EB - Nov 11, 2016

CSPW.19.021
Attachment 3
Part 2

The Blue Mountains
Recreation at its Peak!
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TOWN OF THE BLUE MOUNTAINS
CLASS ENVIRONMENTAL ASSESSMENT FOR
LEACHATE MANAGEMENT AT THE BLUE MOUNTAINS LANDFILL

NOTICE OF PUBLIC OPEN HOUSE

6-460-5001-62125

THE PROJECT:

Town of The Blue Mountains initiated a Class Environmental Assessment (Class EA) process in August 2016 to consider options associated with the management of leachate at The Blue Mountains Landfill site (see key plan). Currently, leachate is collected within lined portions of the landfill site and then trucked to the Town's wastewater treatment facility for treatment and disposal. A range of alternatives are being considered to address long term management of the leachate including, but not necessarily limited to, i) on site treatment and disposal of the leachate, ii) conveyance of the leachate to an existing sanitary collection and treatment system, and iii) continued use of trucking to dispose of the leachate. The study is also considering opportunities to partner wastewater servicing with adjacent commercial/industrial operations for each of the alternatives being considered.

THE ENVIRONMENTAL SCREENING PROCESS:

The planning for this project is following the planning process established for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, Aboriginal communities, stakeholders and review agencies.

PUBLIC INVOLVEMENT:

Public consultation is a key component of this study. A **Public Information Centre** has therefore been scheduled to advise residents and project stakeholders about the project and to receive input from interested parties on the alternatives being considered in regards to the treatment of leachate at the landfill site. Details of the Public Information Centre are as follows

Date:	**Thursday November 24, 2016**
Time:	**6:00 - 8:00 p.m.**
Location:	**Town of The Blue Mountains - Town Hall Atrium** **32 Mill Street, Thornbury**

Following the meeting, input into the Class EA will be accepted until **December 30, 2016.** Comments collected in conjunction with this Class EA Schedule 'B' process will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record. For further information on this project, or to review the MEA Class EA process, please contact the project engineers: B.M. Ross and Associates: 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (Toll Free): (888) 524-2641.
Fax: (519) 524-4403. Kelly Vader, Environmental Planner (e-mail: kvader@bmross.net).

This Notice issued November 11, 2016.
Jeffery Fletcher, Manager of Solid Waste and Environmental Initiatives

Notice of Study Commencement Hidden Lake Road Area, Town of The Blue Mountains Road System, Water and Wastewater Servicing Class Environmental Assessment Study

1-315-1000-62125

The Study

The Town of The Blue Mountains is undertaking a Municipal Class Environmental Assessment (Class EA) to assess alternatives for the road system and the provision of water and wastewater servicing in the area of Hidden Lake Road and the Alta development lands and along Highway 26.

The Study will assess needed improvements to Hidden Lake Road and evaluate options for the establishment of a future road network to provide service to the Alta Phase 2 subdivision.

Options will be assessed for extending the water distribution system to Phase 2 of the Alta development and to improve the existing water distribution system to provide adequate fire protection to existing homes in the area of Hidden Lake Road and the Alta subdivision.

This Study will also update the previous Class EA (2005) assessment of sanitary servicing concepts for the Alta Phase 2 subdivision, and existing homes along Highway 26 from Delphi Point to just west of Fraser Crescent.

The Process

The Study is being carried out in accordance with the planning and design process for a Schedule B project as outlined in the Municipal Engineers Association Municipal Class EA document (October 2000, amended in 2007, 2011 & 2015). During the Class EA, alternative solutions will be evaluated, potential impacts to the environment and the community will be assessed, and mitigating measures will be defined. A Public Information Centre will be held in early 2017 to obtain public and agency input on the alternative solutions. Throughout the Study, project information will be posted on the following webpage: http://thebluemountains.ca/hiddenlakeea.cfm. Upon completion of the Study, a report will be made available for public and agency review and comment.

Comments Invited

Initial comments or input are invited at this time for consideration in the assessment of alternatives. If you have any questions, comments, or input regarding the study or the study area, or wish to be added to the mailing list, please contact:

Jason R. Covey, B.Sc.(Eng.), P.Eng.
Senior Project Engineer
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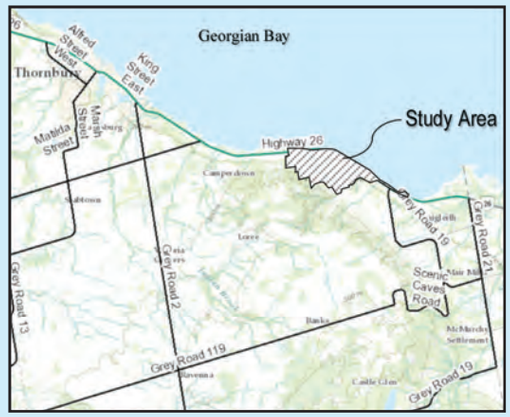
Collingwood, Ontario, L9Y 5A6
Tel: 705-444-2565 Fax: 705-444-2327
Email: jcovey@cctatham.com

Reg Russwurm, P. Eng.
Director of Infrastructure and Public Works
Town of The Blue Mountains
32 Mill Street, P.O. Box 310
Thornbury, Ontario, N0H 2P0
Tel: (519) 599-3131 ext. 260 Fax: (519) 599-7723
Email: rrusswurm@thebluemountains.ca



Future 2016 Council and Committee meetings:.

