PATERSON GROUP

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Geotechnical Engineering
Environmental Engineering
Hydrogeology
Materials Testing
Building Science
Rural Development Design
Temporary Shoring Design
Retaining Wall Design
Noise and Vibration Studies
Energy and Sustainability
Temporary Shoring Design
Pile Dynamic Analysis and Testing

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August 14, 2025
File: PE7096-LET.03

W.O. Stinson & Son Ltd.
4728 Bank Street
Ottawa, Ontario
K1T 0K5

Attention: **Mr. Scott Stinson**

Subject: **Landfill Impact Assessment**
301/331 Somme Street
Ottawa, Ontario

Dear Sir,

Further to your request, Paterson Group (Paterson) has prepared a Landfill Impact Assessment for the proposed commercial/industrial development at 301/331 Somme Street, in the City of Ottawa, Ontario.

1.0 Introduction

To comply with the City of Ottawa's Official Plan (2022), Paterson has prepared a Landfill Impact Assessment for the subject property to demonstrate that the former MOE Waste Disposal Site (X 9013) will not have adverse effects on the proposed commercial/industrial development. It should be noted that the existence and/or actual location of this purported landfill is in debate, as there is no known definitive evidence that the subject property was previously used for domestic waste disposal.

The following report has been prepared specifically and solely for the aforementioned project, which is described herein, in general accordance with the Ministry of the Environment, Conservation and Parks (MECP) 'D-4 Land Use on or Near Landfills and Dumps' Guideline.

2.0 Proposed Development

It is our understanding that the proposed development will be comprised of a tank and equipment storage building, a vehicle bay and lubricant storage building, a bulk propane filling plant, a propane tank and equipment storage yard, and a cardlock (pre-authorized commercial gas bar). The proposed buildings will be of slab-on-grade construction, surrounded by paved access lanes, loading areas, and parking areas.

3.0 Background Information

As part of this assessment Paterson has reviewed historical and more recent environmental reports completed by CRA and Paterson for the subject property and surroundings. The CRA report was completed for the entire Hawthorne Industrial Park. A hydrogeological report completed by GHD was also reviewed as part of this assessment.

Based on the findings presented in these reports, the following summarizes the highlighted key points related to the reported landfill:

- Despite the information above, CRA did not observe any evidence of a landfill on the property based on their aerial photograph review.
- No evidence of municipal/domestic wastes have been observed to date within the overburden during numerous subsurface investigations across the Hawthorne Industrial Park.
- No evidence of typical landfill leachate parameters has been identified during the groundwater investigations carried out across the Hawthrone Industrial Park.

4.0 Landfill Impact Assessment

4.1 Introduction

The subject parcel of land, currently referred to as 301/331 Somme Street, is situated on the north side of the intersection of Somme Street and Sappers Ridge, in the City of Ottawa. The subject land is zoned as a Rural Heavy Industrial (RH) Zone and is approximately 6.1 hectares in size and is situated within the boundary of the former reported landfill footprint, which is consistent with the footprint of the Hawthorne Industrial Park.

4.2 Former Waste Disposal Facility

The former waste disposal facility known as X 9013 (MOEE9013) was listed as active during the 1960s, although the exact date of operation/closure is unknown. According to the Ontario Ministry of Environment, Conservation and Parks document entitled, “Waste Disposal Site Inventory of Ontario, 1991”, the site was classified as A5, and used for the disposal of urban municipal and/or domestic wastes.

4.3 Local Geology

The subsurface profile in the area of subject property consists of a fill layer (7 to 9m) generally comprised of silty sand and/or silty clay with crushed stone, gravel and organics and trace fragments of concrete, wood and asphalt. The fill material is a result of the placement of waste road building materials by Tomlinson, which was approved by the MECP, and is not related to the reported landfill. The fill material is underlain by in-situ native silty clay and glacial till, with some pockets of topsoil and native silty sand in areas. Bedrock in the area was inferred to be approximately 15m below ground surface and consists of a combination of sandstone and shale from the Nepean Formation and Carlsbad Formation, respectively.

4.4 Hydrogeological Review

The local groundwater flow in the area is towards the northeast. Groundwater on the subject property was encountered within the fill material. During the most recent monitoring event, groundwater was measured to flow towards the northeast with a hydraulic gradient of 0.012m/m.

