Functional Serviceability Report

Official Plan Amendment and Zoning By-law Amendment
Proposed Industrial Development
5368 Boundary Road and 6150 Thunder Road, Ottawa ON

Prepared for:

Avenue 31
222 Somerset Street West
Unit 401, Ottawa ON
K2P 2G3

Attention: Ms. Jennifer Murray

LRL File No.: 200578

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TABLE OF CONTENTS

APPENDICES

Appendix A **Concept Site Plan**

Appendix B **Existing Topography**

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION AND SITE DESCRIPTION

LRL Associates Ltd. was retained by Avenue 31 to prepare a functional serviceability report to support the Official Plan Amendment and Zoning By-lay amendment application for the property located at the south west corner of the intersection of Boundary Road and Thunder Road in Ottawa ON. The subject land encompasses three (3) separate properties as shown in Figure 1 below. The civic address' for the parcels are 6150 Thunder Road, 5368A Boundary Road and 5368B Boundary Road.

Figure 1: Arial View of Subject Lands

The serviceability review summarized in this document has been completed to further investigate servicing options for potential future development on the subject lands for uses such as light industrial, logistics and/or a distribution warehouse.

One potential concept for future development includes six (6) separate industrial buildings, asphalt parking lots and travel ways to enhance vehicular maneuverability, as well as landscaped area. The site boundary encompasses two (2) main areas delineated by an unnamed waterway; a large parcel with an access from Boundary Road, and a smaller parcel (Site 2) with exclusive entrance off Thunder Road. For the purposes of this investigation, although ultimate buildout options are unknown at the time of this review, a conceptual site plan has been included in Appendix A for reference.

The specifics of the proposed buildings outlined in the conceptual site plan are summarized in table 1 below.

Table 2: Conceptual Design, Building Details

	Industrial Building A	Industrial Building B	Industrial Building C	Industrial Building D	Industrial Building E	Site 2 Building	Total
Building Size	8 920 m^2	8 920 m^2	8 920 m^2	10 405 m^2	4 460 m^2	5 545 m^2	47 170 m^2
Approximate Allocated Office Space	225 m^2	225 m^2	225 m^2	260 m^2	125 m^2	585 m^2	1 645m^2
Number of Auto Parking Spaces	85	64	61	79	36	48	373
Number of Loading Docks	12	12	12	14	4	1	55
Number of Trailer Parking Spaces	15	15	15	15	0	0	60

2 EXISTING SITE AND AVAILABLE SERVICES

The subject site measures approximately 17.75 ha with most of the land vacant with ground cover consisting primarily of long grasses, shallow vegetation and trees surrounding the boundary of the property. Two dwellings exist on the lands; however, for future development intentions would be to remove these.

The property is bordered to the east by Boundary Road, North by Thunder Road, and is intersected on the north west corner by an unnamed drain. This drain naturally divides the overall site into two parcels.

Existing topography of the land is relatively flat, with elevations ranging from approximately 76.0 m to 77.5 m. The general elevation interior to the site boundary is slightly lower than those of the surrounding roads. Appendix B includes an overall site boundary with contours demonstrating the existing topography.

The site does not have access to municipal storm, sanitary or traditional water service as the infrastructure does not exist on Boundary Road or Thunder Road; however, the site is within the service boundary of the Carlsbad Springs trickle-feed water system. This system is supplied by the City of Ottawa's central distribution system and distributed via a network of small diameter pipes in the area of the subject lands. At the present time, the subject site has been allocated three (3) equivalent service connections to the Carlsbad Springs trickle-feed water system. This may result in alternate building uses and overall site plan to ensure that the water demands of the site can be met. Further discussion relating to the servicing options are summarized in the following sections.

3 WATER SERVICE

3.1 Carlsbad Springs Trickle-Feed Water Supply System

The proposed development site boundary falls within the Carlsbad Springs trickle-feed Water System. The Carlsbad Springs trickle-feed Water System is intended to provide sufficient water for indoor (domestic) use only through a network of small diameter mainline piping. During the design and planning stages of this system, no allowances were made for outdoor water use fire protection, therefore fire suppression requirements will have to be addressed with a designed site-specific fire reservoir.

A 102mm diameter pipe exists along Boundary Road and a 75mm pipe exists along Thunder Road which would be utilized for domestic supply.

The subject site has been allocated a pre-set constant flow rate, referred to as equivalent units (2,700L/d per unit) – however; the assigned three (3) equivalent units for the subject property does not necessarily represent the amount of water expected to be consumed within the development. In fact, given the magnitude of the site, and potential development opportunities, to ensure that the domestic demands of the development could be fulfilled by the trickle-feed system, it is expected that a flow rate greater than the 3 assigned equivalent unites (8 100 L/d) would ultimately be required.

