Township of Drummond/North Elmsley
Committee of the Whole

Report By	**Brady McGlade, Planner**
Date	**April 25, 2023**
Report Title	**Whyte Zoning Amendment – ZA-22-10**
	1688 Rideau Ferry Road, Part Lot 23 and 24, Concession 7, North Elmsley

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Staff Recommendation: **Resolution ☒** **Direction ☐** **Information ☐**

THAT the Committee of the Whole **defer** a decision for zoning amendment application ZA-22-10, an application to rezone a portion of lands described as 1688 Rideau Ferry Road, Part Lot 23 and 24, Concession 7, North Elmsley, from Rural (RU) to Rural Exception Zone (RU-X), to permit a place of recreation, which shall be restricted to a gun range and a gun (shooting) club as an additional permitted use.

Purpose:

The Township has received a site-specific zoning amendment application to rezone a portion of lands located at 1688 Rideau Ferry Road and described as Part Lots 23 and 24, Concession 7, North Elmsley. The purpose of the amendment is to:

- Change the zoning of the affected portion of the property from Rural (RU) to Rural Exception Zone (RU-X), to permit the following use in addition to the uses permitted in the RU Zone:
    - Place of recreation, which shall be restricted to a gun range and a gun (shooting) club.
        - A gun range shall be defined as any use of land by the public, meaning any individuals attending for the outdoor or indoor discharge of firearms, whether for recreational use such as target practice, skeet shooting, trap shooting, or for firearms training purposes.
        - A gun (shooting) club shall be defined as a for-profit or not-for-profit organization whose activities include target practice or target shooting competitions using restricted firearms or prohibited handguns at an identified approved shooting range.

Background:

The purpose of ZA-22-10 is to allow the property owner of 1668 Rideau Ferry Road to establish a shooting range and shooting club on a portion of the property. The Applicant is proposing to rezone a portion of the property to a rural exception zone, with a place of recreation being additional permitted use, limited to a shooting range and shooting club. Township Staff were contacted by the property owner in February of 2022 requesting a letter from the Township

providing that a shooting range formally used by OPP at 1688 Rideau Ferry Road was a permitted use or a legal non-conforming use. Township Staff advised that the use of a shooting range did not comply with the permitted uses of the Rural zone, nor was it considered a legal non-conforming use. As such, the property owner was advised that a zoning amendment would be required to allow the use.

Based on information gathered in the review of this application, it is understood that the shooting range was constructed in approximately 1995 by the OPP for training purposes, and approximately 400-500 OPP officers would use the range annually to participate in annual firearms requalification. The OPP would annually notify neighbours regarding the dates on which the range would be used. During the review of the subject application, Township Staff were provided dated letters from 2014-2019 sent by the OPP. The letters provided notice of the dates when the range would be used for training. The number of days the range was used in a year varied between 18 to 38 days. The actual number of days the gun range was used each year is unknown. The OPP would occasionally use the range at night in the fall months. The range that the OPP used is approximately 70 metres in length and has a constructed berm at the end of the range. A pavilion is present, and it is understood that a clubhouse is normally present, however, it was not present during the Staff site visit.

Presently, a majority of the property is zoned Rural, except the northwest portion of the lot that is within a Provincially Significant Wetland (PSW). The Rural Zone allows a wide range of low-impact uses typical to a rural setting, including single-family residential, agriculture, conservation and forestry.

The subject property is a large landholding, approximately 55 hectares, consisting of fields, woodlands and wetlands. The site of the proposed gun range is located within a former gravel pit which was utilized in the 1960s for gravel. A single-detached residential dwelling currently occupies the property. The area subject to this zoning amendment application is accessed from a separate entrance from the residential dwelling located at 1688 Rideau Ferry Road. The Applicant proposes upgrading the existing field entrance to the required standards provided by the County of Lanark. Rideau Ferry Road is a County road, and as such, upgrades and changes to the entrances are subject to County approval, which has been provided.

The area of the property that is proposed to be rezoned is located on the northeast portion of the property.

To the west of the subject lands, a wetland separates the area that is subject to the zoning amendment and a number of residential lots. Several residential lots along both sides of Rideau Ferry Road are currently vacant or occupied by a residential dwelling. Further to the west is Otty Lake, and residential development surrounds Otty Lake on public and private roads. Subdivision development is located off Mile Point Road.

To the south of the subject lands, a mix of residential and agricultural land uses surround Rideau Ferry Road. Lots sizes vary in size along Rideau Ferry Road, and the Big Rideau Lake is located to the south of the subject lands.

The Tay Marsh is located north of the subject lands. The Tay Marsh is identified as a PSW. The properties to the immediate north of the unopened road allowance are occupied by the Millar Broke Farm, a farm and an equestrian training facility.

To the east of the subject lands are land holdings that are predominately occupied by residential dwellings located along Rideau Ferry Road and Port Elmsley Road. The north portion of the lots to the east are generally used for agriculture or are covered by mature woodland.

In support of the application, the Applicant has submitted the following:

- Planning Justification Report – Zanderplan – July 19, 2022
- Noise Study – BT Engineering – July 13, 2022

Since the December 6 2022, COW meeting, in which the last Staff report was provided, the Township has received a completed peer review of the BT Engineering Noise Study, dated July 13, 2022. The Township has also received the following documents from members of the public:

- Phase 1 Environmental Site Assessment, Smiths Falls IST Range, 1686 County Road #1, Perth ON, Project number: BRM-00244589-A0, prepared by EXP Services, dated September 4, 2018

- Phase 2 Environmental Site Assessment, Smiths Falls IST Range, 1686 County Road #1, Perth ON, Project number: BRM-00244589-A0, prepared by EXP Services, dated March 20, 2019

- Remedial Options, Smiths Falls IST Range, 1686 County Road #1, Perth ON, Project number: BRM-00244589-A0, prepared by EXP Services, dated May 7, 2019

- Soil Remediation Cost Estimate – Rev. A. Smiths Falls Firing Range at 1688 County Road #1, Perth, ON. Englobe File.: 02202823.000, Prepared by Englobe, dated December 16, 2022

It is understood that members of the public obtained the provided documents listed above through requests for access to information through the Ministry of the Solicitor General of Ontario. Information regarding site contamination referred to by the Applicant in original submissions was not provided to Staff upon request.

Jurisdiction Overview

Federal Regulation:

It is the responsibility of the Chief Firearms Officer (CFO) to license and regulate firearm ranges under federal regulations. The purpose of licensing is to ensure safe firearms practices are being followed. The CFO does not regulate sound relating to outdoor or indoor ranges. Regulations for storage, ownership and transportation of a restricted or prohibited firearm are the responsibility of the Royal Canadian Mounted Police (RCMP) and CFO.

As per s.3(2)(d) of Regulation SOR/98-212, a request for approval of a shooting range must be accompanied by evidence of compliance with applicable zoning laws. SOR/98-212 regulations are not intended or designed to consider the land use compatibility considerations that a municipality evaluates in land use planning decisions. Township approval is only one step/requirement in receiving approval through CFO. As per s.2(3) a shooting range that is used only by public officers within the meaning of subsection 117.07(2) of the Criminal Code is exempt from the application of these Regulations (SOR/98-212) on condition that each public officer uses

the shooting range only in connection with his or her lawful duties or employment.

Provincial Involvement:

The Ministry of the Environment, Conservation and Parks (MECP) is responsible for protecting clean and safe air, land and water to ensure healthy communities, ecological protection and sustainable development for present and future generations. In fulfilling their role, the MECP ensures the sources of emissions to the environment are adequately controlled to prevent the potential for adverse effects, and this includes noise emissions to the environment. To assist in understanding, and presumably to assist in the regulating of noise emissions, the MECP established noise guidelines.

In 2013, NPC-232 was replaced with NPC-300 as the new Noise Guidelines for Stationary Sources. As stated by the MECP, NPC-300 is a guideline and is intended to be used by municipalities, as such, in particular, when considering making land use planning decisions or when drafting or reviewing noise by-laws. The NPC-300 guideline differentiates between the source of sound from a steady and from an impulsive sound from a stationary source. For a sound from a stationary source, including quasi-steady impulsive sounds but not including other impulsive sounds, the sound level limit at a point of reception is expressed in terms of the one-hour equivalent sound level (Leq). For impulsive sound, other than quasi-steady impulsive sound, from a stationary source, the sound level limit at a point of reception is expressed in terms of the Logarithmic Mean Impulse Sound Level (LLM). A shooting range produces an impulse noise.

The levels set in NPC-300 for an impulsive sound source are based on the average of the total number of impulses recorded in an hour. Based on a Township Staff review of the NPC-300 guideline, the subject lands would be considered a Class 3 Area, which is described as a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as a small community, agricultural area, a rural recreational area such as a cottage or a resort area or a wilderness area. Charts 1 and 2 below are excerpts from NPC-300, which show the NPC-300 Class 3 Area Guidelines for impulsive sounds. Under normal firing range operations, more than 9 impulses or shots would be fired within an hour.

NPC-300 - Table B-3
Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)
Outdoor Points of Reception

Time of Day	Actual Number of Impulses in Period of One-Hour	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 – 23:00	9 or more	50	50	45	55
	7 to 8	55	55	50	60
	5 to 6	60	60	55	65
	4	65	65	60	70
	3	70	70	65	75
	2	75	75	70	80
	1	80	80	75	85

Chart 1

NPC-300 - Table B-4
Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)
Plane of Window – Noise Sensitive Spaces (Day/Night)

Actual Number of Impulses in Period of One-Hour	Class 1 Area (07:00–23:00)/ (23:00–07:00)	Class 2 Area (07:00–23:00)/ (23:00–07:00)	Class 3 Area (07:00–19:00)/ (19:00–07:00)	Class 4 Area (07:00–23:00)/ (23:00–07:00)
9 or more	50/45	50/45	45/40	60/55
7 to 8	55/50	55/50	50/45	65/60
5 to 6	60/55	60/55	55/50	70/65
4	65/60	65/60	60/55	75/70
3	70/65	70/65	65/60	80/75
2	75/70	75/70	70/65	85/80
1	80/75	80/75	75/70	90/85

Chart 2

Understandably, the impact of stationary noise (i.e. noises at a steady level, such as a lawn mower) is much different than the impact of impulse noise, such as gunfire. Therefore, it would be understandable that the recommended noise limits should also be different.

Municipal Role:

In relation to shooting ranges, the Township has the authority to regulate land uses through the Zoning By-law. Planning decisions must be consistent with the Provincial Policy Statement and conform to the Lanark County SCOP and the Township Official Plan.

December 6, 2023 Question Regarding the Role of the Environmental Protection Act:

During the December 6, 2023 COW meeting, Councilor Kehoe inquired about the role of the Environmental Protection Act (EPA), which is administered and enforced through the Ministry of Environment, Conservation and Parks (MECP), and the role of the Township in ensuring land use planning decisions are consistent with the EPA intent. Staff provide the following comments: -- Section 14 of the EPA prohibits the discharge of a contamination to the natural environment that causes or may cause an adverse effect. The definition of contamination is broadly defined but does include (but is not limited to) any solid, sound or vibration or combination. An adverse effect is broadly defined to mean one or more of the following: the impairment of the quality of the environment for any use that can be made of it, injury or damage to property or to plant or animal life, harm or material discomfort any person, an adverse effect on the health of any person impairment on the safety of any person, rendering any property or plant or animal life unfit for human use loss of enjoyment of normal use of property and interference of the normal conduct of business. It is important to note that section 9 of the EPA prohibits the use or operation of a facility that may discharge a contaminant into the natural environment, other than water, without an environmental compliance approval (ECA). Most industrial uses that discharge contaminants are required to apply for an ECA prior to the discharge of contaminants however, there are specific uses that are exempt from applying for an ECA, such as a new outdoor gun range. All uses, regardless of whether being exempt from the requirement of an ECA, is subject to section 14 of the EPA. In summary, a new gun range would be exempt from the requirements of obtaining an ECA, but the use is not exempt from section 14. It would be the responsibility of the MECP to enforce the EPA. The Township has the authority to request compatibility studies, such as a noise study, in accordance with NPC-300 guidelines, as part of the application review.

Lot Creation: B22/136, B22/137 & B22/138

The subject lands are subject to three consent applications. The consent applications propose to create three 0.72 ha residential lots. The consent applications are each to front on Rideau Ferry Road. Two of the proposed residential lots are currently vacant. Consent application B22/137 proposes to sever the existing residential dwelling. The proposed retained lot, which would include the lands that are subject to the ZA-22-10, is proposed to 46.5 ha. The County of Lanark has circulated the consent application, and comments from the public may be directed to the County as the County is the approval authority of consent applications. The Township will provide comments to the County regarding the proposed lot creation and evaluate the consent applications concerning consistency with the PPS, conformity with the County SCOP and Township Official Plan, and compliance with the Township Zoning By-law.

Report on Notification and Written Comments Received:

Part of the zoning amendment process is to involve neighbours and Council in the process of looking at a change in the land use rules for an area of land. Public consultation is a crucial component of land use planning, and input from any resident and applicable government agency is welcomed in order to assist the Township in ensuring that decisions are in best keeping with the public interest. On October 11, 2022, the Township held a public meeting that was well attended. Several members of the public spoke in opposition to the application, and the Applicant and the Applicant's agent provided additional details of the proposal. On December 6, 2022, Staff prepared and presented a planning report regarding the subject application. Staff recommended that a decision on the subject application be deferred to allow for the completion of the noise study peer review, to ensure the submitted study was completed in accordance with NPC-300 guidelines. Additionally, Staff recommended that information regarding the existing site contamination, proposed clean up and mitigative measures for avoiding new site contamination was needed before a decision was made in recognition of RVCA recommendations.

Amendments to the Zoning By-Law are subject to the provisions of Section 34 of the Planning Act (RSO 1990, as amended). Ontario Regulation 545/06 further outlines the required notifications for the public hearing and the prescribed bodies that must be circulated on the application. Pursuant to the policies of the Act, copies of the Notice of Public Hearing were mailed by Staff to all landowners within 120 metres of the subject property as well as all requisite public agencies. Staff posted the notice in a visible location on the site of the subject lands along Rideau Ferry Road. In addition to this, the required notification notice of the public meeting was posted on the public notice board within the Township office that is available for public viewing.

In evaluating this application, Staff must consider the relevant planning documents and policies, and apply them to this particular site to determine whether this proposal is appropriate. Staff also consider advice and feedback from neighbours who have a strong sense of local context and who would be most affected by a land use planning rules change. An important part of the public participation component is to seek opinions from neighbours and others who may also have particular insight or knowledge about a property or planning issue that may not immediately have been apparent to Township staff.

The written comments received up to November 29 2022, and a petition was presented to the COW and attached to the December 6, 2022 planning report. The minutes of the December 6, 2022 meeting, the planning report, and all attachments are available on the Township website. At this

time, the Township has received approximately 180 written submissions and oral submissions. A petition in opposition to ZA-22-10 was also submitted to the Township in December 2022.

Summary of Noise Study Peer Review

The peer review of the submitted noise study has been completed by WSP (formally WSP-Golder). The specific findings of the review are provided within the report, which is attached to this planning report. The peer review concludes further assessment be completed meeting MECP requirements to address items provided in the review. WSP provides that it does not currently come to the same conclusion as the site can operate in compliance with applicable noise limits. Further assessment is required before WSP can find that the site is expected to be able to operate in compliance with applicable noise limits and not be a potential source of nuisance noise complaints. The peer review has been provided to the Applicant and their consultant to address the shortcomings identified through the peer review. It is normal practice in the review of planning applications to allow the Applicant an opportunity to address the shortcomings identified through the peer review. WSP will provide a review of the amended noise study once submitted by the Applicant.

Summary of Reports Regarding Soil Contamination

EXP Services Inc. completed phases I and II environmental site assessments in 2018 and 2019 for the area of the site occupied by the former range. It is understood that subsequent groundwater, surface water and sediment monitoring was conducted by ECOH Management Inc. and EXP between 2018 and 2021. It is also understood that Englobe prepared a contamination delineation report in November 2022. The Township has not received any reports conducted by ECOH Management Inc. or the delineation report prepared by Englobe. The received reports are attached to this planning report. The provided reports confirm the presence of site contamination. The provided reports also confirm a plan by the OPP to remediate the site; however the full remediation plan has not been provided. It is understood that the remediation project will include the excavation and off-site disposal of hazardous and non-hazardous metal-contaminated soil, backfilling of the excavated areas and site restoration to pre-construction conditions, and decommissioning three existing monitoring wells. It is understood that a contractor will excavate, load, transport, and dispose of up to approximately 1700 tonnes of non-hazardous lead-contaminated soil and approximately 300 tonnes of hazardous lead-contaminated soil. it is also understood that the final grading will be completed to match the existing surrounding grading of the site. It was previously understood that the berm for the gun range would be replaced as part of the OPP remediation of the site however, based on the provided reports, this does not appear to be the case. There has been no confirmation provided when the site work will be completed. It is unknown whether monitoring will continue after the remediation work is completed. Considering that the groundwater test wells are proposed to be decommissioned, it is possible to assume groundwater monitoring will not continue.

Policy Review - Planning Act

Section 34(9) states that no by-law passed under this section applies: (a) to prevent the use of any land, building or structure for any purpose prohibited by the by-law if such land, building or structure was lawfully used for such purpose on the day of the passing of the by-law, so long as it continues to be used for that purpose.

The Planning Act states that a zoning by-law may not prevent the use of any land use that is legally established, provided that the use continues. The subject application for a zoning amendment proposes a new land use for the subject property. The previous use of the range by OPP as a training facility does not establish a ‘grand-fathered’ use to allow for a private gun

range. As a provincial government body, the OPP use of the property would have been deemed a ‘public use’, which would have been permitted. Concerning the current zoning amendment application, it is not the role of the Township Council to determine the legal non-conformity status of the proposed use. Township Council must evaluate the proposal in the context of the application for a zoning amendment for a new land use as described by the application.

Policy Review - Provincial Policy Statement (PPS)

The PPS defines development as the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the Planning Act. An application for a zoning amendment is considered development per the PPS definition.

Section 1.1.1. c) of the PPS states that "healthy, liveable and safe communities are sustained by… avoiding development and land use patterns which may cause environmental or public health and safety concerns."

> *Environmental and public Health – The potential impact of noise has been raised as a possible environmental and health impact caused by the proposed gun range. Concerns have been raised regarding the potential site contamination and possible impacts on water quality within the wetland and groundwater-surface water. The Township has received a letter from Dr. Linna Li, the Acting Medical Officer of Health and Chief Executive Officer of the Corporation of the Leeds, Grenville and Lanark District Health Unit, who provided comments on the subject zoning amendment application, specifically on the potential impacts of lead in spent bullets on the surrounding environment and environmental noise as a health concern. The letter submitted by Dr. Li is provided as an attachment to this planning report. Regarding environmental noise, which Dr. Li explains as any unwanted sound created by human activity, environmental noise can have negative health impacts on humans, specifically regarding cardiovascular effects, cognitive impacts, sleep disturbance, mental health, and pulmonary effects. Dr. Li references the RCMP report on shooting and sounds: "Sudden or unexpected noise can evoke a startle reflex, where the body is prepared for ‘fight or flight.’ The body normally returns to the pre-exposure condition over a period of a few minutes. However, it is suggested that sustained or repeated exposure could lead to persistent changes in the neurophysiological, endocrine, sensory, digestive and cardiovascular systems, which in turn could cause deterioration in health.” Regarding soil contamination, Dr. Li provides concerns regarding lead site contamination and its potential impact on human health. Dr. Li recommends that prior to a decision being made that the Township receives confirmation that the site has been remediated; to see a plan to mitigate future contamination, and to have an enforcement mechanism in place for ensuring mitigation activities are undertaken.*
>
> *Safety concerns – Public safety measures associated with the discharge of firearms and transportation are regulated by the CFO.*

Section 1.1.1. h) of the PPS states that "healthy, liveable and safe communities are sustained by… "promoting development and land use patterns that conserve biodiversity."

> *If the Applicant proposes to alter the area which is proposed to be used for the gun range, including the placement of fill or construction of a building, an environmental impact study will be needed to ensure consistency with the PPS. At this time, no alterations are*

proposed that would impact the diversity of the site, given the physical range was previously constructed.

Section 1.1.4 provides that rural areas are important to the Province's economic success and quality of life. Rural areas are a system of lands that may include rural settlement areas, rural lands, prime agricultural areas, natural heritage features and areas, and other resource areas. Further, it is provided that it is important to leverage rural assets and amenities and protect the environment as a foundation for a sustainable economy. It is acknowledged in section 1.1.4 that Ontario's rural areas have diverse population levels, natural resources, geographies and physical characteristics, and economies. Across rural Ontario, local circumstances vary by region.

By recognizing the diversity of rural areas across the Province, it is understood that the characteristics of the rural area should be considered in its own merits as all rural areas are different. Population density, land use, natural features, local infrastructure and the local economy must be considered in evaluating appropriate uses in a rural area based on local context. A proposed use may be appropriate in one rural area but not in another. The zoning amendment process allows for the opportunity to evaluate the local context to ensure each application is reviewed case by case.

The relevant policies of section 1.1.4.1 provide that healthy, integrated and viable rural areas should be supported by:

a) Building upon rural character and leveraging rural amenities and assets

f) Promoting diversification of the economic base and employment opportunities through goods and services, including value-added products and the sustainable management or use of resources;

g) providing opportunities for sustainable and diversified tourism, including leveraging historical, cultural, and natural assets

h) conserving biodiversity and considering the ecological benefits provided by nature

If approved, the proposed zoning amendment would allow for the commercial use of a gun range within the subject lands. The subject lands are located in the proximity of existing residential development, a commercial equestrian training facility, the Tay River, Otty Lake and Big Rideau Lake. At this time, Staff are not in a position to advise that the proposed use would be building upon the area's rural character. Many comments from the public have raised concerns about the appropriateness of the proposal in this area. Members of the Public provided that it would impact the enjoyment of their rural properties in which they enjoy offerings the natural environment and the associated quietness that it provided. A common theme in comments from the public is that the sound of gunfire would impact their enjoyment due to sudden impulse noises. Written submissions and verbal submissions have provided that members of the public put up with the noise from the range because the police used it, and that there was a sense of a 'greater good.' The OPP recognized the impacts of the gun range on neighbours and, as a courtesy, would notify neighbours on the days the range would have been in use. The subject application proposes to allow, as a right, a private gun range that can be used commercially. It is important to recognize that this is a change of use. The OPP use would have been considered a 'public use', which would have been permitted under the applicable zoning

by-law. While the physical range is there today, the subject application proposes a new land use, as a private gun range. The submission of the zoning application for a zoning amendment recognizes the change of use.

The relevant policies of Section 1.1.4.1 (Rural Lands in Municipalities) provide:

- 1.1.5.3 Recreational, tourism and other economic opportunities should be promoted.

- 1.1.5.4 Development that is compatible with the rural landscape and can be sustained by rural service levels should be promoted.

- 1.1.5.5 Development shall be appropriate to the infrastructure which is planned or available, and avoid the need for the unjustified and/or uneconomical expansion of this infrastructure.

- 1.1.5.6 Opportunities should be retained to locate new or expanding land uses that require separation from other uses.

  The proposed use may provide new recreational and economic opportunities within the Township. However, it is advised that the compatibility of the use must first be determined. Given that a private on-site septic system will service the subject property, the proposed use is expected to be adequately serviced. The County of Lanark Public Works Department, has confirmed entrance viability and entrance location. Members of the Public have raised concerns that the proposed gun range will impact existing recreational and tourism operations in the area, such as rental cottages and tourism in the area, which may be focused on the natural environment.

Section 1.7.1 of the PPS provides that long-term economic prosperity should be supported by:

a) promoting opportunities for economic development and community investment-readiness;

h) providing for opportunities for sustainable tourism development;

The proposed use will allow for a commercial business. Council should consider the potential impacts on economic development and tourism development that take place in the area, including recreational tourism of local waterbodies and waterways.

Section 2.1 of the PPS addresses natural heritage. Section 2.1.1 provides that natural features and areas shall be protected for the long term. Further, Section 2.1.2 provides that the diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features. Section 2.1.8 provides that development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

The subject lands are located within 120 metres of a PSW. Given that no site alteration is proposed, Staff did not request an environmental impact study (EIS) at the time of

application submission. It is within the power of Council to request that an EIS be submitted in support of the subject application if it is in the Council's opinion that there is not enough information present to make a decision that will be consistent with the natural heritage policies of the PPS. If such a request is made, it is advised that the request be completed following the peer review and determined that the provided noise study has been completed per NPC-300 guidelines.

Section 2.2.1 provides that planning authorities shall protect, improve or restore the quality and quantity of water by:

f) implementing necessary restrictions on development and site alteration to:

1. protect all municipal drinking water supplies and designated vulnerable areas; and

2. protect, improve or restore vulnerable surface and groundwater, sensitive surface water features and sensitive ground water features, and their hydrologic functions

Section 2.2.2 provides that Development and site alteration shall be restricted in or near sensitive surface water features and sensitive groundwater features such that these features and their related hydrologic functions will be protected, improved or restored. Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive ground water features, and their hydrologic functions.

Sections 2.2.1 and 2.2.2 outline the municipality's responsibility when making planning decisions that may impact the quality and quantity of water. The Township has been provided with the Phase I and II Environmental Site Assessment (ESA). The ESA has confirmed that the previous use of the shooting range has resulted in site contamination and that contamination from the land use has and found to have impacted the surface water of the adjacent pond. It is understood at this time that the groundwater has not been found to be impacted. As provided by the study by EXP, the migration of metals contamination may be occurring through wind and water erosion and or surface water runoff, and there is potential for off-site impact beyond the OPP operated lands as it could be facilitated through the movement of impacted surface water and or groundwater.

In a review of the subject application, the Rideau Valley Conservation Authority (RVCA) has raised concerns that the proposed use may negatively impact the water quality of surface water features and vulnerable groundwater features. RVCA Staff have recommended deferral of this application until it is confirmed that remediation has been completed successfully and measures to protect against future contamination are provided.

Township Staff's opinion is that it is premature to conclude that the approval of the subject application would be consistent with Section 2.2.1 of the PPS, given that there are known contaminates present on site. It is clear that if approved, the proposed use would contribute further to the existing site contamination or contribute to new contamination on-site if the site is remediated. Despite the current levels of contamination not requiring action from the MECP, it does not exempt the proposal from meeting relevant planning policy regarding site contamination. The PPS is clear that municipal planning decisions shall protect, improve or restore vulnerable surface and groundwater, sensitive surface

water features and sensitive groundwater features, and their hydrologic functions. At this time, it is the opinion of Staff that, based on the information provided, a decision to approve the subject application would not be consistent with sections 2.2.1 and 2.2.2 of the PPS. As provided by the RVCA, the subject lands are located on highly vulnerable aquifer, and the subject lands are in close proximity to surface water features.

The Applicant has provided that mitigation measures will be implemented should the proposed gun range be approved to address site contamination avoidance. Such mitigation measures include:

- *"The use of lime and phosphates. This will neutralize soils and help bind any potential contaminates so that they may be collected*
- *Regular manual raking and sifting of soils to separate leads and coppers from the soil so that they will not leach*
- *Drainage swales and settling pools to collect any leachate and regular removal and replacement of leachate soil in pools"*

It is not known at this time how the Township can require such mitigation measures if the subject application is approved. Additional information can be brought forward to Council regarding how such measures can be implemented and enforced can be brought forward.

Section 3.2 addresses human-made hazards. Section 3.2.2 provides that sites with contaminants in land or water shall be assessed and remediated as necessary prior to any activity on the site associated with the proposed use such that there will be no adverse effects.

As provided in the submitted studies by EXP, it has been confirmed that site contamination is present from the use of the property by the OPP as a training facility. It is understood that site remediation is to occur, however the Township has not been presented with this information or remediation plan.

It has been provided that there are known soil exceedances related to OPP range activities on the area of the property that has been used for a shooting range. A Phase I and Phase II ESA was completed by EXP Services in 2018 and 2019 in order to assist with remedial action planning to ensure the sites meet the MECP Site Condition Standards (SCS) for metals in the environment. Potential impacts to the groundwater and pond have been identified along with soil impacts as a result of the shooting range. It is understood that remediation has not yet been completed, and monitoring requirements to ensure future contamination is mitigated have not been provided to the Township.

Policy Review - Lanark County Sustainable Communities Official Plan (SCOP)

The subject lands are located within the ANSI, Life Science land use designation.

Section 5.0 of the SCOP provides policy related to natural heritage. Section 5.2 states that For the purposes of the Natural Heritage policies, "development" is defined as the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*. Section 5.3 "objectives" provides that it is an overall goal that the County's natural heritage features be both conserved and protected from negative impacts of

development. Principles that form the basis of policies that achieve this goal are as follows:

1. The County's significant natural heritage features shall be protected from the negative impacts of development.

2. The County's natural heritage features, including non-significant features, should be conserved and rehabilitated for the benefit of future generations according to best management practices undertaken today and as they evolve.

   The subject zoning amendment application proposes a new land use, which is considered a form of development as per section 5.2 of the SCOP. As provided within the PPS section of this report, an EIS was not required to be submitted with the subject application, given that site alteration was not proposed. Council may request that an EIS be submitted if adequate information is unavailable to ensure that a decision conforms with the SCOP.

Section 7.6 addresses' Other contaminated site', and it is provided that Contaminated sites are defined as sites where the environmental condition of the property, i.e. the quality of the soil or groundwater, may have the potential for adverse effects on human health or the natural environment. Where the ESA produces reasonable evidence to suggest the presence of site contamination, the proponent may be required to undertake appropriate technical studies as part of the development review process in order to identify the nature and extent of contamination, to determine potential human health and safety concerns as well as effects on ecological health and the natural environment, to demonstrate that the site can be rehabilitated to meet provincial standards and to establish procedures for site rehabilitation and mitigation of the contamination. The ESA and site restoration, if required, shall be undertaken according to Ontario Regulation 153/04, Record of Site Condition.

See comments regarding site contamination within the Policy Review – Provincial Policy Statement section of this report.

Policy Review - Official Plan

The subject lands are designated as Rural (RU), Areas of Natural Scientific Interest (ANSI) and Wetland (W).

All proposed amendments to the Township's Zoning By-Law must comply with the intent of the Township's Official Plan. The Official Plan is the guiding planning document for the Township that outlines Council's vision for the overall growth and development of the community, including providing evaluation parameters for the consideration of new uses. As provided by section 1.3.1, the purpose of this Plan is to guide future growth and development in a logical and orderly manner, and to protect existing development from the adverse effects which may arise from incompatible development. As well, it is intended to protect and preserve those significant environmental features and resources that give the Township its unique character.

Section 2.3 of the Official Plan provides the objectives of the plan. Relevant objectives to this proposal include:

- 2.3.1 To protect the quality of the environment, particularly in regard to the health, safety, convenience and welfare of the residents of the Township;

- 2.3.2 To protect the natural resources and natural heritage features of the Township, such as prime agricultural lands, wetlands, forestry resources, aggregate resources, sensitive waterfront areas, and other identified environmental features which have contributed to the natural character of the Township

- 2.3.3 To protect existing land uses from the impacts of incompatible development

- 2.3.4 To protect the rural character of the Township by requiring rural non-farm development to be appropriately located and designed**;**

- 2.3.7 To promote environmentally sound development;

Council must consider the Official Plan general objectives in reviewing the subject application and relevant sections of the Official Plan.

Section 3.3 Aesthetics - Through land use planning, Council shall encourage the preservation and enhancement of natural amenities of the Township and require a high standard of site planning.

A Site Plan Agreement will be required should the zoning amendment be approved. All future property owners will be subject to the site plan control agreement. If site alterations are proposed in the future, an amendment to the site plan control agreement would be required. During the Site Plan Control stage, aspects such as the site design, lighting, signage, stormwater and buffering will be finalized in consultation with Staff and agencies.

Section 3.5 Buffering – Avoid conflicts between competing land uses and establish buffering where required to mitigate any adverse impacts of one land use on another. Buffering could include open space, retention of natural vegetation, berms, fences and vegetation.

Based on the location of the proposed range, there will be no visual impacts requiring buffering; however, the noise study has provided that ground cover should be maintained as a soft surface. Buffering measures are expected to be addressed through the noise study.

Section 3.10.1 Contaminated Sites - Where a development application is made where a known, suspected, or potentially contaminated site exists or on a property adjacent to such a site, the proposed development shall not be approved until a Record of Site Condition, signed by a certified engineer and acknowledged by the Ministry of the Environment, is received and if necessary, a site clean-up plan is designed, and the site is cleaned up in accordance with Ontario regulation 153/04 and with the MOE Guideline Records of Site Condition.

Comments regarding site contamination have been provided in the PPS and the SCOP sections of this report.

Section 3.14 Noise Attenuation– While noise studies are typically required (as per MOE guidelines) for certain industrial and extractive uses, the Township can request studies or provision of additional information when new development of another nature may cause compatibility concerns with respect to nearby sensitive land uses (ie. houses,).

The Official Plan does not set a trigger for noise studies for commercial uses, nor does it

establish decibel parameters that would be used as evaluation criteria. Nonetheless, the Township can request supporting information regarding the impacts of noise on existing residential development, and other sensitive land uses, including recreational areas and equestrian training facilities. The peer review of the noise study provided that there were shortcomings in the BTE noise study. It is understood that the Applicant and their consultant are to provide an amended study which will also be subject to a peer review. The Township received comments from the owners of Millar Brooke Farms as well as from Equestrian Canada regarding the potential noise impacts of the proposed gun range on the operations of the equestrian facility. Brad Jukosky, of Millar Brooke Farms, provided that when the OPP used the gun range, the farm would bring horses indoors during the planned shooting hours and did not show or practice during that time. It is expected that the Applicant will address concerns submitted by the public regarding the compatibility of the proposed gun range and the equestrian training facility. Staff are not in a position to recommend to Council that the proposal complies with the intent of this section.

Section 3.18 Private Servicing Systems – Well and Septic

To be addressed through the building permit and site plan process.

Section 4.3.1: Intent of Rural Designation- Designation intended to protect traditional rural activities and to permit a broad range of uses that are appropriate in a rural setting. The Rural designation is intended to protect traditional rural activities such as agriculture and forestry, and to permit a broad range of other uses which are appropriate in a rural setting. It is recognized that the majority of the Township's existing, as well as future, residential development, will be located in the Rural designation. Other permitted uses will be carefully controlled in order to protect existing uses and the rural character of the Township.

The subject lands are located within a rural area of the municipality, consisting of a mix of agricultural lands, wetlands, forested land, residential development and waterfront development. The Township received a number of written submissions from the public that referenced the compatibility of the proposed range with existing development in the area. In particular, concerns were raised about the potential impacts on the operation of a nearby equestrian training facility, the enjoyment of residential properties, and the enjoyment of local waterbodies and waterways. The Official Plan is clear that new development is to be carefully controlled to protect existing uses and the area's rural character. The provided noise study will be an important component in determining the potential impact of the proposed use on surrounding land uses.

Section 4.3.6: Rural Commercial Development- The Plan envisions a wide range of commercial land uses within the Rural designation. This section contains a series of evaluation criteria that must be considered when evaluating a new commercial development in the Rural designation:

1. Most development should be located in hamlets however, it is recognized that not all development is suitable for hamlet areas due to size and locational considerations.

   It is not expected that the proposed use would be compatible with the hamlet designation, as such, it can be considered in the rural designation.

2. Commercial uses are encouraged to locate on a provincial highway or County road and are generally restricted from developing with individual access points. Access is provided only according to the policies of the authority having jurisdiction.

   Entrance to Rideau Ferry Road is subject to Lanark County Public Works Approval - County permission has been provided for the new entrance.

3. Access points should be limited to defined driveways at suitable locations and be limited in number.

   Entrance to Rideau Ferry Road is subject to Lanark County Public Works Approval - County permission has been provided for the new entrance.

4. Advertising, signs, lighting and other site features are to be carefully located to ensure good site design and traffic safety practices.

   Subject to site plan control and consultation would occur with the County of Lanark Public Works Department.

5. Adequate off-street parking, loading and other facilities are provided.

   Subject to site plan control. There should be adequate room available on site.

6. Where commercial uses buffer residential or other sensitive land uses, adequate buffering or setbacks are provided.

   Staff comments in regards to buffering are addressed in the review of section 3.5 of the Official Plan within this report.

7. New commercial uses only permitted through an amendment to Zoning By-law.

   As per the application.

8. New commercial uses subject to site plan control

   The proposed use would be subject to site plan control.

Section 3.13.1 Areas of Natural and Scientific Interest (ANSI) - Areas of Natural and Scientific Interest (ANSI) are areas of land and water which include natural landscapes or features which have been identified as having values related to protection, natural heritage appreciation, scientific study and/or education. Where an ANSI overlay designation applies to a Provincially Significant Wetland, the policies of Section 4.6 shall also apply.

Section 4.6: Wetland (and adjacent lands) – No development or site alteration is permitted within wetland designation (applying to Provincially Significant Wetlands). Environmental Impact Studies shall be required for all development and site alteration within 120 m of a PSW to ensure no negative impacts on the ecological function of wetlands.

RVCA has regulatory approval over development proposals in or near PSWs. The subject lands that are proposed to be rezoned are located within 120 metres of a PSW and identified to be within an ANSI. Given that no site alteration is proposed, Staff did not

request an EIS at the time of application submission. However, it is within the power of Council to request that an EIS be submitted in support of the subject application if it is in the opinion of Council that there is not enough information present to make a decision that will be consistent with natural heritage policies of the Official Plan.

Section 6.6: Site Plan Control Area- Any new commercial development is subject to site plan control in order to regulate the general site design of the property and conceptual design of buildings and structures. In this case, site plan control would be used as a tool, complementary to the Zoning By-law to ensure that:

Site Plan Control will be required if the proposed use is approved.

Section 6.8: Environmental Impact Study - Is intended to determine the following prior to development:

- Research, identify and map applicable natural features, values and functions;
- Describe proposed activities, including structures and all alterations;
- Predict and evaluate the effects of development on various components of the environment and wildlife;
- Itemize and recommend measures that can be undertaken to reduce or mitigate effects;
- Evaluate the cumulative effect that the project may have, following the implementation of mitigation measures;
- Conclude with a professional opinion on whether negative effects will occur.

The Official Plan outlines triggers that would establish the need for an EIS. In this case, triggers are areas of natural and scientific interest and provincially significant wetland. The Township can require the completion of an EIS prior to development and implementation through site plan control, if development is supported, however Council may want to give further consideration as to whether this should be done before zoning permission is granted as a zoning right. Council may request an EIS if there are concerns that there is not enough information currently available to make a decision that adequality addresses the natural heritage policies of the Official Plan.

Section 6.10 addresses the Rideau Canal Management Plan And World Heritage Site Management Plan. The Canal is designated as both "Canadian Heritage River and National Historic Site" by the Canadian Government and "World Heritage Site" by UNESCO. Pursuant to these designations, Parks Canada has prepared the Rideau Canal Management Plan and the World Heritage Site Management Plan. When considering development proposals on and adjacent to the Canal, Council shall consider the recommendations and policies contained in these Plans and, without limiting the generality of the foregoing, shall be guided by the following policies.

Parks Canada representative Susan Millar, Planner, provided that the subject property is not adjacent to the Rideau (jurisdiction of the marsh is limited to the Tay Canal itself), and as such, Parks Canada feedback is limited. Parks Canada provided that a concern they have is regarding the potential impact of sound/sound volumes; however, they have been addressed satisfactorily by the accompanying report. Parks Canada will be provided with the amended noise study once completed.

Summary of Evaluation

Planning Staff have given careful consideration to the application, the comments from the RVCA, Parks Canada, the Applicant, nearby property owners (those with the highest potential of experience the effects of the proposed development), and the general Public that spoke at the public meeting or provided written submissions. The following issues have arisen most frequently in the correspondence, and while the Official Plan provides some direction on most of these issues, they will be addressed more concisely here.

Gun Safety

Concern has been raised by members of the public regarding public safety in regard to the discharge of firearms and the transportation of firearms to and from the site. The role of the municipality in relation to the subject application is to evaluate the proposed change in land use. The Federal government provides regulations for the transportation and use of firearms. If the application to rezone the property is approved, the Applicant will be required to demonstrate that the gun range is constructed to the standards of CFO.

Compatibility and Noise

Concern was raised regarding noise in terms of impacts on neighbouring residences, enjoyment of recreational properties, commercial equestrian training facilities, agriculture, and wildlife. While the Official Plan does not automatically trigger a noise study to address this application, it is clear, based on the comments and information received, that this is a matter that needs to be fully addressed in order to satisfy Staff and Council that the proposed use is suitable from a compatibility standpoint. The Applicant has provided a noise study which has been peer-reviewed. The peer review has provided that there are shortcomings in the provided noise study. It is understood the Applicant and their consultant will provide an amended noise study which will also be subject to a peer review. Before consideration of approval, it would need to be fully demonstrated to the Township's satisfaction that this application would not negatively impact adjacent sensitive land uses. Noise attenuation needs to be addressed in the planning process since the Township presently does not have a noise by-law in effect. As provided within this report, the Township has received a letter from the Acting Officer of Health and Chief Officier, Dr. Linna Li of the Health Unit, who provided concerns about environmental noise as a health concern. Staff will bring a report back to Council for consideration when Staff deem there to be enough information to warrant an update or if Staff needs additional direction.

Site Contamination

The Township has a responsibility when making planning decisions which may impact the quality and quantity of water. The Township has been provided with the EXP studies. The RVCA has raised concerns regarding the potential impact that the proposed use may negatively impact the water quality of surface water features and vulnerable groundwater features. RVCA Staff have recommended deferral of this application until it is confirmed that remediation has been completed successfully and measures to protect against future contamination are provided.

Based on previous contamination caused by use of the gun range, it is likely that the proposed use would contribute further to the existing site contamination or contribute to new contamination on-site if the site is remediated. The Applicant has provided mitigative measures to implement should the subject application be approved. The current contamination levels do not require action from the MECP, as per the provided email, however it does not exempt the proposal from meeting planning policies. The PPS, Lanark County SCOP and Township Official Plan are clear that municipal planning decisions shall protect, improve or restore the vulnerable surface and

groundwater, sensitive surface water features and sensitive ground water features, and their hydrologic functions.

In addition, the PPS, Lanark County SCOP, and Township Official Plan is clear on-site clean-up requirements before new development is approved. The Health Unit and RVCA have recommended that decision be deferred until it is confirmed that site remediation has been completed and mitigative measures are provided to ensure future protections.

Effects on Wildlife and Wetlands

Potential impacts on natural heritage features, such as the nearby wetland and animal migration, have been raised as a concern during the public consultation process. As provided in this report, the subject lands are located within 120 metres of a PSW and an ANSI. Given that no site alteration is proposed, Staff did not request an EIS at the time of application submission. It is, however within the power of Council to request that an EIS be submitted in support of the subject application if it is in the opinion of Council that there is not enough information present to make a decision that will be consistent with natural heritage policies in respect to addressing the PSW and ANSI.

The Official Plan does not specifically provide for the protection of the habitat of species such as deer, turkeys and others that are not covered specifically by provincial legislation or a municipal by-law. Staff suggest that the protection of the environmentally sensitive areas on the subject land would help retain the integrity of the habitat of these animals. The proposed zoning amendment would exclude areas that are currently zoned Wetland.

At this time, Township Staff is of the opinion that it is essential to complete the noise study and peer review to ensure the general compatibility of the proposed use can be confirmed.

Hours of Operation

The zoning by-law does not regulate the hours of operations of businesses, and the Township does not have a by-law regulating any commercial operation's business hours. The Township also does not have a noise by-law that can be utilized to regulate noise.

Options:

With respect to this zoning amendment application, Staff suggest three options:

1) Approve application as submitted;

2) Defer a decision pending receipt of additional information or major modifications; or

3) Deny the application.

Approval: Accepting this option at this time would approve the requested zoning amendment, allowing the Applicant to proceed with approvals from the CFO to establish the shooting range. Staff recommend that this option is not advisable at this time as there are a number of planning concerns relating to the application as currently submitted.

Defer a decision: If Council opts for this option, then no decision will be made at this time, and the area subject to the zoning amendment application will retain its current zoning. A decision to defer the application will allow time to finalize the noise study peer review. Once the peer review is complete, more information should be available to allow Council to make an informed decision regarding potential noise impacts and compatibility. **This is the option that Staff recommends.**

Denial: If Council determines that the requested zoning amendment and proposed use of a place of recreation, which shall be restricted to a gun range and a gun (shooting) club are absolutely unsuitable for this property and opts for this option, then the application would be denied, and the property would retain current zoning (pending any appeals).

Summary

Based on a review of the application and its compliance with the Township's, County's and Province's planning policies and other applicable law, Staff is of the view that the application at this time does not conclusively conform or is consistent with all provisions of the relevant planning documents and planning policies. In particular, Staff are of the view that the compatibility of the proposed use in relation to surrounding sensitive land uses has not been sufficiently determined. Staff advise that a decision be deferred to allow the Applicant to amend the noise study and to address issues raised by the peer review as well as compatibility concerns raised by the public. Staff are also in agreement with the recommendation provided by the RVCA that Council should defer a decision on the subject application until it is confirmed that remediation has been completed successfully and measures to protect against future contamination has been confirmed to be adequate to protect surface water and groundwater feature. Staff will bring a report back to Council for consideration when Staff deem there to be enough information to warrant an update or if Staff needs additional direction. Staff advise that if the application is to be recommended for approval or refusal at this time, it is important for the Committee to provide the rationale behind its approval or refusal for appeal purposes.

