	0.20	0.23
E1400.00-WC-MLV 136+4.373	LTRCA	0.06	0.06	0.10	0.10	0.06	0.04	0.03	0.03	0.03	0.04	0.06	0.06
E1410.00-WC-MLV 136+5.548	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1420.00-WC-MLV 136+7.704	LTRCA	0.17	0.18	0.31	0.30	0.18	0.13	0.10	0.09	0.10	0.13	0.17	0.19
E1430.00-WC-MLV 136+7.950	LTRCA	0.17	0.18	0.31	0.31	0.18	0.13	0.10	0.09	0.10	0.13	0.17	0.19
E1440.00-WC-MLV 136+8.008	LTRCA	0.18	0.18	0.31	0.31	0.18	0.13	0.10	0.09	0.10	0.13	0.17	0.19
E1450.00-WC-MLV 136+8.012	LTRCA	0.18	0.18	0.31	0.31	0.18	0.13	0.10	0.09	0.10	0.13	0.17	0.19
E1460.00-WC-MLV 136+8.025	LTRCA	0.18	0.18	0.31	0.31	0.18	0.13	0.10	0.09	0.10	0.13	0.17	0.19
E1470.00-WC-MLV 136+8.103	LTRCA	0.18	0.18	0.31	0.31	0.18	0.13	0.10	0.09	0.10	0.13	0.17	0.19
E1480.00-WC-MLV 136+8.489	LTRCA	0.33	0.35	0.59	0.57	0.34	0.24	0.20	0.17	0.19	0.24	0.32	0.36
E1490.00-WC-MLV 136+11.297	LTRCA	0.04	0.04	0.08	0.07	0.04	0.03	0.03	0.02	0.02	0.03	0.04	0.05
E1500.00-WC-MLV 136+11.327	LTRCA	0.04	0.04	0.08	0.07	0.04	0.03	0.03	0.02	0.02	0.03	0.04	0.05

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E1510.00-WC-MLV 136+11.790	LTRCA	0.92	0.97	1.7	1.6	0.95	0.67	0.55	0.47	0.53	0.68	0.91	1.0
E1520.00-WC-MLV 136+13.732	LTRCA	1.5	1.6	2.8	2.7	1.6	1.1	0.92	0.79	0.89	1.1	1.5	1.7
E1530.00-WC-MLV 136+13.813	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1570.00-WC-MLV 136+19.441	LTRCA	0.02	0.02	0.03	0.03	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.02	0.02
Pipeline Segment MLV 137 - 138													
E1580.00-WC-MLV 137+0.610	LTRCA	0.08	0.09	0.15	0.15	0.09	0.06	0.05	0.04	0.05	0.06	0.08	0.09
E1600.00-WC-MLV 137+2.850	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1610.00-WC-MLV 137+3.113	LTRCA	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E1620.00-WC-MLV 137+3.758	LTRCA	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E1630.00-WC-MLV 137+4.128	LTRCA	0.03	0.03	0.06	0.05	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03
E1640.00-WC-MLV 137+4.896	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1700.00-WC-MLV 137+9.109	LTRCA	0.18	0.19	0.33	0.32	0.19	0.13	0.11	0.09	0.11	0.13	0.18	0.20
E1710.00-WC-MLV 137+9.173	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1720.00-WC-MLV 137+9.414	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1730.00-WC-MLV 137+9.496	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1740.00-WC-MLV 137+12.375	LTRCA	<0.01	0.01	0.02	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E1750.00-WC-MLV 137+13.471 [(b)]	LTRCA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E1760.00-WC-MLV 137+13.493	LTRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1770.00-WC-MLV 137+13.527	LTRCA	0.08	0.07	0.18	0.26	0.13	0.05	0.02	0.01	0.01	0.02	0.05	0.08
E1780.00-WC-MLV 137+13.985	LTRCA	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1790.00-WC-MLV 137+14.840 [(b)]	LTRCA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E1800.00-WC-MLV 137+14.856	LTRCA	0.05	0.04	0.11	0.16	0.08	0.03	0.01	<0.01	<0.01	0.01	0.03	0.05
E1810.00-WC-MLV 137+16.906	LTRCA	121	105	269	402	194	77.4	32.0	20.1	21.4	36.0	81.6	125
Pipeline Segment MLV 138 - 138A													
E1811.00-WC-MLV 137+18.054	LTRCA	<0.01	<0.01	0.02	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1812.00-WC-MLV 137+19.289	LTRCA	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1813.00-WC-MLV 137+20.12	LTRCA	0.01	0.01	0.03	0.05	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E1814.00-WC-MLV 137+20.29 [(b)]	LTRCA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E1815.00-WC-MLV 137+20.862	LTRCA	0.01	0.01	0.03	0.04	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E1816.00-WC-MLV 137+21.458	LTRCA	0.01	<0.01	0.02	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pipeline Segment MLV 139 - 139A													
E1820.00-WC-MLV 139+2.718	QCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1830.00-WC-MLV 139+2.959	QCA	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1840.00-WC-MLV 139+3.749	QCA	0.10	0.08	0.22	0.32	0.16	0.06	0.03	0.02	0.02	0.03	0.07	0.10
E1841.00-WC-MLV 139+4.944	QCA	0.02	0.02	0.05	0.07	0.03	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02
E1850.00-WC-MLV 139+5.020	QCA	0.03	0.02	0.06	0.09	0.04	0.02	<0.01	<0.01	<0.01	<0.01	0.02	0.03
E1860.00-WC-MLV 139+5.737	QCA	13.6	13.7	29.9	26.9	8.8	4.8	1.3	1.1	2.5	4.7	13.3	17.2
E1870.00-WC-MLV 139+7.180	QCA	0.04	0.04	0.08	0.07	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.04	0.05
E1880.00-WC-MLV 139+8.150 [(b)]	QCA	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
E1890.00-WC-MLV 139+10.920	QCA	0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E1900.00-WC-MLV 139+12.388	QCA	0.12	0.12	0.26	0.23	0.08	0.04	0.01	<0.01	0.02	0.04	0.12	0.15
E1910.00-WC-MLV 139+13.606	QCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Pipeline Segment MLV 139A - 140													
E1920.00-WC-MLV 139A+1.706	QCA	0.07	0.07	0.15	0.14	0.04	0.02	<0.01	<0.01	0.01	0.02	0.07	0.09
E1930.00-WC-MLV 139A+5.125	QCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pipeline Segment MLV 140 - 140A													
E1940.00-WC-MLV 140+0.429	QCA	0.97	0.97	2.1	1.9	0.62	0.34	0.09	0.08	0.18	0.33	0.95	1.2
E1950.00-WC-MLV 140+0.477	QCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1960.00-WC-MLV 140+1.675	QCA	0.03	0.03	0.07	0.06	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.03	0.04
E1970.00-WC-MLV 140+1.698	QCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E1980.00-WC-MLV 140+3.285	QCA	12.6	12.7	27.7	25.0	8.1	4.4	1.2	1.0	2.3	4.3	12.4	16.0
E1990.00-WC-MLV 140+3.430	QCA	0.02	0.02	0.04	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02
E2000.00-WC-MLV 140+6.250	CRCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2010.00-WC-MLV 140+7.458	CRCA	0.06	0.06	0.13	0.12	0.04	0.02	<0.01	<0.01	0.01	0.02	0.06	0.08
E2020.00-WC-MLV 140+7.862	CRCA	0.08	0.08	0.18	0.16	0.05	0.03	<0.01	<0.01	0.02	0.03	0.08	0.10
Pipeline Segment MLV 140A - 141													
E2030.00-WC-MLV 140A+0.749	CRCA	0.41	0.41	0.90	0.81	0.26	0.14	0.04	0.03	0.08	0.14	0.40	0.52
E2040.00-WC-MLV 140A+2.437	CRCA	0.03	0.03	0.07	0.06	0.02	0.01	<0.01	<0.01	<0.01	0.01	0.03	0.04
E2050.00-WC-MLV 140A+4.040	CRCA	0.01	0.01	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02
E2060.00-WC-MLV 140A+6.889	CRCA	0.09	0.09	0.20	0.18	0.06	0.03	<0.01	<0.01	0.02	0.03	0.09	0.12

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E2070.00-WC-MLV 140A+9.523	CRCA	1.3	1.3	2.9	2.6	0.84	0.46	0.13	0.11	0.24	0.45	1.3	1.7
E2080.00-WC-MLV 140A+13.614	CRCA	0.03	0.02	0.05	0.06	0.02	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.03
E2090.00-WC-MLV 140A+13.755	CRCA	0.03	0.03	0.06	0.07	0.02	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.04
E2100.00-WC-MLV 140A+15.134	CRCA	3.1	2.7	6.5	7.0	2.2	0.92	0.30	0.24	0.68	1.3	3.0	3.8
Pipeline Segment MLV 142 - 142A													
E2110.00-WC-MLV 142+0.734	CRCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E2130.00-WC-MLV 142+3.500	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2140.00-WC-MLV 142+3.879	CRCA	0.02	0.02	0.05	0.05	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.03
E2150.00-WC-MLV 142+5.017	CRCA	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2190.00-WC-MLV 142+7.006	CRCA	0.01	0.01	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E2200.00-WC-MLV 142+7.476	CRCA	0.02	0.01	0.03	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02
E2210.00-WC-MLV 142+7.616	CRCA	0.02	0.02	0.04	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02
E2220.00-WC-MLV 142+7.960	CRCA	0.28	0.24	0.59	0.64	0.20	0.08	0.03	0.02	0.06	0.12	0.28	0.34
E2230.00-WC-MLV 142+8.100	CRCA	0.33	0.29	0.70	0.75	0.24	0.10	0.03	0.03	0.07	0.14	0.33	0.41
E2240.00-WC-MLV 142+9.175	CRCA	0.11	0.10	0.24	0.26	0.08	0.03	0.01	<0.01	0.03	0.05	0.11	0.14
E2250.00-WC-MLV 142+9.895	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pipeline Segment MLV 142A - 143													
E2260.00-WC-MLV 142A+0.338	CRCA	0.01	0.01	0.03	0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02
E2270.00-WC-MLV 142A+1.942	CRCA	0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E2280.00-WC-MLV 142A+2.040	CRCA	0.01	<0.01	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E2290.00-WC-MLV 142A+2.980	CRCA	0.30	0.29	0.68	0.77	0.20	0.08	0.03	0.02	0.03	0.14	0.27	0.30
E2300.00-WC-MLV 142A+4.039	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2310.00-WC-MLV 142A+4.533	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2320.00-WC-MLV 142A+5.075	CRCA	0.01	0.01	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E2330.00-WC-MLV 142A+6.350	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2340.00-WC-MLV 142A+6.407	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2350.00-WC-MLV 142A+6.579	CRCA	11.9	11.2	26.6	30.4	7.7	3.2	1.1	0.9	1.3	5.4	10.5	11.6
E2360.00-WC-MLV 142A+7.944	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2370.00-WC-MLV 142A+9.814	CRCA	0.04	0.04	0.10	0.11	0.03	0.01	<0.01	<0.01	<0.01	0.02	0.04	0.04
E2380.00-WC-MLV 142A+11.669	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[(a)]	Conservation Authority[(c)]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E2390.00-WC-MLV 142A+12.152	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2400.00-WC-MLV 142A+13.016	CRCA	0.23	0.22	0.53	0.60	0.15	0.06	0.02	0.02	0.03	0.11	0.21	0.23
E2410.00-WC-MLV 142A+14.922	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2420.00-WC-MLV 142A+14.940	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2430.00-WC-MLV 142A+15.026	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2440.00-WC-MLV 142A+15.080	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2450.00-WC-MLV 142A+17.307	CRCA	0.03	0.03	0.07	0.08	0.02	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.03
E2460.00-WC-MLV 142A+17.711	CRCA	0.32	0.30	0.71	0.81	0.20	0.08	0.03	0.02	0.04	0.14	0.28	0.31
E2470.00-WC-MLV 142A+18.818	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2480.00-WC-MLV 142A+18.945	CRCA	0.07	0.06	0.15	0.17	0.04	0.02	<0.01	<0.01	<0.01	0.03	0.06	0.06
E2490.00-WC-MLV 142A+19.578	CRCA	0.06	0.06	0.14	0.16	0.04	0.02	<0.01	<0.01	<0.01	0.03	0.05	0.06
E2500.00-WC-MLV 142A+19.951	CRCA	0.01	0.01	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E2520.00-WC-MLV 142A+21.040	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2530.00-WC-MLV 142A+21.348	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pipeline Segment MLV 143A – 144													
E2531.00-WC-MLV 143A+1.167	CRCA	0.28	0.26	0.63	0.72	0.18	0.07	0.03	0.02	0.03	0.13	0.25	0.27
E2532.00-WC-MLV 143A+3.208	CRCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2533.00-WC-MLV 143A+4.878	SNCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2534.00-WC-MLV 143A+5.325	SNCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2535.00-WC-MLV 143A+5.843	SNCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2536.00-WC-MLV 143A+6.511	SNCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2537.00-WC-MLV 143A+8.180	SNCA	0.04	0.04	0.13	0.18	0.05	0.02	0.01	<0.01	<0.01	0.02	0.04	0.05
Pipeline Segment MLV 144 - 145													
E2540.00-WC-MLV 144+0.868	SNCA	0.03	0.02	0.09	0.12	0.03	0.01	<0.01	<0.01	<0.01	0.01	0.03	0.03
E2550.00-WC-MLV 144+1.506	SNCA	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2560.00-WC-MLV 144+4.973	SNCA	<0.01	<0.01	0.03	0.04	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
E2570.00-WC-MLV 144+6.005	SNCA	0.10	0.09	0.34	0.45	0.12	0.05	0.03	0.02	0.02	0.05	0.10	0.12
E2580.00-WC-MLV 144+8.675	SNCA	<0.01	<0.01	0.03	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2590.00-WC-MLV 144+9.089	SNCA	0.01	0.01	0.05	0.06	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02
E2600.00-WC-MLV 144+10.173	SNCA	0.11	0.10	0.35	0.47	0.13	0.05	0.03	0.02	0.02	0.05	0.11	0.13

Table H-3: Estimated Mean Monthly Flows at Watercourse Crossings

Water Crossing ID[a]	Conservation Authority[c]	Estimated Mean Monthly Flows [m^3/s]											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
E2610.00-WC-MLV 144+13.442	SNCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2620.00-WC-MLV 144+17.420	SNCA	0.04	0.04	0.14	0.19	0.05	0.02	0.01	<0.01	<0.01	0.02	0.04	0.05
E2630.00-WC-MLV 144+18.822	SNCA	0.14	0.12	0.46	0.61	0.17	0.07	0.04	0.02	0.02	0.06	0.14	0.16
E2640.00-WC-MLV 144+20.095	SNCA	<0.01	<0.01	0.03	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2650.00-WC-MLV 144+20.583	SNCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2660.00-WC-MLV 144+21.570	SNCA	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2670.00-WC-MLV 144+21.628	SNCA	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2680.00-WC-MLV 144+21.780	SNCA	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2690.00-WC-MLV 144+22.150	SNCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2700.00-WC-MLV 144+22.696	SNCA	0.24	0.22	0.81	1.1	0.29	0.13	0.07	0.04	0.04	0.11	0.24	0.29
E2710.00-WC-MLV 144+22.827	SNCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2720.00-WC-MLV 144+23.404	SNCA	0.01	0.01	0.04	0.05	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01
E2730.00-WC-MLV 144+23.584	SNCA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
E2740.00-WC-MLV 144+24.100	SNCA	0.01	0.01	0.04	0.06	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02
E2750.00-WC-MLV 144+25.321	SNCA	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

(a) Water Crossing Identification (ID) naming based on the pipeline alignment, dated September 28, 2015.

(b) Pond/lake crossing.

(c) TRCA = Toronto and Region Conservation Authority
CLOCA = Central Lake Ontario Conservation Authority
GRCA = Ganaraska Region Conservation Authority
LTRCA = Lower Trent Region Conservation Authority
QCA = Quinte Conservation Authority
CRCA = Cataraqui Region Conservation Authority
SNCA = South Nation Conservation Authority
n/a = not applicable

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
Toronto and Region Conservation Authority												
E10.00-WC-MLV 132+1.098	MLV 132 - 133	Unnamed	4,872,811	151,538	Permanent	Flowing	Cold	19.15	838	7.61	3.36	Poor
E20.00-WC-MLV 132+1.709	MLV 132 - 133	Bruce Creek	4,872,958	152,131	Permanent	Flowing	Cold	22.50	621	7.96	8.43	Good
E30.00-WC-MLV 132+2.476	MLV 132 - 133	Unnamed	4,873,225	152,872	Permanent	Impounded pond	Cold	24.78	466	8.50	9.05	Good
E40.00-WC-MLV 132+2.557	MLV 132 - 133	Unnamed	4,873,225	152,872	Permanent	Limited	Cold	19.75	1,004	7.60	2.51	Lethal
E50.00-WC-MLV 132+2.759	MLV 132 - 133	Unnamed	4,873,275	153,067	Permanent	Limited	Cold	16.52	753	7.77	6.35	Poor
E60.00-WC-MLV 132+3.954	MLV 132 - 133	Unnamed	4,873,201	154,108	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E70.00-WC-MLV 132+4.934	MLV 132-137A	Tributary to Little Rouge Creek	4,865,822	636,664	Permanent	Flowing	Cold	17.50	800	7.81	6.48	Adequate
E80.00-WC-MLV 132+5.825	MLV 132-137A	Little Rouge Creek	4,865,456	637,356	Permanent	Flowing	Cold	19.00	740	8.38	10.23	Good
E90.00-WC-MLV 132+7.009	MLV 132 - 133	Unnamed	4,873,851	158,744	Permanent	Limited	Cold	15.20	990	8.23	9.16	Good
E100.00-WC-MLV 132+9.232	MLV 132 - 133	Unnamed	4,873,851	158,744	Permanent	Limited	Warm*	22.99	1,198	7.93	9.29	Good
E110.00-WC-MLV 132+12.359	MLV 132 - 133	Stouffville Creek	4,874,705	161,666	Permanent	Flowing	Warm	17.00	665	7.94	8.79	Good
E120.00-WC-MLV 132+12.799	MLV 132 - 133	Unnamed	4,874,812	162,094	Permanent	Flowing	Cold	22.40	640	8.35	9.81	Good
E130.00-WC-MLV 132+12.849	MLV 132 - 133	Reesor Creek	4,874,824	162,142	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E140.00-WC-MLV 132+12.977	MLV 132-137A	Tributary to Reesor Creek	4,867,798	643,733	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E150.00-WC-MLV 132+14.019	MLV 132 - 133	Unnamed	4,875,106	163,277	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E160.00-WC-MLV 132+14.898	MLV 132-137A	West Duffins Creek	4,868,446	645,537	Permanent	Flowing	Cold	15.30	470	8.45	9.60	Good
E170.00-WC-MLV 132+15.36	MLV 132-137A	Wixon Creek	4,868,628	645,960	Permanent	Flowing	Cold	15.70	500	8.16	9.57	Good
E180.00-WC-MLV 132+15.791	MLV 132 - 133	Unnamed	4,875,631	164,968	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E190.00-WC-MLV 132+16.381	MLV 132 - 133	Unnamed	4,875,731	165,550	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E200.00-WC-MLV 132+16.648	MLV 132-137A	Unnamed	4,868,972	647,200	Permanent	Impounded marsh	Cold	16.80	800	7.81	4.43	Poor
E210.00-WC-MLV 132+18.073	MLV 132 - 133	Unnamed	4,876,056	167,195	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E220.00-WC-MLV 132+18.301	MLV 132-137A	Michell Creek	4,876,120	167,414	Permanent	Flowing	Cold	14.60	570	8.25	8.39	Good
E230.00-WC-MLV 132+18.601	MLV 132-137A	Tributary to Michell Creek	4,869,535	649,051	Permanent	Flowing	Cold	15.20	550	8.26	7.65	Good
E240.00-WC-MLV 132+18.896	MLV 132 - 133	Unnamed	4,876,284	167,986	Permanent	Flowing	Cold	N/A				N/A
E250.00-WC-MLV 132+19.211	MLV 132 - 133	Unnamed	4,876,386	168,283	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E260.00-WC-MLV 132+19.453	MLV 132 - 133	Unnamed	4,876,349	168,491	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E270.00-WC-MLV 132+19.527	MLV 132 - 133	Unnamed	4,876,283	168,525	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E280.00-WC-MLV 132+20.034	MLV 132 - 133	Unnamed	4,876,013	168,895	Permanent	Limited	Cold	17.14	1,659	8.10	8.91	Good
E290.00-WC-MLV 132+20.038	MLV 132 - 133	Unnamed	4,876,014	168,899	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E300.00-WC-MLV 132+21.555	MLV 132 - 133	Unnamed	4,876,743	169,813	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E310.00-WC-MLV 132+21.88	MLV 132 - 133	Unnamed	4,876,771	170,137	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E320.00-WC-MLV 132+22.054	MLV 132 - 133	Unnamed	4,876,786	170,311	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E330.00-WC-MLV 132+22.505	MLV 132 - 133	Unnamed	4,876,824	170,760	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E340.00-WC-MLV 133+0.863	MLV 133 - 134	Unnamed	4,877,169	172,167	Permanent	Flowing	Cold	14.72	417	8.48	8.97	Good
E350.00-WC-MLV 132+24.886	MLV 132-137A	Tributary to Duffins Creek	4,871,028	653,876	Permanent	Flowing	Cold	15.90	410	8.41	9.68	Good
E360.00-WC-MLV 133+1.754	MLV 133 - 134	Unnamed	4,877,388	172,990	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E370.00-WC-MLV 133+2.156	MLV 133 - 134	Unnamed	4,877,438	173,388	Permanent	Limited	Cold	17.22	762	7.18	5.18	Poor
E380.00-WC-MLV 132+25.866	MLV 132-137A	Tributary to Duffins Creek	4,871,209	654,838	Permanent	Flowing	Cold	16.40	650	8.34	8.45	Good
E390.00-WC-MLV 133+2.929	MLV 133 - 134	Unnamed	4,877,545	174,152	Permanent	Dry	Unknown	Dry	Dry	Dry	Dry	N/A

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
Central Lake Ontario Conservation Authority												
E400.00-WC-MLV 132+27.023	MLV 132-137A	Unnamed	4871505	655954	Permanent	Limited	Cold	N/A	N/A	N/A	N/A	Good
E410.00-WC-MLV 133+5.429	MLV 133 - 134	Unnamed	4,878,211	176,556	Permanent	Limited	Cold	18.11	484	8.10	9.67	Good
E420.00-WC-MLV 133+7.320	MLV 133 - 134	Unnamed	4,878,370	178,383	Permanent	Dry	Cold	16.00	660	8.10	ND	N/A
E430.00-WC-MLV 132+32.001	MLV 132-137A	Lynde Creek	4,872,723	660,471	Permanent	limited	Permanent	9.00	600	8.13	10.40	Good
E440.00-WC-MLV 132+32.138	MLV 132-137A	Tributary to Lynde Creek	4,872,799	660,586	Permanent	N/A	Permanent	No Field Visit				
E450.00-WC-MLV 132+32.518	MLV 132-137A	Tributary to Lynde Creek	4,873,012	660,890	Permanent	N/A	Permanent	No Field Visit				
E460.00-WC-MLV 133+9.039	MLV 132-137A	Unnamed	4,878,824	179,787	Permanent	N/A	Permanent	No Field Visit				
E470.00-WC-MLV 133+9.041	MLV 132-137A	Unnamed	4,878,825	179,788	Permanent	N/A	Permanent	No Field Visit				
E480.00-WC-MLV 132+32.726	MLV 132-137A	Tributary to Lynde Creek	4,873,124	661,061	Permanent	N/A	Permanent	No Field Visit				
E490.00-WC-MLV 132+33.540	MLV 132-137A	Unnamed	4,873,465	661,799	Permanent	Flowing	Cold	8.60	660	8.46	11.21	Good
E500.00-WC-MLV 132+34.658	MLV 132-137A	Unnamed	4,873,389	662,795	Permanent	Flowing	Cold	14.70	1,040	8.27	9.16	Good
E510.00-WC-MLV 133+11.739	MLV 133 - 134	Unnamed	4,878,795	182,162	Permanent	Impounded	Cold	16.80	566	7.80	1.60	Lethal
E520.00-WC-MLV 133+11.956	MLV 133 - 134	Unnamed	4,878,846	182,373	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E530.00-WC-MLV 132+35.493	MLV 132-137A	Unnamed	4,873,438	663,600	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E540.00-WC-MLV 132+36.102	MLV 132-137A	Tributary to Oshawa Creek	4,873,631	664,177	Permanent	Flowing	Cold	15.40	720	8.14	9.19	Good
E550.00-WC-MLV 132+36.873	MLV 132-137A	Oshawa Creek	4,873,248	664,635	Permanent	Flowing	Cold	3.60	620	8.20	12.18	Good
E560.00-WC-MLV 132+37.402	MLV 132-137A	Tributary to Oshawa Creek	4,873,416	665,136	Permanent	Flowing	Cold	9.80	880	8.16	8.63	Good
E570.00-WC-MLV 132+38.828	MLV 132-137A	Oshawa Creek	4,873,219	666,199	Permanent	Flowing	Cold	15.73	450	8.09	9.67	Good
E580.00-WC-MLV 132+39.722	MLV 132-137A	Unnamed	4,873,318	666,982	Permanent	Flowing	Cold	15.31	652	7.67	5.09	Good
E590.00-WC-MLV 132+40.462	MLV 132-137A	Unnamed	4,873,647	667,622	Permanent	Flowing	Cold	N/A	N/A	N/A	N/A	N/A
E600.00-WC-MLV 132+40.965	MLV 132-137A	Unnamed	4,873,872	668,068	Intermittent	N/A	Cold	No Field Visit				
E610.00-WC-MLV 132+41.407	MLV 132-137A	Tributary to East Oshawa Creek	4,874,081	668,452	Intermittent	Flowing	Cold	17.00	1,080	8.22	7.22	Good
E620.00-WC-MLV 132+41.677	MLV 132-137A	East Oshawa Creek	4,874,169	668,707	Intermittent	Flowing	Cold	15.00	500	7.50	9.64	Good
E630.00-WC-MLV 133+18.458	MLV 133 - 134	Unnamed	4,879,419	188,014	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E640.00-WC-MLV 133+19.741	MLV 133 - 134	Unnamed	4,878,583	188,590	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E650.00-WC-MLV 133+20.403	MLV 133 - 134	Unnamed	4,877,942	188,759	Permanent	Flowing	Cold	15.59	473	8.12	9.40	Good
E660.00-WC-MLV 132+45.417	MLV 132-137A	Unnamed	4,873,047	671,180	Permanent	Flowing	Cold	8.20	640	8.59	11.52	Good
E670.00-WC-MLV 132+48.472	MLV 132-137A	Unnamed	4,871,327	673,088	Permanent	Flowing	Cold	Dry	Dry	Dry	Dry	Good
E680.00-WC-MLV 132+48.841	MLV 132-137A	Unnamed	4,871,223	673,409	Intermittent	Dry	Cold	Dry	Dry	Dry	Dry	N/A
E690.00-WC-MLV 132+50.242	MLV 132-137A	Unnamed	4,870,321	674,110	Permanent	Flowing	Cold	17.90	730	7.84	5.90	Poor
E700.00-WC-MLV 132+51.753	MLV 132-137A	Tributary to Harmony Creek	4,869,656	675,213	Intermittent	N/A	Cold	No Field Visit				
E710.00-WC-MLV 134+0.495	MLV 134 - 134B	Unnamed	4,874,235	193,940	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E720.00-WC-MLV 134+0.643	MLV 134 - 134B	Unnamed	4,874,168	194,023	Permanent	N/A	Cold	No Field Visit				N/A
E730.00-WC-MLV 134+1.801	MLV 134 - 134B	Unnamed	4,874,347	195,156	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E740.00-WC-MLV 132+54.285	MLV 132-137A	Farewell Creek	4,869,750	677,536	Permanent	N/A	Cold	No Field Visit				
E750.00-WC-MLV 134+3.952	MLV 134 - 134B	Black Creek	4,874,363	197,306	Permanent	Flowing	Cold	21.83	551	7.98	7.47	Adequate
E760.00-WC-MLV 132+56.871	MLV 132-137A	Tributary to Black Creek	4869885	679959	Intermittent	N/A	Cold	No Field Visit				
E770.00-WC-MLV 132+57.408	MLV 132-137A	Tributary to Black Creek	4,869,927	680,494	Intermittent	Dry	Cold	18.20	790	7.62	1.97	Lethal

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
E780.00-WC-MLV 132+58.508	MLV 132-137A	Bowmanville Creek	4,869,962	681,590	Permanent	Flowing	Cold	13.90	510	7.97	9.76	Good
E790.00-WC-MLV 132+59.057	MLV 132-137A	Tributary to Bowmanville Creek	4,869,991	682,138	Permanent	Flowing	Cold	18.42	381	8.12	9.75	Good
E800.00-WC-MLV 132+59.611	MLV 132-137A	Tributary to Bowmanville Creek	4,870,023	682,690	Permanent	Dry	Cold	Dry	Dry	Dry	Dry	N/A
E810.00-WC-MLV 132+60.706	MLV 132-137A	Unnamed	4,870,094	683,743	Permanent	Impounded	Cold	18.26	577	6.72	1.68	Good
E820.00-WC-MLV 132+61.204	MLV 132-137A	Unnamed	4,870,096	684,240	Intermittent	Limited	Cold	19.60	617	7.73	5.67	Good
E830.00-WC-MLV 134+10.230	MLV 134 - 134B	Unnamed	4,874,169	203,349	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E840.00-WC-MLV 134+10.642	MLV 134 - 134B	Unnamed	4,874,141	203,759	Permanent	Limited	Cold	17.19	980	7.32	1.16	Lethal
E850.00-WC-MLV 132+62.095	MLV 132-137A	Unnamed	4,870,099	685,131	Permanent	Limited	Cold	4.10	770	8.10	2.95	Lethal
E860.00-WC-MLV 134+11.871	MLV 134 - 134B	Soper Creek	4,873,896	204,885	Permanent	Flowing	Cold	6.50	560	8.61	11.98	Good
E870.00-WC-MLV 134+13.993	MLV 134 - 134B	Unnamed	4,873,751	206,948	Permanent	Limited	Cold	15.90	544	7.85	8.62	Good
E880.00-WC-MLV 134+15.471	MLV 134 - 134B	Unnamed	4,873,639	208,420	Unknown	Dry	Cold	N/A	N/A	N/A	N/A	N/A
Ganaraska Region Conservation Authority												
E890.00-WC-MLV 134+15.996	MLV 134 - 134B	Unnamed	4,873,693	208,904	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E999.00_134-WC-MLV 134+16.365	MLV 134 - 134B	Wilmot Creek	4,873,669	209,271	Permanent	Flowing	Cold	16.18	553	8.18	10.74	Good
E900.00-WC-MLV 134+16.365	MLV 134 - 134B	Wilmot Creek	4,873,669	209,271	Permanent	Flowing	Cold	16.95	550	8.24	10.15	Good
E910.00-WC-MLV 134+16.490	MLV 134 - 134B	Unnamed	4,873,681	209,394	Permanent	Flowing	Cold	12.18	399	8.56	10.56	Good
E920.00-WC-MLV 134+16.680	MLV 134 - 134B	Orono Creek	4,873,662	209,571	Permanent	Flowing	Cold	13.78	711	8.22	8.83	Good
E930.00-WC-MLV 134+18.490	MLV 134 - 134B	Hunter Creek	4,873,624	211,186	Permanent	Flowing	Cold	16.93	448	812.00	10.55	Good
E940.00-WC-MLV 134B+0.465	MLV 134B - 135	Unnamed	4,873,601	211,785	Permanent	Dry	Cold	20.72	341	8.06	4.46	N/A
E950.00-WC-MLV 132+72.515	MLV 132-137A	Tributary to Stalker Creek	4,870,104	694,459	Permanent	Limited	Cold	21.50	560	7.28	4.83	Good
E960.00-WC-MLV 132+72.985	MLV 132-137A	Stalker Creek	4,870,057	694,894	Permanent	Limited	Cold	23.20	460	8.22	8.41	Good
E970.00-WC-MLV 132+73.564	MLV 132-137A	Unnamed	4,869,946	695,411	Intermittent	Flowing	Cold	13.31	472	7.98	9.96	Good
E980.00-WC-MLV 132+74.364	MLV 132-137A	Unnamed	4,870,169	696,178	Permanent	Limited	Cold	16.76	475	7.83	9.41	Good
E990.00-WC-MLV 132+75.275	MLV 132-137A	Unnamed	4,870,417	697,054	Permanent	Flowing	Cold	14.70	490	8.49	8.99	Good
E1000.00-WC-MLV 132+75.528	MLV 132-137A	Unnamed	4,870,462	697,303	Intermittent	Limited	Cold	N/A	N/A	N/A	N/A	Good
E1010.00-WC-MLV 132+75.618	MLV 132-137A	Tributary to Graham Creek	4,870,475	697,391	Intermittent	Limited	Cold	N/A	N/A	N/A	N/A	Good
E1020.00-WC-MLV 132+76.379	MLV 132-137A	Graham Creek	4,870,558	698,143	Permanent	Flowing	Cold	19.80	460	8.48	11.05	Good
E1030.00-WC-MLV 134B+6.476	MLV 134B - 135	Unnamed	4,873,730	217,598	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1040.00-WC-MLV 132+77.866	MLV 132-137A	Graham Creek	4,870,787	699,605	Permanent	Flowing	Cold	23.00	440	8.42	11.63	Good
E1050.00-WC-MLV 132+78.076	MLV 132-137A	Unnamed	4,870,833	699,808	Permanent	Near Dry	Cold	17.80	620	8.47	8.31	Good
E1060.00-WC-MLV 134B+7.527	MLV 134B - 135	Unnamed	4,873,819	218,644	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1070.00-WC-MLV 132+78.313	MLV 132-137A	Unnamed	4,870,865	700,042	Permanent	Near Dry	Cold	13.70	1,080	8.48	8.62	Good
E1080.00-WC-MLV 132+80.099	MLV 132-137A	Graham Creek	4,871,273	701,631	Intermittent	Limited	Cold	20.08	446	7.97	7.42	Adequate
E1090.00-WC-MLV 134B+12.641	MLV 134B - 135	Unnamed	4,873,963	223,414	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1100.00-WC-MLV 132+88.137	MLV 132-137A	Unnamed	4,872,605	709,263	Permanent	Flowing	Cold	15.90	440	8.06	9.23	Good
E1110.00-WC-MLV 132+88.189	MLV 132-137A	Unnamed	4,872,614	709,314	Permanent	Flowing	Cold	12.57	405	8.00	10.15	Good
E1120.00-WC-MLV 132+89.163	MLV 132-137A	Unnamed	4,872,887	710,244	Permanent	Limited	Cold	17.55	530	7.46	6.86	Adequate
E1130.00-WC-MLV 135+3.652	MLV 135 - 135A	Unnamed	4,875,483	230,928	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1140.00-WC-MLV 135+3.889	MLV 135 - 135A	Unnamed	4,875,511	231,163	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1150.00-WC-MLV 135+3.983	MLV 135 - 135A	Unnamed	4,875,524	231,257	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1160.00-WC-MLV 135+4.528	MLV 135 - 135A	Unnamed	4,875,592	231,797	Permanent	Flowing	Cold	19.90	703	7.62	7.79	Adequate
E1170.00-WC-MLV 135+4.716	MLV 135 - 135A	Unnamed	4,875,609	231,984	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1180.00-WC-MLV 135+6.212	MLV 135 - 135A	Unnamed	4,875,755	233,473	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
E1190.00-WC-MLV 135+6.384	MLV 135 - 135A	Unnamed	4,875,780	233,643	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1200.00-WC-MLV 132+95.055	MLV 132-137A	Ganaraska River	4,874,191	715,974	Permanent	Flowing	Cold	21.05	366	8.28	12.75	Good
E1210.00-WC-MLV 132+97.915	MLV 132-137A	Unnamed	4,875,432	718,487	Permanent	Flowing	Cold	7.20	570	7.30	10.98	Good
E1220.00-WC-MLV 132+99.315	MLV 132-137A	Gage Creek	4,875,819	719,833	Permanent	Flowing	Cold	15.90	448	ND	9.55	Good
E1230.00-WC-MLV 132+101.941	MLV 132-137A	Tributary to Gage Creek	4,875,509	721,870	Permanent	Flowing	Cold	16.80	580	7.81	8.82	Good
E1240.00-WC-MLV 132+102.983	MLV 132-137A	Unnamed	4,876,013	722,664	Permanent	Flowing	Cold	19.48	440	8.29	9.06	Good
E1250.00-WC-MLV 132+104.985	MLV 132-137A	Unnamed	4,876,252	724,548	Permanent	Flowing	Cold	17.10	670	8.16	8.23	Good
E1260.00-WC-MLV 132+108.093	MLV 132-137A	Cobourg Brook	4,876,166	727,149	Permanent	Flowing	Cold	16.30	450	8.56	10.32	Good
E1270.00-WC-MLV 132+109.229	MLV 132-137A	Unnamed	4,876,101	728,100	Permanent	Flowing	Cold	13.10	570	8.40	10.72	Good
E1280.00-WC-MLV 132+110.958	MLV 132-137A	Unnamed	4,876,643	729,700	Permanent	Flowing	Cold	14.50	530	8.37	9.44	Good
E1290.00-WC-MLV 135A+11.483	MLV 135A - 136	Unnamed	4,877,901	250,070	Permanent	Flowing	Cold	11.34	557	8.03	9.52	Good
E1300.00-WC-MLV 132+113.027	MLV 132-137A	Unnamed	4,877,396	731,571	Permanent	N/A	Cold	No Field Visit				
Lower Trent Region Conservation Authority												
E1310.00-WC-MLV 132+117.161	MLV 132-137A	Unnamed	4879410	734149	Permanent	Flowing	Cold	13.60	470	8.19	8.29	Good
E1320.00-WC-MLV 132+117.927	MLV 132-137A	Unnamed	4879702	734857	Permanent	Impounded	Cold	12.85	626	7.45	4.95	Poor
E1330.00-WC-MLV 132+121.584	MLV 132-137A	Shelter Valley Creek	4880978	738283	Permanent	Flowing	Cold	15.90	480	8.33	9.53	Good
E1340.00-WC-MLV 132+121.812	MLV 132-137A	Unnamed	4881063	738494	Permanent	N/A	Cold	No Access				N/A
E1350.00-WC-MLV 132+122.954	MLV 132-137A	Unnamed	4881412	739440	Permanent	Limited	Cold	18.68	418	7.41	6.07	Good
E1360.00-WC-MLV 132+123.570	MLV 132-137A	Unnamed	4881470	739991	Permanent	Flowing	Cold	16.15	411	7.88	8.60	Good
E1370.00-WC-MLV 132+123.689	MLV 132-137A	Unnamed	4881509	740103	Permanent	Limited	Cold	18.01	459	7.63	7.65	Good
E1380.00-WC-MLV 136+0.432	MLV 136 - 137	Unnamed	4,881,569	259,594	Permanent	Near Dry	Cold	11.82	446	7.86	9.47	Good
E1390.00-WC-MLV 132+125.143	MLV 132-137A	Unnamed	4,882,219	741,193	Permanent	Flowing	Cold	13.90	476	8.12	9.47	Good
E1400.00-WC-MLV 136+4.373	MLV 136 - 137	Unnamed	4,882,961	263,160	Intermittent	N/A	Cold	No Field Visit				
E1410.00-WC-MLV 136+5.548	MLV 136 - 137	Unnamed	4,883,435	264,220	Intermittent	N/A	Cold	No Field Visit				
E1420.00-WC-MLV 136+7.704	MLV 136 - 137	Unnamed	4,883,886	266,219	Permanent	N/A	Cold	No Field Visit				
E1430.00-WC-MLV 136+7.950	MLV 136 - 137	Unnamed	4,883,949	266,457	Permanent	Dry	Cold	21.32	307	7.97	6.49	Poor
E1440.00-WC-MLV 136+8.008	MLV 136 - 137	Unnamed	4,883,964	266,513	Permanent	Flowing	Cold	No Field Visit				
E1450.00-WC-MLV 136+8.012	MLV 136 - 137	Unnamed	4,883,965	266,517	Permanent	Impounded	Cold	20.53	317	7.78	2.70	Lethal
E1460.00-WC-MLV 136+8.025	MLV 136 - 137	Unnamed	4,883,969	266,529	Permanent	Flowing	Cold	23.07	318	7.95	5.74	Poor
E1470.00-WC-MLV 136+8.103	MLV 136 - 137	Unnamed	4,883,989	266,605	Permanent	Impounded	Cold	23.47	322	7.64	4.77	Poor
E1480.00-WC-MLV 132+132.463	MLV 132-137A	Cold Creek	4,884,608	747,441	Permanent	Flowing	Cold	21.55	422	7.95	9.41	Good
E1490.00-WC-MLV 136+11.297	MLV 136 - 137	Unnamed	4,885,192	269,346	Permanent	Flowing	Cold	16.59	387	7.60	5.16	Poor
E1500.00-WC-MLV 136+11.327	MLV 136 - 137	Unnamed	4,885,201	269,375	Permanent	Limited	Cold	16.59	387	7.60	5.16	Poor
E1510.00-WC-MLV 132+135.766	MLV 132-137A	Cold Creek	4,886,118	750,144	Permanent	Dry	Cold	18.10	366	7.89	8.12	Good
E1520.00-WC-MLV 132+137.707	MLV 132-137A	Cold Creek	4,886,934	751,836	Permanent	Flowing	Cold	19.79	450	8.28	11.06	Good
E1530.00-WC-MLV 136+13.813	MLV 136 - 137	Unnamed	4,886,110	271,605	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1540.00-WC-MLV 136+18.165	MLV 136 - 137	Unnamed	44,107,008	77,802,706	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1550.00-WC-MLV 136+18.290	MLV 136 - 137	Unnamed	44,107,305	77,801,204	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1560.00-WC-MLV 132+143.416	MLV 132-137A	Unnamed	44,108,584	77,794,801	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1570.00-WC-MLV 136+19.441	MLV 136 - 137	Unnamed	44,110,205	77,787,406	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1580.00-WC-MLV 132+144.800	MLV 132-137A	Breakaway Creek	4,889,611	758,393	Permanent	Flowing	Cold	13.40	536	8.19	11.30	Good
E1590.00-WC-MLV 137+2.474	MLV 132-137A	Unnamed	4,888,814	280,047	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1600.00-WC-MLV 132+147.039	MLV 137 - 138A	Unnamed	4,890,416	760,483	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	Good
E1610.00-WC-MLV 132+147.303	MLV 132-137A	Unnamed	4,890,527	760,722	Permanent	Flowing	Cold	7.80	910	8.28	10.74	Good
E1620.00-WC-MLV 132+147.947	MLV 132-137A	Unnamed	4,890,810	761,301	Permanent	Flowing	Cold	16.30	410	8.10	8.02	Good