As part of GHD’s hydrogeological assessment, groundwater levels were measured at monitoring wells located to the north and south of the subject property. The recorded groundwater depths ranged between 0.95 to 11.80 meters below ground surface (mbgs), with shallower groundwater levels observed at monitoring wells situated to the north and southeast of the subject site. Based on the data collected during their assessment, the groundwater flow within the drilled wells appears to in an easterly direction. It should be noted that no monitoring wells targeting shallow groundwater were included as part GHD’s assessment.

4.5 Landfill Leachate

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology, and parameters within the landfill such as pH, moisture

content, degree of compaction, geometry, etc. Based the lack of information pertaining to the reported landfill, there are known leachate characteristics.

The groundwater tested to date across the industrial park does not appear to have been affected by potential leachate parameters.

4.6 Ground Settlement

Ground settlement on the subject site is not expected to occur as a result of former domestic waste placement, since no such waste has been identified during the subsurface investigations.

4.7 Visual Impact

Based on the subsurface investigations completed on the subject site and larger industrial park lands, no domestic waste fill has been identified, thus, no potential visual impacts exist.

4.8 Landfill Gas and Odours

Based on previous subsurface investigations completed on the subject site and the larger industrial park lands, no domestic waste fill has been identified or is suspected to be present in the area, therefore, it is not anticipated that landfill gases will be present on-site.

Regardless, a gas monitoring program was completed to test for the presence of any typical landfill gases on-site in the headspace of the monitoring wells.

Gas monitoring was completed by Paterson using a Landtec GEM 5000 Plus portable landfill gas monitor. The Landtec GEM 5000 Plus reports the concentration of various landfill related gases (CH_4, H_2S, CO_2, CO, O_2) in percentage by volume. The Landtec GEM 5000 Plus was calibrated to open air vapour readings prior to taking readings from monitoring wells on the subject property. The calibration report for the Landtec GEM 5000 Plus used as part of this assessment has been appended to this report.

Table 1 – Gas Monitoring				
Parameter	Gas Concentration (%)			
	August 1, 2025			
	Ambient Air	BH1-25	BH3B-25	BH4-25
Methane (CH_4)	0.0	0.0	0.0	0.0
Hydrogen Sulfide (H_2S)	0.0	0.0	0.0	0.0.
Carbon Dioxide (CO_2)	0.1	0.1	0	0.0
Carbon Monoxide (CO)	0.0	0.0	1.0	0.0
Oxygen (O_2)	21.1	21.3	20.9	21.1
Balance	78.8	78.6	79.1	78.9

No methane or hydrogen sulfide concentrations and minimal amounts of carbon dioxide and carbon monoxide were detected in the headspace of the monitoring wells. The composition of the gas detected in the monitoring wells is consistent with the ambient air reading taken prior to sampling. As such, the methane, hydrogen sulfide, carbon dioxide and carbon monoxide results are not considered to be indicative of any gases from a former domestic waste disposal site. No odours were present, since it has not been an active site for a long time. With respect to the proposed commercial/light industrial development and the proposed slab-on-grade construction of the buildings, there is a low risk of vapour intrusion.

4.9 Dust and Litter

A landfill has the potential to generate litter and fugitive dust emissions when active, however, the subject site is associated with a reported former waste disposal site, which has not actually been located/confirmed. As such, there are no identified concerns related to dust and litter issues within the surrounding area.

4.10 Noise Control Plan

Based on the subject site's location within an established industrial park and it being a former waste disposal site, there are no identified concerns related to landfill traffic noise.

4.11 Contaminated Soil and Groundwater

Soil

A total of twenty-three (23) boreholes have been advanced across the subject site as part of previous and current subsurface investigations carried out by Paterson Group and by others. Based on the available data, fill material encountered in the boreholes contained waste road building materials, consistent with Tomlinson's past on-site activities. Minor

PAH impacts were identified in one sample which are considered to be a result of asphalt in the fill material. No evidence of domestic waste or related contaminants were observed in any of the boreholes or analyzed soil samples.

Shallow/Unconfined Aquifer Monitoring Wells

On-site groundwater monitoring wells have been sampled and analyzed for petroleum hydrocarbons (PHCs, F1-F4), polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs), which are commonly associated with landfill contaminants. No VOCs or PHCs were detected in any of the samples. Several PAH parameters were detected, however, they met the drinking water standards, as per O.Reg.169/03. As such, the groundwater does not exhibit characteristics typically associated with leachate indicator parameters. Therefore, it is interpreted that the groundwater at this location has not been impacted by a former waste disposal site.