Attachments:

1. Key Map
2. Public Comments and Written Submissions (submitted after December 6, 2022 report finalization)
3. Letter submitted from the Corporation of the Leeds, Grenville And Lanark District Health Unit, Dr. Linna Li, dated March 10, 2023
4. Letter from Martin Whyte, regarding December 6, 2022, Staff report, no date
5. Phase 1 Environmental Site Assessment, Smiths Falls IST Range, 1686 County Road #1, Perth ON, Project number: BRM-00244589-A0, prepared by EXP Services, dated September 4, 2018
6. Phase 2 Environmental Site Assessment, Smiths Falls IST Range, 1686 County Road #1, Perth ON, Project number: BRM-00244589-A0, prepared by EXP Services, dated March 20, 2019
7. Remedial Options, Smiths Falls IST Range, 1686 County Road #1, Perth ON, Project number: BRM-00244589-A0, prepared by EXP Services, dated May 7, 2019
8. Soil Remediation Cost Estimate – Rev. A. Smiths Falls Firing Range at 1688 County Road #1, Perth, ON. Englobe File.: 02202823.000, Prepared by Englobe, dated December 16, 2022
9. Review of the noise study prepared by BT Engineering for the gun range located at 1688 Rideau Ferry Road, Drummond, Ontario, prepared by WSP (Formally WSP/Golder), dated December 21, 2022

Prepared By
Brady McGlade, Planner

B McGlade

Approved By
Cathy Ryder, CAO

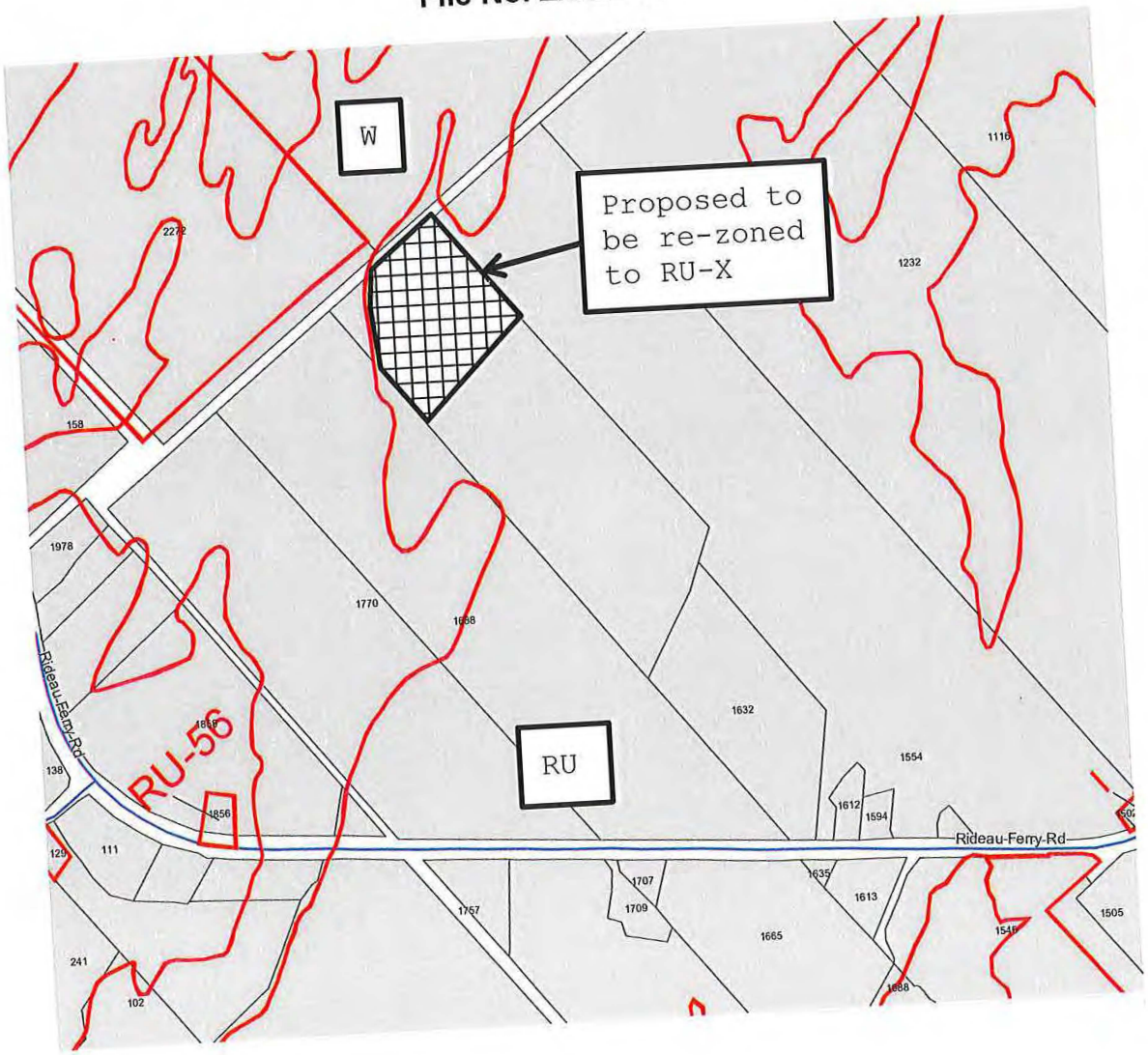
C Ryder

KEY MAP

Whyte

1688 Rideau Ferry Road
Part Lots 23 and 24, Concession 7, North Elmsley

File No. ZA-22-10



Key map to be used as reference only.

From: Don Frizell
To: Brady McGlade; Stephen Fournier
Subject: Proposed Gun Range
Date: December 4, 2022 8:48:27 AM

Hello Brady, Stephen,

Hope you are doing well.

Time for Linda and I to voice our opinion/ concern regarding the proposed gun range.

Over the years we listened to the constant barrage of OPP gun fire, echoing across the Tay Marsh.
We were never notified of any practices, although the gun fire sounds like it's in our back yard, which it is, since I own a significant portion.

The township not only needs to listen to the Rideau Ferry Road residents, it also needs to focus on the residents surrounding the Tay Watershed.

Not only will it affect local residents, it will have a negative environmental impact, negatively affect migratory wildlife and also tourism.

No one from Le Boat or the Boating Community will want to venture the Tay Canal from Beveridge Bay to Perth, with sounds of echoing gunfire.

We haven't signed a petition yet, however this will be considered our official opposition.

Call or mail if you require additional information, or would like to visit the property.

Thank you,
Linda and Don
Don- [redacted]

Sent from Don's iPhone....

From: frederic garceau
To: Brady McGlade
Subject: Support for new gun range
Date: December 1, 2022 6:16:41 PM

Good evening,

My name is Frederic Garceau and I am a resident of Perth. I am writing this email to show my support for the plan for a new gun range in the area. I am a competitive sport shooter and have been a member of gun clubs all over the country.

By having a gun range in this area, we will be able to bring many people from the towns in the area, who usually have to drive quite a long distance to do their favorite sport/hobby. This will be a prevalent location and endeavor for hunters and sports shooters.

I fully support this project and remain available to you and your team for further steps or questions.

Thank you,

Regards,

Frederic

From: Cathy Ryder
To: Brady McGlade
Cc: John Matheson; p.coutts@hotmail.ca; "Pauljdar@gmail.com"; Ray Scissons; Stephen Fournier
Subject: FW: Opposition to proposed commercial gun range
Date: November 25, 2022 10:46:47 AM

-----Original Message-----
From: Jeremy Wright [redacted]
Sent: November 25, 2022 10:36 AM
To: Cathy Ryder <cryder@dnetownship.ca>
Subject: Opposition to proposed commercial gun range

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

We are residents of Rideau Ferry and we oppose the proposed commercial gun range for a number of reasons, which we will summarize below.

Everyone knows the disruptive noise that gunshots make and the fact that this noise carries significant distances, particularly with wind and nearby bodies of water.

The proposed commercial gun range does not good make planning sense as it is incompatible with essentially all neighbouring and nearby land uses, including:

* dozens, if not hundreds, of residential properties, built, or bought, specifically because of the peace and quiet of the surrounding area;

* hospitality and tourism properties, one of the main attractions of which is peace and quiet;

* a retirement home, where calm and quiet is of paramount importance;

* a church, where again, the absence of disruptive noise is of paramount importance;

* a world class equine breeding and training property, where disruptive noise could have a significant impact;

* a provincial park, in which enjoyment of its activities and the wildlife in it would be significantly impacted;

* a wildlife reserve, in which the wildlife would be significantly impacted;

* the only Unesco World Heritage site in Ontario (the Rideau Canal Waterway), which attracts visitors from around the world to appreciate its natural beauty and calm;

* a cemetery, where peaceful contemplation ought to be respected.

Underlining how ill conceived this proposal is, most of the affected property owners have not been properly notified of the proposal, with many receiving no notification at all. Affected property owners, conservation bodies and levels of government have not been properly consulted, all of whom would doubtless express their serious concerns with the proposal. This all demonstrates that this proposal affects a wide range of interests throughout a multi jurisdictional territory and that it is not consistent with the type of holistic assessment expected in current modern society.

From a planning point of view, this proposal is certainly premature, and, in any event, clearly does not make good

planning sense given its total incompatibility with surrounding land uses.

We strongly oppose this proposal. We would be happy to discuss this further should you wish. We can be reached at this email or by phone at [redacted]

Thank you for your attention to this very important issue.

Jeremy Wright and Lexi Campbell

24 R8, Rideau Ferry

From: Steve Fournier
To: Jay Dee
Cc: Brady McGlade
Subject: Re: Martin Whyte gun range zoning application
Date: January 13, 2023 12:38:34 PM

Thank you Jay for your comment, by means of this reply our Township planner has been copied, thank you, Steve

Sent from my iPad

On Jan 13, 2023, at 12:35 PM, Jay Dee [redacted] wrote:

Dear Reeve Steve Fournier

Thank you for your time

I have just been made aware in the news of the Martin Whyte's Zoning application in Drummond North Elmsley off of Rideau Ferry Rd.

Although I do not reside in Drummond North Elmsley, I do live nearby on Bass Lake near Rideau Ferry and I normally shop and frequent Perth.

I am actively seeking a firing range in the area to practise with firearms, specifically long guns used for hunting, and for recreation to hone my skills.

Martin Whyte's proposed firing range would be very convenient for me and helps alleviate the pressure and demand for an area firing ranges.

I am a retired police officer with 31 years service. I support responsible lawful firearms use and hunting.

I am also preparing to engage in hunting in the area for turkey etc.

I understand noise concerns and have dealt with them in my career. However a firing range operated under strict rules and times is a perfectsnd natural balance of rights. Historical hunting has also been occurring in the area forever and with that comes normal firearms noise. Firearms noise is not new to the area and will not be excessive in my opinion. The range will provide an economic benefit to the area. It will also support the health of retired law enforcement like myself.

Please add my comments to the application process or direct me to where I can send them.

Thank you for your time.

Yours truly
John Dorsch
Rideau Ferry

From: Steve Fournier
To: Brady McGlade
Subject: Fwd: Gun Range
Date: February 2, 2023 7:30:51 AM

Sent from my iPad

Begin forwarded message:

From: Katie Kirkpatrick [redacted]
Date: February 1, 2023 at 4:59:09 PM EST
To: Steve Fournier <sfournier@dnetownship.ca>
Subject: Gun Range

Good afternoon - just want to say that we are NOT in favour of a gun range in North Elmsley.

Thank you.

Katherine (Katie) and Jim Kirkpatrick
116 Bracken Avenue. RR3
Smiths Falls ON. K7A 4S4
[redacted]

From: Cathy Ryder
To: Brady McGlade
Subject: FW: Gun Range
Date: January 11, 2023 10:38:58 AM

-----Original Message-----
From: Kerry Milford Farming (Happy Frog Farms) [redacted]
Sent: January 11, 2023 9:48 AM
To: Cathy Ryder <cryder@dnetownship.ca>
Subject: Gun Range

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi,

Just a note that I oppose a new gun range proposal in the township.
Like GIM, the range will create noise infringement that the township nor the province will address.
Thanks,

Kerry Milford

Sent from my iPhone

From: Cathy Ryder
To: Brady McGlade
Subject: FW: opposed to the gun range
Date: December 5, 2022 10:18:24 AM

From: Michelle Fournier [redacted]
Sent: December 5, 2022 10:15 AM
To: Cathy Ryder <cryder@dnetownship.ca>
Subject: opposed to the gun range

We live in Rideau Ferry so not far from the property at 1688 Rideau Ferry road. We are very much against a gun range on this property for many reasons that I am sure you have already heard from many residents in the area.

Kind regards,

Michelle Fournier

Royal LePage Advantage Real Estate Brokerage
Sales Representative
73 Gore Street, East, Perth, ON K7H 1H8

[redacted]

"I am never too busy to help!"
"Top 2% of all Royal LePage agents nationally "2021"

From: Cathy Ryder
To: Brady McGlade
Subject: FW: Proposed Gun range Rideau ferry
Date: November 25, 2022 11:22:59 AM

From: Pauline Sherar [redacted]
Sent: November 25, 2022 10:41 AM
To: Cathy Ryder <cryder@dnetownship.ca>
Subject: Re: Proposed Gun range Rideau ferry

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

HI Cathy

Thank you , can you add both my husband Gordon Sherar and myself Pauline Sherar to the list.

[redacted]

thanks so much

Pauline Sherar

On Fri, 25 Nov 2022 at 10:05, Cathy Ryder <cryder@dnetownship.ca> wrote:

> Thank you for your email. Your email will be added to the application file in opposition to the proposed gun range.
>
> Cathy
>
> Cathy Ryder, CMO
> Clerk
> Township of Drummond/North Elmsley
> 310 Port Elmsley Road
> Perth, Ontario K7H 3C7
> Phone: (613) 267-6500 Ext 251
> *This E-mail may contain privileged and confidential information intended only for the individual or entity named in the message. If the reader of this message is not the intended recipient, or the agent responsible to deliver it to the intended recipient, you are hereby notified that any review, dissemination, distribution or copying of this communication is prohibited. If this communication was received in error, please notify us by reply E-mail and delete the original message*

From: Pauline Sherar [redacted]
Sent: November 24, 2022 4:31 PM

To: Cathy Ryder <cryder@dnetownship.ca>
Subject: Proposed Gun range Rideau ferry

Hello

We have just moved up to Rideau Ferry last August across from the Rideau Ferry Marina. It is heart breaking to hear that the environment is going to be ruined by a constant blast of guns going off. We bought up here for our children and grandchildren to enjoy this beautiful area and share the peaceful environment and waterway. We are profusely opposed to this proposal that Mr Whyte has put forward. Not only is it the noise, it is peace on mind and also concern of the devaluation of the residential properties!

Please put our name on petition list

Thank you P G Sherar

From: Steve Fournier
To: Brady McGlade
Subject: Fwd: Proposed Gun Range
Date: March 25, 2023 9:41:52 AM

Sent from my iPad

Begin forwarded message:

From: Catherine Stapleton <[redacted]com>
Date: March 24, 2023 at 8:49:59 PM EDT
To: stephenmfournier@outlook.com
Subject: Proposed Gun Range

Good evening

I am writing to express my opposition to the proposed commercial gun range in Township of Drummond/ North Elmsley.
I own a residential property at 567 Ferrier Road West, Perth and through the years could hear the gun noise from the occasional OPP shooting.
I also a cottage on Otty Lake on the north shore, 201 Consitt Lane and the noise is pronounced.
I do not understand in an area populated with farms, cottages, the Rideau Canal, a historic site and popular tourist area that such a business would be allowed. The noise and pollution are deterrents to the enjoyment of the natural landscape of lakes, wetlands and wildlife. There is also the issue of soil contamination.
This type of business operation does not in any way fit in or suit the area for the people who live, have cottages or operate other small tourist enterprises.
I oppose the proposal.

Respectively submitted

Catherine Stapleton
[redacted]

Sent from my iPad
Catherine Stapleton

Nancy & Andrew Chevrier
484 Mile Point Road
Perth, Ontario K7H 0H2

Drummond – North Elmsley (DNE) Township Council
310 Port Elmsley Road
Perth, Ontario K7H 0H1

March 19, 2023

Subject: Rezoning ZA-22-10

To: Drummond North Elmsley Council and Staff,

When the application for rezoning ZA-22-10 was submitted in July 2022, reference was made in the ZanderPlan Justification Report to "Environmental Site Assessments" conducted on the property. These documents, however, were never shared with the DNE Township, RVCA nor the community. Through applications for Freedom of Information and Privacy we have obtained these documents and they indeed, provide more insight on the conditions of the site.

Contrary to the Zanderplan statement which says "the shooting range is located in an identified ANSI, and is **adjacent** to provincially significant wetlands", figures 2 and 3 of the Phase I Environmental Site Assessment by EXP point out that part of the shooting range is actually **within** the provincially significant wetlands. Phase 1 of the ESA says it best..."*The current range is already in a non-conformance impactful situation based on the mapping supplied by Ministry of Natural Resources and Forestry and Ministry of Environment.*"

Let's set the story straight. The Environmental Site Assessments and follow-up monitoring work indicate that harmful contaminants exist in and around the former OPP gun range. This includes the surface water and bottom sediment of the nearby water body. In addition, there were measured metal exceedances (copper and lead) in the groundwater at the site.

However, the true extent of the contamination is still unknown. To better define the extent of contamination, the consultants for the OPP have recommended additional soil sampling, an additional three groundwater monitoring wells around the site, and an expanded program of sediment and surface water sampling in the adjacent surface water body.

The OPP have made a commitment to clean up the mess but as far as we know these plans haven't come to fruition. Clean-up was supposed to begin in August of 2022 but nothing has been done. The township planner has recommended deferral of a decision until clean up is complete. The monitoring and additional work could go on for years. Our concern is that ongoing studies for clean-up have not been completed let alone a time frame established for the clean- up. How long does the community have to wait for this decision?

Sincerely,

Nancy & Andrew Chevrier

Cc:

Steve Fournier, Reeve DNE (sfournier@dnetownship.ca)

Ray Scissons, Deputy Reeve DNE (rscissons@dnetownship.ca)

Paul Kehoe, Counsellor DNE (pauljdar@gmail.com)

John Matheson, Counsellor DNE (jmatheson@dnetownship.ca)

Paul Coutts, Counsellor DNE (pcoutts@dnetownship.ca)

Cindy Halcrow, CAO DNE (chalcrow@dnetownship.ca)

Brady McGlade, planner DNE (bmcglade@dnetownship.ca)

RVCA (dan.cooper@rvca.ca)

Otty Lake Association (lakesteward@ottylakeassociation.ca)

Stuart Cryer
182 McLaren Drive
Perth, Ontario
K7H 0H1

March 17, 2023

Drummond – North Elmsley (DNE) Township Council
310 Port Elmsley Road
Perth, Ontario
K7H 0H1

Re: Delay in denial of zoning amendment application by Martin Whyte

To DNE Council members and staff,

The Drummond North Elmsley community is overwhelmingly opposed to any gun range being allowed in the township. Martin Whyte's property, where he is proposing a gun range, is not in a zone that permits a gun range.

The DNE Council has a responsibility to ensure that zoning regulations are adhered to and has every right and the duty to deny Martin Whyte's application to make an exception to the zoning.

The Council is being negligent in delaying its decision to deny the application. This unnecessary delay has led many residents to experience deterioration of their health due to anxiety, and to the very real possibility of a drop in their property values.

I expect the DNE Council to advise Martin Whyte that his application is being denied at their next council meeting. It is the responsible and obligatory step for the Council to take.

If Council does not deny Martin Whyte's application at the next meeting, the community deserves a rationale from the Council as to why Council is not carrying out the community's justifiable wishes.

Sincerely,

Stuart Cryer

Cc:
Steve Fournier, Reeve DNE (sfournier@dnetownship.ca)

Ray Scissons, Deputy Reeve DNE (rscissons@dnetownship.ca)

Paul Kehoe, Counsellor DNE
(pauljdar@gmail.com)

John Matheson, Counsellor DNE
(jmatheson@dnetownship.ca)

Paul Coutts, Counsellor DNE
(pcoutts@dnetownship.ca)

Cindy Halcrow, CAO DNE
(chalcrow@dnetownship.ca)

Brady McGlade, planner DNE
(bmcglade@dnetownship.ca)

RVCA
(dan.cooper@rvca.ca)

Otty Lake Association
(lakesteward@ottylakeassociation.ca)

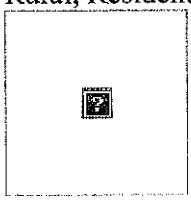
From: Scott Somerville
To: Brady McGlade
Subject: Fwd: this ok to send ? any suggestions
Date: December 7, 2022 3:12:06 PM

Planning Department DNE.
Given the current rhetoric regarding the continuance of a shooting range on the property fronting on Rideau Ferry Rd. I would like to be counted as a. Positive vote. For the. Shooting range to continue.

There has been one there for a number of years and it has not been a problem. I understand that most private ranges are highly regulated and should actually be held to a higher standard than a closed to public Provincial police range.

It is interesting that the noise studies have found everything to be within standards and that while there has been an active range there for years all of a sudden there is going to be a pollution problem. This is akin to farmers needing "right to farm" legislation enacted to allow the continuance of ongoing farming practices when newer people move into an area and find the smells and noise offensive.

Scott Somerville REALTOR® BSc, MA, MCNE, CIN
CENTURY21 EXPLORER REALTY INC.
[redacted]
Rural, Residential, Recreational, Agricultural, & Commercial Real Estate



Leeds, Grenville & Lanark District
HEALTH UNIT
Your Partner in Public Health

March 10, 2023

Brady McGlade
Planner
Township of Drummond/North Elmsley
bmcglade@dnetownship.ca

Re: 1688 Rideau Ferry Road, Part Lots 23 and 24, Concession 7, North Elmsley, File No. ZA-22-10

Dear Brady McGlade,

The Leeds, Grenville & Lanark District Health Unit (LGLDHU) is pleased to provide feedback on file No. ZA-22-10. The Ontario Public Health Standards (OPHS), under the Health Protection and Promotion Act (HPPA), require Public Health Units in Ontario to implement programs and services to help protect population health in the communities we serve. The Healthy Environments and Climate Change Guideline, 2018, states the following:

- Boards of health shall collaborate with municipalities under the Ontario Planning Act to address local impacts of climate change and reduce exposure to environmental health hazards in the community…Aspects to consider for review include, but are not limited to:
    - Land use compatibility (e.g., air quality impacts, $PM_{2.5}$, protection of ground water)
    - Other local or emerging environmental health concerns

File No. ZA-22-10 could potentially impact land use compatibility, specifically with regards to protection of ground water and surface water. Considering the LGLDHU mandate as outlined in the OPHS, LGLDHU staff have reviewed documentation regarding File No. ZA-22-10, with the intention to provide potential health-related considerations. Reviewed documents include:

- BT Engineering – Site Entrance and Noise Reviews, 1688 Rideau Ferry Road (June 1, 2022)
- Application for Zoning Amendment (July 26, 2022)
- Zanderplan – Planning Justification Report (July 19, 2022)
- The agenda and minutes from the Township of Drummond/North Elmsley #25 Special Committee of the Whole meeting that was held on December 6, 2022. Of note, these minutes include the Report from Brady McGlade, Planner for Drummond/North Elmsley and a letter from the Rideau Valley Conservation Authority (RVCA), dated November 25, 2022.

Based on the information that is publicly available, the following information is known:

- A Phase I and II Environmental Site Assessment (ESA) has been completed on the property which identified “soil exceedances related to OPP range activities on the area of the property that has been used for a shooting range…Potential impacts to the

groundwater and pond have been identified along with soil impacts as a result of the existing shooting range. The area is being remediated by the OPP summer, 2022, and any further monitoring requirements can be enforced by a Site Plan Agreement." (Zanderplan – Planning Justification Report).

- Thus far, LGLDHU staff understand that:
    - The Phase I and II ESA is not available for review.
    - The site has not been remediated by the Ontario Provincial Police (OPP).

Potential impact of lead in spent bullets on the surrounding environment

The main health concern related to spent bullets is the presence of lead. The vast majority of bullets used in Canada contain lead.[1] The negative health effects related to lead exposure are well documented. Lead poisoning can cause harmful health effects to the human brain, nervous system, blood system, and kidneys. The risks are greater for children.[2]

The letter from the Rideau Valley Conservation Authority (RVCA), dated November 25, 2022, details the vulnerability of the ground and surface water features on this property and the RVCA "concerns about the impacts of pollution on water quality and the ecological functions of natural features." As the RVCA is the organization with the greatest expertise on local source water protection, the LGLDHU supports the position of the RVCA whereby the "RVCA would recommend deferral of this application until it is confirmed that remediation has been completed successfully and measures to protect against future contamination are provided."

Research has shown that lead from spent bullets can leach into soil, surface water or ground water, depending on the complex environmental conditions of the specific site (e.g., soil pH, soil composition, topography, nearby water features, surface water runoff, level of precipitation, usage level of the shooting range, etc.).[3,4,5,6] A report from the British Columbia Centre for Disease Control (BCCDC) details evidence-based literature that examines "the potential for water contamination posed by lead from a firing range in close proximity to a drinking water supply inlet." The BCCDC report notes that: "If there is potential for contaminants to migrate offsite, sampling soil, groundwater, and surface water at the range and adjacent areas would provide the best indication and extent of contamination. Assessing contamination patterns and specific characteristics of the range are not only important for risk assessments but also for management of the range."[3] In the absence of many stakeholders (e.g., DNE staff and Council, RVCA, LGLDHU) being able to review the Phase I and II ESA, there remains concern regarding potential site contamination, specifically the potential of how this site contamination could impact the quality of nearby drinking water sources. From information in Brady McGlade's Planning Report (Dec. 6, 2022), it is understood that the number of days the OPP used the shooting range was between 18-38 days/year. It is estimated that the OPP began using this shooting range in 2009. This use resulted in known soil exceedances that require site remediation. Assuming a new shooting range is operating for more than 18-38 days/year as it had been for approximately twenty years, it is reasonable to expect that lead (and other contaminants) could increase with increased use of the site. Therefore, it is important to see the results of the Phase I and II ESA to know the extent of site contamination; to have confirmation that the site has been remediated; to see a plan to mitigate future contamination; and to have an enforcement mechanism in place for ensuring mitigation activities are undertaken.

Environmental noise as a health concern

Environmental noise includes any unwanted sounds created by human activity. Research on the health effects of environmental noise specific to shooting ranges is somewhat limited. There is evidence that certain environmental noise can have negative health impacts in humans, specifically regarding cardiovascular effects, cognitive impacts, sleep disturbance, mental health, and pulmonary effects.[7,8] A Royal Canadian Mounted Police (RCMP) report on shooting ranges and sound notes that "Sudden or unexpected noise can evoke a startle reflex, where the body is prepared for 'fight or flight.' The body normally returns to the pre-exposure condition over a period of a few minutes. However, it is suggested that sustained or repeated exposure could lead to persistent changes in the neurophysiological, endocrine, sensory, digestive and cardiovascular systems, which in turn could cause deterioration in health."[9]. These health effects would vary based on characteristics of the sound (volume, frequency, etc.). While research specific to the health effects of environmental noise from a shooting range is limited, it is reasonable for a municipality to ensure that noise levels from any site are consistently within the levels that have been established by the Ontario Ministry of the Environment, Conservation and Parks (MECP). A municipality may need to implement a noise bylaw to be able to enforce noise infractions. The LGLDHU supports the municipality's decision to complete a peer review of the noise review that was provided by the applicant.

Recommendations

The LGLDHU recommends deferral of this application until a full picture of the potential environmental impact of the shooting range is known, since this has a bearing on individual and population health impacts. Specifically, the following are important factors:

- Regarding potential lead contamination in soil, ground water, and surface water:
    - The ability for municipal staff and Council to review the complete Phase I and II Environmental Site Assessment that was completed.
    - Confirmation that site remediation was completed.
    - If the amendment is approved, we recommend requiring a detailed mitigation plan to be put in place to ensure future site contamination is avoided so that soil and surface and ground water sources are protected. Best practices on mitigation can be found in several sources. For example:
        - United States Environmental Protection Agency: Best Management Practices for Lead at Outdoor Shooting Ranges
        - BC Wildlife Federation: Standards and Best Practices for Lead Management – An assessment of approaches to lead management for outdoor shooting ranges
        - Environment Protection Authority Victoria: 1710: Guide for managing contamination at shooting ranges
    - An enforcement mechanism put in place for ensuring site contamination mitigation activities are consistently undertaken.
- Regarding potential environmental noise:
    - The ability for municipal staff and Council to ensure noise testing is consistent with actual use of the site (e.g., number of shots in a given timeframe, type of guns used, etc.) for the noise review that was provided by the applicant and any further noise reviews.

Joseph Reid (Joseph.Reid@healthunit.org), Health Promotion Consultant, is looking forward to working with you to continue promoting healthy community development in Drummond/North Elmsley.

Your partner in public health,

THE CORPORATION OF THE LEEDS, GRENVILLE

AND LANARK DISTRICT HEALTH UNIT

Linna Li, MD, FRCPC

Medical Officer of Health (Acting) and Chief Executive Officer

References

1. Government of Canada. Study to gather information on uses of lead ammunition and non-lead alternatives in non-military activities in Canada. Published March 29, 2018. Accessed December 6, 2022. https://www.canada.ca/en/environment-climate-change/services/management-toxic-substances/list-canadian-environmental-protection-act/lead/using-more-lead-free-ammunition/lead-ammunition-executive-summary.html
2. Government of Canada. Reduce your exposure to lead. Published May 2, 2016. Accessed December 6, 2022. https://www.canada.ca/en/health-canada/services/home-garden-safety/reduce-your-exposure-lead.html
3. Struck, S. British Columbia Centre for Disease Control [BCCDC]. Lead from firing range and the potential to contaminate drinking water supply. Published November 21, 2011. Accessed December 6, 2022. https://ncceh.ca/sites/default/files/BCCDC-Lead_Shot_Drinking_Water_Nov_2011.pdf
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7. Toronto Public Health. How loud is too loud? Health impacts of environmental noise in Toronto. Technical report. Published April 2017. Accessed December 8, 2022. https://www.toronto.ca/wp-content/uploads/2017/11/8f98-tph-How-Loud-is-Too-Loud-Health-Impacts-Environmental-Noise.pdf
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Township of Drummond/North Elmsley Committee of the Whole

Report By	
Date	
Report Title	

Staff Recommendation: **Resolution** **Direction** **Information**

THAT the Committee of the Whole **defer** a decision for zoning amendment application ZA-22-10, an application to rezone a portion of lands described as 1688 Rideau Ferry Road, Part Lot 23 and 24, Concession 7, North Elmsley, from Rural (RU) to Rural Exception Zone (RU-X), to permit a place of recreation, which shall be restricted to a gun range and a gun (shooting) club as an additional permitted use.

Purpose:
Background:

Report on Notification and Written Comments Received:

Part of the zoning amendment process is to involve neighbours and Council in the process of looking at a change in the land use rules for an area of land. Public consultation is a crucial component of land use planning, and input from any resident and applicable government agency is welcomed in order to assist the Township in ensuring that decisions are in best keeping with the public interest. On October 11, 2022, the Township held a public meeting that was well attended. Several members of the public spoke in opposition to the application, and the Applicant and the Applicant's agent provided additional details of the proposal. The minutes of the public meeting are included as an attachment to this report.

Amendments to the Zoning By-Law are subject to the provisions of Section 34 of the Planning Act (RSO 1990, as amended). Ontario Regulation 545/06 further outlines the required notifications for the public hearing and the prescribed bodies that must be circulated on the application. Pursuant to the policies of the Act, copies of the Notice of Public Hearing were mailed by Staff to all landowners within 120 metres of the subject property as well as all requisite public agencies. Staff posted the notice in a visible location on the site of the subject lands along Rideau Ferry Road. In addition to this, the required notification notice of the public meeting was posted on the public notice board within the Township office that is available for public viewing.

In evaluating this application, Staff must consider the relevant planning documents and policies and apply them to this particular site to determine whether this proposal is appropriate. Staff also consider advice and feedback from neighbours who have a strong sense of local context and who would be most affected by a land use planning rules change. An important part of the public participation component is to seek opinions from neighbours and others who may also have particular insight or knowledge about a property or planning issue that may not immediately have been apparent to Township staff.

The written comments received up to November 29 and a petition have been included as an attachment to this report.

Policy Review - Planning Act

For the purposes of the Natural Heritage policies, "development" is defined as the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*. Section 5.3 "objectives" provides that it is an overall goal that the County's natural heritage features be both conserved and protected from negative impacts of development. Principles that form the basis of policies that achieve this goal are as follows:

- The County's significant natural heritage features shall be protected from the negative impacts of development.

- The County's natural heritage features, including non-significant features, should be conserved and rehabilitated for the benefit of future generations according to best management practices undertaken today and as they evolve.

  The subject zoning amendment application proposes a new land use, which is considered a form of development as per section 5.2 of the SCOP. As provided within the PPS section of this report, an EIS was not required to be submitted with the subject application, given that site alteration was not proposed. Council may request that an EIS be submitted if adequate information is unavailable to ensure that a decision conforms with the SCOP.

  AS STATED BEFORE ... WE STILL SUBMIT THAT THIS IS A GRANDFATHERED USE AND WHILE STAFF MAY DISAGREE COUNCIL SHOULD TAKE THIS INTO CONSIDERATION AND ACCOUNT FOR THE FACT THAT THE RANGE HAS BEEN IN USE FOR OVER 25 YEARS NOONE DISPUTES THAT IT HAS BEEN THERE AND BOTH THE TOWNSHIP AND OPPONENTS TO THE AMMENDMENT ADMIT THAT IT HAS BEEN THERE ... BUT ...
  NOONE HAD ISSUES WITH IT BEING THERE.... UNTIL NOW.!!

Section 7.6 addresses' Other contaminated site', and it is provided that Contaminated sites are defined as sites where the environmental condition of the property, i.e. the quality of the soil or groundwater, may have the potential for adverse effects on human health or the natural environment. Where the ESA produces reasonable evidence to

suggest the presence of site contamination, the proponent may be required to undertake appropriate technical studies as part of the development review process in order to identify the nature and extent of contamination, to determine potential human health and safety concerns as well as effects on ecological health and the natural environment, to demonstrate that the site can be rehabilitated to meet provincial standards and to establish procedures for site rehabilitation and mitigation of the contamination.
The ESA and site restoration, if required, shall be undertaken according to Ontario Regulation 153/04, Record of Site Condition.

> *It has been provided that there are known soil exceedances related to OPP EXCEEDENCES ARE MINIMAL AT BEST AND OF NO CONCERN TO MOE. REGARDLESS THE SITE WILL BE REMEDIATED BY OPP*
>
> *range activities on the area of the property that has been used for a shooting range. A Phase I and Phase II ESA was completed by EXP Services in 2018 and 2019 in order to assist with remedial action planning to ensure the sites meet the MECP SCS for metals in the environment. Potential impacts to the groundwater and pond have been identified along with soil impacts as a result of the existing shooting range. It is understood that remediation has not yet been completed, and monitoring requirements to ensure future contamination is mitigated have not been provided to the Township*
>
> *FUTURE MITIGATION MEASURES INCLUDE*
> *1.THE USE OF LIME AND PHOSPHATES. THIS WILL NEUTRALIZE SOILS AND HELP BIND ANY POTENTIAL CONTAMINATES SO THAT THEY MAY BE COLLECTED*
> *2. REGULAR MANUAL RAKING AND SIFTING OF SOILS TO SEPARATE LEADS AND COPPERS FROM THE SOIL SO THAT THEY WILL NOT LEACH*
> *3.DRAINAGE SWALES AND SETTLING POOLS TO COLLECT ANY LEACHATE AND REGULAR REMOVAL AND REPLACEMENT OF LEACHATE SOIL IN POOLS*

Policy Review - Official Plan

The subject lands are designated as Rural (RU), Areas of Natural Scientific Interest (ANSI) and Wetland (W).

All proposed amendments to the Township's Zoning By-Law must comply with the intent of the Township's Official Plan. The Official Plan is the guiding planning document for the Township that outlines Council's vision for the overall growth and development of the community, including providing evaluation parameters for the consideration of new uses. As provided by section 1.3.1, the purpose of this Plan is to guide future growth and development in a logical and orderly manner and to protect existing development

from the adverse effects which may arise from incompatible development. As well it is intended to protect and preserve those significant environmental features and resources that give the Township its unique character.

Section 2.3 of the Official Plan provides the objectives of the plan. Relevant objectives to this proposal include:

- 2.3.1 To protect the quality of the environment, particularly in regard to the health, safety, convenience and welfare of the residents of the Township;

- 2.3.2 To protect the natural resources and natural heritage features of the Township, such as prime agricultural lands, wetlands, forestry resources, aggregate resources, sensitive waterfront areas, and other identified environmental features which have contributed to the natural character of the Township

- GIVEN THE MINOR FOOTPRINT OF THE RANGE IN THE SCOPE OF THE SIZE OF THE PROPERTY THERE BE MINIMAL DISTURBANCE TO THE SENSITIVE AREAS, FURTHER THE ZONING CHANGE WILL NOT BE IN ANY DESIGNATED LANDS

- 2.3.3 To protect existing land uses from the impacts of incompatible development

- THERE IS NO REASON WHY A HORSE FARM AND A SHOOTING RANGE CANNOT BE COMPATIBLE USES GIVEN THE DISTANCE FROM EACH OTHER AND WITH THE LIMITED NOISE FROM THE RANGE AS PROVEN BY THE NOISE STUDY AND PEER REVIEW

- THEY HAVE BEEN COMPATIBLE FOR THE LAST 25 YEARS

- AS PER THEIR OWN ADMISSION.. MILLARBROOK HAS EXPANDED AND GROWN OVER THE LAST TWO DECADES. THE RANGE HAS BEEN IN EXISTENCE FOR THE LAST 25 YEARS . SO THEY CHOSE TO EXPAND KNOWING FULL WELL AND IN SPITE OF THE RANGES EXISTENCE

- 2.3.4 To protect the rural character of the Township by requiring rural non-farm development to be appropriately located and designed**;**

- **THIS IS EXACTLY THE TYPE OF NON FARM DEVELOPMENT SUGGESTED**

- **MARKED PAINTBALL WHICH IS AN ALMOST IDENTICAL USE WAS APPROVED JUST A FEW YEARS AGO. THIS COUNCIL FACED THE EXACT SAME PUBLIC OPPOSITION. NOISE, ENVIRONMENTAL CONCERNS ETC, YET MARKED HAS FIT INTO THE COMMUNITY WELL AND HAS BROUGHT VARIETY TO THE ECONOMIC BASE AND HAS BECOME A GOOD CORPORATE CITIZEN.**

- 2.3.7 To promote environmentally sound development;

Council must consider the Official Plan general objectives in reviewing the subject application and relevant sections of the Official Plan.

Section 3.3 Aesthetics - Through land use planning, Council shall encourage the preservation and enhancement of natural amenities of the Township and require a high standard of site planning.

A Site Plan Agreement will be required should the zoning application be approved. All future property owners will be subject to the site plan control agreement. If site alterations are proposed in the future, an amendment to the site plan control agreement would be required. During the Site Plan Control stage, aspects such as the site design, lighting, signage, stormwater and noise attenuation and other buffering will be finalized in consultation with Staff and agencies.

This is a large rural property that is well-suited to this type of rural recreational land use. It is set back significantly from the road and nearby land uses, so there is complete visual screening and a large separation

THERE WILL BE VERY LITTLE SIGNAGE IF ANY AND WE HAVE NO INTENTION OF BRINGING IN HYDRO FOR LIGHTING

Section 3.5 Buffering – Avoid conflicts between competing land uses and establish buffering where required to mitigate any adverse impacts of one land use on another. Buffering could include open space, retention of natural vegetation, berms, fences and vegetation.

Based on the location of the proposed range, there will be no visual impacts requiring buffering; however, the noise study has provided that ground cover should be maintained as a soft surface. Confirmation is needed through the peer review that the provided noise study has been completed in accordance with NPC-300 guidelines before recommendations addressing noise attenuation berming/buffering policies of the Official Plan can be provided.

THE PROPERTY WILL ALSO BE USED FOR HUNTING AND WILDLIFE MANAGEMENT AS MY OTHER PROPERTIES ARE. WE ARE TRYING TO BRING NATURE BACK TO OUR PROPERTIES AND WILL BE MANAGING THE WOODLANDS AND FIELDS FOR THIS PURPOSE, CUTTING DOWN OF TREES OR REMOVING GROUND COVERS IS JUST THE OPPOSITE OF OUR OBJECTIVES.

WE SPEND MANY THOUSANDS OF DOLLARS PER YEAR IMPROVING OUR LANDS IN AN ENVIRONMENTALLY SOUND MANNER TO IMPROVE HABITAT FOR ALL WILD LIFE INCLUDING BIRDS, SNAKES AND TURTLES. THE RANGE WILL HAVE LITTLE TO NO NEGATIVE IMPACT ON EXISISTING OR FUTURE WILD LIFE

Section 3.10.1 Contaminated Sites - Where a development application is made where a known, suspected, or potentially contaminated site exists or on a property adjacent to such a site, the proposed development shall not be approved until a Record of Site Condition, signed by a certified engineer and acknowledged by the Ministry of the Environment, is received and if necessary, a site clean-up plan is designed, and the site is cleaned up in accordance with Ontario regulation 153/04 and with the MOE Guideline Records of Site Condition.

Comments regarding site contamination have been provided in the PPS and the SCOP sections of this report, however at this time, Staff do not have adequate information to confirm that a decision to approve the subject application would conform with section 3.10.1 of the Official Plan.

WHAT IS THE DEFINITION OF A CONTAMINATED SITE ??

ACCOREDING TOTHE MOE THIS IS NOT A CONTAMINATED SITE.

COMMENT FROM MOE

I am not aware any guidance documents for contamination prevention at gun ranges. I imagine impermeable barriers to contain the shot/bullets and perhaps stop precipitation from landing on impacted soil to control possible leachate issues with the use of a roof. All sites really go back to the Environmental Protection Act to not cause an adverse effect. There are drinking water standards for obviously potable water (serviced area like in town or even a potable well using groundwater). And then there are the Table values in the Record of Site Condition regulation….this is when an industrial or commercial site changes in use to something more sensitive like residential and the more sensitive use table values needs to be met in order to get a building permit for a residence. Many people use these table values (as did the consultant for the OPP reports) to compare with but legally speaking these table values are only when there is a Record of Site Condition and do not represent the value that an adverse effect would occur. For example there are groundwater values for areas that have municipal water as these compounds (say gasoline) could migrate up inside a dwelling. The values though are very safe (conservative) are for a worst case scenario…cracked foundation with the contamination in the groundwater that could be just below the ground surface. When in most situations the groundwater could be down 20 m, no cracks in foundation, etc and therefore the exceedance would not cause an adverse effect. A little confusing I know All this to say contaminated sites can be compared to the Table values but an exceedance does not mean there is an adverse effect especially when the exceedances are well within the property boundary.

An RSC is only needed if the site use changes to something more sensitive (to residential use for example) so if the site continues to be used as a gun range (or other commercial use) there is no requirement for the RSC. The planning authority

(township) is involved as they issue the building permits for residences and they would require the RSC prior to issuing a permit for the more sensitive use. There could be more areas on the site that the RSC would look at depending on the historic use of the site. The consultant looks back in records as best as possible to see what the site has been used as. If the gun range is the only potentially contaminating activity then the area of focus would be limited to that area. If there are any RSC table value exceedances the impacted areas would need to be cleaned up to the value OR the consultant could do a risk assessment stating the exceedances of the table values would not cause an adverse effect for which they would have to justify.

THE MOE HAS CLEARLY STATED THAT THE "EXCEEDENCES " ARE A NON ISSUE AND WHILE THE OP MAY SUGGEST THAT CONTAMINATS ARE TO BE REMEDIATED AND MITIGATED ....THE MOE HAS STATED THAT THERE IS NOT ENOUGH CONTAMINANT TO REQUIRE ANY REMEDIATION OR MITIGATION.

THEREFORE THIS SITE DOES NOT MEET THE DEFININITION OF A CONTAMINATED SITE .

Section 3.14 Noise Attenuation– While noise studies are typically required (as per MOE guidelines) for certain industrial and extractive uses, the Township can request studies or provision of additional information when new development of another nature may cause compatibility concerns with respect to nearby sensitive land uses (ie. houses,).