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
E1630.00-WC-MLV 132+148.317	MLV 132-137A	Unnamed	4,890,973	761,633	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1640.00-WC-MLV 132+149.085	MLV 132-137A	Unnamed	4,891,318	762,320	Permanent	Flowing	Cold	15.20	410	6.87	8.60	Good
E1650.00-WC-MLV 137+5.630	MLV 132-137A	Unnamed	4,889,987	282,975	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1660.00-WC-MLV 137+5.669	MLV 132-137A	Unnamed	4,890,002	283,010	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1670.00-WC-MLV 137+5.724	MLV 132-137A	Unnamed	4,890,024	283,061	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1680.00-WC-MLV 137+6.901	MLV 132-137A	Unnamed	4,890,492	284,141	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1690.00-WC-MLV 137+7.491	MLV 132-137A	Unnamed	4,890,723	284,684	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1700.00-WC-MLV 137+9.109	MLV 137 - 138A	Unnamed	4,891,314	286,186	Permanent	Flowing	Cold	13.79	379	8.05	11.13	Good
E1710.00-WC-MLV 137+9.173	MLV 137 - 138A	Unnamed	4,891,334	286,246	Permanent	Flowing	Cold	16.10	407	8.11	10.31	Good
E1720.00-WC-MLV 137+9.414	MLV 137 - 138A	Unnamed	4,891,412	286,475	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1730.00-WC-MLV 137+9.496	MLV 137 - 138A	Unnamed	4,891,438	286,552	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A
E1740.00-WC-MLV 137+12.375	MLV 137 - 138A	Unnamed	4,892,015	289,304	Permanent	Dry	Warm	16.85	1,345	6.95	6.04	N/A
E1750.00-WC-MLV 137+13.471	MLV 137 - 138A	Unnamed	4,892,330	290,300	Unknown	Impounded	Warm	20.27	225	7.68	1.21	Lethal
E1760.00-WC-MLV 137+13.493	MLV 137 - 138A	Unnamed	4,892,335	290,322	Permanent	Near Dry	Warm	See 1750.00	See 1750.00	See 1750.00	See 1750.00	N/A
E1770.00-WC-MLV 137+13.527	MLV 137 - 138A	Unnamed	4,892,343	290,355	Permanent	Flowing	Warm	18.50	560	7.42	6.86	Adequate
E1780.00-WC-MLV 137+13.985	MLV 137 - 138A	Unnamed	4,892,469	290,795	Unknown	Impounded	Warm	19.03	994	7.07	0.19	Lethal
E1790.00-WC-MLV 137+14.840	MLV 137 - 138A	Unnamed	4,892,531	291,615	Unknown	Impounded	Warm	26.37	358	7.56	6.65	Adequate
E1800.00-WC-MLV 137+14.856	MLV 137 - 138A	Unnamed	4,892,528	291,631	Unknown	Flowing	Cold	26.80	351	7.70	8.05	Good
Quinte Conservation Authority												
E1810.00-WC-MLV 137+16.906	MLV 137 - 138A	Unnamed	4893039	293301.32	Permanent	Flowing	Unclassified	23.66	293	8.25	8.70	Good
E1820.00-WC-MLV 139+2.718	MLV 139 - 139A	Unnamed	4,900,667	324,458	Permanent	Limited	Warm	19.18	386	7.02	2.32	Lethal
E1830.00-WC-MLV 139+2.959	MLV 139 - 139A	Unnamed	4,900,640	324,675	Permanent	Limited	Warm	18.78	336	7.25	4.84	Poor
E1840.00-WC-MLV 139+3.749	MLV 139 - 139A	Unnamed	4,900,819	325,444	Permanent	Flowing	Warm	17.45	900	7.56	7.31	Adequate
E1850.00-WC-MLV 139+5.020	MLV 139 - 139A	Unnamed	4,901,111	326,682	Permanent	Near Dry	Unclassified	17.30	484	7.22	4.98	Poor
E1860.00-WC-MLV 139+5.736	MLV 139-141	Salmon River	4,901,121	327,363	Permanent	Flowing	Warm	19.08	283	8.22	9.43	Good
E1870.00-WC-MLV 139+7.180	MLV 139 - 139A	Unnamed	4,901,297	328,768	Permanent	Flowing	Warm	19.01	274	7.45	7.71	Adequate
E1880.00-WC-MLV 139+8.150	MLV 139 - 139A	Unnamed	4,901,512	329,714	Unknown	Impounded	Warm	24.49	386	7.67	12.22	Good
E1890.00-WC-MLV 139+10.917	MLV 139-141	Unnamed	4,902,008	332,435	Permanent	Limited	Warm	15.19	371	7.48	8.04	Good
E1900.00-WC-MLV 139+12.387	MLV 139-141	Marysville Creek	4,902,228	333,888	Permanent	Limited	Warm	20.51	383	7.63	11.55	Good
E1910.00-WC-MLV 139+13.606	MLV 139 - 139A	Unnamed	4,902,324	335,050	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E1920.00-WC-MLV 139A+1.706	MLV 139A - 140	Unnamed	4,902,686	336,924	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E1930.00-WC-MLV 139A+5.125	MLV 139A - 140	Unnamed	4,903,226	340,284	Intermittent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E1940.00-WC-MLV 140+0.429	MLV 140 - 140A	Sucker Creek	4,903,810	343,453	Permanent	Flowing	Warm	19.37	414	8.13	8.68	Good
E1950.00-WC-MLV 140+0.477	MLV 140 - 140A	Unnamed	4,903,814	343,501	Unknown	Flowing	Warm	20.40	520	7.10	15.00	Good
E1960.00-WC-MLV 140+1.675	MLV 140 - 140A	Unnamed	4,904,093	344,662	Permanent	Flowing	Warm	20.35	691	7.64	8.78	Good
E1970.00-WC-MLV 140+1.698	MLV 140 - 140A	Unnamed	4,904,100	344,685	Permanent	Flowing	Warm	20.35	691	7.64	8.78	Good
E1980.00-WC-MLV 140+3.285	MLV 140 - 140A	Unnamed	4,904,465	346,158	Permanent	Limited	Unclassified	25.71	466	8.67	6.95	Adequate
E1990.00-WC-MLV 139+25.326	MLV 139-141	Tributary to Napanee River	4,904,499	346,332	Permanent	Flowing	Warm	18.86	1,265	6.33	6.53	Adequate
Cataraqui Region Conservation Authority												
E2000.00-WC-MLV 140+6.250	MLV 140 - 140A	Unnamed	4,904,841	348,641	Intermittent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2010.00-WC-MLV 140+7.458	MLV 140 - 140A	Unnamed	4,904,449	349,602	Intermittent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2020.00-WC-MLV 139+29.343	MLV 139-141	Unnamed	4,904,442	350,004	Permanent	Flowing	Warm	21.10	663	7.89	4.01	Poor
E2030.00-WC-MLV 139+30.212	MLV 139-141	Little Creek	4,904,350	350,750	Permanent	Flowing	Warm	20.10	550	8.05	6.72	Adequate
E2040.00-WC-MLV 140A+2.437	MLV 140 - 140A	Unnamed	4,904,960	352,264	Permanent	Flowing	Warm	16.13	417	8.22	7.87	Adequate
E2050.00-WC-MLV 140A+4.040	MLV 140 - 140A	Unnamed	4,905,205	353,833	Permanent	Flowing	Unclassified	19.15	492	6.57	4.30	Poor

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
E2060.00-WC-MLV 140A+6.889	MLV 140 - 140A	Spring Creek	4,905,739	356,267	Permanent	Flowing	Warm	11.95	533	7.21	3.90	Lethal
E2070.00-WC-MLV 140A+9.523	MLV 140 - 140A	Wilton Creek	4,905,950	358,860	Permanent	Flowing	Warm	22.84	516	8.18	9.34	Good
E2080.00-WC-MLV 140A+13.614	MLV 140 - 140A	Unnamed	4,906,177	362,560	Intermittent	Flowing	Warm	16.47	407	7.16	3.54	Poor
E2090.00-WC-MLV 140A+13.755	MLV 140 - 140A	Unnamed	4,906,188	362,698	Intermittent	Flowing	Warm	6.70	480	7.98	7.90	Good
E2100.00-WC-MLV 140A+15.134	MLV 140 - 140A	Millhaven Creek	4,906,305	364,068	Permanent	Flowing	Unclassified	23.11	509	7.84	4.54	Poor
E2110.00-WC-MLV 142+0.734	MLV 142 - 142A	Unnamed	4,910,745	392,026	Permanent	N/A	Warm	No Field Visit				
E2120.00-WC-MLV 142+2.572	MLV 142 - 142A	Unnamed	4,911,612	395,042	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2130.00-WC-MLV 142+3.500	MLV 142 - 142A	Unnamed	4,911,515	394,676	Permanent	N/A	Warm	No Field Visit				
E2140.00-WC-MLV 142+3.879	MLV 142 - 142A	Unnamed	4,911,613	395,042	Permanent	Flowing	Warm	29.70	996	6.85	3.20	Poor
E2150.00-WC-MLV 142+5.017	MLV 142 - 142A	Unnamed	4,912,102	396,062	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2160.00-WC-MLV 142+5.336	MLV 142 - 142A	Unnamed	4,912,235	396,350	Intermittent	N/A	Warm	N/A	N/A	N/A	N/A	N/A
E2170.00-WC-MLV 142+5.446	MLV 142 - 142A	Unnamed	4,912,276	396,452	Permanent	N/A	Warm	N/A	N/A	N/A	N/A	N/A
E2180.00-WC-MLV 142+6.151	MLV 142 - 142A	Unnamed	4,912,463	397,131	Permanent	N/A	Warm	N/A	N/A	N/A	N/A	N/A
E2190.00-WC-MLV 142+7.100	MLV 142-143	Unnamed	4,912,659	397,962	Permanent	Flowing	Warm	15.80	725	7.47	3.00	Lethal
E2200.00-WC-MLV 142+7.476	MLV 142 - 142A	Unnamed	4,912,765	398,422	Permanent	N/A	Warm	N/A	N/A	N/A	N/A	N/A
E2210.00-WC-MLV 142+7.616	MLV 142 - 142A	Unnamed	4,912,796	398,558	Permanent	Dry	Warm	22.97	571	7.57	5.97	Poor
E2220.00-WC-MLV 142+8.056	MLV 142-143	Mud Creek	4,912,873	398,894	Permanent	Flowing	Warm	18.10	503	7.82	8.60	Good
E2230.00-WC-MLV 142+8.195	MLV 142-143	Unnamed	4,912,904	399,029	Permanent	Flowing	Warm	21.40	538	8.02	ND	Good
E2240.00-WC-MLV 142+9.270	MLV 142-143	Unnamed	4,913,151	400,075	Permanent	Flowing	Warm	17.40	393	7.55	3.26	Lethal
E2250.00-WC-MLV 142+9.895	MLV 142 - 142A	Unnamed	4,913,306	400,778	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2260.00-WC-MLV 142A+0.338	MLV 142A - 143	Unnamed	4,913,512	401,687	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2270.00-WC-MLV 142+12.528	MLV 142-143	Unnamed	4,913,912	403,237	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2280.00-WC-MLV 142A+2.040	MLV 142A - 143	Unnamed	4,913,934	403,332	Permanent	Near Dry	Warm	N/A	N/A	N/A	N/A	N/A
E2290.00-WC-MLV 142A+2.980	MLV 142A - 143	Sucker Brook	4,914,032	404,168	Permanent	Flowing	Unclassified	22.10	365	8.01	ND	Good
E2300.00-WC-MLV 142A+4.039	MLV 142A - 143	Unnamed	4,914,571	405,054	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E2310.00-WC-MLV 142A+4.533	MLV 142A - 143	Unnamed	4,914,801	405,490	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E2320.00-WC-MLV 142+15.655	MLV 142-143	Unnamed	4914902	405992	Permanent	Limited	Unclassified	21.20	158	7.60	4.27	Poor
E2330.00-WC-MLV 142+16.922	MLV 142-143	Unnamed	4915359	407109	Permanent	N/A	Unclassified	No Field Visit				
E2340.00-WC-MLV 142+17.007	MLV 142-143	Unnamed	4915361	407194	Permanent	N/A	Unclassified	No Field Visit				
E2350.00-WC-MLV 142+17.160	MLV 142-143	Gananoque River	4915366	407347	Permanent	Flowing	Warm	25.48	481	7.72	7.82	Good
E2360.00-WC-MLV 142+18.526	MLV 142-143	Unnamed	4915769	408601	Permanent	Limited	Unclassified	14.64	506	7.88	9.45	Good
E2370.00-WC-MLV 142+20.347	MLV 142-143	Unnamed	4916381	410217	Permanent	Impounded	Unclassified	19.99	446	8.01	0.50	Lethal
E2380.00-WC-MLV 142+22.241	MLV 142-143	Unnamed	4917463	411764	Permanent	Dry	Unclassified	16.83	177	6.30	3.85	N/A
E2390.00-WC-MLV 142+22.736	MLV 142-143	Unnamed	4917770	412123	Permanent	Flowing	Unclassified	21.80	340	7.30	3.50	Lethal
E2400.00-WC-MLV 142+23.646	MLV 142-143	Unnamed	4918455	412632	Permanent	Impounded	Unclassified	21.40	468	6.96	8.02	Good
E2410.00-WC-MLV 142+25.552	MLV 142-143	Unnamed	4919433	414261	Permanent	Limited	Unclassified	N/A	N/A	N/A	N/A	Lethal
E2420.00-WC-MLV 142+25.569	MLV 142-143	Unnamed	4919442	414275	Permanent	Limited	Unclassified	N/A	N/A	N/A	N/A	Lethal
E2430.00-WC-MLV 142+25.657	MLV 142-143	Unnamed	4919487	414351	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E2440.00-WC-MLV 142A+15.080	MLV 142A - 143	Unnamed	4,919,514	414,396	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A
E2450.00-WC-MLV 142+27.937	MLV 142-143	Unnamed	4920797	416213	Permanent	Flowing	Unclassified	19.00	468	7.68	9.94	Good
E2460.00-WC-MLV 142+28.341	MLV 142-143	Black Creek	4921043	416533	Permanent	Flowing	Unclassified	19.70	358	7.65	7.30	Adequate
E2470.00-WC-MLV 142+29.457	MLV 142-143	Unnamed	4921618	417402	Permanent	Limited	Warm	17.64	404	7.90	5.29	Poor
E2480.00-WC-MLV 142+29.585	MLV 142-143	Unnamed	4921730	417401	Permanent	Limited	Unclassified	N/A	N/A	N/A	N/A	Lethal
E2490.00-WC-MLV 142+30.361	MLV 142-143	Unnamed	4922217	418006	Permanent	Flowing	Warm	18.16	399	7.68	7.45	Poor
E2500.00-WC-MLV 142+30.532	MLV 142-143	Unnamed	4922320	418143	Permanent	Flowing	Unclassified	14.65	244	6.62	4.82	Poor
E2510.00-WC-MLV 142A+20.142	MLV 142-143	Unnamed	4,922,427	418,300	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A

Table H-4: In Situ Water Quality Data Collected during Field Surveys in 2014 and 2015

Water Crossing Identification (ID)[a]	Valve Segment	Watercourse Name[b]	Zone 17N/18N UTM (NAD 83)		Flow Status		Thermal Regime[b]	Field Measured Parameters[c]				Water Quality - Assessment
			Northing	Easting								
			(m)	(m)	Flow Assigned[b]	Flow Condition During Survey[c]		Water Temperature (°C)	Conductivity (µS/Sec)	PH	Dissolved Oxygen (mg O_2/L)	
E2520.00-WC-MLV 142A+21.040	MLV 142-143	Unnamed	4923006	418986	Permanent	N/A	Unclassified	No Field Visit				
E2530.00-WC-MLV 142A+21.348	MLV 142-143	Unnamed	4923222	419203	Permanent	N/A	Unclassified	No Field Visit				
South Nation Conservation Authority												
E2540.00-WC-MLV 144+0.868	MLV 144 - 145	Unnamed	4,948,649	451,393	Permanent	N/A	Unclassified	No Field Visit				
E2550.00-WC-MLV 144+1.506	MLV 144 - 145	Unnamed	4,949,105	451,799	Permanent	N/A	Unclassified	No Field Visit				
E2560.00-WC-MLV 144+4.973	MLV 144 - 145	Unnamed	4,951,624	454,174	Permanent	N/A	Unclassified	No Field Visit				
E2570.00-WC-MLV 144+6.005	MLV 144 - 145	Unnamed	4,952,307	454,914	Permanent	N/A	Unclassified	No Field Visit				
E2580.00-WC-MLV 144+8.675	MLV 144 - 145	Unnamed	4,954,144	456,849	Permanent	N/A	Unclassified	No Field Visit				
E2590.00-WC-MLV 144+9.089	MLV 144 - 145	Unnamed	4,954,207	457,225	Permanent	N/A	Unclassified	No Field Visit				
E2600.00-WC-MLV 144+10.173	MLV 144 - 145	Unnamed	4,954,994	457,851	Permanent	N/A	Unclassified	No Field Visit				
E2610.00-WC-MLV 144+13.442	MLV 144 - 145	Unnamed	4,957,082	460,228	Permanent	N/A	Unclassified	No Field Visit				
E2620.00-WC-MLV 144+17.420	MLV 144 - 145	Unnamed	4,959,775	463,155	Permanent	N/A	Unclassified	No Field Visit				
E2630.00-WC-MLV 144+18.822	MLV 144 - 145	Unnamed	4,960,725	464,187	Permanent	N/A	Warm	No Field Visit				
E2640.00-WC-MLV 144+20.095	MLV 144 - 145	Unnamed	4,961,675	465,033	Permanent	N/A	Unclassified	No Field Visit				
E2650.00-WC-MLV 144+20.583	MLV 144 - 145	Unnamed	4,962,050	465,274	Permanent	N/A	Unclassified	No Field Visit				
E2660.00-WC-MLV 144+21.570	MLV 144 - 145	Unnamed	4,962,648	466,001	Permanent	N/A	Unclassified	No Field Visit				
E2670.00-WC-MLV 144+21.628	MLV 144 - 145	Unnamed	4,962,688	466,042	Permanent	N/A	Unclassified	No Field Visit				
E2680.00-WC-MLV 144+21.780	MLV 144 - 145	Unnamed	4,962,792	466,152	Permanent	N/A	Unclassified	No Field Visit				
E2690.00-WC-MLV 144+22.150	MLV 144 - 145	Unnamed	4,963,048	466,421	Permanent	N/A	Unclassified	No Field Visit				
E2700.00-WC-MLV 144+22.696	MLV 144 - 145	Unnamed	4,963,425	466,816	Permanent	N/A	Unclassified	No Field Visit				
E2710.00-WC-MLV 144+22.827	MLV 144 - 145	Unnamed	4,963,523	466,869	Permanent	N/A	Unclassified	No Field Visit				
E2720.00-WC-MLV 144+23.404	MLV 144 - 145	Unnamed	4,963,847	467,259	Permanent	N/A	Unclassified	No Field Visit				
E2730.00-WC-MLV 144+23.584	MLV 144 - 145	Unnamed	4,963,971	467,389	Permanent	N/A	Unclassified	No Field Visit				
E2740.00-WC-MLV 144+24.100	MLV 144 - 145	Unnamed	4,964,327	467,763	Permanent	N/A	Unclassified	No Field Visit				
E2750.00-WC-MLV 144+25.321	MLV 144 - 145	Unnamed	4,965,169	468,647	Permanent	N/A	Unclassified	No Field Visit				

(a) Water Crossing Identification (ID) naming based on the pipeline alignment, dated September 28, 2015.

(b) Data obtained from the Ministry of Natural Resources and Forestry Land Information Ontario Electronic Database (MNRF 2014a).

(c) Field surveys completed between June to September 2014 and June and September, 2015.

Notes: No field visit. Watercourse crossing not confirmed: This is a potential watercourse crossing identified through the desktop study; however, its existence cannot be confirmed at this time because a field visit was not completed due to land access constraints.
Lethal – waterbodies where dissolved oxygen was measured to be less than 3.0 mg0_2/L;
Poor - waterbodies where dissolved oxygen was measured greater than 3.0 mg0_2/L but less than 5.0 mg0_2/L;
Adequate – dissolved oxygen concentrations between 5.0 and 6.0 mg0_2/L; and
Good - dissolved oxygen concentrations greater than 6.0 mg0_2/L.
N/A – Not Available.

APPENDIX I

Recorded Water Well Information within the Groundwater Local Study Area - 200 metres from Pipeline Centreline

