Stantec

Memo

To:	Stephen Willis Ottawa, ON	From:	Jamie Koch, Lesley Veale Waterloo, ON
File:	160401780	Date:	August 14, 2024

Reference: LeBreton Flats Hydrogeological Memo

The National Capital Commission (NCC) retained Stantec Consulting Ltd (Stantec) to conduct a desktop hydrogeological review for the LeBreton Flats Plan of Subdivision in Ottawa, Ontario (the Site, Figure 1). The proposed development at the Site includes low- to high-rise buildings up to 45 storeys in height, surface pathways, and access streets and lanes. Underground parking is planned below most buildings although the number of levels is not detailed (NCC 2021[1]).

This review details hydrogeologic conditions on the Site and includes background details with respect to potential Low Impact Development (LID) infrastructure / techniques to be used at the Site and the potential dewatering requirements for both short-term construction and long-term operation.

This memo provides the results of the background review and includes the following:

- Background review including a review of regional groundwater studies, Ministry of the Environment, Conservation, and Parks (MECP) Water Well Records (WWRs), regional geological and hydrogeological mapping, source water protection reports, and historical site reports focusing on the Geotechnical Desktop Review (Paterson Group Inc, 2020[2]) and Data Gap and Remedial Options Analyses (Geofirma Engineering Ltd 2019[3])
- Description of the available geology and stratigraphy throughout the Site and overview of basic groundwater level data for the Site and recommendations
- Summary of potential LID techniques suitable for the Site

All figures referenced in this memo are presented in Attachment A.

Site Setting

The Site is an approximate 29 hectare, primarily undeveloped urban brownfield property, located west of the downtown core of the City of Ottawa, and ranges from 50 m to 300 m south of the Ottawa River. The Site is generally bounded by Albert Street to the south, Trillium Pathway to the west, Kichi Zibi Mikan Parkway and Willington Street to the north, and Booth Street, Lett Street and Bronson Avenue to the east.

[1] National Capital Commission (NCC), 2021. LeBreton Flats Master Concept Plan.
[2] Paterson Group Inc, 2020. Geotechnical Desktop Review, Proposed Site Development, LeBreton Flats – 825 Albert Street, Ottawa, Ontario. Prepared for National Capital Commission c/o O2 Planning and Design, February 22, 2020.
[3] Geofirma Engineering Ltd, 2019. Data Gap and Remedial Options Analyses, Nepean Bay Sector, LeBreton Flats, Ottawa, ON. Prepared for National Capital Commission, November 19, 2019.

For discussion purposes, the Site is divided into four regions including the North, East, South and West Portions as shown in Figure 2. This division is consistent with the nomenclature from Paterson Group (2020[2]).

The Site previously included residences and heavy industries, including a train and lumber yard until the early 1970's. The West Portion of the Site, which was formerly part of the Ottawa River, was used as a municipal landfill from the late 1950's to the early 1970's. Landfill activities raised the grade above the Ottawa River which led to the construction of the Sir John A. Macdonald Parkway, at which time most structures were removed from the Site.

A soil remediation program was conducted in the mid 2010's, which removed contaminated soil in the North Portion of the Site, west of Booth Street, which exposed the bedrock surface. The West Portion of the Site is generally grass covered with some trees. The South Portion of the Site is slightly sloped toward the northwest from Albert Street and are generally grass covered with some construction activity and signs of land disturbance.

Physiography and Topography

The Site is situated within the physiographic region defined by Chapman and Putnam (2007[4]) as the Ottawa Valley Clay Plains, which consists of silty clay plains with ridges of bedrock or sand. In the vicinity of the Site, the physiographic region is characterized by limestone plains.

Site topography and surface water features surrounding the Site are shown on Figure 3. Topography has been altered due to infilling and landfilling of the Site. Topography near the Site is relatively flat, with elevations ranging from approximately 55 m to 65 m above mean sea level (AMSL), sloping to the north towards the Ottawa River. The main surface water features near the Site are:

- the Ottawa River, located north of the Site. The Ottawa River Bay, upstream of the covered aqueduct, has an average water elevation of approximately 52.7 m AMSL and can reach 53.3 m AMSL during 100-year storm events (CIMA+ 2021[5])
- aqueducts which flow from west to east through the centre of the Site (Figure 2). The aqueducts divert flow from the Ottawa River to the Fleet Street Pumping Station. The aqueducts will remain intact throughout and after construction. One of the aqueducts is open and the other is closed.

Regional Geology and Hydrogeology

Figure 4 presents the surficial geology within and near the Site as mapped by the Ontario Geological Survey (2010[6]). This mapping indicates that the West and South Portions of the Site are generally covered by stone-poor, silty to sandy till at surface (Unit 5b, Figure 4) and the North and East Portions of the Site have exposed Paleozoic bedrock mapped at surface (Unit 3, Figure 4).

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[4] Chapman, L.J. and D.F. Putnam. 2007. Physiography of southern Ontario. *Ontario Geological Survey.* Miscellaneous Release – Data 228.
[5] CIMA+. 2021. Building LeBreton, Master Servicing Report, Renewed Master Concept Plan and Development Strategy. Prepared March 5, 2021.
[6] Ontario Geological Survey. 2010. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release -- Data 128 – Revised.

A review of MECP WWRs mapped near the Site (MECP 2023a[7]) indicates that there are approximately 150 wells within 200 m of the Site and 15 within the Site boundaries. Based on the WWRs, overburden thickness at on-site wells is approximately 7 m. MECP WWRs within 200 m of the Site indicate that overburden thickness is variable, ranging from 0 to 11 m.