> *The Official Plan does not set a trigger for noise studies for commercial uses, nor does it establish decibel parameters that would be used as evaluation criteria. Nonetheless, the Township can request a supporting study undertaken by a qualified professional that provides information regarding the impacts of noise on existing residential development, and other sensitive land uses, including recreational areas and equestrian training facilities. Staff are not in a position to recommend to Council that the proposed shooting range complies with the intent of this section of the official plan. Confirmation must be provided through the peer review that the noise study was completed and meets the sound emission protocols set out in the NPC-300 guidelines, notably for impulsive sound emissions.*
>
> *The study has recommended that: "the gun range operations should be kept to a small/moderate scale. The noise measurements recorded by BTE were for a small scale operation. (BTE) recommendation is that the gun range should be limited to no more than 5 persons at a time. A larger scale gun range operation (5+ persons at a time) would require additional field measurements to determine sound levels." If the subject zoning application is approved, the Township will have limited, to no capacity to limit the scale of operation of the subject site, except for site plan control provisions which will have enforcement limitations. The noise study has also recommended that the gun range operations should be restricted to daylight hours for safety and not allowed between 11:00 pm and 7:00 am according to MECP acoustic standards. The Zoning By-law can not be utilized to regulate hours of operation, nor can the site plan control by-law. The*

Township does not have a noise by-law, and as such, there will be no ability for the municipality to enforce the provided recommendation relating to the time of operations. The Township may be able to use the *Municipal Act* to control hours of operation and licensing however this needs to be investigated further.

THE NOISE STUDY PROVES THAT IT IS WITHIN ACCEPTABLE LIMITS BY MECP STANDARDS, ANY CONCERNS/COMPLAINTS ABOUT THE NOISE LEVELS SHOULD BE TAKEN AT FACE VALUE BUT NOT HAVING MERIT

SHOOTING FIREARMS AFTER DARK IS ILLEGAL SO THERE IS NO CONCERN THERE ON THAT POINT.

NOT SURE WHY HOURS OF OPERATION ARE A CONCERN.. PLS ADVISE WHAT THE SPECIFIC POTENTIAL IS SO I CAN RESPOND TO THIS CONCERN

MOST BUSINESS EXPANSION IS NOT LIMITED OR CONTROLLED BY ANY TOWNSHIP , NOT SURE WHY THIS IS OF CONCERN. THAT SAID THE ZONING AREA CAN BE AND IS LIMITED TO A CERTAIN AREA AND SIZE. THIS WAS BASED ON THE PLANNERS RECCOMENDATION

Section 3.18 Private Servicing Systems – Well and septic

To be addressed through the building permit and site plan process.

WELL AND SEPTIC ALREADY ON SITE

Section 4.3.1:Intent of Rural Designation- Designation intended to protect traditional rural activities and to permit a broad range of uses that are appropriate in a rural setting. The Rural designation is intended to protect traditional rural activities such as agriculture and forestry, and to permit a broad range of other uses which are appropriate in a rural setting. It is recognized that the majority of the Township's existing, as well as future, residential development will be located in the Rural designation. Other permitted uses will be carefully controlled in order to protect existing uses and the rural character of the Township.

The subject lands are located within a rural area of the municipality, consisting of a mix of agricultural lands, wetlands, forested land, residential development and waterfront development. The Township received a number of written submissions from the public that referenced the compatibility of the proposed range with existing development in the area. In particular, concerns were raised about the potential impacts on the operation of a nearby equestrian training facility, the enjoyment of residential properties, and the enjoyment of local waterbodies and waterways. The Official Plan is clear that new development is to be carefully controlled to protect existing uses and the area's rural character. The provided noise study will be an important component in determining the potential impact of

the proposed use on surrounding land uses. The peer review will need to be completed to ensure that the NPC-300 guidelines have been met. An EIS may provide further information of the impacts of noise on breeding season and potentially other impacts on wildlife

HOUSING DEVELOPMENT

ANY POTENTIAL HOUSING DEVELOPMENT SHOULD NOT BE AN ISSUE AS THERE ARE SEVERAL SUBDIVISIONS BUILT AROUND THE RANGES IN SMITHS FALLS AND AT CONNAUGHT. SOME HOMES AS CLOSE AS 240M FROM THE RANGE

THERE CAN BE NO DEVELOPMENT TO THE WEST OR NORTH DUE TO PSW. THE ONLY POSSIBLE DEVELOPMENT WOULD BE TO THE EAST BUT A GOOD PORTION OF THAT IS PSW AS WELL .

HOUSING DEVELOPMENT COULD PROCEED AS A RANGE WILL NOT IMPACT POTENTIAL DEVELOPMENT AS SEEN AT BOTH THE SMITHS FALLS AND CONNAUGHT RANGES

WILDLIFE IMPACT

THIS RANGE HAS BEEN IN EXISTENSE FOR 25 YEARS IN THIS LOCATION. ANY POTENTIAL IMPACT ON WILDLIFE HAS ALREADY HAPPENED AND WONT BE CHANGED BY THE CONTINUED USE OF THE RANGE. THERE ARE LOTS OF DEER TURKEY AND BEAR, BIRDS ETC ON THIS PROPERTY NOW. I CANNOT IMAGINE HOW ANY FURTHER IMPACT COULD BE CREATED BY CONTINUING THE EXISTING USE

TURTLES AND SNAKES DO NOT TYPICALLY INHABIT MOWED LAWNS OR FLAT ROCK AREAS.

MILLARBROOK FARM :

AS COUNCIL WAS ADVISED.. BY BRAD JUKOWSKI ON BEHALF OF MILLAR BROOKE .. THE MILLARS HAVE EXPANDED THE HORSE FARM OVER THE LAST 2 DECADES IN SPITE OF THE RANGES EXISTENCE. FURTHER THE RANGE WAS THERE DURING AND PRIOR TO THIS EXPANSION, IT DOESNT SEEM TO HAVE HAD AN IMPACT DURING THIS PERIOD .. AGAIN I MUST REMIND YOU THAT THERE WERE LITTLE TO NO COMPLAINTS FROM THE PUBLIC OR EVEN THE MILLARS IN THE LAST 25 YEARS.

AS TO NOISE AT MILLARBROOKE.. THE NEAREST TRAINING RING IS OVER 1.6 KM FROM THE FIRING LINE. IF THE NOISE AT 800M IS BELOW THE MECP LIMIT THEN IT WILL BE WELL BELOW THAT AT 1.6 KM SO I THINK THIS CONCERN IS OVERBLOWN. SEE THE STUDY BELOW

ABSTRACT

An experiment was conducted in an open practice ground (shooting range) regarding the recording of the sound of gunshots. Shots were fired using various types of firearms (seven pistols, five revolvers, two submachine guns, one rifle, and one shotgun) in different calibers, from several various distances with reference to the recording sources. Both, a conventional sound level meter (device) and a measurement microphone were used, having been placed in a fixed point behind the shooting line. The sound of each shot was recorded (from the device). At the same time the signal received by the microphone was transferred to a connected computer through an appropriate audio interface with a pre-amplifier. Each sound wave was stored and depicted as a wave function. After the physic-mathematical analysis of these depictions, the volume was calculated in the accepted engineering units(Decibels or dB) of Sound Pressure Level (SPL). The distances from the recording sources were 9.60 meters, 14.40 m, 19.20 m, and 38.40 m. The experiment was carried out by using the following calibers: .22 LR, 6.35 mm(.25 AUTO), 7.62 mm Tokarev(7,62×25), 7.65 mm(.32 AUTO), 9 mm Parabellum(9×19), 9 mm Short(9×17), 9 mm Makarov(9×18), .45 AUTO, .32 S&W, .38 S&W, .38 SPECIAL, .357 Magnum, 7,62 mm Kalashnikov(7,62×39) and 12 GA. Tables are given for the environmental conditions (temperature, humidity, altitude & barometric pressure), the length of the barrel of each gun, technical characteristics of the used ammunition, as well as for the volume taken from the SLM. The data for the sound intensity were collected after 168 gunshots (158 single shot & 10 bursts). According to the results, a decreasing of the volume, equivalent to the increasing of the distance, was remarked, as it was expected. Values seem to follow the Inverse square Law. For every doubling of the distance from the sound source, the sound intensity diminishes by 5.9904±0.2325 decibels (on average). .

AIP Conference Proceedings 1203, 846 (2010); https://doi.org/10.1063/1.3322568

Section 4.3.6: Rural Commercial Development- The Plan envisions a wide range of commercial land uses within the Rural designation. This section contains a series of evaluation criteria that must be considered when evaluating a new commercial development in the Rural designation:

- Most development should be located in Hamlets however it is recognized that not all development is suitable for hamlet areas due to size and locational considerations.

  It is not expected that the proposed use would be compatible with the hamlet designation, as such, it can be considered in the rural designation.

- Commercial uses are encouraged to locate on a provincial highway or County road and are generally restricted from developing with individual access points. Access is provided only according to the policies of the authority having jurisdiction.

  Entrance to Rideau Ferry Road is subject to Lanark County Public Works Approval - County permission has been provided for the new upgraded entrance.

- Access points should be limited to defined driveways at suitable locations and be limited in number.

  Entrance to Rideau Ferry Road is subject to Lanark County Public Works Approval - County permission has been provided for the new entrance.

- Advertising, signs, lighting and other site features are to be carefully located to ensure good site design and traffic safety practices.

  Subject to site plan control and consultation would occur with the County of Lanark Public Works Department.

  THERE WILL BE NO POWER AT THE SITE SO LIGHTING ETC IS NOT AN ISSUE AS TO SIGNAGE IT WILL BE MINIMAL IF AT ALL

- Adequate off-street parking, loading and other facilities are provided.

  Subject to site plan control. There should be adequate room available on site.

- Where commercial uses buffer residential or other sensitive land uses, adequate buffering or setbacks are provided.

  Staff comments in regards to buffering are addressed in the review of section 3.5 of the Official Plan within this report.

- New commercial uses only permitted through an amendment to Zoning By-law.

- *As per the application.*

- New commercial uses subject to site plan control

  The proposed use would be subject to site plan control.

Section 3.13.1 Areas of Natural and Scientific Interest (ANSI) - Areas of Natural and Scientific Interest (ANSI) are areas of land and water which include natural landscapes or features which have been identified as having values related to protection, natural heritage appreciation, scientific study and/or education. Where an ANSI overlay designation applies to a Provincially Significant Wetland, the policies of Section 4.6 shall also apply.

Section 4.6: Wetland (and adjacent lands) – No development or site alteration is permitted within wetland designation (applying to Provincially Significant Wetlands). Environmental Impact Studies shall be required for all development and site alteration within 120 m of a PSW to ensure no negative impacts on the ecological function of wetlands.

> *RVCA has regulatory approval over development proposals in or near PSWs. The subject lands that are proposed to be rezoned are located within 120 metres of a PSW and identified to be within an ANSI. Given that no site alteration is proposed, Staff did not request an EIS at the time of application submission. However, it is within the power of Council to request that an EIS be submitted in support of the subject application if it is in the opinion of Council that there is not enough information present to make a decision that will be consistent with natural heritage policies of the PPS. A request at this point in the zoning by-law amendment process must be carefully rationalized. Staff suggest that a request for the completion of the EIS could be appropriate if the noise study is amended with specific recommendations for noise attenuation measures that require site alteration.*
>
> *TECHNICALLY YES THE RANGE IS WITHIN 120M*
>
> *THE CLOSEST POINT IS APPROX 80M AND SEPARATED BY A BEDROCK RIDGE. THE RANGE ITSELF IS ON A FLAT ROCK AREA UNLIKELY HABITAT FOR TURTLES SNAKES ETC.. I BELIEVE THEY WILL BE NOT BE INHABITING A MOWED GRASS AREA. IT HAS BEEN THIS WAY FOR 25 YEARS AND WE WONT BE CHANGING THAT OR TAKING AWAY ANY EXISTING HABITAT.*

Section 6.6: Site Plan Control Area- Any new commercial development is subject to site plan control in order to regulate the general site design of the property and conceptual design of buildings and structures. In this case, site plan control would be used as a tool, complementary to the Zoning By-law to ensure that:

> *Site Plan Control will be required if the proposed use is approved.*

Section 6.8: Environmental Impact Study - Is intended to determine the following prior to development:

- Research, identify and map applicable natural features, values and functions;
- Describe proposed activities, including structures and all alterations;
- THIS IS ALREADY KNOWN
- Predict and evaluate impacts of development on various components of environment and wildlife, particularly with respect to sound levels;

ANY IMPACTS HAVE ALREADY TAKEN PLACE IN THE LAST 25 YEARS WE ARE NOT CHANGING THE USE

- Itemize and recommend measures that can be undertaken to reduce or mitigate effects;
- Evaluate the cumulative effect that the project may have, following the implementation of mitigation measures;
- Conclude with a professional opinion on whether negative effects will occur.

The Official Plan outlines triggers that would establish the need for an EIS. In this case, triggers are areas of natural and scientific interest and provincially significant wetland. The Township can require the completion of an EIS prior to development and implemented through site plan control, if development is supported, however Council may want to give further consideration as to whether this should be done before zoning permission is granted as a zoning right. Council may request an EIS if there are concerns that there is not enough information currently available to make a decision that adequality addresses natural heritage policies of the Official Plan.

AGAIN THIS IS ON A FLAT ROCK WITH MINIMAL POTENTIAL FOR ANY HABITAT DISTURBANCE AND HAS BEEN USED FOR THIS PURPOSE FOR THE LAST 25 YEARS.

Section 6.10 addresses the Rideau Canal Management Plan And World Heritage Site Management Plan. The Canal is designated as both "Canadian Heritage River and National Historic Site" by the Canadian Government and "World Heritage Site" by UNESCO. Pursuant to these designations, Parks Canada has prepared the Rideau Canal Management Plan and the World Heritage Site Management Plan. When considering development proposals on and adjacent to the Canal, Council shall consider the recommendations and policies contained in these Plans and, without limiting the generality of the foregoing, shall be guided by the following policies.

Parks Canada representative Susan Millar, Planner, provided that the subject property is not adjacent to the Rideau (jurisdiction of the marsh is limited to the Tay Canal itself), and as such, Parks Canada feedback is limited. Parks Canada provided that a concern they have is regarding the potential impact of sound/sound volumes; however, they have been addressed satisfactorily by the accompanying report. Parks Canada will be provided with the peer review once completed.

Evaluation

Planning Staff have given careful consideration to the application, the comments from the RVCA, Parks Canada, the Applicant, nearby property owners (those with the highest potential of experience the effects of the proposed development), and the general public that spoke at the public meeting or provided written submissions. The following issues have arisen most frequently in the correspondence, and while the Official Plan provides some direction on most of these issues, they will be addressed more concisely here.

Gun Safety

Concern has been raised by members of the public regarding public safety in regard to the discharge of firearms and the transportation of firearms to and from the site. The role of the municipality in relation to the subject application is to evaluate the proposed change in land use. The Federal government provides regulations for the transportation and use of firearms. If the application to rezone the property is approved, the Applicant will be required to demonstrate that the gun range is constructed to the standards of CFO. A copy of the proposed safety rules for the gun club should be submitted to the municipality.

The Township received a number of written submissions from the public supporting the proposed gun range with the reason that it would allow an opportunity to have a location to discharge firearms safely. Staff acknowledge these comments provide reasonable reason why individuals may want a gun range, however the planning policy must be addressed to allow for Council to be in a position to make a decision.

Compatibility and Noise

Concern was raised regarding noise in terms of impacts on neighbouring residences, enjoyment of recreational properties, commercial equestrian training facilities, agriculture, and wildlife. While the Official Plan does not automatically trigger a noise study to address this application, it is clear, based on the comments and information received, that this is a matter that needs to be fully addressed in order to satisfy Staff and Council that the proposed use is suitable from a compatibility standpoint. The Applicant has provided a noise study in support of the application. Staff have obtained the services of a consultant to peer review the study however, the peer review has not yet been completed. The peer review will confirm whether the submitted noise study was completed in accordance with NPC-300 guidelines. Staff advise that any decision should be deferred until the Township is satisfied that the findings of the noise study can be used as part of the review of the application. Before consideration of approval, it would need to be fully demonstrated to the Township's satisfaction that this application would not negatively impact adjacent sensitive land uses. Noise attenuation needs to be addressed in the planning process since the Township presently does not have a noise by-law in effect. If a decision is deferred, Staff will continue to work with Applicant and the consultant hired by the Township to finalize the peer review. Staff will bring a report back to Council for consideration when Staff deem there to be enough information to warrant an update or if Staff needs additional direction.

Site Contamination

The Township has a responsibility when making planning decisions which may impact the quality and quantity of water. It is understood that contaminants are present on-site from the previous use of the OPP range and training facility, and it is understood that a Phase I and II ESA have been completed. The Township has not been provided with the ESA. The Applicant has provided Township Staff with an email from an environmental officer of MECP. The RVCA has raised concerns regarding the potential impact that the proposed use may negatively impact the water quality of surface water features and vulnerable groundwater features. RVCA Staff have recommended deferral of this application until it is confirmed that remediation has been completed successfully and measures to protect against future contamination are provided.

A HOLDING ZONE WOULD PROVIDE THE SAME EFFECT

It is evident that if approved, the proposed use would contribute further to the existing site contamination or contribute to new contamination on-site if the site is remediated. No mitigative measures have been provided to the Township to ensure long-term water quality protection. Although the current contamination levels do not require action from the MECP, as per the provided email, it does not exempt the proposal from meeting planning policies. The PPS, Lanark County SCOP and Township Official Plan are clear that municipal planning decisions shall protect, improve or restore the vulnerable surface and groundwater, sensitive surface water features and sensitive ground water features, and their hydrologic functions.

In addition, the PPS, Lanark County SCOP and Township Official Plan is clear on site clean-up requirements before new development is approved. Staff recommend that decision be deferred until it is confirmed that site remediation has been completed and mitigative measures are provided to ensure future protections.

THIS IS NOT NEW DEVELOPMENT THIS HAS BEEN IN PLACE FOR 25 YEARS

THE FACT THAT THE TOWNSHIP CHOSE NOT TO RECOGNIZE ITS EXISTENCE DOESNT CHANGE THE FACT THAT IT DID INDEED EXIST.

DENYING ITS CONTINUING USE WONT CHANGE THE CURRENT SITUATION.

THE FACT THAT IT IS BEING REMEDIATED IS A BONUS BUT AS CLEARLY STATED BY THE MOE IT IS NOT REQUIRED UNDER ANY PROVINCIAL GUIDELINE AND THE EXISTING CONTAMINATION IS SO MINOR THAT I WOULD SUGGEST IT IS INCONSEQUENTIAL. FUTURE CONTINUING USE EVEN FOR ANOTHER 25 YEARS WONT LIKELY BRING IT TO LEVELS ABOVE PROVINCIAL GUIDELINES SO TO DENY FOR THESE REASONS DOESN'T MAKE SENSE

Effects on Wildlife and Wetlands

Potential impacts on natural heritage features, such as the nearby wetland and animal migration, WHAT ANIMAL MIGRATION ???? GEESE ARE NOT AFFECTED AND WE HAVE NO OTHER MIGRATING ANIMALS IN LANARK COUNTY... AND AGAIN.. ITS BEEN THERE FOR 25 YEARS ANY EFFECTS ARE ALREADY DONE

have been raised as a concern during the public consultation process. As provided in this report, the subject lands are located within 120 metres of a PSW and an ANSI. Given that no site alteration is proposed, Staff did not request an EIS at the time of application submission. It is, however within the power of Council to request that an EIS be submitted in support of the subject application if it is in the opinion of Council that there is not enough information present to make a decision that will be consistent with natural heritage policies in respect to addressing the PSW and ANSI.

The Official Plan does not specifically provide for the protection of the habitat of species such as deer, turkeys and others that are not covered specifically by provincial legislation or a municipal by-law. Staff suggest that the retention of the environmentally sensitive areas on the subject land would help retain the integrity of the habitat of these

animals. The proposed zoning amendment would exclude areas that are currently zoned Wetland.

CORRECT: ANY SENSITIVE AREAS ARE OUTSIDE OF THE REQUESTED APPLICATION

At this time, Township Staff is of the opinion that it is essential to finalize the review of the noise study to ensure the general compatibility of the proposed use can be confirmed.

Hours of Operation

The zoning by-law does not regulate the hours of operations of businesses, and the Township does not have a by-law regulating any commercial operation's business hours. The Township also does not have a noise by-law that can be utilized to regulate noise.

Options:

Summary

I do wish to note again that the range has been in operation for over 25 years. Everyone including the township had to have known of its existence. Just because it wasnt officially recognized by the township doesnt negate its exisistence or status as a functioning business and range at this location. The OPP paid the homeowner for use of her land. At the very least that makes this a commercial venture for the last 25 years. . There are many " grandfathered " businesses operating in this township without current zoning. To disqualify its status based on neighbor complaints after the zoning application is not the right way to proceed . we are trying to do the right thing and while i still believe this is a grandfathered situation, i would rather move forward in a positive way working with the township rather than against it.

BASED ON THE ABOVE STAFF REPORT AND THE HIGHLIGHTED COMMENTS FROM THE APPLICANT IT IS OUR BELIEF THAT THE PROPOSED AMMENDMENT

... WHILE NOT REQUIRED UNDER GRANDFATHERING RULES....

DOES IN FACT MEET ALL OF THE GUIDELINES FOR A PERMITTED USE AND SHOULD BE APPROVED by COUNCIL.

THE FACT THAT THIS COUNCIL APPROVED AN ALMOST IDENTICAL ZONING REQUEST FROM MARKED PAINTBALL SPEAKS VOLUMES TO THE FACT THAT THIS IS A VERY COMPATIBLE AND ACCEPTABLE RURAL USE FOR THIS TOWNSHIP.

WE BELEIVE WE HAVE ADDRESSED ALL THE CONCERNS OUTLINED IN THE STAFF REPORT SUCH THAT STAFF SHOULD NOW BE IN A POSITION TO RECOMMEND APPROVAL.

IF THERE ARE ANY OTHER CONCERN BY STAFF OR STAFF FEELS WE HAVE NOT ADDRESSED AND ISSUE SATISFACTORILY WE WOULD APPRECIATE KNOWING THE SPECIFIC DETAILS SO WE MAY ADDRESS THOSE AS WELL

THANK YOU

MARTIN WHYTE

Attachments:

- Key Map
- Neighbourhood context
- Site Photos
- Planning Justification Report – Zanderplan – July 19, 2022
- Noise Study – BT Engineering – July 13, 2022
- RVCA Comments – November 25, 2022
- Park Canada Comments- October 17, 2022
- Email from Greg Davis, Environmental Officer, MECP – November 16, 2022
- Public Comments and Written Submissions
- Minutes of Public Meeting on October 11, 2022

PHASE I ENVIRONMENTAL SITE ASSESSMENT

Smiths Falls IST Range
1686 County Road #1,
Perth, Ontario

Client
Ontario Provincial Police
General Headquarters
777 Memorial Avenue
Orillia, Ontario
L3V 7V3

Attn: Mr. Duncan McLelland

Project Number
BRM-00244589-A0

Prepared By
EXP Services Inc.
100-2650 Queensview Drive
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K2B 8H6, Canada

Date Submitted
September 4, 2018

Executive Summary

EXP Services Inc. (EXP) was retained by Ontario Provincial Police (OPP) to complete a Phase I Environmental Site Assessment (ESA) at Smiths Falls IST Range located at 1686 County Road #1, Perth, Ontario, hereinafter referred to as the 'Site'. A Site location plan is provided as Figure 1.

The objective of this Phase I ESA is to identify potential sources of environmental concern to the Site with a primary focus on the potential for environmental impacts resulting from the activities conducted by the OPP as part of their use of the Site. It is EXP's understanding that the Phase I ESA is required for due diligence purposes and that a Record of Site Condition (RSC) is not required at this time. The Phase I ESA was completed in general accordance to CSA Standard Z768-01 (R2016).

The Site is located 1 km north of County Road #1 in Perth, Ontario. The Site is located within a portion of a former gravel pit. The entire property measures approximately 55 hectares, however; for the purpose of this assessment only the northwestern portion of the property approximately 0.3 hectares (i.e. portion of site occupied by the firing range) was assessed (Figure 1 and 2). For the purpose of this assignment, the Phase I ESA study area consisted of neighbouring properties within a distance of approximately 150 metres from the Site boundaries.

The Site is currently owned by Mrs. Marilyn Hicken and is used by the OPP as a firing range. Reportedly, the site was originally developed as a gravel pit in the 1960s. It has operated as an active firing range since approximately 1995.

A site trailer is located in the northwest corner of the site with two associated gas-powered generators. A deck is situated the east of the trailer. The trailer is used as a class room. A shed is located centrally, on the west side of the Site. The shed is used to store the targets and the used shell casings. Adjacent to the east are two water bodies and to the west is a berm. To the south and north are wooded areas.

Based on the Phase I ESA findings, the following significant environmental issues were identified at the Site:

Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
Site		
Historical and current use as an active firing range	Soil, Groundwater and Surface water Metals	The Site has operated as an active firing range since approximately 1995. Lead bullets were utilized as ammunition by the OPP since they first occupied the Site. In 2014, the OPP switched to copper frangible bullets that reportedly do not contain lead; however, lead bullets are still occasionally utilized. Previous reports indicated that extensive metals impacts exceeding the then applicable MOE table 2 Site Condition Standards in various shallow soil samples collected from the berm and floor areas. These metals included lead, antimony, copper, zinc, and arsenic. To date, remediation of the impacted soil has not been completed. Surface water was present adjacent to the subject site, along the property boundary to the east.

Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
Historical burning of refuse on Site	Soil Polycyclic Aromatic Hydrocarbons (PAHs) and Metals	Previous environmental investigations indicated the presence of 'burn barrels' utilized by the OPP to occasionally burn empty bullet/shell casing boxes. During the Site visit, EXP identified the 'burn barrel' location as indicated in the previous reports. Previous investigations did not asses the burn barrel location.
Importation of fill of unknown quality (firing range berms)	Soil Metals, Inorganics and PAH	The Site is located within a portion of the property that was formerly a gravel pit. The berm observed along the southern portion of the firing range during the Site visit appeared to have been constructed from excess sand and gravel material sourced from the Site or property with a top layer of topsoil which was possibly imported. The top of the berm had creosote containing rail ties that were used to support the upper portion of the berm.
Surrounding properties		
None	N/A	N/A

Based on the environmental issues identified, EXP recommends the following:

Issues Identified	Recommendation	Rationale
Historical and current use as an active firing range. Known exceedances of metals in soil. Historical burning of refuse on Site. Potential for fill of unknown quality.	Conduct a Supplemental Phase II ESA consisting of soil, groundwater and surface water sampling and analysis, including delineating soil impacts and install monitoring wells to collect groundwater samples.	To delineate the extent of known soil impacts and to assess groundwater and surface water in order to derive a Remedial Action Plan.

EXP understands that potential environmental concerns that were not a result of the OPP's use of the Site will not be further investigated at this time.

This executive summary is a brief synopsis of the report and should not be read in lieu of reading the report in its entirety. Limitation of liability, scope of report and third-party reliance are outlined in Section 10 of this report.

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1 Introduction

EXP Services Inc. (EXP) was retained by Ontario Provincial Police (OPP) to complete a Phase I Environmental Site Assessment (ESA) at Smith Falls IST Range located at 1686 County Road # 1, Perth, Ontario, hereinafter referred to as the 'Site'. A Site location plan is provided as Figure 1. The Site is currently owned by Mrs. Marilyn Hicken. It is EXP's understanding that the Phase I ESA is being completed to support the potential lease of the property and that a Record of Site Condition (RSC) is not required.

1.1 Objective

The objective of this Phase I ESA is to identify potential sources of environmental concern to the Site with a primary focus on the potential for environmental impacts resulting from the activities conducted by the OPP as part of their use of the Site. It is EXP's understanding that the Phase I ESA is required for due diligence purposes and that a Record of Site Condition (RSC) is not required at this time.

A Phase I ESA is a systematic qualitative process to assess the environmental condition of a Site based on its historical and current uses. The Phase I ESA was completed in general accordance to CSA Standard Z768-01 (R2016). Subject to this standard of care, EXP makes no express or implied warranties regarding its services and no third-party beneficiaries are intended. Limitation of liability, scope of report and third-party reliance are outlined in Section 10 of this report.

1.2 Site Description

The Site is located 1 km north of County Road #1 in Perth, Ontario. The Site is located within a portion of a former gravel pit. The entire property measures approximately 55 hectares, however; for the purpose of this assessment only the northwestern portion of the property approximately 0.3 hectares was assessed (Figure 1 and 2). The Phase I ESA study area consisted of neighbouring properties within a distance of approximately 150 metres from the Site boundaries.

The Site is currently owned by Mel Hicken and is used by the OPP as a firing range. Reportedly, the site was originally developed as a gravel pit in the 1960s. It has operated as an active firing range since approximately 1995.

A site trailer is located in the northwest corner of the site with two associated gas-powered generators, and a deck to the east of the trailer, the trailer is used as a class room. A shed is located in the middle west side of the Site, the shed is used to store the targets and the used shell casings. Adjacent to the east are two water bodies and to the west is a berm. To the south and north are wooded areas.

The current range is already in a non-conformance impactful situation based on the mapping supplied by Ministry of Natural Resources and Forestry and Ministry of Environment.

Photographs of the Site are included in Appendix A.

2 Scope of Investigation

The scope of work the Phase I ESA consisted of the following activities:

- Reviewing the historical occupancy of the Site through the use of available archived and relevant municipal and business directories, fire insurance plans (FIPs), topographical maps, and aerial photographs;
- Contacting municipal and/or provincial agencies to determine the existence of records of environmental regulatory non-compliance, if any, and reviewing such records where available;
- Reviewing available geological maps, well records and utility maps for the vicinity of the Site;
- Reviewing available environmental reports for the Site;
- Conducting a Site visit of the Site and Site infrastructure in order to identify the presence of actual and/or potential environmental contaminants or concerns of significance;
- Conducting interviews with designated Site representative(s) as a resource for current and historical Site information, as well as to provide EXP staff with unrestricted access to all areas of the Site and Site buildings;
- Reviewing the current uses of the Site and any land use practices that may have impacted the environmental conditions at the Site;
- From the Site and publicly accessible areas, reviewing the current use of the surrounding properties and any land use practices that may have impacted the environmental condition of the Site; and,
- Preparing a report to document the findings.

In completing the scope of work, EXP did not conduct any intrusive investigations, including sampling, analyses or monitoring of materials. In addition, general environmental management and housekeeping practices were reviewed as part of this assessment insofar as they could impact the environmental condition of the property; however, a detailed review of regulatory compliance issues was beyond the scope of this investigation.

EXP personnel who conducted assessment work for this project included Mr. Daniel Clarke, P.Eng., and Mr. Chris Kimmerly, M.Sc., P.Geo., QP_{ESA}. An outline of their qualifications is provided in Section 8.

3 Records Review

3.1 General

The Site is located 1 km north of Country Road #1 in the Township of Perth, Ontario. For the purpose of this assignment, the Phase I ESA study area consisted of neighbouring properties within a distance of approximately 150 metres from the Site boundaries. The Phase I ESA study area is shown on Figure 2.

3.2 Aerial Photographs

The aerial photograph for the Site dated 1948 was obtained from the National Aerial Photograph Library, 1964, 1987 and 1995 aerial photographs were obtained from the previous reports. In addition, aerial photographs dated 2010 and 2016 were obtained from Google Earth. The aerial photographs were reviewed in order to assess the development and land use history of the Site and surrounding area. Copies of the aerial photographs are included in Appendix B.

The development and land use history of the Site and adjacent properties as depicted from the review of the aerial photographs is summarized below.

Aerial Photograph	Observations
1948	• The Site appears to be vacant and partially treed. • The surrounding properties appear to be treed and undeveloped. • Country Road #1 is present.
1964	• The Site appears to be developed as a gravel pit, no buildings appear to be present on site. • The surrounding area appears to be developed as a pit or treed
1987	• The gravel pit no longer appears operational and vegetation is present at the site.
1995	• No significant changes were noted between the 1987 and 1995 aerial photographs. • The scale was too poor of quality to identify the firing range berm, however the site has a similar shape as the firing range observed during the site visit.
2010	• The Site appears to be developed similar to what was observed during the site visit, with a trailer and deck in the northeastern portion of the site and a shed in the central west portion of the site. • Soil berms are visible in the eastern portion of the Site, similar to that observed during the Site visit, suggesting that the firing range is active. • The surrounding areas within the Phase I study area appear similar to the 1995 aerial photograph.
2016	• The Site and surrounding properties within the Phase I study area appear similar to the 2010 aerial photograph.

3.3 Fire Insurance Plans

The Catalogue of Canadian Fire Insurance Plans 1875 – 1975 (Catalogue) was used to determine if historical Fire Insurance Plans (FIPs) were available for the Site and surrounding area. Based on a review of the Catalogue, no FIPs were available for review.

3.4 City Directories

The Perth historical city directories were searched. No listings for the subject site were available.

3.5 Previous Reports

The following environmental reports were reviewed as part of this Phase I ESA:

1. "*Phase I Environmental Site Assessment and Limited Soil Sampling,* OPP Firing Range, Mel Hicken Property, 1686 County Road One, Perth, Ontario", prepared by Seacor Environmental Inc., dated June 8, 2007.
2. "*Phase II Environmental Site Assessment,* OPP Firing Range, Mel Hicken Property, 1686 County Road One, Perth, Ontario", prepared by AMEC Earth and Environmental, dated March 2008.

3.5.1 Phase I ESA and Limited Soil Sampling (Seacor, 2007)

- The Site was developed in approximately 1995 for use as an OPP outdoor firing range, encompassing approximately 0.3 hectares, while the remainder of the large property was mixture of agricultural fields, treed and undeveloped. Formally, the site was a used as a gravel pit.
- In March 2007, a total of ten shallow (0.15 m depth) soil samples were collected by Seacor from the earth berm and submitted for laboratory analysis. All ten samples exceeded the then applicable MOE Table 2 SCS for lead, antimony, and copper, with the exception of copper at two locations.

Revisions to the Ontario Ministry of the Environment 2004 SCS were made in 2009 and came into effect in July 2011, resulting in more stringent SCS for a number of chemical parameters. Based on a comparison of the 2009 analytical data collected by Seacor to the current (2011) Table 2 SCS, an exceedance of at least one metal parameter was noted in all ten soil samples analyzed.

3.5.2 Phase II ESA (AMEC, 2008)

- In November 2007, a total of 16 hand auger boreholes were advanced from the berm and firing range floor. A total of 28 soil samples were collected and submitted for laboratory analysis. The samples were collected at various depths to a maximum of 0.9 m.
- Concentrations of lead, antinomy, copper, total chromium and/or zinc exceeded the then applicable MOE Table 1 SCS in 24 of the 28 soil samples submitted for laboratory analysis.
- Intact bullet fragments were observed in 17 of the soil samples.
- The estimated volume of impacted material was estimated to be approximately 243 m^3 and an estimated mass of 405 tonnes.
- A toxicity characteristic leaching procedure (TCLP) was performed on the worst-case sample. The TCLP exceeded O.Reg 347 Schedule 4 criteria for lead. This indicated that any impacted material removed from the site must be managed as hazardous waste.

Revisions to the Ontario Ministry of the Environment 2004 SCS were made in 2009 and came into effect in July 2011, resulting in more stringent SCS for a number of chemical parameters. Based on a comparison of the 2009 analytical data collected by AMEC to the current (2011) Table 1 SCS, an exceedance of at least one metal parameter was noted in 24 of the 28 soil samples analyzed

3.6 Chain of Title

A chain of title was not completed for the Site as the Site history was established using historical information available from other sources.

3.7 Regulatory Requests

Provincial regulatory agencies were contacted to obtain information regarding environmental permits, past or pending environmental control orders or complaints, outstanding environmental regulatory non-compliance issues and Sewer Use By-Law infractions. EXP did not identify the need to contact any federal agencies.

3.7.1 Ministry of the Environment

On May 16, 2018, a request for information was submitted to the Ministry of Environmental and Climate Change (MOECC) Freedom of Information, Protection of Privacy Office for information in their files regarding any environmental concerns, Orders and spills that pertain to the Site. No records were found. A copy of the request and response from the MOECC is included in Appendix C.

3.7.2 Technical Standards and Safety Authority

The Technical Standards and Safety Authority (TSSA) is the Provincial regulatory agency responsible for overseeing the storage of fuels in Ontario. As such, the TSSA maintains a database (approximately 1987 to present) of all registered fuel storage tanks in Ontario.

On June 8, 2018, a Customer Service Representative for the TSSA was contacted by email and requested to search the TSSA database for records of fuel storage at the Site. Based on the review of their database, the TSSA indicated that there were no records of any fuel storage tanks at the subject addresses. A copy of the request and the response from the TSSA is included in Appendix C.

3.8 Maps

The following maps were reviewed:

- Atlas of Canada Topographic Map (also known as Toporama) found on the Natural Resources Canada website at http://atlas.nrcan.gc.ca/site/english/maps/topo/map
- Ministry of Northern Development and Mines, OGSEarth "Surficial Geology". Available online at http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth.
- Ministry of Northern Development and Mines, OGSEarth "Bedrock Geology" Available online at http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth.
- Ministry of Natural Resources and forestry, Natural heritage area map, Available online at https://www.ontario.ca/page/make-natural-heritage-area-map

A review of the above noted maps indicated the following:

- The Site is generally flat with a slight downward slope towards the pond and wetlands to the east of the site.
- Along the west property line there is an increase in elevation due to the elevated bedrock outcrop. Elevated bedrock outcrops are also located approximately 100 m east of the site just past the pond.
- The surrounding area is encompassed by a low-lying wetland area to the south, north, east and west of the site and drains into Tay River located approximately 1.8 km north of the site. The local groundwater flow direction is inferred to be towards the eastwards towards the pond and wetlands adjacent to the east of the Site.
- Native soils in the area of the Site are noted as till consisting of sandy silt to silty sand-textured on Paleozoic terrain. The wetlands area located to the north, west and south of the site is noted as organic deposits consisting of peat, muck, and marl.
- The bedrock in the area of the Site is part of a group belonging to the Beekmantown Formation consisting of dolostone and sandstone.

3.9 Company Records

No company records such as Material Safety Data Sheets (MSDSs), drawings or Certificates of Approvals were made available to EXP at the time of this Phase I ESA.

3.10 Environmental Source Information

Environmental source information includes documents published by the MOECC and online databases maintained by the MOECC. These documents and databases were reviewed to determine if waste disposal, coal tar, coal gasification, PCB storage sites or sites that generate hazardous wastes were located on or in the immediate vicinity of the Site. The review of the Environmental source information is provided below.

3.10.1 Waste Disposal Sites

The MOECC maintains an inventory of all known active and closed waste disposal sites in Ontario. The review of Waste Disposal Site Inventory published by the MOECC indicated that there were no former waste disposal facilities at the Site or within the Phase I study area.

3.10.2 Inventory of Coal Gasification Plan Waste Sites in Ontario

This inventory was published by the MOECC in 1988 to document the industrial facilities in Ontario that produced or used coal tar and other related tars (waste by-products of coal gasification). The information included in this inventory includes: facility type, size, land use, soil condition, site operators/occupants, site description, and potential environmental impacts.

Based on the review, no coal gasification sites were identified at the Site or within the Phase I ESA study area.

3.10.3 Ontario Inventory of PCB Storage Sites

The MOECC maintains an inventory of all known PCB storage sites in Ontario. The review of the Ontario MOECC Inventory of PCB Storage Sites in Ontario (1999, 2003, and 2004) indicated that there were no PCB Storage sites at the Site or within the Phase I study area.

3.10.4 Hazardous Waste Information (HWIN)

The Hazardous Waste Information Network (HWIN) identifies companies listed as waste generators and/or receivers (from 1986 to present). A review of the HWIN database indicated the Site and properties within the Phase I ESA Study Area were not identified as a registered generator of hazardous waste with the MOECC.

3.10.5 Well Records

The MOECC maintains an inventory of all known well records in Ontario. The review of well records inventory published by the MOECC indicated that there was one monitoring well completed on August 16, 2012. The monitoring well indicated the subsurface was sandy silty, gravel to a depth of 0.76 m, followed by limestone bedrock to a drilled depth of 4.57 m below grade. The monitoring well was not found during the site reconnaissance.

3.11 Record of Site Condition

A Record of Site Condition (RSC) summarizes the environmental conditions of a property as determined by a qualified person (QP) by conducting a Phase I ESA, and where necessary, a Phase II ESA, remediation, confirmatory sampling and risk assessment. Upon completion of the necessary environmental Site assessments, a RSC for an assessed property can be filed with the MOE and added to the Environmental Brownfields Site Registry database. This online, publicly available database can be searched to identify what properties may have potential environmental concerns.

Based on the search of the MOECC's Environmental Brownfields Site Registry database on June 8, 2018, no RSCs were identified for the Site or within the Phase I study area.

3.12 Utility Company Records

No utility company records were reviewed at the time of this Phase I ESA.

3.13 Public Health Concerns

No public health concerns were identified at the time of EXP's Phase I ESA.

4 Interviews

Interviews were conducted by EXP with the individuals identified to be the most knowledgeable with respect to both the current and historical Site uses. The interviews were conducted in order to obtain information to assist in identifying areas of potential environmental concern and identify details of potentially contaminating activities or potential contaminant pathways, in, on, or below the Site.

During the completion of this Phase I ESA, the following individuals were interviewed:

1 Mr. Duncan McLelland, OPP Facilities Management Coordinator, was interviewed during the Site visit. Mr. McLelland has been employed with the OPP for ten (10) years and has been familiar with the Site for approximately five (5) years. Mr. McLelland provided information regarding former and current operations on-Site.

2 Ms. Jennifer Chown, OPP Environmental Facilities Coordinator, was interviewed during the Site visit. Ms. Chown has been employed with the OPP since July 31, 2017 and provided information regarding current operations on-Site.

5 Site Reconnaissance

On June 6, 2018, Mr. Daniel Clarke of EXP conducted the Site visit in accordance with EXP's internal health and safety protocols and with the Ministry of Labour health and safety regulations. The purpose of the Site visit was to assess the current conditions of the Site.

The general environmental management and housekeeping practices at the Site were reviewed as part of this assessment insofar as they could impact the environmental condition of the property; however, a detailed review of regulatory compliance issues was beyond the scope of EXP's investigation.

A Site layout, and potential sources of environmental impairment identified in this Phase I ESA are shown on Figure 3.

The Site and the adjoining properties were observed from the Site and/or publicly accessible areas. Photographs documenting the Site visit are included in Appendix A.

5.1 Site

5.1.1 Property Use

The Site has operated as an OPP firing range since approximately 1995. Prior to that, the site was used as a gravel pit. The Site is accessed by a laneway from County Road #1 (Photograph 1, Appendix A). During the site visit there were shell casings located on the floor of the range approximately 10 m from the berm (Photograph 2-3, Appendix A). The site representative indicated the shell casings are usually picked up after shooting, however the last time the range was used it was snow covered and therefore they were unable to pick up the shell casings and they would be picked up when they use the range next. The Site representatives also indicated they use the range approximately 52 days a year with approximately 14 shooters each time.

5.1.2 Buildings and Structures

The Site currently has one mobile trailer and a deck attached located at the north-east portion of the site with two portable gasoline generators (Photograph 4-6, Appendix A). The site representatives indicated they use the trailer as a class room for training purposes. There was also a shed located in the central west portion of the property. The site representatives indicated the shed is used as storage for the wooden and paper targets as well as the shell casings after they pick them up off the ground (Photograph 7 and 8, Appendix A). A portable toilet was also observed on site (Photograph 9, Appendix A).

5.1.3 Limitations at the Site

No limitations were encountered during the Phase I Site visit.

5.1.4 Chemical Inventory, Storage and Handling

No significant chemical inventory, storage or evidence of chemical handling was observed or reported at the time of the Site visit.

5.1.5 Storage Tanks and Containers

The presence/absence and condition (if present) of Underground Storage Tanks (USTs) and Aboveground Storage Tanks (ASTs) at the Site were assessed during the Site visit.

No evidence of a potential UST or AST (vent and fill pipes) was identified during the Site visit. Site personnel indicated that there was never an AST or UST located at the site to their knowledge with the exception of one old 900 L AST that was observed in the northern portion of the site and being used as a burn pit. The AST was cut open to be used as a burn pit. No liquids were being stored in the AST (Photograph 10 and 11, Appendix A). There was some ash piled near the burn pit that was likely from the burn pit being cleaned out.

5.1.6 Special Attention Substances

5.1.6.1 Polychlorinated Biphenyls (PCBs)

The manufacture of PCBs in North America was prohibited under the Toxic Substances Control Act (1977). Their use as a constituent of new products manufactured in or imported into Canada was prohibited by regulations in 1977 and 1980. As such, sites developed or significantly renovated after 1980 are unlikely to have PCBs-containing equipment on the Site. Potential equipment, which could contain PCBs include fluorescent mercury and sodium vapour light ballasts, oil filled capacitors and transformers. A review of the Site was conducted to evaluate the potential presence of PCBs-containing equipment in use or stored at the Site.

Any electrical equipment containing PCBs must be disposed in accordance with Ontario Regulation 362 when it is removed from service. Ongoing operation of equipment containing PCBs is permissible.

Fluorescent light fixtures were observed within the utility rooms of the Site building. Based on the age of the Site building (constructed in approximately 1995), it is considered unlikely for PCBs to be present within the fluorescent light ballasts within the Site building.

