Impact Assessment Study – Mining Hazards
4380 Trail Road, Ottawa, Ontario

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1 Introduction

1.1 Project Description

Since 2015, Drain-All Ltd. (now Green For Life [GFL]), has been managing inert fill and clean soil at a former sand a gravel pit located at 4380 Trail Road hereinafter referred to as the 'Site'. These activities are now governed by Ontario Regulation 406/19. In December 2020, GFL submitted an Environmental Compliance Approval (ECA) application to the Ministry of Environment Conservation and Parks (MECP) for the continuation of the operation of the soil management activities. As part of the ECA approval process, the MECP requires that the zoning needs to be changed to match the site operations. Specifically, the zoning for the Site needs to be amended to Rural General Industrial Zone (RG) from Parks and Open Space Zone – O1 and Mineral Aggregate Reserve Zone, Rural Exception 7 – MR[7r].

As part of the Zoning By-Law Amendment (ZBLA) and Site Plan Approval (SPA) process, an Impact Assessment Study – Mining Hazard (IAS) is required to be completed.

1.2 Project Objectives

As per the City of Ottawa Terms of Reference, the objective of an IAS is to identify or confirm if lands have been mined for minerals, petroleum or mineral aggregates and to evaluate the site for the presence of mine hazards. Where a mine hazard, or abandoned pit or quarry exists, the proponent is to:

- Evaluate the potential risks to human health and property;
- Establish measures to address and mitigate known or suspected risks; and,
- Demonstrate that the site can be rehabilitated to support the proposed development.

1.3 Scope of Work

To achieve the objectives, EXP completed the following:

- Review previous reports;
- Review provincial databases;
- Review planning requirements;
- Conduct site reconnaissance;
- Compile data; and,
- Prepare a report summarizing the results of the investigation.

2 Site Background

2.1.1 Site Description

The Site is a former sand and gravel pit that is located on the south side of Trail Road, east of Moodie Drive (Figure 1). The Site covers an area of approximately 4.2 hectares. The Site is bounded by the active Trail Road Landfill to the north across Trail Road, and the closed Nepean Landfill to the north and west. The property to the south and west of the Site is referred to as the South Aggregate Pond, which is involved with sand and gravel extraction. Industrial properties are also present in the study area (Figure 2).

According to the City of Ottawa GeoOttawa on-line mapping tool, the south part of the IAS property is zoned for mineral extraction. The northwest part of the IAS property, parallel to the property line, is zoned for open space. Surrounding properties to the south, east, and west are zoned mineral extraction zones. The property north of the IAS property is zoned rural countryside.

The former a gravel pit that was historically operated by different owners predated the licensing requirements under the Aggregate Resources Act, which came into effect in 1990. Apart from extraction activities, the site has not been developed in the past.

2.1.2 Previous Studies

As part of the ZBLA and SAP process, EXP has completed several studies for the site:

- EXP Services Inc., Proposed Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario, May 13, 2022
- EXP Services Inc. Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario
- EXP Services Inc. Geotechnical Investigation – Slope Stability Analysis in Support of Zoning By-Law Amendment, 4380 Trail Road, Ottawa, Ontario, December, 2023
- EXP Services Inc. Phase One Environmental Site Assessment, 4380 Trail Road, Ottawa, Ontario, June, 2023
- EXP Services Inc. Stormwater Management Report, 4380 Trail Road, Ottawa, ON, December, 2023
- EXP Services Inc. Zoning Plan C002
- EXP Services Inc. Site Rehabilitation Plan C003
- EXP Services Inc. Ultimate Siter Grading Plan C200-4
- EXP Services Inc. Ultimate Erosion and Sediment Control Plan C300
- EXP Services Inc. Pre-Development Catchments C400
- EXP Services Inc. Post-Development Catchments C500

Based on the previous studies, the Phase One Environmental Assessment and Groundwater Monitoring did not identify environmental impacts related to past or current site operations. The slope stability report recommended rehabilitation steps be considered to stabilize the steeper slope sections on site. This latter work indicated some of the existing gravel slopes required regrading and/or backfill placement.

The civil engineering studies and drawings have been completed to support continued site operations related to soil management.

2.1.3 Site Topography

Topographic surveys were completed by EXP (February 2022) and Farley, Smith and Denis Surveying (April 2022) to a geodetic benchmark. The surveys indicate the surface elevation of the Site base ranges between approximately 99.5 metres above sea level (masl) at the west end of the Site to 101.8 masl at the east end of the Site. Trail Road, representing original ground surface, is approximately 110.5 masl.

As the Site, and surrounding properties to the south (South Aggregate Ponds) have been used for extraction of aggregate resources and landfilling, the topography varies significantly locally.

2.1.4 Local Surface Water Features

The IAS property is located on the north boundary of the Mud Creek watershed. Properties to the east are part of the Jock River – Leamy Creek Watershed, and properties to the north are part of the Jock River Barrhaven watershed.