Bedrock is mapped by Armstrong and Dodge (2007[8]) as limestone of the Lindsay Formation, with a narrow wedge of limestone and shale associated with the Verulam Formation located in the West Portion of the Site.

Local Geology and Hydrogeology

Numerous geotechnical and environmental field investigations have been completed at the Site. Local conditions included:

- In the North Portion, the overburden has been removed during previous remediation programs, resulting in weathered limestone bedrock at the surface, with less weathering and higher rock quality with depth.
- The East Portion consists of silty sand fill overlying a compact native glacial till or bedrock layer; however, there is limited borehole data available for this area.
- In the South Portion of the Site, boreholes are extensive and indicated silty sand fill material with gravel, cobbles, and boulders as well as construction debris. The fill is underlain by silty sand or silty clay. A thin layer of peat was noted in some areas.
- The West Portion of the Site is a former landfill, and soil was characterized as a thick (up to 12 m below ground surface (BGS)) layer of sand and gravel fill with debris (wood, brick, plastic). Fill is underlain by peat and/or native silty sand with highly weathered bedrock being encountered at some borehole locations.

As the presence of peat may be a factor for general construction, the following additional details were provided. Within the South Portion of the Site, peat material was noted within the fill deposits at BH10-16 and BH10-26, and about 0.1 m of peat material was noted underlying fill material at BH10-02, BH10-03, BH10-04 and BH10-07. Within the West Portion of the Site, peat was noted underlying the fill material at four boreholes (BHW-09, BHW-11, BHW-15, MW01-07) located north of the transitway, with thickness ranging from 0.1 m to 1.5 m. Stantec (2024[9]) indicated that the fill and peat material should be removed from the proposed building footprints and paved areas prior to construction.

Stantec (2024[9]) summarized the depth to top of bedrock measured in 37 boreholes previously installed at the Site. Bedrock elevations at the Site included:

- North Portion of the Site ranged from 50.2 m AMSL (ground surface) to 55.1 m AMSL, averaged 53.0 m AMSL

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[7] Ministry of the Environment, Conservation and Parks. 2023a. Well Record Dataset, Ontario Water Well Information System. Accessed July 2023.
[8] Armstrong, D.K, and J.E.P Dodge, 2007. Paleozoic geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release—Data 219.
[9] Stantec Consulting Ltd. 2024. Geotechnical Desktop Review: The LeBreton Flats Plan of Subdivision, Ottawa, Ontario (Draft). February 2024.

- East Portion of the Site from 51.0 m AMSL to 59.4 m AMSL, averaged 55.6 m AMSL
- South Portion of the Site from 48.1 m AMSL to 53.9 m AMSL, averaged 51.4 m AMSL
- West Portion of the Site from 45.0 m AMSL to 59.4 m AMSL, averaged 49.6 m AMSL

The Data Gap Analysis conducted by Geofirma Engineering Ltd (2019[3]) summarized available groundwater elevation data for the majority of the West Portion of the Site. Groundwater elevations in the overburden generally ranged between 52.1 m AMSL to 57.8 m AMSL with groundwater in shallow bedrock wells ranging between 52.1 and 53.3 m AMSL. Groundwater flow within the overburden and bedrock on the West Portion of the Site is northwest towards the Ottawa River (Geofirma Engineering Ltd 2019[3]). Golder Associates (2012[10]) indicated that shallow groundwater flow in the vicinity of the aqueducts is controlled by the water levels in the aqueducts, and when the water level is low, they act as groundwater sinks; however, when it is high it can reverse flow out of the aqueducts to the surroundings. Golder also noted utility trenches in the former roads were backfilled with sand following site remediation and may act as preferential pathways to shallow groundwater. The regional groundwater flow was noted to be to the northwards toward the Ottawa River (Golder Associates 2015a[11]).

Paterson Group (2020[2]) included logs for boreholes at the Site, some of which provided groundwater elevation data. Historical borehole logs indicated that groundwater elevations across the Site ranged between approximately 51 and 60 m AMSL (generally between 2 and 4 m BGS with some instances of water levels between 8 and 9 m BGS). Seasonal variability was documented in some borehole logs with low groundwater elevations observed in the fall typically around 51 m AMSL and high groundwater elevations observed in the spring ranging between approximately 51.5 and 53 m AMSL.

Stantec (2024**Error! Bookmark not defined.**) summarized groundwater levels measured in 37 boreholes previously i nstalled at the Site. Some measurements were from monitoring wells and others were observed during drilling which are inferred groundwater levels. Groundwater elevations at the Site included:

- North Portion of the Site ranged from 49.2 m AMSL to 52.3 m AMSL, averaged 51.4 m AMSL
- East Portion of the Site from 51.4 m AMSL to 59.6 m AMSL, averaged 52.9 m AMSL
- West Portion of the Site from 52.1 m AMSL to 54.1 m AMSL, averaged 53.1 m AMSL

Two Phase II Environmental Site Assessments were conducted by Golder Associates (2015b[12], 2015c[13]). Monitoring wells were installed into the limestone bedrock in the South Portion and the southern extent of the West Portion of the Site, which exhibited hydraulic conductivity values ranging between 1×10^{-7} to 7×10^{-5} m/s. Monitoring wells completed in the fill in the North Portion of the Site exhibited hydraulic conductivity values of approximately 10^{-3} m/s.