5.1.6.2 Asbestos-Containing Materials (ACMs)

Asbestos-containing materials (ACMs) are fibrous hydrated silicates and can be found in building materials as either "unbound" or "bound" asbestos. Friable asbestos refers to materials where the asbestos fibres can be separated from the material with which it is associated. Non-Friable asbestos refers to asbestos, which is associated with a binding agent (such as tar or cement). Friable asbestos is commonly found in boiler and pipe insulation. Non-Friable asbestos is typically found in roofing tars, floor and ceiling tiles, and asbestos-containing cement.

ACMs in the workplace are defined as a Designated Substance under the Ontario Occupational Health and Safety Act (OHSA). Under OHSA, persons in the workplace are required to be notified of the presence of ACMs once they are suspected to be present, and if there is a potential for workers to be exposed. The use of ACMs was discontinued in Canada in the late 1970s/early 1980s, although friable asbestos can still be found in recently constructed buildings.

Based on the age of the Site building (constructed in approximately 1995), it is considered unlikely for ACMs to be present within the Site building in the form of floor tiles, roofing material, and piping insulation. EXP did not conduct any sampling for asbestos during the Site visit

5.1.6.3 Ozone Depleting Substances (ODSs)

Chlorofluorocarbons (CFCs) often referred to as Freons, ceased production in Canada in 1993 as a result of their ozone-depleting characteristics. Importation of CFCs into Canada ceased in 1997 and a total ban on their use is proposed for 2020. The use of these materials is still permitted in existing equipment, but equipment must be serviced by a licensed contractor such that CFCs are contained and not released to the environment during servicing or operation.

Under the management of a licensed contractor, the subject systems do not represent a significant threat to human health or the environment. However, if present, CFCs will require replacement by 2020 and as such consideration should be given to future phase out programs.

No ODS-containing materials were observed and are considered likely present at the site.

5.1.6.4 Lead

Lead has frequently been used in oil-based paints, roofing materials, cornices, tank linings, electrical conduits and soft solders for tinplate and plumbing. The use of lead-based paints (LBPs) was phased out circa 1976. Paint that was produced or used between 1976 and 1980 may contain small amounts of lead. Paint that was produced or used prior to 1950 may contain high levels of lead. The main concern regarding lead paint is its potential to become lead dust or chips either through deterioration and/or mechanical means (i.e., sanding, abrasion, etc.). Exposure to lead dust or chips occurs by ingestion or inhalation.

Based on the age of the Site building (constructed in approximately 1995), it is considered possible for LPBs to be present within the Site building. The painted surfaces noted during the Site visit were observed to be in good condition.

Lead bullets were utilized as ammunition by the OPP since they first occupied the Site. In 2014, the OPP switched to copper frangible bullets that reportedly do not contain lead; however, lead bullets are still occasionally utilized.

5.1.6.5 Urea Formaldehyde Foam Insulation (UFFI)

UFFI was formerly sprayed into cavities of walls and above ceilings as an insulating material. UFFI has been discontinued from commercial use since the early 1980s.

No evidence of UFFI was noted during EXP's Site visit

5.1.6.6 Mercury

Mercury was historically used in some batteries, light bulbs, old paints, thermostats, old mirrors, etc. Based on an investigation by Consumer and Corporate Affairs Canada, and an assessment of potential health risks by Health and Welfare Canada, in 1991 the decision was made to eliminate the use of mercury compounds in indoor latex paints. The Canadian Paint and Coatings Association (CPCA) supported the withdrawal and all Canadian manufacturers and formulators of the preservative voluntarily agreed to remove "interior uses" from their product labels.

Site personnel indicated that some of the residential units contained thermostats. Based on the age of the building (constructed in approximately 1995) it is considered unlikely for mercury-containing

materials to be present within the thermostats and on painted surfaces. The painted surfaces noted during the Site visit were observed to be in good condition, no mercury containing paints or thermostats were observed at the site.

No mercury containing thermostats were observed during the Site visit.

5.1.6.7 Mould

Mould is found in the natural environment and is required for the breakdown of plant debris such as leaves and wood. Mould spores are found in the air in both the indoor and outdoor environments. In order for mould to grow it requires a food source (i.e. gypsum wallboard, carpets, wallpaper, wood, etc.) and moist conditions. Mould can have an impact on human health depending on the species and concentration of the mould. Health effects can include allergies and mucous membrane irritation.

Currently there are no regulations governing mould; however, there are several guidelines addressing mould assessments and abatement. At present, the industry standards include the Canadian Construction Association (CCA) document 82-2004 titled “Mould guidelines for the Canadian construction industry” and the Environmental Abatement Council of Ontario (EACO) guidelines titled “EACO Mould Abatement Guidelines, Edition 2 (2010)”.

It is important to note that the Ontario Ministry of Labour (MOL) has governed protecting workers under the Occupational Health and Safety Act, which states that employers are required to take every precaution reasonable to protect their workers. This includes protecting workers from mould within workplace buildings.

No evidence of suspected mould was observed within the Site building at the time of EXP’s Site visit

5.1.6.8 Radon

Radon is a colourless, odourless, radioactive gas that occurs naturally in the environment. It comes from the natural breakdown of uranium in soils and rocks. Exposure to high levels of radon increases the risk of developing lung cancer. This relationship has prompted concern that radon levels in some Canadian buildings may pose a health risk. Radon gas can move through small spaces in the soil and rock and seep into a building through cracks in concrete, sumps, joints and basement drains. Concrete-block walls are particularly porous to radon and radon trapped in water from wells can be released into the air when the water is used.

Due to the potential health concerns associated with radon, Health Canada released a guideline in June 2007 for a maximum acceptable level of radon gas of 200 becquerels per cubic metre (Bq/m^3). Where radon gas is present and the annual radon concentration exceeds 200 Bq/m^3 in the normal occupancy area, Health Canada recommends taking the necessary actions to reduce radon levels.

Based on the overburden and bedrock materials underlying the Site, significant concentrations of radon gas are not anticipated. However, the presence of radon at the Site can only be determined by actual testing which was beyond the scope-of-work for this assessment.

5.1.6.9 Other Substances

No other special attention substances (such as acrylonitrile or isocyanates) were suspected to be present at the Site at the time of this Phase I ESA.

5.1.7 Unidentified Substances

No unidentified substances were present at the Site at the time of this Phase I ESA.

5.1.8 Drains and Sumps

No drains, pits or sumps were observed during the site visit.

5.1.9 Building Heating and Cooling Systems

The site building is heated with electrical heating powered by a portable gasoline generator. The site building is reportedly not cooled.

5.1.10 Mechanical Equipment

No significant mechanical equipment was identified at the time of the Site visit. However, two portable generators were present at the site.

5.1.11 Air Emissions

Air emissions in Ontario are regulated under the Environmental Protection Act (EPA) and its Regulations (O. Reg. 419/05, O. Reg. 245/11). Owners and operators of activities that may discharge a contaminant into the natural environment must seek approval from the Ministry of the Environment (ministry) to carry out these activities. As of October 31, 2011, amendments to the EPA resulted in a two-path environmental approval process, the Environmental Compliance Approval (ECA) and Environmental Activity and Sector Registry (EASR). The EASR allows businesses to register certain activities with the ministry, rather than apply for approvals. The EASR is for common systems and processes, currently for heating systems, standby power systems and automotive refinishing, to which preset rules of operation can be applied. Unless explicitly exempted, most industrial processes or modification to industrial processes and equipment require an ECA, formerly a Certificate of Approval (Air and Noise). Retroactive approval should be sought for equipment installed and unchanged between 1972 and June 29th, 1988 when the requirement for a Certificate of Approval was added to the EPA. The EPA provides a list of specific equipment and conditions, which are exempt from approval requirements (i.e. fuel burning equipment for comfort heating in a building using natural gas or number 2 fuel oil at a rate of less than 1.5 million British Thermal Units per hour [BTU/hour])

No significant sources of air emissions were identified during the Site visit.

5.1.12 Odour and Noise

No chemical or other significant odours were detected during the Site visit.

When the gun range is in operation, excessive noise would be created due to the use of fire arms going off. Proper hearing protection is reportedly worn during use. Therefore, based on proper hearing protection worn at all times during the gun fire, no concerns were identified.

No other source of excessive noise was detected at the Site during the Site visit.

5.1.13 Sewage and Wastewater Disposal

The Site is not serviced with sewage or waste disposal, and the surrounding areas are served by private septic systems.

5.1.14 Liquid Chemical Waste Generation, Storage & Disposal

No significant liquid chemical waste generation was observed during the Site visit.

5.1.15 Solid Waste Generation, Storage & Disposal

The Site representatives mentioned that general waste is reportedly removed from the Site after every operation. The shell casings are reportedly picked up afterwards and removed from the site, and the bullets remain in the berm. However, during the winter some of the shells were not found due to the snow cover and the remaining shells get picked up upon returning to the site during the next operation. The bullets in the berm are considered to be an environmental concern.

5.1.16 Topographic, Geologic and Hydrogeologic Conditions

The Site is relatively flat and the surrounding area generally slopes downwards to the east towards a wetlands area located adjacent to the site, as discussed in Section 3.8 of this report.

The actual groundwater flow direction can only be determined by long term groundwater elevation investigation in the area. The local groundwater flow direction is inferred to be towards the eastwards towards the pond and wetlands to adjacent to the east of the Site.

5.1.17 Water Courses, Ditches and Site Drainage

The Tay Marsh (a provincially significant wetlands) is situated approximately 0 to 50 m, west, north and south of the Site. The marsh appears to discharge to Tay River approximately 1.8 km northeast of the Site, which discharged to the Rideau River.

A pond and a wetlands area are located adjacent to the east site (Photograph 12 and 13, Appendix A).

5.1.18 Abandoned and Existing Wells

No existing or abandoned wells were observed during the Phase I Site visit. However, monitoring well records exist for the site for one monitoring well, discussed in Section 3.10.5 and shown Figure 4. The monitoring well is suspected to be located under a layer of fill added to the berm. The monitoring well was not observed during the site visit.

5.1.19 Potable Water Sources

The Site is not connected to the municipal water supply system.

5.1.20 Fill Material

The Site is located within a portion of the property that was formerly a gravel pit. A gravel berm was observed along the southern section of the firing range during the Site visit. The berm appears to have been constructed from excess material sourced from the property and not imported to the site, with a top layer of topsoil. The Site representative mentioned the topsoil layer was added to the berm to help resurface the berm. The top soil layer was likely imported to the site. At the top of the berm was creosote containing rail ties to support the upper portion of the berm (Photograph 14 to 16, Appendix A).

5.1.21 Stained Materials

Some staining was observed around the fire pit area (Photograph 9 and 10, Appendix A). No other staining was identified at the Site during the Site visit.

5.1.22 Stressed Vegetation

No stressed vegetation was observed at the time of the Site visit.

5.1.23 Roads, Parking Facilities and Right of Ways

The Site is accessible from County Road # 1, to the south of the Site. Parking is located to the east of the site.

5.1.24 Pits and Lagoons

No pits or lagoons were observed on the Site.

5.1.25 Other Issues

Some debris was observed next to the shed including old empty paint cans, and some steel. The Site representative indicated the steel targets get painted periodically (Photograph 17, Appendix A).

Plastic shot gun shell casings were observed on the back side of the berm area. The site representative indicated they resurface the berm periodically and that could have pushed some of the plastic shot gun shells over the top of the berm and to the ground on the back side of the berm, extending approximately 12 m from the back of the berm. (Photographs 18, Appendix A).

No other issues were identified during the site visit.

5.2 Neighbouring Properties

The condition of the adjoining and neighbouring properties within the study area were observed at the time of EXP's Site visit. Table 5.1 summarizes the occupancy of the immediate surrounding properties.

Table 5.1 Summary of the Immediate Surrounding Properties

Location	Address	Land Use
North	Hicken Property, 1686 County Road # 1 (Property)	Wooded area/ wetlands
East	Hicken Property, 1686 County Road # 1 (Property)	Two ponds followed by wooded area/ agricultural land
South	Hicken Property, 1686 County Road # 1 (Property)	Wooded area followed by wetlands
West	Hicken Property, 1686 County Road # 1 (Property)	Wooded area/ agricultural land followed by wetlands

No environmental concerns were identified with respect to properties located within the Phase I study area.

6 Conclusions

Based on the Phase I ESA findings, the following significant environmental issues were identified at the Site:

Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
Site		
Historical and current use as an active firing range	Soil, Groundwater and Surface water Metals	The Site has operated as an active firing range since approximately 1995. Lead bullets were utilized as ammunition by the OPP since they first occupied the Site. In 2014, the OPP switched to copper frangible bullets that reportedly do not contain lead; however, lead bullets are still occasionally utilized. Previous reports indicated that extensive metals impacts exceeding the then applicable MOE Table 2 Site Condition Standards in various shallow soil samples collected from the berm and floor areas. These metals included lead, antimony, copper, zinc, and arsenic. To date, remediation of the impacted soil has not been completed. Surface water was present adjacent to the subject site, along the property boundary to the east.
Historical burning of refuse on Site	Soil Polycyclic Aromatic Hydrocarbons (PAHs) and Metals	Previous environmental investigations indicated the presence of 'burn barrels' utilized by the OPP to occasionally burn empty bullet/shell casing boxes. During the Site visit, EXP identified the 'burn barrel' location as indicated in the previous reports. Previous investigations did not asses the burn barrel location.
Importation of fill of unknown quality (firing range berms)	Soil Metals, Inorganics and PAH	The Site is located within a portion of the property that was formerly a gravel pit. The berm observed along the southern portion of the firing range during the Site visit appeared to have been constructed from excess sand and gravel material sourced from the Site or property with a top layer of topsoil which was possibly imported. The top of the berm had creosote containing rail ties that were used to support the upper portion of the berm.
Surrounding properties		
None	N/A	N/A

7 Recommendations

Based on environmental issues identified, EXP recommends the following:

Issues Identified	Recommendation	Rationale
Historical and current use as an active firing range. Known exceedances of metals in soil. Historical burning of refuse on Site. Potential for fill of unknown quality.	Conduct a Supplemental Phase II ESA consisting of soil, groundwater and surface water sampling and analysis, including delineating soil impacts and install monitoring wells to collect groundwater samples.	To delineate the extent of known soil impacts and to assess groundwater and surface water in order to derive a Remedial Action Plan.

8 Qualifications of Assessors

The records review, Site visit and reporting were conducted by **Daniel Clarke,** P.Eng., who has 8 years of experience in the environmental consulting field. Technical undertakings have included: project coordination; Phase I, II and III Environmental Site Assessments; contaminated site investigations including drilling supervision, environmental sampling and data evaluation; and technical report preparation.

The report was reviewed by **Chris Kimmerly**, M.Sc., P.Geo., who has more than 25 years of environmental consulting experience, 24 of which have been with EXP. A graduate of Brock University with a Master of Science Degree in Geological Science, His technical experience includes managing, coordinating, and conducting environmental site assessments; groundwater sampling programs; soil and groundwater remedial action and risk mitigation plans; mineral aggregate assessments; hydrogeological and terrain analysis assessments; designated substances and hazardous materials surveys.

EXP Services Inc. is a full-service consulting and engineering firm and provides a full range of environmental services through the Environmental Services Group. EXP's Environmental Services Group has developed a strong working relationship with clients in both the private and public sectors and has developed a positive relationship with the Ontario Ministry of the Environment. Personnel in the numerous branch offices form part of a large network of full-time dedicated environmental professionals in the EXP organization.

9 References

1. Canadian Standards Association. November 2001. Z768-01 (R2016). *Phase I Environmental Site Assessment.*

2. *Occupational Health and Safety Act* - Ministry of Labour (MOL).

3. Natural Resources Canada, The Atlas of Canada, Toporama. Available online at: http://atlas.nrcan.gc.ca/site/english/maps/topo/map

4. Ministry of Northern Development and Mines, OGSEarth "Surficial Geology". Available online at http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth.

5. Ministry of Northern Development and Mines, OGSEarth "Bedrock Geology" Available online at http://www.mndm.gov.on.ca/en/mines-and-minerals/applications/ogsearth.

6. Ministry of Natural Resources and forestry, Natural heritage area map, Available online at https://www.ontario.ca/page/make-natural-heritage-area-map

7. Inventory of Coal Gasification Plant Waste Sites in Ontario. Ontario Ministry of the Environment, April 1987.

8. Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario. Ontario Ministry of the Environment, November 1988.

9. Waste Disposal Site Inventory. Waste Management Branch Ontario Ministry of the Environment, June 1991.

10. Ontario Inventory of PCB Storage Sites. Ontario Ministry of the Environment, 1993- 2003-2004.

11. Hazardous Waste Information Network (HWIN, 1986-2009).

12. Ontario Ministry of the Environment, Brownfields Registry website (www.ene.gov.on.ca/environet/BESR/index.htm)

13. *Phase I Environmental Site Assessment and Limited Soil Sampling,* OPP Firing Range, Mel Hicken Property, 1686 County Road One, Perth, Ontario", prepared by Seacor Environmental Inc., dated June 8, 2007.

14. *Phase II Environmental Site Assessment,* OPP Firing Range, Mel Hicken Property, 1686 County Road One, Perth, Ontario", prepared by AMEC Earth and Environmental, dated March 2008.

10 Limitations and Use of Report

BASIS OF REPORT

This report ("Report") is based on site conditions known or inferred by the investigation undertaken as of the date of the Report. Should changes occur which potentially impact the condition of the site the recommendations of EXP may require re-evaluation. Where special concerns exist, or the Client has special considerations or requirements, these should be disclosed to EXP to allow for additional or special investigations to be undertaken not otherwise within the scope of investigation conducted for the purpose of the Report.

Where applicable, recommended field services are the minimum necessary to ascertain that construction is being carried out in general conformity with building code guidelines, generally accepted practices and EXP's recommendations. Any reduction in the level of services recommended will result in EXP providing qualified opinions regarding the adequacy of the work. EXP can assist design professionals or contractors retained by the Client to review applicable plans, drawings, and specifications as they relate to the Report or to conduct field reviews during construction.

RELIANCE ON INFORMATION PROVIDED

The evaluation and conclusions contained in the Report are based on conditions in evidence at the time of site inspections and information provided to EXP by the Client and others. The Report has been prepared for the specific site, development, building, design or building assessment objectives and purpose as communicated by the Client. EXP has relied in good faith upon such representations, information and instructions and accepts no responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of any misstatements, omissions, misrepresentation or fraudulent acts of persons providing information. Unless specifically stated otherwise, the applicability and reliability of the findings, recommendations, suggestions or opinions expressed in the Report are only valid to the extent that there has been no material alteration to or variation from any of the information provided to EXP. If new information about the environmental conditions at the Site is found, the information should be provided to EXP so that it can be reviewed and revisions to the conclusions and/or recommendations can be made, if warranted.

STANDARD OF CARE

The Report has been prepared in a manner consistent with the degree of care and skill exercised by engineering consultants currently practicing under similar circumstances and locale. No other warranty, expressed or implied, is made. Unless specifically stated otherwise, the Report does not contain environmental consulting advice.

COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment form part of the Report. This material includes, but is not limited to, the terms of reference given to EXP by the Client, communications between EXP and the Client, other reports, proposals or documents prepared by EXP for the Client in connection with the site described in the Report. In order to properly understand the suggestions, recommendations and opinions expressed in the Report, reference must be made to the Report in its entirety. EXP is not responsible for use by any party of portions of the Report.

USE OF REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. No other party may use or rely upon the Report in whole or in part without the written consent of EXP. Any use of the Report, or any portion of the Report, by a third party are the sole responsibility of such third party. EXP is not responsible for damages suffered by any third party resulting from unauthorised use of the Report.

REPORT FORMAT

Where EXP has submitted both electronic file and a hard copy of the Report, or any document forming part of the Report, only the signed and sealed hard copy shall be the original documents for record and working purposes. In the event of a dispute or discrepancy, the hard copy shall govern. Electronic files transmitted by EXP utilize specific software and hardware systems. EXP makes no representation about the compatibility of these files with the Client's current or future software and hardware systems. Regardless of format, the documents described herein are EXP's instruments of professional service and shall not be altered without the written consent of EXP.

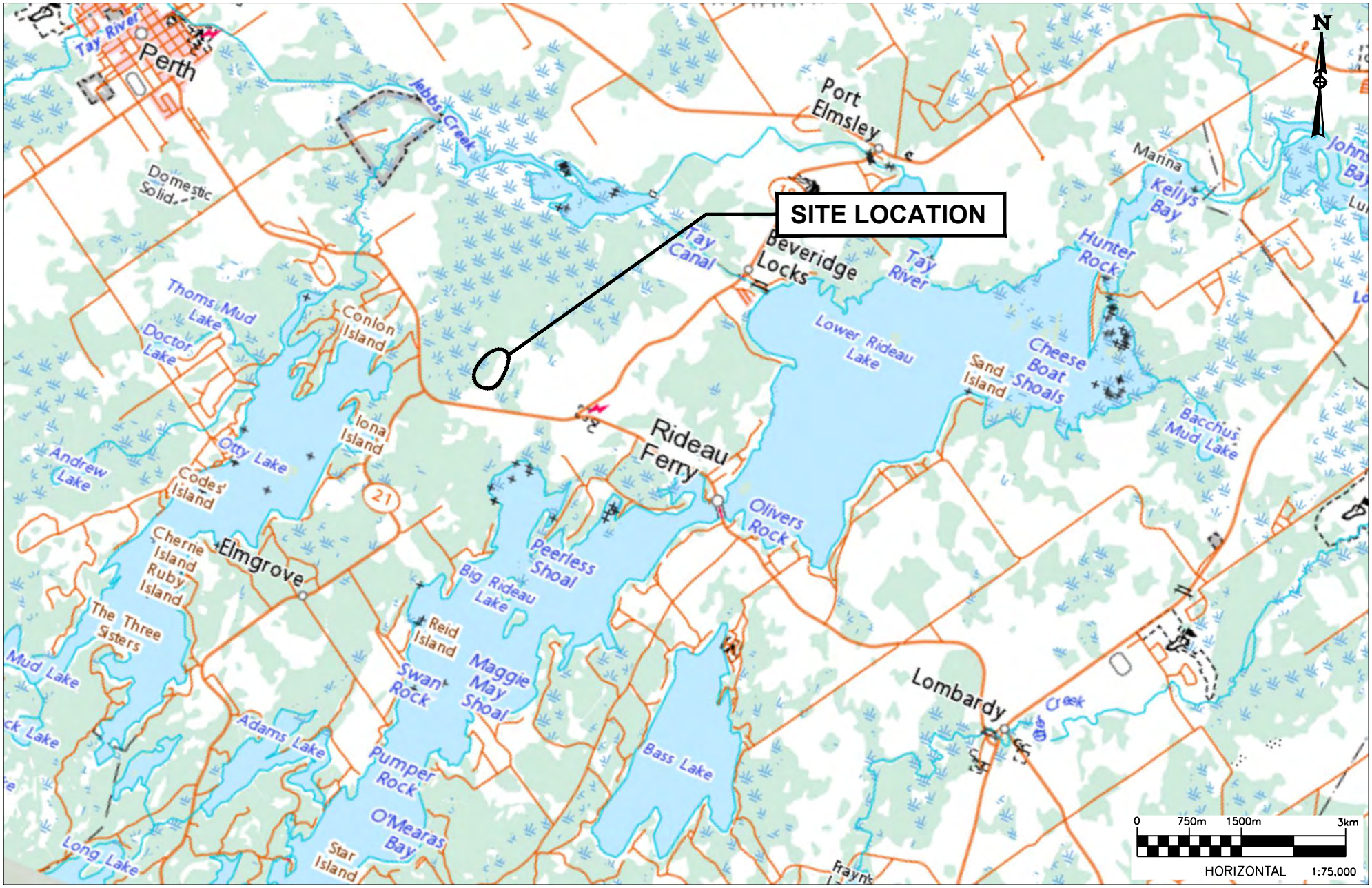
We trust this report satisfies your immediate requirements. If you have any questions regarding the information in this report, please do not hesitate to contact this office.

EXP Services Inc.

Daniel Clarke, P.Eng.
Environmental Engineer
Earth and Environment

Chris Kimmerly, P.Geo., M.Sc.
Manager - Senior Geoscientist
Earth and Environment

Figures



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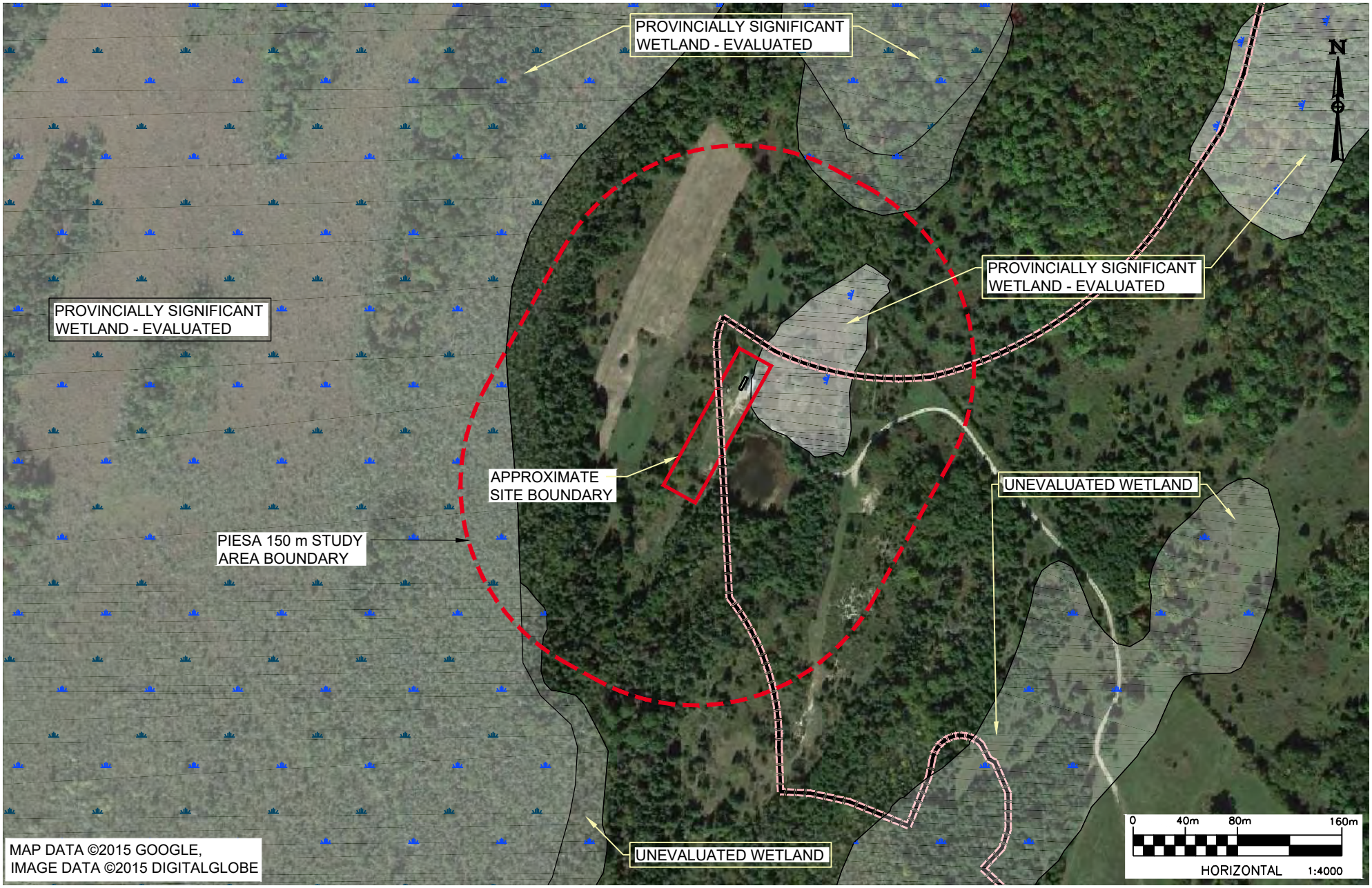
LEGEND:

TITLE AND LOCATION:

SITE LOCATION PLAN
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 75,000	CK: DC
DATE: AUGUST 2018	FIG. NO.: 1



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LEGEND:

PROVINCIALLY SIGNIFICANT WETLAND - EVALUATED/
UNEVALUATED WETLAND

APPROXIMATE SITE BOUNDARY

PIESA 150 m STUDY AREA BOUNDARY

RIDEAU VALLEY CONSERVATION AUTHORITY REGULATION LIMIT

TITLE AND LOCATION:

SITE PLAN
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 4000	CK: DC
DATE: AUGUST 2018	FIG. NO.: 2

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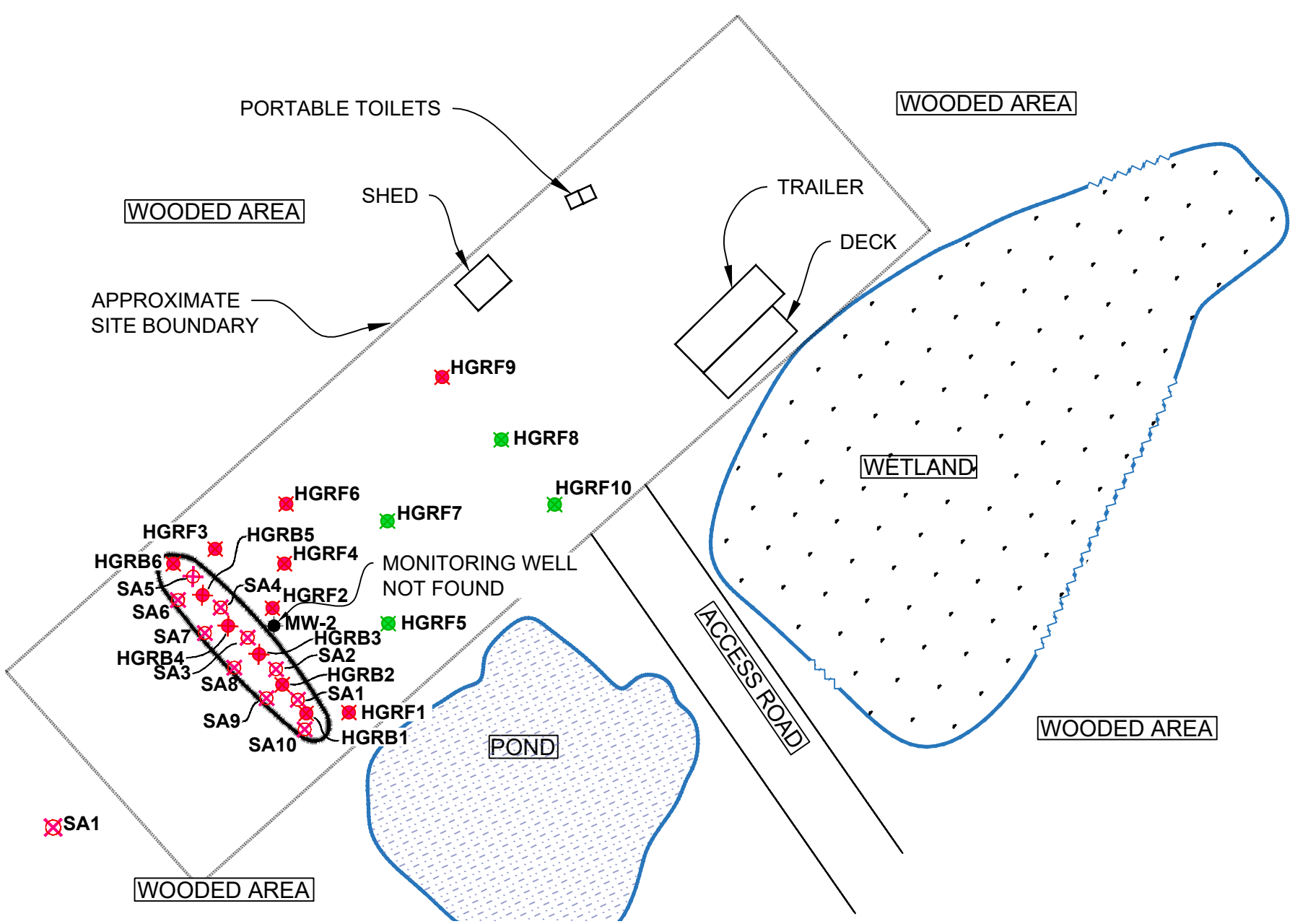
LEGEND:

TITLE AND LOCATION:

SITE LAYOUT
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 750	CK: DC
DATE: AUGUST 2018	FIG. NO.: 3



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LEGEND:
- **AMEC (2008)**
- **SEACOR (2007)**

PREVIOUS SOIL SAMPLING RESULTS
- SOIL EXCEEDS MOECC TABLE 2 SCS
- SOIL MEETS MOECC TABLE 2 SCS

TITLE AND LOCATION:

SUMMARY OF PREVIOUS SAMPLING LOCATIONS
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: N.T.S.	CK: DC
DATE: AUGUST 2018	FIG. NO.: 4

Appendix A:
Site Photographs

Photo 1: View of the site entrance from Country Road #1

Photo 2: View of Subject site facing west at the central part of the site

Photo 3: View of the shell casing located approximately 10 m from the berm

Photo 4: View of the Site trailer and deck

Photo 5: View of a portable gasoline generator

Photo 6: View of a portable gasoline generator

exp. EXP Services Inc. 100-2650 Queensview Drive Ottawa Ontario K2B 8H6 T: 613-688-1899 F: 613-225-7337	PROJECT TITLE AND LOCATION Phase I ESA Site Photographs Smiths Falls IST Range, 1686 County Road #1, Perth, Ontario	PROJECT NO.: BRM-00244589-A0 SCALE: N/A DATE August 2018	DWN.: DC DWN.: DC DWG. No.: A-1

Photo 7: View of shed located along the central west portion

Photo 8: View inside the shed located along the central west portion

Photo 9: View of the portable toilet

Photo 10: View AST used as a bun pit

Photo 11: View AST used as a bun pit

Photo 12: View the surface water located adjacent to the south of the site from the western portion of the site

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PROJECT TITLE AND LOCATION

Phase I ESA Site Photographs
Smiths Falls IST Range,
1686 County Road #1, Perth, Ontario

PROJECT NO.: BRM-00244589-A0	DWN.: DC
SCALE: N/A	DWN.: DC
DATE: August 2018	DWG. No.: A-2

Photo 13: View the surface water located adjacent to the south of the site from the eastern portion of the site

Photo 14: View of the berm facing west

Photo 15: View of the berm facing southwest

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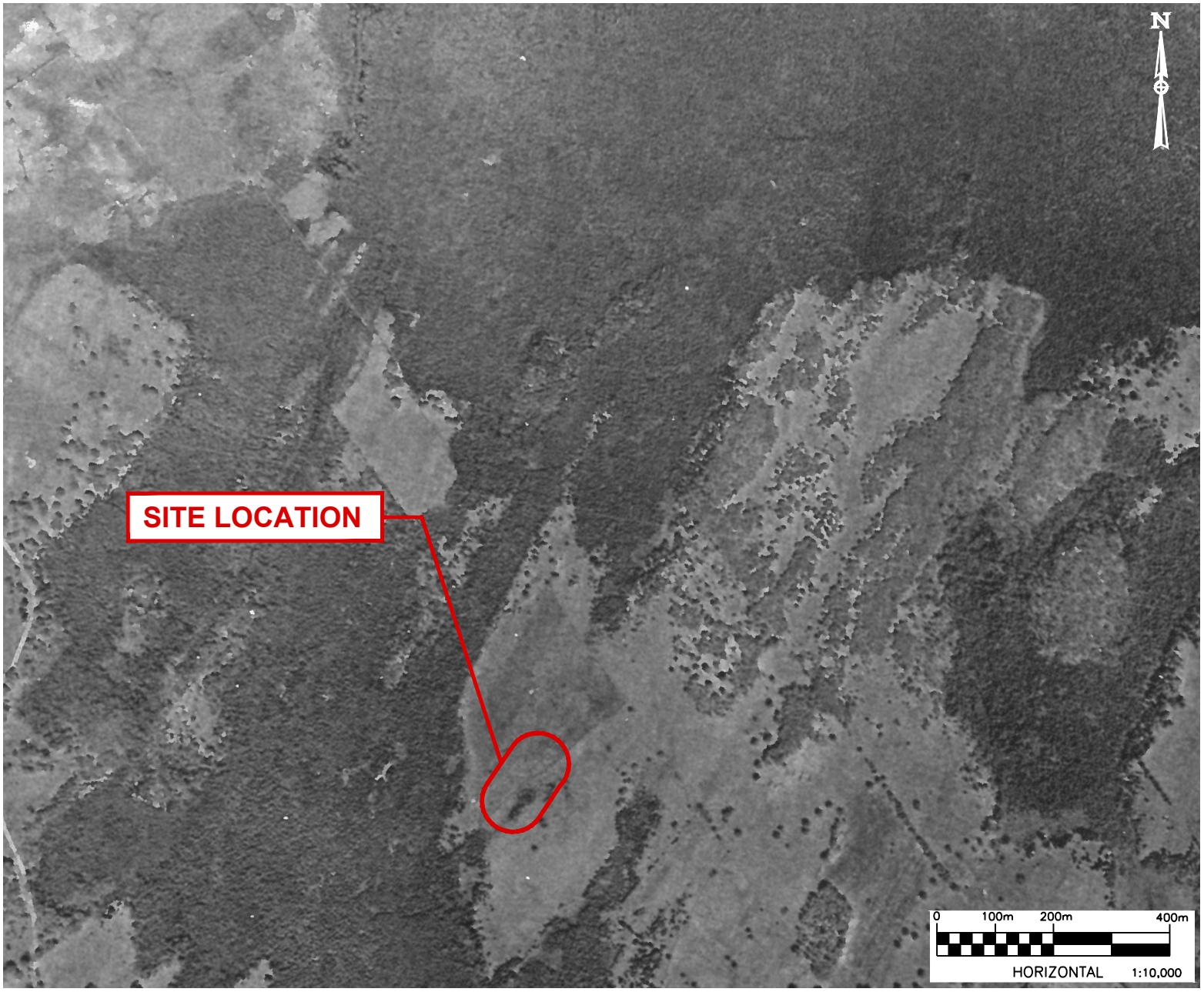
PROJECT TITLE AND LOCATION

Phase I ESA Site Photographs
Smiths Falls IST Range,
1686 County Road #1, Perth, Ontario

PROJECT NO.: BRM-00244589-A0	DWN.: DC
SCALE: N/A	DWN.: DC
DATE: August 2018	DWG. No.: A-3

Appendix B:
Aerial Photographs



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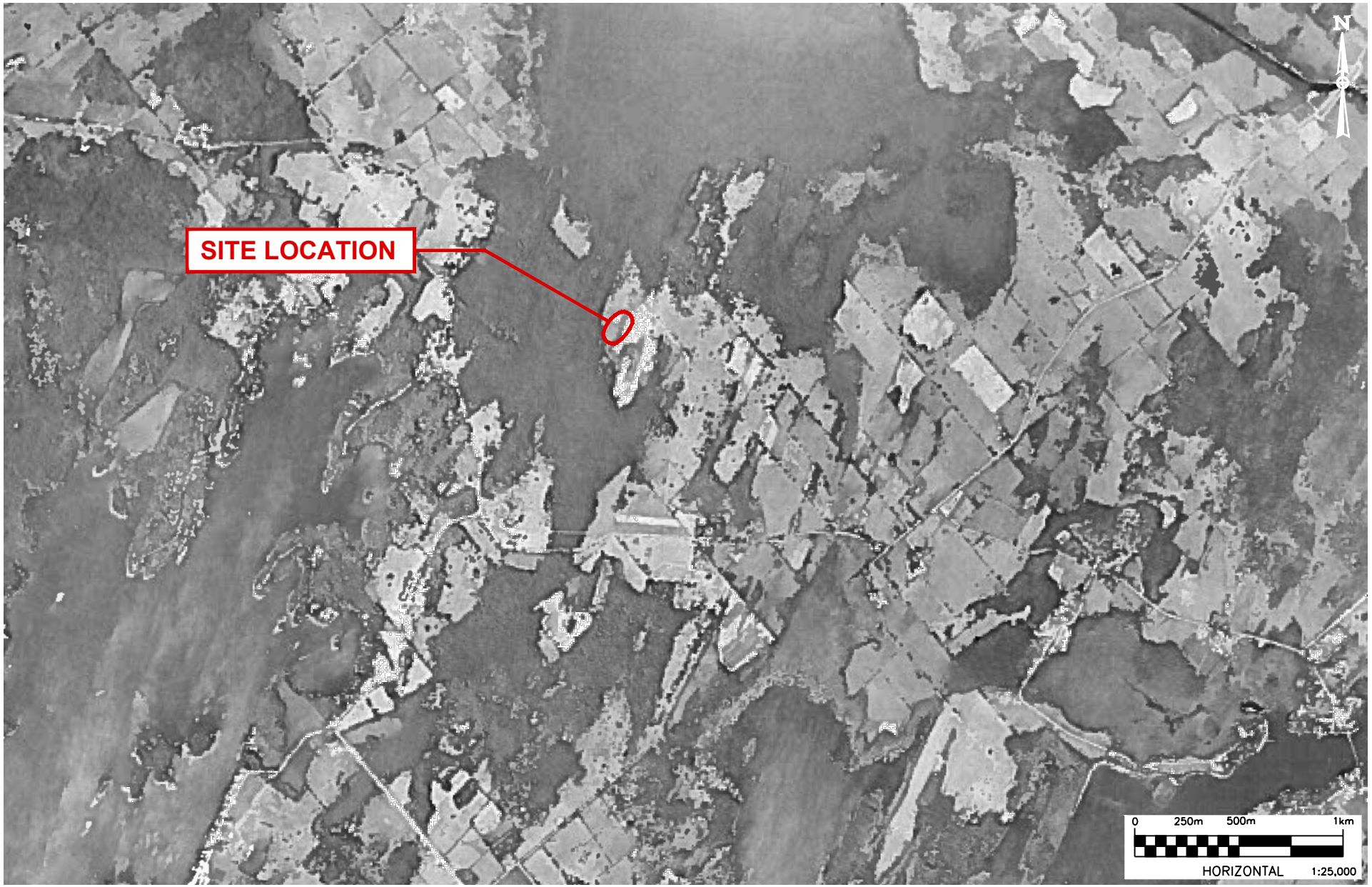
LEGEND:

TITLE AND LOCATION:

1948 AERIAL PHOTOGRAPH
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 10,000	CK: DC
DATE: AUGUST 2018	FIG. NO.: A1



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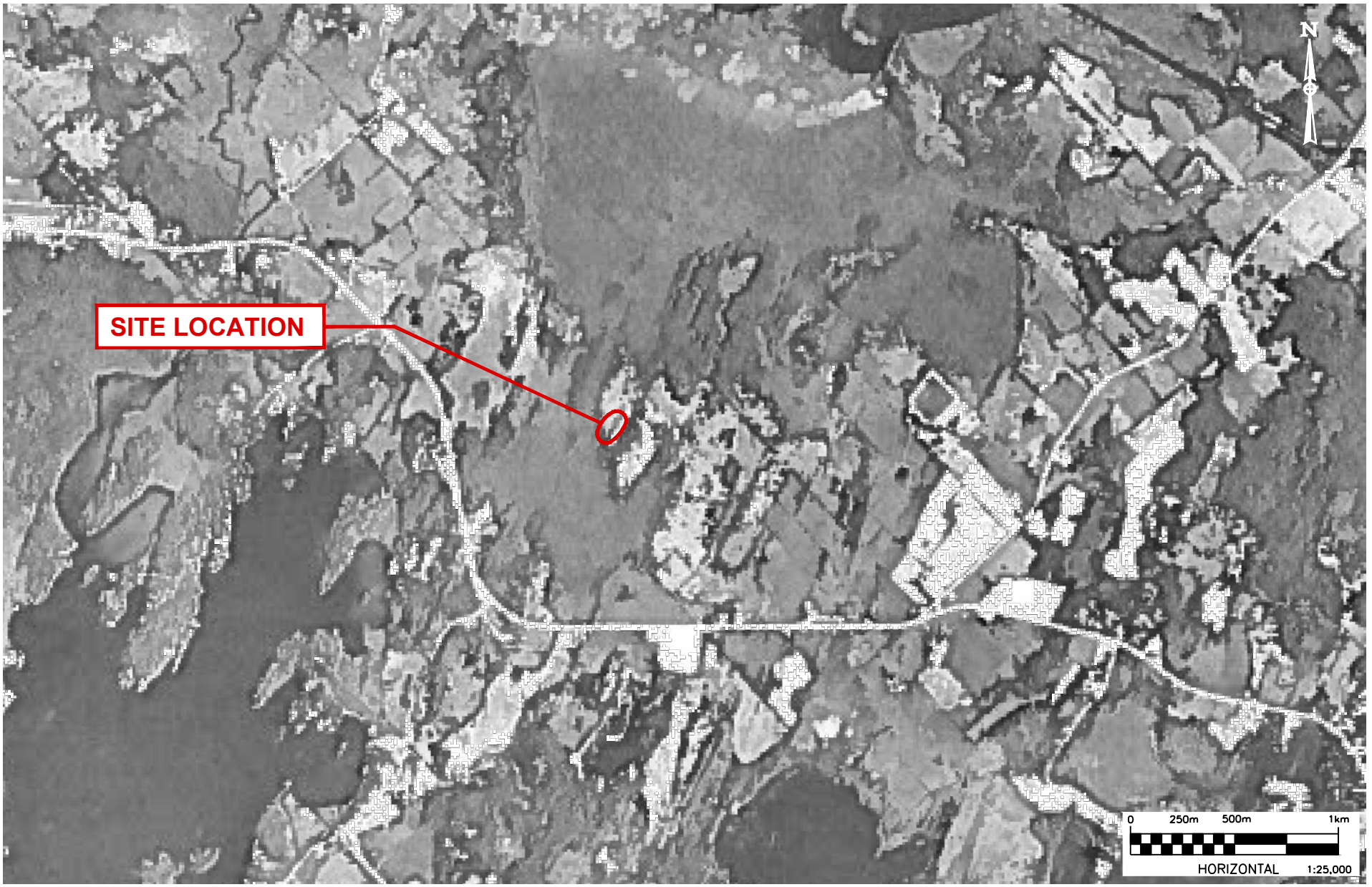
LEGEND:

TITLE AND LOCATION:

1964 AERIAL PHOTOGRAPH
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 25,000	CK: DC
DATE: AUGUST 2018	FIG. NO.: A2



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LEGEND:

TITLE AND LOCATION:

1987 AERIAL PHOTOGRAPH
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 25,000	CK: DC
DATE: AUGUST 2018	FIG. NO.: A3

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LEGEND:

TITLE AND LOCATION:

1995 AERIAL PHOTOGRAPH
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 25,000	CK: DC
DATE: AUGUST 2018	FIG. NO.: A4

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LEGEND:

TITLE AND LOCATION:

2010 AERIAL PHOTOGRAPH
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 12,500	CK: DC
DATE: AUGUST 2018	FIG. NO.: A5

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LEGEND:

TITLE AND LOCATION:

2016 AERIAL PHOTOGRAPH
Phase I Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 10,000	CK: DC
DATE: AUGUST 2018	FIG. NO.: A6

Appendix C:
Regulatory Correspondence and Well Records

Ministry of the Environment and Climate Change

Freedom of Information and Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de l'Environnement et de l'Action en matière de changement climatique

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc.: (416) 314-4285

Ontario

May 31, 2018

Kathy Radisch
exp Services Inc
100 - 2650 Queensview Dr
Ottawa, ON K2B 8H6

Dear Kathy Radisch:

RE: ***Freedom of Information and Protection of Privacy Act* Request**
Our File # A-2018-03560, Your Reference BRM-00244589-08

This letter is in response to your request made pursuant to the *Freedom of Information and Protection of Privacy Act* relating to 1686 County Road 1, Perth.