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
6903394	MLV 132 - 133	0.1	-44	South	11-Sep-1962	13.7	N/A	Overburden	13.7	4.6	159	Cable Tool	6	Steel	43.9221	-79.3518	100 m - 300 m	239.4	York	4	29		Null	Fresh	Water Supply	Irrigation	Null
6903392	MLV 132 - 133	0.1	-89	South	14-Oct-1958	11.0	N/A	Overburden	11.0	4.6	Null	Cable Tool	6	Steel	43.9217	-79.3513	100 m - 300 m	238.9	York	4	29		Null	Fresh	Water Supply	Livestock	Domestic
6903395	MLV 132 - 133	0.1	-34	South	17-Sep-1962	14.3	N/A	Overburden	14.3	4.9	341	Cable Tool	6	Steel	43.9222	-79.3513	100 m - 300 m	239.3	York	4	29		Null	Fresh	Water Supply	Irrigation	Null
7107166	MLV 132 - 133	0.3	97	North	28-Apr-2008	65.5	N/A	Null	65.5	6.1	Null	Rotary (Air)	6	Steel	43.9238	-79.3493	10 – 30 m	239.0	York	5	28	11367 Warden Ave	Markham	Fresh	Water Supply	Domestic	Null
6925830	MLV 132 - 133	1.2	-91	South	20-Mar-2001	23.2	N/A	Overburden	18.6	0	91	Rotary (Air)	6	Steel	43.9252	-79.3388	unknown UTM	230.4	York	5	29		Null	Not Stated	Water Supply	Public	Null
6927856	MLV 132 - 133	1.2	-91	South	6-May-2004	2.3	N/A	Null	2.0	1.2	Null	Cable Tool	36	Plastic	43.9252	-79.3388	3 km - 10 km	230.4	York	5	29	11303 Warden Ave	Null	Fresh	Water Supply	Domestic	Null
6903589	MLV 132 - 133	1.9	-79	South	22-Oct-1962	6.4	N/A	Overburden	5.5	2.4	Null	Boring	34	Concrete	43.9271	-79.3305	100 m - 300 m	230.5	York	5	29		Null	Fresh	Water Supply	Livestock	Null
6915739	MLV 132 - 133	2.1	-170	South	23-Dec-1980	45.7	N/A	Overburden	44.5	9.1	91	Rotary (Convent.)	6	Steel	43.9272	-79.3268	30 m - 100 m	235.4	York	5	29		Null	Fresh	Water Supply	Domestic	Null
6912792	MLV 132 - 133	2.4	-125	South	26-May-1975	42.7	N/A	Overburden	39.0	15.8	136	Rotary (Convent.)	6	Steel	43.9285	-79.3258	30 m - 100 m	230.0	York	6	29		Null	Fresh	Water Supply	Irrigation	Domestic
6920988	MLV 132 - 133	2.5	-27	South	6-Mar-1990	21.0	N/A	Overburden	18.0	0	Null	Rotary (Air)	6	Steel	43.9296	-79.3251	30 m - 100 m	228.4	York	6	29		Null	Not Stated	Null	Irrigation	Null
6920989	MLV 132 - 133	2.5	22	North	14-Mar-1990	28.0	N/A	Overburden	23.8	0	Null	Rotary (Air)	6	Steel	43.9300	-79.3251	30 m - 100 m	228.0	York	6	29		Null	Not Stated	Null	Null	Null
6921152	MLV 132 - 133	2.6	-179	South	14-Jun-1990	61.0	N/A	Overburden	37.2	12.8	Null	NULL	6	Steel	43.9285	-79.3232	30 m - 100 m	233.3	York	6	29		Null	Not Stated	Null	Irrigation	Null
6920987	MLV 132 - 133	2.6	-185	South	24-Feb-1990	57.9	N/A	Overburden	54.9	42.7	Null	Rotary (Air)	6	Steel	43.9286	-79.3228	30 m - 100 m	233.8	York	6	29		Null	Not Stated	Null	Irrigation	Null
6921059	MLV 132 - 133	3.1	-178	South	11-Jun-1990	67.1	N/A	Overburden	53.0	0	Null	NULL	NULL	Null	43.9299	-79.3173	30 m - 100 m	226.9	York	6	29		Null	Not Stated	Null	Irrigation	Null
6903844	MLV 132 - 133	4.6	188	North	20-Apr-1959	70.7	N/A	Overburden	70.7	6.7	45	Cable Tool	NULL	Null	43.9336	-79.3024	100 m - 300 m	227.5	York	6	29		Null	Fresh	Water Supply	Livestock	Domestic
6903842	MLV 132 - 133	4.6	-155	South	18-Jul-1962	7.9	N/A	Overburden	7.3	5.5	Null	Boring	34	Concrete	43.9307	-79.3008	100 m - 300 m	226.1	York	6	28		Null	Fresh	Water Supply	Domestic	Null
6903841	MLV 132 - 133	4.6	-77	South	22-May-1961	9.4	N/A	Overburden	5.5	4.9	14	Boring	34	Concrete	43.9315	-79.3008	100 m - 300 m	225.1	York	6	28		Null	Fresh	Water Supply	Livestock	Domestic
6908774	MLV 132 - 133	5.0	43	North	5-Jun-1968	36.0	N/A	Overburden	34.1	7.9	36	Cable Tool	6	Steel	43.9330	-79.2959	30 m - 100 m	220.1	York	7	27		Null	Fresh	Water Supply	Domestic	Null
6929581	MLV 132 - 133	7.3	-187	South	5-Oct-2005	196.0	N/A	Null	187.0	41.6	Null	Rotary (Air)	6	Steel	43.9320	-79.2725	NULL	233.6	York	8	27	10919 Hwy 48	Markham	Fresh	Water Supply	Domestic	Null
6926332	MLV 132 - 133	9.8	22	North	12-Mar-2002	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	43.9407	-79.2373	unknown UTM	239.3	York	9	27		Null	Null	Null	Null	Null
6926743	MLV 132 - 133	9.8	22	North	28-Nov-2002	67.7	N/A	Overburden	58.5	33.2	55	Rotary (Convent.)	6	Steel	43.9407	-79.2373	unknown UTM	239.3	York	9	27		Null	Fresh	Water Supply	Domestic	Null
7100347	MLV 132 - 133	10.8	157	North	28-Mar-2007	0.0	N/A	Null	Null	0	Null	NULL	34	Concrete	43.9374	-79.2491	10 m - 30 m	244.1	York	9	27		Markham	Null	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
6929592	MLV 132 - 133	10.8	-55	South	8-Mar-2005	75.6	N/A	Overburden	75.6	45.1	Null	Rotary (Air)	6	Null	43.9392	-79.2501	NULL	240.7	York	8	27	10966 Ninth Line	Null	Fresh	Water Supply	Domestic	Null
7039948	MLV 132 - 133	10.9	132	North	15-Nov-2006	81.7	N/A	Null	Null	42.2	Null	Rotary (Air)	6	Steel	43.9374	-79.2501	10 m - 30 m	242.3	York	8	27		Null	Null	Water Supply	Domestic	Null
6904162	MLV 132 - 133	12.6	-78	South	17-Aug-1964	6.7	N/A	Overburden	6.1	2.1	Null	Boring	34	Concrete	43.9473	-79.2132	100 m - 300 m	236.0	York	10	27		Null	Fresh	Water Supply	Domestic	Null
7229503	MLV 132 - 133	18.9	-39	South	25-Jul-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	43.9642	-79.1382	30 m - 100 m	Null	Durham	8	20		Null	Null	Null	Null	Null
1917033	MLV 132 - 133	19.2	171	North	7-Apr-2004	72.2	N/A	Overburden	71.0	33.3	19	Rotary (Convent.)	6	Steel	43.9670	-79.1356	100 m - 300 m	244.9	Durham	8	6	4716 Carpenter Court	Claremont	Fresh	Water Supply	Domestic	Null
1916138	MLV 132 - 133	19.9	38	North	22-Oct-2002	51.5	N/A	Overburden	51.5	22.9	45	Rotary (Convent.)	6	Steel	43.9629	-79.1290	unknown UTM	239.1	Durham	8	19		Null	Fresh	Water Supply	Domestic	Null
1912014	MLV 132 - 133	20.0	-45	South	25-Jul-1994	36.9	N/A	Overburden	36.9	17.7	45	Rotary (Air)	6	Steel	43.9620	-79.1271	30 m - 100 m	228.2	Durham	8	19		Null	Fresh	Water Supply	Domestic	Null
1908722	MLV 132 - 133	20.1	8	North	9-Oct-1987	82.6	N/A	Overburden	82.6	28.7	45	Rotary (Convent.)	6	Steel	43.9626	-79.1268	30 m - 100 m	230.7	Durham	8	19		Null	Fresh	Water Supply	Domestic	Null
1910585	MLV 132 - 133	20.1	170	North	25-May-1990	43.0	N/A	Overburden	41.8	21.3	23	Cable Tool	6	Steel	43.9640	-79.1273	100 m - 300 m	240.8	Durham	8	19		Null	Fresh	Water Supply	Domestic	Null
1908914	MLV 132 - 133	20.1	-28	South	14-Oct-1987	69.8	N/A	Overburden	69.8	22.6	68	Rotary (Convent.)	6	Steel	43.9623	-79.1263	30 m - 100 m	231.5	Durham	8	19		Null	Fresh	Water Supply	Domestic	Null
4601717	MLV 132 - 133	20.2	-89	South	13-Jan-1960	27.7	N/A	Overburden	27.7	17.1	36	Cable Tool	6	Steel	43.9620	-79.1254	100 m - 300 m	234.2	Durham	8	18		Null	Fresh	Water Supply	Domestic	Null
4601720	MLV 132 - 133	20.2	-28	South	27-Sep-1965	26.8	N/A	Overburden	26.8	20.7	36	Cable Tool	6	Steel	43.9627	-79.1247	100 m - 300 m	237.6	Durham	8	18		Null	Fresh	Water Supply	Domestic	Null
1908935	MLV 132 - 133	20.5	195	North	25-Mar-1988	41.5	N/A	Overburden	30.5	22.9	23	Cable Tool	6	Steel	43.9654	-79.1277	100 m - 300 m	245.1	Durham	8	19		Null	Fresh	Water Supply	Domestic	Null
1907953	MLV 132 - 133	20.5	170	North	10-Oct-1986	52.4	N/A	Overburden	48.2	32	32	Cable Tool	6	Steel	43.9662	-79.1266	100 m - 300 m	250.6	Durham	8	18		Null	Fresh	Water Supply	Domestic	Null
1911875	MLV 132 - 133	20.5	161	North	21-Jun-1993	68.0	N/A	Overburden	66.4	27.4	73	NULL	6	Steel	43.9654	-79.1273	100 m - 300 m	245.6	Durham	8	18		Null	Fresh	Water Supply	Domestic	Null
1912578	MLV 132 - 133	20.9	169	North	12-Jun-1995	46.0	N/A	Overburden	44.8	24.4	23	Cable Tool	6	Steel	43.9676	-79.1252	30 m - 100 m	259.6	Durham	8	18		Null	Fresh	Water Supply	Domestic	Null
1907954	MLV 132 - 133	21.4	24	North	27-Sep-1986	29.3	5.5	Bedrock	25.9	18.9	36	Cable Tool	6	Steel	43.9695	-79.1175	100 m - 300 m	265.5	Durham	8	18		Null	Fresh	Water Supply	Domestic	Null
1913050	MLV 132 - 133	22.9	-134	South	13-Nov-1996	91.4	N/A	Overburden	39.0	6.7	Null	Rotary (Convent.)	8	Steel	43.9698	-79.0999	unknown UTM	240.9	Durham	8	13		Null	Fresh	Water Supply	Irrigation	Null
4601714	MLV 132 - 133	22.9	78	North	15-Nov-1961	19.5	N/A	Overburden	5.5	3	9	Boring	30	Concrete	43.9718	-79.0991	100 m - 300 m	242.3	Durham	8	13		Null	Fresh	Water Supply	Livestock	Null
1916733	MLV 133 - 134	0.6	-133	South	25-Sep-2003	53.6	N/A	Overburden	53.3	23.2	23	Rotary (Convent.)	6	Steel	43.9721	-79.0901	unknown UTM	211.0	Durham	8	11		Null	Fresh	Water Supply	Domestic	Null
1916734	MLV 133 - 134	0.6	-133	South	18-Sep-2003	51.8	N/A	Overburden	51.8	23.8	32	Rotary (Convent.)	5	Steel	43.9721	-79.0901	unknown UTM	211.0	Durham	8	11		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
1916735	MLV 133 - 134	0.6	-133	South	10-Sep-2003	56.7	N/A	Overburden	54.6	20.4	32	Rotary (Convent.)	6	Steel	43.9721	-79.0901	unknown UTM	211.0	Durham	8	11		Null	Fresh	Water Supply	Domestic	Null
7184364	MLV 133 - 134	0.7	51	North	26-Jun-2012	44.2	N/A	Null	44.2	22.6	68	Other Method	6	Steel	43.9740	-79.0897	30 m - 100 m	Null	Durham	8	13	4800 Westney Rd	Claremont	Fresh	Water Supply	Domestic	Null
1905190	MLV 133 - 134	0.7	19	North	20-Apr-1978	44.2	N/A	Overburden	42.7	21.3	68	Cable Tool	6	Steel	43.9740	-79.0888	30 m - 100 m	206.9	Durham	8	11		Null	Fresh	Water Supply	Domestic	Null
1915598	MLV 133 - 134	0.9	-190	South	25-Mar-2002	80.8	N/A	Overburden	80.8	32	91	Rotary (Convent.)	6	Steel	43.9732	-79.0851	unknown UTM	196.0	Durham	8	10		Null	Fresh	Water Supply	Domestic	Null
1915617	MLV 133 - 134	0.9	-190	South	21-Mar-2001	82.0	N/A	Overburden	82.0	36	45	Rotary (Convent.)	6	Steel	43.9732	-79.0851	unknown UTM	196.0	Durham	8	10		Null	Fresh	Water Supply	Domestic	Null
4604669	MLV 133 - 134	1.5	68	North	16-Oct-1970	45.7	N/A	Overburden	44.5	1.2	27	Cable Tool	5	Steel	43.9769	-79.0799	30 m - 100 m	195.0	Durham	8	9		Null	Fresh	Water Supply	Domestic	Null
4604062	MLV 133 - 134	1.6	-93	South	22-May-1969	7.3	N/A	Overburden	2.4	2.4	27	Boring	30	Concrete	43.9755	-79.0790	30 m - 100 m	206.3	Durham	8	9		Null	Fresh	Water Supply	Domestic	Null
4604505	MLV 133 - 134	1.6	-93	South	29-Nov-1969	20.1	N/A	Overburden	19.2	9.1	23	Boring	30	Concrete	43.9755	-79.0790	100 m - 300 m	206.3	Durham	8	9		Null	Fresh	Water Supply	Domestic	Null
1915848	MLV 133 - 134	1.9	-155	South	28-May-2002	80.8	N/A	Overburden	80.8	30.8	45	Rotary (Convent.)	6	Steel	43.9754	-79.0754	unknown UTM	199.3	Durham	8	8		Null	Fresh	Water Supply	Domestic	Null
1915600	MLV 133 - 134	1.9	-155	South	25-Mar-2002	77.7	N/A	Overburden	77.7	27.1	91	Rotary (Convent.)	6	Steel	43.9754	-79.0754	unknown UTM	199.3	Durham	8	8		Null	Fresh	Water Supply	Domestic	Null
4601710	MLV 133 - 134	1.9	106	North	30-May-1963	10.4	N/A	Overburden	3.0	3	Null	Boring	30	Concrete	43.9777	-79.0758	100 m - 300 m	211.9	Durham	8	8		Null	Fresh	Water Supply	Domestic	Null
1916089	MLV 133 - 134	2.3	-93	South	25-Jul-2002	79.2	N/A	Overburden	79.2	29.9	45	Rotary (Convent.)	6	Steel	43.9766	-79.0704	unknown UTM	203.8	Durham	8	7		Null	Fresh	Water Supply	Domestic	Null
1913108	MLV 133 - 134	2.4	142	North	30-Dec-1996	8.2	N/A	Overburden	4.9	0.9	Null	Cable Tool	33	Concrete	43.9787	-79.0697	30 m - 100 m	209.0	Durham	8	7		Null	Fresh	Water Supply	Domestic	Null
1914181	MLV 133 - 134	2.4	159	North	16-Aug-1999	12.2	N/A	Overburden	12.2	9.8	9	Cable Tool	30	Concrete	43.9789	-79.0692	30 m - 100 m	207.6	Durham	8	7		Null	Fresh	Water Supply	Domestic	Null
1915929	MLV 133 - 134	2.7	-35	South	2-Jul-2002	78.3	N/A	Overburden	78.3	30.8	45	Rotary (Convent.)	6	Steel	43.9777	-79.0655	unknown UTM	219.4	Durham	8	6		Null	Fresh	Water Supply	Domestic	Null
1914946	MLV 133 - 134	2.7	-34	South	31-Jan-2001	59.1	N/A	Overburden	12.8	21.9	45	Cable Tool	6	Null	43.9777	-79.0655	unknown UTM	219.5	Durham	8	6		Null	Fresh	Water Supply	Domestic	Null
1915594	MLV 133 - 134	2.7	-34	South	25-Mar-2002	65.2	N/A	Overburden	65.2	29	91	Rotary (Convent.)	6	Steel	43.9777	-79.0655	unknown UTM	219.5	Durham	8	6		Null	Fresh	Water Supply	Domestic	Null
1916086	MLV 133 - 134	3.1	-6	South	16-Sep-2002	84.4	N/A	Overburden	84.4	33.8	45	Cable Tool	6	Steel	43.9789	-79.0606	unknown UTM	219.4	Durham	8	5		Null	Fresh	Water Supply	Domestic	Null
1916087	MLV 133 - 134	3.1	-6	South	18-Sep-2002	63.7	N/A	Overburden	63.7	32	45	Rotary (Convent.)	6	Steel	43.9789	-79.0606	unknown UTM	219.4	Durham	8	5		Null	Fresh	Water Supply	Domestic	Null
1915608	MLV 133 - 134	3.1	-6	South	9-Jun-2000	65.2	N/A	Overburden	65.2	30.8	91	Rotary (Convent.)	6	Steel	43.9789	-79.0606	unknown UTM	219.4	Durham	8	5		Null	Fresh	Water Supply	Domestic	Null
1915501	MLV 133 - 134	3.5	15	North	19-Dec-2001	66.1	N/A	Overburden	66.1	12.2	45	Rotary (Air)	6	Steel	43.9800	-79.0557	unknown UTM	219.1	Durham	8	4		Null	Fresh	Water Supply	Domestic	Null
1916088	MLV 133 - 134	3.9	27	North	26-Aug-2002	75.9	N/A	Overburden	75.9	31.7	36	Rotary (Convent.)	6	Steel	43.9811	-79.0508	unknown UTM	225.4	Durham	8	3		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
1915605	MLV 133 - 134	3.9	27	North	25-Mar-2002	70.1	10.4	Bedrock	70.1	29.9	Null	Rotary (Convent.)	NULL	Steel	43.9811	-79.0507	unknown UTM	225.5	Durham	8	3		Null	Fresh	Water Supply	Domestic	Null
1915847	MLV 133 - 134	3.9	27	North	20-May-2002	48.8	N/A	Overburden	48.8	24.7	36	Rotary (Convent.)	6	Steel	43.9811	-79.0507	unknown UTM	225.5	Durham	8	3		Null	Fresh	Water Supply	Domestic	Null
4601702	MLV 133 - 134	4.1	187	North	5-Mar-1965	12.5	N/A	Overburden	11.9	2.4	36	Cable Tool	6	Steel	43.9832	-79.0493	100 m - 300 m	236.0	Durham	8	3		Null	Fresh	Water Supply	Domestic	Null
1915615	MLV 133 - 134	4.8	-57	South	27-Jun-2001	77.4	N/A	Overburden	77.4	30.8	91	Rotary (Convent.)	5	Steel	43.9834	-79.0399	unknown UTM	233.1	Durham	8	1		Null	Fresh	Water Supply	Domestic	Null
1915647	MLV 133 - 134	4.8	-57	South	14-Feb-2002	6.7	N/A	Overburden	6.7	1.5	14	Cable Tool	36	Concrete	43.9834	-79.0399	unknown UTM	233.1	Durham	8	1		Null	Fresh	Water Supply	Domestic	Null
1915698	MLV 133 - 134	9.0	28	North	5-Mar-2002	32.0	N/A	Overburden	32.0	1.5	14	Cable Tool	6	Steel	43.9922	-78.9942	unknown UTM	229.6	Durham	8	27		Null	Fresh	Water Supply	Domestic	Null
1906045	MLV 133 - 134	9.2	173	North	22-May-1981	40.5	N/A	Overburden	36.0	0	91	Cable Tool	6	Steel	43.9947	-78.9925	100 m - 300 m	233.4	Durham	8	27		Null	Fresh	Water Supply	Domestic	Null
1916195	MLV 133 - 134	9.4	-71	South	9-Nov-2002	37.2	N/A	Overburden	37.2	1.8	Null	Cable Tool	6	Steel	43.9933	-78.9893	unknown UTM	232.1	Durham	8	26		Null	Fresh	Water Supply	Domestic	Null
1916371	MLV 133 - 134	9.4	-72	South	5-Feb-2003	92.7	N/A	Overburden	92.7	17.4	45	Cable Tool	6	Steel	43.9933	-78.9893	1 km - 3 km	232.0	Durham	8	26		Null	Fresh	Water Supply	Domestic	Null
1915359	MLV 133 - 134	9.8	-108	South	21-Sep-2001	73.5	N/A	Overburden	73.5	0	23	Rotary (Convent.)	6	Steel	43.9944	-78.9846	unknown UTM	229.8	Durham	8	25		Null	Fresh	Water Supply	Domestic	Null
1916266	MLV 133 - 134	10.2	-153	South	17-Dec-2002	13.7	N/A	Overburden	13.7	6.7	36	Cable Tool	6	Steel	43.9956	-78.9796	1 km – 3 km	225.5	Durham	8	24		Null	Fresh	Water Supply	Domestic	Null
1917718	MLV 133 - 134	10.5	-140	South	2-Jul-2005	89.3	N/A	Overburden	89.3	45.7	Null	Rotary (Air)	6	Steel	43.9962	-78.9773	NULL	227.6	Durham	1	14	York Durham Twn Line	Uxbridge	Fresh	Water Supply	Industrial	Null
4603618	MLV 133 - 134	11.0	37	North	16-Dec-1963	36.0	N/A	Overburden	35.7	6.1	45	Cable Tool	6	Steel	43.9954	-78.9713	100 m - 300 m	228.3	Durham	8	23		Null	Fresh	Water Supply	Livestock	Domestic
4603614	MLV 133 - 134	11.7	100	North	24-Jan-1966	8.5	N/A	Overburden	5.5	4.6	9	Boring	30	Concrete	43.9940	-78.9649	100 m - 300 m	224.3	Durham	8	21		Null	Fresh	Water Supply	Domestic	Null
1910135	MLV 133 - 134	12.0	-114	South	14-Aug-1989	78.0	N/A	Overburden	75.6	0.9	45	Cable Tool	6	Steel	43.9930	-78.9601	100 m - 300 m	221.9	Durham	7	21		Null	Fresh	Water Supply	Domestic	Commercial
4600631	MLV 133 - 134	14.5	-155	South	13-Apr-1966	42.7	N/A	Overburden	39.9	21.3	36	Cable Tool	6	Steel	43.9913	-78.9382	30 m - 100 m	218.0	Durham	7	17		Null	Fresh	Water Supply	Domestic	Null
4604590	MLV 133 - 134	17.9	-61	South	31-Oct-1970	15.8	N/A	Overburden	13.7	13.7	9	Boring	24	Galvanized	44.0002	-78.8973	30 m - 100 m	225.0	Durham	7	8		Null	Fresh	Water Supply	Domestic	Null
4600612	MLV 133 - 134	18.1	-144	South	10-Apr-1957	3.7	N/A	Overburden	1.5	1.2	Null	Boring	36	Concrete	43.9999	-78.8951	100 m - 300 m	207.6	Durham	7	8		Null	Fresh	Water Supply	Domestic	Null
1912038	MLV 133 - 134	20.0	-65	South	5-Aug-1994	30.5	N/A	Overburden	24.4	13.7	14	Rotary (Air)	6	Steel	43.9917	-78.8835	30 m - 100 m	222.2	Durham	7	7		Null	Fresh	Water Supply	Domestic	Null
1909252	MLV 133 - 134	20.3	-104	South	28-Jul-1988	13.1	N/A	Overburden	6.4	6.4	18	Boring	30	Concrete	43.9893	-78.8829	100 m - 300 m	209.2	Durham	7	7		Null	Fresh	Water Supply	Domestic	Null
4600580	MLV 133 - 134	20.6	-182	South	7-Nov-1960	25.6	N/A	Overburden	25.3	10.4	23	Cable Tool	36	Concrete	43.9864	-78.8798	100 m - 300 m	210.9	Durham	6	6		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4604298	MLV 133 - 134	21.2	87	North	16-Jun-1969	19.5	N/A	Overburden	19.5	11.6	36	Cable Tool	6	Steel	43.9896	-78.8723	30 m - 100 m	224.6	Durham	6	5		Null	Fresh	Water Supply	Domestic	Null
1908630	MLV 133 - 134	21.2	-88	South	1-Sep-1987	44.5	N/A	Overburden	42.7	13.7	114	Cable Tool	6	Steel	43.9882	-78.8714	100 m - 300 m	232.8	Durham	6	5		Null	Fresh	Water Supply	Domestic	Null
7154799	MLV 133 - 134	23.7	-179	South	18-Oct-2010	0.0	N/A	Null	Null	0	Null	Rotary (Convent.)	6	Steel	43.9801	-78.8547	3 m – 10 m	Null	Durham	6	2	1396 Winchester Rd. East	Oshawa	Null	Water Supply	Domestic	Null
7161209	MLV 133 - 134	23.7	-141	South	14-Mar-2011	0.0	N/A	Null	Null	4.7	Null	NULL	NULL	Null	43.9802	-78.8543	3 m – 10 m	Null	Durham	NULL	NULL	1396 Winchester Rd	Oshawa	Null	Water Supply	Domestic	Null
1905326	MLV 133 - 134	23.7	-174	South	4-May-1979	15.5	N/A	Overburden	15.5	9.1	27	Cable Tool	6	Steel	43.9797	-78.8542	30 m - 100 m	243.4	Durham	6	2		Null	Not Stated	Water Supply	Livestock	Null
4600450	MLV 133 - 134	24.0	74	North	18-May-1959	19.2	N/A	Overburden	18.9	5.5	9	Cable Tool	4	Steel	43.9787	-78.8501	100 m - 300 m	232.9	Durham	5	1		Null	Fresh	Water Supply	Livestock	Domestic
1916687	MLV 133 - 134	25.5	-165	South	29-Aug-2003	72.2	N/A	Overburden	72.2	24.4	18	Rotary (Air)	6	Steel	43.9708	-78.8390	unknown UTM	217.4	Durham	6	35		Null	Fresh	Water Supply	Domestic	Null
1901707	MLV 133 - 134	25.8	134	North	28-Mar-1963	54.6	N/A	Overburden	54.6	13.4	23	Cable Tool	6	Steel	43.9694	-78.8345	100 m - 300 m	215.8	Durham	6	34		Null	Fresh	Water Supply	Livestock	Domestic
1901706	MLV 133 - 134	26.3	18	North	21-Jan-1954	36.3	N/A	Overburden	36.3	0	Null	Cable Tool	6	Steel	43.9651	-78.8334	unknown UTM	201.7	Durham	6	34		Null	Fresh	Water Supply	Livestock	Domestic
1902607	MLV 133 - 134	27.5	282	North	8-Aug-1968	34.7	N/A	Overburden	34.4	18.3	23	Cable Tool	6	Steel	43.9622	-78.8212	30 m - 100 m	211.2	Durham	5	32		Null	Fresh	Water Supply	Commercial	Null
1906104	MLV 133 - 134	27.5	309	North	24-Jul-1981	21.9	N/A	Overburden	14.3	14.3	36	Cable Tool	6	Steel	43.9624	-78.8209	30 m - 100 m	212.7	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1903253	MLV 133 - 134	27.8	265	North	21-Jul-1971	15.8	N/A	Overburden	13.1	13.4	18	Boring	30	Concrete	43.9616	-78.8204	30 m - 100 m	211.7	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1910355	MLV 133 - 134	27.8	-16	South	18-Dec-1989	9.8	N/A	Overburden	6.1	6.1	18	Boring	30	Concrete	43.9591	-78.8201	100 m - 300 m	206.6	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1903382	MLV 133 - 134	27.8	-77	South	16-Apr-1971	32.3	N/A	Overburden	30.8	11.3	45	Cable Tool	6	Steel	43.9585	-78.8198	30 m - 100 m	207.2	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1904455	MLV 133 - 134	27.8	-77	South	8-Oct-1976	33.2	N/A	Overburden	33.2	11.3	27	Cable Tool	6	Steel	43.9585	-78.8198	30 m - 100 m	207.2	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1903958	MLV 134 - 134b	0.0	21	North	27-Sep-1974	25.9	N/A	Overburden	23.8	10.7	18	Cable Tool	6	Steel	43.9594	-78.8194	30 m - 100 m	207.7	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1903465	MLV 134 - 134b	0.1	-194	South	17-Oct-1972	45.7	N/A	Overburden	44.5	13.1	27	Cable Tool	6	Steel	43.9574	-78.8183	30 m - 100 m	207.2	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1903446	MLV 134 - 134b	0.1	-244	South	14-Apr-1972	41.5	N/A	Overburden	40.2	12.2	55	Cable Tool	6	Steel	43.9569	-78.8183	30 m - 100 m	205.7	Durham	5	32		Null	Fresh	Water Supply	Domestic	Null
1908104	MLV 134 - 134b	0.5	-176	South	5-Feb-1987	30.2	N/A	Overburden	29.0	3	36	Cable Tool	6	Steel	43.9564	-78.8165	unknown UTM	201.6	Durham	5	32		Null	Not Stated	Water Supply	Domestic	Null
1903247	MLV 134 - 134b	1.0	150	North	21-Oct-1971	6.4	N/A	Overburden	2.7	2.4	23	Boring	30	Concrete	43.9590	-78.8101	30 m - 100 m	196.7	Durham	5	31		Null	Fresh	Water Supply	Domestic	Null
1903967	MLV 134 - 134b	1.0	100	North	30-Aug-1974	13.1	N/A	Overburden	2.7	3	14	Boring	30	Concrete	43.9586	-78.8099	30 m - 100 m	195.4	Durham	5	31		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
1901661	MLV 134 - 134b	1.0	-175	South	30-Jul-1965	42.7	N/A	Overburden	24.4	14.6	9	Cable Tool	4	Steel	43.9564	-78.8084	100 m - 300 m	191.8	Durham	5	30		Null	Fresh	Water Supply	Public	Null
1901659	MLV 134 - 134b	1.1	141	North	7-Feb-1964	32.3	N/A	Overburden	31.1	13.7	45	Cable Tool	6	Steel	43.9592	-78.8090	100 m - 300 m	201.0	Durham	5	30		Null	Fresh	Water Supply	Livestock	Domestic
1907301	MLV 134 - 134b	1.1	-90	South	13-Jun-1985	12.2	N/A	Overburden	9.1	6.1	45	Cable Tool	6	Steel	43.9573	-78.8079	30 m - 100 m	195.7	Durham	5	30		Null	Fresh	Water Supply	Domestic	Null
1916300	MLV 134 - 134b	1.2	30	North	12-Aug-2002	47.2	N/A	Overburden	47.2	11.9	27	Cable Tool	6	Steel	43.9587	-78.8068	1 km – 3 km	208.1	Durham	5	30		Null	Not Stated	Water Supply	Domestic	Null
1901648	MLV 134 - 134b	3.9	-158	South	26-Feb-1964	57.6	57	Bedrock	57.0	0	41	Cable Tool	6	Steel	43.9585	-78.7736	100 m - 300 m	166.9	Durham	5	24		Null	Fresh	Water Supply	Livestock	Domestic
7100910	MLV 134 - 134b	4.6	-78	South	16-Nov-2007	24.1	N/A	Null	22.9	2.4	32	Rotary (Air)	6	Steel	43.9596	-78.7641	10 m - 30 m	168.3	Durham	5	22	2090 Taunton Rd	Hampton	Fresh	Water Supply	Domestic	Null
1904525	MLV 134 - 134b	4.9	-91	South	28-Dec-1976	9.1	N/A	Overburden	3.7	3.7	14	Boring	30	Concrete	43.9580	-78.7633	30 m - 100 m	166.0	Durham	4	22		Null	Fresh	Water Supply	Domestic	Null
1905930	MLV 134 - 134b	4.9	-141	South	20-Oct-1980	10.4	N/A	Overburden	3.0	3	18	Boring	30	Concrete	43.9575	-78.7630	30 m - 100 m	165.7	Durham	4	22		Null	Fresh	Water Supply	Domestic	Null
1901509	MLV 134 - 134b	6.2	173	North	26-Aug-1961	30.5	N/A	Overburden	29.9	4.6	41	Cable Tool	6	Steel	43.9618	-78.7464	100 m - 300 m	162.2	Durham	4	18		Null	Fresh	Water Supply	Domestic	Null
1910696	MLV 134 - 134b	6.6	175	North	9-Aug-1990	34.4	N/A	Overburden	34.4	7	68	Cable Tool	6	Steel	43.9618	-78.7420	100 m - 300 m	165.6	Durham	4	19		Null	Fresh	Water Supply	Domestic	Null
1901508	MLV 134 - 134b	6.7	-53	South	28-Feb-1959	39.0	N/A	Overburden	39.0	6.1	Null	Cable Tool	6	Steel	43.9597	-78.7410	100 m - 300 m	164.3	Durham	4	18		Null	Fresh	Water Supply	Livestock	Domestic
1901505	MLV 134 - 134b	6.8	29	North	22-Jun-1957	7.9	N/A	Overburden	6.1	3.7	Null	Boring	36	Concrete	43.9604	-78.7398	100 m - 300 m	161.4	Durham	4	17		Null	Fresh	Water Supply	Domestic	Null
1901502	MLV 134 - 134b	7.2	151	North	31-Oct-1963	14.3	N/A	Overburden	10.4	4.6	18	Cable Tool	6	Steel	43.9616	-78.7340	100 m - 300 m	161.2	Durham	4	16		Null	Fresh	Water Supply	Livestock	Domestic
1902852	MLV 134 - 134b	7.3	-97	South	7-Apr-1970	8.2	N/A	Overburden	3.0	3	18	Boring	30	Concrete	43.9593	-78.7336	30 m - 100 m	158.5	Durham	4	16		Null	Fresh	Water Supply	Livestock	Null
1906988	MLV 134 - 134b	7.3	113	North	13-Jul-1984	30.8	N/A	Overburden	29.6	6.1	14	Cable Tool	6	Steel	43.9612	-78.7335	30 m - 100 m	160.6	Durham	4	16		Null	Not Stated	Water Supply	Livestock	Null
1902988	MLV 134 - 134b	7.3	-119	South	12-Nov-1970	10.1	N/A	Overburden	3.0	3	23	Boring	30	Concrete	43.9591	-78.7332	30 m - 100 m	158.3	Durham	4	16		Null	Fresh	Water Supply	Domestic	Null
1916053	MLV 134 - 134b	8.3	-116	South	22-Jul-2002	48.5	N/A	Overburden	48.5	0.6	18	Rotary (Air)	6	Steel	43.9594	-78.7213	unknown UTM	164.3	Durham	4	14		Null	Fresh	Water Supply	Domestic	Null
1910335	MLV 134 - 134b	8.3	-116	South	15-Jan-1990	61.0	52.4	Bedrock	52.4	1.8	9	Cable Tool	6	Steel	43.9594	-78.7213	unknown UTM	164.3	Durham	4	14		Null	Fresh	Water Supply	Domestic	Null
1916280	MLV 134 - 134b	8.7	-48	South	1-Sep-2002	16.8	N/A	Overburden	16.8	4.3	45	Cable Tool	6	Steel	43.9605	-78.7164	1 km – 3 km	180.0	Durham	4	13		Null	Fresh	Water Supply	Domestic	Null
1915404	MLV 134 - 134b	8.7	-48	South	5-Sep-2001	32.3	N/A	Overburden	29.3	4.9	23	Cable Tool	6	Steel	43.9605	-78.7164	unknown UTM	180.0	Durham	4	13		Null	Fresh	Water Supply	Domestic	Null
1913496	MLV 134 - 134b	8.7	-48	South	19-Dec-1997	0.0	N/A	No Formation Data	Null	0	Null	Cable Tool	NULL	Null	43.9605	-78.7163	unknown UTM	180.0	Durham	4	13		Null	Null	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
1902820	MLV 134 - 134b	8.8	7	North	15-Aug-1969	19.8	N/A	Overburden	14.3	9.1	45	Cable Tool	6	Steel	43.9612	-78.7153	30 m - 100 m	182.6	Durham	4	13		Null	Fresh	Water Supply	Domestic	Null
1901497	MLV 134 - 134b	8.8	-65	South	24-Nov-1967	15.5	N/A	Overburden	11.9	11.9	5	Boring	36	Concrete	43.9608	-78.7144	100 m - 300 m	179.6	Durham	4	13		Null	Fresh	Water Supply	Domestic	Null
1914043	MLV 134 - 134b	9.1	68	North	27-May-1999	19.5	N/A	Overburden	18.3	2.7	18	Cable Tool	6	Steel	43.9617	-78.7115	unknown UTM	168.1	Durham	4	12		Null	Fresh	Water Supply	Domestic	Null
1912422	MLV 134 - 134b	9.1	68	North	19-Apr-1995	16.2	N/A	Overburden	14.9	8.5	18	Cable Tool	6	Steel	43.9617	-78.7114	unknown UTM	168.0	Durham	4	12		Null	Not Stated	Water Supply	Domestic	Null
1903965	MLV 134 - 134b	9.4	30	North	4-Sep-1974	10.7	N/A	Overburden	4.6	6.1	14	Boring	36	Concrete	43.9611	-78.7081	30 m - 100 m	167.9	Durham	4	11		Null	Fresh	Water Supply	Domestic	Null
1910736	MLV 134 - 134b	10.7	-126	South	11-Jul-1990	7.3	N/A	Overburden	4.3	4	18	Boring	30	Concrete	43.9594	-78.6912	100 m - 300 m	159.5	Durham	4	8		Null	Fresh	Water Supply	Domestic	Null
1901488	MLV 134 - 134b	11.3	-82	South	14-Mar-1963	49.4	36.3	Bedrock	36.6	6.1	9	Cable Tool	6	Steel	43.9587	-78.6847	100 m - 300 m	138.6	Durham	4	7		Null	Fresh	Water Supply	Domestic	Null
1910451	MLV 134 - 134b	11.6	-22	South	27-Feb-1990	35.1	N/A	Overburden	34.1	18.3	55	Cable Tool	6	Steel	43.9596	-78.6816	100 m - 300 m	140.8	Durham	4	7		Null	Fresh	Water Supply	Domestic	Null
1901486	MLV 134 - 134b	11.6	-69	South	30-Apr-1954	58.5	52.4	Bedrock	36.6	21.9	Null	Cable Tool	5	Open Hole	43.9592	-78.6812	100 m - 300 m	135.1	Durham	4	7		Null	Fresh	Water Supply	Livestock	Domestic
1903271	MLV 134 - 134b	11.8	-132	South	5-Nov-1971	29.3	N/A	Overburden	29.3	18.3	55	Cable Tool	6	Steel	43.9578	-78.6797	30 m - 100 m	128.6	Durham	3	6		Null	Fresh	Water Supply	Domestic	Null
1901383	MLV 134 - 134b	13.5	52	North	6-Oct-1967	28.3	N/A	Overburden	27.4	18.3	23	Cable Tool	6	Steel	43.9581	-78.6587	100 m - 300 m	141.8	Durham	3	3		Null	Fresh	Water Supply	Livestock	Null
1902975	MLV 134 - 134b	15.6	130	North	11-Jul-1970	11.0	N/A	Overburden	8.2	8.2	27	Boring	36	Concrete	43.9591	-78.6329	30 m - 100 m	140.3	Durham	4	33		Null	Fresh	Water Supply	Domestic	Null
7163151	MLV 134 - 134b	15.8	-143	South	28-Jan-2011	34.4	N/A	Null	32.3	9.4	23	Cable Tool	6	Steel	43.9567	-78.6301	10 m- 30 m	Null	Durham	NULL	NULL	4771 Pollard Rd	Orono	Fresh	Water Supply	Domestic	Null
1900846	MLV 134 - 134b	16.4	-32	South	23-Dec-1965	11.6	N/A	Overburden	10.4	9.8	23	Boring	36	Concrete	43.9582	-78.6226	unknown UTM	122.3	Durham	4	31		Null	Fresh	Water Supply	Domestic	Null
1900845	MLV 134 - 134b	16.6	91	North	22-Feb-1957	19.2	N/A	Overburden	18.3	6.1	Null	Cable Tool	5	Steel	43.9597	-78.6212	100 m - 300 m	131.6	Durham	4	31		Null	Fresh	Water Supply	Domestic	Null
1900844	MLV 134 - 134b	16.6	166	North	30-May-1955	16.8	N/A	Overburden	16.8	7.6	Null	Cable Tool	6	Steel	43.9604	-78.6211	100 m - 300 m	130.4	Durham	4	31		Null	Fresh	Water Supply	Domestic	Null
1902929	MLV 134 - 134b	16.8	-78	South	11-Apr-1970	6.4	N/A	Overburden	6.1	1.2	27	Cable Tool	36	Concrete	43.9578	-78.6192	30 m - 100 m	122.8	Durham	4	30		Null	Fresh	Water Supply	Domestic	Null
1902838	MLV 134 - 134b	16.8	-99	South	16-Mar-1970	9.8	N/A	Overburden	3.7	3.7	18	Boring	30	Concrete	43.9575	-78.6180	30 m - 100 m	130.4	Durham	4	30		Null	Fresh	Water Supply	Domestic	Null
1912340	MLV 134 - 134b	16.9	46	North	22-Feb-1995	20.1	N/A	Overburden	18.9	12.2	23	Cable Tool	6	Steel	43.9587	-78.6168	30 m - 100 m	132.4	Durham	4	29		Null	Not Stated	Water Supply	Domestic	Null
1900838	MLV 134 - 134b	17.2	148	North	15-Sep-1965	25.0	N/A	Overburden	22.9	12.2	45	Cable Tool	6	Steel	43.9599	-78.6136	100 m - 300 m	137.6	Durham	4	29		Null	Fresh	Water Supply	Domestic	Null
1912513	MLV 134 - 134b	17.3	-98	South	12-Jul-1995	28.3	22.6	Bedrock	25.9	12.2	5	Cable Tool	6	Steel	43.9573	-78.6149	30 m - 100 m	133.4	Durham	4	30		Null	Not Stated	Water Supply	Domestic	Null
1900816	MLV 134 - 134b	17.8	-125	South	23-Jun-1955	9.1	N/A	Overburden	7.6	7	Null	Boring	36	Concrete	43.9561	-78.6078	unknown UTM	132.1	Durham	4	28		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
1900821	MLV 134 - 134b	17.8	-161	South	7-Dec-1959	6.1	N/A	Overburden	5.5	2.4	Null	Boring	30	Concrete	43.9558	-78.6078	100 m - 300 m	131.4	Durham	4	28		Null	Fresh	Water Supply	Commercial	Null
1900819	MLV 134 - 134b	17.8	-142	South	29-Aug-1958	121.9	30.5	Bedrock	30.5	6.1	Null	Cable Tool	6	Steel	43.9560	-78.6077	100 m - 300 m	131.7	Durham	4	28		Null	Fresh	Water Supply	Commercial	Null
1910121	MLV 134 - 134b	17.8	-86	South	5-Sep-1984	11.6	N/A	Overburden	5.5	4.3	18	Boring	30	Concrete	43.9565	-78.6077	30 m - 100 m	132.8	Durham	4	28		Null	Fresh	Water Supply	Domestic	Null
1900817	MLV 134 - 134b	17.8	-142	South	25-Sep-1957	6.1	N/A	Overburden	4.6	3.7	Null	Boring	36	Concrete	43.9560	-78.6075	100 m - 300 m	131.7	Durham	4	28		Null	Fresh	Water Supply	Commercial	Null
1913877	MLV 134b - 135	0.6	-58	South	11-Nov-1998	20.4	N/A	Overburden	18.3	1.2	27	Cable Tool	6	Steel	43.9584	-78.5907	30 m - 100 m	144.6	Durham	4	25		Null	Not Stated	Water Supply	Domestic	Null
1912079	MLV 134b - 135	1.2	31	North	25-Jul-1994	12.2	N/A	Overburden	10.4	1.2	36	Cable Tool	6	Steel	43.9591	-78.5837	30 m - 100 m	151.5	Durham	4	24		Null	Fresh	Water Supply	Domestic	Null
1902615	MLV 134b - 135	1.3	-138	South	30-Aug-1968	9.8	N/A	Overburden	4.9	0.6	Null	Boring	36	Concrete	43.9576	-78.5817	30 m - 100 m	154.4	Durham	3	23		Null	Fresh	Water Supply	Domestic	Null
1908994	MLV 134b - 135	1.4	-115	South	29-Apr-1988	49.1	48.5	Bedrock	48.8	9.1	91	Cable Tool	6	Steel	43.9578	-78.5811	100 m - 300 m	156.4	Durham	3	23		Null	Not Stated	Water Supply	Domestic	Null
7194158	MLV 134b - 135	2.7	76	North	15-Nov-2012	12.2	N/A	Null	Null	4	Null	NULL	6	Null	43.9568	-78.5668	30 m - 100 m	Null	Durham	3	21	3694 Golf Course Rd.	Orono	Fresh	Water Supply	Null	Null
1912990	MLV 134b - 135	4.3	97	North	4-Oct-1996	7.3	N/A	Overburden	3.7	1.5	9	Cable Tool	30	Concrete	43.9607	-78.5470	30 m - 100 m	151.6	Durham	3	17		Null	Fresh	Water Supply	Domestic	Null
1916569	MLV 134b - 135	6.7	12	North	4-Jul-2003	50.3	49.4	Bedrock	50.3	1.8	23	Cable Tool	6	Open Hole	43.9627	-78.5170	unknown UTM	159.0	Durham	3	11		Null	Fresh	Water Supply	Domestic	Null
1914504	MLV 134b - 135	6.9	-108	South	25-Feb-2000	16.5	N/A	Overburden	16.5	2.4	27	Cable Tool	6	Steel	43.9618	-78.5147	30 m - 100 m	157.4	Durham	3	11		Null	Fresh	Water Supply	Domestic	Null
1904094	MLV 134b - 135	6.9	52	North	7-Nov-1974	21.9	N/A	Overburden	21.9	9.1	Null	Cable Tool	6	Steel	43.9633	-78.5143	30 m - 100 m	156.6	Durham	3	10		Null	Fresh	Water Supply	Domestic	Null
1913605	MLV 134b - 135	7.0	196	North	25-Apr-1998	0.0	N/A	No Formation Data	Null	0	Null	Cable Tool	NULL	Null	43.9646	-78.5143	30 m - 100 m	149.3	Durham	3	10		Null	Null	Water Supply	Domestic	Null
1915449	MLV 134b - 135	7.1	88	North	22-Nov-2001	7.6	N/A	Overburden	5.5	5.5	9	Cable Tool	30	Concrete	43.9638	-78.5121	unknown UTM	147.8	Durham	3	10		Null	Fresh	Water Supply	Domestic	Null
1912341	MLV 134b - 135	7.4	-62	South	16-Feb-1995	21.0	N/A	Overburden	20.1	8.2	23	Cable Tool	6	Steel	43.9629	-78.5084	30 m - 100 m	156.1	Durham	3	9		Null	Not Stated	Water Supply	Domestic	Null
1916391	MLV 134b - 135	7.6	144	North	31-Mar-2003	7.9	N/A	Overburden	6.1	5.5	5	Cable Tool	30	Concrete	43.9648	-78.5069	1 km – 3 km	156.6	Durham	3	9		Null	Fresh	Water Supply	Domestic	Null
1914369	MLV 134b - 135	7.7	-14	South	11-Jan-2000	60.7	N/A	Overburden	60.7	9.1	23	Rotary (Convent.)	6	Steel	43.9636	-78.5044	30 m - 100 m	159.9	Durham	3	9		Null	Fresh	Water Supply	Domestic	Null
1904896	MLV 134b - 135	7.8	-92	South	7-Dec-1977	27.1	N/A	Overburden	27.1	13.7	14	Cable Tool	6	Steel	43.9630	-78.5038	30 m - 100 m	163.6	Durham	3	9		Null	Fresh	Water Supply	Domestic	Null
1904872	MLV 134b - 135	7.8	-92	South	7-Nov-1977	26.2	N/A	Overburden	25.0	13.7	14	Cable Tool	6	Steel	43.9630	-78.5038	30 m - 100 m	163.6	Durham	3	9		Null	Fresh	Water Supply	Domestic	Null
1915401	MLV 134b - 135	8.5	85	North	19-Sep-2001	8.2	N/A	Overburden	4.6	3	9	Cable Tool	30	Concrete	43.9670	-78.4971	unknown UTM	165.2	Durham	3	7		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
1912814	MLV 134b - 135	8.7	-131	South	29-Apr-1996	61.0	61	Bedrock	60.7	6.4	36	Cable Tool	6	Steel	43.9654	-78.4944	30 m - 100 m	156.8	Durham	3	7		Null	Not Stated	Water Supply	Domestic	Null
1905991	MLV 134b - 135	8.7	-169	South	11-Sep-1979	60.0	59.7	Bedrock	60.0	0.3	45	Cable Tool	6	Steel	43.9651	-78.4940	30 m - 100 m	156.0	Durham	3	7		Null	Fresh	Water Supply	Domestic	Null
7184256	MLV 134b - 135	9.0	-88	South	30-May-2012	60.7	N/A	Null	60.7	4.9	36	Rotary (Convent.)	6	Steel	43.9652	-78.4924	30 m - 100 m	Null	Durham	3	6	3235 Stewart Rd	Newtonville	Null	Water Supply	Domestic	Null
1900747	MLV 134b - 135	10.9	27	North	13-Nov-1963	15.2	N/A	Overburden	11.9	11	23	Boring	30	Concrete	43.9664	-78.4687	100 m - 300 m	175.5	Durham	3	2		Null	Fresh	Water Supply	Livestock	Domestic
1900749	MLV 134b - 135	10.9	83	North	1-Oct-1966	75.0	74.7	Bedrock	75.0	24.4	45	Cable Tool	6	Steel	43.9670	-78.4683	100 m - 300 m	177.0	Durham	3	2		Null	Fresh	Water Supply	Livestock	Domestic
1917395	MLV 134b - 135	11.2	180	North	14-Oct-2004	13.1	N/A	Overburden	13.1	5.2	136	Cable Tool	6	Steel	43.9680	-78.4658	10 m - 30 m	177.5	Durham	3	1	4876 Concession Road 3	Newtonville	Fresh	Water Supply	Commercial	Null
4507362	MLV 134b - 135	13.3	152	North	3-Jun-1988	39.9	N/A	Overburden	36.6	28.7	27	Cable Tool	6	Steel	43.9692	-78.4402	10 m - 30 m	205.6	Northumberland	3	31		Null	Not Stated	Water Supply	Domestic	Null
4506132	MLV 134b - 135	13.3	171	North	25-Jan-1985	33.5	N/A	Overburden	31.7	28.3	23	Cable Tool	6	Steel	43.9694	-78.4399	10 m - 30 m	202.6	Northumberland	3	31		Null	Not Stated	Water Supply	Domestic	Null
4508123	MLV 134b - 135	13.5	123	North	2-Nov-1979	102.4	23.8	Overburden	92.7	39.6	45	Cable Tool	6	Steel	43.9692	-78.4381	10 m - 30 m	197.0	Northumberland	3	30		Null	Fresh	Water Supply	Domestic	Null
4511290	MLV 134b - 135	15.3	181	North	7-Apr-1997	61.3	60	Bedrock	56.7	38.7	14	Cable Tool	6	Steel	43.9748	-78.4175	10 m - 30 m	163.7	Northumberland	3	26		Null	Fresh	Water Supply	Livestock	Null
1902692	MLV 134b - 135	16.1	-63	South	17-Jul-1968	7.6	0	Overburden	4.6	1.2	Null	Boring	30	Concrete	43.9742	-78.4072	30 m - 100 m	151.0	Northumberland	3	24		Null	Fresh	Water Supply	Livestock	Null
1903799	MLV 134b - 135	16.2	197	North	12-Oct-1973	50.6	43.3	Bedrock	50.6	15.2	18	Cable Tool	6	Steel	43.9768	-78.4056	30 m - 100 m	147.0	Northumberland	3	24		Null	Fresh	Water Supply	Domestic	Null
1904352	MLV 135 - 135a	0.8	-124	South	8-Apr-1976	19.2	17.1	Bedrock	17.1	6.7	45	Cable Tool	6	Steel	43.9757	-78.3893	30 m - 100 m	115.1	Northumberland	3	21		Null	Fresh	Water Supply	Domestic	Null
4509113	MLV 135 - 135a	4.1	-189	South	15-Mar-1991	12.2	N/A	Overburden	6.1	6.1	18	Boring	30	Concrete	43.9821	-78.3491	unknown UTM	117.1	Northumberland	3	13		Null	Fresh	Water Supply	Domestic	Null
4508690	MLV 135 - 135a	4.3	-146	South	24-May-1990	15.5	N/A	Overburden	6.1	6.1	18	Boring	30	Concrete	43.9827	-78.3473	10 m - 30 m	117.2	Northumberland	3	13		Null	Fresh	Water Supply	Domestic	Null
4506663	MLV 135 - 135a	4.3	-146	South	22-Mar-1987	11.6	N/A	Overburden	6.1	6.1	23	Boring	30	Concrete	43.9828	-78.3471	10 m - 30 m	117.0	Northumberland	3	13		Null	Fresh	Water Supply	Domestic	Null
4513338	MLV 135 - 135a	4.5	-112	South	15-Aug-2002	48.8	28	Bedrock	48.8	10.7	Null	Cable Tool	6	Steel	43.9834	-78.3442	1 km – 3 km	116.6	Northumberland	3	12		Null	Fresh	Water Supply	Domestic	Null
4514111	MLV 135 - 135a	4.9	-83	South	21-Jul-2004	25.0	N/A	Overburden	24.9	8.3	Null	Cable Tool	6	Steel	43.9841	-78.3398	unknown UTM	126.1	Northumberland	5	7	5786 Knoxville Road	Porthope	Fresh	Water Supply	Domestic	Null
4509398	MLV 135 - 135a	5.2	-192	South	1-Oct-1991	27.1	N/A	Overburden	27.1	4.6	18	Boring	30	Concrete	43.9834	-78.3362	10 m - 30 m	142.2	Northumberland	3	11		Null	Fresh	Water Supply	Domestic	Null
4505666	MLV 135 - 135a	5.2	39	North	5-Oct-1981	20.1	N/A	Overburden	20.1	11	36	Cable Tool	6	Steel	43.9855	-78.3365	30 m - 100 m	135.2	Northumberland	3	10		Null	Fresh	Water Supply	Livestock	Domestic
4505226	MLV 135 - 135a	6.0	91	North	5-Oct-1973	10.4	N/A	Overburden	9.8	4.6	Null	Cable Tool	36	Concrete	43.9869	-78.3267	30 m - 100 m	116.8	Northumberland	3	9		Null	Fresh	Water Supply	Livestock	Domestic