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[10] Golder Associates, 2012. Supplemental Phase II Environmental Site Assessment, South LeBreton Flats, Blocks B1, B2, C1, C2, E1, E2, E3, G, H1 and H2, Ottawa, Ontario. February 2012.
[11] Golder Associates, 2015a. Summary of Subsurface Conditions & Construction Considerations, South LeBreton Flats, Blocks B, C, D, E, F, G, and H, Ottawa, Ontario. November 2015.
[12] Golder Associates, 2015b. Phase II ESA and Remediation LeBreton Flats North, Lands South of Closed Aqueduct, Blocks J and K, Ottawa, Ontario. Prepared for the National Capital Commission, January 2015.
[13] Golder Associates, 2015c. Phase II ESA and Remediation LeBreton Flats North, Lands North of Closed Aqueduct, Blocks J and K, Ottawa, Ontario. Prepared for the National Capital Commission, January 2015.

Source Water Protection

As established under the Ontario Clean Water Act, 2006, S.O., 2006, c. 22, source protection areas and associated land use restrictions exist for all municipal drinking water sources located throughout the Rideau Valley Source Protection Area. The MECP has designated the following vulnerable areas that apply to drinking water sources.

Wellhead Protection Area (WHPA): an area delineated on the ground surface that represents the capture zone for the underlying aquifer in which a given municipal well draws its water. Based on a review of the online MECP Source Water Protection Information Atlas (2023b[14]), the Site is not located within a WHPA. The nearest WHPA is located approximately 19 km south and is associated with the Greely Water Supply Well.

Significant Groundwater Recharge Area (SGRA): Groundwater recharge represents the proportion of precipitation and/or surface water runoff that infiltrates to the subsurface and reaches the groundwater table. Recharge areas are classified as "significant" when they supply more water to an aquifer used as a drinking water source than the surrounding area. The volume of water that infiltrates to the subsurface is largely influenced by site topography, the physical properties of the soil, and land cover characteristics. The Mississippi Valley Source Protection Region (MVSPR 2011[15]) defines a SGRA to be an area where the annual recharge rate is greater than 55% of the average regional water surplus. In the case of the MVSPR, an area where infiltration is greater than 190 mm/year is identified as an SGRA. Mapping provided by the MECP (2023b[15]) indicates that the Site is not located within an SGRA.

Highly Vulnerable Aquifer (HVA): Defined as subsurface, geologic formations that are sources of drinking water, which could be easily affected by the release of pollutants on the ground surface. The HVA is identified using variables that include depth to the aquifer, physical properties of the overlying soil and/or rock, and the aquifer composition. In general, an HVA will consist of granular aquifer materials (i.e., sands and gravels) that are exposed near the ground surface and where a relatively shallow water table is present. Based on a review of the online MECP Source Water Protection Information Atlas (2023b[14]), the Site is located within an area designated as HVA with a vulnerability score of 6. Based on review of source water threats, there are no significant threats associated with an HVA with a vulnerability score of 6 and therefore, no mitigation measures recommended with respect to source water protection. To note, much of the Ottawa area is mapped as a HVA with vulnerability score of 6.

Intake Protection Zone (IPZ): A zone around a municipal intake pipe that contributes source water to a drinking water system. The size and shape of each IPZ represents either a set distance or set time that it would take water (and potential contaminants) to reach the intake. These zones also include land adjacent to streams and storm sewers where surface water runoff can quickly reach the intake. Based on a review of the online MECP Source Water Protection Information Atlas (2023b[14]), the western third of the Site is located within an IPZ-2 associated with the Lemiuex Island IPZ with a vulnerability score of 8.1. IPZ-2 is the area in which surface water could reach the intake within two hours.

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[14] Ministry of the Environment, Conservation and Parks. 2023b. Source Water Protection Information Atlas. Accessed July 2023. (https://www.gisapplication.lrc.gov.on.ca/SourceWaterProtection/Index.html?viewer=SourceWaterProtection.SWPViewer&locale=en-US)

[15] Mississippi Valley Source Protection Region, 2011. Mississippi Valley Source Protection Area, Approved Assessment Report. August 4, 2011.

Based on review of 2021 source water threats, a number of activities are listed as a significant source water threat within the IPZ-2, vulnerabiity score of 8.1 including but not limited to: storage and handling of sewage; generation, storage and/or application of agricultural and non-agricultural source material; industrial and/or commerial effluent/stormwater; overflow of combined or sanitary sewers; snow storage (area greater than 0.2 ha); and pesticide application (area greater than 10 ha). It is understood that the proposed development does not include the above activities and mitigation measures are not required. Sewer design for the proposed development should ensure that combined/sanitary sewer overflow can not occur within the IPZ-2.

Water Quantity Vulnerable Area (WHPA-Q): Water quantity vulnerable areas are determined through a tiered process of water budget analyses as set out in the Technical Rules under O. Reg. 287/07. WHPA-Q is defined as an area where an activity can occur and pose a threat to drinking water quantities. Any activity that takes water without returning it to the same source (Q1) or an activity which reduces recharge (Q2) may be a threat in WHPA-Q. Based on a review of the MECP mapping (2023b[14]), the Site is not located within WHPA-Q1 or WHPA-Q2.

Issue Contributing Area (ICA): ICAs were also defined for municipal sources, as needed, where historical raw water quality data suggested that anthropogenic activity could be deteriorating drinking water quality. Based on MECP source protection mapping (2023b[14]), the Site does not intercept any ICAs.

Design and Construction Considerations – Groundwater

This memo does not review in detail the various reports that include discussions on historical impacts to groundwater quality and potential impacts of water quality on design, construction or long-term operation at the Site.