After a thorough search through the files of the Ministry's Ottawa District Office, Investigations and Enforcement Branch, Environmental Monitoring and Reporting Branch, Sector Compliance Branch and Safe Drinking Water Branch, no records were located responsive to your request. To provide you with this response and in accordance with Section 57 of the *Freedom of Information and Protection of Privacy Act*, the fee owed is $30.00 for 1 hour of search time @ $30.00 per hour. **We have applied the $30.00 for this request from your initial payment. This file is now closed.**

You may request a review of my decision by contacting the Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, ON M4W 1A8 (800-387-0073 or 416-326-3333). Please note that there is a $25.00 fee and you only have 30 days from receipt of this letter to request a review.

If you have any questions regarding this matter, please contact Nasreen Salar at nasreen.salar@ontario.ca.

Yours truly,

pp:

Janet Dadufalza
FOI Manager

Kathy Radisch

From: Public Information Services <publicinformationservices@tssa.org>
Sent: Friday, June 8, 2018 12:14 PM
To: Kathy Radisch
Subject: RE: File Search - 1686 County Road 1, Perth, Ontario - No Record Found

Follow Up Flag: Follow up
Flag Status: Flagged

No Records Found

Hello,

Thank you for your request for confirmation of public information.

- We confirm that there are **no fuel storage tanks records** in our database at the subject address(es).

For copies of documents, please complete the Release of Public Information form, found at https://www.tssa.org/en/about-tssa/resources/Release-of-Records-form--Jan-2018Final.pdf and email the completed form to publicinformationservices@tssa.org or through mail along with the appropriate fee. TSSA's fee schedule can be found at: https://www.tssa.org/en/about-tssa/resources/Documents/Public-Information-Fee-Schedule_Jan_2018.pdf. Fees are payable with a credit card (Visa or MasterCard) or by a cheque made payable to TSSA.

Although TSSA believes the information provided pursuant to your request is accurate, please note that TSSA does not warrant this information in any way whatsoever.

Kind regards,

Connie

From: Kathy Radisch <kathy.radisch@exp.com>
Sent: June 8, 2018 11:41 AM
To: Public Information Services <publicinformationservices@tssa.org>
Subject: File Search - 1686 County Road 1, Perth, Ontario

Good Morning,

Would you please search your files for 1686 County Road 1, Perth, Ontario. We are looking for any environmental concerns.

Thank you,

Kathy Radisch
EXP | Sr. Administrative Assistant
t : +1.613.688.1899, 3296 | e : kathy.radisch@exp.com

2650 Queensview Drive
Suite 100
Ottawa, ON K2B 8H6
CANADA

Ontario — Ministry of the Environment

Measurements recorded in: [X] Metric [ ] Imperial

Well Tag No. (Place Sticker and/or Print Below)

Tag#: A133600 A133600

5-12897

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	[ ] Well Constructed by Well Owner
	DST Consulting Engineers		

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
203-2150 Thurston Drive	Ottawa	ON	K1G5T9	(613) 748-1415

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1686 County Road #1	Drummond North Elmsley		

County/District/Municipality	City/Town/Village	Province	Postal Code
Lanark	Perth.	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	406446	4968689		

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brun	Silt	Sand, gravel.	Dense, compact.	0	.76
White	Limestone			.76	4.57

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	.31	Flushmount / concrete	
.31	1.5	Bensel	
1.5	4.57	sand.	

Method of Construction

[ ] Cable Tool [ ] Diamond
[ ] Rotary (Conventional) [ ] Jetting
[ ] Rotary (Reverse) [ ] Driving
[ ] Boring [ ] Digging
[X] Air percussion
[ ] Other, specify ____

Well Use

[ ] Public [ ] Commercial [ ] Not used
[ ] Domestic [ ] Municipal [ ] Dewatering
[ ] Livestock [X] Test Hole [X] Monitoring
[ ] Irrigation [ ] Cooling & Air Conditioning
[ ] Industrial
[ ] Other, specify ____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
4.03	plastic	.368	0	1.83

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To
4.92	plastic	10	1.83	4.57

Status of Well

[ ] Water Supply
[ ] Replacement Well
[X] Test Hole
[ ] Recharge Well
[ ] Dewatering Well
[X] Observation and/or Monitoring Hole
[ ] Alteration (Construction)
[ ] Abandoned, Insufficient Supply
[ ] Abandoned, Poor Water Quality
[ ] Abandoned, other, specify
[ ] Other, specify

Water Details

Water found at Depth (m/ft)	Kind of Water	
	[ ] Fresh [ ] Untested [ ] Gas [ ] Other, specify	
	[ ] Fresh [ ] Untested [ ] Gas [ ] Other, specify	
	[ ] Fresh [ ] Untested [ ] Gas [ ] Other, specify	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	.91	11.43
.91	4.57	7.62

Results of Well Yield Testing

After test of well yield, water was:
[ ] Clear and sand free
[ ] Other, specify ____

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ____ hrs + ____ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

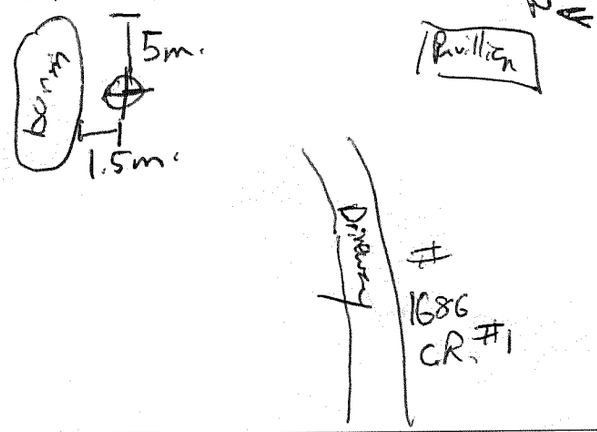
Well production (l/min / GPM)

Disinfected? [ ] Yes [ ] No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level				
1			1	
2			2	
3			3	
4			4	
5			5	
10			10	
15			15	
20			20	
25			25	
30			30	
40			40	
50			50	
60			60	

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Strata Soil Sampling	7241

Business Address (Street Number/Name)	Municipality
2-147 West Beaver Creek Rd.	Richmond Hill

Province	Postal Code	Business E-mail Address
ON	L4B1C6	wreed@stratasoil.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
9057649304	Myers, Mike

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
3448		2012/09/06

Well owner's information package delivered: [ ] Yes [ ] No

Date Package Delivered: Y Y Y Y M M D D

Date Work Completed: 2012/08/16

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Received NOV 09 2012

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PHASE II ENVIRONMENTAL SITE ASSESSMENT

Smiths Falls IST Range
1686 County Road #1, Perth, Ontario

Client
Ontario Provincial Police
777 Memorial Avenue
Orillia, Ontario
L3V 7V3

Attn: Jennifer Chown

Project Number
BRM-00244589-A0

Prepared By
EXP Services Inc.
1595 Clark Boulevard
Brampton, Ontario
L6T 4V1 Canada

Date Submitted
March 20, 2019

Executive Summary

EXP Services Inc. (EXP) was retained by the Ontario Provincial Police (OPP) to conduct a Phase II Environmental Site Assessment (ESA) at the Smiths Falls IST Range located at 1686 County Road #1, Perth, Ontario, hereinafter referred to as the 'Site'. EXP understands that the Phase II ESA is required for due diligence purposes and that a Record of Site Condition is not required at this time.

The Site is located 1 km north of County Road #1 in Perth, Ontario. The Site is located within a portion of a former gravel pit. The entire property measures approximately 55 hectares, however; for the purpose of this assessment only the northwestern portion of the property approximately 0.3 hectares (i.e. portion of site occupied by the firing range) was assessed (Figure 1 and 2).

The Smiths Falls IST Range consists of one firing range oriented in a northeast-southwest direction. Bullets are fired southwest towards an end berm (Figure 2). A monitoring well was previously installed and exists in front of the end berm. A pond is located east of the end berm. A provincially significant wetland exists northeast of the OPP firing range operations (Figure 2).

The Site is currently owned by Mrs. Marilyn Hicken and is used by the OPP as a firing range. Reportedly, the site was originally developed as a gravel pit in the 1960s. It has operated as an active firing range since approximately 1995.

In June 2018, EXP conducted a Phase I ESA of the Site with the findings summarized in a report entitled "*Phase I Environmental Site Assessment, Smiths Falls IST Range 1686 County Road #1, Perth, Ontario"*, dated September 4, 2018. Based on the findings of the Phase I ESA report, the following potential environmental concerns were identified.

Areas of Potential Environmental Concern (APEC) Number	Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
Site			
1	Historical and current use as an active firing range	Soil, Groundwater and Surface Water Metals	The Site has operated as an active firing range since approximately 1995. Lead bullets were utilized as ammunition by the OPP since they first occupied the Site. In 2014, the OPP added copper frangible bullets that reportedly do not contain lead. Lead bullets are still occasionally utilized. Previous reports indicated that extensive metals impacts exceeding the then applicable MOE table 2 Site Condition Standards in various shallow soil samples collected from the berm and floor areas. These metals included lead, antimony, copper, zinc, and arsenic. To date, remediation of the impacted soil has not been completed.

Areas of Potential Environmental Concern (APEC) Number	Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
			Surface water was present adjacent to the Site, along the property boundary to the east.
2	Historical burning of refuse on Site	Soil Polycyclic Aromatic Hydrocarbons (PAHs) and Metals	Previous environmental investigations indicated the presence of 'burn barrels' utilized by the OPP to occasionally burn empty bullet/shell casing boxes. During the Site visit, EXP identified the 'burn barrel' location as indicated in the previous reports. Previous investigations did not asses the burn barrel location.
3	Importation of fill of unknown quality (firing range berms)	Soil Metals, Inorganics and PAH	The Site is located within a portion of the property that was formerly a gravel pit. The berm observed along the southern portion of the firing range during the Site visit appeared to have been constructed from excess sand and gravel material sourced from the Site or property with a top layer of topsoil which was possibly imported. The top of the berm had creosote containing rail ties that were used to support the upper portion of the berm.
Surrounding properties			
None		N/A	N/A

Based on the findings of the Phase I ESA, EXP recommended that a Phase II ESA be completed to address the APECs attributed to OPP activities. Considering that previous investigations determined that the end berm face was impacted with metals, this investigation focused on defining the extent of impact in front, behind and on the side of the firing range end berm.

Based on the Phase II ESA results, the following summary is provided:

- On October 12th, 2018, the Phase II ESA field work consisting of soil, sediment and groundwater sampling was conducted at the Site by EXP staff.
- The surficial overburden encountered during the soil sampling program consisted of brown medium grained sand below a layer of topsoil. Spent ammunition casings and cartridges were found at surface throughout the fire range area. Bedrock outcropping was observed at the Site. Typical bedrock depth across the Site is approximately 0.3 m to 0.6 m.
- For assessment purposes of soil and groundwater, EXP selected the Ministry of the Environment and Climate Change (MOECC) 2011 Table 1 Site Condition Standards (SCS) for industrial/commercial/community land use with coarse grained soil (Table 1 SCS). For

sediment criteria, EXP selected the Table 1 Full Depth Background SCS All Types of Property Use for course textured soil (Table 1 SCS).

- Several soil samples submitted for chemical analysis of metals in the vicinity of the end berm, the firing range near the end berm and the burn area had concentrations exceeding the MOECC (2011) Table 1 SCS most commonly for antimony, copper and lead and less commonly for boron, chromium, selenium, silver, and vanadium.
- A composite soil sample collected from the northeast end of the OPP firing range and closer to the wetland (RFG-5) was found not to be impacted with metals.
- The soil sample submitted for the chemical analysis of PAHs below the rail ties (SA1) exceeded the MOECC (2011) Table 1 SCS for most of the parameters tested. Soil samples submitted from the burn area were non-detect or below the MOECC (2011) Table 1 SCS.
- The results of the toxicity characteristic leachate procedure (TCLP) completed on a composite soil sample collected from the face of the end berm to determine off-site disposal options indicated the leachate result for lead exceeded the criteria as listed in Schedule 4 of O. Reg. 558. All other concentrations were below Schedule 4 of O. Reg 558. As a result, the soil from the face of the end berm is classified as hazardous waste.
- One sediment sample was collected from a nearby pond to the south (S1) and was submitted for analysis of metals. The sediment sample submitted for the analysis of metals exceeded Table 1 SCS for lead and copper.
- A groundwater sample was collected from an on-site monitoring well (MW1) and submitted for analysis of metals. The results reported no exceedances of the SCS for metals in groundwater.

Based on the results of the Phase II ESA, soil impacts were identified on the firing range floor and vicinity of the end berm. The extent of impact does not extend to the northeast end of the OPP operated lands. The majority of the metal exceedances are related to lead and copper and to a lesser extent antimony. The metal impacts are attributed to the property being used as a firing range for approximately 23 years. It is possible that the sediment impact in the pond could be attributed to sloughing of material from the end berm and/or surface water flow or wind blown soil from the end berm.

Although the goal of the Phase II ESA was to characterize and define the extent of impact, the horizontal and to some degree vertical extent of the impacts in the firing range floor and end berm could not be determined based on the current scope of work and number of samples submitted for analyses.

As the full extent of soil impact has not been delineated, there is potential for soil impacts to extend beyond the OPP operated areas. The potential for off-site impact beyond OPP operated lands could also be facilitated through the movement of impacted surface water and/or groundwater. A sediment sample collected from the adjacent pond was found to be impacted whereas the groundwater was not found to be impacted.

Based on the above, EXP provides the following options for consideration.

Option 1 – Conduct Delineation Investigation prior to Remediation

Additional soil, sediment and surface water sampling should be completed to delineate the extent of impact. This option involves conducting a delineation investigation prior to remediation to further define the extent of impact. The advantage of this option is that it will allow for a more accurate volume and remedial cost estimate to be developed. The main disadvantage is the additional costs and time commitments associated with completing these tasks.

Option 2 – Conduct Delineation during Remediation

This option involves completing the horizontal and vertical delineation of the metals exceedances during the remedial activities. This could be achieved by using the equipment that is on-site for remediation to collect additional soil samples at the beginning of the remedial works. Sediment and surface water sampling of the adjacent pond could also be done at this time. The advantage of this option is the cost associated with delineation is absorbed into the remediation phase. The disadvantage is that there is more uncertainty associated with remedial costs at the onset of the remediation phase.

Additional lateral and vertical sampling for TCLP analysis should also be completed prior to or during remediation to differentiate areas of hazardous soils (ie berm faces to variable depths) and non-hazardous soils (ie. range floor). This assessment could be completed as part of Options 1 or 2

The existing monitoring well in front of the end berm should be protected and maintained for future monitoring. If the well is no longer to be used, it should be abandoned by a licensed well contractor as per O. Reg. 903, as amended.

Table of Contents

List of Appendices

1 Introduction

EXP Services Inc. (EXP) was retained by the Ontario Provincial Police (OPP) to conduct a Phase II Environmental Site Assessment (ESA) at the Smiths Falls IST Range located at 1686 County Road #1, Perth, Ontario, hereinafter referred to as the 'Site'. EXP understands that the Phase II ESA is required for due diligence purposes and that a Record of Site Condition is not required at this time.

The Site is located 1 km north of County Road #1 in Perth, Ontario. The Site is located within a portion of a former gravel pit. The entire property measures approximately 55 hectares, however; for the purpose of this assessment only the northwestern portion of the property approximately 0.3 hectares (i.e. portion of site occupied by the firing range) was assessed (Figure 1 and 2).

The Smiths Falls IST Range consists of one firing range oriented in a northeast-southwest direction. Bullets are fired southwest towards an end berm (Figure 2). A monitoring well was previously installed and exists in front of the end berm. A pond is located east of the end berm. A provincially significant wetland exists northeast of the OPP firing range operations (Figure 2).

The Site is currently owned by Mrs. Marilyn Hicken and is used by the OPP as a firing range. Reportedly, the site was originally developed as a gravel pit in the 1960s. It has operated as an active firing range since approximately 1995.

A site trailer is located in the northwest corner of the Site with two associated gas-powered generators. A deck is situated east off of the trailer. The trailer is used as a class room. A shed is located centrally, on the west side of the Site. The shed is used to store the targets and the used shell casings. Adjacent to the east are two water bodies and to the west is a berm. To the south and north are wooded areas.

1.1 Background

In June 2018, EXP conducted a Phase I ESA of the Site with the findings summarized in a report entitled "*Phase I Environmental Site Assessment, Smiths Falls IST Range 1686 County Road #1, Perth, Ontario"*, dated September 4, 2018. Based on the findings of the Phase I ESA report, the following potential environmental concerns were identified.

Areas of Potential Environmental Concern (APEC) Number	Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
Site			
1	Historical and current use as an active firing range	Soil, Groundwater and Sediment Metals	The Site has operated as an active firing range since approximately 1995. Lead bullets were utilized as ammunition by the OPP since they first occupied the Site. In 2014, the OPP added copper frangible bullets that reportedly do not contain lead. Lead bullets are still occasionally utilized.

Areas of Potential Environmental Concern (APEC) Number	Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
			Previous reports indicated that extensive metals impacts exceeding the then applicable MOE Table 2 Site Condition Standards in various shallow soil samples collected from the berm and floor areas. These metals included lead, antimony, copper, zinc, and arsenic. To date, remediation of the impacted soil has not been completed. Surface water was present adjacent to the Site, along the property boundary to the east.
2	Historical burning of refuse on Site	Soil Polycyclic Aromatic Hydrocarbons (PAHs) and Metals	Previous environmental investigations indicated the presence of 'burn barrels' utilized by the OPP to occasionally burn empty bullet/shell casing boxes. During the Site visit, EXP identified the 'burn barrel' location as indicated in the previous reports. Previous investigations did not asses the burn barrel location.
3	Importation of fill of unknown quality (firing range berms)	Soil Metals, Inorganics and PAH	The Site is located within a portion of the property that was formerly a gravel pit. The berm observed along the southern portion of the firing range during the Site visit appeared to have been constructed from excess sand and gravel material sourced from the Site or property with a top layer of topsoil which was possibly imported. The top of the berm had creosote containing rail ties that were used to support the upper portion of the berm.
Surrounding properties			
None		N/A	N/A

Based on the environmental issues identified, EXP recommended the following to address the potential environmental impacts resulting from the use of the Site by the OPP.

Issues Identified	Recommendation	Rationale
Historical and current use as an active firing range. Known exceedances of metals in soil. Historical burning of refuse on Site. Potential for fill of unknown quality.	Conduct a Supplemental Phase II ESA consisting of soil, groundwater and sediment sampling and analysis, including delineating soil impacts and install monitoring wells to collect groundwater samples.	To delineate the extent of known soil impacts and to assess groundwater and sediment in order to derive a Remedial Action Plan.

Considering that previous investigations determined that the end berm face was impacted with metals, this investigation focused on defining the extent of impact in front, behind and on the side of the firing range end berm. EXP understands that potential environmental concerns that were not a result of the OPP's use of the Site will not be further investigated at this time.

2 Scope of Work

The Phase II ESA scope of work for the on-Site investigation consisted of the following activities:

- Collect composite and discrete soil samples for chemical analysis of one or more of the following: metals parameters, and PAHs;
- Complete shallow boreholes on the end berm sides and range floor to obtain composite soil samples for chemical analysis of metals;
- Collect a soil sample from the firing range end berm for TCLP analysis;
- Collect a sediment sample from the pond in close proximity to the end berm;
- Review the analytical data and prepare a report summarizing the findings.

The following deviations were encountered during the completion of this Phase II ESA:

- Due to the presence of shallow bedrock, hand auger refusal was encountered in some vertical sampling locations at 0.3 m bgs. In the locations were refusal was encountered, soil samples could not be collected or submitted for chemical analysis at 0.6 m bgs.

3 Site Assessment Criteria

The assessment criteria, Site Condition Standards (SCS), applicable to a given site in Ontario are stablished under subsection 168.4(1) of the Environmental Protection Act. Tabulated generic criteria are provided in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" ("the SGWS Standards"), Ministry of the Environment and Climate Change (MOECC), April 15, 2011. These criteria, which came into force on July 1, 2011, are based on site sensitivity (sensitive or non-sensitive), groundwater use (potable or non-potable), property use (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil type (coarse or medium/fine textured) and restoration depth (full or stratified restoration). In addition, site specific criteria may be established on the basis of the findings of a Risk Assessment carried out in accordance with Part IX and Schedule C of Ontario Regulation 153/04 (O. Reg. 153/04) as amended by Ontario Regulation 511/09 (O. Reg. 511/09).

The SGWS Standards specify SCS for soil, groundwater and sediment that are tabulated as follows:

Table 1 - applicable to sites where background concentrations must be met (full depth) such as sensitive sites where site-specific criteria have not been derived;

Table 2 - applicable to sites with potable groundwater and full depth restoration;

Table 3 - applicable to sites with non-potable groundwater and full depth restoration;

Table 4 - applicable to sites with potable groundwater and stratified restoration;

Table 5 - applicable to sites with non-potable groundwater and stratified restoration;

Table 6 - applicable to sites with less than 2 m of overburden above bedrock in a potable groundwater condition;

Table 7 - applicable to sites with less than 2 m of overburden above bedrock in non-potable groundwater condition;

Table 8 - applicable to sites (all or part thereof) within 30 m of a water body in a potable groundwater condition;

Table 9 - applicable to sites (all or part thereof) within 30 m of a water body in a non-potable groundwater condition.

Note, a "water body" means a permanent stream, river or similar watercourse or a pond or lake, but does not include a pond constructed on the property for the purpose of controlling surface water drainage.

For assessment purposes, Table 1 (background site conditions), Table 6 (shallow soil) and Table 8 (within 30 m of water body) are all applicable to this site. The criteria in Table 1 and 8 are the same,

whereas the criteria in Table 6 are slightly less sensitive for some parameters. This is based on the following factors:

- The Site was identified as an environmentally sensitive site as defined by O. Reg. 153/04 because a provincially significant wetland is located within 30 m of the northeast Site boundary (Table 1 SCS);
- As per the requirements of Section 43.1 of O. Reg. 153/04, a property is considered to be a "shallow soil property" if 1/3 or more of the property consists of soil equal to or less than 2 m in depth beneath the soil surface. Based on the surficial geology of the Site, the overburden thickness is known to be more less than 2 m (Table 6);
- A portion of the OPP operations is located within 30 metres of a water body (pond east of the berm face) (Table 8).
- The Site is utilized for commercial purposes and no change in land use is planned.
- Measurements of soil pH were not obtained as a part of the scope of work for the Phase II ESA, however, based on previous assessments soil pH was found to range between 6.64 and 8.2 which is within the MOECC acceptable ranges of 5 to 9 for surface soils and 5 to 11 for subsurface soils, respectively);
- The soil type on the Site is assumed to be coarse textured as defined in O. Reg. 153/04; and,

Based on the above, for assessment purposes of soil and groundwater, EXP selected the Ministry of the Environment and Climate Change (MOECC) 2011 Table 1 Site Condition Standards (SCS) for industrial/commercial/community land use with coarse grained soil (Table 1 SCS). For sediment criteria, EXP selected the Table 1 Full Depth Background SCS All Types of Property Use for course textured soil (Table 1 SCS).

4 Methodology

4.1 Environmental Sampling

On October 12th, 2018, the Phase II ESA field work was conducted by EXP staff, which consisted of a series of shallow soil samples, sediment sampling and groundwater sampling. A summary of the sampling locations and an overview of the results are presented on Figures 3.

The boreholes were advanced to the depths summarized in the table below.

Table 4.1.1: Summary of Environmental Samples

Soil Samples and Type	Date of Completion	Completion Depths (m bgs)	Comments
Composite Surface (Grid)	October 12, 2018	Surface (0 to 0.05 m)	Soil samples obtained from a 5 m x 10 m grid.
Vertical Sampling Point (from Grid)	October 12, 2018	0.6 m	Soil samples collected shallow (0.15 m) and deeper (0.6 m) intervals where practical.
Burn Barrel Investigation	October 12, 2018	0.2 m	Soil samples collected at surface (0.05 m) and shallow (0.15 m) intervals.
Railway Ties Investigation	October 12, 2018	Surface (0 to 0.05 m)	Soil samples collected at surface (0.05 m) and shallow (0.15 m) intervals.
Sediment Samples	**Date of Completion**	**Completion Depths (m bgs)**	**Comments**
Sediment Sample	October 12, 2018	Surface (0 to 0.05 m)	Sediment obtained from edge of pond at 0.05 m.
Groundwater Samples	**Date of Completion**	**Water Depth**	**Comments**
Monitoring Well	October 12, 2018	Shallow Aquifer	Groundwater obtained from existing onsite monitoring well.

Within each grid, soil from approximately fifteen (15) discrete locations was obtained and homogenized in a disposable sealable plastic bag. The homogenized soil was then placed in laboratory supplied jars.

Vertical sampling points were advanced to a maximum completion depth of 0.6 m bgs using stainless-steel hand augers. Representative soil samples were recovered from the hand auger, and then placed into laboratory provided jars.

The sediment sample was collected using a stainless-steel shovel from the edge of the pond where standing water was observed. The sediment was placed in laboratory supplied jars.

The groundwater sample was obtained from the existing onsite monitoring well (MW1) using a dedicated inertia hand pump and polyethylene Waterra® tubing. Prior to groundwater sampling, the depth to groundwater in the monitoring well was measured using a water level meter after which the well was developed by removing three well volumes. The groundwater sample was placed directly into a laboratory supplied bottle with the appropriate preservative and placed in a cooler containing icepacks for sample preservation purposes.

Decontamination protocols were followed during sample collection and handling to minimize the potential for cross-contamination. During the collection of soil and sediment samples, the hand auger and or stainless-steel shovel was scraped and decontaminated between sampling intervals by washing with an alconox® solution followed by a rinse of both distilled water and methanol in accordance with EXP's SOP (Standard Operating Procedure). New disposable nitrile gloves were used for the handling and collection of samples from each location, for sample collection from each borehole and for each groundwater sampling. Similarly, the water level meter was decontaminated prior to use using an alconox® solution and rinsed with distilled water.

EXP logged the stratigraphy observed from the recovered soil cores, to record the depth of soil sample collection, to record total depths of borings, and to record visual or olfactory observations of potential impacts.

Noting the composite sampling procedure described above, soil samples intended for other non-volatile chemical parameters were placed directly into pre-cleaned, laboratory-supplied glass sample jars. The soil, sediment and groundwater samples were placed in clean ice-packed coolers prior to and during transportation to the subcontract laboratory, Maxxam Analytics Inc. (Maxxam) of Mississauga, Ontario. The samples were transported/submitted under Chain of Custody documentation.

The soil samples were predetermined through the soil sampling program mentioned above. The following samples for soil, sediment and groundwater were submitted for laboratory analysis.

Table 4.1.2: Summary of Soil, Sediment and Groundwater Samples Submitted for Laboratory Analyses

Sample ID	Depth (m bgs)	Rationale for Submission	Analysis
Soil Samples			
RFG1 COMPOSITE to RFG5 COMPOSITE BBF1 COMPOSITE to BBF3 COMPOSITE NWSB1 COMPOSITE SESB1 COMPOSITE	Surface Composite (0 to 0.05 m)	To assess the condition of the surface soil in the firing range	Metals

Sample ID	Depth (m bgs)	Rationale for Submission	Analysis
RFG1 to RFG3 BBF1 to BBF3 NWSB1 SESB1	Vertical Sampling Location (0.15 m bgs, 0.3 m bgs and/or 0.6 m bgs)	To assess the soil conditions vertically at shallow and deep intervals	Metals
BURN BARREL SURFACE BURN BARREL 0.15M	Discrete (Surface Sample and 0.15 m bgs)	To assess the condition of the soil relating to a burn area	Metals and PAH
SA1	Surface Discrete	To assess the condition of the soil relating to rail tie storage	PAH
TCLP	Composite from face of end berm	For leachate analysis to determine suitability for landfill disposal	Leachate Metals
Sediment Samples			
S1	Surface (0 to 0.05 m)	To assess the conditions of the sediment located in the adjacent pond	Metals
Groundwater Samples			
MW1	2.19 m to 4.70 m	To assess the conditions of the groundwater.	Metals
QA/QC Samples			
RFG10 – 0.6M RFG20 – COMPOSITE SESB10 – 0.15M	Surface Composite, 0.15 m bgs and 0.6 m bgs	For QA/QC purposes	Metals

RFG = Range foreground
BBF = Back berm floor
NWSB = Northwest side berm
SESB = Southeast side berm

Due to the presence of shallow bedrock, hand auger refusal was encountered in some vertical sampling locations at 0.3 m bgs. In the locations were refusal was encountered, soil samples could not be collected or submitted for chemical analysis at 0.6 m bgs. (i.e. BBF1).

4.2 Deviations from CSA Standard

No deviations from the CSA Standard Z769-00 for Phase II ESAs (R2013) were encountered during this Phase II ESA.

5 Findings

5.1 Subsurface Conditions

Boundaries of soils indicated are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change. A brief description of the soil stratigraphy at the Site, in order of depth, is summarized in the following sections.

5.1.1 Firing Range Floor

The surficial overburden encountered during the soil sampling program consisted of brown medium grained sand below a thin layer of topsoil. Spent ammunition casings and cartridges were found at surface throughout the fire range area. Surficial bedrock was observed at the Site. Typical bedrock depth across the Site is approximately 0.3 m to 0.6 m.

5.1.2 End Berm

The end berm consisted of a brown medium grained sand fill with a thin layer of topsoil in parts. Lead and copper bullet fragments were evident throughout. Bedrock outcropping was observed behind the end berm.

5.2 Groundwater

Groundwater was sampled from one existing onsite monitoring well located in front of the end berm. The static water level was 2.19 metres below ground surface (m bgs). The total depth of the well was 4.70 m bgs. The sample water was grey, cloudy and did not exhibit any sheen or odour.

5.3 Sediment

The sediment consisted of 2 cm of organics, roots followed by sandy silt to 5 cm (depth of sample).

6 Analytical Results

6.1 Soil Quality

In accordance with the scope of work, chemical analyses were performed on selected soil samples recovered from the boreholes. The selection of representative "worst case" soil samples from each borehole was based on visual and/or olfactory evidence of impacts, where observed. Plans showing the location of soil samples that have exceeded and that have met the SCS can be found on Figures 3 to 5B Appendix A. Soil analytical results are summarized in Tables I and II in Appendix B and the laboratory certificates of analysis are attached in Appendix C.

6.1.1 Metals

Twenty-seven (27) soil samples, including three (3) duplicate samples were analyzed for metals. Two (2) of the above soil samples (BURN BARREL) were collected from a burn area where refuse was burnt at the Site. The results of the analysis together with the applicable Table 1 SCS are presented in Table I.

The soil analytical results submitted for metals indicated that parameters including copper and lead at various sampling locations were detected above the SCS. The laboratory reporting detection limits (RDLs) were below the SCS in all samples except RFG1 - COMPOSITE.

Refer to the following figures for a summary of analytical results:

- Figure 3 - Summary of Analytical Results;
- Figure 4A - Summary of Analytical Results – Lead at 0.15 m
- Figure 4B - Summary of Analytical Results – Lead at 0.30/0.6 m;
- Figure 5A: Summary of Analytical Results – Copper at 0.15 m
- Figure 5B: Summary of Analytical Results – Copper at 0.3/0.6 m;
- Figure 6A - Summary of Analytical Results – Antimony, Chromium, Selenium and/or Vanadium at 0.15 m;
- Figure 6B - Summary of Analytical Results – Antimony, Chromium, Selenium and/or Vanadium at 0.3/0.6 m.

6.1.2 PAHs

Three (3) soil samples were analyzed for PAHs. Two of these soil samples were collected from a burn area (BURN BARREL) where refuse was burnt at the Site and the third sample was collected from below rail ties (SA1) that were being stored at the site and used to support the end berm. The results of the analysis together with the applicable Table 1 SCS are presented in Table II in Appendix B.

Both samples collected from the burn area were non-detect. Concentration of PAHs in the surface sampled collected at the rail ties (SA1) were found to exceed the SCS for several PAHs.

6.1.3 Toxicity Characteristic Leaching Procedure

A composite soil sample was collected from the face of the end berm and analyzed for the toxicity characteristic leaching procedure (TCLP) for metals. The TCLP was completed in accordance with O. Reg. 558 to classify for waste characterization purposes and assess off-site disposal options.

The results of the TCLP exceeded the criteria as listed in Schedule 4 of O. Reg. 558 for lead. As a result, the soil contained within the end berm is classified as a hazardous waste. The TCLP results are presented in Table V in Appendix B.

6.2 Sediment Quality

One sediment sample (S1) was analyzed for metals. The results of the analysis together with the applicable Table 1 SCS are presented in Table III in Appendix B.

The concentrations from in the sediment sample S1 exceeded Table 1 SCS for the metals lead and copper.

6.3 Groundwater Quality

One groundwater sample (MW1) was analyzed for metals. The results of the analysis together with the applicable Table 1 SCS are presented in Table IV in Appendix B.

There were no exceedances of metals in groundwater.

6.4 Discussion

Based on the results of the Phase II ESA, soil impacts were identified on the firing range floor and the vicinity of the end berm. The lateral extent of impact does not extend to the northeast end of the OPP operated lands. The vertical extent of the metal impact in the soil extends to approximately 0.5 m bgs on the range floor and to 0.6 m bgs on the lateral extents of the end berm.

Although the depth to bedrock is shallow, the potential risk associated with contaminant impact in bedrock fractures is low. Weathering fractures are typically present in the upper metre. Beyond a metre or so, bedrock typically becomes more competent. Structural bedrock fractures can still be present and is more dependent on rock type. The greater risk would be the potential for leaching into the groundwater, however, testing at this site did not indicate groundwater impact.

The majority of the metal exceedances are related to lead and copper and to a lesser extent antimony. The metal impacts are attributed to the property being used as a firing range for approximately 23 years. It is possible that the sediment impact in the pond could be attributed to soughing of material from the end berm and/or surface water flow or wind-blown soil from the end berm.

Although the goal of the Phase II ESA was to characterize and define the extent of impact, the horizontal and to some degree vertical extent of the impacts in the firing range floor and end berm could not be determined based on the current scope of work and number of samples submitted for analyses.

As the full extent of soil impact has not been delineated, there is potential for soil impacts to extend beyond the OPP operated areas, particularly in the south part of the firing range. The potential for off-site impact beyond OPP operated lands could also be facilitated through the movement of impacted

surface water and/or groundwater. A sediment sample collected from the adjacent pond was found to be impacted whereas the groundwater was not found to be impacted. The migration of metals contamination may be occurring through wind and water erosion and or surface water runoff

6.5 Quality Assurance

Details regarding quality assurance measures taken in the field, including instrument calibration, decontamination procedures, use of dedicated equipment, sample storage and Chain of Custody documentation were provided in Section 4, Methodology.

The subcontract laboratory used during this investigation, Maxxam Analytics Inc., is accredited by the Standards Council of Canada/Canadian Association of Laboratory Accreditation (Accredited Laboratory No.97) in accordance with ISO/IEC 17025:1999 – "General Requirements for the Competence of Testing and Calibration Laboratories" for the analysis of all parameters for all samples in the scope of work for which SCS have been established under O.Reg.153/04.

The "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" ("the Analytical Protocol"), prepared by the MOECC, March 2004 amended as of July 1, 2011, establishes criteria used in assessing the performance of analytical laboratories when the data are used in support of the filing of Records of Site Condition.

Three (3) soil sample pairs labeled RFG 1-0.60M (duplicate of RFG 10-0.6M), RFG2-COMPOSITE (duplicate of RFG20-COMPOSITE) and SESB1-0.15M (duplicate of SESB10-0.15M) were submitted for metals analysis.

The field duplicate sample results were quantitatively evaluated by calculating the relative percent difference (RPD) between the samples and their duplicates. Assessment of the duplicate soil and groundwater samples, where quantifiable, showed that the results generally met analytical test group specific acceptance criteria. There was a more of a gap between SESB1-0.15M and duplicate SESB10-0.15M. Variances in the results of the duplicate samples and their corresponding RPD values can be attributed to heterogeneities in the samples. Given the nature of the source of contaminant (i.e. bullet fragments), the RPD may have been elevated by small fragments of metal that were not observed in the sample. Notwithstanding, it is EXP's opinion that the overall assessment indicates that the soil and groundwater samples were collected with an acceptable level of precision, and the data is acceptable quality for meeting the objectives of this Phase II ESA.

The analytical program conducted by Maxxam included analytical test group specific QA/QC measures to evaluate the accuracy and precision of the analytical results and the efficiency of analyte recovery during solute extraction procedures. The Maxxam laboratory QA/QC program consisted of the preparation and analysis of laboratory duplicate samples to assess precision and sample homogeneity, method blanks to assess analytical bias, spiked blanks and QC standards to evaluate analyte recovery, matrix spikes to evaluate matrix interferences and surrogate compound recoveries (VOCs only) to evaluate extraction efficiency. The laboratory QA/QC results are presented in the Quality Assurance Report provided in the Certificate of Analysis prepared by Maxxam. The QA/QC results are reported as percent recoveries for matrix spikes, spike blanks and QC standards, relative percent difference for laboratory duplicates and analyte concentrations for method blanks.

7 Conclusions

Based on the Phase II ESA results, the following summary is provided:

- On October 12th, 2018, the Phase II ESA field work consisting of soil, sediment and groundwater sampling was conducted at the Site by EXP staff.
- The surficial overburden encountered during the soil sampling program consisted of brown medium grained sand below a layer of topsoil. Spent ammunition casings and cartridges were found at surface throughout the fire range area. Bedrock outcropping was observed at the Site. Typical bedrock depth across the Site is approximately 0.3 m to 0.6 m.
- For assessment purposes of soil and groundwater, EXP selected the Ministry of the Environment and Climate Change (MOECC) 2011 Table 1 Site Condition Standards (SCS) for industrial/commercial/community land use with coarse grained soil (Table 1 SCS). For sediment criteria, EXP selected the Table 1 Full Depth Background SCS All Types of Property Use for course textured soil (Table 1 SCS).
- Several soil samples submitted for chemical analysis of metals in the vicinity of the end berm, the firing range near the end berm and at a burn area had concentrations exceeding the MOECC (2011) Table 1 SCS most commonly for antimony, copper and lead and less commonly for boron, chromium, selenium, silver, and vanadium.
- A composite soil sample collected from the northeast end of the OPP firing range and closer to the wetland (RFG-5) was found not to be impacted with metals.
- The soil sample submitted for the chemical analysis of PAHs below the rail ties (SA1) exceeded the MOECC (2011) Table 1 SCS for most of the parameters tested. Soil samples submitted from the burn area were non-detect or below the MOECC (2011) Table 1 SCS.
- The results of the TCLP completed on a composite soil sample collected from the face of the end berm to determine off-site disposal options indicated the leachate result for lead exceeded the criteria as listed in Schedule 4 of O. Reg. 558. All other concentrations were below Schedule 4 of O. Reg 558. As a result, the soil from the face of the end berm is classified as hazardous waste.
- One sediment sample was collected from a nearby pond to the south (S1) and was submitted for analysis of metals. The sediment sample submitted for the analysis of metals exceeded Table 1 SCS for lead and copper.
- A groundwater sampled was collected from an on-site monitoring well (MW1) and submitted for analysis of metals. The results reported no exceedances of the SCS for metals in groundwater.

Based on the results of the Phase II ESA, soil impacts were identified on the firing range floor and vicinity of the end berm. The extent of impact does not extend to the northeast end of the OPP operated lands. The majority of the metal exceedances are related to lead and copper and to a lesser extent antimony. The metal impacts are attributed to the property being used as a firing range for

approximately 23 years. It is possible that the sediment impact in the pond could be attributed to soughing of material from the end berm and/or surface water flow or wind blown soil from the end berm.

Although the goal of the Phase II ESA was to characterize and define the extent of impact, the horizontal and to some degree vertical extent of the impacts in the firing range floor and end berm could not be determined based on the current scope of work and number of samples submitted for analyses.

As the full extent of soil impact has not been delineated, there is potential for soil impacts to extend beyond the OPP operated areas. The potential for off-site impact beyond OPP operated lands could also be facilitated through the movement of impacted surface water and/or groundwater. A sediment sample collected from the adjacent pond was found to be impacted whereas the groundwater was not found to be impacted. The migration of metals contamination may be occurring through wind and water erosion and or surface water runoff.

8 Recommendations

Based on the above, EXP provides the following options for consideration.

Option 1 – Conduct Delineation Investigation prior to Remediation

Additional soil, sediment and surface water sampling should be completed to delineate the extent of impact. This option involves conducting a delineation investigation prior to remediation to further define the extent of impact. The advantage of this option is that it will allow for a more accurate volume and remedial cost estimate to be developed. The main disadvantage is the additional costs and time commitments associated with completing these tasks.

Option 2 – Conduct Delineation during Remediation

This option involves completing the horizontal and vertical delineation of the metals exceedances during the remedial activities. This could be achieved by using the equipment that is on-site for remediation to collect additional soil samples at the beginning of the remedial works. Sediment and surface water sampling of the adjacent pond could also be done at this time. The advantage of this option is the cost associated with delineation is absorbed into the remediation phase. The disadvantage is that there is more uncertainty associated with remedial costs at the onset of the remediation phase.

Additional lateral and vertical sampling for TCLP analysis should also be completed prior to or during remediation to differentiate areas of hazardous soils (ie berm faces to variable depths) and non-hazardous soils (ie. range floor). This assessment could be completed as part of Options 1 or 2

The existing monitoring well front of the end berm should be protected and maintained for future monitoring. If the well is no longer to be used, it should be abandoned by a licensed well contractor as per O. Reg. 903, as amended.

9 General Limitations

The information presented in this report is based on a limited investigation designed to provide information to support an assessment of the current environmental conditions within the subject property. The conclusions and recommendations presented in this report reflect Site conditions existing at the time of the investigation.

More specific information with respect to the conditions between samples, or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during any such excavation operations. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent. Should this occur, EXP Services Inc. should be contacted to assess the situation, and the need for additional testing and reporting. EXP has qualified personnel to provide assistance in regards to any future geotechnical and environmental issues related to this property.

The environmental investigation was carried out to address the intent of applicable provincial Regulations, Guidelines, Policies, Standards, Protocols and Objectives administered by the Ministry of Environment. It should also be noted that current environmental Regulations, Guidelines, Policies, Standards, Protocols and Objectives are subject to change, and such changes, when put into effect, could alter the conclusions and recommendations noted throughout this report. Achieving the study objectives stated in this report has required us to arrive at conclusions based upon the best information presently known to us. No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and in the formulation of the conclusions. Like all professional persons rendering advice we do not act as absolute insurers of the conclusions we reach, but we commit ourselves to care and competence in reaching those conclusions.