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4508625	MLV 135 - 135a	8.4	15	North	4-May-1990	29.0	29	Bedrock	29.0	7.6	18	Cable Tool	6	Steel	43.9919	-78.2988	10 m - 30 m	120.2	Northumberland	3	3		Null	Fresh	Water Supply	Domestic	Null
4508623	MLV 135 - 135a	8.4	102	North	11-May-1990	51.8	46.6	Bedrock	48.8	12.2	14	Cable Tool	6	Steel	43.9927	-78.2992	10 m - 30 m	114.0	Northumberland	3	3		Null	Fresh	Water Supply	Domestic	Null
1901959	MLV 135 - 135a	8.6	-114	South	31-Aug-1955	12.2	N/A	Overburden	12.2	1.5	Null	Cable Tool	5	Steel	43.9917	-78.2949	unknown UTM	122.9	Northumberland	3	3		Null	Fresh	Water Supply	Commercial	Null
1901950	MLV 135 - 135a	8.7	-86	South	24-Nov-1955	32.0	18	Bedrock	32.0	15.2	Null	Cable Tool	6	Steel	43.9922	-78.2942	unknown UTM	124.6	Northumberland	3	2		Null	Fresh	Water Supply	Domestic	Null
4513102	MLV 135 - 135a	13.3	-84	South	15-Jul-2002	54.6	N/A	Overburden	51.8	13.1	18	Cable Tool	6	Steel	43.9992	-78.2464	100 m - 300 m	119.3	Northumberland	3	28		Null	Fresh	Water Supply	Domestic	Null
4500811	MLV 135 - 135a	13.3	-196	South	2-Sep-1965	9.1	N/A	Overburden	7.6	6.7	Null	Boring	30	Concrete	43.9988	-78.2477	100 m - 300 m	119.2	Northumberland	3	28		Null	Fresh	Water Supply	Domestic	Null
4511644	MLV 135 - 135a	13.4	-167	South	4-Jun-1998	11.6	N/A	Overburden	11.6	1.8	Null	Cable Tool	6	Steel	43.9982	-78.2470	10 m - 30 m	117.0	Northumberland	2	27		Null	Fresh	Water Supply	Domestic	Null
4510668	MLV 135a - 136	2.5	-46	South	8-Aug-1995	34.4	N/A	Overburden	34.4	21.3	32	Cable Tool	6	Steel	44.0005	-78.2138	10 m - 30 m	131.8	Northumberland	2	22		Null	Fresh	Water Supply	Domestic	Null
4511790	MLV 135a - 136	2.6	-59	South	5-May-1999	49.4	N/A	Overburden	Null	0	Null	Cable Tool	6	Steel	44.0011	-78.2131	30 m - 100 m	132.3	Northumberland	2	21		Null	Null	Null	Null	Null
4508918	MLV 135a - 136	3.9	160	North	5-Sep-1990	19.5	N/A	Overburden	19.5	3.7	32	Cable Tool	6	Steel	44.0068	-78.1988	10 m - 30 m	125.0	Northumberland	2	19		Null	Fresh	Water Supply	Domestic	Null
4503088	MLV 135a - 136	4.3	173	North	7-Jul-1971	5.5	N/A	Overburden	2.4	2.1	32	Boring	30	Concrete	44.0074	-78.1971	30 m - 100 m	131.5	Northumberland	2	18		Null	Fresh	Water Supply	Domestic	Null
4502643	MLV 135a - 136	4.3	129	North	9-Jan-1970	7.6	N/A	Overburden	7.6	3	18	Boring	30	Concrete	44.0072	-78.1962	30 m - 100 m	132.5	Northumberland	2	18		Null	Fresh	Water Supply	Domestic	Null
7106137	MLV 135a - 136	4.9	113	North	20-Aug-2007	43.2	N/A	Null	41.1	26.7	20	Cable Tool	6	Steel	44.0078	-78.1886	10 m - 30 m	159.1	Northumberland	2	17		Null	Null	Water Supply	Domestic	Null
7121441	MLV 135a - 136	5.0	117	North	4-Jul-2008	54.9	N/A	Null	53.0	29.4	23	Cable Tool	6	Steel	44.0079	-78.1885	10 m - 30 m	159.2	Northumberland	2	17	2700 Castle Hill Rd.	Cobourg	Fresh	Water Supply	Domestic	Null
4500746	MLV 135a - 136	5.1	-194	South	13-Jun-1956	18.3	N/A	Overburden	16.8	0.9	Null	Cable Tool	6	Steel	44.0055	-78.1860	unknown UTM	147.0	Northumberland	2	16		Null	Fresh	Water Supply	Domestic	Null
4500747	MLV 135a - 136	5.7	-154	South	18-Dec-1962	44.5	N/A	Overburden	44.5	12.2	23	Cable Tool	6	Steel	44.0032	-78.1829	100 m - 300 m	158.0	Northumberland	2	16		Null	Fresh	Water Supply	Livestock	Domestic
4500741	MLV 135a - 136	5.8	19	North	20-Nov-1952	12.8	N/A	Overburden	12.5	11	Null	Cable Tool	6	Open Hole	44.0044	-78.1802	unknown UTM	160.6	Northumberland	2	15		Null	Fresh	Water Supply	Domestic	Null
4508824	MLV 135a - 136	6.0	-132	South	9-Aug-1990	45.1	N/A	Overburden	45.1	12.2	23	Cable Tool	6	Steel	44.0033	-78.1784	10 m - 30 m	160.5	Northumberland	2	16		Null	Fresh	Water Supply	Domestic	Null
4511489	MLV 135a - 136	6.1	181	North	25-Jun-1998	54.9	N/A	Overburden	53.6	41.1	23	Cable Tool	6	Steel	44.0063	-78.1772	30 m - 100 m	164.4	Northumberland	2	15		Null	Fresh	Water Supply	Domestic	Null
7151127	MLV 135a - 136	6.2	185	North	3-Jun-2010	115.8	N/A	Null	Null	66.1	Null	Rotary (Convent.)	6	Steel	44.0052	-78.1742	30 m - 100 m	165.1	Northumberland	2	4	8 Skye Valley Drive	Cobourg	Null	Water Supply	Domestic	Null
4502591	MLV 135a - 136	6.2	-50	South	15-May-1969	7.6	N/A	Overburden	7.6	2.1	23	Boring	30	Concrete	44.0037	-78.1764	30 m - 100 m	163.6	Northumberland	2	15		Null	Fresh	Water Supply	Domestic	Null
4502328	MLV 135a - 136	6.3	-95	South	24-Aug-1968	64.9	63.4	Bedrock	63.4	31.4	18	Cable Tool	6	Steel	44.0028	-78.1766	100 m - 300 m	160.6	Northumberland	2	15		Null	Fresh	Water Supply	Domestic	Null

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Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
7157934	MLV 135a - 136	6.4	-167	South	14-Oct-2010	46.3	N/A	Null	45.1	34.4	32	Cable Tool	6	Steel	44.0022	-78.1773	10 m - 30 m	Null	Northumberland	2	15	2515 Division St N	Cobourg	Fresh	Water Supply	Domestic	Null
4502658	MLV 135a - 136	6.4	-104	South	28-Apr-1970	7.9	N/A	Overburden	2.4	3	18	Boring	30	Concrete	44.0024	-78.1765	30 m - 100 m	159.3	Northumberland	2	15		Null	Fresh	Water Supply	Domestic	Null
4510227	MLV 135a - 136	6.4	-163	South	29-Mar-1994	85.3	60.4	Bedrock	Null	0	Null	Rotary (Air)	NULL	Null	44.0019	-78.1771	10 m – 30 m	157.0	Northumberland	2	15		Null	Null	Null	Null	Null
4502695	MLV 135a - 136	6.4	-159	South	23-Jun-1970	3.7	N/A	Overburden	1.5	1.5	18	Boring	30	Concrete	44.0015	-78.1768	30 m - 100 m	152.8	Northumberland	2	15		Null	Fresh	Water Supply	Domestic	Null
4504306	MLV 135a - 136	7.7	22	North	12-Mar-1976	59.7	57.9	Bedrock	57.9	22.9	27	Cable Tool	6	Steel	44.0043	-78.1596	30 m - 100 m	152.6	Northumberland	2	12		Null	Fresh	Water Supply	Domestic	Null
4503612	MLV 135a - 136	7.7	197	North	11-Oct-1973	50.3	N/A	Overburden	50.3	30.5	68	Cable Tool	6	Steel	44.0045	-78.1574	30 m - 100 m	164.1	Northumberland	2	11		Null	Fresh	Water Supply	Domestic	Null
4503613	MLV 135a - 136	7.7	181	North	21-Nov-1973	21.3	N/A	Overburden	19.8	12.2	9	Cable Tool	6	Steel	44.0045	-78.1576	30 m - 100 m	164.1	Northumberland	2	11		Null	Fresh	Water Supply	Domestic	Null
4502491	MLV 135a - 136	7.8	86	North	1-May-1969	21.9	N/A	Overburden	21.9	12.2	9	Cable Tool	6	Steel	44.0040	-78.1586	100 m - 300 m	162.3	Northumberland	2	11		Null	Fresh	Water Supply	Domestic	Null
4504572	MLV 135a - 136	8.0	107	North	24-Nov-1976	53.3	N/A	Overburden	51.2	30.5	45	Cable Tool	6	Steel	44.0034	-78.1579	30 m - 100 m	164.5	Northumberland	2	11		Null	Fresh	Water Supply	Domestic	Null
7054238	MLV 135a - 136	8.8	169	North	23-Mar-2007	35.0	N/A	Null	35.0	14.2	82	Cable Tool	6	Null	44.0050	-78.1493	10 m - 30 m	162.9	Northumberland	NULL	NULL	2434 Hircock Rd	Baltimore	Fresh	Water Supply	Domestic	Null
4500665	MLV 135a - 136	10.9	-158	South	23-Jun-1966	9.4	N/A	Overburden	5.5	6.1	5	Cable Tool	30	Concrete	44.0084	-78.1233	100 m - 300 m	212.6	Northumberland	1	5		Null	Fresh	Water Supply	Domestic	Null
4512326	MLV 135a - 136	13.6	59	North	18-Dec-1999	30.2	N/A	Overburden	30.2	21.6	Null	Cable Tool	6	Steel	44.0225	-78.1087	10 m - 30 m	234.0	Northumberland	2	1		Null	Not Stated	Water Supply	Domestic	Null
7112789	MLV 135a - 136	15.1	-134	South	15-Sep-2008	63.1	N/A	Null	58.5	34	32	Rotary (Air)	6	Steel	44.0259	-78.0909	10 m - 30 m	263.3	Northumberland	3	NULL	145 Noble Rd.	Baltimore	Untested	Water Supply	Domestic	Null
4500571	MLV 135a - 136	17.4	163	North	13-Feb-1963	33.8	N/A	Overburden	32.0	21.3	23	Cable Tool	6	Steel	44.0355	-78.0641	100 m - 300 m	255.2	Northumberland	3	26		Null	Fresh	Water Supply	Domestic	Null
4506853	MLV 135a - 136	19.1	18	North	24-Sep-1987	88.7	N/A	Overburden	87.5	54.9	36	Cable Tool	6	Steel	44.0385	-78.0440	10 m - 30 m	254.9	Northumberland	3	21		Null	Not Stated	Water Supply	Domestic	Null
7229685	MLV 135a - 136	21.1	-5	South	14-Oct-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0443	-78.0200	30 m - 100 m	Null	Northumberland	3	17		Null	Null	Null	Null	Null
7229686	MLV 135a - 136	21.1	-5	South	24-Sep-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0443	-78.0200	30 m - 100 m	Null	Northumberland	3	17		Null	Null	Null	Null	Null
4502637	MLV 135a - 136	21.8	21	North	13-Feb-1970	8.5	N/A	Overburden	8.5	4	Null	Boring	24	Galvanized	44.0464	-78.0135	30 m - 100 m	184.0	Northumberland	3	15		Null	Fresh	Water Supply	Domestic	Null
4512054	MLV 135a - 136	21.8	168	North	29-Dec-1999	39.3	N/A	Overburden	38.1	1.8	9	Cable Tool	6	Steel	44.0468	-78.0153	30 m - 100 m	193.6	Northumberland	3	16		Null	Fresh	Water Supply	Domestic	Null
4505101	MLV 135a - 136	22.0	119	North	26-Oct-1978	75.0	N/A	Overburden	73.8	57.9	45	Cable Tool	6	Steel	44.0477	-78.0117	30 m - 100 m	182.8	Northumberland	3	16		Null	Fresh	Water Supply	Domestic	Null
4503022	MLV 135a - 136	22.0	-312	South	16-Jun-1971	9.4	N/A	Overburden	6.1	6.1	27	Boring	30	Concrete	44.0441	-78.0098	30 m - 100 m	178.3	Northumberland	3	16		Null	Fresh	Water Supply	Domestic	Null
4504791	MLV 135a - 136	22.1	-190	South	16-Sep-1977	78.0	74.4	Bedrock	74.4	17.4	23	Cable Tool	6	Steel	44.0453	-78.0091	30 m - 100 m	179.7	Northumberland	3	15		Null	Fresh	Water Supply	Commercial	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
7179391	MLV 135a - 136	22.1	-60	South	3-Oct-2011	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0465	-78.0091	30 m - 100 m	Null	Northumberland	NULL	NULL		Null	Null	Null	Null	Null
4500564	MLV 135a - 136	22.2	44	North	9-May-1963	82.0	77.1	Bedrock	77.7	9.1	14	Cable Tool	6	Steel	44.0474	-78.0093	100 m - 300 m	182.6	Northumberland	3	16		Null	Fresh	Water Supply	Commercial	Null
4500562	MLV 135a - 136	22.2	-65	South	21-Jun-1966	21.0	N/A	Overburden	21.0	4.9	14	Cable Tool	6	Steel	44.0467	-78.0081	100 m - 300 m	183.0	Northumberland	3	15		Null	Fresh	Water Supply	Commercial	Null
7106708	MLV 135a - 136	22.3	212	North	18-Mar-2008	12.5	N/A	Null	12.5	1.8	18	Cable Tool	6	Steel	44.0494	-78.0073	10 m - 30 m	189.5	Northumberland	3	51	442 Pipeline Rd	Centreton	Fresh	Water Supply	Domestic	Null
4504847	MLV 136 - 137	0.0	-429	South	4-Nov-1977	17.4	N/A	Overburden	16.2	8.5	23	Cable Tool	6	Steel	44.0429	-78.0075	30 m - 100 m	168.0	Northumberland	3	15		Null	Fresh	Water Supply	Commercial	Null
4511530	MLV 136 - 137	0.0	-281	South	12-Aug-1998	61.0	N/A	Overburden	61.0	13.7	36	Cable Tool	6	Steel	44.0441	-78.0062	unknown UTM	168.6	Northumberland	3	15		Null	Fresh	Water Supply	Domestic	Null
4506788	MLV 136 - 137	0.3	-258	South	10-Jul-1987	11.0	N/A	Overburden	5.8	1.2	18	Boring	30	Concrete	44.0452	-78.0015	unknown UTM	164.8	Northumberland	3	14		Null	Fresh	Water Supply	Domestic	Null
4510664	MLV 136 - 137	0.3	-258	South	4-Aug-1995	14.9	N/A	Overburden	13.4	13.4	9	Cable Tool	30	Concrete	44.0452	-78.0015	unknown UTM	164.8	Northumberland	3	14		Null	Fresh	Water Supply	Domestic	Null
4509788	MLV 136 - 137	0.3	-258	South	18-Aug-1992	76.5	N/A	Overburden	76.5	15.2	23	Cable Tool	6	Galvanized	44.0452	-78.0015	unknown UTM	164.8	Northumberland	3	14		Null	Fresh	Water Supply	Domestic	Null
4514167	MLV 136 - 137	0.4	168	North	12-Nov-2004	77.4	76.8	Bedrock	77.4	20.7	23	Cable Tool	6	Steel	44.0490	-78.0025	NULL	186.5	Northumberland	3	14	513 Pipeline Rd	Grafton	Fresh	Water Supply	Domestic	Null
4506816	MLV 136 - 137	1.4	-127	South	25-Aug-1987	12.8	N/A	Overburden	12.8	0.6	18	Boring	3	Concrete	44.0492	-77.9892	10 m - 30 m	189.8	Northumberland	3	11		Null	Fresh	Water Supply	Domestic	Null
7135840	MLV 136 - 137	2.5	178	North	16-Sep-2008	28.3	N/A	Null	28.3	8.7	23	Cable Tool	6	Steel	44.0564	-77.9786	10 m - 30 m	197.4	Northumberland	3	9	Shelter Valley Rd.	Vernonville	Fresh	Water Supply	Domestic	Null
7212872	MLV 136 - 137	4.1	55	North	11-Sep-2013	7.6	N/A	Null	7.6	0.6	14	Cable Tool	6	Steel	44.0610	-77.9606	30 m - 100 m	Null	Northumberland	3	6	3205 Shelter Valley Rd	Null	Fresh	Water Supply	Domestic	Null
7198305	MLV 136 - 137	4.2	-153	South	14-Dec-2010	39.5	N/A	Null	39.5	18.2	682	Rotary (Convent.)	6	Steel	44.0595	-77.9589	30 m - 100 m	Null	Northumberland	3	5	Shelter Valley Rd.	Grafton	Untested	Water Supply	Commercial	Null
4504044	MLV 136 - 137	5.0	196	North	29-Apr-1975	24.7	N/A	Overburden	23.5	3.7	114	Cable Tool	6	Steel	44.0659	-77.9510	30 m - 100 m	193.2	Northumberland	3	3		Null	Not Stated	Water Supply	Domestic	Null
4505454	MLV 136 - 137	5.1	160	North	15-Jul-1980	18.9	N/A	Overburden	17.7	9.1	23	Cable Tool	6	Steel	44.0658	-77.9502	30 m - 100 m	192.0	Northumberland	3	3		Null	Fresh	Water Supply	Domestic	Null
7230037	MLV 136 - 137	5.6	-80	South	4-Sep-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0655	-77.9433	30 m - 100 m	Null	Northumberland	3	2		Null	Null	Null	Null	Null
7230038	MLV 136 - 137	5.6	-68	South	4-Sep-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0657	-77.9433	30 m - 100 m	Null	Northumberland	NULL	NULL		Null	Null	Null	Null	Null
7230036	MLV 136 - 137	5.6	-87	South	4-Sep-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0655	-77.9431	100 m - 300 m	Null	Northumberland	3	2		Null	Null	Null	Null	Null
7230020	MLV 136 - 137	5.9	-53	South	18-Aug-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0662	-77.9403	30 m - 100 m	Null	Northumberland	NULL	NULL		Null	Null	Null	Null	Null
7230019	MLV 136 - 137	5.9	-49	South	21-Aug-2014	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.0663	-77.9403	30 m - 100 m	Null	Northumberland	NULL	NULL		Null	Null	Null	Null	Null
4514793	MLV 136 - 137	5.9	188	North	23-Nov-2006	65.8	N/A	Overburden	12.0	3.7	32	Cable Tool	6	Steel	44.0685	-77.9407	10 m - 30 m	184.9	Northumberland	3	1	3577 Shelter Valley Rd	Castleron	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4506263	MLV 136 - 137	6.1	-26	South	17-Oct-1985	16.2	N/A	Overburden	14.6	2.7	36	Cable Tool	6	Steel	44.0671	-77.9381	10 m - 30 m	186.7	Northumberland	3	1		Null	Not Stated	Water Supply	Industrial	Null
7052931	MLV 136 - 137	6.5	106	North	28-Sep-2007	73.7	N/A	Null	73.7	12.1	18	Cable Tool	6	Steel	44.0698	-77.9344	10 m - 30 m	190.0	Northumberland	5	35	177 Pipeline Road	Colborne	Fresh	Water Supply	Domestic	Null
4513123	MLV 136 - 137	6.8	146	North	19-Aug-2002	75.0	N/A	Overburden	75.0	11.6	18	Cable Tool	6	Steel	44.0715	-77.9301	100 m - 300 m	186.7	Northumberland	5	34		Null	Fresh	Water Supply	Domestic	Null
4503252	MLV 136 - 137	7.4	5	North	23-Nov-1970	13.7	N/A	Overburden	6.1	3	36	Boring	30	Concrete	44.0701	-77.9226	30 m - 100 m	168.1	Northumberland	5	32		Null	Fresh	Water Supply	Domestic	Null
4511853	MLV 136 - 137	14.3	-148	South	16-Jul-1999	39.9	N/A	Overburden	39.9	13.1	18	Cable Tool	6	Steel	44.0928	-77.8472	10 m - 30 m	181.6	Northumberland	6	17		Null	Fresh	Water Supply	Domestic	Null
4500428	MLV 136 - 137	15.1	-16	South	2-Jun-1964	57.9	N/A	Overburden	33.5	30.5	14	Cable Tool	5	Steel	44.0971	-77.8379	100 m - 300 m	211.0	Northumberland	6	15		Null	Fresh	Water Supply	Livestock	Domestic
4503633	MLV 137 - 138a	2.0	-137	South	17-Nov-1973	26.5	N/A	Overburden	24.4	7.6	14	Cable Tool	6	Steel	44.1167	-77.7541	30 m - 100 m	213.4	Northumberland	4	33		Null	Fresh	Water Supply	Domestic	Null
4514029	MLV 137 - 138a	2.0	24	North	20-Sep-2004	10.8	N/A	Overburden	10.2	0.9	Null	Cable Tool	6	Steel	44.1181	-77.7546	10 m - 30 m	196.4	Northumberland	4	33	Hansen Rd Rr7	Brighton	Null	Water Supply	Domestic	Null
4500266	MLV 137 - 138a	2.0	78	North	31-Jul-1957	32.0	N/A	Overburden	31.4	15.2	Null	Cable Tool	6	Steel	44.1187	-77.7543	unknown UTM	195.7	Northumberland	4	33		Null	Fresh	Water Supply	Domestic	Null
4514027	MLV 137 - 138a	2.1	-73	South	14-Sep-2004	18.0	N/A	Overburden	17.1	10.6	Null	Cable Tool	6	Steel	44.1174	-77.7535	10 m - 30 m	213.0	Northumberland	4	33	Rr7 414 Hansen Rd	Brighton	Null	Water Supply	Domestic	Null
4514028	MLV 137 - 138a	2.1	62	North	27-Sep-2004	6.9	N/A	Overburden	6.6	1.6	Null	Cable Tool	6	Steel	44.1187	-77.7535	10 m - 30 m	199.8	Northumberland	4	32	Hansen Rd Rr7	Brighton	Null	Water Supply	Domestic	Null
4513107	MLV 137 - 138a	3.0	87	North	7-Aug-2002	9.1	N/A	Overburden	9.1	3.7	18	Cable Tool	6	Steel	44.1216	-77.7434	100 m - 300 m	211.1	Northumberland	4	30		Null	Fresh	Water Supply	Domestic	Null
4500264	MLV 137 - 138a	3.8	142	North	7-Sep-1956	11.0	N/A	Overburden	11.0	3.7	Null	Cable Tool	6	Steel	44.1251	-77.7344	unknown UTM	184.8	Northumberland	4	28		Null	Fresh	Water Supply	Domestic	Null
4503523	MLV 137 - 138a	4.6	-66	South	29-Aug-1973	101.5	101.2	Bedrock	101.2	86.6	45	Cable Tool	6	Steel	44.1263	-77.7242	30 m - 100 m	226.3	Northumberland	4	26		Null	Fresh	Water Supply	Domestic	Null
7103941	MLV 137 - 138a	8.6	159	North	14-Feb-2008	27.7	N/A	Null	27.7	4.6	36	Cable Tool	6	Steel	44.1435	-77.6801	10 m - 30 m	148.3	Northumberland	NULL	NULL	380 Nicholl's Road	Wooler	Not Stated	Water Supply	Domestic	Null
4504563	MLV 137 - 138a	8.6	-128	South	10-Nov-1976	18.3	N/A	Overburden	13.7	4.6	9	Cable Tool	6	Steel	44.1411	-77.6789	30 m - 100 m	141.3	Northumberland	4	17		Null	Fresh	Water Supply	Livestock	Null
4513525	MLV 137 - 138a	8.6	183	North	30-Jul-2003	4.0	N/A	Overburden	4.0	1.8	Null	Digging	36	Concrete	44.1438	-77.6802	unknown UTM	148.4	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4513526	MLV 137 - 138a	8.6	183	North	30-Jul-2003	4.0	N/A	Overburden	4.0	2.7	Null	Digging	36	Concrete	44.1438	-77.6802	unknown UTM	148.4	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4512592	MLV 137 - 138a	8.6	183	North	7-Mar-2001	6.7	N/A	Overburden	6.1	1.5	36	Cable Tool	5	Null	44.1438	-77.6802	unknown UTM	148.3	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4512298	MLV 137 - 138a	8.6	183	North	26-Jul-2000	7.0	N/A	Overburden	6.7	1.2	18	Cable Tool	5	Steel	44.1438	-77.6802	unknown UTM	148.3	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4512723	MLV 137 - 138a	8.6	183	North	2-Aug-2001	5.5	N/A	Overburden	2.4	2.4	Null	Digging	36	Concrete	44.1438	-77.6802	unknown UTM	148.2	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4512724	MLV 137 - 138a	8.6	183	North	7-Aug-2001	5.5	N/A	Overburden	2.7	2.1	Null	Digging	36	Concrete	44.1438	-77.6802	unknown UTM	148.2	Northumberland	4	17		Null	Not Stated	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4512732	MLV 137 - 138a	8.6	183	North	15-Jun-2001	12.8	N/A	Overburden	11.3	4.9	45	Cable Tool	6	Open Hole	44.1438	-77.6802	unknown UTM	148.2	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4512770	MLV 137 - 138a	8.6	183	North	28-Aug-2001	4.6	N/A	Overburden	2.7	3	Null	Digging	36	Concrete	44.1438	-77.6802	unknown UTM	148.2	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4509134	MLV 137 - 138a	8.6	181	North	25-Oct-1990	24.4	19.2	Bedrock	20.7	10.7	23	Rotary (Convent.)	6	Steel	44.1438	-77.6801	unknown UTM	147.6	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4509448	MLV 137 - 138a	8.6	181	North	26-Jul-1990	17.7	N/A	Overburden	17.7	6.4	23	Rotary (Convent.)	6	Steel	44.1438	-77.6801	unknown UTM	147.6	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4509449	MLV 137 - 138a	8.6	181	North	30-Jul-1990	18.0	N/A	Overburden	18.0	7	23	Rotary (Convent.)	6	Steel	44.1438	-77.6801	unknown UTM	147.6	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4509132	MLV 137 - 138a	8.6	181	North	25-Oct-1990	22.9	18.6	Bedrock	19.5	10.7	23	Rotary (Convent.)	6	Steel	44.1438	-77.6801	unknown UTM	147.6	Northumberland	4	17		Null	Fresh	Water Supply	Domestic	Null
4513624	MLV 137 - 138a	9.0	178	North	27-Sep-2003	4.6	N/A	Overburden	3.0	2.7	Null	Digging	36	Concrete	44.1449	-77.6751	unknown UTM	126.6	Northumberland	4	16		Null	Fresh	Water Supply	Domestic	Null
4508495	MLV 137 - 138a	9.0	177	North	10-Jan-1990	73.2	N/A	Overburden	73.2	43.6	23	Rotary (Convent.)	6	Steel	44.1449	-77.6751	unknown UTM	126.6	Northumberland	4	16		Null	Fresh	Water Supply	Domestic	Null
4510618	MLV 137 - 138a	9.0	177	North	25-May-1995	18.0	N/A	Overburden	6.4	0.6	45	Cable Tool	6	Steel	44.1449	-77.6751	unknown UTM	126.6	Northumberland	4	16		Null	Fresh	Water Supply	Domestic	Null
4510032	MLV 137 - 138a	9.0	177	North	15-Jul-1993	76.5	N/A	Overburden	43.0	34.1	36	Cable Tool	6	Steel	44.1449	-77.6751	unknown UTM	126.6	Northumberland	4	16		Null	Fresh	Water Supply	Domestic	Null
4510619	MLV 137 - 138a	9.0	177	North	18-May-1995	18.9	N/A	Overburden	6.4	0.9	32	Cable Tool	6	Steel	44.1449	-77.6751	unknown UTM	126.6	Northumberland	4	16		Null	Fresh	Water Supply	Domestic	Null
4510847	MLV 137 - 138a	9.0	177	North	28-Feb-1996	4.9	N/A	Overburden	2.4	2.1	Null	Digging	36	Galvanized	44.1449	-77.6751	unknown UTM	126.6	Northumberland	4	16		Null	Fresh	Water Supply	Domestic	Null
4513353	MLV 137 - 138a	9.4	162	North	19-Aug-2002	15.8	N/A	Overburden	14.6	2.1	18	Cable Tool	6	Open Hole	44.1461	-77.6701	1 km - 3 km	136.6	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4513005	MLV 137 - 138a	9.4	162	North	4-Jun-2002	68.9	N/A	Overburden	68.9	41.1	68	Cable Tool	6	Steel	44.1461	-77.6701	unknown UTM	136.7	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4513147	MLV 137 - 138a	9.4	162	North	8-Aug-2002	3.7	N/A	Overburden	3.4	0	Null	Rotary (Reverse)	36	Concrete	44.1461	-77.6701	unknown UTM	136.7	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4513524	MLV 137 - 138a	9.4	162	North	27-Jul-2003	29.6	N/A	Overburden	29.6	5.5	23	Cable Tool	8	Open Hole	44.1461	-77.6701	unknown UTM	136.7	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4512374	MLV 137 - 138a	9.4	162	North	8-Aug-2000	29.0	N/A	Overburden	28.3	6.1	45	Cable Tool	6	Open Hole	44.1461	-77.6701	unknown UTM	136.7	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4512375	MLV 137 - 138a	9.4	162	North	27-Jul-2000	15.8	N/A	Overburden	15.2	2.7	45	Cable Tool	6	Steel	44.1461	-77.6701	unknown UTM	136.7	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4512575	MLV 137 - 138a	9.4	162	North	1-Feb-2001	18.0	N/A	Overburden	17.4	4	23	Cable Tool	6	Steel	44.1461	-77.6701	unknown UTM	136.7	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511761	MLV 137 - 138a	9.4	160	North	22-Apr-1999	32.0	27.1	Bedrock	27.1	2.4	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511763	MLV 137 - 138a	9.4	160	North	16-Mar-1999	19.5	N/A	Overburden	18.9	0.6	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511764	MLV 137 - 138a	9.4	160	North	6-Apr-1999	31.1	20.1	Bedrock	19.2	2.4	32	Cable Tool	NULL	Null	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4511802	MLV 137 - 138a	9.4	160	North	30-Apr-1999	20.4	N/A	Overburden	18.3	0	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511760	MLV 137 - 138a	9.4	160	North	15-Apr-1999	40.2	N/A	Overburden	38.7	0	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511762	MLV 137 - 138a	9.4	160	North	22-Mar-1999	29.3	19.8	Bedrock	19.2	2.4	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511765	MLV 137 - 138a	9.4	160	North	29-Mar-1999	18.9	N/A	Overburden	17.7	2.4	9	Cable Tool	5	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511803	MLV 137 - 138a	9.4	160	North	13-May-1999	25.9	25.3	Bedrock	25.3	1.5	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511804	MLV 137 - 138a	9.4	160	North	17-May-1999	21.0	N/A	Overburden	20.4	1.5	45	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4509304	MLV 137 - 138a	9.5	161	North	31-Jul-1991	71.3	N/A	Overburden	19.5	36.6	18	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4509748	MLV 137 - 138a	9.5	161	North	30-Jul-1992	7.6	N/A	Overburden	1.8	1.8	Null	Digging	36	Concrete	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510087	MLV 137 - 138a	9.5	161	North	30-Aug-1993	3.0	N/A	Overburden	Null	44.5	Null	Digging	36	Concrete	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Null	Water Supply	Domestic	Null
4510534	MLV 137 - 138a	9.5	161	North	23-Aug-1994	78.3	77.7	Bedrock	77.7	48.8	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510535	MLV 137 - 138a	9.5	161	North	21-Sep-1994	76.8	75.6	Bedrock	75.6	46.6	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510538	MLV 137 - 138a	9.5	161	North	27-Oct-1994	76.8	75.9	Bedrock	75.9	46	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510579	MLV 137 - 138a	9.5	161	North	30-Mar-1995	39.3	39	Bedrock	36.0	12.2	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4509747	MLV 137 - 138a	9.5	161	North	30-Jul-1992	7.6	N/A	Overburden	6.1	3	Null	Digging	36	Concrete	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4509934	MLV 137 - 138a	9.5	161	North	20-Jan-1993	7.0	N/A	Overburden	1.8	0.9	23	Digging	36	Concrete	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4509960	MLV 137 - 138a	9.5	161	North	15-May-1992	5.5	N/A	Overburden	5.5	3.7	Null	Diamond	36	Concrete	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511518	MLV 137 - 138a	9.5	161	North	6-Jul-1998	19.5	N/A	Overburden	18.6	1.5	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511592	MLV 137 - 138a	9.5	161	North	31-Jul-1998	24.7	N/A	Overburden	22.6	3.7	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4511915	MLV 137 - 138a	9.5	161	North	27-Aug-1999	28.3	26.2	Bedrock	25.6	4.6	9	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510536	MLV 137 - 138a	9.5	161	North	7-Sep-1994	78.3	76.5	Bedrock	76.5	45.7	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510537	MLV 137 - 138a	9.5	161	North	4-Oct-1994	76.8	76.5	Bedrock	76.5	46.9	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4510539	MLV 137 - 138a	9.5	161	North	25-Nov-1994	85.3	75.9	Bedrock	75.9	44.8	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4510662	MLV 137 - 138a	9.5	161	North	5-Aug-1995	41.5	41.1	Bedrock	5.5	14.6	23	Cable Tool	6	Steel	44.1461	-77.6700	unknown UTM	136.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4502532	MLV 137 - 138a	9.5	-28	South	7-Apr-1969	33.5	N/A	Overburden	18.3	3.7	23	Cable Tool	5	Steel	44.1448	-77.6683	30 m - 100 m	146.6	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4508878	MLV 137 - 138a	9.6	-194	South	15-Jun-1990	42.7	14.6	Bedrock	18.3	2.4	27	Air Percussion	6	Steel	44.1436	-77.6670	10 - 30 m	160.0	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4505399	MLV 137 - 138a	9.6	54	North	29-Mar-1980	26.2	N/A	Overburden	25.9	3	36	Cable Tool	6	Steel	44.1457	-77.6678	30 m - 100 m	150.9	Northumberland	4	15		Null	Fresh	Water Supply	Domestic	Null
4508395	MLV 137 - 138a	9.6	86	North	10-Nov-1989	11.3	N/A	Overburden	6.1	6.1	18	Boring	30	Concrete	44.1460	-77.6679	10 - 30 m	151.5	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4511446	MLV 137 - 138a	9.7	-90	South	3-Apr-1998	67.7	67.4	Bedrock	34.7	40.2	36	Cable Tool	6	Open Hole	44.1447	-77.6664	10 - 30 m	156.2	Northumberland	4	14		Null	Not Stated	Water Supply	Municipal	Null
4505604	MLV 137 - 138a	9.7	20	North	3-Jun-1981	44.2	N/A	Overburden	42.7	22.3	36	Cable Tool	6	Steel	44.1457	-77.6666	30 m - 100 m	150.5	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4503190	MLV 137 - 138a	9.8	197	North	28-Apr-1972	35.7	N/A	Overburden	24.4	6.1	9	Cable Tool	6	Steel	44.1475	-77.6661	30 m - 100 m	160.0	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4512865	MLV 137 - 138a	9.8	159	North	28-Nov-2001	13.1	N/A	Overburden	13.1	6.1	18	Cable Tool	5	Null	44.1473	-77.6651	unknown UTM	147.3	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4512484	MLV 137 - 138a	9.8	159	North	20-Nov-2000	11.6	N/A	Overburden	11.6	6.4	23	Cable Tool	5	Null	44.1473	-77.6651	unknown UTM	147.3	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4511702	MLV 137 - 138a	9.8	158	North	30-May-1998	19.8	N/A	Overburden	14.0	0	Null	Cable Tool	6	Steel	44.1473	-77.6651	unknown UTM	146.9	Northumberland	4	14		Null	Not Stated	Water Supply	Domestic	Null
4511732	MLV 137 - 138a	9.8	158	North	8-Mar-1999	66.8	N/A	Overburden	39.9	41.1	45	Cable Tool	6	Steel	44.1473	-77.6651	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4512126	MLV 137 - 138a	9.8	158	North	6-Jan-2000	13.4	N/A	Overburden	11.6	6.7	14	Cable Tool	6	Steel	44.1473	-77.6651	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4512088	MLV 137 - 138a	9.8	158	North	10-Jan-1999	4.9	N/A	Overburden	2.7	3.7	Null	Digging	36	Null	44.1473	-77.6651	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4512136	MLV 137 - 138a	9.8	158	North	11-Mar-2000	14.6	N/A	Overburden	14.3	6.4	18	Cable Tool	5	Null	44.1473	-77.6651	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4512212	MLV 137 - 138a	9.8	158	North	1-May-2000	10.7	N/A	Overburden	8.5	1.8	18	Cable Tool	6	Steel	44.1473	-77.6651	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4507789	MLV 137 - 138a	9.8	158	North	20-Mar-1989	56.4	50.6	Bedrock	44.8	18.3	23	Cable Tool	6	Steel	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4509133	MLV 137 - 138a	9.8	158	North	3-Oct-1990	38.7	35.1	Bedrock	37.8	10.7	18	Rotary (Convent.)	6	Steel	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4509643	MLV 137 - 138a	9.8	158	North	20-Apr-1992	36.6	N/A	Overburden	36.6	21.3	27	Rotary (Air)	6	Steel	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4509958	MLV 137 - 138a	9.8	158	North	10-Sep-1992	2.4	N/A	Overburden	5.5	3.7	Null	Digging	NULL	Galvanized	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4510120	MLV 137 - 138a	9.8	158	North	6-Jul-1993	46.3	37.5	Bedrock	32.0	11.6	18	Cable Tool	6	Steel	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4508525	MLV 137 - 138a	9.8	158	North	21-Feb-1990	7.0	N/A	Overburden	3.0	2.4	18	Boring	30	Concrete	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null