Based on the available City of Ottawa documentation prepared during the extension of the Carlsbad Springs trickle-feed system, it is understood that monitoring does take place to assess the performance and consumption of properties relying on the water network. As outlined in the report titled “Feasibility Study - Extension of Carlsbad Springs Trickle Feed Water System – Area East of Carlsbad Springs (Russell Road, Carlsbad Lane, Sabourin Road & Boundary Road Industrial Park” Prepared by Stantec in 2014, the City’s available monitoring data will provide a further understanding of the actual peak demands in the overall system, which may conclude that additional equivalent units are available for the subject property.

This report mentioned above concludes that the existing trickle feed system has sufficient capacity to accommodate the potential 112 severance opportunities identified that exist along the network which were not accounted for in the original design, with additional capacity for potential extension.

Furthermore, based on available mapping data for the network, it appears that a blow-off point for flushing the system exists along Thunder Road, slightly north of the subject point. The increased demand conditions for this site could impact the requirement for flushing, ultimately decreasing the peak demand caused by the regular flushing at this location and transferring this as equivalent units to the subject property.

Additionally, a further investigation was completed by Stantec in 2015, titled Feasibility Study for an Extension of the Carlsbad Springs Trickle feed Water System- Boundary Road industrial Park. This study further investigated the feasibility of extending the Trickle Feed System to provide municipal water supply to a study area which encompasses the subject property.

The previously completed investigations and modeling on the system have assumed parameters which have a large outcome on the resultant pressures and travel times within the trickle feed system. The conclusion in the reports state that through monitoring over time and further data on the buildout conditions of the severed lots along the trickle feed system, capacity may be increased. Impacts such was the removal of flushing locations or further data and analysis on concurrent usage would be further investigated prior to development of such property to ensure that domestic demands could be met.

With the intentions to move the subject parcel forward into a detailed site plan application, Avenue 31 has mandated Stantec to further review the system and comment on the availability of domestic water to service the parcel. The conclusions of this further investigation will assist in determining potential availability of additional equivalent units in the system prior to the detailed design at the Site Plan Application stage.

3.2 Buildout Scenario Domestic Demands

The domestic demands of the site would be intended to be met using the flow provided by the trickle-feed water system in conjunction with buildings specific water tanks or cisterns to meet peak instantaneous demands. The sizing of such cisterns would be determined during the detailed design phase.

Recognizing that the domestic flow provided by the trickle-feed system may impact the end user and building design, further review of reasonable demands has been completed. The demands summarized in table 3 on the following page provide a magnitude of the average water demands which may be required to meet the domestic flow requirements of a fully built out site with specifics as outlined in the concept plan included in Appendix A.

Table 3: Conceptual Domestic Demands based on Building Use

Use	Average Day Demands	Value	Total (L/day)
Office Space	75 L/9.2m^2	1 645 m^2 of Office Space	*Building A=1 834*
			Building B=1 834
			Building C=1 834
			Building D=2 120
			Building E=1 020
			Site 2=4 770
			13 412
Loading Bay	150L/Loading Bay	55 Loading Bays	*Building A=1 800*
			Building B=1 800
			Building C=1 800
			Building D=2 100
			Building E=600
			Site 2=150
			8 250
Misc. Additional Use (Dependant on Tennant)	-	-	**2 000**
		Total Consumption	*Building A=4 034*
			Building B= 4 034
			Building C= 4034
			Building D=4 620
			Building E=2 020
			Site 2=4 920
			23 660
		Number of Equivalent Residential Units (2 700 L/day ea.)	**9**

The above scenario is a sample of what average water demands may be expected from this property. For the proposed concept with six (6) separate industrial buildings, approximately 9 equivalent residential units would be required. The demands will vary greatly based on the final building design and site plan.

As can be concluded from the table above, if this site were to proceed with a partial buildout for buildings equivalent to approximately 50% of the proposed concept site plan on a large portion of the site, is it expected that the domestic demands would be met by the 3 assigned equivalent residential units. As can be seen, the allocated office space and building layout have large impact on the water demands.

During the detailed design completed in the future Site Plan Application process, a water meter chamber would be specified at the property boundary to accommodate (while ensuring it is not exceeded) the allowable flow rate determined to be available and required to meet the demands of the subject property.

3.3 Fire Protection

In order to provide adequate fire protection and fulfill the fire suppression demands for the subject site, above grade (or equivalent) storage tanks will be required. Detailed design and selection of the most appropriate tanks will be completed and required during the permitting stage of future development on this site.

4 SANITARY SERVICE

Currently there is no municipal sanitary sewer adjacent to the proposed property, on Boundary Road or Thunder Road as it does not fall within the City of Ottawa's sanitary service area.