The LeBreton Flats Environmental Impact Statement (Paterson Group Inc 2021[16]) indicated that impacted groundwater was encountered in the West Portion of the Site; however, it is not anticipated to be encountered during the redevelopment of that Portion into parkland. Impacted groundwater has been identified in regions where commercial and residential buildings may be constructed. The Master Servicing Report (CIMA+ 2021[5]) indicated that methane gas from former landfill sites may pose issues in the construction and approval of some stormwater management (SWM) facilities.

Groundwater levels at the Site will need to be considered during design and construction. Groundwater levels are recommended to be monitored continuously at key locations such as parking lots and where other below ground infrastructures are proposed, to assess the variability in the groundwater levels at the Site. This monitoring would be completed as needed as part of detailed design. Lined structures being constructed below the groundwater level will require water management during construction. Unlined structures below the groundwater level will require permanent water management. Stantec (2024**Error! Bookmark not defined.**) identified that underslab drainage should be anticipated to control groundwater, particularly during wet seasons, where basement/underground floors are proposed. Water will need to be managed during construction. Impacted water will need to meet the applicable Ontario Site Conditions Standards criteria prior to discharge, or applicable site specific discharge options.

[16] Paterson Group Inc, 2021. Environmental Impact Statement, LeBreton Flats Master Concept Plan, Ottawa, Ontario. Prepared for National Capital Commission c/o O2 Planning + Design Inc, February 2021.

Low-Impact Development Options

The Master Servicing Report (CIMA+ 2021[5]) indicated that the preferred LID measures for the Site include bio-swales, rain gardens, and green roofs. A SWM pond was considered in earlier design phases but was abandoned due to concerns such as fluctuating river water level, fill requirements, and environmental issues and approvals. The purpose of the LID measures is to mitigate impacts of increased runoff and potential stormwater impacts by managing and reducing runoff. The ability to infiltrate stormwater within the development will be limited by space constraints and the shallow depth of bedrock. The SWM strategy in the servicing report indicated that stormwater quantity control is required for each individual private block at the Site.

The majority of the Site is being proposed to be developed in large blocks along the public roads, with many of the blocks comprised of single, high-rise buildings with probably up to two (2) levels of underground parking. Infiltration of the volumes required for the 100-year event would not be feasible based on the space available and the shallow depth to bedrock. Capture and infiltration of stormwater within these large blocks is also not recommended as infiltration along the margins of the building can be captured by the pumping systems engaged to keep groundwater away from the below ground building foundations. This can lead to exfiltration of water from the LID infiltration system to the buildings pumping system causing constant circulation of water if captured water is not able to be discharged into a stormwater system designed to carry water away from the building. Infiltrating stormwater may also pickup contaminants if present in the near subsurface. For these reasons, infiltration-based LID systems would need to be carefully designed if implemented in this development.

LID systems that are designed to promote sediment filtration, evapotranspiration, and/or capture stormwater and direct it toward a stormwater sewer that conveys the water away from buildings are recommended. Additional field work to confirm groundwater levels and infiltration rates at potential LID system locations is recommended as part of detailed design of any proposed LID systems.

Recommendations

The following recommendations are provided:

- Groundwater monitoring should be undertaken to support the future design of the subdivision blocks. Where LID systems are proposed, infiltration rates should be confirmed where applicable.
- Once additional details are available regarding the proposed development and mitigation measures, construction dewatering rate estimates should be completed to evaluate the need for dewatering permitting. These calculations should be completed at the design phase.

Reference: LeBreton Flats Hydrogeological Memo

We trust this meets your current requirements. Should you have any questions or concerns please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

Digitally signed by Koch, Jamie
Date: 2024.08.15 18:57:17 -04'00'

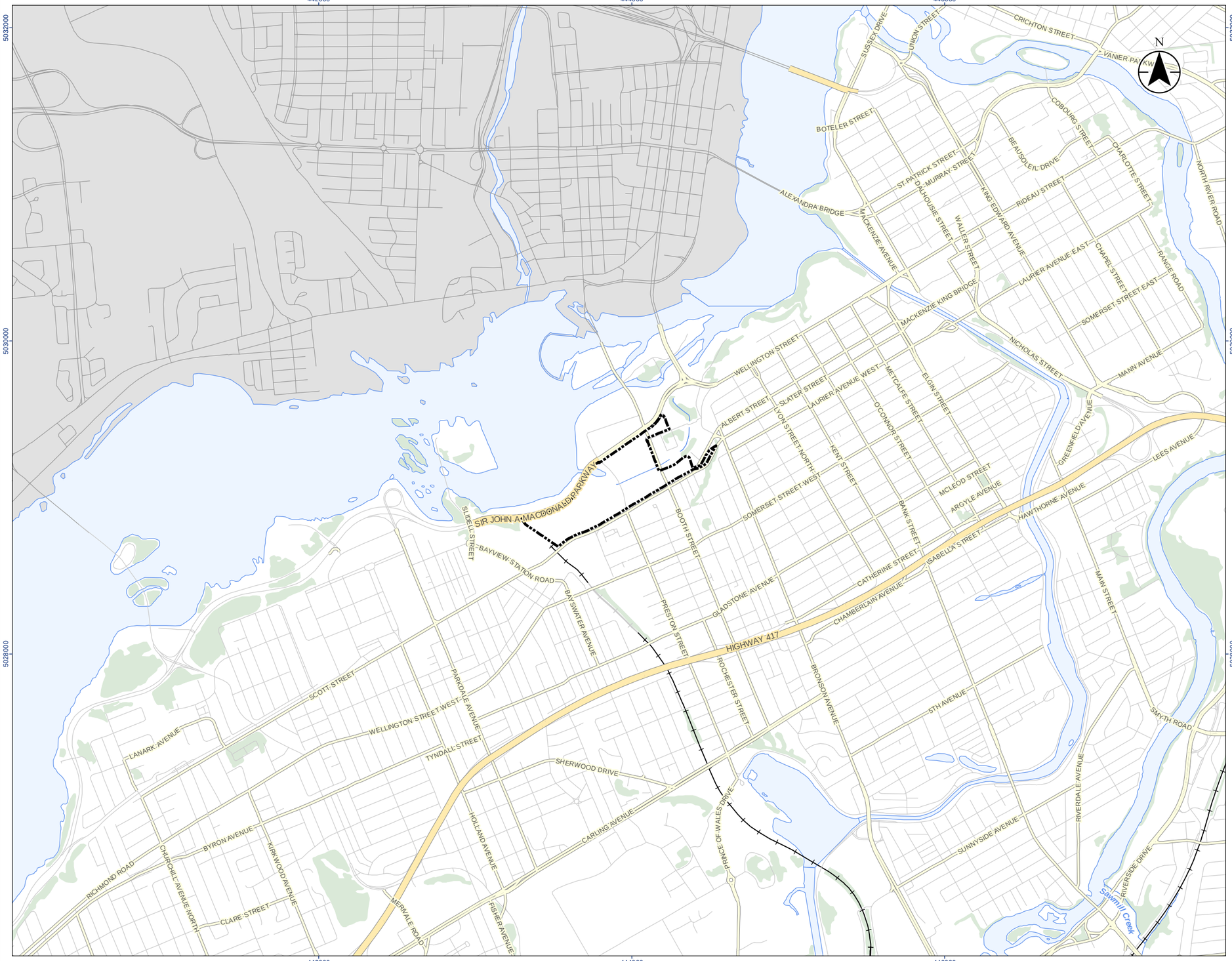
Jamie Koch M.Sc., P. Geo.
Hydrogeologist
Phone: (226) 220-7359
jamie.koch@stantec.com