1-110-1000-62125

- Committee of the Whole, November 14
- Council, November 28, 7:00 p.m.

All meetings are at the Town Hall, 32 Mill Street, unless otherwise indicated. For meeting times please Call 519-599-3131 Extension 232 or check the Town website at www.thebluemountains.ca

Town documents can be made available in other accessible formats where practicable and upon request.

COMMUNITY VISION

The Blue Mountains will be a progressive four season community, building on its agricultural and recreational features, offering a healthy and supportive lifestyle to a diverse range of residents, businesses and visitors.

EB - Nov 18, 2016

The Blue Mountains
Recreation at its Peak!
www.thebluemountains.ca

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TOWN OF THE BLUE MOUNTAINS

CLASS ENVIRONMENTAL ASSESSMENT FOR LEACHATE MANAGEMENT AT THE BLUE MOUNTAINS LANDFILL

NOTICE OF PUBLIC OPEN HOUSE

6-460-5001-62125

THE PROJECT:

Town of The Blue Mountains initiated a Class Environmental Assessment (Class EA) process in August 2016 to consider options associated with the management of leachate at The Blue Mountains Landfill site (see key plan). Currently, leachate is collected within lined portions of the landfill site and then trucked to the Town's wastewater treatment facility for treatment and disposal. A range of alternatives are being considered to address long term management of the leachate including, but not necessarily limited to, i) on site treatment and disposal of the leachate, ii) conveyance of the leachate to an existing sanitary collection and treatment system, and iii) continued use of trucking to dispose of the leachate. The study is also considering opportunities to partner wastewater servicing with adjacent commercial/industrial operations for each of the alternatives being considered.

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Date:	**Thursday November 24, 2016**
Time:	**6:00 - 8:00 p.m.**
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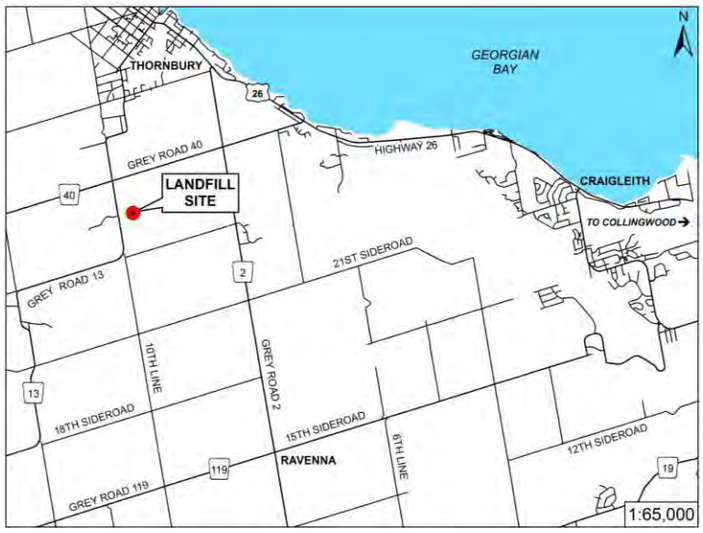

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Jeffery Fletcher, Manager of Solid Waste and Environmental Initiatives

TOWN OF THE BLUE MOUNTAINS

CLASS ENVIRONMENTAL ASSESSMENT

FOR LEACHATE MANAGEMENT AT THE BLUE MOUNTAINS LANDFILL

WELCOME

PUBLIC INFORMATION MEETING

NOVEMBER 24, 2016

TOWN OF THE BLUE MOUNTAINS

BMROSS engineering better communities

BACKGROUND

- **SEPTEMBER 2008** – TWO (2) ENVIRONMENTAL SCREENING PROCESSES INITIATED FOR THE EXPANSION AND MINING OF THE BLUE MOUNTAINS LANDFILL SITE

- **JULY 2012** – ENVIRONMENTAL SCREENING REPORT (ESR) PUBLISHED BY GOLDER ASSOCIATES DOCUMENTING THE RESULTS OF THE STUDY
  - Scenario 2 (Vertical Expansion and Mining of Former Thornbury/Blue Mountains Landfill) Selected as Preferred Alternative
  - Mined Area to be Lined and Leachate Collection System Installed

- **2014 and 2015 –** LANDFILL MINING AND LEACHATE COLLECTION SYSTEM CONSTRUCTED

- **2015/16 –** LANDFILL WASTES DIRECTED TO NEWLY LINED PORTION OF THE LANDFILL

- **SPRING/SUMMER 2016 –** LEACHATE VOLUMES EXCEED VOLUMES ANTICIPATED DURING THE DESIGN PROCESS

- **AUGUST 2016** – CLASS EA TO ADDRESS LEACHATE MANAGEMENT PROCESS INITIATED

SITE PHOTOS

- **LEACHATE COLLECTION CHAMBER** – INSTALLED WITHIN THE LINED PORTION OF THE LANDFILL, LEACHATE IS COLLECTED IN THE CHAMBER AND PROVIDES ACCESS FOR PUMPING AND TRANSPORT