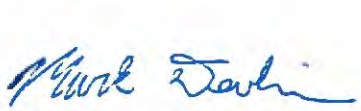
Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the engineering profession. It is intended that the outcome of this investigation assist in reducing the client's risk associated with environmental impairment. Our work should not be considered 'risk mitigation'. No other warranty or representation, either expressed or implied, is included or intended in this report.

This report was prepared for the exclusive use of the **OPP** and may not be reproduced in whole or in part, without the prior written consent of EXP, or used or relied upon in whole or in part by other parties for any purposes whatsoever. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

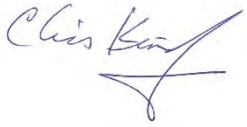
We trust this report is satisfactory for your purposes. Should you have any questions, please do not hesitate to contact this office.

Yours truly,

EXP Services Inc.

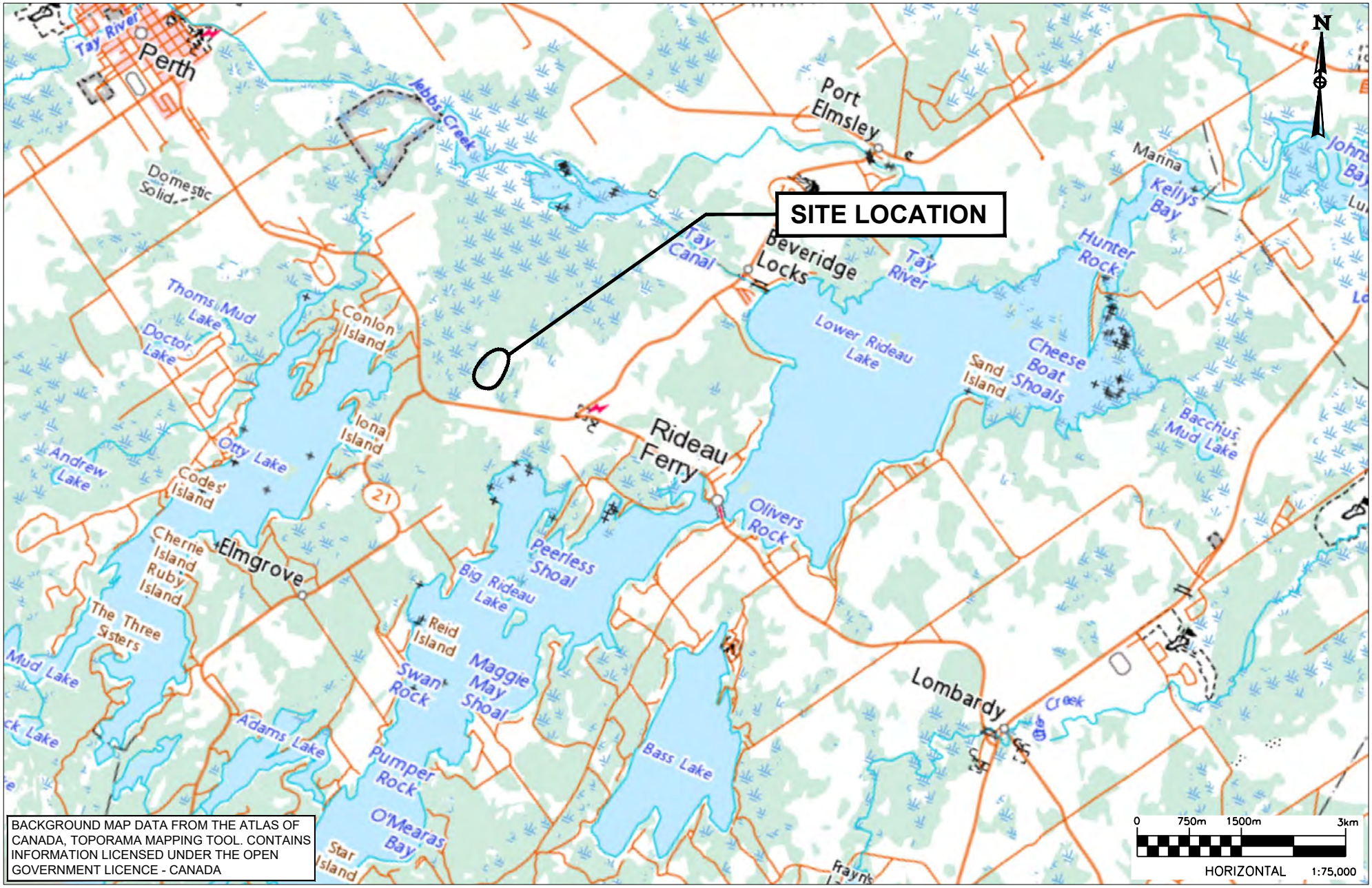


Mark Devlin, B.Sc., C.E.T.
Environmental Scientist
Earth & Environment



Chris Kimmerly, M.Sc., P.Geo.
Manager – Senior Geoscientist
Earth and Environment

Appendix A - Figures



BACKGROUND MAP DATA FROM THE ATLAS OF CANADA, TOPORAMA MAPPING TOOL. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - CANADA

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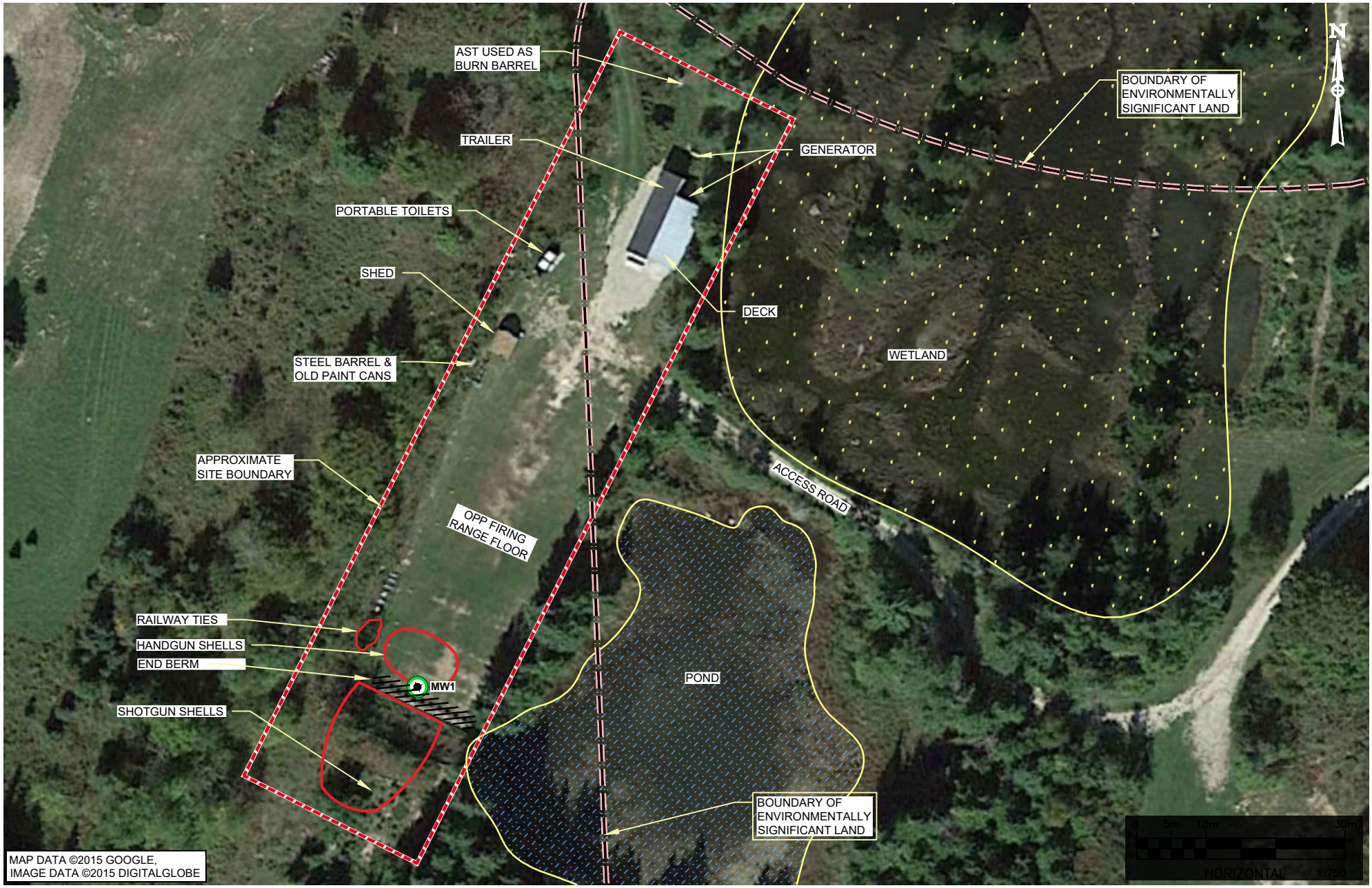
LEGEND:

TITLE AND LOCATION:

SITE LOCATION PLAN
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 75,000	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 1



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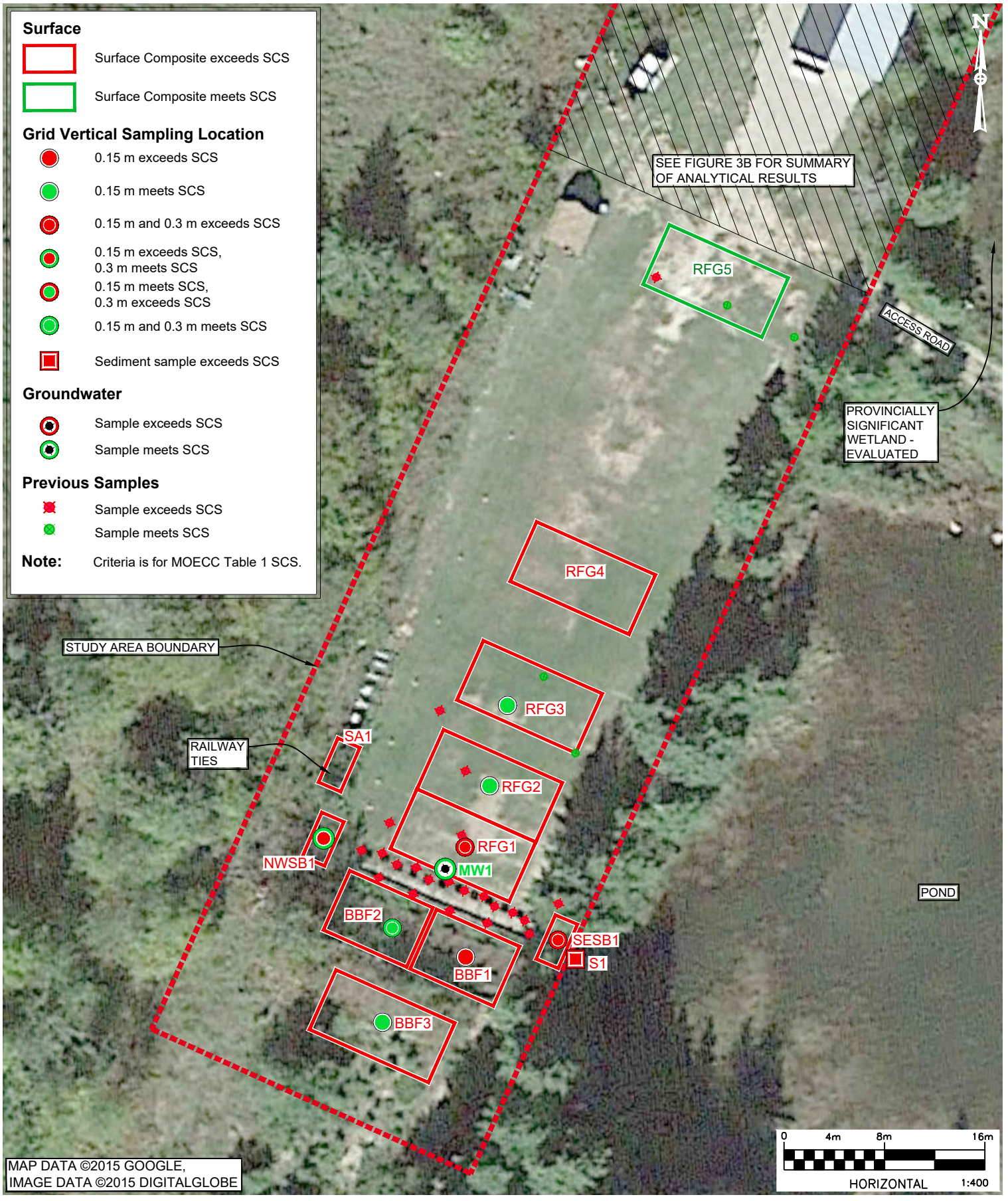
LEGEND:

MW1 MONITORING WELL

TITLE AND LOCATION:

SITE PLAN
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 750	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 2



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TITLE AND LOCATION:

SUMMARY OF ANALYTICAL RESULTS
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 3A

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TITLE AND LOCATION:

SUMMARY OF ANALYTICAL RESULTS - BURN BARREL METALS AND PAH

Phase II Environmental Site Assessment

Smiths Falls IST Range

1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 3B

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TITLE AND LOCATION:

SUMMARY OF ANALYTICAL RESULTS - LEAD AT 0.15 m
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 4A

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TITLE AND LOCATION: SUMMARY OF ANALYTICAL RESULTS
- LEAD AT 0.3 &/or 0.6 m
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 4B

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TITLE AND LOCATION:

SUMMARY OF ANALYTICAL RESULTS - COPPER AT 0.15 m
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 5A

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TITLE AND LOCATION:

SUMMARY OF ANALYTICAL RESULTS
COPPER AT 0.3 &/or 0.6 m
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 5B

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TITLE AND LOCATION:

SUMMARY OF ANALYTICAL RESULTS - ANTIMONY, CHROMIUM, SELENIUM &/OR VANADIUM @0.15 m

Phase II Environmental Site Assessment

Smiths Falls IST Range

1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 6A

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TITLE AND LOCATION: SUMMARY OF ANALYTICAL RESULTS
ANTIMONY, CHROMIUM, SELENIUM &/OR VANADIUM @0.3 m
Phase II Environmental Site Assessment
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1:400	CK: CK
DATE: FEBRUARY 2019	FIG. NO.: 6B

Appendix B – Analytical Summary Tables

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	BURN BARREL SURFACE	BURN BARREL 0.15M	RFG 1-COMPOSITE	RFG 1-0.15M
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.05	0.15	0.05	0.15
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	**6.2**	0.25	**39**	**6.0**
Arsenic	18	2.6	<1.0	<10	1.4
Barium	220	140	51	120	88
Beryllium	2.5	0.39	0.25	<2.0	0.38
Boron (Total)	36	**38**	12	<50[1]	<5.0
Cadmium	1.2	0.22	<0.10	<1.0	0.13
Chromium (total)	70	20	10	27	32
Cobalt	21	5.8	3.6	5.8	7.5
Copper	92	**98**	20	**64000**	**1600**
Lead	120	**130**	8.1	**3900**	**470**
Molybdenum	2	0.95	0.56	<5.0	<0.50
Nickel	82	11	6.1	20	14
Selenium	1.5	<0.50	<0.50	**10**	<0.50
Silver	0.5	0.22	<0.20	**3.1**	<0.20
Thallium	1	0.076	0.072	<0.50	0.12
Uranium	2.5	0.36	0.32	0.88	0.33
Vanadium	86	28	18	<50	34
Zinc	290	230	17	150	76

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (2011) SCS.

[1] Due to high concentrations of metals the sample required dilution which in turn raised the detection limit.

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	**RFG 1-0.60M**	**RFG 10-0.6M (dup of RFG 1-0.60M)**	**RFG 2-COMPOSITE**	**RFG 20-COMPOSITE (dup of RFG 2-COMPOSITE)**
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.60	0.60	0.05	0.05
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	0.75	0.49	**11**	**10**
Arsenic	18	1.2	1.3	1.8	1.8
Barium	220	62	56	110	110
Beryllium	2.5	0.31	0.35	0.39	0.42
Boron (Total)	36	<5.0	<5.0	<5.0	<5.0
Cadmium	1.2	0.10	0.12	0.10	<0.10
Chromium (total)	70	12	14	68	**91**
Cobalt	21	4.3	5.0	7.2	8.0
Copper	92	**220**	76	**4300**	**4200**
Lead	120	40	20	**1000**	**870**
Molybdenum	2	<0.50	<0.50	<0.50	<0.50
Nickel	82	6.7	9.6	25	29
Selenium	1.5	<0.50	<0.50	0.76	0.76
Silver	0.5	<0.20	<0.20	0.30	0.29
Thallium	1	0.089	0.079	0.15	0.15
Uranium	2.5	0.29	0.26	0.41	0.32
Vanadium	86	20	23	37	43
Zinc	290	24	23	140	140

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	RFG 2-0.15M	RFG 3-COMPOSITE	RFG 3-0.15,M	BBF1-COMPOSITE
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.15	0.05	0.15	0.05
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	0.50	2.5	<0.20	**16**
Arsenic	18	1.7	1.2	1.1	1.7
Barium	220	81	100	94	68
Beryllium	2.5	0.50	0.37	0.38	0.27
Boron (Total)	36	5.2	<5.0	<5.0	<5.0
Cadmium	1.2	0.11	<0.10	<0.10	<0.10
Chromium (total)	70	30	63	26	13
Cobalt	21	7.2	6.9	6.1	4.6
Copper	92	75	**310**	15	**700**
Lead	120	24	**160**	10	**2600**
Molybdenum	2	<0.50	<0.50	<0.50	<0.50
Nickel	82	12	21	12	8.0
Selenium	1.5	<0.50	<0.50	<0.50	<0.50
Silver	0.5	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.16	0.096	0.10	0.23
Uranium	2.5	0.49	0.30	0.37	0.34
Vanadium	86	38	38	29	21
Zinc	290	32	46	23	120

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	**BBF1-0.15M**	**BBF2-COMPOSITE**	**BBF2-COMPOSITE Lab-Dup**	**BBF2-0.15M**
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.15	0.05	0.05	0.15
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	**1.8**	**7.9**	**8.4**	1.2
Arsenic	18	<1.0	1.0	1.0	<1.0
Barium	220	37	52	50	22
Beryllium	2.5	0.23	0.23	0.22	<0.20
Boron (Total)	36	<5.0	<5.0	<5.0	<5.0
Cadmium	1.2	<0.10	<0.10	<0.10	<0.10
Chromium (total)	70	7.8	10	10	5.5
Cobalt	21	4.0	3.6	3.6	2.5
Copper	92	23	**330**	**310**	19
Lead	120	58	**1300**	**1200**	89
Molybdenum	2	<0.50	<0.50	<0.50	<0.50
Nickel	82	5.1	5.8	5.9	3.4
Selenium	1.5	<0.50	<0.50	<0.50	<0.50
Silver	0.5	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.083	0.14	0.14	0.055
Uranium	2.5	0.25	0.28	0.30	0.22
Vanadium	86	16	17	18	12
Zinc	290	7.2	51	48	5.1

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	BBF2-0.35M	BBF3-COMPOSITE	BBF3-0.15M	NWSB1-COMPOSITE
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.35	0.05	0.15	0.05
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	0.62	**1.9**	0.27	**12**
Arsenic	18	<1.0	<1.0	<1.0	2.0
Barium	220	59	52	40	99
Beryllium	2.5	0.21	0.22	<0.20	0.40
Boron (Total)	36	<5.0	<5.0	<5.0	<5.0
Cadmium	1.2	<0.10	<0.10	<0.10	0.17
Chromium (total)	70	9.5	10	6.3	26
Cobalt	21	4.5	3.6	3.1	6.6
Copper	92	28	**230**	8.5	**250**
Lead	120	67	**340**	3.2	**1300**
Molybdenum	2	<0.50	<0.50	<0.50	**3.1**
Nickel	82	6.9	6.3	4.5	14
Selenium	1.5	<0.50	<0.50	<0.50	<0.50
Silver	0.5	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.10	0.085	0.058	0.19
Uranium	2.5	0.26	0.25	0.23	0.28
Vanadium	86	19	16	13	27
Zinc	290	18	34	8.2	130

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	NWSB1-0.15M	NWSB1-0..50	SESB1-COMPOSITE	SESB1-0.15M
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.15	0.50	0.05	0.15
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	**2.7**	0.29	**18**	**20**
Arsenic	18	2.1	3.9	1.6	1.6
Barium	220	170	190	93	77
Beryllium	2.5	0.60	1.3	0.32	0.30
Boron (Total)	36	<5.0	5.3	<5.0	<5.0
Cadmium	1.2	0.27	0.42	<0.10	0.12
Chromium (total)	70	30	37	16	20
Cobalt	21	8.5	16	5.1	4.8
Copper	92	25	55	**4300**	**310**
Lead	120	**190**	35	**1700**	**2000**
Molybdenum	2	0.71	1.0	<0.50	<0.50
Nickel	82	17	29	10	8.9
Selenium	1.5	<0.50	0.84	0.76	<0.50
Silver	0.5	<0.20	0.21	0.28	<0.20
Thallium	1	0.20	0.35	0.18	0.21
Uranium	2.5	0.33	0.69	0.45	0.35
Vanadium	86	35	62	25	25
Zinc	290	55	66	62	42

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	**SESB1-0.60M**	**SA1**	**SESB 10-0.15M (dup of SESB1-0.15M)**	**SESB 10-0.15M Lab-Dup**
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.60	0.05	0.15	0.15
Consultant		EXP	EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878	B8R0878
Antimony	1.3	**3.9**	**13**	**15**	**13**
Arsenic	18	<1.0	3.3	1.4	1.7
Barium	220	45	140	71	70
Beryllium	2.5	0.21	0.64	0.32	0.31
Boron (Total)	36	<5.0	5.7	<5.0	<5.0
Cadmium	1.2	0.15	0.21	<0.10	0.11
Chromium (total)	70	9.4	37	20	21
Cobalt	21	2.9	9.4	4.9	4.8
Copper	92	**240**	**430**	**180**	**150**
Lead	120	**300**	**1400**	**1500**	**1200**
Molybdenum	2	<0.50	0.99	<0.50	<0.50
Nickel	82	5.0	22	8.6	9.0
Selenium	1.5	<0.50	<0.50	<0.50	<0.50
Silver	0.5	<0.20	<0.20	<0.20	<0.20
Thallium	1	0.072	0.21	0.15	0.13
Uranium	2.5	0.26	0.39	0.29	0.28
Vanadium	86	17	38	25	26
Zinc	290	48	68	36	35

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table I - Metals in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	**RFG-4 COMPOSITE**	**RFG-5 COMPOSITE**
Sampling Date		12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.05	0.05
Consultant		EXP	EXP
Laboratory		Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878
Antimony	1.3	**2.0**	0.75
Arsenic	18	1.7	1.5
Barium	220	120	81
Beryllium	2.5	0.60	0.29
Boron (Total)	36	8.7	<5.0
Cadmium	1.2	<0.10	<0.10
Chromium (total)	70	**110**	21
Cobalt	21	16	4.3
Copper	92	**510**	41
Lead	120	**190**	17
Molybdenum	2	<0.50	<0.50
Nickel	82	33	8.9
Selenium	1.5	<0.50	<0.50
Silver	0.5	<0.20	<0.20
Thallium	1	0.14	0.084
Uranium	2.5	0.29	0.28
Vanadium	86	**93**	24
Zinc	290	99	23

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS Table 1.

Non-detect but detection limit exceeds the MOECC (201

[1] Due to high concentrations of metals the sample required

SOIL ANALYTICAL RESULTS:

Table II - Polycyclic Aromatic Hydrocarbons (PAHs) in Soil

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	BURN BARREL SURFACE	BURN BARREL 0.15M	SA1
Lab ID		HZZ627	HZZ628	HZZ654
Sampling Date		12-Oct-18	12-Oct-18	12-Oct-18
Soil Sample Depth (m)		0.05	0.15	0.05
Consultant		EXP	EXP	EXP
Laboratory		Maxxam	Maxxam	Maxxam
Certificate of Analysis Number		B8R0878	B8R0878	B8R0878
Acenaphthene	0.072	<0.0050	<0.0050	**0.10**
Acenaphthylene	0.093	<0.0050	<0.0050	**0.72**
Anthracene	0.16	<0.0050	<0.0050	**0.82**
Benzo(a)anthracene	0.36	<0.0050	<0.0050	**2.1**
Benzo(a)pyrene	0.3	<0.0050	<0.0050	**1.8**
Benzo(b)fluoranthene	0.47	0.0077	<0.0050	**3.6**
Benzo(ghi)perylene	0.68	<0.0050	<0.0050	**1.6**
Benzo(k)fluoranthene	0.48	<0.0050	<0.0050	**1.1**
Chrysene	2.8	<0.0050	<0.0050	2.3
Dibenz(a,h)anthracene	0.1	<0.0050	<0.0050	**0.53**
Fluoranthene	0.56	<0.0050	<0.0050	**5.6**
Fluorene	0.12	<0.0050	<0.0050	**0.37**
Indeno(1,2,3-cd)pyrene	0.23	<0.0050	<0.0050	**1.7**
1-Methylnaphthalene	0.59	<0.0050	<0.0050	0.061
2-Methylnaphthalene	0.59	<0.0050	<0.0050	0.039
1&2-Methylnaphthalene	0.59	<0.0071	<0.0071	0.099
Naphthalene	0.09	<0.0050	<0.0050	0.011
Phenanthrene	0.69	0.0050	<0.0050	**2.0**
Pyrene	1	<0.0050	<0.0050	**3.8**

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS.

Non-detect but detection limit exceeds the MOECC (2011) SCS.

SEDIMENT ANALYTICAL RESULTS:

Table III - Metals in Sediment

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	**S1**
Sampling Date		12-Oct-18
Soil Sample Depth (m)		0.05 m
Consultant		EXP
Laboratory		Maxxam
te of Analysis Number		B8R0878
Antimony	NV	3.2
Arsenic	6	<1.0
Barium	NV	38
Beryllium	NV	<0.20
Boron (Total)	NV	<5.0
Cadmium	0.6	<0.10
Chromium (total)	26	8.3
Cobalt	50	2.5
Copper	16	**230**
Lead	31	**420**
Molybdenum	NV	<0.50
Nickel	16	4.7
Selenium	NV	<0.50
Silver	0.5	<0.20
Thallium	NV	0.076
Uranium	NV	0.30
Vanadium	NV	15
Zinc	120	25

All soil concentrations reported in µg/g.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Underline — Concentration exceeds MOECC (2011) SCS Table 8 (sediment).

Non-detect but detection limit exceeds the MOECC (2011) SCS.

GROUNDWATER ANALYTICAL RESULTS:

Table IV - Metals in Groundwater

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	MOECC (2011) Table 1: Full Depth Background SCS Residential/Parkland/Institutional/Industrial/Commercial/Community Land Use (coarse and/or fine textured soil)	**MW-1**
Lab ID		12-Oct-18
Sampling Date		HZZ660
Screen Depth Interval (m)		2.10 - 4.70
Consultant		EXP
Laboratory		Maxxam
Certificate of Analysis Number		B8R0878
Antimony	1.5	<0.50
Arsenic	13	<1.0
Barium	610	130
Beryllium	0.5	<0.50
Boron (Total)	1700	20
Cadmium	0.5	<0.10
Chromium (total)	11	<5.0
Cobalt	3.8	<0.50
Copper	5	2.1
Lead	1.9	<0.50
Molybdenum	23	<0.50
Nickel	14	<1.0
Selenium	5	<2.0
Silver	0.3	<0.10
Thallium	0.5	0.11
Uranium	8.9	0.2
Vanadium	3.9	<0.50
Zinc	160	<5.0

All groundwater concentrations reported in µg/L.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds MOECC (2011) SCS.

Non-detect but detection limit exceeds the MOECC (2011) SCS.

SOIL ANALYTICAL RESULTS:

Table V - Toxicity Characteristic Leaching Procedure (TCLP)

1686 County Road #1, Perth, Ontario

BRM-00244589-A0, Phase II Environmental Assessment

Sample ID	Schedule 4 Criteria	**TCLP**
Lab ID		HJW231
Sampling Date		12-Oct-18
Consultant		EXP
Laboratory		Maxxam
Certificate of Analysis Number		76543
Leachable Mercury (Hg)	0.1	<0.0010
Leachable Arsenic (As)	2.5	<0.2
Leachable Barium (Ba)	100	1.6
Leachable Boron (B)	500	0.2
Leachable Cadmium (Cd)	0.5	<0.05
Leachable Chromium (Cr)	5	<0.1
Leachable Lead (Pb)	5	**90**
Leachable Selenium (Se)	1	<0.1
Leachable Silver (Ag)	5	<0.01
Leachable Uranium (U)	10	<0.01

All concentrations reported in mg/L.

'<' = Parameter below detection limit, as indicated

'NV'= No value

Bold Concentration exceeds Schedule 4 Criteria

Appendix C – Certificates of Analysis

Your Project #: OTT-00244589-A0
Site#: SMITH FALLS

Attention: Daniel Clarke

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Your C.O.C. #: C#687574-02-01, C#687574-01-01, C#687574-05-01, C#687574-04-01

Report Date: 2018/10/19
Report #: R5448799
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R0878
Received: 2018/10/13, 07:20

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum (1)	3	N/A	2018/10/19	CAM SOP-00301	EPA 8270D m
Mercury (TCLP Leachable) (mg/L) (1)	1	N/A	2018/10/18	CAM SOP-00453	EPA 7470A m
Strong Acid Leachable Metals by ICPMS (1)	15	2018/10/17	2018/10/17	CAM SOP-00447	EPA 6020B m
Strong Acid Leachable Metals by ICPMS (1)	13	2018/10/17	2018/10/18	CAM SOP-00447	EPA 6020B m
Total Metals in TCLP Leachate by ICPMS (1)	1	2018/10/18	2018/10/19	CAM SOP-00447	EPA 6020B m
Moisture (1)	3	N/A	2018/10/16	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM) (1)	3	2018/10/18	2018/10/18	CAM SOP-00318	EPA 8270D m
TCLP - % Solids (1)	1	2018/10/17	2018/10/18	CAM SOP-00401	EPA 1311 Update I m
TCLP - Extraction Fluid (1)	1	N/A	2018/10/18	CAM SOP-00401	EPA 1311 Update I m
TCLP - Initial and final pH (1)	1	N/A	2018/10/18	CAM SOP-00401	EPA 1311 Update I m

Sample Matrix: SEDIMENT
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Strong Acid Leachable Metals by ICPMS (1)	1	2018/10/17	2018/10/17	CAM SOP-00447	EPA 6020B m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Dissolved Metals by ICPMS (1)	1	N/A	2018/10/18	CAM SOP-00447	EPA 6020B m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

Your Project #: OTT-00244589-A0
Site#: SMITH FALLS

Attention: Daniel Clarke

exp Services Inc
Ottawa Branch
100-2650 Queensview Drive
Ottawa, ON
CANADA K2B 8H6

Your C.O.C. #: C#687574-02-01, C#687574-01-01, C#687574-05-01, C#687574-04-01

Report Date: 2018/10/19
Report #: R5448799
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8R0878
Received: 2018/10/13, 07:20

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Alisha Williamson, Project Manager
Email: AWilliamson@maxxam.ca
Phone# (613) 274-0573

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

RESULTS OF ANALYSES OF SOIL

Maxxam ID		HZZ627	HZZ628	HZZ628		
Sampling Date		2018/10/12 08:30	2018/10/12 08:35	2018/10/12 08:35		
COC Number		C#687574-02-01	C#687574-02-01	C#687574-02-01		
	UNITS	**BURN BARREL SURFACE**	**BURN BARREL 0.15M**	**BURN BARREL 0.15M Lab-Dup**	**RDL**	**QC Batch**
Inorganics						
Moisture	%	18	12	12	1.0	5785837

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam ID		HZZ654			HZZ657		
Sampling Date		2018/10/12 13:40			2018/10/12 14:20		
COC Number		C#687574-05-01			C#687574-04-01		
	UNITS	**SA1**	**RDL**	**QC Batch**	**TCLP**	**RDL**	**QC Batch**
Inorganics							
Final pH	pH				5.22		5788329
Initial pH	pH				8.18		5788329
Moisture	%	21	1.0	5785966			
TCLP - % Solids	%				100	0.2	5788324
TCLP Extraction Fluid	N/A				FLUID 1		5788326
Metals							
Leachable Mercury (Hg)	mg/L				<0.0010	0.0010	5790096

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ627	HZZ628		
Sampling Date			2018/10/12 08:30	2018/10/12 08:35		
COC Number			C#687574-02-01	C#687574-02-01		
	UNITS	**Criteria**	**BURN BARREL SURFACE**	**BURN BARREL 0.15M**	**RDL**	**QC Batch**
Metals						
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**6.2**	0.25	0.20	5787742
Acid Extractable Arsenic (As)	ug/g	**18**	2.6	<1.0	1.0	5787742
Acid Extractable Barium (Ba)	ug/g	**220**	140	51	0.50	5787742
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.39	0.25	0.20	5787742
Acid Extractable Boron (B)	ug/g	**36**	**38**	12	5.0	5787742
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	0.22	<0.10	0.10	5787742
Acid Extractable Chromium (Cr)	ug/g	**70**	20	10	1.0	5787742
Acid Extractable Cobalt (Co)	ug/g	**21**	5.8	3.6	0.10	5787742
Acid Extractable Copper (Cu)	ug/g	**92**	**98**	20	0.50	5787742
Acid Extractable Lead (Pb)	ug/g	**120**	**130**	8.1	1.0	5787742
Acid Extractable Molybdenum (Mo)	ug/g	**2**	0.95	0.56	0.50	5787742
Acid Extractable Nickel (Ni)	ug/g	**82**	11	6.1	0.50	5787742
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	<0.50	0.50	5787742
Acid Extractable Silver (Ag)	ug/g	**0.5**	0.22	<0.20	0.20	5787742
Acid Extractable Thallium (Tl)	ug/g	**1**	0.076	0.072	0.050	5787742
Acid Extractable Uranium (U)	ug/g	**2.5**	0.36	0.32	0.050	5787742
Acid Extractable Vanadium (V)	ug/g	**86**	28	18	5.0	5787742
Acid Extractable Zinc (Zn)	ug/g	**290**	230	17	5.0	5787742

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ629			HZZ630	HZZ631		
Sampling Date			2018/10/12 08:45			2018/10/12 08:50	2018/10/12 08:55		
COC Number			C#687574-02-01			C#687574-02-01	C#687574-02-01		
	UNITS	**Criteria**	**RFG 1-COMPOSITE**	**RDL**	**QC Batch**	**RFG 1-0.15M**	**RFG 1-0.60M**	**RDL**	**QC Batch**
Metals									
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**39**	2.0	5787892	**6.0**	0.75	0.20	5787742
Acid Extractable Arsenic (As)	ug/g	**18**	<10	10	5787892	1.4	1.2	1.0	5787742
Acid Extractable Barium (Ba)	ug/g	**220**	120	5.0	5787892	88	62	0.50	5787742
Acid Extractable Beryllium (Be)	ug/g	**2.5**	<2.0	2.0	5787892	0.38	0.31	0.20	5787742
Acid Extractable Boron (B)	ug/g	**36**	**<50 (1)**	50	5787892	<5.0	<5.0	5.0	5787742
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<1.0	1.0	5787892	0.13	0.10	0.10	5787742
Acid Extractable Chromium (Cr)	ug/g	**70**	27	10	5787892	32	12	1.0	5787742
Acid Extractable Cobalt (Co)	ug/g	**21**	5.8	1.0	5787892	7.5	4.3	0.10	5787742
Acid Extractable Copper (Cu)	ug/g	**92**	**64000**	25	5787892	**1600**	**220**	0.50	5787742
Acid Extractable Lead (Pb)	ug/g	**120**	**3900**	10	5787892	**470**	40	1.0	5787742
Acid Extractable Molybdenum (Mo)	ug/g	**2**	**<5.0 (1)**	5.0	5787892	<0.50	<0.50	0.50	5787742
Acid Extractable Nickel (Ni)	ug/g	**82**	20	5.0	5787892	14	6.7	0.50	5787742
Acid Extractable Selenium (Se)	ug/g	**1.5**	**10**	5.0	5787892	<0.50	<0.50	0.50	5787742
Acid Extractable Silver (Ag)	ug/g	**0.5**	**3.1**	2.0	5787892	<0.20	<0.20	0.20	5787742
Acid Extractable Thallium (Tl)	ug/g	**1**	<0.50	0.50	5787892	0.12	0.089	0.050	5787742
Acid Extractable Uranium (U)	ug/g	**2.5**	0.88	0.50	5787892	0.33	0.29	0.050	5787742
Acid Extractable Vanadium (V)	ug/g	**86**	<50	50	5787892	34	20	5.0	5787742
Acid Extractable Zinc (Zn)	ug/g	**290**	150	50	5787892	76	24	5.0	5787742

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use
(1) RDL exceeds criteria

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ632			HZZ633		
Sampling Date			2018/10/12 09:10			2018/10/12 09:20		
COC Number			C#687574-02-01			C#687574-02-01		
	UNITS	**Criteria**	**RFG 2-COMPOSITE**	**RDL**	**QC Batch**	**RFG 2-0.15M**	**RDL**	**QC Batch**
Metals								
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**11**	0.20	5787892	0.50	0.20	5787742
Acid Extractable Arsenic (As)	ug/g	**18**	1.8	1.0	5787892	1.7	1.0	5787742
Acid Extractable Barium (Ba)	ug/g	**220**	110	0.50	5787892	81	0.50	5787742
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.39	0.20	5787892	0.50	0.20	5787742
Acid Extractable Boron (B)	ug/g	**36**	<5.0	5.0	5787892	5.2	5.0	5787742
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	0.10	0.10	5787892	0.11	0.10	5787742
Acid Extractable Chromium (Cr)	ug/g	**70**	68	1.0	5787892	30	1.0	5787742
Acid Extractable Cobalt (Co)	ug/g	**21**	7.2	0.10	5787892	7.2	0.10	5787742
Acid Extractable Copper (Cu)	ug/g	**92**	**4300**	2.5	5787892	75	0.50	5787742
Acid Extractable Lead (Pb)	ug/g	**120**	**1000**	1.0	5787892	24	1.0	5787742
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	0.50	5787892	<0.50	0.50	5787742
Acid Extractable Nickel (Ni)	ug/g	**82**	25	0.50	5787892	12	0.50	5787742
Acid Extractable Selenium (Se)	ug/g	**1.5**	0.76	0.50	5787892	<0.50	0.50	5787742
Acid Extractable Silver (Ag)	ug/g	**0.5**	0.30	0.20	5787892	<0.20	0.20	5787742
Acid Extractable Thallium (Tl)	ug/g	**1**	0.15	0.050	5787892	0.16	0.050	5787742
Acid Extractable Uranium (U)	ug/g	**2.5**	0.41	0.050	5787892	0.49	0.050	5787742
Acid Extractable Vanadium (V)	ug/g	**86**	37	5.0	5787892	38	5.0	5787742
Acid Extractable Zinc (Zn)	ug/g	**290**	140	5.0	5787892	32	5.0	5787742

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ634	HZZ635		HZZ637		
Sampling Date			2018/10/12 09:30	2018/10/12 09:50		2018/10/12 10:10		
COC Number			C#687574-02-01	C#687574-02-01		C#687574-01-01		
	UNITS	**Criteria**	**RFG 3-COMPOSITE**	**RFG 3-0.15,M**	**QC Batch**	**RFG 10-0.6M**	**RDL**	**QC Batch**
Metals								
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**2.5**	<0.20	5787892	0.49	0.20	5787742
Acid Extractable Arsenic (As)	ug/g	**18**	1.2	1.1	5787892	1.3	1.0	5787742
Acid Extractable Barium (Ba)	ug/g	**220**	100	94	5787892	56	0.50	5787742
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.37	0.38	5787892	0.35	0.20	5787742
Acid Extractable Boron (B)	ug/g	**36**	<5.0	<5.0	5787892	<5.0	5.0	5787742
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	<0.10	5787892	0.12	0.10	5787742
Acid Extractable Chromium (Cr)	ug/g	**70**	63	26	5787892	14	1.0	5787742
Acid Extractable Cobalt (Co)	ug/g	**21**	6.9	6.1	5787892	5.0	0.10	5787742
Acid Extractable Copper (Cu)	ug/g	**92**	**310**	15	5787892	76	0.50	5787742
Acid Extractable Lead (Pb)	ug/g	**120**	**160**	10	5787892	20	1.0	5787742
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	<0.50	5787892	<0.50	0.50	5787742
Acid Extractable Nickel (Ni)	ug/g	**82**	21	12	5787892	9.6	0.50	5787742
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	<0.50	5787892	<0.50	0.50	5787742
Acid Extractable Silver (Ag)	ug/g	**0.5**	<0.20	<0.20	5787892	<0.20	0.20	5787742
Acid Extractable Thallium (Tl)	ug/g	**1**	0.096	0.10	5787892	0.079	0.050	5787742
Acid Extractable Uranium (U)	ug/g	**2.5**	0.30	0.37	5787892	0.26	0.050	5787742
Acid Extractable Vanadium (V)	ug/g	**86**	38	29	5787892	23	5.0	5787742
Acid Extractable Zinc (Zn)	ug/g	**290**	46	23	5787892	23	5.0	5787742

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ638			HZZ639	HZZ640		
Sampling Date			2018/10/12 10:20			2018/10/12 10:30	2018/10/12 10:40		
COC Number			C#687574-01-01			C#687574-01-01	C#687574-01-01		
	UNITS	**Criteria**	**RFG 20-COMPOSITE**	**RDL**	**QC Batch**	**BBF1-COMPOSITE**	**BBF1-0.15M**	**RDL**	**QC Batch**
Metals									
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**10**	0.20	5787742	**16**	**1.8**	0.20	5787892
Acid Extractable Arsenic (As)	ug/g	**18**	1.8	1.0	5787742	1.7	<1.0	1.0	5787892
Acid Extractable Barium (Ba)	ug/g	**220**	110	0.50	5787742	68	37	0.50	5787892
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.42	0.20	5787742	0.27	0.23	0.20	5787892
Acid Extractable Boron (B)	ug/g	**36**	<5.0	5.0	5787742	<5.0	<5.0	5.0	5787892
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	0.10	5787742	<0.10	<0.10	0.10	5787892
Acid Extractable Chromium (Cr)	ug/g	**70**	**91**	1.0	5787742	13	7.8	1.0	5787892
Acid Extractable Cobalt (Co)	ug/g	**21**	8.0	0.10	5787742	4.6	4.0	0.10	5787892
Acid Extractable Copper (Cu)	ug/g	**92**	**4200**	2.5	5787742	**700**	23	0.50	5787892
Acid Extractable Lead (Pb)	ug/g	**120**	**870**	1.0	5787742	**2600**	58	1.0	5787892
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	0.50	5787742	<0.50	<0.50	0.50	5787892
Acid Extractable Nickel (Ni)	ug/g	**82**	29	0.50	5787742	8.0	5.1	0.50	5787892
Acid Extractable Selenium (Se)	ug/g	**1.5**	0.76	0.50	5787742	<0.50	<0.50	0.50	5787892
Acid Extractable Silver (Ag)	ug/g	**0.5**	0.29	0.20	5787742	<0.20	<0.20	0.20	5787892
Acid Extractable Thallium (Tl)	ug/g	**1**	0.15	0.050	5787742	0.23	0.083	0.050	5787892
Acid Extractable Uranium (U)	ug/g	**2.5**	0.32	0.050	5787742	0.34	0.25	0.050	5787892
Acid Extractable Vanadium (V)	ug/g	**86**	43	5.0	5787742	21	16	5.0	5787892
Acid Extractable Zinc (Zn)	ug/g	**290**	140	5.0	5787742	120	7.2	5.0	5787892

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ642	HZZ642	HZZ643		
Sampling Date			2018/10/12 11:00	2018/10/12 11:00	2018/10/12 11:10		
COC Number			C#687574-01-01	C#687574-01-01	C#687574-01-01		
	UNITS	**Criteria**	**BBF2-COMPOSITE**	**BBF2-COMPOSITE Lab-Dup**	**BBF2-0.15M**	**RDL**	**QC Batch**
Metals							
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**7.9**	**8.4**	1.2	0.20	5787892
Acid Extractable Arsenic (As)	ug/g	**18**	1.0	1.0	<1.0	1.0	5787892
Acid Extractable Barium (Ba)	ug/g	**220**	52	50	22	0.50	5787892
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.23	0.22	<0.20	0.20	5787892
Acid Extractable Boron (B)	ug/g	**36**	<5.0	<5.0	<5.0	5.0	5787892
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	<0.10	<0.10	0.10	5787892
Acid Extractable Chromium (Cr)	ug/g	**70**	10	10	5.5	1.0	5787892
Acid Extractable Cobalt (Co)	ug/g	**21**	3.6	3.6	2.5	0.10	5787892
Acid Extractable Copper (Cu)	ug/g	**92**	**330**	**310**	19	0.50	5787892
Acid Extractable Lead (Pb)	ug/g	**120**	**1300**	**1200**	89	1.0	5787892
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	<0.50	<0.50	0.50	5787892
Acid Extractable Nickel (Ni)	ug/g	**82**	5.8	5.9	3.4	0.50	5787892
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	<0.50	<0.50	0.50	5787892
Acid Extractable Silver (Ag)	ug/g	**0.5**	<0.20	<0.20	<0.20	0.20	5787892
Acid Extractable Thallium (Tl)	ug/g	**1**	0.14	0.14	0.055	0.050	5787892
Acid Extractable Uranium (U)	ug/g	**2.5**	0.28	0.30	0.22	0.050	5787892
Acid Extractable Vanadium (V)	ug/g	**86**	17	18	12	5.0	5787892
Acid Extractable Zinc (Zn)	ug/g	**290**	51	48	5.1	5.0	5787892