An on-site sewage collection and treatment facility would be required to meet the treatment demands of the subject development. The detailed sewage treatment options would have to be sized to treat the wastewater generated by the ultimate end user for the proposed developments. To ensure that the wastewater generated can meet the effluent requirements, detailed designs during site plan approval and building permit will be required. Provided that the site is delineated into two parcels by the unnamed waterway, it is expected that independent wastewater treatment options would be proposed for each parcel.

Given the site topography and space constraints, outlet options for the highly treated effluent would be to the unnamed drainage ditch which intersects the north portion of the property. Given the outlet will be to the unnamed ditch, during the detailed design, the effluent rate will be considered during stormwater management design to ensure the overall release rate to the unnamed ditch is not greater than pre-development conditions. Additionally, during the detailed design phase considerations will be given to ensure the downstream quality and thermal regime is not negatively impacted from any offsite drainage.

As discussed in Section 1, the conceptual ultimate buildout conditions contain six (6) separate buildings. Options exist to have a private sewage system for a portion of the site, or discharge from the five (5) most easterly buildings may be connected to the main treatment facility central to the site pending detailed design.

Manufactured products such as a Modified Sequencing Batch Reactor packaged plant or a Membrane Bioreactor (MBR) package plant would be further investigated during the detailed design phase to complete the design, supply and commissioning for an appropriately designed solution for the development. During the design of such units, design parameters such as average daily flow, maximum daily flow, ambient temperatures, and expected influent wastewater characteristics would be provided. These design considerations will be carefully analyzed to ensure the effluent discharge of the selected system meets all regulatory requirements for the treatment and discharge of the wastewater.

5 STORMWATER MANAGEMENT

Currently there is no municipal storm sewer adjacent to the subject lot. In pre-development conditions, the stormwater accumulated on the property would be retained from various depressions in the topography, sheet drain in the north direction to the unnamed drain or towards

the undeveloped lands bordering the parcel to the south and west, ultimately reaching the surrounding pervious area.

Refer to Appendix B for high level existing contours for the subject lands which are used to determine predevelopment flow directions.

It is assumed that the site will be developed with parking area, asphalt roadways as well as landscaped portions and various building footprints. With the assumption that the parcel will become developed with a similar concept as detailed in Appendix A, additional impervious surfaces will be introduced, which will require appropriately designed quantity and quality control measures as per the City of Ottawa Stormwater Management Design Guidelines.

A combination of an on-site sewer network, detention areas, quality treatment units, best management practices and low impact development principles are to be implemented to ensure the proposed development will meet the City's stormwater quantity and quality requirements. Consideration would be given to the site features such as soil characteristics as well as the end user to determine the viability of implementing low impact development to address both quality and quantity. Given the large scale of the site, options such as rainwater harvesting can be considered to also alleviate minor shortfalls in available water supply.

For quantity control measures, collection & overland flow should mimic pre-development conditions to ensure there is no additional run-off from the site to neighbouring properties or downstream watersheds. In regard to quantity, the overall flow leaving the site must also accommodate for any effluent expected from the on site septic treatment.

Given the large size of the site, available space for retention areas must be allocated on the detailed site plan. To fulfill future site plan control applications for this site, a detailed stormwater management design would be required to propose a sufficient quantity and quality control system to ensure the following requirements are met:

- Enhanced Level of protection for Water Quality (80% TSS Removal)
- Quantity control storage to limit post development peak flows to predevelopment levels.

6 CONCLUSIONS AND SERVICEABILITY CONSIDERATIONS

This evaluation is limited to assessing the technical feasibility of servicing the site described within this document to support an Official Plan Amendment and Zoning By-law Amendment.

Based on the forgoing the conclusions in relation to the serviceability of the site are as follows:

- Water:
    - Domestic demands will be required to be supplied by the Carlsbad Springs trickle-feed supply system. However, based on an assumed buildout scenario, demands are higher than previously allocated equivalent water units. Opportunity exists for partial buildout, and increase in the allocated equivalent units for the subject parcels or an alternate concept to service the buildings with allocated three equivalent units.
    - Since the trickle-feed water supply system was installed in 1997, the City has monitored water use patterns and confirmed that actual concurrent use is lower than originally planned. As a result, there is a potential for more connections which may prove to accommodate the domestic demands of the subject site.

- Avenue 31 has mandated Stantec to further examine the existing conditions of the as-built trickle feed system and model. Conclusions if this investigation will assist in the detailed site plan design which will be completed for a future SPC application.
- A storage tank and pressure system to provide the water required for fire suppression is required to meet the fire demands of development on the subject property.