Leachate Collection Chamber

Leachate Transport

- **Lined Landfill Cell –** FORMER THORNBURY LANDFILL THAT WAS MINED AND THEN LINED TO COLLECT LEACHATE

NEXT STEPS

- **COLLECT INPUT –** INPUT WILL BE COLLECTED FROM THE GENERAL PUBLIC, REVIEW AGENCIES, FIRST NATIONS AND ADJACENT PROPERTY OWNERS

- **REVIEW FEEDBACK -** FEEDBACK FROM MEETING WILL BE REVIEWED WITH TOWN WASTE MANAGEMENT STAFF AND ENGINEERS

- **PREFERRED ALTERNATIVE –** A PREFERRED ALTERNATIVE WILL BE SELECTED AND PRESENTED TO MUNICIPAL COUNCIL

- **ADDITIONAL CONSULTATIONS** – ADDITIONAL CONSULTATIONS WILL BE UNDERTAKEN WITH APPROVAL AGENCIES/ ABORIGINAL COMMUNITIES AND AFFECTED PROPERTY OWNERS

- **FINALIZE CLASS EA** – AN ENVIRONMENTAL STUDY REPORT WILL BE COMPILED DOCUMENTING THE CLASS EA PROCESS CONDUCTED

- **IMPLEMENTATION –** WORK WILL MOVE FORWARD ON DETAILED DESIGNS FOR THE PREFERRED ALTERNATIVE WITH CONSTRUCTION SCHEDULED FOR SUMMER OF 2018

CLASS EA STUDY PROCESS (PHASES 1 & 2)

DEFINE PROBLEM OR OPPORTUNITY

↓

IDENTIFY ALTERNATIVE SOLUTIONS

↓

INVENTORY THE ENVIRONMENTAL SETTING

↓

IDENTIFY IMPACT OF ALTERNATIVE SOLUTIONS AND MITIGATING MEASURES

↓

CONSULT WITH PUBLIC AND REVIEW AGENCIES TO IDENTIFY ISSUES OF CONCERN

← **WHERE WE ARE TODAY**

↓

EVALUATE ALTERNATIVE SOLUTIONS

↓

DOCUMENT STUDY FINDINGS AND PRESENT EVALUATIONS TO COUNCIL

↓

SELECT PREFERRED ALTERNATIVE

↓

PREPARE PROJECT FILE AND PUBLISH NOTICE OF COMPLETION

↓

ADDRESS OUTSTANDING CONCERNS

↓

FINALIZE PROJECT FILE AND PROCEED TO DESIGN PHASE

CLASS EA INVESTIGATION

STUDY PURPOSE:

- TO IDENTIFY REASONABLE ALTERNATIVES TO ADDRESS MANAGEMENT OF LEACHATE COLLECTED AT THE BLUE MOUNTAINS LANDFILL SITE;
- EVALUATE VARIOUS ROUTING ALTERNATIVES TO PUMP LEACHATE TO EXISTING SANITARY COLLECTION SYSTEM SERVING COMMUNITY OF THORNBURY;
- CONSULT WITH POTENTIALLY AFFECTED PROPERTY OWNERS LOCATED ALONG THE ROUTE ALTERNATIVES.
- DEFINE ANY POTENTIAL IMPACTS WITH THE PROPOSED ALTERNATIVES AND EVALUATE MEASURES TO MITIGATE ANY IDENTIFIED CONCERNS; AND
- SELECT A PREFERRED ALTERNATIVE (INCLUDING DEFINING ANY REQUIRED MITIGATION).

CLASS EA ALTERNATIVES:

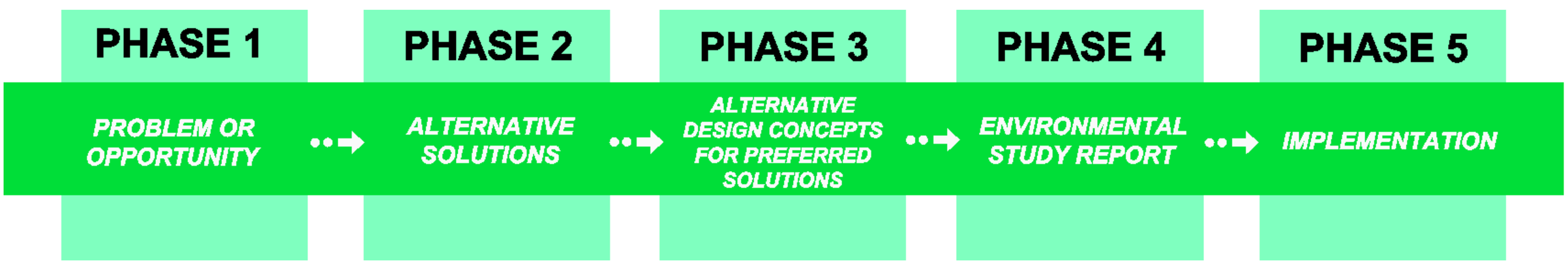
1) ON-SITE TREATMENT AND DISPOSAL OF LEACHATE
2) ON-SITE COLLECTION AND OFF-SITE DISPOSAL OF LEACHATE TO INDIAN BROOK
3) PUMP LEACHATE VIA FORCEMAIN TO EXISTING SANITARY COLLECTION SYSTEM IN THORNBURY
4) DO NOTHING – CONTINUE TO TRUCK LEACHATE

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

SUMMARY OF CLASS EA PROCESS:

- PLANNING AND DESIGN PROCESS FOR MUNICIPAL WATER, WASTEWATER, AND ROAD PROJECTS
- CONDUCTED TO EVALUATE THE POTENTIAL IMPACTS OF THE PROJECT ON THE NATURAL, CULTURAL, SOCIAL, ECONOMIC, AND BUILT ENVIRONMENTS

STUDY PHASES:

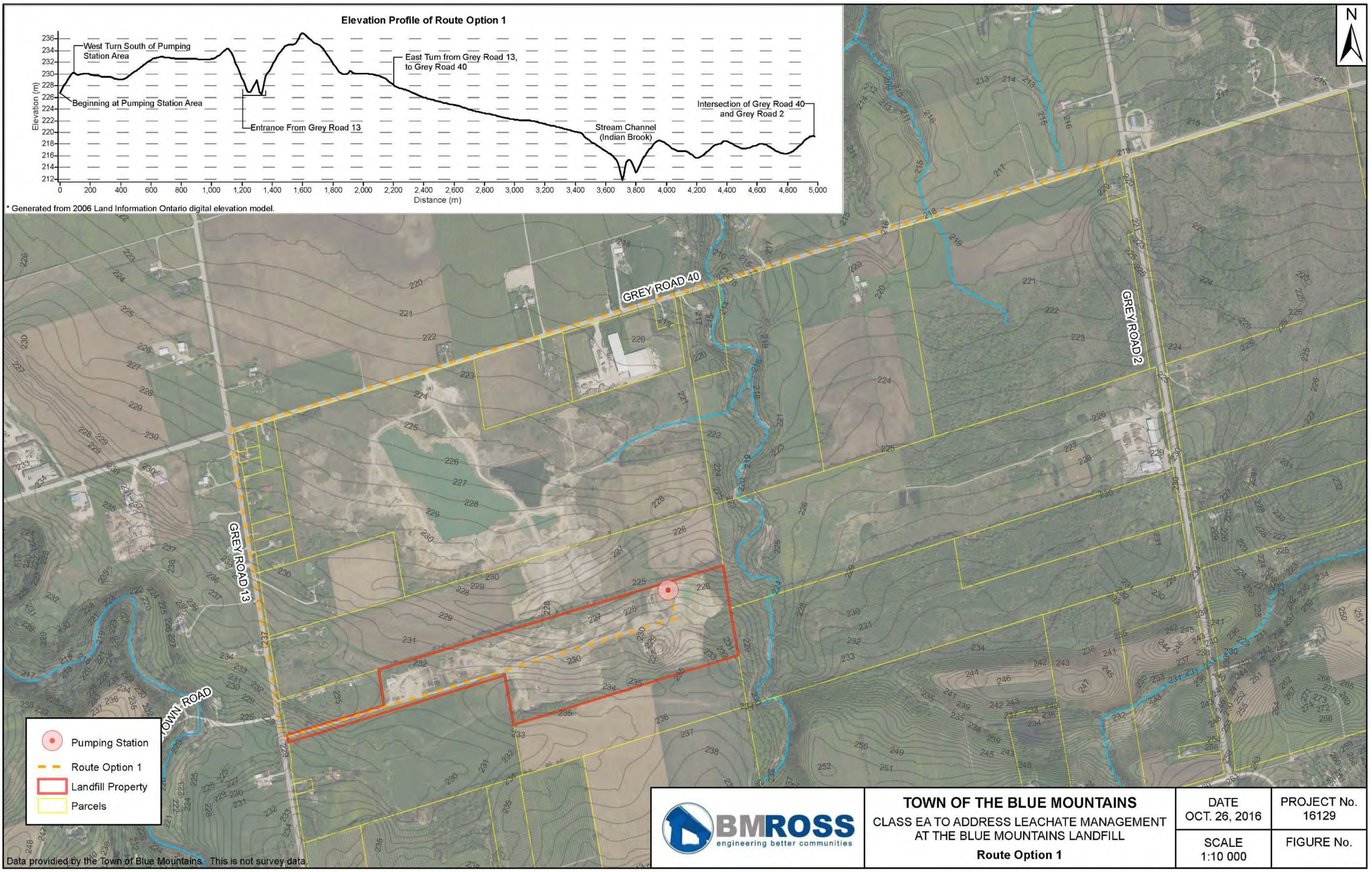


SCOPE OF THIS STUDY:

- ESTABLISH EXTEND OR ENLARGE A SEWAGE COLLECTION SYSTEM AND ALL WORKS NECESSARY TO CONNECT THE SYSTEM TO AN EXISTING SEWAGE OUTLET WHERE SUCH FACILTIES ARE NOT IN AN EXISTING ROAD ALLOWANCE OR AN EXISTING UTILITY CORRIDOR.
  - SCHEDULE B PROJECTS APPROVED SUBJECT TO COMPLETION OF PHASES 1 AND 2 OF THE CLASS EA PROCESS
- GENERAL STUDY COMPONENTS:
  - DEFINE PROBLEM / OPPORTUNITY;
  - IDENTIFICATION OF ALTERNATIVE SOLUTIONS;
  - CONSULTATION WITH THE PUBLIC / REVIEW AGENCIES;
  - SELECTION OF A PREFERRED ALTERNATIVE;
  - EVALUATION OF ALTERNATIVES / IMPACT MITIGATION;
  - PREPARATION OF ENVIRONMENTAL SCREENING REPORT ; AND
  - FINAL PUBLIC NOTIFICATION.