Deep/Confined Aquifer Monitoring Wells

As part of the 2022 monitoring program conducted by GHD, a deep well (A342117) was installed within the confined bedrock aquifer in the central portion of the subject site. In addition to the supply well, an observation well (MW7-08) was installed on the western portion of the site.

No volatile organic compound (VOC), petroleum hydrocarbons (PHCs, F1-F4) and polycyclic aromatic hydrocarbons (PAHs) concentrations were detected in the deep supply well during the 2022 sampling event. Based on the laboratory results, no health-related parameter exceedances were observed with respect to the ODWS. Several exceptions include aesthetic objectives for hardness, total dissolved solids, manganese and iron. The elevated parameter concentrations are not related to typical leachate parameters observed in groundwater. Therefore, it is interpreted that the groundwater at this location has not been impacted by a former waste disposal facility.

4.12 Rodents, Vectors and Vermin

Rodents, vectors and vermin are commonly associated with active landfill sites, however no domestic waste materials have been identified on-site or in the area. Furthermore, the purported landfill was reportedly active in the 1960s. during the previous and current subsurface investigations. As such, no conditions that support the presence of rodents, vectors, and vermin are considered to exist.

5.0 Conclusion

Based on a review of the available environmental reports prepared for the subject site and neighbouring lands, it is our opinion that the former waste disposal site (X 9013) was not located on the subject property. Regardless, there is no evidence to suggest any potential adverse impact on the proposed development from typical former landfill characteristics.

6.0 Statement of Limitations

The recommendations provided in this report are in accordance with our present understanding of the project.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than W.O. Stinson & Son Ltd. is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of this report.

Paterson Group Inc.

Mark D'Arcy, P.Eng., Q.P.ESA

Report Distribution:

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- ❒ Paterson Group Inc.

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

159 Colonnade Road
Unit 3
Ottawa, Ontario K2E 7L9

Pine Environmental Services, Inc.

Instrument ID 39780
Description Gem 5000
Calibrated 7/29/2025 4:47:19PM

Manufacturer CES Landtec
Model Number Gem 5000
Serial Number/ Lot Number G504533
Location Ottawa
Department

State Certified
Status Pass
Temp °C 24.7
Humidity % 36

Calibration Specifications

Group # 1
Group Name Methane (CH4)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.0

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.0 / 0.0	%Volume	0.0	%Volume	0.0	0.0	0.00%	Pass
50.0 / 50.0	%Volume	50.0	%Volume	50.7	50.0	0.00%	Pass

Group # 2
Group Name Carbon Dioxide (CO2)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.0

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.0 / 0.0	%Volume	0.0	%Volume	0.0	0.0	0.00%	Pass
35.0 / 35.0	%Volume	35.0	%Volume	35.6	35.0	0.00%	Pass

Group # 3
Group Name Oxygen (O2)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.0

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
20.9 / 20.9	%Volume	20.9	%Volume	21.7	20.9	0.00%	Pass

Group # 4
Group Name Carbon Monoxide (CO)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	PPM	0.00	PPM	0.00	0.00	0.00%	Pass
1000.00 / 1000.00	PPM	1000.00	PPM	999.00	1,000.00	0.00%	Pass

Group # 5
Group Name Hydrogen Sulfide (H2S)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC

159 Colonnade Road
Unit 3
Ottawa, Ontario K2E 7L9

Pine Environmental Services, Inc.

Instrument ID 39780
Description Gem 5000
Calibrated 7/29/2025 4:47:19PM

Group # 5
Group Name Hydrogen Sulfide (H2S)
Stated Accy Pct of Reading
Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
0.00 / 0.00	PPM	0.00	PPM	0.00	0.00	0.00%	Pass
50.00 / 50.00	PPM	50.00	PPM	42.00	50.00	0.00%	Pass