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Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
4510661	MLV 137 - 138a	9.8	158	North	31-Jul-1995	34.1	33.8	Bedrock	10.4	7.6	18	Cable Tool	6	Steel	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4510690	MLV 137 - 138a	9.8	158	North	15-Aug-1995	41.5	36.6	Bedrock	36.6	13.7	14	Cable Tool	6	Steel	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4509060	MLV 137 - 138a	9.8	158	North	12-Dec-1990	7.0	N/A	Overburden	6.1	6.1	23	Digging	30	Concrete	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4510281	MLV 137 - 138a	9.8	158	North	29-May-1994	5.5	N/A	Overburden	1.5	0.6	Null	Digging	36	Concrete	44.1473	-77.6650	unknown UTM	146.9	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4504075	MLV 137 - 138a	9.8	90	North	8-Apr-1975	15.8	N/A	Overburden	15.8	7.3	23	Cable Tool	6	Steel	44.1467	-77.6648	100 m - 300 m	143.8	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4503486	MLV 137 - 138a	9.9	-70	South	20-Jun-1973	51.8	N/A	Overburden	50.3	27.4	36	Cable Tool	6	Open Hole	44.1453	-77.6639	30 m - 100 m	161.8	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4504165	MLV 137 - 138a	10.0	-118	South	6-Sep-1975	64.0	N/A	Overburden	64.0	35.1	23	Cable Tool	6	Steel	44.1449	-77.6631	30 m - 100 m	169.3	Northumberland	4	14		Null	Fresh	Water Supply	Domestic	Null
4504665	MLV 137 - 138a	10.7	-167	South	2-Mar-1977	63.7	N/A	Overburden	63.7	35.1	45	Cable Tool	36	Concrete	44.1464	-77.6531	30 m - 100 m	178.0	Northumberland	4	12		Null	Fresh	Water Supply	Domestic	Null
4507234	MLV 137 - 138a	11.2	-153	South	15-Jul-1988	5.2	N/A	Overburden	4.6	1.5	18	Boring	30	Null	44.1476	-77.6485	10 m - 30 m	175.6	Northumberland	4	11		Null	Fresh	Water Supply	Domestic	Null
4508801	MLV 137 - 138a	11.4	-115	South	27-Jun-1990	52.7	52.1	Bedrock	43.3	15.5	23	Cable Tool	6	Steel	44.1485	-77.6458	10 m - 30 m	177.1	Northumberland	4	10		Null	Fresh	Water Supply	Domestic	Null
4514369	MLV 137 - 138a	11.4	-195	South	3-Aug-2005	5.2	N/A	Overburden	2.5	1.4	Null	Digging	36	Galvanized	44.1478	-77.6454	NULL	172.7	Northumberland	4	10	268 Doens Rd, Rr#3	Quinte West	Fresh	Water Supply	Domestic	Null
7199017	MLV 137 - 138a	11.4	-167	South	22-Jun-2012	31.7	N/A	Null	6.1	7.5	5	Cable Tool	6	Steel	44.1481	-77.6451	30 m - 100 m	Null	Northumberland	4	10	2 Cardinal Court	Null	Fresh	Water Supply	Domestic	Null
7210454	MLV 137 - 138a	11.4	-163	South	23-Sep-2013	60.4	N/A	Null	11.0	43.9	5	Cable Tool	6	Steel	44.1482	-77.6450	30 m - 100 m	Null	Northumberland	4	10	2 Cardinal Court	Rr3 Trenton	Untested	Water Supply	Domestic	Null
4508450	MLV 137 - 138a	11.5	-118	South	21-Dec-1989	50.3	N/A	Overburden	6.7	12.2	32	Cable Tool	6	Steel	44.1487	-77.6443	10 m - 30 m	176.4	Northumberland	4	10		Null	Fresh	Water Supply	Domestic	Null
4514605	MLV 137 - 138a	11.5	-152	South	23-Mar-2006	6.7	N/A	Overburden	3.5	4.2	Null	Digging	36	Null	44.1485	-77.6441	10 m - 30 m	176.2	Northumberland	4	16	16 Cardinal Crt.	Quinte West	Fresh	Water Supply	Domestic	Null
7144274	MLV 137 - 138a	11.5	-189	South	27-Apr-2010	53.0	N/A	Null	4.6	50.2	5	Cable Tool	6	Steel	44.1482	-77.6438	30 m - 100 m	174.6	Northumberland	4	10	5 Cardinal Crt Rr3	Trenton	Untested	Water Supply	Domestic	Null
7144275	MLV 137 - 138a	11.5	-189	South	27-Apr-2010	59.4	N/A	Null	57.3	0	Null	NULL	NULL	Null	44.1482	-77.6438	30 m - 100 m	174.6	Northumberland	4	10	5 Cardinal Crt Rr3	Trenton	Gas	Null	Null	Null
4508451	MLV 137 - 138a	11.5	-190	South	14-Dec-1989	54.3	53.6	Bedrock	8.2	7.6	32	Cable Tool	6	Steel	44.1482	-77.6436	10 m - 30 m	174.5	Northumberland	4	10		Null	Fresh	Water Supply	Domestic	Null
4514606	MLV 137 - 138a	11.6	-133	South	27-Mar-2006	6.2	N/A	Overburden	3.6	3.6	Null	Digging	36	Null	44.1487	-77.6436	10 m - 30 m	175.9	Northumberland	4	14	14 Cardinal Srt	Null	Fresh	Water Supply	Domestic	Null
7172788	MLV 137 - 138a	11.6	-196	South	2-Jun-2011	28.7	N/A	Null	1.8	3.7	5	Cable Tool	6	Steel	44.1482	-77.6434	10 m - 30 m	Null	Northumberland	4	10	7 Cardinal Court	Trenton	Fresh	Water Supply	Domestic	Null
4514741	MLV 137 - 138a	11.6	-192	South	10-Jul-2006	30.5	N/A	Overburden	2.7	3.6	Null	Cable Tool	6	Steel	44.1483	-77.6430	10 m - 30 m	173.6	Northumberland	4	10	Cardinal Court Rr#3	Trenton	Null	Water Supply	Domestic	Null
7050436	MLV 137 - 138a	11.6	-101	South	28-May-2007	25.6	N/A	Null	5.2	0	9	Cable Tool	6	Steel	44.1491	-77.6432	10 m - 30 m	175.2	Northumberland	4	10		Null	Null	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
7042891	MLV 137 - 138a	11.6	-186	South	27-Mar-2007	71.5	N/A	Overburden	15.0	14	Null	Cable Tool	6	Steel	44.1484	-77.6425	10 m - 30 m	172.7	Northumberland	4	10	11 Cardinal Court Rr#3	Trenton	Fresh	Water Supply	Domestic	Null
4514479	MLV 137 - 138a	11.7	-120	South	15-Nov-2005	28.6	N/A	Overburden	26.2	5.5	11	Cable Tool	6	Steel	44.1491	-77.6425	10 m - 30 m	174.2	Northumberland	4	10	Rr3	Trenton	Fresh	Water Supply	Domestic	Null
4514577	MLV 137 - 138a	11.7	-114	South	24-Mar-2006	22.6	N/A	Overburden	5.8	4.5	Null	Cable Tool	6	Steel	44.1492	-77.6422	10 m - 30 m	174.1	Northumberland	4	10	Cardinal Court Rr#3	Trenton	Null	Water Supply	Domestic	Null
7111269	MLV 137 - 138a	11.9	-172	South	6-Jun-2008	57.0	N/A	Null	56.4	39.9	36	Cable Tool	6	Steel	44.1486	-77.6418	10 m - 30 m	172.8	Northumberland	4	10	15 Cardinal Court Rr#3	Trenton	Gas	Water Supply	Domestic	Null
7042893	MLV 137 - 138a	11.9	-141	South	3-Feb-2007	89.8	N/A	Overburden	7.0	14	Null	Cable Tool	NULL	Open Hole	44.1488	-77.6416	10 m - 30 m	174.1	Northumberland	4	10	17 Cardinal Court	Trenton	Fresh	Water Supply	Domestic	Null
4511334	MLV 137 - 138a	13.1	180	North	13-Nov-1997	5.2	N/A	Overburden	2.1	0.3	0	Digging	36	Concrete	44.1548	-77.6272	10 m - 30 m	131.6	Northumberland	4	6		Null	Fresh	Water Supply	Domestic	Null
4505328	MLV 137 - 138a	13.5	-146	South	17-Sep-1979	34.1	11.3	Bedrock	11.6	7.3	5	Cable Tool	6	Steel	44.1529	-77.6212	30 m - 100 m	115.2	Northumberland	4	6		Null	Fresh	Water Supply	Livestock	Null
4503213	MLV 137 - 138a	13.6	-148	South	31-May-1972	27.4	8.8	Bedrock	5.8	5.8	5	Rotary (Air)	6	Steel	44.1531	-77.6200	30 m - 100 m	113.4	Northumberland	4	5		Null	Fresh	Water Supply	Domestic	Null
4503572	MLV 137 - 138a	13.7	140	North	16-Sep-1973	35.1	3	Bedrock	4.6	2.7	5	Cable Tool	6	Steel	44.1557	-77.6205	30 m - 100 m	112.8	Northumberland	4	5		Null	Fresh	Water Supply	Domestic	Null
2905730	MLV 137 - 138a	17.3	-187	South	12-Feb-1973	14.0	1.2	Bedrock	7.6	0.6	23	Cable Tool	8	Steel	44.1607	-77.5802	30 m - 100 m	98.4	Hastings	3	2		Null	Fresh	Water Supply	Domestic	Null
2902251	MLV 137 - 138a	17.3	-49	South	23-Nov-1965	15.2	3.4	Bedrock	7.6	3.4	5	Cable Tool	6	Steel	44.1619	-77.5804	unknown UTM	98.2	Hastings	3	2		Null	Fresh	Water Supply	Domestic	Null
2902230	MLV 137 - 138a	17.3	-77	South	9-Jul-1957	8.8	1.5	Bedrock	8.8	1.5	Null	Cable Tool	6	Steel	44.1618	-77.5796	unknown UTM	103.3	Hastings	3	2		Null	Fresh	Water Supply	Domestic	Null
2904047	MLV 139 - 139a	0.0	-156	South	19-Aug-1968	5.5	N/A	Overburden	5.5	3.7	23	Cable Tool	6	Steel	44.2325	-77.2326	100 m - 300 m	116.7	Hastings	2	9		Null	Fresh	Water Supply	Industrial	Null
7179394	MLV 139 - 139a	0.0	-76	South	11-Oct-2011	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.2330	-77.2316	10 m - 30 m	Null	Hastings	2	9		Null	Null	Null	Null	Null
2903501	MLV 139 - 139a	0.8	-130	South	4-Dec-1963	17.4	3.4	Bedrock	15.2	2.4	9	Cable Tool	6	Steel	44.2336	-77.2220	100 m - 300 m	118.3	Hastings	2	11		Null	Fresh	Water Supply	Domestic	Null
2907704	MLV 139 - 139a	5.7	136	North	18-Oct-1976	14.9	0	Bedrock	13.7	4.3	45	Air Percussion	6	Open Hole	44.2442	-77.1626	100 m - 300 m	84.3	Hastings	2	22		Null	Sulphur	Water Supply	Domestic	Null
7216750	MLV 139 - 139a	7.7	-161	South	24-Jul-2013	6.1	N/A	Null	3.5	3	Null	Digging	35	Concrete	44.2444	-77.1384	30 m - 100 m	Null	Hastings	2	27	Callaghan Rd	Marysville	Fresh	Water Supply	Domestic	Null
3705848	MLV 139a - 140	0.1	67	North	17-Nov-1982	29.9	2.4	Bedrock	28.3	4.6	91	Rotary (Air)	6	Open Hole	44.2573	-77.0628	100 m - 300 m	126.0	Lennox & Addington	3	2		Null	Fresh	Water Supply	Domestic	Null
3705845	MLV 139a - 140	0.1	67	North	17-Nov-1982	29.3	2.4	Bedrock	27.7	4.6	182	Rotary (Air)	6	Steel	44.2573	-77.0628	100 m - 300 m	126.0	Lennox & Addington	3	2		Null	Fresh	Water Supply	Livestock	Domestic
3702055	MLV 139a - 140	0.1	129	North	24-Oct-1961	33.8	2.4	Bedrock	21.9	7.6	45	Cable Tool	6	Steel	44.2579	-77.0629	100 m - 300 m	124.3	Lennox & Addington	4	2		Null	Fresh	Water Supply	Livestock	Domestic
3701991	MLV 139a - 140	0.2	-18	South	3-Jun-1964	20.7	1.5	Bedrock	7.6	3	27	Cable Tool	6	Steel	44.2567	-77.0616	100 m - 300 m	123.6	Lennox & Addington	3	2		Null	Fresh	Water Supply	Domestic	Null
3703847	MLV 139a - 140	0.2	74	North	26-May-1973	21.9	3.7	Bedrock	13.7	9.1	227	Rotary (Air)	6	Open Hole	44.2576	-77.0615	30 m - 100 m	127.0	Lennox & Addington	3	2		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
7231216	MLV 139a - 140	0.2	45	North	NULL	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.2574	-77.0613	30 m - 100 m	Null	Lennox & Addington	3	2		Null	Null	Null	Null	Null
7160125	MLV 139a - 140	0.3	55	North	28-Feb-2011	31.4	N/A	Null	Null	0	Null	Boring	4	Steel	44.2575	-77.0610	10 m - 30 m	Null	Lennox & Addington	3	2	1271 Beechwood Rd	Napanee	Null	Null	Null	Null
7160506	MLV 139a - 140	0.3	60	North	25-Feb-2011	32.3	N/A	Null	Null	0	Null	Boring	4	Steel	44.2575	-77.0610	10 m - 30 m	Null	Lennox & Addington	NULL	NULL	1271 Beechwood Rd	Napanee	Null	Null	Null	Null
3702054	MLV 139a - 140	0.3	182	North	17-Aug-1960	36.6	6.1	Bedrock	25.9	4.6	Null	Cable Tool	6	Steel	44.2587	-77.0610	100 m - 300 m	126.2	Lennox & Addington	4	2		Null	Sulphur	Water Supply	Livestock	Null
7160363	MLV 139a - 140	0.3	72	North	28-Feb-2011	35.9	N/A	Null	Null	0	Null	NULL	4	Steel	44.2577	-77.0607	10 m - 30 m	Null	Lennox & Addington	NULL	NULL	1271 Beechwood Rd	Napanee	Null	Null	Null	Null
7126257	MLV 139a - 140	0.3	68	North	9-Apr-2009	0.0	N/A	Null	Null	0	Null	NULL	6	Steel	44.2577	-77.0604	10 m - 30 m	126.7	Lennox & Addington	3	2	1250 Beechwood Rd.	Napanee	Null	Water Supply	Null	Null
7160509	MLV 139a - 140	0.4	124	North	24-Sep-2010	33.8	N/A	Null	Null	0	Null	Boring	4	Steel	44.2584	-77.0587	10 m - 30 m	Null	Lennox & Addington	3	3	1271 Beechwood Rd	Napanee	Null	Null	Null	Null
3702057	MLV 139a - 140	0.5	178	North	10-Feb-1966	28.7	4.6	Bedrock	15.8	10.7	32	Cable Tool	6	Steel	44.2590	-77.0576	100 m - 300 m	130.1	Lennox & Addington	4	3		Null	Sulphur	Water Supply	Domestic	Null
7160508	MLV 139a - 140	0.6	148	North	24-Sep-2010	32.9	N/A	Null	Null	0	Null	Boring	4	Steel	44.2588	-77.0569	10 m - 30 m	Null	Lennox & Addington	NULL	NULL	1271 Beechwood Rd	Napanee	Null	Null	Null	Null
3703189	MLV 139a - 140	2.6	124	North	29-May-1971	21.6	2.4	Bedrock	4.9	0.6	14	Rotary (Air)	6	Steel	44.2617	-77.0318	30 m - 100 m	118.7	Lennox & Addington	3	8		Null	Fresh	Water Supply	Domestic	Null
3705051	MLV 139a - 140	2.9	53	North	7-Jun-1977	18.3	6.4	Bedrock	15.8	4.3	18	Rotary (Air)	6	Steel	44.2615	-77.0279	100 m - 300 m	119.8	Lennox & Addington	3	9		Null	Sulphur	Water Supply	Domestic	Null
3705258	MLV 139a - 140	5.0	-74	South	6-Apr-1978	22.6	7.6	Bedrock	19.2	9.1	136	Cable Tool	6	Steel	44.2638	-77.0029	100 m - 300 m	111.0	Lennox & Addington	3	13		Null	Fresh	Water Supply	Domestic	Null
3709364	MLV 139a - 140	5.7	-168	South	8-Aug-2001	24.1	0.6	Bedrock	14.0	13.4	91	Cable Tool	6	Open Hole	44.2642	-76.9934	unknown UTM	109.2	Lennox & Addington	3	16		Null	Not Stated	Water Supply	Domestic	Null
3706613	MLV 139a - 140	5.7	-170	South	26-May-1987	16.2	1.2	Bedrock	12.8	12.2	91	Rotary (Air)	6	Steel	44.2642	-76.9934	unknown UTM	109.2	Lennox & Addington	3	16		Null	Fresh	Water Supply	Domestic	Null
3708435	MLV 139a - 140	5.7	-170	South	3-Oct-1994	27.4	4	Bedrock	19.2	16.8	68	Cable Tool	6	Steel	44.2642	-76.9934	unknown UTM	109.2	Lennox & Addington	3	16		Null	Fresh	Water Supply	Domestic	Null
3706630	MLV 139a - 140	5.7	-170	South	11-Sep-1987	30.5	0	Bedrock	20.7	16.5	55	Cable Tool	6	Steel	44.2642	-76.9934	unknown UTM	109.2	Lennox & Addington	3	16		Null	Fresh	Water Supply	Domestic	Null
3707702	MLV 139a - 140	5.7	-170	South	13-Nov-1990	24.4	4	Bedrock	20.1	12.2	45	Cable Tool	6	Steel	44.2642	-76.9934	unknown UTM	109.2	Lennox & Addington	3	16		Null	Fresh	Water Supply	Domestic	Null
3706661	MLV 139a - 140	6.1	-143	South	16-Nov-1987	15.2	3.7	Bedrock	Null	0	Null	Cable Tool	NULL	Null	44.2654	-76.9889	unknown UTM	110.7	Lennox & Addington	2	17		Null	Null	Null	Null	Null
3706663	MLV 139a - 140	6.1	-143	South	1-Dec-1987	31.1	3.7	Bedrock	Null	0	Null	Cable Tool	NULL	Null	44.2654	-76.9889	unknown UTM	110.7	Lennox & Addington	2	17		Null	Null	Null	Null	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
3703082	MLV 139a - 140	7.1	-20	South	27-Nov-1970	40.2	1.5	Bedrock	17.7	7	27	Cable Tool	6	Steel	44.2690	-76.9768	30 m - 100 m	110.2	Lennox & Addington	2	20		Null	Fresh	Water Supply	Domestic	Null
3702008	MLV 139a - 140	7.2	-103	South	10-May-1962	17.7	0	Bedrock	2.4	1.2	5	Cable Tool	6	Null	44.2681	-76.9759	100 m - 300 m	108.3	Lennox & Addington	2	19		Null	Fresh	Water Supply	Commerical	Null
3702004	MLV 139a - 140	7.3	-54	South	19-Oct-1955	9.8	0	Bedrock	2.4	1.8	Null	Cable Tool	6	Steel	44.2685	-76.9750	unknown UTM	108.1	Lennox & Addington	2	19		Null	Fresh	Water Supply	Commerical	Null
3702015	MLV 139a - 140	7.3	-115	South	19-Sep-1960	8.5	1.2	Bedrock	6.7	2.4	Null	Cable Tool	6	Steel	44.2680	-76.9748	unknown UTM	107.8	Lennox & Addington	2	20		Null	Fresh	Water Supply	Commerical	Null
3708924	MLV 139a - 140	7.3	10	North	20-Aug-1998	21.3	3.7	Bedrock	12.5	9.1	23	Cable Tool	6	Open Hole	44.2691	-76.9750	unknown UTM	108.9	Lennox & Addington	2	20		Null	Not Stated	Water Supply	Domestic	Null
3702012	MLV 139a - 140	7.4	27	North	3-Oct-1955	35.7	0	Bedrock	33.8	9.1	Null	Cable Tool	6	Open Hole	44.2695	-76.9736	unknown UTM	108.8	Lennox & Addington	2	20		Null	Salty	Water Supply	Commerical	Null
3706960	MLV 139a - 140	7.7	78	North	8-Mar-1988	19.2	1.5	Bedrock	11.0	6.1	18	Cable Tool	6	Open Hole	44.2704	-76.9704	unknown UTM	108.8	Lennox & Addington	2	21		Null	Sulphur	Water Supply	Commerical	Null
3706696	MLV 139a - 140	7.7	78	North	10-Jul-1987	29.0	3.7	Bedrock	Null	8.5	9	Cable Tool	6	Null	44.2704	-76.9704	unknown UTM	108.8	Lennox & Addington	2	21		Null	Null	Water Supply	Domestic	Null
3704480	MLV 139a - 140	7.8	32	North	4-Nov-1975	32.9	4.3	Bedrock	6.7	3.7	18	Rotary (Air)	6	Open Hole	44.2702	-76.9687	100 m - 300 m	107.3	Lennox & Addington	2	21		Null	Fresh	Water Supply	Commerical	Null
3705296	MLV 139a - 140	7.9	170	North	19-Aug-1978	38.7	5.8	Bedrock	5.8	4.6	9	Rotary (Air)	6	Steel	44.2716	-76.9681	100 m - 300 m	110.0	Lennox & Addington	2	21		Null	Fresh	Water Supply	Commerical	Null
3702033	MLV 139a - 140	7.9	123	North	20-Mar-1964	41.1	1.8	Bedrock	9.1	6.1	0	Cable Tool	6	Steel	44.2712	-76.9675	100 m - 300 m	108.7	Lennox & Addington	2	22		Null	Fresh	Water Supply	Commerical	Null
3702021	MLV 140 - 140a	0.0	-60	South	4-Jun-1960	12.8	1.2	Bedrock	10.4	3	68	Cable Tool	6	Steel	44.2696	-76.9663	100 m - 300 m	105.6	Lennox & Addington	2	22		Null	Fresh	Water Supply	Commerical	Null
3703425	MLV 140 - 140a	0.0	139	North	20-Jun-1972	38.1	1.8	Bedrock	28.0	4.3	23	Rotary (Air)	6	Steel	44.2714	-76.9663	30 m - 100 m	108.6	Lennox & Addington	2	22		Null	Fresh	Water Supply	Domestic	Null
3702029	MLV 140 - 140a	0.1	-153	South	1-Aug-1963	14.6	0	Bedrock	6.1	4.6	0	Cable Tool	6	Steel	44.2688	-76.9660	100 m - 300 m	104.3	Lennox & Addington	2	22		Null	Sulphur	Water Supply	Commerical	Null
3702028	MLV 140 - 140a	0.1	-151	South	20-May-1961	12.2	0.6	Bedrock	7.0	3	36	Cable Tool	6	Steel	44.2688	-76.9660	100 m - 300 m	104.3	Lennox & Addington	2	22		Null	Fresh	Water Supply	Commerical	Null
3704284	MLV 140 - 140a	0.1	141	North	30-Aug-1974	65.8	0	Bedrock	54.9	6.1	Null	Cable Tool	6	Open Hole	44.2715	-76.9659	30 m - 100 m	108.3	Lennox & Addington	2	22		Null	Fresh	Water Supply	Domestic	Null
3703703	MLV 140 - 140a	0.1	171	North	4-Aug-1973	27.4	2.7	Bedrock	15.2	2.4	23	Cable Tool	6	Steel	44.2718	-76.9658	30 m - 100 m	108.8	Lennox & Addington	2	22		Null	Fresh	Water Supply	Domestic	Null
7143711	MLV 140 - 140a	0.2	149	North	14-Apr-2010	0.0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.2717	-76.9653	30 m - 100 m	108.0	Lennox & Addington	2	22	38 Van Luven Rd	Napanee	Null	Null	Null	Null
3703715	MLV 140 - 140a	0.2	169	North	8-Oct-1973	33.5	2.4	Bedrock	5.2	4.9	23	Cable Tool	6	Steel	44.2719	-76.9652	30 m - 100 m	108.4	Lennox & Addington	2	22		Null	Fresh	Water Supply	Domestic	Null
3702037	MLV 140 - 140a	0.2	197	North	1-Sep-1967	32.9	0.6	Bedrock	19.8	12.2	0	Cable Tool	6	Open Hole	44.2722	-76.9647	100 m - 300 m	108.1	Lennox & Addington	2	22		Null	Fresh	Water Supply	Domestic	Null
3704227	MLV 140 - 140a	0.2	149	North	8-Aug-1974	30.5	0	Bedrock	11.6	7.6	14	Rotary (Air)	6	Open Hole	44.2718	-76.9641	30 m - 100 m	106.1	Lennox & Addington	2	22		Null	Fresh	Water Supply	Domestic	Null
3705303	MLV 140 - 140a	0.3	22	North	28-Aug-1978	22.3	1.5	Bedrock	5.5	4.3	Null	Rotary (Air)	6	Steel	44.2708	-76.9631	100 m - 300 m	99.5	Lennox & Addington	2	22		Null	Fresh	Water Supply	Industrial	Null