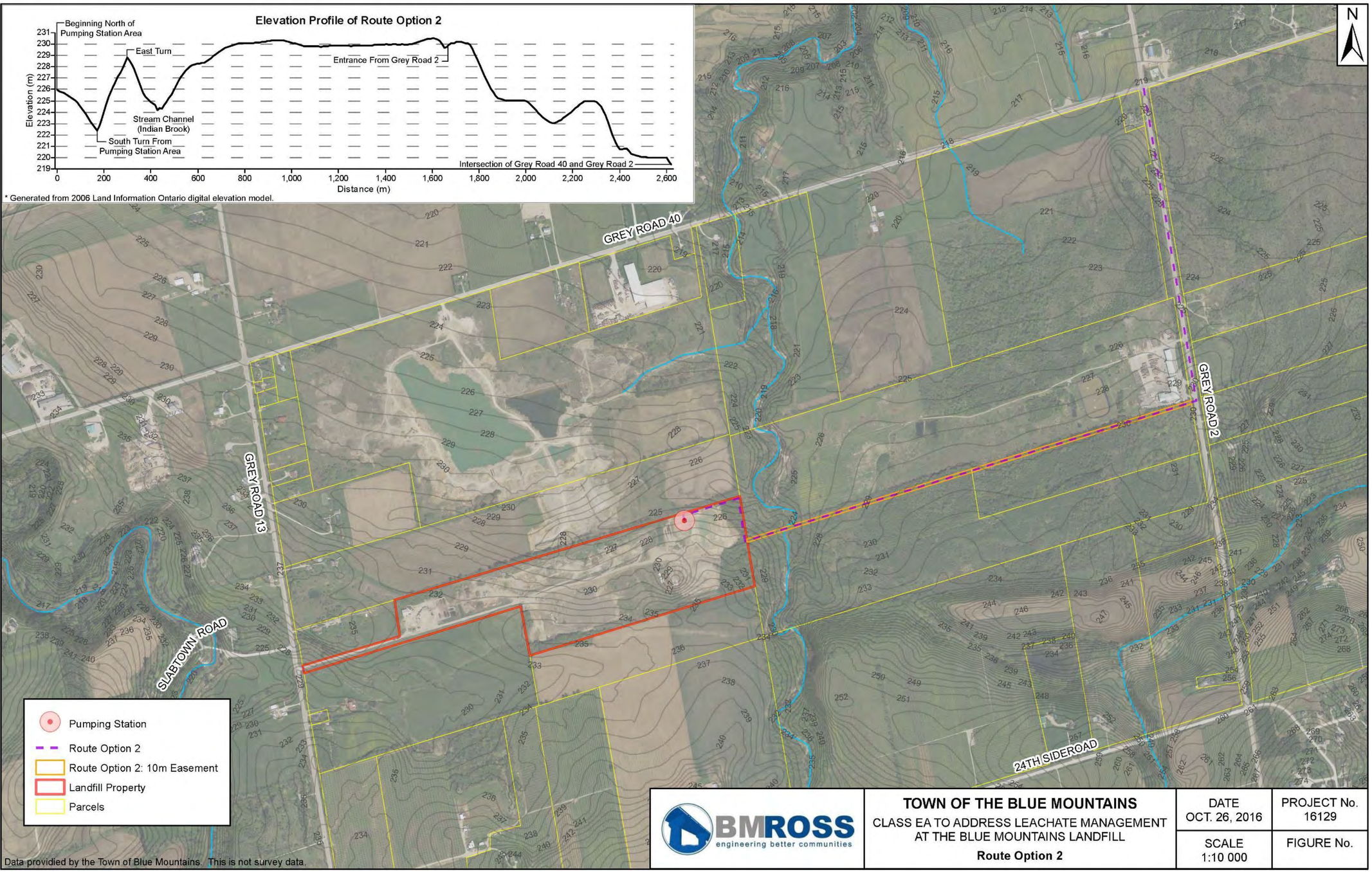
AERIAL PHOTOGRAPHY OF BLUE MOUNTAINS LANDFILL (2015)

Forcemain Route Alternatives – Route 1



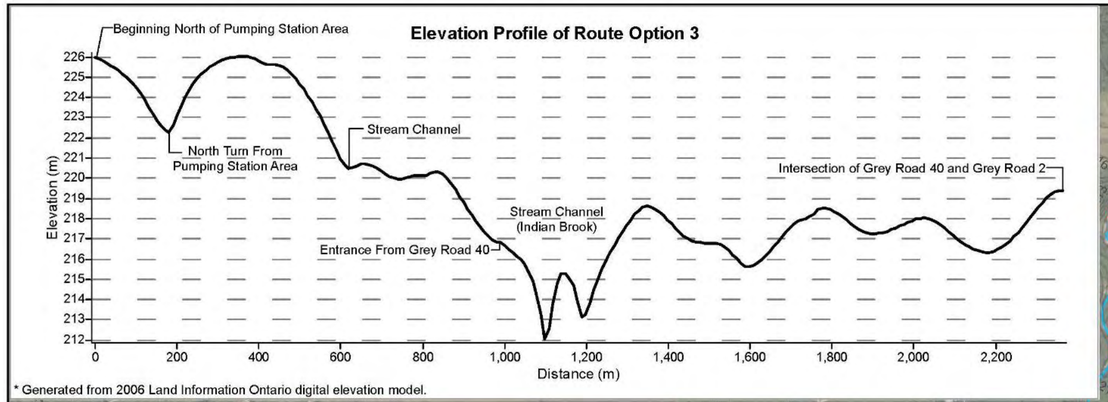
- Longest Route
- Fewer Impacts to Natural Features
- More Properties Along Route Potentially Impacted by Construction