The South Aggregate Ponds (Burnside Ponds) are present south adjacent to the Phase One property. The ponds were generated by aggregate extraction activities on the property. Due to extraction activities, the elevation of the ponds is significantly lower than surrounding properties. The ponds have no outlet and can therefore be considered representative of the local water table (shallow aquifer).

Engineering studies are being completed by EXP to manage stormwater on-site.

2.1.5 Local Geology

A summary of subsurface soil stratigraphy is provided in the following paragraphs. The soil descriptions are based on the borehole logs from previous investigations. Based on the borehole logs, the general subsurface soil stratigraphy consists of the following units from top to bottom:

Sand

A layer of fine, medium to coarse grained, well-sorted sand was present from surface to between 17 to 37 m bgs. The sand was interbedded with layers of fine to very fine-grained sand.

Silty Cobbly Till

A silty cobble till was encountered overlying the bedrock in MW-1 (P-1) (encountered 17.2 meters below ground surface). This layer consisted of poorly sorted till with cobbles.

Dolostone Bedrock

Bedrock was not encountered in any of the boreholes on the Site. Based on regional maps and previous investigations, bedrock is anticipated to be dolostone of the Oxford Formation and present approximately 30 to 35 m bgs. In boreholes to the southeast and north of the Site bedrock was encountered at 17 m bgs and 37 m bgs respectively. Bedrock appears to be dipping to the north.

2.1.6 Local Hydrogeology

Static water levels in the monitoring wells installed on the Site were recorded on June 8, 2022 and May 5, 2023. Based on field measurements, the static water level in the overburden deposit ranged from 2.8 m to 6.7 metres below ground surface (mbgs) in May 2023 and 3.2 to 7.0 mbgs in June 2022. Based on the depth to groundwater measures, there was a difference of 0.3 to 0.43 metre between wet and dry seasons.

Based on the above water levels, the shallow overburden groundwater flow direction on the Site is to the north (Figure 2 and 3).

2.2 Site History

2.2.1 Site Ownership

Based on a review of GeoWarehouse, the following ownership chain was identified:

Sale Date	Type	To
July 31, 2013	Transfer	Drain-All Industrial Services Ltd..
July 30, 2008	Transfer	2177302 Ontario Ltd.

May 9, 1998	Transfer	Bakermet Inc.
Sep 12, 1967	Transfer	Marcel Brazeau
November 26, 1953	Transfer	Patrick Lennon

2.2.2 Provincial Database Review

EXP reviewed the Geology Ontario website, www.geologyontario.mndm.gov.on.ca and Aggregate Resources Inventory of the City of Ottawa, Southern Ontario; Ontario Geological Survey. Based on that review, there are no records of abandoned mines or wells at the site. The site is free of any mine hazards, which is current to the updated Geology Ontario site, 2022-04-29.

2.2.3 Historical Aerial Photographs

Aerial photographs dated 1976, 1991, 1999, 2005, 2008, 2015, and 2019 were available for review on the City of Ottawa website. Aerial photographs dated prior to 1976 were not available for review. The following table summarizes the development and land use history of the IAS property and adjacent properties as depicted on the reviewed aerial photographs. Copies of the aerial photographs are provided in Appendix E.

Year	Details
1976	The IAS property, as well as the adjacent properties to the east and south appear to be operating as aggregate resource operations. The Nepean Landfill is present to the west of the IAS property. The remainder of the IAS study area consists of farmland.
1991	Additional material has been removed from the IAS property, and aggregate stockpiles are present on the site. Expansion of aggregate resource activities has occurred on the south adjacent properties. The Trail Road landfill is present to the north of the IAS property across Trail Road.
1999	No significant changes on the IAS property or adjacent and surrounding properties.
2005	Pit operations no longer appear active on the site or south adjacent property. The excavated area on the south adjacent property has infilled with water (South Aggregate Ponds).
2008	The IAS property is similarly developed to the 2005 aerial photograph. The Plastec energy-from-waste demonstration facility has replaced the existing budling on the property to the west. Trail Road landfill operations have expanded to the east.
2015	The IAS property is in use as a soil disposal site. The de-canting area for liquid soils is visible at the northwest corner of the site. No significant changes were observed on the adjacent and surrounding properties.
2019	No significant changes on the IAS property or adjacent and surrounding properties.

The IAS property appears to have been used as an aggregate resource operation between the 1970s and the 1990s. As of 2015, Drain-All has been operating the IAS property as a receiver site for unimpacted excess soil.

2.2.4 Current Operations

Since 2015, GFL has been operating the Site as a receiver site for unimpacted excess soil generated from various construction sites throughout the region. There are two areas where soil is stored on the Site. Incoming excess soil is initially placed in either Zone A for liquid soils (for decanting) or Zone B for dry soils. The soil is then sampled and analyzed for various parameters to confirm suitability for final placement on the site (Figure 2).