Digitally signed by Veale, Lesley
Date: 2024.08.14 16:36:31 -04'00'

Lesley Veale M.Sc., P. Geo
Senior Hydrogeologist
Phone: (519) 242-8554
lesley.veale@stantec.com

Attachment: Attachment A: Figures
Figure 1 - Site Location
Figure 2 - Borehole Location Plan
Figure 3 - Topography and Surface Water Features
Figure 4 - Surficial Geology
Figure 5 - MECP Water Well Records
Figure 6 - Intake Protection Zone

Attachment A Figures



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Legend

- Site Boundary
- Expressway / Highway
- Major Road
- Minor Road
- Railway - Operational
- Railway - Discontinued
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wooded Area

0 0.5 1 km

1:25,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.

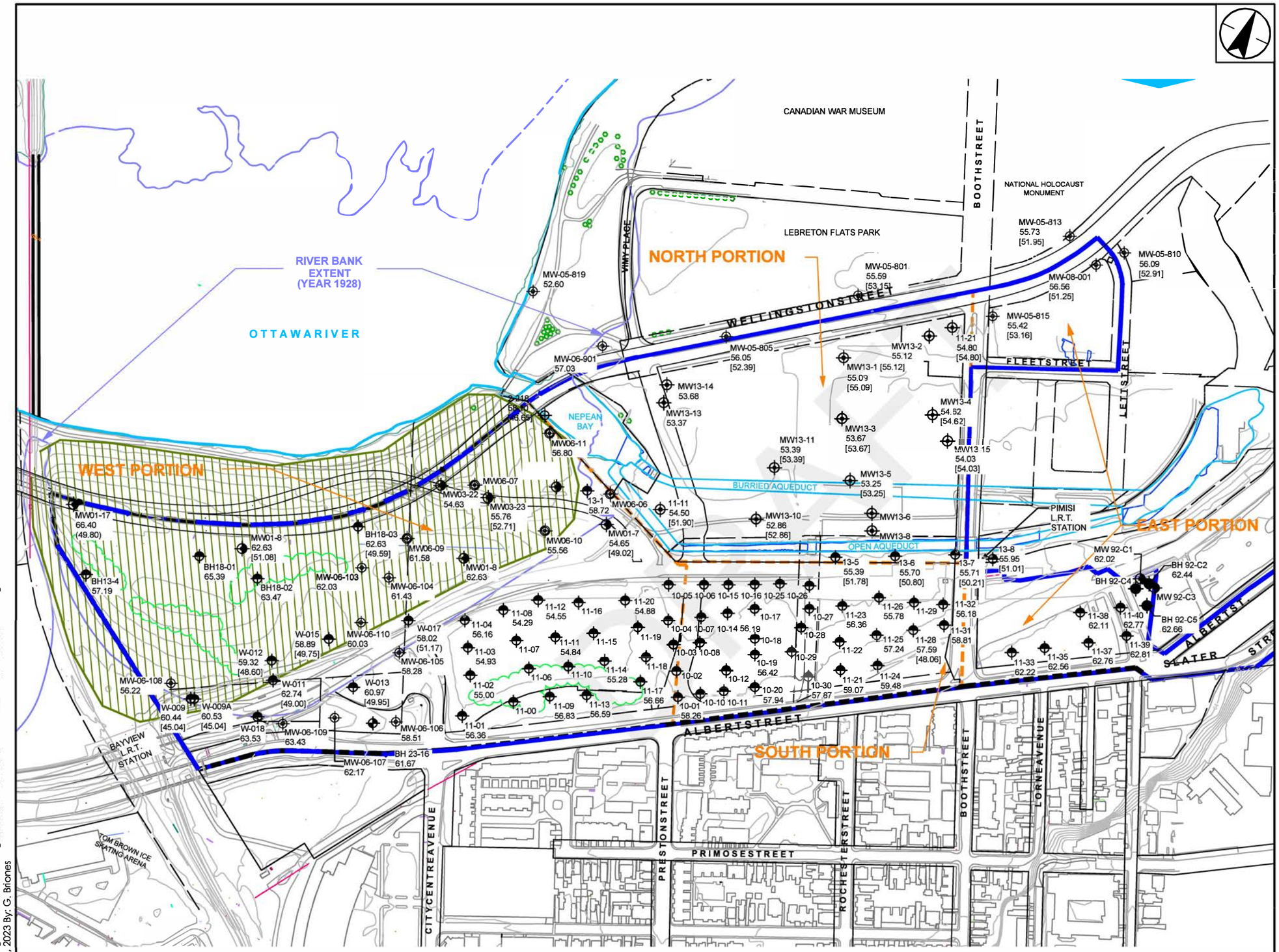
Project Location
Ottawa, ON

160401780 REVA
Prepared by PRM on 2023-11-24

Client/Project
National Capital Commission
LeBreton Flats Plan of Subdivision
Hydrogeology Background Review

Figure No.
1

Title
Site Location



C:\CAD Drawings\Acad2019 Drawings\2023\106401780\106401780_Borehole Locations.dwg
Printed: Oct 03, 2023 By: G. Briones

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300 - 1331 Clyde Avenue
Ottawa, ON, Canada K2C 3G4
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LEGEND

- BOREHOLE LOCATION (PATERSON GROUP, 2016)
- BOREHOLE LOCATION (GOLDER, 2010-2013)
- BOREHOLE WITH MONITORING WELL LOCATION (GOLDER, 2010-2013)
- BOREHOLE LOCATION (JACQUES, WHITFORD LIMITED, 2001)
- BOREHOLE WITH MONITORING WELL LOCATION (JACQUES, WHITFORD LIMITED, 2001)
- BOREHOLE LOCATION (TROW, 2002)
- BOREHOLE WITH MONITORING WELL LOCATION (AQUA TERRA, 2005-2008)
- BOREHOLE WITH MONITORING WELL LOCATION (INTERA, 2006)
- FORMER LANDFILL (Ur-06)

55.76 GROUND SURFACE ELEVATION (m)

[52.71] BEDROCK SURFACE ELEVATION (m)

NOTES

1. BASEPLAN TAKEN FROM A PDF COPY OF A DRAWING PREPARED BY PATERSON GROUP ENTITLED HISTORICAL TEST HOLE LOCATION PLAN, DATED 29/04/2020.