Forcemain Route Alternatives – Route 2



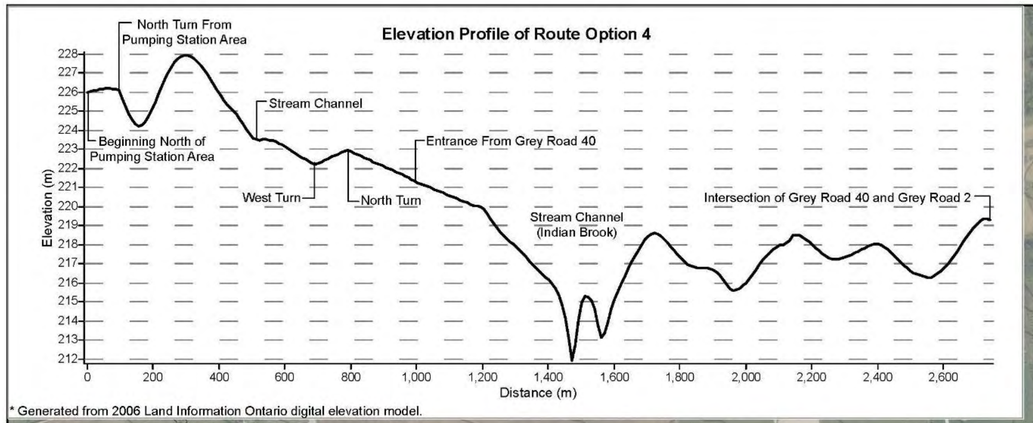
- Shorter Route
- Greater Impacts to Natural Features due to Indian Brook Crossing
- Fewest Properties Affected
- Easement required over Private Lands

Forcemain Route Alternatives – Route 3



- Shortest Route
- Some Impacts to Natural Features
- Fewer Impacts To Properties
- Easement required over Private Lands

Forcemain Route Alternatives – Route 4



* Generated from 2006 Land Information Ontario digital elevation model.