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ644		HZZ645		HZZ646		
Sampling Date			2018/10/12 11:20		2018/10/12 11:30		2018/10/12 11:40		
COC Number			C#687574-01-01		C#687574-01-01		C#687574-01-01		
	UNITS	**Criteria**	**BBF2-0.35M**	**QC Batch**	**BBF3-COMPOSITE**	**QC Batch**	**BBF3-0.15M**	**RDL**	**QC Batch**
Metals									
Acid Extractable Antimony (Sb)	ug/g	**1.3**	0.62	5787742	**1.9**	5787892	0.27	0.20	5787742
Acid Extractable Arsenic (As)	ug/g	**18**	<1.0	5787742	<1.0	5787892	<1.0	1.0	5787742
Acid Extractable Barium (Ba)	ug/g	**220**	59	5787742	52	5787892	40	0.50	5787742
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.21	5787742	0.22	5787892	<0.20	0.20	5787742
Acid Extractable Boron (B)	ug/g	**36**	<5.0	5787742	<5.0	5787892	<5.0	5.0	5787742
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	5787742	<0.10	5787892	<0.10	0.10	5787742
Acid Extractable Chromium (Cr)	ug/g	**70**	9.5	5787742	10	5787892	6.3	1.0	5787742
Acid Extractable Cobalt (Co)	ug/g	**21**	4.5	5787742	3.6	5787892	3.1	0.10	5787742
Acid Extractable Copper (Cu)	ug/g	**92**	28	5787742	**230**	5787892	8.5	0.50	5787742
Acid Extractable Lead (Pb)	ug/g	**120**	67	5787742	**340**	5787892	3.2	1.0	5787742
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	5787742	<0.50	5787892	<0.50	0.50	5787742
Acid Extractable Nickel (Ni)	ug/g	**82**	6.9	5787742	6.3	5787892	4.5	0.50	5787742
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	5787742	<0.50	5787892	<0.50	0.50	5787742
Acid Extractable Silver (Ag)	ug/g	**0.5**	<0.20	5787742	<0.20	5787892	<0.20	0.20	5787742
Acid Extractable Thallium (Tl)	ug/g	**1**	0.10	5787742	0.085	5787892	0.058	0.050	5787742
Acid Extractable Uranium (U)	ug/g	**2.5**	0.26	5787742	0.25	5787892	0.23	0.050	5787742
Acid Extractable Vanadium (V)	ug/g	**86**	19	5787742	16	5787892	13	5.0	5787742
Acid Extractable Zinc (Zn)	ug/g	**290**	18	5787742	34	5787892	8.2	5.0	5787742

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ648	HZZ649	HZZ650		
Sampling Date			2018/10/12 12:30	2018/10/12 12:40	2018/10/12 12:50		
COC Number			C#687574-05-01	C#687574-05-01	C#687574-05-01		
	UNITS	**Criteria**	**NWSB1-COMPOSITE**	**NWSB1-0.15M**	**NWSB1-0..50**	**RDL**	**QC Batch**
Metals							
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**12**	**2.7**	0.29	0.20	5787892
Acid Extractable Arsenic (As)	ug/g	**18**	2.0	2.1	3.9	1.0	5787892
Acid Extractable Barium (Ba)	ug/g	**220**	99	170	190	0.50	5787892
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.40	0.60	1.3	0.20	5787892
Acid Extractable Boron (B)	ug/g	**36**	<5.0	<5.0	5.3	5.0	5787892
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	0.17	0.27	0.42	0.10	5787892
Acid Extractable Chromium (Cr)	ug/g	**70**	26	30	37	1.0	5787892
Acid Extractable Cobalt (Co)	ug/g	**21**	6.6	8.5	16	0.10	5787892
Acid Extractable Copper (Cu)	ug/g	**92**	**250**	25	55	0.50	5787892
Acid Extractable Lead (Pb)	ug/g	**120**	**1300**	**190**	35	1.0	5787892
Acid Extractable Molybdenum (Mo)	ug/g	**2**	**3.1**	0.71	1.0	0.50	5787892
Acid Extractable Nickel (Ni)	ug/g	**82**	14	17	29	0.50	5787892
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	<0.50	0.84	0.50	5787892
Acid Extractable Silver (Ag)	ug/g	**0.5**	<0.20	<0.20	0.21	0.20	5787892
Acid Extractable Thallium (Tl)	ug/g	**1**	0.19	0.20	0.35	0.050	5787892
Acid Extractable Uranium (U)	ug/g	**2.5**	0.28	0.33	0.69	0.050	5787892
Acid Extractable Vanadium (V)	ug/g	**86**	27	35	62	5.0	5787892
Acid Extractable Zinc (Zn)	ug/g	**290**	130	55	66	5.0	5787892

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ651		HZZ652	HZZ653	HZZ654		
Sampling Date			2018/10/12 13:00		2018/10/12 13:10	2018/10/12 13:20	2018/10/12 13:40		
COC Number			C#687574-05-01		C#687574-05-01	C#687574-05-01	C#687574-05-01		
	UNITS	**Criteria**	**SESB1-COMPOSITE**	**RDL**	**SESB1-0.15M**	**SESB1-0.60M**	**SA1**	**RDL**	**QC Batch**
Metals									
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**18**	0.20	**20**	**3.9**	**13**	0.20	5787892
Acid Extractable Arsenic (As)	ug/g	**18**	1.6	1.0	1.6	<1.0	3.3	1.0	5787892
Acid Extractable Barium (Ba)	ug/g	**220**	93	0.50	77	45	140	0.50	5787892
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.32	0.20	0.30	0.21	0.64	0.20	5787892
Acid Extractable Boron (B)	ug/g	**36**	<5.0	5.0	<5.0	<5.0	5.7	5.0	5787892
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	0.10	0.12	0.15	0.21	0.10	5787892
Acid Extractable Chromium (Cr)	ug/g	**70**	16	1.0	20	9.4	37	1.0	5787892
Acid Extractable Cobalt (Co)	ug/g	**21**	5.1	0.10	4.8	2.9	9.4	0.10	5787892
Acid Extractable Copper (Cu)	ug/g	**92**	**4300**	2.5	**310**	**240**	**430**	0.50	5787892
Acid Extractable Lead (Pb)	ug/g	**120**	**1700**	1.0	**2000**	**300**	**1400**	1.0	5787892
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	0.50	<0.50	<0.50	0.99	0.50	5787892
Acid Extractable Nickel (Ni)	ug/g	**82**	10	0.50	8.9	5.0	22	0.50	5787892
Acid Extractable Selenium (Se)	ug/g	**1.5**	0.76	0.50	<0.50	<0.50	<0.50	0.50	5787892
Acid Extractable Silver (Ag)	ug/g	**0.5**	0.28	0.20	<0.20	<0.20	<0.20	0.20	5787892
Acid Extractable Thallium (Tl)	ug/g	**1**	0.18	0.050	0.21	0.072	0.21	0.050	5787892
Acid Extractable Uranium (U)	ug/g	**2.5**	0.45	0.050	0.35	0.26	0.39	0.050	5787892
Acid Extractable Vanadium (V)	ug/g	**86**	25	5.0	25	17	38	5.0	5787892
Acid Extractable Zinc (Zn)	ug/g	**290**	62	5.0	42	48	68	5.0	5787892

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ656	HZZ656			HZZ657		
Sampling Date			2018/10/12 14:00	2018/10/12 14:00			2018/10/12 14:20		
COC Number			C#687574-05-01	C#687574-05-01			C#687574-04-01		
	UNITS	**Criteria**	**SESB 10-0.15M**	**SESB 10-0.15M Lab-Dup**	**RDL**	**QC Batch**	**TCLP**	**RDL**	**QC Batch**
Metals									
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**15**	**13**	0.20	5787742			
Acid Extractable Arsenic (As)	ug/g	**18**	1.4	1.7	1.0	5787742			
Leachable Arsenic (As)	mg/L	-					<0.2	0.2	5790343
Acid Extractable Barium (Ba)	ug/g	**220**	71	70	0.50	5787742			
Leachable Barium (Ba)	mg/L	-					1.6	0.2	5790343
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.32	0.31	0.20	5787742			
Acid Extractable Boron (B)	ug/g	**36**	<5.0	<5.0	5.0	5787742			
Leachable Boron (B)	mg/L	-					0.2	0.1	5790343
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	0.11	0.10	5787742			
Leachable Cadmium (Cd)	mg/L	-					<0.05	0.05	5790343
Acid Extractable Chromium (Cr)	ug/g	**70**	20	21	1.0	5787742			
Leachable Chromium (Cr)	mg/L	-					<0.1	0.1	5790343
Acid Extractable Cobalt (Co)	ug/g	**21**	4.9	4.8	0.10	5787742			
Acid Extractable Copper (Cu)	ug/g	**92**	**180**	**150**	0.50	5787742			
Acid Extractable Lead (Pb)	ug/g	**120**	**1500**	**1200**	1.0	5787742			
Leachable Lead (Pb)	mg/L	-					90	0.5	5790343
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	<0.50	0.50	5787742			
Leachable Selenium (Se)	mg/L	-					<0.1	0.1	5790343
Acid Extractable Nickel (Ni)	ug/g	**82**	8.6	9.0	0.50	5787742			
Leachable Silver (Ag)	mg/L	-					<0.01	0.01	5790343
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	<0.50	0.50	5787742			
Acid Extractable Silver (Ag)	ug/g	**0.5**	<0.20	<0.20	0.20	5787742			
Acid Extractable Thallium (Tl)	ug/g	**1**	0.15	0.13	0.050	5787742			
Acid Extractable Uranium (U)	ug/g	**2.5**	0.29	0.28	0.050	5787742			
Leachable Uranium (U)	mg/L	-					<0.01	0.01	5790343
Acid Extractable Vanadium (V)	ug/g	**86**	25	26	5.0	5787742			
Acid Extractable Zinc (Zn)	ug/g	**290**	36	35	5.0	5787742			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

Maxxam Analytics International Corporation o/a Maxxam Analytics 32 Colonnade Rd, Unit #1000, Nepean, ON K2E 7J6 Phone: 613 274-0573 Fax: 613 274-0574 Website: www.maxxam.ca

Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID			HZZ658	HZZ659		
Sampling Date			2018/10/12 15:00	2018/10/12 15:10		
COC Number			C#687574-04-01	C#687574-04-01		
	UNITS	**Criteria**	**RFG-4 COMPOSITE**	**RFG-5 COMPOSITE**	**RDL**	**QC Batch**
Metals						
Acid Extractable Antimony (Sb)	ug/g	**1.3**	**2.0**	0.75	0.20	5787892
Acid Extractable Arsenic (As)	ug/g	**18**	1.7	1.5	1.0	5787892
Acid Extractable Barium (Ba)	ug/g	**220**	120	81	0.50	5787892
Acid Extractable Beryllium (Be)	ug/g	**2.5**	0.60	0.29	0.20	5787892
Acid Extractable Boron (B)	ug/g	**36**	8.7	<5.0	5.0	5787892
Acid Extractable Cadmium (Cd)	ug/g	**1.2**	<0.10	<0.10	0.10	5787892
Acid Extractable Chromium (Cr)	ug/g	**70**	**110**	21	1.0	5787892
Acid Extractable Cobalt (Co)	ug/g	**21**	16	4.3	0.10	5787892
Acid Extractable Copper (Cu)	ug/g	**92**	**510**	41	0.50	5787892
Acid Extractable Lead (Pb)	ug/g	**120**	**190**	17	1.0	5787892
Acid Extractable Molybdenum (Mo)	ug/g	**2**	<0.50	<0.50	0.50	5787892
Acid Extractable Nickel (Ni)	ug/g	**82**	33	8.9	0.50	5787892
Acid Extractable Selenium (Se)	ug/g	**1.5**	<0.50	<0.50	0.50	5787892
Acid Extractable Silver (Ag)	ug/g	**0.5**	<0.20	<0.20	0.20	5787892
Acid Extractable Thallium (Tl)	ug/g	**1**	0.14	0.084	0.050	5787892
Acid Extractable Uranium (U)	ug/g	**2.5**	0.29	0.28	0.050	5787892
Acid Extractable Vanadium (V)	ug/g	**86**	**93**	24	5.0	5787892
Acid Extractable Zinc (Zn)	ug/g	**290**	99	23	5.0	5787892

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			HZZ627	HZZ628		
Sampling Date			2018/10/12 08:30	2018/10/12 08:35		
COC Number			C#687574-02-01	C#687574-02-01		
	UNITS	**Criteria**	**BURN BARREL SURFACE**	**BURN BARREL 0.15M**	**RDL**	**QC Batch**
Calculated Parameters						
Methylnaphthalene, 2-(1-)	ug/g	**0.59**	<0.0071	<0.0071	0.0071	5783251
Polyaromatic Hydrocarbons						
Acenaphthene	ug/g	**0.072**	<0.0050	<0.0050	0.0050	5790676
Acenaphthylene	ug/g	**0.093**	<0.0050	<0.0050	0.0050	5790676
Anthracene	ug/g	**0.16**	<0.0050	<0.0050	0.0050	5790676
Benzo(a)anthracene	ug/g	**0.36**	<0.0050	<0.0050	0.0050	5790676
Benzo(a)pyrene	ug/g	**0.3**	<0.0050	<0.0050	0.0050	5790676
Benzo(b/j)fluoranthene	ug/g	**0.47**	0.0077	<0.0050	0.0050	5790676
Benzo(g,h,i)perylene	ug/g	**0.68**	<0.0050	<0.0050	0.0050	5790676
Benzo(k)fluoranthene	ug/g	**0.48**	<0.0050	<0.0050	0.0050	5790676
Chrysene	ug/g	**2.8**	<0.0050	<0.0050	0.0050	5790676
Dibenz(a,h)anthracene	ug/g	**0.1**	<0.0050	<0.0050	0.0050	5790676
Fluoranthene	ug/g	**0.56**	<0.0050	<0.0050	0.0050	5790676
Fluorene	ug/g	**0.12**	<0.0050	<0.0050	0.0050	5790676
Indeno(1,2,3-cd)pyrene	ug/g	**0.23**	<0.0050	<0.0050	0.0050	5790676
1-Methylnaphthalene	ug/g	**0.59**	<0.0050	<0.0050	0.0050	5790676
2-Methylnaphthalene	ug/g	**0.59**	<0.0050	<0.0050	0.0050	5790676
Naphthalene	ug/g	**0.09**	<0.0050	<0.0050	0.0050	5790676
Phenanthrene	ug/g	**0.69**	0.0050	<0.0050	0.0050	5790676
Pyrene	ug/g	**1**	<0.0050	<0.0050	0.0050	5790676
Surrogate Recovery (%)						
D10-Anthracene	%	-	90	89		5790676
D14-Terphenyl (FS)	%	-	88	82		5790676
D8-Acenaphthylene	%	-	84	81		5790676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID			HZZ628			HZZ654		
Sampling Date			2018/10/12 08:35			2018/10/12 13:40		
COC Number			C#687574-02-01			C#687574-05-01		
	UNITS	**Criteria**	**BURN BARREL 0.15M Lab-Dup**	**RDL**	**QC Batch**	**SA1**	**RDL**	**QC Batch**
Calculated Parameters								
Methylnaphthalene, 2-(1-)	ug/g	**0.59**				0.099	0.0071	5785171
Polyaromatic Hydrocarbons								
Acenaphthene	ug/g	**0.072**	<0.0050	0.0050	5790676	**0.10**	0.0050	5790676
Acenaphthylene	ug/g	**0.093**	<0.0050	0.0050	5790676	**0.72**	0.0050	5790676
Anthracene	ug/g	**0.16**	<0.0050	0.0050	5790676	**0.82**	0.0050	5790676
Benzo(a)anthracene	ug/g	**0.36**	<0.0050	0.0050	5790676	**2.1**	0.0050	5790676
Benzo(a)pyrene	ug/g	**0.3**	<0.0050	0.0050	5790676	**1.8**	0.0050	5790676
Benzo(b/j)fluoranthene	ug/g	**0.47**	<0.0050	0.0050	5790676	**3.6**	0.0050	5790676
Benzo(g,h,i)perylene	ug/g	**0.68**	<0.0050	0.0050	5790676	**1.6**	0.0050	5790676
Benzo(k)fluoranthene	ug/g	**0.48**	<0.0050	0.0050	5790676	**1.1**	0.0050	5790676
Chrysene	ug/g	**2.8**	<0.0050	0.0050	5790676	2.3	0.0050	5790676
Dibenz(a,h)anthracene	ug/g	**0.1**	<0.0050	0.0050	5790676	**0.53**	0.0050	5790676
Fluoranthene	ug/g	**0.56**	<0.0050	0.0050	5790676	**5.6**	0.0050	5790676
Fluorene	ug/g	**0.12**	<0.0050	0.0050	5790676	**0.37**	0.0050	5790676
Indeno(1,2,3-cd)pyrene	ug/g	**0.23**	<0.0050	0.0050	5790676	**1.7**	0.0050	5790676
1-Methylnaphthalene	ug/g	**0.59**	<0.0050	0.0050	5790676	0.061	0.0050	5790676
2-Methylnaphthalene	ug/g	**0.59**	<0.0050	0.0050	5790676	0.039	0.0050	5790676
Naphthalene	ug/g	**0.09**	<0.0050	0.0050	5790676	0.011	0.0050	5790676
Phenanthrene	ug/g	**0.69**	<0.0050	0.0050	5790676	**2.0**	0.0050	5790676
Pyrene	ug/g	**1**	<0.0050	0.0050	5790676	**3.8**	0.0050	5790676
Surrogate Recovery (%)								
D10-Anthracene	%	-	94		5790676	82		5790676
D14-Terphenyl (FS)	%	-	84		5790676	89		5790676
D8-Acenaphthylene	%	-	84		5790676	86		5790676

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Reg. 153/04 (Amended April 15, 2011)
Table 1: Full Depth Background Site Condition Standards
Soil - Residential/Parkland/Institutional/Industrial/Commercial/Community Property Use

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		HZZ655		
Sampling Date		2018/10/12 13:50		
COC Number		C#687574-05-01		
	UNITS	**S1**	**RDL**	**QC Batch**
Metals				
Acid Extractable Antimony (Sb)	ug/g	3.2	0.20	5787892
Acid Extractable Arsenic (As)	ug/g	<1.0	1.0	5787892
Acid Extractable Barium (Ba)	ug/g	38	0.50	5787892
Acid Extractable Beryllium (Be)	ug/g	<0.20	0.20	5787892
Acid Extractable Boron (B)	ug/g	<5.0	5.0	5787892
Acid Extractable Cadmium (Cd)	ug/g	<0.10	0.10	5787892
Acid Extractable Chromium (Cr)	ug/g	8.3	1.0	5787892
Acid Extractable Cobalt (Co)	ug/g	2.5	0.10	5787892
Acid Extractable Copper (Cu)	ug/g	230	0.50	5787892
Acid Extractable Lead (Pb)	ug/g	420	1.0	5787892
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	5787892
Acid Extractable Nickel (Ni)	ug/g	4.7	0.50	5787892
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	5787892
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	5787892
Acid Extractable Thallium (Tl)	ug/g	0.076	0.050	5787892
Acid Extractable Uranium (U)	ug/g	0.30	0.050	5787892
Acid Extractable Vanadium (V)	ug/g	15	5.0	5787892
Acid Extractable Zinc (Zn)	ug/g	25	5.0	5787892

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		HZZ660		
Sampling Date		2018/10/12 15:30		
COC Number		C#687574-04-01		
	UNITS	**MW-1**	**RDL**	**QC Batch**
Metals				
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	5785557
Dissolved Arsenic (As)	ug/L	<1.0	1.0	5785557
Dissolved Barium (Ba)	ug/L	130	2.0	5785557
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	5785557
Dissolved Boron (B)	ug/L	20	10	5785557
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	5785557
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	5785557
Dissolved Cobalt (Co)	ug/L	<0.50	0.50	5785557
Dissolved Copper (Cu)	ug/L	2.1	1.0	5785557
Dissolved Lead (Pb)	ug/L	<0.50	0.50	5785557
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	5785557
Dissolved Nickel (Ni)	ug/L	<1.0	1.0	5785557
Dissolved Selenium (Se)	ug/L	<2.0	2.0	5785557
Dissolved Silver (Ag)	ug/L	<0.10	0.10	5785557
Dissolved Thallium (Tl)	ug/L	0.11	0.050	5785557
Dissolved Uranium (U)	ug/L	0.20	0.10	5785557
Dissolved Vanadium (V)	ug/L	<0.50	0.50	5785557
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	5785557

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

Maxxam ID: HZZ627 **Collected:** 2018/10/12
Sample ID: BURN BARREL SURFACE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5783251	N/A	2018/10/19	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu
Moisture	BAL	5785837	N/A	2018/10/16	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5790676	2018/10/18	2018/10/18	Mitesh Raj

Maxxam ID: HZZ628 **Collected:** 2018/10/12
Sample ID: BURN BARREL 0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5783251	N/A	2018/10/19	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu
Moisture	BAL	5785837	N/A	2018/10/16	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5790676	2018/10/18	2018/10/18	Mitesh Raj

Maxxam ID: HZZ628 Dup **Collected:** 2018/10/12
Sample ID: BURN BARREL 0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5785837	N/A	2018/10/16	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5790676	2018/10/18	2018/10/18	Mitesh Raj

Maxxam ID: HZZ629 **Collected:** 2018/10/12
Sample ID: RFG 1-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ630 **Collected:** 2018/10/12
Sample ID: RFG 1-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ631 **Collected:** 2018/10/12
Sample ID: RFG 1-0.60M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

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Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

TEST SUMMARY

Maxxam ID: HZZ632 **Collected:** 2018/10/12
Sample ID: RFG 2-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ633 **Collected:** 2018/10/12
Sample ID: RFG 2-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ634 **Collected:** 2018/10/12
Sample ID: RFG 3-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ635 **Collected:** 2018/10/12
Sample ID: RFG 3-0.15,M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ637 **Collected:** 2018/10/12
Sample ID: RFG 10-0.6M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ638 **Collected:** 2018/10/12
Sample ID: RFG 20-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ639 **Collected:** 2018/10/12
Sample ID: BBF1-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

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Sampler Initials: DC

TEST SUMMARY

Maxxam ID: HZZ640 **Collected:** 2018/10/12
Sample ID: BBF1-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ642 **Collected:** 2018/10/12
Sample ID: BBF2-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ642 Dup **Collected:** 2018/10/12
Sample ID: BBF2-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ643 **Collected:** 2018/10/12
Sample ID: BBF2-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ644 **Collected:** 2018/10/12
Sample ID: BBF2-0.35M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ645 **Collected:** 2018/10/12
Sample ID: BBF3-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ646 **Collected:** 2018/10/12
Sample ID: BBF3-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

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TEST SUMMARY

Maxxam ID: HZZ648 **Collected:** 2018/10/12
Sample ID: NWSB1-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ649 **Collected:** 2018/10/12
Sample ID: NWSB1-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ650 **Collected:** 2018/10/12
Sample ID: NWSB1-0..50 **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ651 **Collected:** 2018/10/12
Sample ID: SESB1-COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ652 **Collected:** 2018/10/12
Sample ID: SESB1-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ653 **Collected:** 2018/10/12
Sample ID: SESB1-0.60M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ654 **Collected:** 2018/10/12
Sample ID: SA1 **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5785171	N/A	2018/10/19	Automated Statchk
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu
Moisture	BAL	5785966	N/A	2018/10/16	Prgya Panchal
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5790676	2018/10/18	2018/10/18	Mitesh Raj

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TEST SUMMARY

Maxxam ID: HZZ655 **Collected:** 2018/10/12
Sample ID: S1 **Shipped:**
Matrix: SEDIMENT **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ656 **Collected:** 2018/10/12
Sample ID: SESB 10-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ656 Dup **Collected:** 2018/10/12
Sample ID: SESB 10-0.15M **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787742	2018/10/17	2018/10/18	Daniel Teclu

Maxxam ID: HZZ657 **Collected:** 2018/10/12
Sample ID: TCLP **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury (TCLP Leachable) (mg/L)	CV/AA	5790096	N/A	2018/10/18	Ron Morrison
Total Metals in TCLP Leachate by ICPMS	ICP1/MS	5790343	2018/10/18	2018/10/19	Arefa Dabhad
TCLP - % Solids	BAL	5788324	2018/10/17	2018/10/18	Jian (Ken) Wang
TCLP - Extraction Fluid		5788326	N/A	2018/10/18	Jian (Ken) Wang
TCLP - Initial and final pH	PH	5788329	N/A	2018/10/18	Jian (Ken) Wang

Maxxam ID: HZZ658 **Collected:** 2018/10/12
Sample ID: RFG-4 COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

Maxxam ID: HZZ659 **Collected:** 2018/10/12
Sample ID: RFG-5 COMPOSITE **Shipped:**
Matrix: Soil **Received:** 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	5787892	2018/10/17	2018/10/17	Daniel Teclu

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TEST SUMMARY

Maxxam ID: HZZ660
Sample ID: MW-1
Matrix: Water

Collected: 2018/10/12
Shipped:
Received: 2018/10/13

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5785557	N/A	2018/10/18	Thao Nguyen

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Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.7°C
Package 2	6.0°C

Sample HZZ629 [RFG 1-COMPOSITE] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
5790676	D10-Anthracene	2018/10/18	90	50 - 130	95	50 - 130	93	%				
5790676	D14-Terphenyl (FS)	2018/10/18	92	50 - 130	92	50 - 130	86	%				
5790676	D8-Acenaphthylene	2018/10/18	85	50 - 130	85	50 - 130	76	%				
5785557	Dissolved Antimony (Sb)	2018/10/18	110	80 - 120	102	80 - 120	<0.50	ug/L				
5785557	Dissolved Arsenic (As)	2018/10/18	101	80 - 120	99	80 - 120	<1.0	ug/L				
5785557	Dissolved Barium (Ba)	2018/10/18	105	80 - 120	102	80 - 120	<2.0	ug/L				
5785557	Dissolved Beryllium (Be)	2018/10/18	102	80 - 120	98	80 - 120	<0.50	ug/L				
5785557	Dissolved Boron (B)	2018/10/18	104	80 - 120	100	80 - 120	<10	ug/L				
5785557	Dissolved Cadmium (Cd)	2018/10/18	105	80 - 120	101	80 - 120	<0.10	ug/L				
5785557	Dissolved Chromium (Cr)	2018/10/18	100	80 - 120	98	80 - 120	<5.0	ug/L				
5785557	Dissolved Cobalt (Co)	2018/10/18	98	80 - 120	98	80 - 120	<0.50	ug/L				
5785557	Dissolved Copper (Cu)	2018/10/18	103	80 - 120	101	80 - 120	<1.0	ug/L				
5785557	Dissolved Lead (Pb)	2018/10/18	95	80 - 120	94	80 - 120	<0.50	ug/L				
5785557	Dissolved Molybdenum (Mo)	2018/10/18	108	80 - 120	102	80 - 120	<0.50	ug/L				
5785557	Dissolved Nickel (Ni)	2018/10/18	96	80 - 120	96	80 - 120	<1.0	ug/L				
5785557	Dissolved Selenium (Se)	2018/10/18	105	80 - 120	100	80 - 120	<2.0	ug/L				
5785557	Dissolved Silver (Ag)	2018/10/18	81	80 - 120	97	80 - 120	<0.10	ug/L				
5785557	Dissolved Thallium (Tl)	2018/10/18	94	80 - 120	91	80 - 120	<0.050	ug/L				
5785557	Dissolved Uranium (U)	2018/10/18	103	80 - 120	99	80 - 120	<0.10	ug/L				
5785557	Dissolved Vanadium (V)	2018/10/18	104	80 - 120	98	80 - 120	<0.50	ug/L				
5785557	Dissolved Zinc (Zn)	2018/10/18	100	80 - 120	97	80 - 120	<5.0	ug/L				
5785837	Moisture	2018/10/16							0	20		
5785966	Moisture	2018/10/16							7.1	20		
5787742	Acid Extractable Antimony (Sb)	2018/10/18	87	75 - 125	99	80 - 120	<0.20	ug/g	13	30		
5787742	Acid Extractable Arsenic (As)	2018/10/18	93	75 - 125	98	80 - 120	<1.0	ug/g	17	30		
5787742	Acid Extractable Barium (Ba)	2018/10/18	NC	75 - 125	92	80 - 120	<0.50	ug/g	0.87	30		
5787742	Acid Extractable Beryllium (Be)	2018/10/18	96	75 - 125	102	80 - 120	<0.20	ug/g	0.53	30		
5787742	Acid Extractable Boron (B)	2018/10/18	97	75 - 125	104	80 - 120	<5.0	ug/g	NC	30		
5787742	Acid Extractable Cadmium (Cd)	2018/10/18	92	75 - 125	100	80 - 120	<0.10	ug/g	9.7	30		
5787742	Acid Extractable Chromium (Cr)	2018/10/18	96	75 - 125	98	80 - 120	<1.0	ug/g	4.1	30		
5787742	Acid Extractable Cobalt (Co)	2018/10/18	91	75 - 125	97	80 - 120	<0.10	ug/g	1.9	30		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
5787742	Acid Extractable Copper (Cu)	2018/10/18	NC	75 - 125	99	80 - 120	<0.50	ug/g	21	30		
5787742	Acid Extractable Lead (Pb)	2018/10/18	NC	75 - 125	99	80 - 120	<1.0	ug/g	16	30		
5787742	Acid Extractable Molybdenum (Mo)	2018/10/18	94	75 - 125	96	80 - 120	<0.50	ug/g	NC	30		
5787742	Acid Extractable Nickel (Ni)	2018/10/18	93	75 - 125	99	80 - 120	<0.50	ug/g	5.0	30		
5787742	Acid Extractable Selenium (Se)	2018/10/18	94	75 - 125	101	80 - 120	<0.50	ug/g	NC	30		
5787742	Acid Extractable Silver (Ag)	2018/10/18	93	75 - 125	102	80 - 120	<0.20	ug/g	NC	30		
5787742	Acid Extractable Thallium (Tl)	2018/10/18	91	75 - 125	97	80 - 120	<0.050	ug/g	14	30		
5787742	Acid Extractable Uranium (U)	2018/10/18	90	75 - 125	96	80 - 120	<0.050	ug/g	4.2	30		
5787742	Acid Extractable Vanadium (V)	2018/10/18	98	75 - 125	100	80 - 120	<5.0	ug/g	2.9	30		
5787742	Acid Extractable Zinc (Zn)	2018/10/18	NC	75 - 125	105	80 - 120	<5.0	ug/g	4.5	30		
5787892	Acid Extractable Antimony (Sb)	2018/10/17	109	75 - 125	102	80 - 120	<0.20	ug/g	6.4	30		
5787892	Acid Extractable Arsenic (As)	2018/10/17	101	75 - 125	106	80 - 120	<1.0	ug/g	0.0098	30		
5787892	Acid Extractable Barium (Ba)	2018/10/17	NC	75 - 125	104	80 - 120	<0.50	ug/g	2.6	30		
5787892	Acid Extractable Beryllium (Be)	2018/10/17	101	75 - 125	100	80 - 120	<0.20	ug/g	3.3	30		
5787892	Acid Extractable Boron (B)	2018/10/17	97	75 - 125	97	80 - 120	<5.0	ug/g	NC	30		
5787892	Acid Extractable Cadmium (Cd)	2018/10/17	99	75 - 125	97	80 - 120	<0.10	ug/g	NC	30		
5787892	Acid Extractable Chromium (Cr)	2018/10/17	93	75 - 125	96	80 - 120	<1.0	ug/g	4.1	30		
5787892	Acid Extractable Cobalt (Co)	2018/10/17	95	75 - 125	99	80 - 120	<0.10	ug/g	0.43	30		
5787892	Acid Extractable Copper (Cu)	2018/10/17	NC	75 - 125	98	80 - 120	<0.50	ug/g	9.1	30		
5787892	Acid Extractable Lead (Pb)	2018/10/17	NC	75 - 125	103	80 - 120	<1.0	ug/g	4.8	30		
5787892	Acid Extractable Molybdenum (Mo)	2018/10/17	99	75 - 125	102	80 - 120	<0.50	ug/g	NC	30		
5787892	Acid Extractable Nickel (Ni)	2018/10/17	97	75 - 125	101	80 - 120	<0.50	ug/g	1.8	30		
5787892	Acid Extractable Selenium (Se)	2018/10/17	100	75 - 125	100	80 - 120	<0.50	ug/g	NC	30		
5787892	Acid Extractable Silver (Ag)	2018/10/17	96	75 - 125	96	80 - 120	<0.20	ug/g	NC	30		
5787892	Acid Extractable Thallium (Tl)	2018/10/17	100	75 - 125	103	80 - 120	<0.050	ug/g	5.7	30		
5787892	Acid Extractable Uranium (U)	2018/10/17	98	75 - 125	98	80 - 120	<0.050	ug/g	5.3	30		
5787892	Acid Extractable Vanadium (V)	2018/10/17	93	75 - 125	102	80 - 120	<5.0	ug/g	5.1	30		
5787892	Acid Extractable Zinc (Zn)	2018/10/17	NC	75 - 125	97	80 - 120	<5.0	ug/g	6.5	30		
5790096	Leachable Mercury (Hg)	2018/10/18	100	75 - 125	95	80 - 120	<0.0010	mg/L	NC	25	<0.0010	mg/L
5790343	Leachable Arsenic (As)	2018/10/18	101	80 - 120	104	80 - 120			NC	35	<0.2	mg/L
5790343	Leachable Barium (Ba)	2018/10/18	NC	80 - 120	102	80 - 120			2.9	35	<0.2	mg/L

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
5790343	Leachable Boron (B)	2018/10/18	110	80 - 120	103	80 - 120			0.43	35	<0.1	mg/L
5790343	Leachable Cadmium (Cd)	2018/10/18	103	80 - 120	104	80 - 120			NC	35	<0.05	mg/L
5790343	Leachable Chromium (Cr)	2018/10/18	96	80 - 120	99	80 - 120			NC	35	<0.1	mg/L
5790343	Leachable Lead (Pb)	2018/10/18	91	80 - 120	94	80 - 120			NC	35	<0.1	mg/L
5790343	Leachable Selenium (Se)	2018/10/18	101	80 - 120	100	80 - 120			NC	35	<0.1	mg/L
5790343	Leachable Silver (Ag)	2018/10/18	97	80 - 120	98	80 - 120			NC	35	<0.01	mg/L
5790343	Leachable Uranium (U)	2018/10/18	97	80 - 120	99	80 - 120			NC	35	<0.01	mg/L
5790676	1-Methylnaphthalene	2018/10/18	88	50 - 130	94	50 - 130	<0.0050	ug/g	NC	40		
5790676	2-Methylnaphthalene	2018/10/18	78	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40		
5790676	Acenaphthene	2018/10/18	79	50 - 130	84	50 - 130	<0.0050	ug/g	NC	40		
5790676	Acenaphthylene	2018/10/18	74	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40		
5790676	Anthracene	2018/10/18	79	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40		
5790676	Benzo(a)anthracene	2018/10/18	83	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40		
5790676	Benzo(a)pyrene	2018/10/18	82	50 - 130	87	50 - 130	<0.0050	ug/g	NC	40		
5790676	Benzo(b/j)fluoranthene	2018/10/18	82	50 - 130	91	50 - 130	<0.0050	ug/g	NC	40		
5790676	Benzo(g,h,i)perylene	2018/10/18	79	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40		
5790676	Benzo(k)fluoranthene	2018/10/18	79	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40		
5790676	Chrysene	2018/10/18	83	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40		
5790676	Dibenz(a,h)anthracene	2018/10/18	82	50 - 130	77	50 - 130	<0.0050	ug/g	NC	40		
5790676	Fluoranthene	2018/10/18	82	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40		
5790676	Fluorene	2018/10/18	82	50 - 130	84	50 - 130	<0.0050	ug/g	NC	40		
5790676	Indeno(1,2,3-cd)pyrene	2018/10/18	83	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40		
5790676	Naphthalene	2018/10/18	76	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40		
5790676	Phenanthrene	2018/10/18	80	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		Leachate Blank	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	Value	UNITS
5790676	Pyrene	2018/10/18	93	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40		

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Leachate Blank: A blank matrix containing all reagents used in the leaching procedure. Used to determine any process contamination.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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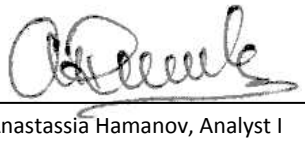
Maxxam Job #: B8R0878
Report Date: 2018/10/19

exp Services Inc
Client Project #: OTT-00244589-A0
Sampler Initials: DC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Anastassia Hamanov, Analyst I

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 4

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17497 exp Services Inc	Company Name:		Quotation #:	~~B46066~~ Stream 3	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Daniel Clarke / Chris Kimmerly	P.O. #:			687574
Address:	100-2650 Queensview Drive	Address:		Project:	OTT-00244589-A0	COC #:	Project Manager:
	Ottawa ON K2B 8H6			Project Name:	Smiths Falls	C#687574-02-01	Alisha Williamson
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Site #:			
Email:	accounting.ottawa@exp.com; Karen.Burke@exp.com;	Email:	daniel.clarke@exp.com / chris.kimmerly@exp.com	Sampled By:	DC		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [X] Table 1 [ ] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [ ] Table 3 [ ] Agri/Other [ ] For RSC
- [ ] Table ___

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558. [ ] Storm Sewer Bylaw
- [ ] MISA Municipality ___
- [ ] PWQO
- [ ] Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? ___

Field Filtered (please circle): Metals / Hg / Cr VI

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

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Date Required: ___ Time Required: ___ [ ]
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	O.Reg 153 ICPMS Metals (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 558 TCLP Metals	O.Reg 153 ICPMS Metals (Sediment)	# of Bottles	Comments
1		Burn Barrel Surface	Oct 12/18	8:30	Soil	X	X			2	
2		Burn Barrel 0.15m		8:35		X	X			2	
3		RFG 1 - Composite		8:45		X				1	
4		RFG 1 - 0.15m		8:50							
5		RFG 1 - 0.60m		8:55							
6		RFG 2 - Composite		9:10							
7		RFG 2 - 0.15m		9:20							
8		RFG 3 - Composite		9:30							
9		RFG 3 - 0.15m		9:50							
10		RFG 3 - 0.30m		10:00							

13-Oct-18 07:20
Alisha Williamson
B8R0878
GUS ENV-837
RECEIVED IN OTTAWA
on ice

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Daniel Clarke	18/10/12	17:00	Sonja Léger	18/10/12	17:20	
			GURVINDER SU	18/10/13	07:56	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	11.2, 10	Present	X	
		Intact	X	

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7,5,5
5,5,8

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CHAIN OF CUSTODY RECORD

Page 2 of 4

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17497 exp Services Inc	Company Name:		Quotation #:	~~B46055~~ 5Y/can 3	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Daniel Clarke / Chris Kinnerly	P.O. #:			687574
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-00244589-A0	COC #:	Project Manager:
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:	5th Line Falls	C#687574-01-01	Alisha Williamson
Email:	accounting.ottawa@exp.com; Karen.Burke@exp.com;	Email:	daniel.clarke@exp.com / chris.kinnerly@exp.com	Site #:			
				Sampled By:	DC		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
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- [ ] Table ___

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558. [ ] Storm Sewer Bylaw
- [ ] MISA Municipality _____
- [ ] PWQO
- [ ] Other _____

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? _____

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Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____ [ ]
Rush Confirmation Number: _____ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	ANALYSIS REQUESTED (PLEASE BE SPECIFIC): O.Reg 153 ICPMS Metals (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 558 TCLP Metals	O.Reg 153 ICPMS Metals (Sediment)	# of Bottles	Comments
1		RFG 10 - 0.6m	OCT/12/12	10:10	Soil	N	X				1	
2		RFG 20 - Composite		10:20								
3		BBF 1 - Composite		10:30								
4		BBF 1 - 0.15m		10:40								
5		BBF 1 - 0.30m		10:50								
6		BBF 2 - Composite		11:00								
7		BBF 2 - 0.15m		11:10								RECEIVED IN OTTAWA
8		BBF 2 - 0.35m		11:20								on ice
9		BBF 3 - Composite		11:30								
10		BBF 3 - 0.15m		11:40								

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Daniel Clarke	18/10/12	17:00	Serge Leger	18/10/12	17:20	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	11, 12, 10	Present	X	
		Intact	X	

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CHAIN OF CUSTODY RECORD

Page 3 of 4

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17497 exp Services Inc	Company Name:		Quotation #:	~~B46066~~ Stream 3	Maxxam Job #:	Bottle Order #: 687574
Attention:	Accounts Payable	Attention:	Daniel Clarke / Chris Kimmerly	P.O. #:			
Address:	100-2650 Queensview Drive	Address:		Project:	OTT-00244589-A0	COC #: C#687574-05-01	Project Manager: Alisha Williamson
	Ottawa ON K2B 8H6			Project Name:	Smiths Falls		
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Site #:			
Email:	accounting.ottawa@exp.com; Karen.Burke@exp.com;	Email:	daniel.clarke@exp.com / chris.kimmerly@exp.c	Sampled By:	DC		

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Other Regulations: [ ] CCME [ ] Sanitary Sewer Bylaw [ ] Reg 558 [ ] Storm Sewer Bylaw [ ] MISA Municipality ___ [ ] PWQO [ ] Other ___

Special Instructions:

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Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 ICPMS Metals (Soil)	O.Reg 153 PAHs (Soil)	O.Reg 558 TCLP Metals	O.Reg 153 ICPMS Metals (Sediment)						# of Bottles	Comments
1		BBF3-0.30m	Oct 12/18	12:00	Soil	N	X										
2		NWSB1-composite	↓	12:30	↓		↓										
3		NWSB1-0.15m		12:40													
4		NWSB1-0.50m		12:50													
5		SESB1-composite		13:00													
6		SESB1-0.15m		13:10													
7		SESB1-0.60m		13:20			↓										RECEIVED IN OTTAWA
8		SA1		13:40	↓			X									On ice
9		S1		13:50	Sediment					X							
10		SESB10-0.15m	↓	14:00	Soil		X										

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Laboratory Use Only: Temperature (°C) on Recei	Custody Seal	Yes	No
Daniel Clarke	18/10/12	17:00	Serge Léger	18/10/12	17:20			11, 12, 10	Present	X	
									Intact	X	

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#17497 exp Services Inc	Company Name:		Quotation #:	~~B46066~~ 57/Team 3	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Daniel Clarke / Chris Kimmerly	P.O. #:			687574
Address:	100-2650 Queensview Drive Ottawa ON K2B 8H6	Address:		Project:	OTT-00244589-A0	COC #:	Project Manager:
Tel:	(613) 688-1899 Fax: (613) 225-7337	Tel:	Fax:	Project Name:		C#687574-04-01	Alisha Williamson
Email:	accounting.ottawa@exp.com; Karen.Burke@exp.com;	Email:	daniel.clarke@exp.com / Chris.Kimmerly@exp.com	Site #:			
				Sampled By:	DC		

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Regulation 153 (2011)	Other Regulations	Special Instructions
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1		TCLP	Oct 17/12	14:20	So:1				X								2	
2		RFG-4 composite	↓	15:00	So:1		X										1	
3		RFG-5 composite		15:10	So:1		X										1	
4		MW 1		15:30	GW		X										4	
5																		
6																		
7																		RECEIVED IN OTTAWA
8																		6H ICE
9																		
10																		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Daniel Clarke	12/10/12	17:00	Serge Léger	12/10/12	17:20	

Laboratory Use Only					
Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	11.1, 2.0	Present	X	
		Intact	X	

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May 7, 2019

Ms. Jennifer Chown
Ontario Provincial Police (OPP)
777 Memorial Avenue
Orillia, Ontario
L3V 7V3

Re: BRM–00244589-A0 Smiths Falls IST Range
1686 County Road #1, Perth, Ontario
Remedial Options

Dear Ms. Chown,

EXP Services Inc. (EXP) is pleased to provide the Ontario Provincial Police (OPP) with this Remedial Options Plan at the Smiths Falls IST firing range located at 1686 County Road #1, Perth, Ontario, hereinafter referred to as the 'Site'.

The Site is located 1 km north of County Road #1 in Perth, Ontario. The Site is located within a portion of a former gravel pit. The entire property measures approximately 55 hectares, however; for the purpose of this assessment only the northwestern portion of the property approximately 0.3 hectares (i.e. portion of site occupied by the firing range) was assessed (Figure 1 and 2).