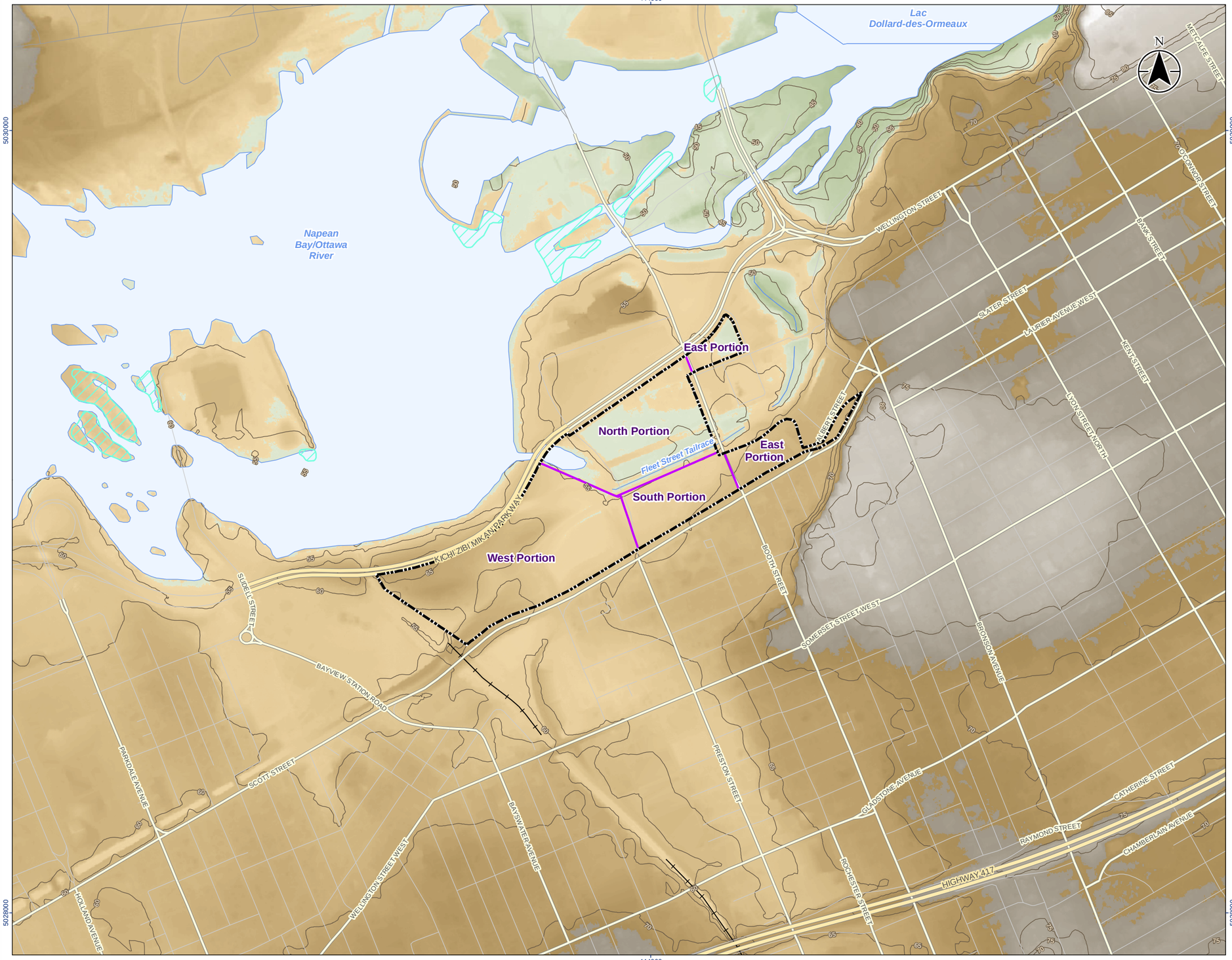
40m 0 40 80m
1 : 4000

OCTOBER 2023
Project No. 106401780

Client/Project
NATIONAL CAPITAL COMMISSION
HYDROGEOLOGY BACKGROUND REVIEW
LEBRETON FLATS PLAN OF SUBDIVISION, OTTAWA, ON

Fig No.
2

Title
BOREHOLE LOCATION PLAN



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Legend

- Site Boundary
- Topographic Contour (m AMSL)
- Expressway / Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Wetland - Not evaluated per Ontario Wetland Evaluation System
- Development Portion

Elevation (m AMSL)

High : 90.15

Low : 35.72

0 0.25 0.5 km

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
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Project Location