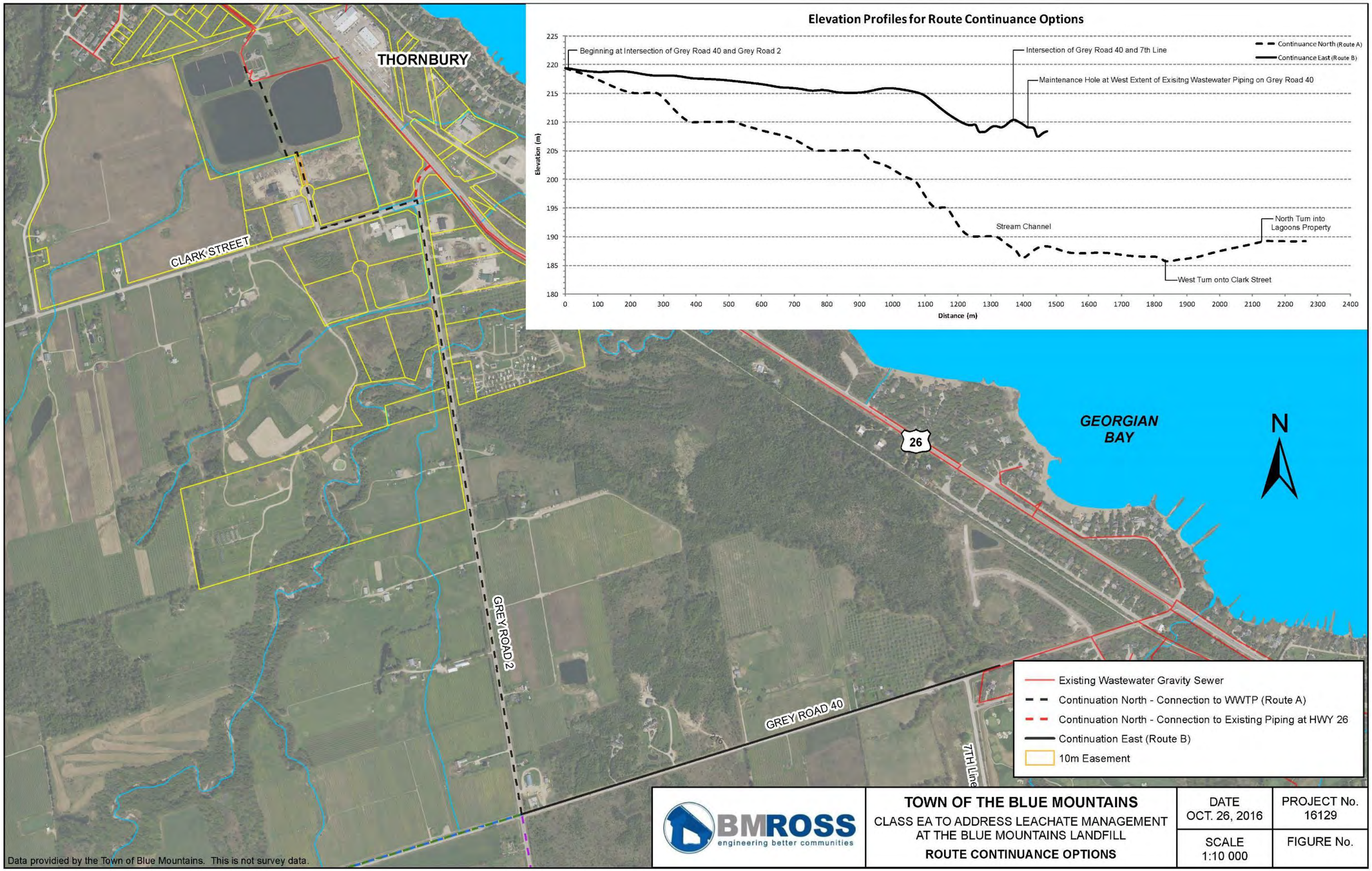
BMROSS engineering better communities

TOWN OF THE BLUE MOUNTAINS
CLASS EA TO ADDRESS LEACHATE MANAGEMENT AT THE BLUE MOUNTAINS LANDFILL
Route Option 4

DATE	PROJECT No.
OCT. 26, 2016	16129
SCALE	FIGURE No.
1:10 000	

- Shorter Route
- Some Impacts to Natural Features
- Greater Impacts To Private Properties
- Easement required over Private Lands

Forcemain Route Continuance Options A & B



Route A North

- Longest Route
- Greater Impact to Natural Features
- More Properties Affected

Route B East

- Shortest Route
- Fewer Impacts to Natural Features
- Fewer Properties Impact
- Higher Connection Fees

Preliminary Evaluation of Alternatives*

Alternative	Description	Social	Cultural	Economic	Natural	Technical	Results
I	Do Nothing- Truck Leachate						Least Preferred
II	On-Site Treatment & Infiltration						Least Preferred
III	On-Site Treatment, Discharge to Indian Brook						Least Preferred
IV	Pump to Plant Route #1A						Somewhat Preferred
V	Pump to Plant Route #1B						Moderately Preferred
V	Pump to Plant Route #2A						Somewhat Preferred
VI	Pump to Plant Route #2B						Somewhat Preferred
VII	Pump to Plant Route #3A						Somewhat Preferred
VIII	Pump to Plant Route #3B						Moderately Preferred
IX	Pump to Plant Route #4A						Somewhat Preferred
X	Pump to Plant Route #4B						Moderately Preferred

* Scoring: Most Preferred Moderately Preferred Somewhat Preferred

Least Preferred Not Preferred

File: 16129

TOWN OF THE BLUE MOUNTAINS

CLASS EA FOR LEACHATE MANAGEMENT

PUBLIC INFORMATION CENTRE

Thursday, November 24, 2016

COMMENTS

Name: _____

Address: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

PLEASE HAND IN, MAIL, EMAIL, OR FAX TO:

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street
Goderich, Ontario
N7A 2T4

Phone: (519) 524-2641 Fax: (519) 524-4403
E-mail: kvader@bmross.net
Attention: Kelly Vader, Environmental Planner

Comments and Information collected by B.M. Ross & Associates Limited on behalf of the Town of the Blue Mountains will assist in decision making pertaining to the project. Comments and opinions will be kept on file but will not be made available for public review. Under the Freedom of Information and Protection Act (1987) personal information provided to the Town of the Blue Mountains will remain confidential unless prior consent is obtained.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 16129

TOWN OF THE BLUE MOUNTAINS
CLASS EA FOR LEACHATE MANAGMENT

NOTES FROM THE STAKEHOLDER MEETING AND THE PUBLIC INFORMATION CENTRE

Details:

November 24, 2016
Beaver Valley Community Centre, Thornbury
Stakeholder Meeting: 3:00 p.m. – 5:00 p.m.

November 24, 2016
Town Administration Building Lobby, Thornbury
Public Open House: 6:00 p.m. – 8:00 p.m.

In Attendance:

Jeffery Fletcher, Town of the Blue Mountains (Town)

Andrew Garland, B. M. Ross and Associates Limited (BMROSS)
Kelly Vader, BMROSS

Stakeholders: 15 ±

1.0 Stakeholder Meeting

A number of display panels were arranged around the perimeter of the room to provide details on key project investigations. The display boards provided information related to the Class Environmental Assessment process, route evaluations associated with the forcemain option, and background information on the landfill operations and previous studies.

A brief presentation was conducted by Kelly Vader from BMROSS, outlining the Class EA process, previous studies completed at the landfill which resulted in leachate being collected within lined portions of the site, which alternatives were being considered to address the long term management of the leachate, and the estimated costs for each.

2.0 Public Open House

Display boards were arranged in the Lobby of the Town's Administration Office to provide details on key project investigations. The display boards provided information related to the Class Environmental Assessment process, route evaluations associated with the forcemain option, and background information on the landfill operations and previous studies.