- Sanitary Sewage
  - Onsite sewage treatment and collection facility will be designed in detail to release treated effluent to the unnamed drain running through the property. This effluent will be considered during the stormwater management design as well to ensure post development flow rates do not exceed predevelopment conditions.
- Stormwater
  - Currently stormwater runoff flows uncontrolled to the South & West borders of the property.
  - The property is mostly pervious area in existing conditions. In developing the lot into a "light industrial" lot, the development will increase the impervious area of the property. The increase in impervious area, along with City of Ottawa design requirements, will require the site to implement a stormwater quantity and quality management system.

7 CLOSURE

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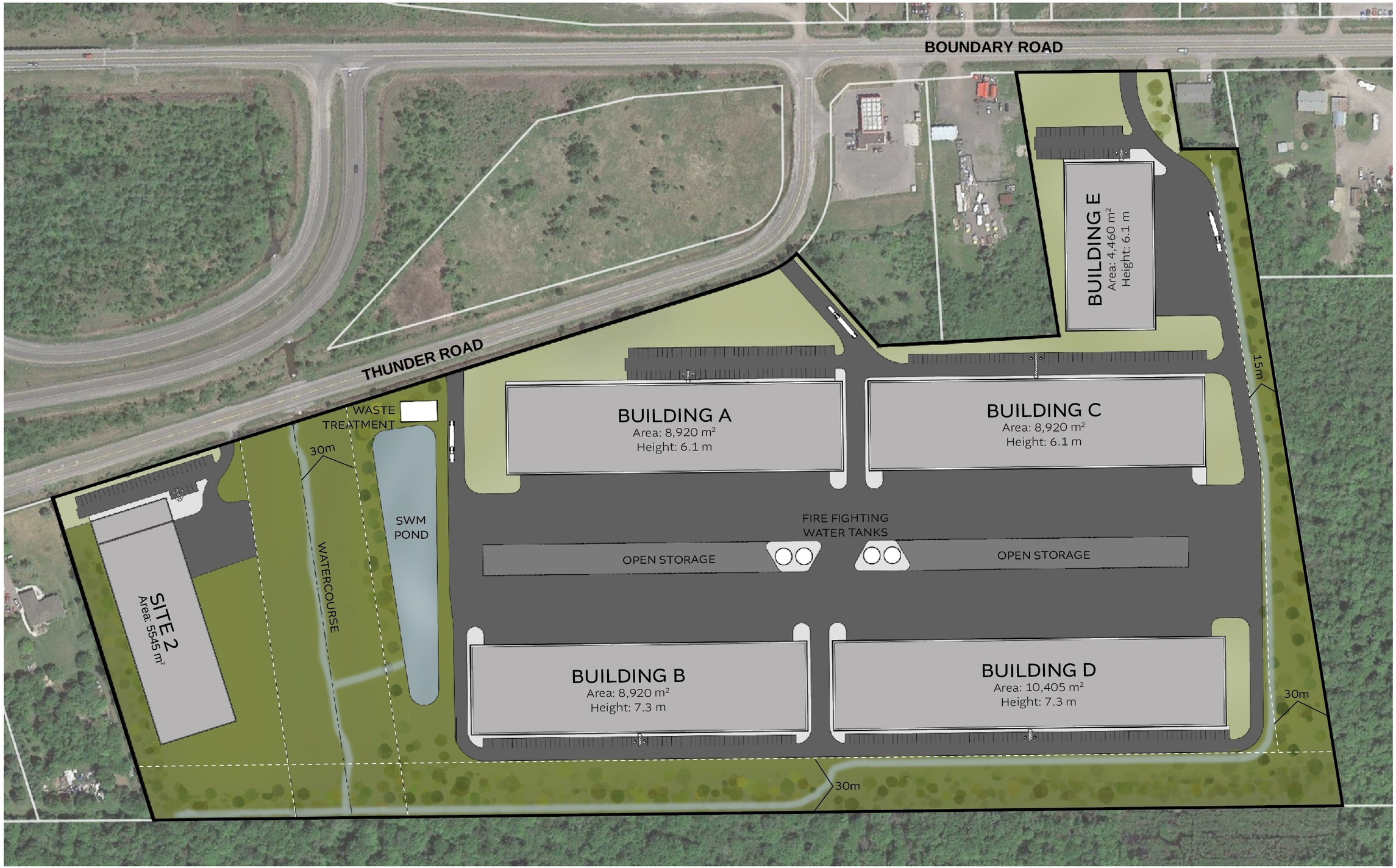
APPENDIX A

Concept Site Plan



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CONCEPT SITE PLAN

5368 Boundary Road and 6150 Thunder Road, Ottawa ON

APPENDIX A

DATE:
JULY 2021

SK01

APPENDIX B

Existing Topography

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EXISTING TOPOGRAPHY

5368 Boundary Road and 6150 Thunder Road, Ottawa ON

APPENDIX B

DATE:
DECEMBER 2020

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