The Smiths Falls IST Range consists of one firing range oriented in a northeast-southwest direction. Bullets are fired southwest towards an end berm (Figure 2). A monitoring well was previously installed and exists in front of the end berm. A pond is located east of the end berm. A provincially significant wetland exists northeast of the OPP firing range operations (Figure 2). s.21(1) s.21(2)(f)

The Site is currently owned by and is used by the OPP as a firing range. Reportedly, the site was originally developed as a gravel pit in the 1960s. It has operated as an active firing range since approximately 1995.

EXP understands that the OPP is seeking to manage the impacts resulting from the historic use of the Site as a firing range, and this evaluation of potential remedial approaches was prepared to support the reduction in liabilities from the presence of the impacts sourced from OPP use. EXP also understands that the OPP intends to eventually decommission the site and will require a management plan until decommissioning occurs.

To assist with this, EXP has prepared this document to outline the remedial options which include: i) active decommissioning of the firing range; ii) managing the firing range in place; or, iii) continuing as status quo.

1.0 Background

In June 2018, EXP conducted a Phase I ESA of the Site with the findings summarized in a report entitled "*Phase I Environmental Site Assessment, Smiths Falls IST Range 1686 County Road #1, Perth, Ontario*", dated September 4, 2018. Based on the findings of the Phase I ESA report, the following potential environmental concerns were identified:

Areas of Potential Environmental Concern (APEC) Number	Areas of Potential Environmental Concern	Media and Potential Contaminants of Concern	Comments
Site			
1	Historical and current use as an active firing range	Soil, Groundwater and Sediment Metals	The Site has operated as an active firing range since approximately 1995. Lead bullets were utilized as ammunition by the OPP since they first occupied the Site. In 2014, the OPP added copper frangible bullets that reportedly do not contain lead. Lead bullets are still occasionally utilized. Previous reports indicated that extensive metals impacts exceeding the then applicable MOE Table 2 Site Condition Standards in various shallow soil samples collected from the berm and floor areas. These metals included lead, antimony, copper, zinc, and arsenic. To date, remediation of the impacted soil has not been completed. Surface water was present adjacent to the Site, along the property boundary to the east.
2	Historical burning of refuse on Site	Soil Polycyclic Aromatic Hydrocarbons (PAHs) and Metals	Previous environmental investigations indicated the presence of 'burn barrels' utilized by the OPP to occasionally burn empty bullet/shell casing boxes. During the Site visit, EXP identified the 'burn barrel' location as indicated in the previous reports. Previous investigations did not asses the burn barrel location.
3	Importation of fill of unknown quality (firing range berms)	Soil Metals, Inorganics and PAH	The Site is located within a portion of the property that was formerly a gravel pit. The berm observed along the southern portion of the firing range during the Site visit appeared to have been constructed from excess sand and gravel material sourced from the Site or property with a top layer of topsoil which was possibly imported. The top of the berm had creosote containing rail ties that were used to support the upper portion of the berm.
Surrounding properties			
None		N/A	N/A

Based on the findings of the Phase I ESA, EXP recommended the following to address the potential or known environmental impacts resulting from the use of the Site by the OPP:

Issues Identified	**Recommendation**	**Rationale**
Historical and current use as an active firing range. Known exceedances of metals in soil. Historical burning of refuse on Site. Potential for fill of unknown quality.	Conduct a Supplemental Phase II ESA consisting of soil, groundwater and sediment sampling and analysis, including delineating soil impacts and install monitoring wells to collect groundwater samples.	To delineate the extent of known soil impacts and to assess groundwater and sediment in order to derive a Remedial Action Plan.

In October 2018, EXP conducted a Phase II ESA of the Site with the findings summarized in a report entitled "*Phase II Environmental Site Assessment, Smiths Falls IST Range 1686 County Road #1, Perth, Ontario*", dated March 20, 2019. Based on the results of the Phase II ESA, soil impacts were identified within the firing range floor and vicinity of the end berm. Soil from the end berm was not sampled during this investigation, however is assumed to be impacted. The majority of the metal exceedances are related to lead and copper and to a lesser extent antimony. The metal impacts are attributed to the property being used as a firing range for approximately 23 years. It is possible that the sediment impact in the pond could be attributed to sloughing of material from the end berm and/or surface water flow or wind-blown soil from the end berm. An overview of the impacts in soil are presented in Figure 3.

Based on the Phase II ESA results, the following summary is provided:

- On October 12th, 2018, the Phase II ESA field work consisting of soil, sediment and groundwater sampling was conducted at the Site by EXP staff.
- The surficial overburden encountered during the soil sampling program consisted of brown medium grained sand below a layer of topsoil. Spent ammunition casings and cartridges were found at surface throughout the fire range area. Bedrock outcropping was observed at the Site. Typical bedrock depth across the Site is approximately 0.3 m to 0.6 m.
- For assessment purposes of soil and groundwater, EXP selected the Ministry of the Environment and Climate Change (MOECC) 2011 Table 1 Site Condition Standards (SCS) for industrial/commercial/community land use with coarse grained soil (Table 1 SCS). For sediment criteria, EXP selected the Table 1 Full Depth Background SCS All Types of Property Use for course textured soil (Table 1 SCS).
- Several soil samples submitted for chemical analysis of metals in the vicinity of the end berm, the firing range near the end berm and the burn area had concentrations exceeding the MOECC (2011) Table 1 SCS most commonly for antimony, copper and lead and less commonly for boron, chromium, selenium, silver, and vanadium.
- A composite soil sample collected from the northeast end of the OPP firing range and closer to the wetland (RFG-5) was found not to be impacted with metals.
- The soil sample submitted for the chemical analysis of PAHs below the rail ties (SA1) exceeded the MOECC (2011) Table 1 SCS for most of the parameters tested. Soil samples submitted from the burn area were non-detect or below the MOECC (2011) Table 1 SCS.
- The results of the toxicity characteristic leachate procedure (TCLP) completed on a composite soil sample collected from the face of the end berm to determine off-site disposal options

indicated the leachate result for lead exceeded the criteria as listed in Schedule 4 of O. Reg. 558. All other concentrations were below Schedule 4 of O. Reg 558. As a result, the soil from the face of the end berm is classified as hazardous waste.

- One sediment sample was collected from a nearby pond to the south (S1) and was submitted for analysis of metals. The sediment sample submitted for the analysis of metals exceeded Table 1 SCS for lead and copper.
- A groundwater sample was collected from an on-site monitoring well (MW1) and submitted for analysis of metals. The results reported no exceedances of the SCS for metals in groundwater.

Based on the above, EXP provided the following options for consideration:

Option 1 – Conduct Delineation Investigation prior to Remediation

Additional soil, sediment and surface water sampling should be completed to delineate the extent of impact. This option involves conducting a delineation investigation prior to remediation to further define the extent of impact. The advantage of this option is that it will allow for a more accurate volume and remedial cost estimate to be developed. The main disadvantage is the additional costs and time commitments associated with completing these tasks.

Option 2 – Conduct Delineation during Remediation

This option involves completing the horizontal and vertical delineation of the metal exceedances during the remedial activities. This could be achieved by using the equipment that is on-site for remediation to collect additional soil samples at the beginning of the remedial works. Sediment and surface water sampling of the adjacent pond could also be done at this time. The advantage of this option is the cost associated with delineation is absorbed into the remediation phase. The disadvantage is that there is more uncertainty associated with remedial costs at the onset of the remediation phase.

Additional lateral and vertical sampling for TCLP analysis should also be completed prior to or during remediation to differentiate areas of hazardous soils and non-hazardous soils. It is anticipated that there will be hazardous soil in the main target area (~ 1 m thick band) of the end berm faces (see Section 2.2 Assumptions). It is also anticipated that the balance of the soil in the end berms beyond the target area, side berms and range floors will be non-hazardous. This additional TCLP sampling will confirm this and could be completed as part of Options 1 or 2.

2.0 Remedial Approach

2.1 Project Objectives

The objective of the remediation approach is to remediate the on-Site impacts to levels below the applicable 2011 MOECC Table 1 SCS for commercial land use. If active remediation is not to proceed currently, the goal is to manage the known impacts.

With respect to active remediation, metal impacts have been identified at the Site in soil and sediment. Groundwater was found not to be impacted and surface water has not been assessed. The sediment impact and surface water require further characterization and confirmation. Consequently, only remedial options for soil have been presented.

2.2 Assumptions

It should be noted that the Site impacts have not been fully delineated and as such, various assumptions have been made for the purposes of this assignment. The end berm faces were not sampled as a part of the Phase II ESA and are assumed to be impacted. The following is a list of assumptions relating to information found in the summary table (enclosed as Table 1):

- It is assumed a Record of Site Condition is not required for the Site;

- Assumed lateral delineation is presented in Figure 3;
- Where vertical delineation has not been achieved, 0.6 m was used to calculate the estimated impacted volume in the range floor and burn barrel sampling location;
- The construction height of the end berm is assumed to be 3.0 m and estimated impacted volumes of each berm include the removal of 0.3 m of soil below grade and 3.0 m into the berm face;
- When converting volume to mass or tonnage, a conversion factor of 2 was applied (i.e., $1m^3 = 2$ tonnes). This is subject to change based on the soil type, density, and moisture content;
- In order to provide a realistic-case scenario, disposal costs are based on the following assumptions:
    - Contractor excavation and haulage cost plus disposal cost of hazardous soil = $650/tonne.
    - Contractor excavation and haulage cost plus disposal cost of non-hazardous soil = $80/tonne.
    - Hazardous soil is limited to a 1 m thick band of soil situated within the centre of both the north east end berm and the south east end berm, extending to the mid-vertical point of the end berm.
    - The balance of soil within the end berm and along the floor of the range are classified as non-hazardous.
- The cost associated with backfilling and reinstating the range floor and berm with clean fill are not included in this discussion; and,
- Any additional impacts identified during a delineation/remediation program are not included.

2.3 Ex-Situ Remediation

The results of the Phase II ESA confirmed the presence of non-hazardous soil in the firing range and end berm and hazardous soil in the end berm. The purpose of the remedial approach would be to excavate and dispose of the known impacts in soil at a licensed receiving facility.

Given the presence of multiple impacts, as well as the presence of both non-hazardous and hazardous soil at the Site, EXP has generated a summary table, which provides a high level summary of the nature of the metals impacts, the exceedance locations, concentrations, depths, magnitude of exceedances, area, volume and tonnage estimates in order to present the OPP with an estimate of the potential remedial costs for this option.

The future excavation and disposal remedial activities involve the removal of the impacted soil from the range floor and end berm. As the vertical and lateral extents of the impacted areas on the Site have not been fully delineated, there is some degree of uncertainty with the excavation extents. It should be noted that the final extent of excavation is subject to the field observations and sample results.

To potentially reduce the volume of soil that is considered hazardous, a solidification/stabilization pilot study could be completed on the most impacted soil from the end berm face. The objective of the stabilization/solidification process is to decrease leaching potential of heavy metals from soil by the addition of Portland cement or other similar products. This would involve mixing the impacted soil with Portland cement to bind the metals and limit the leachability of the soil, thus reducing the volume of soil that would be considered hazardous, thereby reducing remedial costs.

2.4 Management in Place

If site remediation does not proceed, the metal impacted soil will remain as a source of potential impact to groundwater and/or surface water through leaching via precipitation. It is recommended that an annual visual assessment of the firing range floor and end berm be undertaken by OPP or a designated

consultant to evaluate their condition and provide maintenance recommendations as required. An annual groundwater monitoring program is also recommended to evaluate potential impact to the groundwater. This would involve sampling and analyses of groundwater from the existing monitoring well. With respect to surface water; spring, summer and fall surface water and sediment monitoring is recommended.

2.5 Status Quo

If the site operations continue as is without remediation, the potential risk as described in Section 2.4 will remain and should be managed as described above. In addition, there is a potential that contaminant load/magnitude will increase with time with continued use of the firing ranges. This will require that Phase I and II ESAs be updated prior to remediation which will also likely result in modifications and/or increases to the remedial cost estimate and/or time.

3.0 Cost Estimate

Based on EXP's experience with projects of this nature EXP has assembled a high-level cost estimate for the completion of the remediation work, which is summarized in the following table:

Table 3.1 – Active Remediation

Item	Description	Unit Rate	Estimated # Units	Cost Estimate
1	**Delineation Program (Before or During Remediation)**	Lump Sum		
2	**Contractor Costs** ***sourced from Table 1 (Appendix A)**	Lump Sum		
3	**Field Staff – Remediation Oversight** Contractor supervision, soil sampling and handling, etc.	$1,000	2 days	
4	**Chemical Analyses- TCLP analysis (1 sample per 150 m^3 of soil)**	$500	5 samples	
5	**Chemical Analyses – Confirmatory Soil Sampling (Metals)** 5 business day turnaround time	$80	17 samples	
6	**Project Management – Soil Removal** Coordination with contractor, field staff and QP, data evaluation, coordination with laboratory, client consultation	Lump Sum		
7	**Remediation Reporting**	Lump Sum		
			SUB-TOTAL	
			CONTINGENCY (25%)	
			TOTAL	
			Optional Feasibility Study	

s.18(1)(c)
s.18(1)(d)
s.18(1)(e)

NOTES:

1. Estimates based on information presented in Table 1 (Appendix B).
2. Assumes contractor can process 500 m^3 of soil per day.

3. As noted on Table 1, soil solidification/stabilization activities could be completed to reduce the volume of soil considered hazardous, thereby reducing remedial costs.
4. An allowance of could be carried to complete a feasibility study for the completion of soil stabilization.
5. Assumed that backfilling of excavation is not required.

It is noted that the unit rates for soil disposal outlined above are estimates only and must be confirmed by a contractor as part of the construction tendering process. It should be noted that estimates provided in this letter are based on limited data, and should be considered an opinion of probable costs required to perform work recommended by EXP. Moreover, EXP is not a professional cost estimator, nor should EXP rendering an opinion of probable costs be considered equivalent to the nature and extent of service a cost estimator or construction contractor would provide.

In the event that active remediation does not proceed, the following should be considered.

s.18(1)(c)
s.18(1)(d)
s.18(1)(e)

Table 3.2 – Management in Place

Item	Description	Cost Estimate
1	**Annual site inspection and monitoring of existing monitoring well**	
2	**Seasonal surface water and sediment monitoring (spring, summer, fall)**	
3	**Placement of impermeable barrier**	

In addition to implementing Table 3.2 while managing the site in place, the following additional costs and efforts will be required to update the site conditions prior to implementing active remediation.

Table 3.3 – Status Quo

Item	Description	Cost Estimate
1	**Update to Phase I/II ESA studies**	
2	**Revaluation of remedial options, assumptions and costs**	
3	**Change in remedial cost**	

4.0 Scheduling

In terms of scheduling, one to two months should be considered if a pilot study is to be completed prior to remediation to further assess the toxicity of the soil.

With respect to active remediation, two to three months should be allocated to factor in tendering, site activities, confirmatory sampling, and reporting.

5.0 Recommendations

Based on the information available to date, EXP recommends that a feasibility study be completed to assess the potential for the completion of soil stabilization at the Site to reduce the volume of soil that would be considered as hazardous. Following the successful feasibility study, suitable contractors should be retained to provide cost estimates for the completion of the remediation activities.

6.0 Closure

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

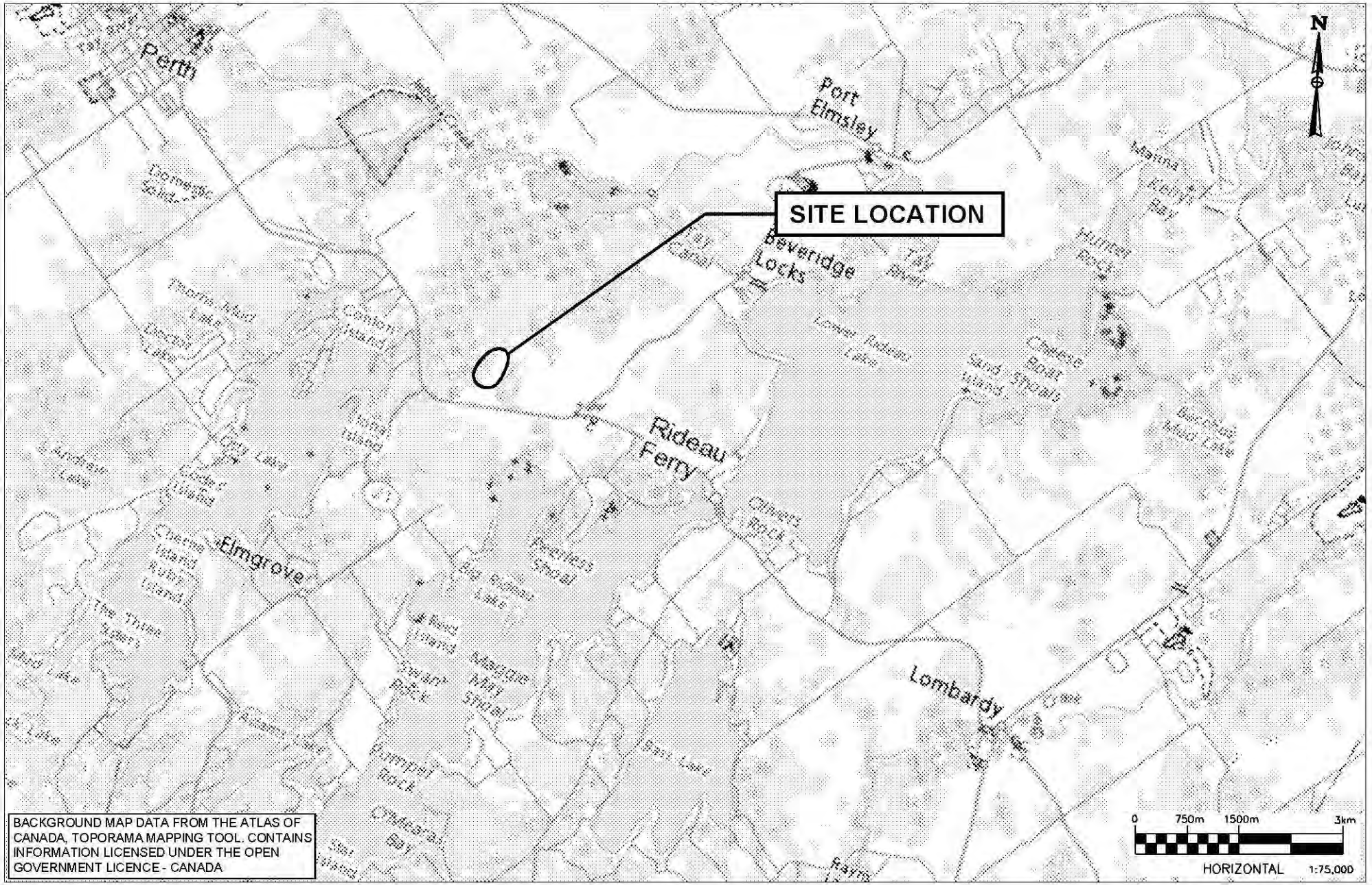
Yours truly,

EXP Services Inc.

Chris Kimmerly, P.Geo.
Manager – Senior Geoscientist
Environmental Services

Rob Helik, P. Eng.
Senior Manager - Brampton
Environmental Services

Appendix A
Figures



BACKGROUND MAP DATA FROM THE ATLAS OF CANADA, TOPORAMA MAPPING TOOL. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - CANADA

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000010

LEGEND:

TITLE AND LOCATION:

SITE LOCATION PLAN
Remedial Options
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 75,000	CK: CK
DATE: MARCH 2019	FIG. NO.: 1

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LEGEND:

MW1 MONITORING WELL

TITLE AND LOCATION:

SITE PLAN
Remedial Options
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN.: JR
SCALE: 1: 750	CK: CK
DATE: MARCH 2019	FIG. NO.: 2

000011

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TITLE AND LOCATION:

ESTIMATED AREA OF IMPACTS
Remedial Options
Smiths Falls IST Range
1686 County Road #1, PERTH, ON

PROJECT NO.: BRM-00244589-A0	DWN: JR
SCALE: 1:400	CK: CK
DATE: MARCH 2019	FIG. NO.: 000012

Appendix B
Tables

Remedial Options Table

[illegible]

Site Area	Contaminant of Concern	MOECC (2011) Table 1 All Types of Property Use SCS (coarse and/or fine)	Maximum Concentration (µg/g)	Number of Exceedances	Total Sample locations	Maximum Depth Investigated (m)	Vertical Delineation Achieved	Maximum Depth of Impacted Soil Sample (m bgs)	Exceedance Magnitude	Estimated Impacted Area (m^2)	Assumed Depth of Soil Impacts (m)	TCLP Results	Assumed Waste Classification for Disposal* * *	Total Estimated Impacted Volume (m^3)	Estimated Volume of HAZ Soils (m^3)	Estimated Tonnage of NON-HAZ Soil	Estimated Tonnage of HAZ Soil	Total Cost Estimate of Hazardous Soil Disposal*	Total Cost Estimate of Non Hazardous Soil Disposal* *
Firing Range																			
Floor	Antimony	1.3	1600	19	30	0.6	No	0.6	1230.8	502.4	0.6	not tested	NON-HAZ	301.4	0.0	602.9	0.0		
	Boron (Total)	36	38	1	30	0.6	Yes	0.05	1.1										
	Chromium (Total)	70	110	2	30	0.6	Yes	0.05	1.6										
	Copper	92	64000	19	30	0.6	No	0.6	695.7										
	Lead	120	3900	19	30	0.6	No	0.6	32.5										
	Selenium	1.5	10	1	30	0.6	No	0.6	6.7										
	Silver	0.5	3.1	1	30	0.6	Yes	0.05	6.2										
	Vanadium	86	93	1	30	0.6	Yes	0.05	1.1										
	Acenaphthene	0.072	0.10	1	3	0.15	No	0.05	1.4										
	Acenaphthylene	0.093	0.72	1	3	0.15	No	0.05	7.7										
	Anthracene	0.16	0.82	1	3	0.15	No	0.05	5.1										
	Benzo(a)anthracene	0.36	2.1	1	3	0.15	No	0.05	5.8										
	Benzo(a)pyrene	0.3	1.8	1	3	0.15	No	0.05	6.0										
	Benzo(b)fluoranthene	0.47	3.6	1	3	0.15	No	0.05	7.7										
	Benzo(ghi)perylene	0.68	1.6	1	3	0.15	No	0.05	2.4										
	Benzo(k)fluoranthene	0.48	1.1	1	3	0.15	No	0.05	2.3										
	Dibenz(a,h)anthracene	0.1	0.53	1	3	0.15	No	0.05	5.3										
	Fluoranthene	0.56	5.6	1	3	0.15	No	0.05	10.0										
	Fluorene	0.12	0.37	1	3	0.15	No	0.05	3.1										
	Indeno(1,2,3-cd)pyrene	0.23	1.7	1	3	0.15	No	0.05	7.4										
	Phenanthrene	0.69	2	1	3	0.15	No	0.05	2.9										
	Pyrene	1	3.8	1	3	0.15	No	0.05	3.8										
Berm	Not Tested - Assumed Impacted	NA	NA	NA	NA	NA	No	Unknown	NA	86.6	3.3	HAZ	PARTIAL HAZ	285.8	19.3	535.0	36.6		
																	SUB-TOTALS		
																	TOTAL		

* - Hazardous Soil Excavation Cost estimated based on a price of

** - Non-Hazardous Soil Excavation Cost estimated based on a price of

*** - To be confirmed at time of remediation/decommissioning of ranges as part of soil management and testing

Rates outlined above are estimates only, subject to change based on Contractor, landfill facilities, and volumes of soil to be managed.

NOTES:

1 Any additional impacts identified during the delineation program (completed either before or as part of the remediation program) are not included above
2 The possibility exists that soil stabilization/management measure be implemented to reduce the volume of soil classified as "hazardous", thereby reducing project costs
3 Pilot programs should be completed to confirm feasibility of soil stabilization
4 Assumes 1 m3 = 2 Tonnes. Actual bulking is subject to nature of soils, and water content at time of disposal.
5 Berm height is assumed as 3 m
6 Measurements are based on aerial photographs and may be subject to change following completion of detailed surveys
7 Volumetric estimates of hazardous and non-hazardous soils are subject to analytical results obtained as part of future remedial programs and soil management measures implemented
8 Estimates outlined herein do not account for any future use of the ranges, including additional of soil, and/or expansion of shooting facilities
9 It is assumed that the hazardous soil within the berms occupies a 1 m band of soil within the center height of the berm, extending to the mid-vertical point of the berm
10 It is assumed that the soil within the floor of the ranges is non-hazardous.

s.18(1)(c)
s.18(1)(d)
s.18(1)(e)

ENGLOBE

December 16, 2022

Ontario Provincial Police
777 Memorial Ave
Orillia, Ontario L3V 7V3

Attention: **Ms. Jennifer Chown**
Facilities Environmental Coordinator

RE: **Soil Remediation Cost Estimate - Rev. A**
Smiths Falls Firing Range at 1688 County Road #1, Perth, ON
OPP Reference #: ENV_D-2223-002

Englobe File No.: 02202823.000

Dear Ms. Chown,

Englobe Corp. ("Englobe") is pleased to present this Soil Remediation Cost Estimate to the Ontario Provincial Police (the "OPP" or "Client") for the Smiths Falls Firing Range, located at 1688 County Road #1 in Perth, Ontario (the "Site").

The Site is a former gravel pit and was used as a firing range by the OPP from approximately 1995 to October 2020. Phase I and II Environmental Site Assessments (ESAs) were completed by EXP Services Inc. (EXP), in 2018 and 2019, respectively, for the area of the Site occupied by the former firing range. Subsequent groundwater, surface water and sediment monitoring programs were conducted by ECOH Management Inc. (ECOH) and EXP between 2018 and 2021. Most recently, a Supplemental Contamination Delineation report was completed by Englobe in November 2022.

Based on the findings of the above-noted reports, the scope of work to complete the soil remediation at the Site is summarized as follows:

1. The project work consists of excavation and off-Site disposal of hazardous (exceeding O. Reg. 347 leachate criteria) and non-hazardous metal contaminated soil, backfilling of the excavated areas, and Site restoration to its pre-construction condition. **It should be noted that lead contaminated soil handling requires special health and safety provisions and all construction activities are to be conducted in accordance with "lead on construction projects" published by Ontario Ministry of Labour, Training, and Skills Development (MOL) dated September 2004 and updated on April 2011 and all other applicable regulations and guidelines, as well as the Environmental Abatement Council of Canada (EACC) Lead Guideline, "For Construction, Renovation, Maintenance or Repair" dated October 2014.**
    a. Contractor to provide required insurance and bonding for project.
    b. Contractor to repair/grade the access road to ensure the accessibility for all construction related vehicle to the Site.
    c. Contractor to confirm location and clearances of all public and private underground and aboveground utility services within and around excavation area, as shown in the attached figures.

ENGLOBE

December 16, 2022

Ontario Provincial Police
777 Memorial Ave
Orillia, Ontario L3V 7V3

Attention: **Ms. Jennifer Chown**
Facilities Environmental Coordinator

RE: **Soil Remediation Cost Estimate - Rev. A**
Smiths Falls Firing Range at 1688 County Road #1, Perth, ON
OPP Reference #: ENV_D-2223-002

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Based on the findings of the above-noted reports, the scope of work to complete the soil remediation at the Site is summarized as follows:

1. The project work consists of excavation and off-Site disposal of hazardous (exceeding O. Reg. 347 leachate criteria) and non-hazardous metal contaminated soil, backfilling of the excavated areas, and Site restoration to its pre-construction condition. **It should be noted that lead contaminated soil handling requires special health and safety provisions and all construction activities are to be conducted in accordance with "lead on construction projects" published by Ontario Ministry of Labour, Training, and Skills Development (MOL) dated September 2004 and updated on April 2011 and all other applicable regulations and guidelines, as well as the Environmental Abatement Council of Canada (EACC) Lead Guideline, "For Construction, Renovation, Maintenance or Repair" dated October 2014.**
    a. Contractor to provide required insurance and bonding for project.
    b. Contractor to repair/grade the access road to ensure the accessibility for all construction related vehicle to the Site.
    c. Contractor to confirm location and clearances of all public and private underground and aboveground utility services within and around excavation area, as shown in the attached figures.

i. Any abandoned underground utility services within the excavation area are to be removed by the Contractor, as approved by the Engineer.

d. Contractor to secure and enclose the Work Area and ensure that adjacent features outside of the Work Area (i.e., wetland and pond adjacent to the Site) are protected from damage for the duration of the work.

e. Surface Water Management - Divert surface runoff from upgradient areas from excavation areas. Pump, haul and dispose of any contaminated water at an off-Site MECP registered facility.

f. Groundwater Management - Pump, haul and dispose of any contaminated groundwater water dewatered from the remedial excavations at an off-site MECP registered facility.

i. Contractor to be responsible for removal and proper disposal of contaminated groundwater and excavation water encountered during soil excavation at a licenced off-Site facility. The quantity may vary based on ambient groundwater conditions at time of the excavation.

ii. Contractor is responsible for the complete setup required for removal of water from the excavation, including installation of excavation sump, pumping of excavation water to on-Site storage tanks and power supply.

iii. Contractor to supply up the storage tanks required for on-Site storage of water pumped from the excavation prior to off-Site disposal.

g. Three (3) existing monitoring wells within the excavation area are to be decommissioned as per Ontario Regulation (O. Reg.) 903 R.R.O. 1990 (as amended).

i. Contractor to protect existing groundwater monitoring wells located outside excavation area, if any.

2. These works include the excavation of non-contaminated soil, temporary stockpiling, backfilling and compaction with clean inert backfill materials, as required.

a. Contractor to excavate, load, transport, and dispose up to approximately 1,700 tonnes of non-hazardous lead contaminated soil exceeding Table 1 Site Condition Standards and approximately 300 tonnes of hazardous lead contaminated soil exceeding O.Reg. 347 leachate criteria.

i. Excavation extents shown on the design drawings and noted herein are approximate and estimates only. Actual excavation extents to be confirmed at time of remediation and approved on Site by the Engineer.

ii. The classification of contaminated soils on Site as non-hazardous shall be confirmed by the Engineer, by completing a toxicity characteristic leaching procedure (TCLP) analysis in accordance with O. Reg. 347, Schedule 4 (as amended).

iii. Costs associated with confirmatory soil sampling and laboratory analysis for the remedial excavation, to confirm that all contaminated soils have been excavated and to determine the final limits of the excavation, will be the responsibility of the Engineer.

1. Contractor to assist Engineer to collect confirmatory soil samples from the walls and floor of the excavation (equipment and labour), at no extra cost to the Client.
2. Confirmatory laboratory test results are anticipated to be available within standard laboratory turn-around times of 72 hours from submission of the samples to the laboratory.

iv. Contractor to remove obstructions, ice and snow, from surfaces to be excavated within limits indicated, should conditions exist later on in the season, at no extra cost to owner.

b. All excavated areas to be backfilled and compacted with approved backfill materials. Approved backfill materials include: OPSS.MUNI 1010 Select Subgrade Material (SSM). Compact all backfilled native, non-contaminated soil and SSM to 95% Standard Proctor Maximum Dry Density (SPMDD).
c. Contractor to clean wash trucks transporting soils off Site, prior to the trucks leaving the Site.

3. Final Site restoration to include grading to match the surroundings of the Site.

Please refer to the preamble of our cost report for all exclusions, assumptions, and information pertaining to the estimate on the next page.

We trust our work will assist in the decision making process and look forward to our continued involvement in this project.

Sincerely,

Salim Eid, P.Eng.
Team Lead, Instrumentation & Monitoring
SouthEast, ON

Attachments:
Drawing 0: Cover Page
Drawing 1: Existing Site Condition Plan
Drawing 2: Existing Soil Contamination Location Plan
Drawing 3: Remedial Excavation - Floor Areas
Drawing 4: Remedial Excavation - End Berm

ESTIMATE SCOPE CLARIFICATIONS

List of Exclusions

1. Harmonized Sales Tax (HST);
2. Premium time/ after-hours work;
3. Accelerated construction schedule; and
4. Premium for construction management or alternate approaches to procurement.

List of Assumptions

- Based on the available information, we have estimated quantities, where possible, and applied typical unit rates for each of the specific elements based on historical cost data for this type of project. Our estimate is developed based on the reports, as noted above, and historical project experience;
- This estimate is meant to reflect the fair market value for this remediation project; it is not intended to be the prediction of the lowest bid and should be representative of the median bid amount received;
- Unit rates in all estimates combine the material, labour, and equipment components for a single unit cost for ease of presentation; and
- Costs were based on 2022 construction rates.

DETAILED BREAKDOWN COST ESTIMATE - REV. A
OPP Smiths Falls Fire Range
Soil Remediation Cost Estimate - Assumption that Soil is Mixed Non-Hazardous Material and Hazardous Material
1688 County Road #1, Perth, Ontario

No.	Work Activity	Qty.	Unit	Unit Rate	Estimated Costs
1.0 Mobilization and Demobilization					
1.1	Pre-construction, post-construction documentation submission, including plans and permits.	1	LS		
1.2	Site set up/mobilization/demobilization, including construction fencing, staging area, etc.	1	LS		
1.3	Access road repair and maintenance during remedial construction	1	LS		
1.4	Locate underground and above ground utilities in construction area	1	LS		
				Activity 1.0 Subtotal	
2.0 Remedial Excavation					
2.1	Excavate and dispose of contaminated soil off-Site, at an MECP-licensed facility, as NON-HAZARDOUS MATERIAL	1,700	Tonne*		
2.2	Excavate and dispose of contaminated soil off-Site, at an MECP-licensed facility, as HAZARDOUS MATERIAL	300	Tonne*		
2.3	Decommissioning of monitoring wells within the area of excavation	1	LS		
2.4	Removal and off-Site disposal of rail ties and burn barrels	1	LS		
				Activity 3.0 Subtotal	
3.0 Excavation Backfilling					
3.1	Import, place and compact clean backfill material (i.e., SSM, as per OPSS.MUNI 1010)	2,100	Tonne*		
				Activity 3.0 Subtotal	
4.0 Construction Dewatering					
4.1	Construction dewatering / diversion in Downgradient Area, including equipment setup, water transportation and off-Site disposal	1	LS		
				Activity 4.0 Subtotal	
5.0 Site Restoration					
5.1	Site restoration, cleanup and sodding (if required)	1	LS		
				Activity 5.0 Subtotal	
				Subtotal of Construction Phase (excl. HST)	
				Contractor Project Management (5%)	
				Project Contingency (15%)	
				Total, including Contingency (excl. HST)	

Assumptions:

* It is assumed that 1 m^3 is equal to 2 tonnes.

List of Exclusions:

Harmonized Sales Tax (HST); and
Premium time / after-hours work

s.18(1)(c)
s.18(1)(d)
s.18(1)(e)

ENGLOBE

Note

Legend

Ontario Provincial Police

1686 County Road 1, Perth, ON

Smiths Falls Firing Range
Soil Remediation Design Drawings

Existing Site Condition Plan

A.B.	As shown
K.M.	November 2022
S.E.	02202023.000
1	DRAFT

TECHNICAL MEMORANDUM

DATE December 21, 2022

22566105

TO Mr. Brady McGlade
Township of Drummond/North Elmsley

FROM Joe Tomaselli

EMAIL joe.tomaselli@wsp.com

REVIEW OF THE NOISE STUDY PREPARED BY BT ENGINEERING FOR THE GUN RANGE LOCATED AT 1688 RIDEAU FERRY ROAD, DRUMMOND, ONTARIO

EXECUTIVE SUMMARY

The Township of Drummond/North Elmsley (the Township) retained Golder Associates Ltd., a member of WSP, (WSP Golder) to conduct a peer review of a noise study, dated July 13, 2022, prepared by BT Engineering for the gun range located at 1688 Rideau Ferry Road, Drummond, Ontario (the Site)..

The approach of the peer review consisted of;

1) reviewing the methodology of the assessments;

2) reviewing proposed mitigation measures;

3) providing comments and findings on any identified shortcomings and implications; and

4) confirming sufficient work has been conducted and proper protocols have been used.

WSP Golder's review was limited to the completeness of the methodology/findings/recommendations and use of applicable standards/guidelines. WSP Golder's review did not include verifying or reproducing any of the prediction modelling or supporting calculations (if applicable).

WSP Golder agrees with the use of the Ontario Ministry of the Environment, Conservation and Park's (MECP)'s Noise Pollution Control (NPC) Document (NPC-300) and the classification of the areas associated with the Point(s) of Reception. However, it is recommended that further clarification / assessment be completed to meet the typical requirements set out by the MECP, and a detailed noise review be completed to verify appropriate noise control measures have been incorporated into the design of the Site and associated Site activities.

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INTRODUCTION

Golder Associates Ltd., a member or WSP (WSP Golder) was retained by the Township of Drummond/North Elmsley (the Township) to prepare a peer review of a noise study, dated July 13, 2022, prepared by BT Engineering for the gun range located at 1688 Rideau Ferry Road, Drummond, Ontario (the Site). The document reviewed was limited to the following:

1) 'Site Entrance and Noise Reviews, 1688 Rideau Ferry Road'. BT Engineering dated July 13, 2022 (NR).

The document described above was reviewed by WSP Golder to answer the following questions:

- Are the methodologies used in the investigation sound and are the findings supportable and in compliance with the Ministry of the Environment, Conservation and Parks (MECP) Noise Pollution Control (NCP) 300?
- Are there any serious shortcomings with the investigations that were undertaken, and the findings contained in the NR? If so, what are the shortcomings and the rationale of the shortcomings?
- Will the proposed mitigation measures (if applicable) adequately address the potential noise impacts and/or are there additional mitigation measures that need to be considered and/or incorporated into the design of the Site?
- Has sufficient work been conducted to provide assurance that all sources of noise emissions have been identified and investigated, proper protocols have been used, and sufficient information has been collected to support the conclusions of the study?

The following sections provide a summary of WSP Golder's responses to the questions above. WSP Golder's review was limited to the completeness of the methodology/findings/recommendations and use of applicable standards/guidelines. WSP Golder's review did not include verifying or reproducing any of the prediction modelling or supporting calculations (if applicable).

GENERAL

The NR indicates that the noise levels associated with the Site activities at off-site Point(s) of Reception (POR(s)) are similar to the ambient environment.

Noise Review

The NR was provided by the Township to WSP Golder to be peer reviewed with respect to noise and is further discussed below. No other noise documents or those supporting the NR were provided.

Methodology

WSP Golder is in general agreement with the scope of the NR where the intent was to assess the potential noise impact of Site operations on off-site POR(s) in the vicinity of the Site. However, as discussed below, a more detailed study of the potential noise impacts at off-site POR(s) should be prepared.

Key aspects of the methodology that WSP Golder generally agrees with include:

- The assessment of Site against Ontario Ministry of the Environment, Conservation and Parks (MECP) requirements.
- The use of the MECP's Noise Pollution Control (NPC) Guideline 300 (NPC-300) as the guideline for the assessment of the Site's potential noise impacts.
- The classification of the Site and surrounding area as a 'Rural Area' (i.e., Class 3 – Rural).
- The applicable noise limit would be 45 dBA. This would be the applicable noise limit during the daytime period (i.e., 07:00 – 19:00) but the applicable noise limit would be 40 dBA during the evening (i.e., 19:00-23:00) and nighttime (i.e., 23:00-07:00) periods.

Impacts and Exceedances

The following are WSP Golder's primary findings regarding the NR with respect to potential noise impacts.

- The NR states the applicable noise limit during the daytime period is 45 dBA however, the expected noise impacts at the nearest residential dwelling (i.e., POR) due to Site activities would be approximately 45-50 dBA. Therefore, it is expected the Site would exceed the applicable noise limit. With the expected levels exceeding the applicable noise limits, it is not clear how BT Engineering has shown that Site activities would comply with applicable MECP limits.

It is WSP Golder's experience that gun ranges and the noise impacts associated with gun ranges can be a polarizing subject for land-use planning. Within NPC-300, the MECP provides recommended noise limits for facilities and associated site activities at off-site POR(s). However, the MECP recognizes meeting the recommended noise limits does not eliminate the potential for noise complaints. Sites with the potential to be a source of nuisance complaints should be planned properly to reduce the potential for noise complaints.

Mitigation Proposed

The following are WSP Golder's primary findings regarding the NR with respect to proposed mitigation.

- The recommendations to limit Site activities to daylight hours, would be prudent, but the NR references a recommended restriction between 11:00 pm (23:00) and 07:00 the next day. In accordance with NPC-300, if Site activities were to continue past 19:00, the Site activities would need to be designed to meet the more restrictive 40 dBA noise limit.
- Maintain the activities to a small scale. This is a prudent qualitative recommendation.
- Maintain the 'soft' ground cover in the lands between the Site and identified PORs. This is a prudent recommendation, but from a review of the NR, it is not clear who owns the lands between the Site and the PORs. It would not be practical or appropriate to make this a requirement if the Site owners do own or have control of the intervening lands between the Site and the PORs.

Identified Shortcomings and Implications

WSP Golder's peer review of the NR resulted in the identification the following shortcoming and the need for further assessment / clarification or discussion on key areas:

- The assessment of the noise impacts of Site operations onto off-site PORs considered 1-hour A-weighted average sound levels as the compliance descriptor. However, based on WSP Golder experience with similar sites/activities, it is expected the Site activities could result in an impulsive sound emission characteristic. As per NPC-300, the assessment of compliance of Site activities should be through the use of the Logarithmic Mean Impulse Sound Level (L_{LM}) descriptor. The applicable compliance noise level limit is directly tied to the expected number of impulsive events in a given hour.
- The assessment and associated findings of the NR was based on a measurement program at two locations. It is understood one monitoring location was within 15 meters (m) of the gun range centroid, and one location was representative of the off-site PORs. While a noise measurement program could be useful to assess potential noise impacts from site activities, it would need to be representative of 'predictable worst-case conditions' as per the requirements of NPC-300. Based on WSP Golder's experience with similar sites, a noise monitoring program could be useful to help verify the accuracy of a site-specific noise model that should be developed to assess the potential noise impacts of Site activities at offsite PORs under predictable worst-case conditions.
- The site-specific noise model should consider 'the Predictable Worst-case Conditions' and be setup meeting MECP configuration requirements. The site-specific noise model should consider:
  - The maximum number of impulses in a given hour;
  - The maximum quantity of firearms being used concurrently;
  - The type of firearm used;
  - The calibre and grains of powder per round;
  - The directional nature of the firearm used;
  - The activity (i.e., trap versus target);
  - The consideration of all noise sources on site. Both; steady state and impulsive sources; and
  - Consider various seasons the range could be operational (i.e., ground cover and existence or non-existence of foliage).
- The NR identified a single existing POR located to the southwest of the Site as being the representative POR. With the directional nature of the firearms and range in general, noise levels should be considered for representative PORs in all cardinal directions of the Site.
- In accordance with NPC-300, the noise assessment should also consider vacant lands that are zoned for sensitive land.

Proposed Recommendations and Actions

The following are WSP Golder's proposed recommendations and actions based on the primary findings from the review of the NR.

- Golder recommends that a site-specific noise model be development that assesses the predictable worst-case conditions and considers the items above.
- The use of 1-hour A-weighted average noise levels and L_{LM} as descriptors for the assessment of compliance, as applicable.
- The consideration of existing and potential (i.e., vacant lots) PORs in all directions of the Site.

CONCLUSION

Golder Associates Ltd., a member of WSP (WSP Golder) was retained by the Township of Drummond/North Elmsley (the Township) to conduct a peer review of a noise study, dated July 13, 2022, prepared by BT Engineering for the gun range located at 1688 Rideau Ferry Road, Drummond, Ontario (the Site)..

WSP Golder has reviewed the BT Engineering Noise Review Study (NR). Overall, WSP Golder agrees with the scope of the NR study; however, have identified shortcomings in the NR.

It is recommended that further assessment be completed meeting the Ontario Ministry of the Environment, Conservation and Parks (MECP) requirements considering the items discussed above.

Based on this review, WSP Golder does not currently come to the same conclusion that the Site can operate in compliance with applicable noise limits. Further assessment is required before WSP Golder can find that the Site is expected to be able to operate in compliance with applicable noise limits and not be a potential source of nuisance noise complaints.

LIMITATIONS

As indicated in the report, this peer review was based on the material provided by the Township of Drummond/North Elmsley, including the NR. WSP Golder has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

WSP Golder's review was limited to the completeness of the methodology/findings/recommendations and use of applicable standards/guidelines. WSP Golder's review did not include verifying or reproducing any of the prediction modelling or supporting calculations. Physical sampling and/or measurement of atmospheric emissions was not completed as part of the scope of work.

This report was prepared for the exclusive use of the Township of Drummond/North Elmsley. Persons other than the Township of Drummond/North Elmsley using this report or observations, or conclusions stated within, may do so at their own discretion.

Golder Associates Ltd.

Tim Gully, B.A., AMIOA(D)
Acoustics, Noise and Vibration Specialist

Joe Tomaselli, M.Eng., P.Eng.
Senior Acoustics, Noise and Vibration Engineer

TG/JT/ng

https://golderassociates.sharepoint.com/sites/168723/project files/6 deliverables/peer review/22566105-tm-rev0 drummond noise peer review 1688 rideau ferry rd 21dec2022.docx