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Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
3708778	MLV 140 - 140a	1.8	106	North	2-Dec-1997	19.8	10.1	Bedrock	12.2	0	0	Cable Tool	NULL	Null	44.2746	-76.9452	unknown UTM	99.6	Lennox & Addington	1	26		Null	Fresh	Water Supply	Domestic	Null
3703132	MLV 140 - 140a	3.1	-186	South	1-Apr-1971	9.1	5.5	Bedrock	7.6	0.9	32	Cable Tool	6	Steel	44.2753	-76.9300	30 m - 100 m	93.5	Lennox & Addington	1	29		Null	Fresh	Water Supply	Domestic	Null
3703134	MLV 140 - 140a	3.1	-159	South	30-May-1971	11.6	4	Bedrock	7.6	1.8	45	Cable Tool	6	Steel	44.2756	-76.9297	30 m - 100 m	92.8	Lennox & Addington	1	29		Null	Fresh	Water Supply	Domestic	Null
3705160	MLV 140 - 140a	3.3	-40	South	10-May-1978	12.5	4	Bedrock	5.5	3	Null	Cable Tool	6	Open Hole	44.2768	-76.9282	100 m - 300 m	87.7	Lennox & Addington	1	30		Null	Fresh	Water Supply	Domestic	Null
3702052	MLV 140 - 140a	3.3	101	North	10-Jan-1956	12.2	3.7	Bedrock	9.1	4	Null	Cable Tool	6	Steel	44.2780	-76.9283	unknown UTM	84.8	Lennox & Addington	1	30		Null	Fresh	Water Supply	Domestic	Null
3704585	MLV 140 - 140a	3.4	51	North	19-Mar-1975	18.9	9.8	Bedrock	16.5	3.7	45	Cable Tool	6	Steel	44.2777	-76.9270	unknown UTM	86.9	Lennox & Addington	7	25		Null	Sulphur	Water Supply	Domestic	Null
7192355	MLV 140 - 140a	3.8	-102	South	12-Oct-2012	19.3	N/A	Null	7.0	3.6	20	Cable Tool	6	Steel	44.2768	-76.9208	30 m - 100 m	Null	Lennox & Addington	7	26	Palace Rd	Napanee	Fresh	Null	Null	Null
3701820	MLV 140 - 140a	4.3	8	North	24-Apr-1950	15.2	0	Bedrock	14.9	2.7	Null	Cable Tool	6	Open Hole	44.2790	-76.9154	unknown UTM	105.4	Lennox & Addington	7	27		Null	Fresh	Water Supply	Public	Null
3705629	MLV 140 - 140a	4.5	-102	South	5-Jul-1980	43.6	9.1	Bedrock	42.7	10.7	91	Cable Tool	6	Steel	44.2788	-76.9132	100 m - 300 m	119.2	Lennox & Addington	7	28		Null	Minerial	Water Supply	Domestic	Null
3701825	MLV 140 - 140a	4.7	-158	South	28-Mar-1964	7.6	2.4	Bedrock	7.6	4.6	45	Cable Tool	6	Steel	44.2795	-76.9104	100 m - 300 m	132.5	Lennox & Addington	7	28		Null	Fresh	Water Supply	Domestic	Null
3701824	MLV 140 - 140a	4.7	-147	South	6-Jul-1963	21.3	2.4	Bedrock	18.9	12.2	5	Cable Tool	6	Steel	44.2798	-76.9099	100 m - 300 m	133.3	Lennox & Addington	7	28		Null	Fresh	Water Supply	Domestic	Null
3703150	MLV 140 - 140a	5.0	-157	South	8-Aug-1970	46.6	5.5	Bedrock	5.5	1.8	9	Cable Tool	6	Steel	44.2807	-76.9075	30 m - 100 m	137.6	Lennox & Addington	7	29		Null	Fresh	Water Supply	Domestic	Null
3703224	MLV 140 - 140a	6.1	117	North	3-Aug-1971	7.6	0.3	Bedrock	1.5	1.5	Null	Cable Tool	6	Steel	44.2825	-76.8962	30 m - 100 m	132.7	Lennox & Addington	7	1		Null	Fresh	Water Supply	Livestock	Null
3705700	MLV 140a - 141	0.4	-99	South	26-Jan-1981	43.6	11	Bedrock	12.2	1.5	5	Cable Tool	6	Steel	44.2758	-76.8755	100 m - 300 m	130.2	Lennox & Addington	6	4		Null	Fresh	Water Supply	Domestic	Null
7186614	MLV 140a - 141	0.6	93	North	13-Aug-2012	100.0	N/A	Null	Null	0	Null	Air Percussion	10	Steel	44.2772	-76.8729	30 m - 100 m	Null	Lennox & Addington	NULL	NULL	Swetzervell Rd	Napanee	Null	Null	Other	Null
7165257	MLV 140a - 141	1.3	116	North	27-May-2011	15.2	N/A	Null	6.1	2	32	Cable Tool	6	Steel	44.2804	-76.8650	10 m - 30 m	Null	Lennox & Addington	6	6	Switzerville Road	Odessa	Untested	Water Supply	Domestic	Null
3701245	MLV 140a - 141	1.4	193	North	6-Jan-1962	9.1	N/A	Overburden	9.1	4.3	9	Cable Tool	6	Steel	44.2813	-76.8640	100 m - 300 m	129.5	Lennox & Addington	6	7		Null	Fresh	Water Supply	Livestock	Domestic
3701246	MLV 140a - 141	1.5	138	North	29-Dec-1961	34.7	9.1	Bedrock	18.3	3	0	Cable Tool	6	Steel	44.2810	-76.8633	100 m - 300 m	128.3	Lennox & Addington	6	7		Null	Fresh	Water Supply	Livestock	Domestic
3706718	MLV 140a - 141	2.0	82	North	26-Jul-1988	27.1	1.2	Bedrock	21.3	11.6	18	Cable Tool	6	Steel	44.2822	-76.8573	100 m - 300 m	126.1	Lennox & Addington	6	8		Null	Sulphur	Water Supply	Livestock	Null
3705590	MLV 140a - 141	2.1	151	North	21-Jun-1980	14.9	1.8	Bedrock	12.2	3.7	Null	Cable Tool	6	Steel	44.2834	-76.8557	100 m - 300 m	126.4	Lennox & Addington	6	8		Null	Fresh	Water Supply	Livestock	Null
7047487	MLV 140a - 141	2.4	193	North	22-Jun-2007	24.3	0	Null	6.4	7.4	16	Cable Tool	NULL	Open Hole	44.2844	-76.8527	10 m - 30 m	124.7	Lennox & Addington	6	9	Swirzerville Rd	Loyalist Twp	Null	Water Supply	Domestic	Null
3703505	MLV 140a - 141	2.4	198	North	16-Jul-1972	34.1	0	Bedrock	30.5	3.7	5	Cable Tool	6	Steel	44.2845	-76.8526	30 m - 100 m	124.9	Lennox & Addington	6	9		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
7120032	MLV 140a - 141	4.1	-153	South	8-Jan-2009	7.0	0	Null	3.0	0.8	Null	Digging	35	Concrete	44.2841	-76.8309	10 m - 30 m	121.3	Lennox & Addington	6	13	Switzerville Rd.	Null	Fresh	Water Supply	Domestic	Null
3710078	MLV 140a - 141	8.3	-189	South	31-Aug-2005	24.6	15.5	Bedrock	20.5	14.2	14	Cable Tool	NULL	Null	44.2911	-76.7849	NULL	128.4	Lennox & Addington	6	22	1157 Simmons Road	Odessa	Fresh	Water Supply	Domestic	Null
3706852	MLV 140a - 141	9.9	-101	South	30-May-1988	16.5	0.6	Bedrock	13.7	3.7	45	Cable Tool	6	Null	44.2925	-76.7640	100 m - 300 m	121.2	Lennox & Addington	5	26		Null	Not Stated	Water Supply	Domestic	Null
3708298	MLV 140a - 141	10.0	13	North	31-Jan-1994	28.7	0.6	Bedrock	25.0	14.6	27	Cable Tool	6	Steel	44.2932	-76.7628	100 m - 300 m	120.7	Lennox & Addington	5	26		Null	Not Stated	Water Supply	Domestic	Null
3707344	MLV 140a - 141	10.3	85	North	4-Jan-1990	29.9	0.6	Bedrock	26.5	21	27	Cable Tool	6	Steel	44.2932	-76.7606	100 m - 300 m	134.0	Lennox & Addington	5	27		Null	Fresh	Water Supply	Domestic	Null
3703003	MLV 140a - 141	10.8	163	North	30-Oct-1970	24.4	0.9	Bedrock	18.3	18.3	5	Cable Tool	6	Steel	44.2945	-76.7541	30 m - 100 m	131.3	Lennox & Addington	5	28		Null	Fresh	Water Supply	Domestic	Null
3708229	MLV 140a - 141	11.1	76	North	28-Oct-1993	28.7	0.6	Bedrock	14.6	7.6	5	Cable Tool	6	Steel	44.2941	-76.7503	100 m - 300 m	138.8	Lennox & Addington	5	29		Null	Not Stated	Water Supply	Domestic	Null
3708021	MLV 140a - 141	11.6	108	North	10-Jul-1992	15.2	4.6	Bedrock	4.6	3.4	14	Cable Tool	6	Steel	44.2949	-76.7442	unknown UTM	140.7	Lennox & Addington	5	30		Null	Not Stated	Water Supply	Domestic	Null
3706657	MLV 140a - 141	12.0	40	North	2-Oct-1987	7.3	3.7	Bedrock	3.7	0	Null	Cable Tool	NULL	Null	44.2967	-76.7400	unknown UTM	141.1	Lennox & Addington	5	31		Null	Fresh	Water Supply	Domestic	Null
3709430	MLV 140a - 141	12.1	-177	South	21-Jan-2002	6.4	2.1	Bedrock	3.7	1.8	73	Digging	36	Concrete	44.2954	-76.7374	10 m - 30 m	142.8	Lennox & Addington	5	31		Null	Fresh	Water Supply	Domestic	Null
3709492	MLV 140a - 141	12.3	30	North	24-Sep-2002	6.7	0.3	Bedrock	3.7	2.4	36	Digging	36	Concrete	44.2979	-76.7364	100 m - 300 m	141.9	Lennox & Addington	5	32		Null	Fresh	Water Supply	Domestic	Null
3709491	MLV 140a - 141	12.3	27	North	24-Sep-2002	6.7	0.3	Bedrock	3.7	2.4	36	Digging	36	Concrete	44.2979	-76.7364	100 m - 300 m	141.9	Lennox & Addington	5	32		Null	Fresh	Water Supply	Domestic	Null
3709616	MLV 140a - 141	12.4	22	North	31-Mar-2003	6.1	2.4	Bedrock	2.4	6.7	45	Digging	36	Concrete	44.2982	-76.7354	1 km – 3 km	142.0	Lennox & Addington	5	32		Null	Fresh	Water Supply	Domestic	Null
3709617	MLV 140a - 141	12.4	22	North	31-Mar-2003	3.7	N/A	Overburden	40.2	6.1	Null	Digging	36	Concrete	44.2982	-76.7354	1 km – 3 km	142.0	Lennox & Addington	5	32		Null	Fresh	Water Supply	Domestic	Null
3701237	MLV 140a - 141	13.8	22	North	11-Mar-1965	10.4	0.9	Bedrock	8.8	2.4	Null	Cable Tool	6	Steel	44.2962	-76.7206	100 m - 300 m	130.7	Lennox & Addington	5	34		Null	Fresh	Water Supply	Domestic	Null
3706105	MLV 140a - 141	14.8	27	North	1-Nov-1984	14.9	10.7	Bedrock	13.1	1.8	136	Cable Tool	7	Steel	44.2974	-76.7082	30 m - 100 m	130.4	Lennox & Addington	5	37		Null	Fresh	Water Supply	Domestic	Null
3705689	MLV 140a - 141	15.3	-191	South	6-Feb-1980	38.4	0.3	Bedrock	26.8	7	18	Air Percussion	8	Steel	44.2956	-76.7019	30 m - 100 m	135.4	Lennox & Addington	4	37		Null	Fresh	Water Supply	Domestic	Null
3705307	MLV 140a - 141	15.3	-91	South	12-Sep-1978	16.2	0.9	Bedrock	11.6	5.5	45	Rotary (Air)	7	Steel	44.2965	-76.7019	30 m - 100 m	133.5	Lennox & Addington	4	38		Null	Fresh	Water Supply	Domestic	Null
3705464	MLV 140a - 141	15.3	-91	South	26-Sep-1979	42.7	0.6	Bedrock	Null	0	Null	Cable Tool	7	Steel	44.2965	-76.7019	30 m - 100 m	133.5	Lennox & Addington	4	38		Null	Null	Water Supply	Domestic	Null
3701145	MLV 140a - 141	15.4	27	North	29-Jul-1955	20.1	10.4	Bedrock	15.2	7.9	Null	Cable Tool	6	Open Hole	44.2977	-76.7010	30 m - 100 m	133.7	Lennox & Addington	4	38		Null	Fresh	Water Supply	Domestic	Null
3703461	MLV 140a - 141	15.5	124	North	7-Jul-1972	24.4	0.6	Bedrock	11.6	6.1	5	Cable Tool	6	Steel	44.2986	-76.7000	30 m - 100 m	134.1	Lennox & Addington	5	38		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
2214316	MLV 140a - 141	17.3	-11	South	28-Oct-1992	22.3	0	Bedrock	21.6	2.4	9	Cable Tool	6	Steel	44.3001	-76.6775	10 m - 30 m	139.9	Frontenac	5	13		Null	Not Stated	Water Supply	Domestic	Null
2214213	MLV 140a - 141	17.3	-20	South	6-Oct-1992	28.0	0	Bedrock	5.2	2.4	14	Cable Tool	6	Steel	44.3000	-76.6775	10 m - 30 m	139.8	Frontenac	5	13		Null	Sulphur	Water Supply	Domestic	Null
2203042	MLV 142 - 142a	0.0	-292	South	4-Nov-1966	28.0	20.7	Bedrock	24.7	13.7	18	Cable Tool	NULL	Null	44.3396	-76.3638	100 m - 300 m	123.6	Frontenac	4	12		Null	Fresh	Water Supply	Domestic	Null
2205404	MLV 142 - 142a	0.0	-263	South	1-Jun-1971	11.3	0.9	Bedrock	10.4	4.9	45	Cable Tool	6	Steel	44.3411	-76.3665	30 m - 100 m	116.9	Frontenac	5	11		Null	Fresh	Water Supply	Domestic	Null
2205200	MLV 142 - 142a	0.2	14	North	11-Nov-1970	28.7	0.6	Bedrock	25.3	20.1	68	Air Percussion	6	Steel	44.3424	-76.3613	30 m - 100 m	124.2	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
2205848	MLV 142 - 142a	0.2	34	North	22-Jun-1972	41.5	28.7	Bedrock	38.1	15.2	91	Cable Tool	6	Steel	44.3426	-76.3613	30 m - 100 m	123.4	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
7159432	MLV 142 - 142a	0.2	-78	South	3-Dec-2010	36.6	N/A	Null	10.7	7.3	23	Air Percussion	6	Steel	44.3416	-76.3608	10 m - 30 m	Null	Frontenac	5	13	3375 Hwy 15	Kingston	Untested	Water Supply	Null	Null
2206820	MLV 142 - 142a	0.3	9	North	12-Sep-1974	50.3	0	Bedrock	49.1	9.4	23	Air Percussion	6	Steel	44.3424	-76.3597	30 m - 100 m	127.0	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
2203070	MLV 142 - 142a	0.3	564	North	11-Aug-1964	31.7	7.6	Bedrock	21.3	13.4	45	Cable Tool	6	Steel	44.3474	-76.3600	100 m - 300 m	120.2	Frontenac	5	13		Null	Not Stated	Water Supply	Commerical	Domestic
2203072	MLV 142 - 142a	0.3	169	North	8-Dec-1964	28.0	0.3	Bedrock	25.9	13.7	14	Cable Tool	6	Steel	44.3438	-76.3593	100 m - 300 m	124.1	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
2210525	MLV 142 - 142a	0.4	105	North	9-Sep-1985	34.4	2.1	Bedrock	25.0	10.4	73	Air Percussion	6	Steel	44.3433	-76.3592	300 m - 1 km	126.6	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
2218262	MLV 142 - 142a	0.4	148	North	19-May-2004	30.5	3	Bedrock	10.7	7.9	Null	Rotary (Air)	6	Steel	44.3437	-76.3590	100 m - 300 m	125.8	Frontenac	5	13	3429 Hwy 15	Null	Not Stated	Water Supply	Domestic	Null
2203044	MLV 142 - 142a	0.4	-188	South	1-Nov-1967	18.3	10.7	Bedrock	17.4	-0.3	23	Cable Tool	6	Steel	44.3406	-76.3588	100 m - 300 m	124.8	Frontenac	4	14		Null	Fresh	Water Supply	Industrial	Null
2203071	MLV 142 - 142a	0.4	382	North	26-Aug-1964	29.3	1.8	Bedrock	16.8	15.2	9	Cable Tool	6	Steel	44.3458	-76.3587	100 m - 300 m	125.5	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
2206423	MLV 142 - 142a	0.4	225	North	18-Oct-1973	22.3	0.3	Bedrock	21.3	12.8	32	Air Percussion	6	Steel	44.3444	-76.3585	30 m - 100 m	124.6	Frontenac	5	13		Null	Fresh	Water Supply	Domestic	Null
2205827	MLV 142 - 142a	2.5	200	North	17-Feb-1972	13.4	7	Bedrock	12.2	0.9	27	Rotary (Air)	6	Steel	44.3485	-76.3341	30 m - 100 m	117.3	Frontenac	5	19		Null	Fresh	Water Supply	Domestic	Null
2209340	MLV 142 - 142a	5.0	-103	South	24-Jan-1979	25.0	3	Bedrock	23.2	3	114	Air Percussion	6	Steel	44.3540	-76.3033	30 m - 100 m	119.9	Frontenac	5	25		Null	Not Stated	Water Supply	Domestic	Null
2207029	MLV 142 - 142a	5.0	153	North	15-Jan-1975	11.6	2.4	Bedrock	8.5	1.2	55	Air Percussion	6	Steel	44.3560	-76.3049	30 m - 100 m	116.1	Frontenac	5	25		Null	Fresh	Water Supply	Domestic	Null
2215676	MLV 142 - 142a	5.1	1	North	3-Sep-1996	18.6	7.3	Bedrock	12.2	0.9	68	Air Percussion	6	Steel	44.3551	-76.3033	10 m - 30 m	113.8	Frontenac	5	25		Null	Fresh	Water Supply	Livestock	Null
2205510	MLV 142 - 142a	5.2	169	North	17-Sep-1971	11.6	4	Bedrock	10.4	1.5	23	Cable Tool	6	Steel	44.3567	-76.3036	30 m - 100 m	113.5	Frontenac	5	25		Null	Fresh	Water Supply	Domestic	Null
2205487	MLV 142 - 142a	5.2	98	North	23-Sep-1971	24.4	4	Bedrock	23.2	3	23	Cable Tool	6	Steel	44.3562	-76.3031	30 m - 100 m	114.7	Frontenac	5	25		Null	Fresh	Water Supply	Domestic	Null
2203116	MLV 142 - 142a	5.2	142	North	10-Feb-1961	10.7	2.1	Bedrock	9.1	1.2	14	Cable Tool	6	Steel	44.3566	-76.3032	100 m - 300 m	113.6	Frontenac	5	25		Null	Fresh	Water Supply	Domestic	Null

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Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
2215679	MLV 142 - 142a	5.2	134	North	18-Sep-1996	24.4	3.7	Bedrock	10.4	2.7	68	Air Percussion	6	Steel	44.3567	-76.3027	10 m - 30 m	113.2	Frontenac	5	25		Null	Fresh	Water Supply	Domestic	Null
2217572	MLV 142 - 142a	5.3	-100	South	8-Jul-2002	24.4	5.5	Bedrock	8.5	0.9	114	Air Percussion	6	Steel	44.3551	-76.3004	100 m - 300 m	114.2	Frontenac	6	26		Null	Not Stated	Water Supply	Livestock	Null
2203114	MLV 142 - 142a	5.3	-38	South	10-Dec-1956	7.0	2.4	Bedrock	6.1	2.7	Null	Cable Tool	6	Open Hole	44.3557	-76.3004	unknown UTM	113.0	Frontenac	5	25		Null	Fresh	Water Supply	Domestic	Null
2203117	MLV 142 - 142a	5.4	-18	South	27-Jan-1956	15.8	6.1	Bedrock	12.2	3	Null	Cable Tool	6	Steel	44.3560	-76.2998	unknown UTM	112.4	Frontenac	5	26		Null	Fresh	Water Supply	Domestic	Null
7107787	MLV 142 - 142a	5.5	123	North	12-Jun-2008	24.4	N/A	Null	16.5	0.6	23	Air Percussion	6	Steel	44.3575	-76.2994	10 m - 30 m	110.8	Frontenac	5	26	3063 6th Con. Rd.	Joyceville	Untested	Water Supply	Domestic	Null
2203118	MLV 142 - 142a	5.6	-153	South	30-Sep-1967	16.2	5.2	Bedrock	7.9	0.6	45	Cable Tool	6	Open Hole	44.3555	-76.2972	100 m - 300 m	115.0	Frontenac	5	26		Null	Not Stated	Water Supply	Livestock	Domestic
2206463	MLV 142 - 142a	7.2	-199	South	20-Nov-1973	16.2	0.9	Bedrock	15.2	5.8	23	Air Percussion	6	Steel	44.3587	-76.2773	30 m - 100 m	116.5	Frontenac	5	30		Null	Fresh	Water Supply	Domestic	Null
2204501	MLV 142 - 142a	7.3	-105	South	3-May-1968	14.6	1.5	Bedrock	13.1	2.4	23	Cable Tool	6	Steel	44.3597	-76.2766	30 m - 100 m	114.5	Frontenac	5	31		Null	Fresh	Water Supply	Domestic	Null
2207719	MLV 142 - 142a	7.3	-71	South	1-Dec-1976	15.5	2.1	Bedrock	11.0	0.9	91	Air Percussion	6	Steel	44.3601	-76.2764	30 m - 100 m	113.6	Frontenac	5	31		Null	Fresh	Water Supply	Domestic	Null
3604087	MLV 142a - 143	0.9	-71	South	21-Jan-1969	19.5	11.9	Bedrock	18.6	6.1	Null	Cable Tool	6	Open Hole	44.3688	-76.2266	30 m - 100 m	107.7	Leeds	2	3		Null	Fresh	Water Supply	Domestic	Null
3607772	MLV 142a - 143	3.1	-120	South	13-Dec-1978	24.4	2.1	Bedrock	6.7	4.6	45	Air Percussion	6	Steel	44.3732	-76.2003	30 m - 100 m	97.8	Leeds	2	8		Null	Not Stated	Water Supply	Domestic	Null
3604328	MLV 142a - 143	3.2	-68	South	2-Dec-1969	16.2	0.9	Bedrock	16.2	0	Null	Cable Tool	6	Steel	44.3743	-76.2001	30 m - 100 m	97.3	Leeds	3	8		Null	Fresh	Water Supply	Domestic	Null
3602133	MLV 142a - 143	3.3	-134	South	26-Aug-1953	9.8	3	Bedrock	5.5	3.4	Null	Cable Tool	6	Steel	44.3740	-76.1993	unknown UTM	98.0	Leeds	3	9		Null	Fresh	Water Supply	Domestic	Null
3608136	MLV 142a - 143	3.3	66	North	19-Sep-1979	53.3	4.6	Bedrock	29.9	0	136	Air Percussion	6	Steel	44.3757	-76.2004	30 m - 100 m	97.8	Leeds	3	7		Null	Not Stated	Water Supply	Domestic	Null
3608714	MLV 142a - 143	3.3	78	North	4-Oct-1982	15.8	0.6	Bedrock	11.0	4.3	114	Air Percussion	6	Steel	44.3759	-76.2002	10 m - 30 m	96.6	Leeds	3	8		Null	Not Stated	Water Supply	Domestic	Null
3602132	MLV 142a - 143	3.4	-183	South	23-May-1962	18.9	2.1	Bedrock	18.9	3	27	Cable Tool	6	Steel	44.3741	-76.1980	unknown UTM	100.6	Leeds	3	8		Null	Fresh	Water Supply	Domestic	Null
3609107	MLV 142a - 143	4.3	-32	South	22-Nov-1984	19.5	3	Bedrock	18.3	4.6	45	Rotary (Convent.)	6	Steel	44.3792	-76.1884	10 m - 30 m	106.9	Leeds	3	11		Null	Fresh	Water Supply	Domestic	Null
3609103	MLV 142a - 143	7.5	-33	South	30-Oct-1984	24.1	1.8	Bedrock	18.3	10.7	55	Rotary (Convent.)	6	Steel	44.3876	-76.1520	unknown UTM	104.7	Leeds	3	17		Null	Fresh	Water Supply	Domestic	Null
3610671	MLV 142a - 143	7.5	-33	South	18-Jul-1988	18.3	6.4	Bedrock	15.8	2.7	45	Air Percussion	6	Steel	44.3876	-76.1520	unknown UTM	104.7	Leeds	3	17		Null	Fresh	Water Supply	Domestic	Null
3611050	MLV 142a - 143	7.9	-163	South	6-Oct-1989	72.2	0	Bedrock	50.3	8.5	68	Air Percussion	6	Null	44.3880	-76.1469	unknown UTM	104.7	Leeds	3	18		Null	Fresh	Water Supply	Domestic	Null
3609841	MLV 142a - 143	7.9	-163	South	2-Dec-1986	21.9	0.9	Bedrock	21.0	5.2	32	Air Percussion	6	Null	44.3880	-76.1469	unknown UTM	104.7	Leeds	3	18		Null	Not Stated	Water Supply	Domestic	Null
3610852	MLV 142a - 143	8.2	168	North	30-Jun-1989	25.9	4.6	Bedrock	22.9	7.3	91	Air Percussion	6	Null	44.3923	-76.1465	10 m - 30 m	102.4	Leeds	3	17		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
3604369	MLV 142a - 143	13.8	156	North	20-Dec-1969	35.7	3	Bedrock	5.5	1.2	9	Cable Tool	NULL	Open Hole	44.4187	-76.0900	unknown UTM	89.1	Leeds	4	3		Null	Fresh	Water Supply	Livestock	Null
3601911	MLV 142a - 143	14.5	60	North	13-Jun-1966	20.1	1.5	Bedrock	7.6	3	23	Cable Tool	6	Open Hole	44.4216	-76.0820	100 m - 300 m	95.0	Leeds	4	5		Null	Fresh	Water Supply	Domestic	Null
3601912	MLV 142a - 143	14.5	173	North	3-Mar-1960	24.4	2.4	Bedrock	21.3	4.6	91	Cable Tool	6	Open Hole	44.4225	-76.0827	100 m - 300 m	96.1	Leeds	4	5		Null	Fresh	Water Supply	Domestic	Null
3601913	MLV 142a - 143	14.9	81	North	17-Aug-1961	11.3	3.7	Bedrock	10.7	3	27	Cable Tool	6	Open Hole	44.4238	-76.0774	100 m - 300 m	93.5	Leeds	4	6		Null	Fresh	Water Supply	Livestock	Null
3606695	MLV 142a - 143	15.0	99	North	19-Oct-1976	68.3	12.2	Bedrock	65.5	5.2	23	Air Percussion	6	Steel	44.4241	-76.0772	30 m - 100 m	93.6	Leeds	4	6		Null	Fresh	Water Supply	Livestock	Domestic
3601941	MLV 142a - 143	22.5	135	North	25-Nov-1961	20.4	1.2	Bedrock	18.3	3.4	32	Cable Tool	6	Steel	44.4660	-76.0069	100 m - 300 m	111.7	Leeds	6	21		Null	Fresh	Water Supply	Livestock	Null
3606994	MLV 143a - 144	0.0	-149	South	13-Jun-1977	18.9	0.6	Bedrock	17.4	3.7	36	Rotary (Convent.)	6	Steel	44.6362	-75.6956	100 m - 300 m	106.6	Leeds	3	6		Null	Fresh	Water Supply	Domestic	Null
3601091	MLV 143a - 144	0.1	-75	South	26-Apr-1967	18.9	1.5	Bedrock	18.3	3	Null	Cable Tool	5	Steel	44.6370	-75.6959	100 m - 300 m	106.8	Leeds	3	6		Null	Fresh	Water Supply	Domestic	Null
3601088	MLV 143a - 144	0.2	-81	South	19-Sep-1953	15.5	1.5	Bedrock	14.9	2.7	Null	Cable Tool	5	Steel	44.6371	-75.6955	unknown UTM	106.7	Leeds	3	6		Null	Fresh	Water Supply	Domestic	Null
3608194	MLV 143a - 144	0.2	102	North	15-Apr-1980	14.6	1.2	Bedrock	13.4	4	Null	Air Percussion	6	Steel	44.6384	-75.6969	100 m - 300 m	106.3	Leeds	3	6		Null	Fresh	Water Supply	Domestic	Null
3609238	MLV 143a - 144	0.2	-51	South	1-Nov-1984	27.4	1.8	Bedrock	25.9	4.6	55	Air Percussion	6	Steel	44.6375	-75.6953	10 m - 30 m	106.8	Leeds	3	6		Null	Fresh	Water Supply	Domestic	Null
3603904	MLV 143a - 144	0.3	40	North	3-Apr-1968	19.5	0.6	Bedrock	18.6	3	14	Cable Tool	6	Steel	44.6385	-75.6954	100 m - 300 m	106.3	Leeds	3	6		Null	Fresh	Water Supply	Domestic	Null
3601082	MLV 143a - 144	0.8	-89	South	30-Aug-1955	24.7	1.8	Bedrock	24.7	4.3	Null	Cable Tool	6	Open Hole	44.6406	-75.6886	unknown UTM	105.4	Leeds	3	5		Null	Fresh	Water Supply	Domestic	Livestock
3604136	MLV 143a - 144	2.1	-117	South	8-Jul-1969	25.6	1.2	Bedrock	25.0	7.6	23	Cable Tool	5	Open Hole	44.6474	-75.6749	30 m - 100 m	113.4	Leeds	3	1		Null	Fresh	Water Supply	Domestic	Null
3601076	MLV 143a - 144	2.1	-195	South	2-Aug-1950	16.5	0.6	Bedrock	16.5	7.6	Null	Cable Tool	6	Steel	44.6469	-75.6742	unknown UTM	113.2	Leeds	3	2		Null	Fresh	Water Supply	Domestic	Null
3611534	MLV 143a - 144	2.1	-162	South	27-Jul-1990	54.9	0	Bedrock	28.7	9.1	91	Rotary (Convent.)	6	Steel	44.6472	-75.6744	10 m - 30 m	113.1	Leeds	3	1		Null	Fresh	Water Supply	Domestic	Null
3605202	MLV 143a - 144	2.2	20	North	5-Apr-1973	19.2	0	Bedrock	17.7	3	Null	Rotary (Convent.)	6	Steel	44.6486	-75.6756	30 m - 100 m	114.9	Leeds	3	3		Null	Fresh	Water Supply	Domestic	Null
7150892	MLV 143a - 144	2.3	-70	South	21-Aug-2010	43	N/A	Null	37.5	17.6	Null	Rotary (Convent.)	10	Open Hole	44.6489	-75.6734	30 m - 100 m	118.1	Leeds	3	1	3105 Bethal Rd. Rr#2	Brockville	Untested	Water Supply	Null	Null
2408949	MLV 143a - 144	2.6	-196	South	8-Sep-1999	48.8	4	Bedrock	46.3	12.2	136	Air Percussion	8	Open Hole	44.6489	-75.6704	10 m - 30 m	113.2	Grenville	2	37		Null	Fresh	Water Supply	Domestic	Null
3611115	MLV 143a - 144	2.6	183	North	27-Jun-1989	27.4	2.4	Bedrock	17.1	7	55	Cable Tool	6	Steel	44.6520	-75.6726	10 m - 30 m	119.2	Leeds	3	1		Null	Fresh	Water Supply	Domestic	Null
2400311	MLV 143a - 144	2.7	-189	South	20-Mar-1956	12.5	8.2	Bedrock	12.5	0	Null	Cable Tool	5	Open Hole	44.6498	-75.6686	unknown UTM	113.2	Grenville	2	37		Null	Fresh	Water Supply	Domestic	Null
2410380	MLV 143a - 144	2.8	167	North	23-Jan-2006	67.4	2.4	Bedrock	58.5	15.4	Null	Rotary (Air)	NULL	Open Hole	44.6526	-75.6708	10 m - 30 m	120.6	Grenville	3	37	3105 Bethel Rd	Brockville	Null	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
7054384	MLV 143a - 144	2.8	171	North	31-Oct-2007	0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.6527	-75.6708	10 m - 30 m	120.9	Grenville	3	37	3105 Bethel Road	Brockville	Null	Null	Null	Null
7054385	MLV 143a - 144	2.8	171	North	31-Oct-2007	0	N/A	Null	Null	0	Null	NULL	NULL	Null	44.6527	-75.6708	10 m - 30 m	120.9	Grenville	3	37	3105 Bethel Road	Brockville	Null	Null	Null	Null
2400531	MLV 143a - 144	2.8	-71	South	27-Dec-1966	35.1	5.2	Bedrock	32.0	15.2	18	Cable Tool	5	Open Hole	44.6513	-75.6682	100 m - 300 m	113.6	Grenville	3	37		Null	Fresh	Water Supply	Domestic	Null
2403359	MLV 143a - 144	3.0	-125	South	3-Jun-1976	45.1	3.7	Bedrock	33.8	5.8	32	Air Percussion	6	Steel	44.6517	-75.6665	100 m - 300 m	112.1	Grenville	2	37		Null	Fresh	Water Supply	Domestic	Null
2404322	MLV 143a - 144	3.0	14	North	16-Nov-1979	45.1	1.2	Bedrock	43.0	12.2	27	Air Percussion	6	Steel	44.6530	-75.6668	30 m - 100 m	113.3	Grenville	3	37		Null	Fresh	Water Supply	Domestic	Null
2405352	MLV 143a - 144	4.9	196	North	11-Aug-1986	36.9	9.8	Bedrock	35.1	10.7	23	Cable Tool	6	Steel	44.6621	-75.6499	100 m - 300 m	112.6	Grenville	3	33		Null	Fresh	Water Supply	Domestic	Null
2402215	MLV 143a - 144	7.3	195	North	20-Oct-1970	23.5	0.3	Bedrock	22.3	3.7	36	Cable Tool	5	Open Hole	44.6784	-75.6316	30 m - 100 m	113.2	Grenville	3	27		Null	Fresh	Water Supply	Domestic	Null
2400515	MLV 143a - 144	7.5	183	North	3-Sep-1963	33.2	0.6	Bedrock	32.9	12.2	23	Cable Tool	5	Open Hole	44.6803	-75.6295	100 m - 300 m	110.4	Grenville	3	26		Null	Fresh	Water Supply	Livestock	Domestic
2403929	MLV 143a - 144	7.7	67	North	6-Jul-1978	19.2	0	Bedrock	17.7	7.6	68	Rotary (Convent.)	6	Steel	44.6802	-75.6267	30 m - 100 m	108.5	Grenville	2	26		Null	Fresh	Water Supply	Domestic	Null
2403243	MLV 143a - 144	7.9	116	North	14-May-1976	18.6	0.9	Bedrock	16.8	6.1	36	Rotary (Convent.)	6	Steel	44.6816	-75.6258	100 m - 300 m	107.0	Grenville	2	25		Null	Fresh	Water Supply	Domestic	Null
2403311	MLV 143a - 144	8.0	166	North	17-Aug-1976	19.2	1.5	Bedrock	17.7	10.7	27	Rotary (Convent.)	6	Steel	44.6825	-75.6255	100 m - 300 m	106.8	Grenville	2	25		Null	Fresh	Water Supply	Domestic	Null
2405406	MLV 143a - 144	8.0	-266	South	12-Jun-1986	19.5	4.3	Bedrock	18.0	2.4	55	Air Percussion	6	Steel	44.6807	-75.6204	10 m - 30 m	104.0	Grenville	2	25		Null	Fresh	Water Supply	Domestic	Null
2403340	MLV 143a - 144	8.1	-309	South	9-Jun-1976	19.2	3	Bedrock	17.7	1.2	64	Rotary (Convent.)	6	Steel	44.6807	-75.6198	100 m - 300 m	105.0	Grenville	2	24		Null	Fresh	Water Supply	Domestic	Null
2403390	MLV 143a - 144	8.1	163	North	2-Aug-1976	19.8	1.2	Bedrock	16.2	2.7	27	Air Percussion	6	Steel	44.6830	-75.6249	100 m - 300 m	106.4	Grenville	2	25		Null	Fresh	Water Supply	Domestic	Null
2402536	MLV 143a - 144	8.2	-152	South	2-Aug-1973	17.1	2.1	Bedrock	15.8	0.6	Null	Rotary (Convent.)	6	Open Hole	44.6819	-75.6210	30 m - 100 m	103.1	Grenville	2	25		Null	Fresh	Water Supply	Domestic	Null
2403058	MLV 143a - 144	8.2	-326	South	22-Aug-1975	24.4	N/A	Overburden	22.9	2.7	91	Cable Tool	6	Steel	44.6807	-75.6195	100 m - 300 m	104.8	Grenville	2	24		Null	Fresh	Water Supply	Domestic	Null
2400514	MLV 143a - 144	8.2	253	North	5-Oct-1955	15.8	0.6	Bedrock	15.8	2.1	Null	Cable Tool	6	Steel	44.6847	-75.6243	unknown UTM	105.7	Grenville	3	25		Null	Fresh	Water Supply	Domestic	Null
2400385	MLV 143a - 144	8.2	-303	South	5-Dec-1964	23.2	4.6	Bedrock	21.9	7	14	Diamond	2	Steel	44.6811	-75.6194	100 m - 300 m	104.7	Grenville	2	24		Null	Fresh	Water Supply	Livestock	Domestic
2403118	MLV 143a - 144	8.2	-237	South	9-Oct-1975	19.5	3	Bedrock	18.0	1.2	55	Rotary (Convent.)	6	Steel	44.6815	-75.6199	30 m - 100 m	104.3	Grenville	2	24		Null	Fresh	Water Supply	Domestic	Null
2402532	MLV 143a - 144	8.2	-262	South	6-Aug-1973	24.7	3.7	Bedrock	23.2	1.8	55	Rotary (Convent.)	6	Steel	44.6817	-75.6192	30 m - 100 m	104.7	Grenville	2	24		Null	Fresh	Water Supply	Domestic	Null
2404895	MLV 144 - 145	1.0	195	North	4-Jul-1984	89	2.1	Bedrock	86.9	15.2	159	Air Percussion	6	Steel	44.6920	-75.6142	30 m - 100 m	109.5	Grenville	2	22		Null	Fresh	Water Supply	Domestic	Null
2403008	MLV 144 - 145	2.0	180	North	1-Aug-1975	68.3	4.6	Bedrock	66.1	16.8	23	Rotary (Convent.)	6	Steel	44.6983	-75.6055	30 m - 100 m	117.1	Grenville	2	20		Null	Fresh	Water Supply	Domestic	Null