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

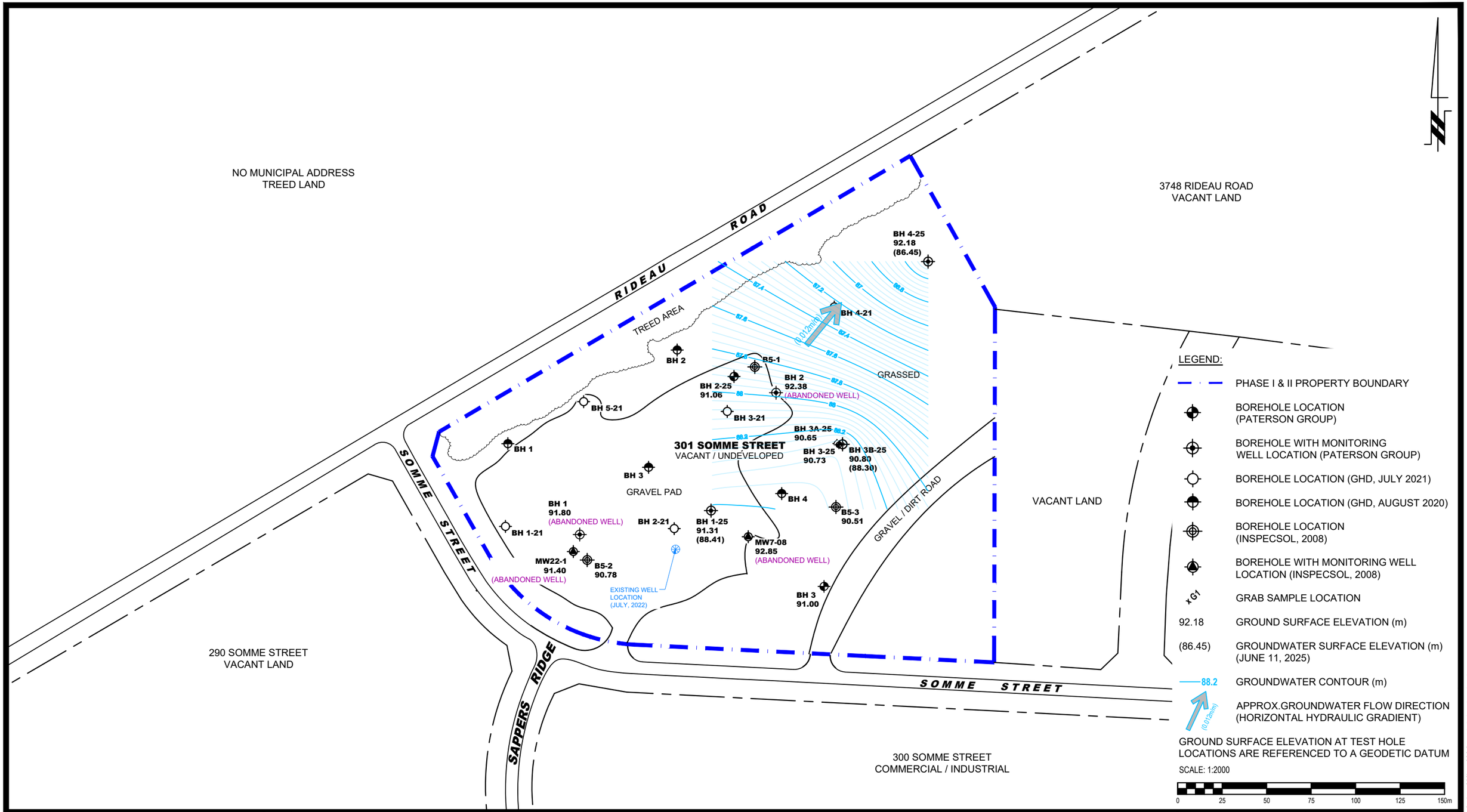
Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date
R0D CH450%CO235%_364493	R0D CH450%CO235%_364493	Calgaz		402364493-1		3/10/2026
R0D H2S 50 PPM, CO1000PPM_2753-1	R0D H2S 50 PPM, CO1000PPM_2753-1	Calgaz	32278	302-403002753-1		4/1/2026

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Melanie Gagnon

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance



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NO.	REVISIONS	DATE	INITIAL

W.O. STINSON & SONS LTD.

LANDFILL IMPACT ASSESSMENT
301 SOMME STREET

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:2000	Date: 08/2025
Drawn by: YA	Report No.: PE7096-LET.03
Checked by: JD	Dwg. No.: PE7096-3R
Approved by: MSD	Revision No.:

11x17

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