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

patersongroup.ca

August 15, 2025
File: PE7190-LET.01

Titan Environmental Containment
1065 Old Path 59
Ile Des Chene, Manitoba
R0A 0T1

Attention: **Mr. Juice Lambert**

Subject: **Landfill Impact Assessment**
541 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 541 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 (X9013), reportedly located on site, 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 one-storey warehouse with a mezzanine and an office along with associated parking and infrastructure. The proposed building 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, Paterson and Pinchin for the subject property and surroundings. The CRA report was completed for the entire Hawthorne Industrial Park.

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 541 Somme Street, is situated on the east side of Somme Street, in the City of Ottawa. The subject land is zoned as a Rural Heavy Industrial (RH) Zone and is approximately 0.8 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 (MECP) 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 the subject property consists of a fill layer (0.6 to 1.3m) generally comprised of loose to compact, grey to brown silty sand to sandy silt with traces of topsoil, gravel and crushed stone. 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 bedrock. Bedrock in the area was observed between approximately 0.6 to 1.3m below ground surface and consists of a combination of sandstone and dolostone of the Nepean Formation and Beekmantown Formation, respectively.

4.4 Hydrogeological Review

The local groundwater flow in the area is towards the east. Groundwater on the subject property was encountered within the bedrock layer. During the most recent monitoring event (2019), groundwater was measured to flow towards the east with a hydraulic gradient of 0.008m/m.

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 on the lack of information pertaining to the reported landfill, there are no known leachate characteristics, specific to this disposal site.

The groundwater tested to date across the industrial park does not appear to have been affected by typical 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 existing monitoring well.

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 the existing monitoring well 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	BH2-24
Methane (CH_4)	0.0	0.0
Hydrogen Sulfide (H_2S)	0.0	0.0
Carbon Dioxide (CO_2)	0.0	0.0
Carbon Monoxide (CO)	1	1
Oxygen (O_2)	21.2	21.1
Balance	78.8	78.9

No methane, hydrogen sulfide or carbon dioxide concentrations and minimal amounts of carbon monoxide were detected in the headspace of the existing monitoring well. The composition of the gas detected in the monitoring well is consistent with the ambient air readings 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 or would be expected, since the reported waste site has not been an active site for a long time. Furthermore, with respect to the proposed commercial/light industrial development and the proposed slab-on-grade construction of the building, there is a very low risk of vapour accumulation in a building of this nature.

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 for the proposed development.

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 eight (8) boreholes and one (1) test pit 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 and test pit contained silty sand and/or sandy silt, with trace amounts of topsoil, gravel and crushed stone deposited during Tomlinson's past on-site activities. No evidence of domestic waste or related contaminants were observed in any of the boreholes/test pits or analyzed soil samples.

Groundwater

An on-site groundwater monitoring well was sampled and analyzed in 2019 for petroleum hydrocarbons (PHCs, F1-F4), polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs), which are commonly associated with landfill contaminants. No VOCs, PHCs and PAHs were detected in the sample, with the exception of an

elevated level of chloroform. The chloroform concentration is considered to be a result of the use of municipal water during the rock coring process and will dissipate readily.

As part of Paterson's Hydrogeological Assessment and Terrain Analysis completed in 2025, a new well was installed on-site (TW1; A421912) within the bedrock aquifer, located on the western portion of the subject site.

No volatile organic compound (VOC), petroleum hydrocarbon (PHC, F1-F4) or polycyclic aromatic hydrocarbon (PAH) concentrations were detected in the test well during the 2025 sampling event. The remaining inorganic and potable water test parameter results are not considered to be indicative of typical landfill leachate characteristics. 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 reported 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 Titan Environmental Containment. is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of this report.

Paterson Group Inc.

Joshua Dempsey, B.Sc.

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

Report Distribution:

- ❒ Titan Environmental Containment
- ❒ Paterson Group Inc.

Attachments:

- ❒ Certification of Calibration
- ❒ Drawing No. PE7190-1 – Test Hole Location Plan

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

401 SOMME STREET
VACANT

SOMME STREET

300 SOMME STREET
COMMERCIAL
(AUTO WRECKER)

BH 1-24
89.30
{88.18}

PROPOSED TITAN
WAREHOUSE

BH 3-24
89.68
{88.82}

TP 12-22
90.05
[88.95]

541 SOMME STREET

GRASSED

BH 2-24
89.58
{88.31}

BH 4
89.43
[87.70]

TREED

5208 RAMSAYVILLE ROAD
AGRICULTURAL LAND

549 SOMME STREET
VACANT

LEGEND:

- BOREHOLE WITH MONITORING WELL LOCATION
- BOREHOLE LOCATION
- TEST PIT LOCATION (PATERSON GROUP REPORT PG6552, 2022)
- BOREHOLE LOCATION (PATERSON GROUP REPORT PG5306, 2019)

89.30 GROUND SURFACE ELEVATION (m)

[87.70] BEDROCK SURFACE ELEVATION (m)

{87.70} PRACTICAL REFUSAL TO AUGERING ELEVATION (m)

GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:600

0 5 10 15 20 25 30m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

TITAN ENVIRONMENTAL CONTAINMENT
LANDFILL IMPACT ASSESSMENT
PROPOSED COMMERCIAL DEVELOPMENT
541 SOMME STREET
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:600	Date: 08/2025
Drawn by: GK	Report No.: PE7190-LET.01
Checked by: JD	Dwg. No.: PE7190-1
Approved by: MD	Revision No.:

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11x17