Table I-1: Recorded Water Well Information within the Groundwater Local Study Area - 200 m from Pipeline Centreline

Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
2402610	MLV 144 - 145	2.2	162	North	14-Oct-1973	50.9	2.4	Bedrock	30.5	30.5	9	Air Percussion	6	Open Hole	44.6992	-75.6040	30 m - 100 m	118.1	Grenville	2	20		Null	Fresh	Water Supply	Domestic	Null
7113159	MLV 144 - 145	4.1	103	North	1-Jul-2008	56	N/A	Null	51.5	11.1	Null	Rotary (Air)	6	Steel	44.7114	-75.5872	10 m - 30 m	111.7	Grenville	3	14	3101 Blue Church Rd.	Manard	Not Stated	Water Supply	Domestic	Null
2400364	MLV 144 - 145	4.1	-105	South	11-Aug-1964	24.1	2.4	Bedrock	23.5	3.7	Null	Cable Tool	6	Open Hole	44.7103	-75.5850	unknown UTM	110.0	Grenville	2	16		Null	Fresh	Water Supply	Domestic	Null
2403599	MLV 144 - 145	4.2	-131	South	25-May-1977	37.2	10.4	Bedrock	35.4	3	36	Rotary (Convent.)	6	Steel	44.7105	-75.5844	30 m - 100 m	108.7	Grenville	2	15		Null	Fresh	Water Supply	Domestic	Null
2406814	MLV 144 - 145	4.2	-41	South	9-Aug-1989	20.7	3	Bedrock	14.6	3	64	Air Percussion	6	Steel	44.7115	-75.5848	10 m - 30 m	107.4	Grenville	2	14		Null	Fresh	Water Supply	Domestic	Null
2403872	MLV 144 - 145	4.2	34	North	17-May-1978	19.5	4.9	Bedrock	17.4	3	68	Rotary (Convent.)	6	Steel	44.7120	-75.5854	30 m - 100 m	108.9	Grenville	2	15		Null	Fresh	Water Supply	Domestic	Null
2404444	MLV 144 - 145	5.3	-40	South	14-Jul-1980	31.1	1.5	Bedrock	12.2	0	45	Air Percussion	6	Steel	44.7183	-75.5754	100 m - 300 m	108.1	Grenville	2	12		Null	Fresh	Water Supply	Domestic	Null
2400338	MLV 144 - 145	8.3	189	North	16-Nov-1957	7.6	0	Bedrock	7.6	0.6	Null	Cable Tool	6	Steel	44.7384	-75.5499	unknown UTM	100.3	Grenville	2	4		Null	Fresh	Water Supply	Domestic	Null
2405380	MLV 144 - 145	8.8	143	North	8-Oct-1986	27.4	0.9	Bedrock	25.9	4.6	23	Cable Tool	6	Steel	44.7412	-75.5448	100 m - 300 m	99.2	Grenville	3	3		Null	Fresh	Water Supply	Domestic	Null
2404785	MLV 144 - 145	8.8	190	North	27-Sep-1983	61	0.3	Bedrock	59.1	7.6	55	Rotary (Convent.)	NULL	Null	44.7419	-75.5440	30 m - 100 m	99.6	Grenville	2	3		Null	Fresh	Water Supply	Domestic	Null
2400328	MLV 144 - 145	9.2	-194	South	14-Oct-1961	24.4	7.6	Bedrock	24.4	6.1	18	Cable Tool	5	Steel	44.7388	-75.5381	100 m - 300 m	98.2	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2402040	MLV 144 - 145	9.2	-192	South	4-Mar-1970	20.4	7	Bedrock	20.1	6.1	27	Cable Tool	5	Steel	44.7389	-75.5381	30 m - 100 m	98.1	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2400332	MLV 144 - 145	9.2	-150	South	27-Sep-1967	10.1	0.6	Bedrock	9.1	1.5	45	Diamond	2	Open Hole	44.7392	-75.5383	100 m - 300 m	97.9	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2405643	MLV 144 - 145	9.2	173	North	18-Jun-1993	31.1	1.5	Bedrock	4.6	4.6	27	Air Percussion	6	Open Hole	44.7418	-75.5401	10 m - 30 m	98.6	Grenville	2	2		Null	Not Stated	Water Supply	Domestic	Null
2402666	MLV 144 - 145	9.2	-131	South	12-Jun-1973	25	6.4	Bedrock	24.4	2.1	45	Diamond	2	Galvanized	44.7395	-75.5381	30 m - 100 m	98.1	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2400322	MLV 144 - 145	9.2	-183	South	31-Oct-1952	35.4	6.1	Bedrock	35.1	5.5	Null	Cable Tool	5	Steel	44.7393	-75.5373	unknown UTM	97.3	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2408931	MLV 144 - 145	9.2	-137	South	9-Sep-1999	43	6.4	Bedrock	25.9	7	45	Air Percussion	6	Open Hole	44.7395	-75.5378	10 m - 30 m	98.1	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2409983	MLV 144 - 145	9.2	-158	South	5-Jun-2004	43	7.3	Bedrock	33.5	6.7	Null	Rotary (Air)	6	Steel	44.7395	-75.5374	100 m - 300 m	97.8	Grenville	2	2	4025 Cedar Grove Road	Prescott	Not Stated	Water Supply	Domestic	Null
2410493	MLV 144 - 145	9.3	-121	South	2-Oct-2006	55.5	1.2	Bedrock	48.0	7.4	31	Rotary (Air)	6	Steel	44.7401	-75.5372	10 m - 30 m	98.2	Grenville	2	2	4016 Cedar Grove Road	Prescott	Null	Water Supply	Domestic	Null
2400327	MLV 144 - 145	9.4	-67	South	28-Sep-1961	25.9	3.4	Bedrock	25.9	7.6	18	Cable Tool	5	Steel	44.7414	-75.5363	100 m - 300 m	96.8	Grenville	2	2		Null	Fresh	Water Supply	Domestic	Null
2400316	MLV 144 - 145	9.5	-195	South	20-Aug-1957	9.4	4.9	Bedrock	9.4	4.6	Null	Cable Tool	6	Steel	44.7410	-75.5344	unknown UTM	93.5	Grenville	2	1		Null	Fresh	Water Supply	Domestic	Null
2400319	MLV 144 - 145	9.6	-139	South	19-Sep-1964	21.9	5.5	Bedrock	21.6	6.1	23	Cable Tool	5	Steel	44.7421	-75.5338	unknown UTM	93.6	Grenville	2	1		Null	Fresh	Water Supply	Domestic	Null

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Well ID	MLV (main line valve) Segment	Chainage Along Route Segment (km)	Distance Off Route (m)	Direction Off Route	Date Completed	Well Depth (m)	Depth To Bedrock (m)	Aquifer Type	Depth Water Found During Drilling (m)	Static Water Level (m)	Recommended Pumping Rate (Litres Per Minute)	Construction Method	Casing Diameter (inch)	Casing Material	Latitude	Longitude	Coordinates Margin of Error	Elevation (metres above sea level)	County	Concession	Lot	Street	City	Water Kind	Final Status	First Use	Second Use
2404458	MLV 144 - 145	9.7	-186	South	10-Sep-1980	19.5	2.1	Bedrock	17.4	0.9	45	Rotary (Convent.)	6	Steel	44.7428	-75.5327	100 m - 300 m	93.0	Grenville	2	1		Null	Fresh	Water Supply	Domestic	Null
2400318	MLV 144 - 145	9.7	-196	South	6-Oct-1961	20.7	4.6	Bedrock	20.7	0.3	18	Cable Tool	5	Steel	44.7429	-75.5325	100 m - 300 m	92.8	Grenville	2	1		Null	Fresh	Water Supply	Domestic	Null
2408526	MLV 144 - 145	11.6	-12	South	22-Jan-1997	33.8	18	Bedrock	29.9	9.1	0	Air Percussion	9	Open Hole	44.7554	-75.5193	10 m - 30 m	100.5	Grenville	2	34		Null	Fresh	Replacement Well	Domestic	Null
2410366	MLV 144 - 145	14.4	194	North	23-Aug-2005	39.3	3.7	Bedrock	36.0	4	88	Rotary (Air)	6	Steel	44.7733	-75.4951	10 m - 30 m	91.0	Grenville	2	23	420 County Rd 44	Null	Null	Water Supply	Domestic	Null
2400890	MLV 144 - 145	14.5	118	North	21-Sep-1961	22.9	6.1	Bedrock	22.3	1.8	27	Cable Tool	4	Open Hole	44.7731	-75.4940	100 m - 300 m	89.1	Grenville	2	27		Null	Fresh	Water Supply	Commerical	Null
2400882	MLV 144 - 145	14.5	178	North	5-Nov-1959	14.9	1.5	Bedrock	14.3	0	Null	Cable Tool	4	Steel	44.7736	-75.4945	100 m - 300 m	90.1	Grenville	2	26		Null	Fresh	Water Supply	Domestic	Null
2409394	MLV 144 - 145	21.4	-34	South	5-Sep-2001	36.6	14.3	Bedrock	20.1	15.2	32	Air Percussion	6	Steel	44.8149	-75.4315	10 m - 30 m	80.6	Grenville	2	10		Null	Fresh	Water Supply	Domestic	Null
2400920	MLV 144 - 145	21.6	69	North	21-Aug-1957	15.8	8.8	Bedrock	12.2	2.4	Null	Cable Tool	4	Steel	44.8171	-75.4303	unknown UTM	80.7	Grenville	3	6		Null	Fresh	Water Supply	Domestic	Null
2400918	MLV 144 - 145	22.2	10	North	12-Dec-1964	15.5	12.2	Bedrock	13.7	2.4	59	Cable Tool	5	Steel	44.8207	-75.4239	100 m - 300 m	79.0	Grenville	3	5		Null	Fresh	Water Supply	Domestic	Null
2403381	MLV 144 - 145	25.3	-189	South	21-Aug-1975	19.8	14.3	Bedrock	17.1	4.6	45	Rotary (Air)	6	Steel	44.8381	-75.3949	30 m - 100 m	80.1	Grenville	3	1		Null	Fresh	Water Supply	Domestic	Null
1805356	MLV 144 - 145	25.5	-119	South	3-Feb-2006	33.3	15.2	Bedrock	Null	1	44	Rotary (Air)	6	Steel	44.8403	-75.3935	10 m - 30 m	79.5	Dundas	2	38	5227 Safford	Mitilda	Null	Water Supply	Domestic	Null

APPENDIX J

Fish Habitat Summary for Potential Watercrossings Associated with the Project

November 2015
Report No. 1311260045/501/1

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
Pipeline Segment MLV 132 – 133																			
E10.00-WC-MLV 132+1.098	Unnamed	Toronto and Region Conservation Authority	4,872,811	151,538	1.15	0.13	Watercourse	Permanent	Flowing	Cold	19.15	838	7.61	3.36	Poor	Yes	Low	Limited	Occupied
E20.00-WC-MLV 132+1.709	Bruce Creek	Toronto and Region Conservation Authority	4,872,958	152,131	2.90	0.51	Watercourse	Permanent	Flowing	Cold	22.5	621	7.96	8.43	Good	Yes	Low	Abundant	Occupied
E30.00-WC-MLV 132+2.476	Unnamed	Toronto and Region Conservation Authority	4,873,205	152,794	32.25	>1.5	Waterbody	Permanent	Impounded	Unclassified	24.78	466	8.5	9.05	Good	Yes	Low	Limited	Occupied
E40.00-WC-MLV 132+2.557	Unnamed	Toronto and Region Conservation Authority	4,873,225	152,872	0.70	0.19	Watercourse	Permanent	Flowing	Cold	19.75	1,004	7.6	2.51	Lethal	Yes	Low	Abundant	Contributing
E50.00-WC-MLV 132+2.759	Unnamed	Toronto and Region Conservation Authority	4,873,275	153,067	1.03	0.10	Watercourse	Permanent	Limited	Cold	16.52	753	7.77	6.35	Poor	Yes	Low	Limited	Contributing
E60.00-WC-MLV 132+3.954	Unnamed	Toronto and Region Conservation Authority	4,873,201	154,108	No defined channel	No defined channel	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	None
E70.00-WC-MLV 132+4.937	Unnamed	Toronto and Region Conservation Authority	4,873,396	155,067	1.93	0.14	Watercourse	Permanent	Flowing	Cold	17.5	800	7.81	6.48	Poor	Yes	Low	Abundant	Occupied
E80.00-WC-MLV 132+5.828	Little Rouge Creek	Toronto and Region Conservation Authority	4,872,981	155,730	10.00	0.28	Watercourse	Permanent	Flowing	Cold	19	740	8.38	10.23	Good	Yes	Low	Abundant	Occupied
E90.00-WC-MLV 132+7.009	Unnamed	Toronto and Region Conservation Authority	4,873,409	156,701	0.72	0.16	Watercourse	Permanent	Flowing	Cold	15.2	990	8.23	9.16	Good	Yes	Low	Abundant	Contributing
E100.00-WC-MLV 132+9.232	Unnamed	Toronto and Region Conservation Authority	4,873,851	158,744	2.10	0.19	Watercourse	Permanent	Limited	Unclassified	22.99	1,198	7.93	9.29	Good	Yes	Low	Abundant	Occupied
E105.00-WC-MLV 132+10.777	Katabokokonk Creek	Toronto and Region Conservation Authority	4,874,197	160,236	-	-	Undetermined	Unclassified	-	Unclassified	-	-	-	-	-	-	-	-	-

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E110.00-WC-MLV 132+12.359	Stouffville Creek	Toronto and Region Conservation Authority	4,874,705	161,666	2.30	0.11	Watercourse	Permanent	Limited	Warm	17	665	7.94	8.79	Good	Yes	Low to Moderate	Abundant	Occupied
E120.00-WC-MLV 132+12.799	Unnamed	Toronto and Region Conservation Authority	4,874,812	162,094	1.00	0.09	Watercourse	Permanent	Flowing	Cold	22.4	640	8.35	9.81	Good	Yes	Low	Limited	Occupied
E130.00-WC-MLV 132+12.849	Reesor Creek	Toronto and Region Conservation Authority	4,874,824	162,142	No defined channel	No defined channel	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E140.00-WC-MLV 132+12.977	Unnamed	Toronto and Region Conservation Authority	4,874,855	162,267	No defined channel	No defined channel	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	None
E150.00-WC-MLV 132+14.019	Unnamed	Toronto and Region Conservation Authority	4,875,106	163,277	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E160.00-WC-MLV 132+14.898	West Duffins Creek	Toronto and Region Conservation Authority	4,875,371	164,115	3.71	0.35	Watercourse	Permanent	Flowing	Cold	15.3	470	8.45	9.6	Good	Yes	Moderate to High	Abundant	Occupied
E170.00-WC-MLV 132+15.36	Wixon Creek	Toronto and Region Conservation Authority	4,875,522	164,551	2.96	0.35	Watercourse	Permanent	Flowing	Cold	15.7	500	8.16	9.57	Good	Yes	Moderate to High	Abundant	Occupied
E180.00-WC-MLV 132+15.791	Unnamed	Toronto and Region Conservation Authority	4,875,631	164,968	Dry	Dry	Watercourse	Permanent	Near Dry	Cold	N/A	N/A	N/A	N/A	N/A	Yes	Low to Moderate	Abundant	Occupied
E190.00-WC-MLV 132+16.381	Unnamed	Toronto and Region Conservation Authority	4,875,731	165,550	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E200.00-WC-MLV 132+16.648	Unnamed	Toronto and Region Conservation Authority	4,875,775	165,813	No defined channel	No defined channel	Wetland	Permanent	Near Dry	Cold	16.8	800	7.81	4.43	Poor	Yes	Low	Limited	Contributing
E210.00-WC-MLV 132+18.073	Unnamed	Toronto and Region Conservation Authority	4,876,056	167,195	Dry	Dry	Wetland	Permanent	Impounded	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E220.00-WC-MLV 132+18.301	Michell Creek	Toronto and Region Conservation Authority	4,876,120	167,414	0.93	0.48	Watercourse	Permanent	Flowing	Cold	14.6	570	8.25	8.39	Good	Yes	Low	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing	Watercourse Name[b]	Conservation Authority	Northing	Easting	Wetted Width	Wetted Depth	Water Crossing Type	Fish Habitat Field Survey Summary											
Identification (ID)[a]			(m)	(m)	(m)	(m)		Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E230.00-WC-MLV 132+18.601	Unnamed	Toronto and Region Conservation Authority	4,876,202	167,702	1.24	0.44	Watercourse	Permanent	Flowing	Cold	15.2	550	8.26	7.65	Adequate	Yes	Low	Abundant	Occupied
E240.00-WC-MLV 132+18.896	Unnamed	Toronto and Region Conservation Authority	4,876,284	167,986	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E250.00-WC-MLV 132+19.211	Unnamed	Toronto and Region Conservation Authority	4,876,386	168,283	No defined channel	No defined channel	Wetland	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low to Moderate	Abundant	Occupied
E260.00-WC-MLV 132+19.453	Unnamed	Toronto and Region Conservation Authority	4,876,349	168,491	Dry	Dry	Wetland	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E270.00-WC-MLV 132+19.527	Unnamed	Toronto and Region Conservation Authority	4,876,283	168,525	Dry	Dry	Wetland	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E280.00-WC-MLV 132+20.034	Unnamed	Toronto and Region Conservation Authority	4,876,013	168,895	0.47	0.14	Watercourse	Permanent	Flowing	Cold	17.14	1,659	8.1	8.91	Good	Yes	Low	Limited	Contributing
E290.00-WC-MLV 132+20.038	Unnamed	Toronto and Region Conservation Authority	4,876,014	168,899	No defined channel	No defined channel	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	None
Pipeline Segment MLV 133 – 134																			
E340.00-WC-MLV 133+0.863	Unnamed	Toronto and Region Conservation Authority	4,877,169	172,167	2.93	0.21	Watercourse	Permanent	Flowing	Cold	14.72	417	8.48	8.97	Good	Yes	Low to Moderate	Abundant	Occupied
E350.00-WC-MLV 133+1.391	Unnamed	Toronto and Region Conservation Authority	4,877,342	172,629	5.35	0.33	Watercourse	Permanent	Flowing	Cold	15.9	410	8.41	9.68	Good	Yes	Low to moderate	Abundant	Occupied
E370.00-WC-MLV 133+2.156	Unnamed	Toronto and Region Conservation Authority	4,877,438	173,388	0.73	0.10	Watercourse	Permanent	Flowing	Cold	17.22	762	7.18	5.18	Poor	Yes	Low	Limited	Contributing
E380.00-WC-MLV 133+2.372	Unnamed	Toronto and Region Conservation Authority	4,877,453	173,604	0.88	0.17	Watercourse	Permanent	Limited	Cold	16.4	650	8.34	8.45	Good	Yes	Low	Limited	Contributing
E390.00-WC-MLV 133+2.929	Unnamed	Toronto and Region Conservation Authority	4,877,545	174,152	No defined channel	No defined channel	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	None

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E400.00-WC-MLV 133+3.528	Unnamed	Central Lake Ontario Conservation Authority	4,877,667	174,738	Dry	Dry	Wetland	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E410.00-WC-MLV 133+5.429	Unnamed	Central Lake Ontario Conservation Authority	4,878,211	176,556	3.75	0.26	Watercourse	Permanent	Limited	Cold	18.11	484	8.1	9.67	Good	Yes	Low	Abundant	Occupied
E420.00-WC-MLV 133+7.320	Unnamed	Central Lake Ontario Conservation Authority	4,878,370	178,383	1.3	0.09	Watercourse	Permanent	Flowing	Cold	13.2	529	6.92	7.72	Adequate	Yes	Low	Abundant	Occupied
E430.00-WC-MLV 133+8.506	Lynde Creek	Central Lake Ontario Conservation Authority	4,878,555	179,337	4.30	0.18	Watercourse	Permanent	Flowing	Cold	9	600	8.13	10.4	Good	Yes	Moderate	Abundant	Occupied
E440.00-WC-MLV 133+8.642	Unnamed	Central Lake Ontario Conservation Authority	4,878,622	179,455	-	-	Undetermined	Unclassified	-	Cold	-	-	-	-	-	-	-	-	-
E450.00-WC-MLV 133+9.022	Unnamed	Central Lake Ontario Conservation Authority	4,878,812	179,775	-	-	Undetermined	Unclassified	-	Cold	-	-	-	-	-	-	-	-	-
E460.00-WC-MLV 133+9.039	Unnamed	Central Lake Ontario Conservation Authority	4,878,824	179,787	-	-	Undetermined	Unclassified	-	Cold	-	-	-	-	-	-	-	-	-
E480.00-WC-MLV 133+9.231	Unnamed	Central Lake Ontario Conservation Authority	4,878,913	179,953	-	-	Undetermined	Unclassified	-	Cold	-	-	-	-	-	-	-	-	-
E490.00-WC-MLV 133+10.045	Unnamed	Central Lake Ontario Conservation Authority	4,879,199	180,716	5.61	0.18	Watercourse	Permanent	Flowing	Cold	8.6	660	8.46	11.21	Good	Yes	Moderate	Abundant	Occupied
E500.00-WC-MLV 133+11.163	Unnamed	Central Lake Ontario Conservation Authority	4,879,050	181,705	0.81	0.25	Watercourse	Permanent	Flowing	Cold	14.7	1,040	8.27	9.16	Good	Yes	Moderate to High	Abundant	Occupied
E510.00-WC-MLV 133+11.739	Unnamed	Central Lake Ontario Conservation Authority	4,878,795	182,162	0.80	0.23	Watercourse	Permanent	Flowing	Cold	16.8	566	7.8	1.6	Lethal	Yes	Moderate	Abundant	Occupied
E530.00-WC-MLV 133+12.124	Unnamed	Central Lake Ontario Conservation Authority	4,878,885	182,536	Dry	Dry	Watercourse	Unclassified	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing			Northing	Easting	Wetted Width	Wetted Depth		Fish Habitat Field Survey Summary										
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	(m)	(m)	(m)	(m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E540.00-WC-MLV 133+12.680	Unnamed	Central Lake Ontario Conservation Authority	4,879,015	183,077	0.68	0.10	Watercourse	Permanent	Flowing	Cold	15.4	720	8.14	9.19	Good	Yes	Low	Abundant	Contributing
E550.00-WC-MLV 133+13.305	Oshawa Creek	Central Lake Ontario Conservation Authority	4,878,775	183,531	2.67	0.30	Watercourse	Intermittent	Flowing	Cold	3.6	620	8.2	12.18	Good	Yes	Moderate	Abundant	Occupied
E560.00-WC-MLV 133+13.834	Unnamed	Central Lake Ontario Conservation Authority	4,878,907	184,044	1.37	0.07	Watercourse	Intermittent	Flowing	Cold	9.8	880	8.16	8.63	Good	Yes	Moderate	Abundant	Occupied
E570.00-WC-MLV 133+15.256	Unnamed	Central Lake Ontario Conservation Authority	4,878,644	185,095	3.90	0.48	Watercourse	Intermittent	Flowing	Cold	15.73	450	8.09	9.67	Good	Yes	Moderate	Abundant	Occupied
E580.00-WC-MLV 133+16.140	Unnamed	Central Lake Ontario Conservation Authority	4,878,685	185,875	0.98	0.15	Watercourse	Permanent	Flowing	Cold	15.31	652	7.67	5.09	Poor	Yes	Moderate	Abundant	Occupied
E590.00-WC-MLV 133+16.878	Unnamed	Central Lake Ontario Conservation Authority	4,878,957	186,542	No defined channel	No defined channel	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Abundant	Contributing
E600.00-WC-MLV 133+17.380	Unnamed	Central Lake Ontario Conservation Authority	4,879,149	187,003	-	-	Undetermined	Intermittent	-	Cold	-	-	-	-	-	-	-	-	-
E610.00-WC-MLV 133+17.822	Unnamed	Central Lake Ontario Conservation Authority	4,879,330	187,402	0.46	0.16	Watercourse	Intermittent	Flowing	Cold	17	1,080	8.22	7.22	Adequate	Yes	Low	Abundant	Contributing
E620.00-WC-MLV 133+18.092	East Oshawa Creek	Central Lake Ontario Conservation Authority	4,879,399	187,663	3.93	0.27	Watercourse	Unclassified	Flowing	Cold	15	500	7.5	9.64	Good	Yes	Moderate	Abundant	Occupied
E630.00-WC-MLV 133+18.458	Unnamed	Central Lake Ontario Conservation Authority	4,879,419	188,014	-	-	Undetermined	Intermittent	-	Cold	-	-	-	-	-	-	-	-	-
E650.00-WC-MLV 133+20.403	Unnamed	Central Lake Ontario Conservation Authority	4,877,942	188,759	2.50	0.12	Watercourse	Intermittent	Flowing	Cold	15.59	473	8.12	9.4	Good	Yes	Low	Abundant	Occupied
E660.00-WC-MLV 133+21.764	Unnamed	Central Lake Ontario Conservation Authority	4,878,098	190,050	2.85	0.22	Watercourse	Permanent	Flowing	Cold	8.2	640	8.59	11.52	Good	Yes	Moderate	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E670.00-WC-MLV 133+24.860	Unnamed	Central Lake Ontario Conservation Authority	4,876,244	191,828	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Abundant	Contributing
E680.00-WC-MLV 133+25.231	Unnamed	Central Lake Ontario Conservation Authority	4,876,115	192,142	Dry	Dry	Watercourse	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E690.00-WC-MLV 133+26.632	Unnamed	Central Lake Ontario Conservation Authority	4,875,164	192,776	1.45	0.05	Watercourse	Permanent	Flowing	Cold	17.9	730	7.84	5.9	Poor	Yes	Low	Limited	Contributing
Pipeline Segment MLV 134 - 134B																			
E700.00-WC-MLV 134+0.266	Unnamed	Central Lake Ontario Conservation Authority	4,874,420	193,828	Dry	Dry	Watercourse	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E710.00-WC-MLV 134+0.495	Unnamed	Central Lake Ontario Conservation Authority	4,874,235	193,940	Dry	Dry	Wetland	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	None
E740.00-WC-MLV 134+2.800	Farewell Creek	Central Lake Ontario Conservation Authority	4,874,346	196,155	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	-
E750.00-WC-MLV 134+3.952	Black Creek	Central Lake Ontario Conservation Authority	4,874,363	197,306	2.40	0.04	Watercourse	Permanent	Flowing	Cold	21.83	551	7.98	7.47	Adequate	Yes	Moderate	Abundant	Occupied
E760.00-WC-MLV 134+5.385	Unnamed	Central Lake Ontario Conservation Authority	4,874,304	198,582	-	-	Undetermined	Unclassified	-	Cold	-	-	-	-	-	-	-	-	-
E770.00-WC-MLV 134+5.921	Unnamed	Central Lake Ontario Conservation Authority	4,874,307	199,118	Dry	Dry	Watercourse	Intermittent	Pooled	Cold	18.2	790	7.62	1.97	Lethal	Yes	Low	Limited	Contributing
E780.00-WC-MLV 134+7.023	Bowmanville Creek	Central Lake Ontario Conservation Authority	4,874,262	200,217	4.90	0.42	Watercourse	Permanent	Flowing	Cold	13.9	510	7.97	9.76	Good	Yes	Moderate	Abundant	Occupied
E790.00-WC-MLV 134+7.558	Unnamed	Central Lake Ontario Conservation Authority	4,874,252	200,751	5.00	0.30	Watercourse	Permanent	Flowing	Cold	18.42	381	8.12	9.75	Good	Yes	Moderate	Abundant	Occupied
E800.00-WC-MLV 134+8.125	Unnamed	Central Lake Ontario Conservation Authority	4,874,243	201,317	No defined channel	No defined channel	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E810.00-WC-MLV 134+9.253	Unnamed	Central Lake Ontario Conservation Authority	4,874,238	202,374	>50	0.47	Wetland	Permanent	Impounded	Cold	18.26	577	6.72	1.68	Lethal	Yes	Low	Abundant	Contributing
E820.00-WC-MLV 134+9.750	Unnamed	Central Lake Ontario Conservation Authority	4,874,203	202,870	0.76	0.27	Wetland	Intermittent	Impounded	Cold	19.6	617	7.73	5.67	Poor	Yes	Low	Abundant	Contributing
E830.00-WC-MLV 134+10.230	Unnamed	Central Lake Ontario Conservation Authority	4,874,169	203,349	Dry	Dry	Watercourse	Intermittent	Limited	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E840.00-WC-MLV 134+10.642	Unnamed	Central Lake Ontario Conservation Authority	4,874,141	203,759	2.14	0.13	Watercourse	Permanent	Near Dry	Cold	17.19	980	7.32	1.16	Lethal	No	Low	Limited	Contributing
E850.00-WC-MLV 134+11.266	Unnamed	Central Lake Ontario Conservation Authority	4,873,998	204,320	-	-	Undetermined	Unclassified	-	Cold	-	-	-	-	-	-	-	-	-
E860.00-WC-MLV 134+11.871	Soper Creek	Central Lake Ontario Conservation Authority	4,873,896	204,885	6.15	0.34	Watercourse	Permanent	Limited	Cold	6.5	560	8.61	11.98	Good	Yes	Moderate	Abundant	Occupied
E870.00-WC-MLV 134+13.993	Unnamed	Central Lake Ontario Conservation Authority	4,873,751	206,948	0.50	0.06	Watercourse	Permanent	Flowing	Cold	15.9	544	7.85	8.62	Good	Yes	Moderate to High	Abundant	Contributing
E890.00-WC-MLV 134+15.996	Unnamed	Ganaraska Region Conservation Authority	4,873,693	208,904	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E900.00-WC-MLV 134+16.365	Wilmot Creek	Ganaraska Region Conservation Authority	4,873,669	209,271	3.10	0.28	Watercourse	Permanent	Flowing	Cold	16.18	553	8.18	10.74	Good	Yes	Moderate to High	Abundant	Occupied
E905.00-WC-MLV 134+16.444	Unnamed	Ganaraska Region Conservation Authority	4,873,669	209,350	1.40	0.16	Watercourse	Permanent	Flowing	Unclassified	16.95	550	8.24	10.15	Good	Yes	Low to Moderate	Abundant	Occupied
E910.00-WC-MLV 134+16.490	Unnamed	Ganaraska Region Conservation Authority	4,873,681	209,394	1.13	0.38	Watercourse	Permanent	Flowing	Cold	12.18	399	8.56	10.56	Good	Yes	Moderate to High	Abundant	Occupied
E920.00-WC-MLV 134+16.680	Orono Creek	Ganaraska Region Conservation Authority	4,873,662	209,571	4.30	0.24	Watercourse	Permanent	Flowing	Cold	13.78	711	8.22	8.83	Good	Yes	Moderate to High	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E930.00-WC-MLV 134+18.490	Hunter Creek	Ganaraska Region Conservation Authority	4,873,624	211,186	4.00	0.07	Watercourse	Permanent	Flowing	Cold	16.93	448	812	10.55	Good	Yes	Moderate to High	Abundant	Occupied
Pipeline Segment MLV 134B - 135																			
E950.00-WC-MLV 134B+1.781	Unnamed	Ganaraska Region Conservation Authority	4,873,468	213,069	>25	0.09	Wetland	Permanent	Limited	Cold	21.5	560	7.28	4.83	Poor	Yes	Low to Moderate	Abundant	Contributing
E960.00-WC-MLV 134B+2.252	Stalker Creek	Ganaraska Region Conservation Authority	4,873,389	213,500	1.60	0.25	Watercourse	Intermittent	Limited	Cold	23.2	460	8.22	8.41	Good	Yes	Low	Abundant	Contributing
E970.00-WC-MLV 134B+2.830	Unnamed	Ganaraska Region Conservation Authority	4,873,241	214,007	2.00	0.11	Watercourse	Permanent	Flowing	Cold	13.31	472	7.98	9.96	Good	Yes	Low to Moderate	Abundant	Occupied
E980.00-WC-MLV 134B+3.629	Unnamed	Ganaraska Region Conservation Authority	4,873,407	214,788	1.00	0.05	Watercourse	Permanent	Limited	Cold	16.76	475	7.83	9.41	Good	Yes	Low	Abundant	Occupied
E990.00-WC-MLV 134B+4.542	Unnamed	Ganaraska Region Conservation Authority	4,873,592	215,681	1.40	0.25	Watercourse	Intermittent	Flowing	Cold	14.7	490	8.49	8.99	Good	Yes	Low to Moderate	Abundant	Occupied
E1000.00-WC-MLV 134B+4.795	Unnamed	Ganaraska Region Conservation Authority	4,873,619	215,933	0.65	0.03	Watercourse	Intermittent	Near Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E1010.00-WC-MLV 134B+4.885	Unnamed	Ganaraska Region Conservation Authority	4,873,625	216,022	0.42	0.05	Watercourse	Permanent	Near Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E1020.00-WC-MLV 134B+5.646	Graham Creek	Ganaraska Region Conservation Authority	4,873,654	216,779	7.00	0.23	Watercourse	Intermittent	Flowing	Cold	19.8	460	8.48	11.05	Good	Yes	Moderate	Abundant	Contributing
E1030.00-WC-MLV 134B+6.476	Unnamed	Ganaraska Region Conservation Authority	4,873,730	217,598	1.80	0.02	Watercourse	Permanent	Limited	Cold	18.84	238	7.89	2.62	lethal	Yes	Low	Limited	Occupied
E1040.00-WC-MLV 134B+7.134	Graham Creek	Ganaraska Region Conservation Authority	4,873,775	218,254	2.80	0.39	Watercourse	Permanent	Flowing	Cold	23	440	8.42	11.63	Good	Yes	Moderate to High	Abundant	Occupied
E1050.00-WC-MLV 134B+7.347	Unnamed	Ganaraska Region Conservation Authority	4,873,807	218,464	0.25	0.01	Watercourse	Permanent	Near Dry	Cold	16.24	507	7.83	8.64	Good	Yes	Low	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E1060.00-WC-MLV 134B+7.527	Unnamed	Ganaraska Region Conservation Authority	4,873,819	218,644	0.45	0.03	Watercourse	Intermittent	Flowing	Cold	13.7	1,080	8.48	8.62	Good	Yes	Low	Abundant	Contributing
E1070.00-WC-MLV 134B+7.580	Unnamed	Ganaraska Region Conservation Authority	4,873,822	218,697	0.30	0.04	Watercourse	Permanent	Near Dry	Cold	13.7	1,080	8.48	8.62	Good	Yes	Low	Limited	Contributing
E1080.00-WC-MLV 134B+9.396	Graham Creek	Ganaraska Region Conservation Authority	4,874,035	220,285	4.50	0.61	Watercourse	Intermittent	Flowing	Cold	20.08	446	7.97	7.42	Adequate	Yes	Moderate	Abundant	Contributing
Pipeline Segment MLV 135 - 135A																			
E1100.00-WC-MLV 135+0.661	Unnamed	Ganaraska Region Conservation Authority	4,874,886	228,011	3.95	0.41	Watercourse	Permanent	Flowing	Cold	15.9	440	8.06	9.23	Good	Yes	Moderate	Abundant	Contributing
E1110.00-WC-MLV 135+0.725	Unnamed	Ganaraska Region Conservation Authority	4,874,893	228,073	3.50	0.22	Watercourse	Permanent	Flowing	Cold	12.57	405	8	10.15	Good	Yes	Moderate	Abundant	Occupied
E1120.00-WC-MLV 135+1.699	Unnamed	Ganaraska Region Conservation Authority	4,875,098	229,022	0.30	0.05	Watercourse	Permanent	Limited	Cold	17.55	530	7.46	6.86	Adequate	Yes	Low	Abundant	Contributing
E1160.00-WC-MLV 135+4.528	Unnamed	Ganaraska Region Conservation Authority	4,875,592	231,797	0.60	0.11	Watercourse	Permanent	Flowing	Cold	19.9	703	7.62	7.79	Adequate	Yes	Low to Moderate	Abundant	Occupied
E1170.00-WC-MLV 135+4.716	Unnamed	Ganaraska Region Conservation Authority	4,875,609	231,984	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E1180.00-WC-MLV 135+6.212	Unnamed	Ganaraska Region Conservation Authority	4,875,755	233,473	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E1200.00-WC-MLV 135+7.590	Ganaraska River	Ganaraska Region Conservation Authority	4,875,981	234,832	18.92	0.47	Watercourse	Permanent	Flowing	Cold	21.05	366	8.28	12.75	Good	Yes	Moderate	Abundant	Occupied
E1210.00-WC-MLV 135+10.450	Unnamed	Ganaraska Region Conservation Authority	4,877,037	237,430	1.05	0.19	Watercourse	Permanent	Flowing	Cold	7.2	570	7.3	10.98	Good	Yes	Moderate	Abundant	Occupied
E1220.00-WC-MLV 135+11.851	Gage Creek	Ganaraska Region Conservation Authority	4,877,325	238,801	2.50	0.20	Watercourse	Permanent	Flowing	Cold	15.9	447.5	N/A	9.55	Good	No	Moderate	Limited	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing	Watercourse Name[b]	Conservation Authority	Northing	Easting	Wetted Width	Wetted Depth	Water Crossing Type	Fish Habitat Field Survey Summary											
Identification (ID)[a]			(m)	(m)	(m)	(m)		Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
Pipeline Segment MLV 135A – 136																			
E1230.00-WC-MLV 135A+0.859	Unnamed	Ganaraska Region Conservation Authority	4,876,867	240,811	1.55	0.15	Watercourse	Permanent	Flowing	Cold	16.8	580	7.81	8.82	Good	Yes	Moderate	Abundant	Occupied
E1240.00-WC-MLV 135A+1.716	Unnamed	Ganaraska Region Conservation Authority	4,876,776	241,572	4.10	0.36	Watercourse	Permanent	Flowing	Cold	19.48	440	8.29	9.06	Good	Yes	Moderate	Abundant	Occupied
E1250.00-WC-MLV 135A+4.015	Unnamed	Ganaraska Region Conservation Authority	4,877,414	243,536	0.62	0.20	Watercourse	Permanent	Flowing	Cold	17.1	670	8.16	8.23	Good	Yes	Low	Abundant	Occupied
E1260.00-WC-MLV 135A+7.122	Cobourg Brook	Ganaraska Region Conservation Authority	4,877,139	246,125	6.42	0.41	Watercourse	Permanent	Flowing	Cold	16.3	450	8.56	10.32	Good	Yes	Moderate	Abundant	Occupied
E1270.00-WC-MLV 135A+8.259	Midtown Creek	Ganaraska Region Conservation Authority	4,877,005	247,068	2.10	0.13	Watercourse	Permanent	Flowing	Cold	13.1	570	8.4	10.72	Good	Yes	Low to Moderate	Abundant	Occupied
E1280.00-WC-MLV 135A+9.987	Unnamed	Ganaraska Region Conservation Authority	4,877,429	248,704	1.75	0.24	Watercourse	Permanent	Flowing	Cold	14.5	530	8.37	9.44	Good	Yes	Moderate	Abundant	Occupied
E1290.00-WC-MLV 135A+11.483	Unnamed	Ganaraska Region Conservation Authority	4,877,901	250,070	0.65	0.13	Watercourse	Permanent	Flowing	Cold	11.34	557	8.03	9.52	Good	Yes	Low	Abundant	Occupied
E1300.00-WC-MLV 135A+12.056	Unnamed	Ganaraska Region Conservation Authority	4,878,044	250,625	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	-
E1310.00-WC-MLV 135A+16.191	Unnamed	Lower Trent Region Conservation Authority	4,879,866	253,343	1.80	0.26	Watercourse	Permanent	Flowing	Cold	13.6	470	8.19	8.29	Good	Yes	Moderate	Abundant	Occupied
E1320.00-WC-MLV 135A+16.956	Unnamed	Lower Trent Region Conservation Authority	4,880,105	254,070	0.72	0.13	Watercourse	Permanent	Impounded	Cold	12.85	626	7.45	4.95	Poor	Yes	Low	Limited	Occupied
E1330.00-WC-MLV 135A+20.617	Shelter Valley Creek	Lower Trent Region Conservation Authority	4,881,129	257,580	4.48	0.35	Watercourse	Permanent	Flowing	Cold	15.9	480	8.33	9.53	Good	Yes	Low	Abundant	Occupied
E1340.00-WC-MLV 135A+20.845	Unnamed	Lower Trent Region Conservation Authority	4,881,198	257,797	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	-