During this time, the IAS property has received approximately 30,000 tonnes of clean soil. Imported fill material consists of excess soil generated from various construction sites throughout the region.

3 Physical Site Review

3.1 Current Site Conditions

On July 21, 2023, EXP conducted a site visit and reviewed basic operational matters with the GFL representative. Photographs of our inspection are provided in Appendix E. During our site visit, we examined the area for any evidence of mine hazards and for any indication of former extraction workings.

Based on our site observations, no evidence of previous aggregate extraction activities and/or risks associated with aggregate extortion were noted.

3.2 Security and Site Access

Access to the Site during operating hours comes from a gated entrance on Trail Road at the north end of the IAS site. When not in business, the gate is locked to prevent vehicle traffic. To the north, there is a medium height (1-2 m) treed/bushed berm that runs along Trail Road along the north property boundary. Along the northwest and west property lines adjacent to the former Nepean Landfill, there is sporadic wire fencing whereas the property to the east is fenced along Trail Road. Access to the Site along the south property line is limited by the esc.

Due to its location, there is limited potential for pedestrian traffic onto the Site.

3.3 Site Rehabilitation

As part of the application for rezoning and site plan approval, a rehabilitation plan has been prepared for the site.

4 Planning Review

Policies for the management of hazards, both natural and human-made, to protect human health are set out in the Provincial Policy Statement (PPS 2020) and the City of Ottawa Official Plan.

4.1 Provincial Policy Statement (PPS 2020)

The PPS 2020 states that:

> "*Development on, abutting or adjacent to lands affected by mine hazards; oil, gas and salt hazards; or former mineral mining operations, mineral aggregate operations or petroleum resource operations may be permitted only if rehabilitation or other measures to address and mitigate known or suspected hazards are under way or have been completed*" (PPS Section 3.2.1)

The proposed use can be considered as an activity which is related to the rehabilitation of a former (unlicensed) sand and gravel pit operation. The studies completed by EXP have confirmed that there are no mine hazards on the subject property.

Section 3.2.3 of the PPS states:

> "*Planning authorities should support, where feasible, on-site and local re-use of excess soil through planning and development approvals while protecting human health and the environment.*"

The proposed rezoning is consistent with the policies of the PPS as they relate to protecting public health and safety.

4.2 City of Ottawa Official Plan

The Official Plan for the City of Ottawa was recently updated and approved by the Ministry of Municipal Affairs and Housing in November 2022.

Section 10 of the Official Plan sets out policies for the Protection of Health and Safety and includes measures to protect people and property from the impacts of natural and human-made conditions. Section 10.1.10 deals "Abandoned mineral and mineral aggregate mining operations, and abandoned petroleum resource operations".

In general, the policies provide that development shall be directed away from areas of natural or human-made hazards, where there is an unacceptable risk to health or safety or of property damage, and shall not create new, or aggravate existing, hazards.

Prior to development on lands adjacent to hazards from mining it shall be required to identify, address and mitigate known or suspected hazards. Where development is proposed where a mine hazard, or abandoned pit or quarry exists, the proposal shall:

a) Evaluate the potential risks to human health and property.

b) Establish measures to address and mitigate known or suspected risks; and

c) Demonstrate that the site can be rehabilitated to support the proposed land use.

Development shall not be permitted within 300 metres of a mine hazard, or abandoned pit or quarry unless measures to address and mitigate known or suspected risks to human health and property are provided.

The proposed zoning amendment would permit the ongoing use of the property for the management of excess soils, in coordination with an Environmental Compliance Approval from the MECP. Management of excess soils at active and depleted mineral aggregate resource operations is common in Ontario. Imported fill is often required to rehabilitate aggregate sites. This activity is jointly regulated by the Ministries of Natural Resources and Forestry (MNRF) and Environment Conservation and Parks (MECP).

The subject lands are within an area of former and active mineral aggregate operations. All of the adjacent properties on the south side of Trail Road are zoned for mineral aggregate extraction. The parcel on the north side of Trail Road is zoned Rural and used as the Trail Road Landfill operated by the City of Ottawa. There are no sensitive land uses located in proximity to the GFL site (Figure 2). There are no expected risks to human health or property associated with the proposed use.

The proposed rezoning conforms with the policies in the City of Ottawa's Official Plan.

5 Conclusions

Based on our site visit and records review, no previous mining or aggregate extraction hazards were observed at the site that could cause potential human and /or property risk.

6 Limitations

This report is based on a limited investigation designed to provide information to support an assessment of the current and future site operations as it pertains to risk to human health and property. The conclusions and recommendations presented within this report reflect Site conditions existing at the time of the assessment.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience/engineering profession. No other warranty or representation, either expressed or implied, is included or intended in this report.

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We trust that this information is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

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Appendix A – Figures

Appendix B – Topographic and Legal Surveys

Appendix C – Engineering Drawings

Appendix D – Aerial Photographs

Appendix E - Site Photographs

Appendix F - Curriculum Vitae