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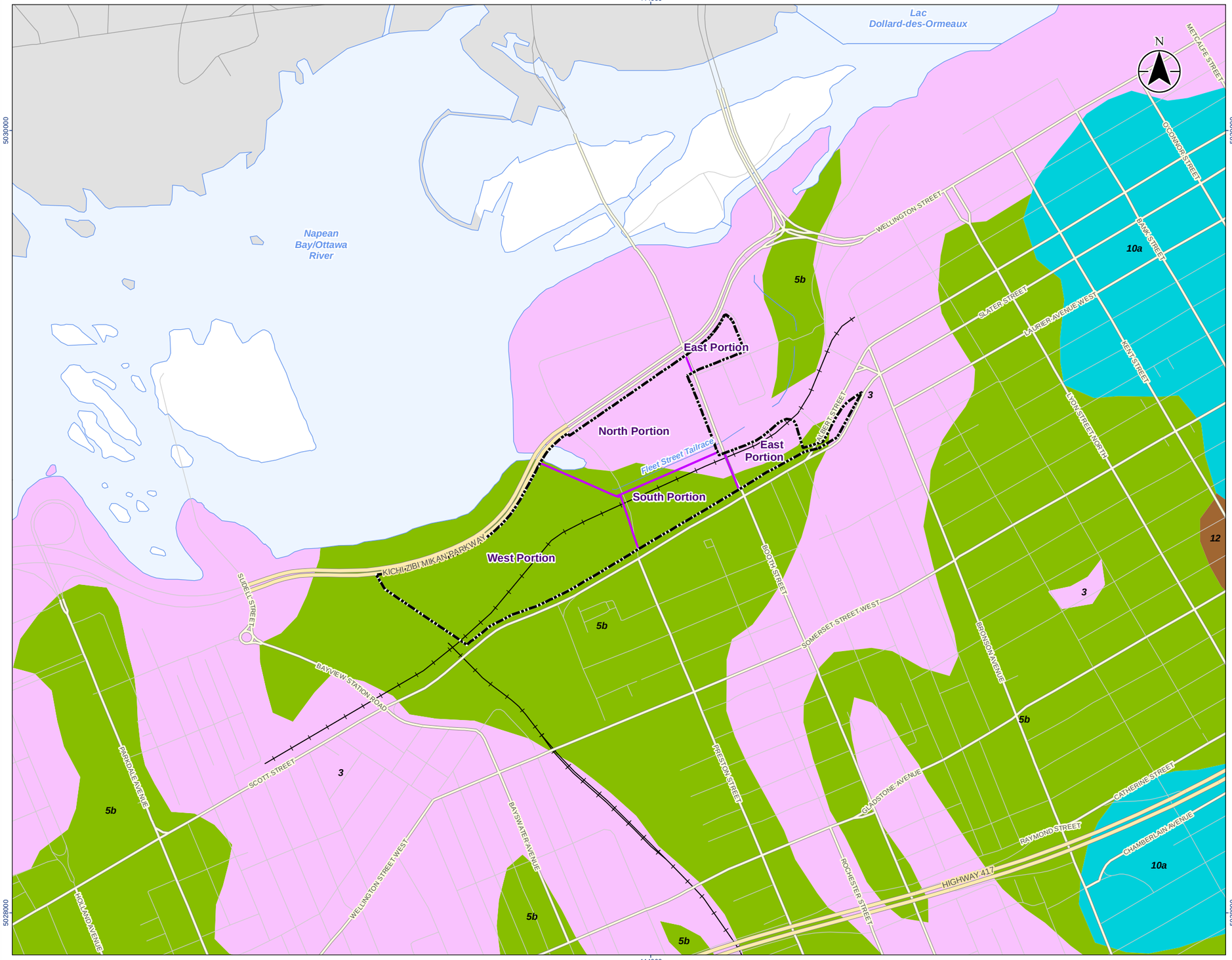
Figure No.
3

Title
Topography and Surface Water Features



Stantec

Legend

- Site Boundary
- Expressway / Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Development Portion

Surficial Geology

- 12: Older alluvial deposits
- 10a: Fine-textured glaciomarine deposits (Massive-well laminated)
- 5b: Stone-poor, carbonate-derived silty to sandy till
- 3: Paleozoic bedrock

0 0.25 0.5 km

1:10,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Ontario Geological Survey 2010. Surficial geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release--Data 128-REV ISBN 978-1-4435-2483-4.