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E1350.00-WC-MLV 135A+21.991	Unnamed	Lower Trent Region Conservation Authority	4,881,477	258,765	>25	>1.5	Wetland	Permanent	Limited	Cold	18.68	418	7.41	6.07	Poor	Yes	Low	Abundant	Occupied
Pipeline Segment MLV 136 – 137																			
E1360.00-WC-MLV 136+0.148	Unnamed	Lower Trent Region Conservation Authority	4,881,495	259,319	0.60	0.02	Watercourse	Permanent	Flowing	Cold	16.15	411	7.88	8.6	Good	Yes	Low	Abundant	Contributing
E1361.00-WC-MLV 136+0.177	Unnamed	Lower Trent Region Conservation Authority	4,881,471	259,356	0.50	0.09	Watercourse	Permanent	Flowing	Cold	14.8	430	7.61	6.11	Poor	Yes	Moderate	Abundant	Contributing
E1370.00-WC-MLV 136+0.267	Unnamed	Lower Trent Region Conservation Authority	4,881,526	259,435	0.50	0.06	Watercourse	Permanent	Flowing	Cold	18.01	459	7.63	7.65	Adequate	Yes	Low	Limited	Contributing
E1380.00-WC-MLV 136+0.432	Unnamed	Lower Trent Region Conservation Authority	4,881,569	259,594	0.65	0.03	Watercourse	Intermittent	Near Dry	Cold	11.82	446	7.86	9.47	Good	Yes	Low	Limited	Contributing
E1390.00-WC-MLV 136+1.305	Unnamed	Lower Trent Region Conservation Authority	4,881,779	260,440	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	Occupied[e]
E1400.00-WC-MLV 136+4.373	Unnamed	Lower Trent Region Conservation Authority	4,882,961	263,160	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	-
E1410.00-WC-MLV 136+5.548	Unnamed	Lower Trent Region Conservation Authority	4,883,435	264,220	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	-
E1420.00-WC-MLV 136+7.704	Unnamed	Lower Trent Region Conservation Authority	4,883,886	266,219	-	-	Undetermined	Permanent	-	Cold	-	-	-	-	-	-	-	-	-
E1430.00-WC-MLV 136+7.950	Unnamed	Lower Trent Region Conservation Authority	4,883,949	266,457	2.45	0.23	Watercourse	Permanent	Flowing	Cold	21.32	307	7.97	6.49	Poor	Yes	Moderate	Abundant	Occupied
E1440.00-WC-MLV 136+8.008	Unnamed	Lower Trent Region Conservation Authority	4,883,964	266,513	4.20	0.32	Wetland	Permanent	Flowing	Cold	20.53	317	7.78	2.7	Lethal	Yes	Low to Moderate	Abundant	Occupied
E1450.00-WC-MLV 136+8.012	Unnamed	Lower Trent Region Conservation Authority	4,883,965	266,517	5.00	0.07	Watercourse	Permanent	Impounded	Cold	20.53	317	7.78	2.7	Lethal	Yes	Low	Limited	Occupied

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Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E1460.00-WC-MLV 136+8.025	Unnamed	Lower Trent Region Conservation Authority	4,883,969	266,529	3.60	0.39	Watercourse	Permanent	Flowing	Cold	23.07	318	7.95	5.74	Poor	Yes	Low	Abundant	Contributing
E1470.00-WC-MLV 136+8.103	Unnamed	Lower Trent Region Conservation Authority	4,883,989	266,605	6.70	0.62	Watercourse	Permanent	Impounded	Cold	23.47	322	7.64	4.77	Poor	Yes	Low	Abundant	Occupied
E1480.00-WC-MLV 136+8.489	Unnamed	Lower Trent Region Conservation Authority	4,884,083	266,978	9.41	0.64	Watercourse	Permanent	Flowing	Cold	21.55	422	7.95	9.41	Good	Yes	Moderate	Abundant	Occupied
E1490.00-WC-MLV 136+11.297	Unnamed	Lower Trent Region Conservation Authority	4,885,192	269,346	0.80	0.16	Watercourse	Permanent	Flowing	Cold	16.59	387	7.6	5.16	Poor	Yes	Low	Limited	Occupied
E1500.00-WC-MLV 136+11.327	Unnamed	Lower Trent Region Conservation Authority	4,885,201	269,375	1.80	0.09	Watercourse	Permanent	Limited	Cold	16.59	387	7.6	5.16	Poor	Yes	Low	Limited	Contributing
E1510.00-WC-MLV 136+11.790	Cold Creek	Lower Trent Region Conservation Authority	4,885,391	269,783	13.80	0.95	Watercourse	Permanent	Flowing	Cold	18.1	365.5	7.89	8.12	Good	Yes	Low to Moderate	Abundant	Occupied
E1520.00-WC-MLV 136+13.732	Cold Creek	Lower Trent Region Conservation Authority	4,886,082	271,529	16.00	0.25	Watercourse	Permanent	Flowing	Cold	19.79	450	8.28	11.06	Good	Yes	Moderate to High	Abundant	Occupied
E1570.00-WC-MLV 136+19.441	Unnamed	Lower Trent Region Conservation Authority	4,887,891	276,934	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
Pipeline Segment MLV 137 – 138																			
E1580.00-WC-MLV 137+0.610	Breakaway Creek	Lower Trent Region Conservation Authority	4,888,275	278,265	2.20	0.14	Watercourse	Permanent	Flowing	Cold	11.58	568	7.56	10.49	Good	Yes	Low	Abundant	Occupied
E1600.00-WC-MLV 137+2.850	Unnamed	Lower Trent Region Conservation Authority	4,888,925	280,407	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E1610.00-WC-MLV 137+3.113	Unnamed	Lower Trent Region Conservation Authority	4,889,018	280,653	1.25	0.10	Watercourse	Permanent	Flowing	Cold	7.8	910	8.28	10.74	Good	Yes	Low	Abundant	Contributing
E1620.00-WC-MLV 137+3.758	Unnamed	Lower Trent Region Conservation Authority	4,889,258	281,251	1.25	0.08	Watercourse	Permanent	Flowing	Cold	16.3	410	8.1	8.02	Good	Yes	Low	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E1630.00-WC-MLV 137+4.128	Unnamed	Lower Trent Region Conservation Authority	4,889,397	281,594	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E1640.00-WC-MLV 137+4.896	Unnamed	Lower Trent Region Conservation Authority	4,889,690	282,304	Dry	Dry	Watercourse	Permanent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E1690.00-WC-MLV 137+7.491	Unnamed	Lower Trent Region Conservation Authority	4,890,723	284,684	Dry	Dry	Watercourse	Intermittent	Dry	Cold	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E1700.00-WC-MLV 137+9.109	Unnamed	Lower Trent Region Conservation Authority	4,891,314	286,186	2.50	0.15	Watercourse	Permanent	Flowing	Cold	13.79	379	8.05	11.13	Good	Yes	Low	Limited	Contributing
E1710.00-WC-MLV 137+9.173	Unnamed	Lower Trent Region Conservation Authority	4,891,334	286,246	3.50	0.07	Watercourse	Permanent	Flowing	Cold	16.1	407	8.11	10.31	Good	Yes	Low	Abundant	Occupied
E1750.00-WC-MLV 137+13.471	Unnamed	Lower Trent Region Conservation Authority	4,892,330	290,300	21.00	0.60	Waterbody	Permanent	Impounded	Warm	20.27	225	7.68	1.21	Lethal	Yes	Low	Limited	Contributing
E1760.00-WC-MLV 137+13.493	Unnamed	Lower Trent Region Conservation Authority	4,892,335	290,322	0.10	0.01	Watercourse	Permanent	Near Dry	Warm	20.27	225	7.68	1.21	Lethal [a]	Yes	Low	Limited	Occupied
E1770.00-WC-MLV 137+13.527	Unnamed	Lower Trent Region Conservation Authority	4,892,343	290,355	3.50	0.22	Watercourse	Permanent	Flowing	Warm	18.5	560	7.42	6.86	Adequate	Yes	Low to Moderate	Abundant	Contributing
E1780.00-WC-MLV 137+13.985	Unnamed	Lower Trent Region Conservation Authority	4,892,469	290,795	0.00	0.75	Wetland	Permanent	Impounded	Warm	19.03	994	7.07	0.19	Lethal	Yes	Low	Limited	Occupied
E1790.00-WC-MLV 137+14.840	Unnamed	Lower Trent Region Conservation Authority	4,892,531	291,615	65.00	1.4	Waterbody	Permanent	Impounded	Warm	26.37	358	7.56	6.65	Adequate	Yes	Low	Abundant	Occupied
E1800.00-WC-MLV 137+14.856	Unnamed	Lower Trent Region Conservation Authority	4,892,528	291,631	1.00	10.00	Watercourse	Permanent	Flowing	Warm	26.8	351	7.7	8.05	Good	Yes	Low	Abundant	Occupied
E1810.00-WC-MLV 137+16.906	Trent River	Lower Trent Region Conservation Authority	4,893,039	293,301	216.00	5.75	Watercourse	Permanent	Impounded	Unclassified	23.66	293	8.25	8.7	Good	Yes	Moderate to High	Abundant	Occupied
E1811.00-WC-MLV 137+18.054	Unnamed	Lower Trent Region Conservation Authority	4,893,366	294,403	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E1812.00-WC-MLV 137+19.289	Unnamed	Lower Trent Conservation Authority	4,893,956	295,264	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E1813.00-WC-MLV 137+20.12	Unnamed	Lower Trent Conservation Authority	4,894,255	296,039	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E1814.00-WC-MLV 137+20.29	Unnamed	Lower Trent Conservation Authority	4,894,315	296,198	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E1815.00-WC-MLV 137+20.862	Unnamed	Lower Trent Conservation Authority	4,894,443	296,754	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E1816.00-WC-MLV 137+21.458	Unnamed	Lower Trent Conservation Authority	4,894,555	297,340	-	-	Undetermined	Permanent	-	Warm	-	-	-	-	-	-	-	-	-
Pipeline Segment MLV 139 - 139A																			
E1820.00-WC-MLV 139+2.718	Unnamed	Quinte Conservation Authority	4,900,667	324,458	0.38	0.1	Watercourse	Permanent	Limited	Warm	19.18	386	7.02	2.32	Lethal	Yes	Low	Abundant	Contributing
E1830.00-WC-MLV 139+2.959	Unnamed	Quinte Conservation Authority	4,900,640	324,675	0.37	0.10	Watercourse	Permanent	Limited	Warm	18.78	336	7.25	4.84	Poor	Yes	Low	Abundant	Contributing
E1840.00-WC-MLV 139+3.749	Unnamed	Quinte Conservation Authority	4,900,819	325,444	3.04	0.32	Watercourse	Permanent	Flowing	Warm	17.45	900	7.56	7.31	Adequate	Yes	Moderate	Abundant	Contributing
E1841.00-WC-MLV 139+4.944	Unnamed	Quinte Conservation Authority	4,901,087	326,609	0.90	0.07	Watercourse	Permanent	Flowing	Unclassified	20.21	967	7.94	8.54	Good	Yes	Low to Moderate	Abundant	Occupied
E1850.00-WC-MLV 139+5.020	Unnamed	Quinte Conservation Authority	4,901,111	326,682	0.40	0.01	Watercourse	Permanent	Near Dry	Unclassified	17.3[(i)]	484.4	7.22	4.98	Poor	No	Low	Limited	Contributing
E1860.00-WC-MLV 139+5.737	Salmon River	Quinte Conservation Authority	4,901,121	327,363	31.50	0.70	Watercourse	Permanent	Flowing	Unclassified	19.08	283	8.22	9.43	Good	Yes	Moderate to High	Abundant	Occupied
E1870.00-WC-MLV 139+7.180	Unnamed	Quinte Conservation Authority	4,901,297	328,768	1.70	10.00	Watercourse	Permanent	Flowing	Warm	19.01	274	7.45	7.71	Adequate	Yes	Low to Moderate	Abundant	Contributing
E1880.00-WC-MLV 139+8.150	Unnamed	Quinte Conservation Authority	4,901,512	329,714	24.50	>1.5	Waterbody	Permanent	Impounded	Warm	21.57	890	7.72	5.47	Poor	Yes	Low	Limited	Contributing
E1890.00-WC-MLV 139+10.920	Unnamed	Quinte Conservation Authority	4,902,009	332,438	1.60	0.07	Watercourse	Permanent	Limited	Warm	15.19	371	7.48	8.04	Good	Yes	Low to Moderate	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E1900.00-WC-MLV 139+12.388	Marysville Creek	Quinte Conservation Authority	4,902,228	333,889	2.63	0.12	Watercourse	Permanent	Limited	Warm	20.51	383	7.63	11.55	Good	Yes	Low to Moderate	Abundant	Occupied
E1910.00-WC-MLV 139+13.606	Unnamed	Quinte Conservation Authority	4,902,324	335,050	Dry	Dry	Watercourse	Intermittent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
Pipeline Segment MLV 139A – 140																			
E1930.00-WC-MLV 139A+5.125	Unnamed	Quinte Conservation Authority	4,903,226	340,284	Dry	Dry	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
Pipeline Segment MLV 140 – 140A																			
E1940.00-WC-MLV 140+0.429	Sucker Creek	Quinte Conservation Authority	4,903,810	343,453	4.70	0.24	Watercourse	Permanent	Flowing	Warm	19.37	414	8.13	8.68	Good	Yes	Moderate	Abundant	Occupied
E1950.00-WC-MLV 140+0.477	Unnamed	Quinte Conservation Authority	4,903,814	343,501	>20	>1	Waterbody	Permanent	Impounded	Warm	20.4	520	7.1	15	Good	Yes	Low	Limited	Occupied
E1960.00-WC-MLV 140+1.675	Unnamed	Quinte Conservation Authority	4,904,093	344,662	Dry	Dry	Watercourse	Permanent	Near Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E1980.00-WC-MLV 140+3.285	Napanee River	Quinte Conservation Authority	4,904,465	346,158	62.00	2.80	Watercourse	Intermittent	Flowing	Unclassified	25.71	466	8.67	6.95	Adequate	Yes	Moderate to High	Abundant	Occupied
E1990.00-WC-MLV 140+3.430	Unnamed	Quinte Conservation Authority	4,904,477	346,302	1.10	0.13	Watercourse	Intermittent	Flowing	Warm	16.75	571	8.34	7.66	Adequate	Yes	Moderate	Abundant	Occupied
E2000.00-WC-MLV 140+6.250	Unnamed	Cataraqui Region Conservation Authority	4,904,841	348,641	No defined channel	No defined channel	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	None
E2020.00-WC-MLV 140+7.862	Unnamed	Cataraqui Region Conservation Authority	4,904,442	350,005	2.70	0.14	Watercourse	Permanent	Flowing	Warm	21.1	663	7.89	4.01	Poor	Yes	Low	Abundant	Occupied
Pipeline Segment MLV 140A – 141																			
E2030.00-WC-MLV 140A+0.749	Little Creek	Cataraqui Region Conservation Authority	4,904,352	350,748	3.75	0.37	Watercourse	Permanent	Flowing	Warm	20.1	550	8.05	6.72	Adequate	Yes	Low	Abundant	Contributing
E2040.00-WC-MLV 140A+2.437	Unnamed	Cataraqui Region Conservation Authority	4,904,960	352,264	Dry	Dry	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2050.00-WC-MLV 140A+4.040	Unnamed	Cataraqui Region Conservation Authority	4,905,206	353,835	0.64	0.04	Watercourse	Permanent	Pooled	Warm	19.15	492	6.57	4.3	Poor	Yes	Low	Limited	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E2060.00-WC-MLV 140A+6.889	Spring Creek	Cataraqui Region Conservation Authority	4,905,739	356,268	1.40	0.20	Watercourse	Intermittent	Flowing	Warm	11.95	533	7.21	3.9	Poor	Yes	Low	Abundant	Contributing
E2070.00-WC-MLV 140A+9.523	Wilton Creek	Cataraqui Region Conservation Authority	4,905,950	358,860	9.25	0.54	Watercourse	Intermittent	Flowing	Warm	22.84	516	8.18	9.34	Good	Yes	Moderate	Abundant	Occupied
E2080.00-WC-MLV 140A+13.614	Unnamed	Cataraqui Region Conservation Authority	4,906,177	362,560	1.50	0.03	Watercourse	Permanent	Limited	Warm	16.47	407	7.16	3.54	Poor	Yes	Low	Abundant	Occupied
E2090.00-WC-MLV 140A+13.755	Unnamed	Cataraqui Region Conservation Authority	4,906,188	362,701	3.05	0.21	Watercourse	Permanent	Flowing	Warm	6.7	480	7.98	7.9	Adequate	Yes	Low	Abundant	Contributing
E2100.00-WC-MLV 140A+15.134	Millhaven Creek	Cataraqui Region Conservation Authority	4,906,305	364,069	40.00	3.00	Watercourse	Permanent	Flowing	Unclassified	23.11	509	7.84	4.54	Poor	Yes	Moderate	Abundant	Occupied
Pipeline Segment MLV 142 - 142A																			
E2110.00-WC-MLV 142+0.734	Unnamed	Cataraqui Region Conservation Authority	4,910,745	392,027	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2130.00-WC-MLV 142+3.500	Unnamed	Cataraqui Region Conservation Authority	4,911,515	394,676	Dry	Dry	Wetland	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2140.00-WC-MLV 142+3.879	Unnamed	Cataraqui Region Conservation Authority	4,911,613	395,042	1.80	0.18	Watercourse	Permanent	Limited	Warm	29.7	996	6.85	3.2	Poor	Yes	Low	Abundant	Contributing
E2150.00-WC-MLV 142+5.017	Unnamed	Cataraqui Region Conservation Authority	4,912,102	396,062	Dry	Dry	Watercourse	Intermittent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2210.00-WC-MLV 142+7.616	Unnamed	Cataraqui Region Conservation Authority	4,912,796	398,558	Dry	Dry	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	Yes	Dry	Dry	Contributing[f]
E2220.00-WC-MLV 142+7.960	Mud Creek	Cataraqui Region Conservation Authority	4,912,873	398,893	2.30	0.34	Watercourse	Permanent	Flowing	Warm	18.1	502.8	7.82	8.6	Good	Yes	Moderate	Limited	Occupied
E2230.00-WC-MLV 142+8.100	Unnamed	Cataraqui Region Conservation Authority	4,912,904	399,030	1.55	0.41	Watercourse	Permanent	Flowing	Warm	21.4	538	8.02	N/A	N/A	Yes	Low to Moderate	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E2240.00-WC-MLV 142+9.175	Unnamed	Cataraqui Region Conservation Authority	4,913,151	400,076	3.60	0.64	Watercourse	Permanent	Flowing	Warm	17.4	392.5	7.55	3.26	Poor	Yes	Low	Abundant	Occupied
Pipeline Segment MLV 142A – 143																			
E2260.00-WC-MLV 142A+0.338	Unnamed	Cataraqui Region Conservation Authority	4,913,512	401,687	Dry	Dry	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2270.00-WC-MLV 142A+1.942	Unnamed	Cataraqui Region Conservation Authority	4,913,911	403,236	Dry	Dry	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Low	Abundant	None
E2280.00-WC-MLV 142A+2.040	Unnamed	Cataraqui Region Conservation Authority	4,913,934	403,332	Dry	Dry	Watercourse	Permanent	Dry	Warm	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2290.00-WC-MLV 142A+2.980	Sucker Brook	Cataraqui Region Conservation Authority	4,914,032	404,168	12.10	0.60	Watercourse	Permanent	Flowing	Warm	16.25	422	7.42	25.1	Good	Yes	Low	Abundant	Occupied
E2310.00-WC-MLV 142A+4.533	Unnamed	Cataraqui Region Conservation Authority	4,914,801	405,490	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2320.00-WC-MLV 142A+5.075	Unnamed	Cataraqui Region Conservation Authority	4,914,902	405,994	0.40	0.05	Watercourse	Permanent	Flowing	Unclassified	16.69	161	6.93	4.35	Poor	Yes	Low	Limited	Contributing
E2340.00-WC-MLV 142A+6.407	Unnamed	Cataraqui Region Conservation Authority	4,915,352	407,176	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2350.00-WC-MLV 142A+6.579	Gananoque River	Cataraqui Region Conservation Authority	4,915,362	407,347	58.00	5.70	Watercourse	Permanent	Flowing	Unclassified	25.48	481	7.72	7.82	Adequate	Yes	Moderate to High	Abundant	Occupied
E2360.00-WC-MLV 142A+7.944	Unnamed	Cataraqui Region Conservation Authority	4,915,768	408,600	0.15	0.02	Wetland	Permanent	Near Dry	Unclassified	14.64	506	7.88	9.45	Good	No	Low	Limited	Contributing
E2370.00-WC-MLV 142A+9.814	Unnamed	Cataraqui Region Conservation Authority	4,916,524	410,242	No defined channel	No defined channel	Wetland	Permanent	Near Dry	Unclassified	19.99	446	8.01	0.5	Lethal	Yes	Low	Limited	Occupied
E2390.00-WC-MLV 142A+12.152	Unnamed	Cataraqui Region Conservation Authority	4,917,769	412,122	1.50	0.01	Watercourse	Permanent	Flowing	Unclassified	21.8	339.8	7.3	3.5	Poor	Yes	Low	Abundant	Occupied

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E2400.00-WC-MLV 142A+13.016	Unnamed	Cataraqui Region Conservation Authority	4,918,454	412,631	17.00	0.82	Watercourse	Permanent	Flowing	Unclassified	21.4	468	6.96	8.02	Good	Yes	Low	Limited	Contributing
E2410.00-WC-MLV 142A+14.922	Unnamed	Cataraqui Region Conservation Authority	4,919,433	414,261	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2420.00-WC-MLV 142A+14.940	Unnamed	Cataraqui Region Conservation Authority	4,919,442	414,276	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2430.00-WC-MLV 142A+15.026	Unnamed	Cataraqui Region Conservation Authority	4,919,486	414,350	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2440.00-WC-MLV 142A+15.080	Unnamed	Cataraqui Region Conservation Authority	4,919,514	414,396	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2450.00-WC-MLV 142A+17.307	Unnamed	Cataraqui Region Conservation Authority	4,920,797	416,213	1.84	0.35	Watercourse	Permanent	Flowing	Unclassified	19	468	7.68	9.94	Good	Yes	Low	Abundant	Contributing
E2460.00-WC-MLV 142A+17.711	Black Creek	Cataraqui Region Conservation Authority	4,921,043	416,533	8.75	0.63	Watercourse	Permanent	Flowing	Unclassified	19.7	357.9	7.65	7.3	Adequate	Yes	Low	Abundant	Occupied
E2470.00-WC-MLV 142A+18.818	Unnamed	Cataraqui Region Conservation Authority	4,921,617	417,402	1.20	0.33	Watercourse	Permanent	Flowing	Unclassified	17.64	404	7.9	5.29	Poor	Yes	Low	Abundant	Contributing
E2490.00-WC-MLV 142A+19.578	Unnamed	Cataraqui Region Conservation Authority	4,922,080	417,908	1.20	0.15	Watercourse	Permanent	Flowing	Unclassified	18.16	399	7.68	7.45	Adequate	Yes	Low	Abundant	Occupied
E2500.00-WC-MLV 142A+19.951	Unnamed	Cataraqui Region Conservation Authority	4,922,319	418,142	1.04	0.05	Watercourse	Permanent	Pooled	Warm	14.65	244	6.62	4.82	Poor	Yes	Low	Limited	Contributing
E2510.00-WC-MLV 142A+20.142	Unnamed	Cataraqui Region Conservation Authority	4,922,427	418,300	Dry	Dry	Watercourse	Permanent	Dry	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Dry	Dry	Contributing
E2520.00-WC-MLV 142A+21.040	Unnamed	Cataraqui Region Conservation Authority	4,923,006	418,985	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-

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Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E2530.00-WC-MLV 142A+21.348	Unnamed	Cataraqui Region Conservation Authority	4,923,222	419,203	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
Pipeline Segment MLV 143A – 144																			
E2531.00-WC-MLV 143A+1.167	Unnamed	Cataraqui Region Conservation Authority	4,943,531	445,611	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2532.00-WC-MLV 143A+3.209	Unnamed	Cataraqui Region Conservation Authority	4,944,581	447,293	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2533.00-WC-MLV 143A+4.879	Unnamed	South Nation Conservation Authority	4,945,452	448,595	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2534.00-WC-MLV 143A+5.325	Unnamed	South Nation Conservation Authority	4,945,791	448,886	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2535.00-WC-MLV 143A+5.843	Unnamed	South Nation Conservation Authority	4,946,183	449,224	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2536.00-WC-MLV 143A+6.511	Unnamed	South Nation Conservation Authority	4,946,692	449,658	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2537.00-WC-MLV 143A+8.181	Unnamed	South Nation Conservation Authority	4,947,929	450,703	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
Pipeline Segment MLV 144 - 145																			
E2540.00-WC-MLV 144+0.868	Unnamed	South Nation Conservation Authority	4,948,649	451,393	2.70	0.24	Watercourse	Permanent	Flowing	Unclassified	19.28	404	7.15	6.67	Adequate	Yes	Low	Abundant	Contributing
E2550.00-WC-MLV 144+1.506	Unnamed	South Nation Conservation Authority	4,949,105	451,799	0.96	0.03	Watercourse	Permanent	Pooled	Unclassified	N/A	N/A	N/A	N/A	N/A	No	Low	Limited	Contributing
E2560.00-WC-MLV 144+4.973	Unnamed	South Nation Conservation Authority	4,951,624	454,174	>100	0.19	Wetland	Permanent	Pooled	Unclassified	20.72	470	7.34	2.33	Lethal	No	Low	Abundant	None

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Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E2570.00-WC-MLV 144+6.005	Unnamed	South Nation Conservation Authority	4,952,307	454,914	>125	1.30	Wetland	Permanent	Pooled	Unclassified	16.3	461	7.37	0.71	Lethal	No	Low	Limited	Contributing
E2580.00-WC-MLV 144+8.675	Unnamed	South Nation Conservation Authority	4,954,144	456,849	1.00	0.08	Wetland	Permanent	Pooled	Unclassified	15.65	631	7.93	3.74	Poor	Yes	Low	Limited	Contributing
E2590.00-WC-MLV 144+9.089	Unnamed	South Nation Conservation Authority	4,954,207	457,225	>100	0.21	Watercourse	Permanent	Flowing	Unclassified	15.93	360	7.3	3.71	Poor	Yes	Low	Abundant	Contributing
E2600.00-WC-MLV 144+10.173	Unnamed	South Nation Conservation Authority	4,954,994	457,851	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2610.00-WC-MLV 144+13.442	Unnamed	South Nation Conservation Authority	4,957,082	460,228	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2620.00-WC-MLV 144+17.420	Unnamed	South Nation Conservation Authority	4,959,775	463,155	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2630.00-WC-MLV 144+18.822	Unnamed	South Nation Conservation Authority	4,960,725	464,187	8.60	0.61	Watercourse	Permanent	Flowing	Unclassified	18.99	349	7.03	2.71	Lethal	Yes	Moderate to High	Abundant	Occupied
E2640.00-WC-MLV 144+20.095	Unnamed	South Nation Conservation Authority	4,961,675	465,033	2.10	0.11	Watercourse	Permanent	Impounded	Warm	14.51	2.77	7.59	7.24	Adequate	Yes	Low	Abundant	Contributing
E2650.00-WC-MLV 144+20.583	Unnamed	South Nation Conservation Authority	4,962,050	465,274	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2660.00-WC-MLV 144+21.570	Unnamed	South Nation Conservation Authority	4,962,648	466,001	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2670.00-WC-MLV 144+21.628	Unnamed	South Nation Conservation Authority	4,962,688	466,042	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2680.00-WC-MLV 144+21.780	Unnamed	South Nation Conservation Authority	4,962,792	466,152	3.50	0.15	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-

Table J-1: Fish Habitat Summary for Potential Water Crossings Associated with the Project

Water Crossing								Fish Habitat Field Survey Summary											
Identification (ID)[a]	Watercourse Name[b]	Conservation Authority	Northing (m)	Easting (m)	Wetted Width (m)	Wetted Depth (m)	Water Crossing Type	Flow Status[c]	Flow Observed During Field Survey	Thermal Regime[c]	Temperature (°C)	Conductivity (µS/cm)	pH	Dissolved Oxygen (mg/L)	Water Quality	Fish Habitat	Habitat Quality	Habitat Quantity	Role to Fish[d]
E2690.00-WC-MLV 144+22.150	Unnamed	South Nation Conservation Authority	4,963,048	466,421	Dry	Dry	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2700.00-WC-MLV 144+22.696	Black Creek	South Nation Conservation Authority	4,963,425	466,816	14.00	0.77	Watercourse	Permanent	Flowing	Unclassified	12.95	364	7.25	3.57	Poor	Yes	Moderate to High	Abundant	Occupied
E2710.00-WC-MLV 144+22.827	Unnamed	South Nation Conservation Authority	4,963,523	466,869	1.05	0.15	Watercourse	Permanent	Flowing	Unclassified	13.75	649	7.73	7.62	Adequate	Yes	Low	Abundant	Contributing
E2720.00-WC-MLV 144+23.404	Unnamed	South Nation Conservation Authority	4,963,847	467,259	24.00	0.59	Wetland	Permanent	Pooled	Unclassified	12.47	191	6.83	1.48	Lethal	Yes	Low	Limited	Contributing
E2730.00-WC-MLV 144+23.584	Unnamed	South Nation Conservation Authority	4,963,971	467,389	>25	1.15	Wetland	Permanent	Pooled	Unclassified	13.15	232	6.91	1.52	Lethal	Yes	Low	Limited	Contributing
E2740.00-WC-MLV 144+24.100	Unnamed	South Nation Conservation Authority	4,964,327	467,763	-	-	Undetermined	Permanent	-	Unclassified	-	-	-	-	-	-	-	-	-
E2750.00-WC-MLV 144+25.321	Unnamed	South Nation Conservation Authority	4,965,169	468,647	1.70	0.10	Watercourse	Permanent	Flowing	Unclassified	16.94	164	6.9	3.3	Poor	Yes	Low	Abundant	Contributing

[a] Water crossing ID code: E = EMP; WC = Water Crossing; MLV = Mainline Value
[b] Watercourse name as provided by MNRF LIO data (MNRF 2013a, MNRF 2014a; 2015)
[c] Flow status and Thermal Regime as provided by MNRF LIO data (MNRF 2013a, MNRF 2014a; 2015)
[d] "None" indicates no role to fish and fish habitat; "Occupied" indicates the water crossing was observed to contain fish and is considered fish habitat; "Contributing" indicates the water crossing was not observed to contain fish but may contribute to the fish habitat
[e] Fish population surveys were conducted in 2014, access was rescinded prior to completion of fish habitat surveys taking place.
[f] Fish population surveys conducted in 2014 captured baitfish species, whereas, 2015 fish habitat surveys found the watercourse to be dry and should be considered ephemeral in flow status.

Note: m = metre; °C = degree Celcius; µS/cm = microSiemens per centimeter; mg/L = milligrams per Litre; > = greater than; N/A = Not applicable; - =undetermined value; Unclassified = No Data value from MNRF LIO data exists for thermal classification or flow status

APPENDIX K

Species at Risk Report (Confidential)