Project Location
Ottawa, ON

160401780 REVA
Prepared by PRM on 2024-06-04

Client/Project
National Capital Commission
LeBreton Flats Plan of Subdivision
Hydrogeology Background Review

Figure No.
4

Title
Surficial Geology

Legend

- Site Boundary
- Water Well Location (MECP)
- Expressway / Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody
- Site Boundary Buffer (200m)

0 200 400 Meters

1:6,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2023.
3. Orthoimagery © City of Ottawa, 2022. Imagery Date, 2017.
4. MECP water well record locations have been positioned based on published UTM coordinates and their locations should be considered approximate.

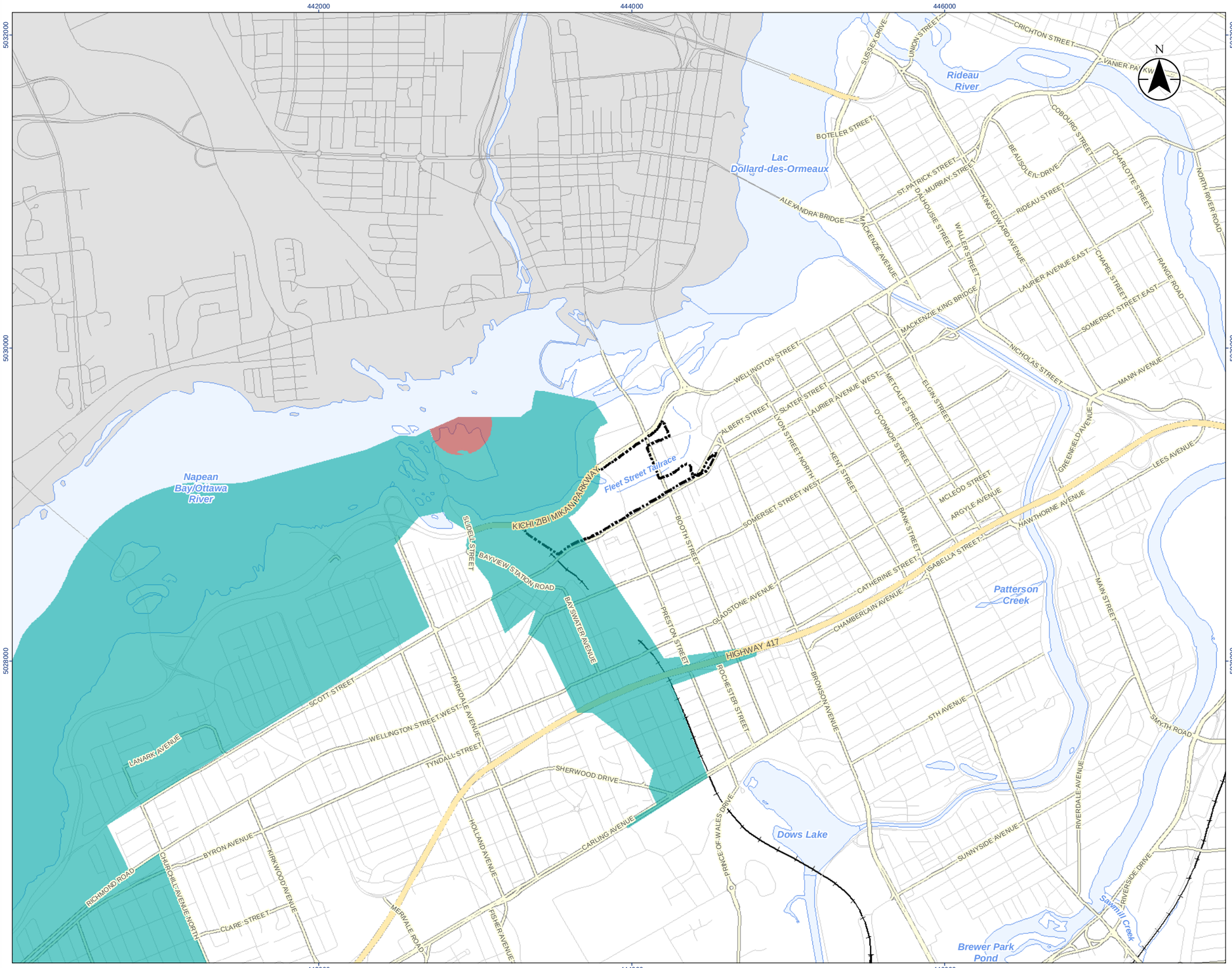
Project Location
Ottawa, ON

160401780 REVA
Prepared by PRM on 2024-06-04

Client/Project
National Capital Commission
LeBreton Flats Plan of Subdivision
Hydrogeology Background Review

Figure No.
5

Title
MECP Water Well Records



Stantec

Legend

- Site Boundary
- Expressway / Highway
- Major Road
- Minor Road
- Railway
- Watercourse (Intermittent)
- Watercourse (Permanent)
- Waterbody

Intake Protection Zone

- IPZ-1
- IPZ-2

0 0.5 1 km

1:25,000 (At original document size of 11x17)

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Client/Project
National Capital Commission
LeBreton Flats Plan of Subdivision
Hydrogeology Background Review

Figure No.
6

Title
Intake Protection Zone