3.0 Question and Comments

The following comments and/or questions were raised by residents in attendance at the meeting:

Q. Why is the leachate a problem?
A. Jeff Fletcher explained that, since the Former Thornbury Landfill site was mined and lined to collect the leachate, leachate volumes collected have exceeded those estimated during the preliminary design. The Town had always planned to implement a different process to deal with the leachate over the long term, however the higher volumes of leachate accelerated the timing.

Q. What are the next steps in the process?
A. Kelly Vader responded that input will be collected from the public following the Stakeholder Meeting and Open House and a preferred alternative will be selected early in the New Year. Additional information will be provided to the public advising of the preferred alternative. The Class EA will be finalized in the spring and the detailed engineering design will be completed later in 2017 with construction tentatively planned for 2018.

Q. Has the Town picked a preferred alternative?
A. Jeff indicated that a preferred alternative had not yet been selected, however the Town had a preliminary preference for the forcemain option, although a preferred route had yet to be identified.

Q. What potential impacts are there to residents along one of the forcemain routes?
A. Andrew Garland indicated that there would be few impacts to residents during construction. The forcemain would be a relatively small pipe (4") and could be installed by directional drilling. Work on the County Road will occur within the limits of the road allowance. For private property owners directly impacted by one of the forcemain routes, the Town will need to negotiate an easement for the forcemain which will provide compensation for impacts during construction.

Q. Will Indian Brook be negatively impacted by forcemain?
A. Andrew G. responded that contractors are very familiar with the technology used to directionally drill under a watercourse. Given the size of the proposed forcemain pipe, there should be few impacts to the watercourse as a result of the forecemain.

Q. How many trucks have been used to truck the leachate to date?
A. Jeff F. said that there have been approximately 700 trucks needed so far this year to truck the leachate.

Q. Where in the road allowance would the forcemain be located?
A. Andrew G. indicated that the forcemain would be installed below the frost line at a depth of approximately 5 feet most likely somewhere in the ditch line. The Town and BMROSS are consulting with the Grey County Highways Department in order to identify a preferred location for the forcemain which will result in the fewest impacts to existing utilities already located within the road allowance.

Q. Would residents be advised of which alternative is selected?
A. Kelly V. indicated that, once a preferred alternative is selected, residents will sent additional information related to the preferred and giving them an opportunity to provide more comments and feedback before the Class EA process is finalized in the spring.

Q. Are some of the adjacent apple manufacturers being approached to possibly partner with the Town on the proposed forcemain option?
A. Jeff F. indicated that the Town has approached several adjacent landowners to see if there is an interest in partnering with the Town on the forcemain.

4.0 General Comments

The following general comments were made by residents or stakeholders during the meetings:

- The forcemain option seems to make the most sense over the long term rather than trucking the leachate;
- A resident from the area believes that a former road allowance is located near the centre of the farm block which might be able to be used for routing the forcemain;
- General questions regarding the current operations of the landfill and location of the area that was mined;

The Stakeholder Meeting concluded at 5:00 p.m. and the Public Open House concluded at 8:00 p.m.

Meeting Notes Prepared by
B. M. ROSS AND ASSOCIATES LIMITED

Kelly Vader, Environmental Planner

CHIEFS AND COUNCILS
SAUGEEN OJIBWAY NATION

Chippewas of Saugeen, RR 1, Southampton ON N0H 2L0 519-797-2781
Chippewas of Nawash, 135 Lakeshore Blvd, Neyaashiinigmiing ON N0H 2T0 519-534-1689

January 3, 2017

SENT VIA EMAIL

BM Ross and Associates Limited,
Engineers and Planners
62 North Street, Goderich, ON
N7A 2T4

Attention: Kelly Vader

RE: Summary of Saugeen Ojibway Nation (SON) Comments and Concerns for the Town of Blue Mountains Municipal Class Environmental Assessment (EA) Leachate Management at Blue Mountains Landfill Site (Schedule 'B')

Background

The Town of the Blue Mountains engaged BM Ross to undertake the **Town of Blue Mountains Municipal Class Environmental Assessment (Class EA) Leachate Management at Blue Mountains Landfill Site (Schedule 'B') Study**.

In August, 2016, SON received a notification letter from BM Ross, on behalf of the Town of Blue Mountains, for this ongoing Class EA Leachate Management. In the letter, SON was asked to participate in the Environmental Assessment process and provide comments. As well, BM Ross outlined general information about the current practices of the leachate management and alternatives considered for potential improvement of the leachate management at the Blue Mountains Landfill Site.

The current practices of leachate management consist of:

- collection of the leachate within the landfill lined portion; and
- trucking to the Thornbury Water Pollution Control Plant (WPCP) – wastewater treatment facility and provide bio-solid disposal, if needed.

Review Comments

To assist SON with pre-consultation process reviews, comments, and draft liaisons preparation for this Class EA Leachate Management at the Blue Mountains Landfill Site, the preliminary engineering/environmental and planning reviews were undertaken by SON's Class EA Exports on the following scientific/environmental/engineering information associated with this Class EA project:

- Town of Blue Mountains Class EA Leachate Management for Blue Mountains Landfill Site Public Information Meeting presentation dated November 24, 2016;
- Class EA Leachate Management at Blue Mountains Landfill Site, presentation to the Committee of Whole of the Town of Blue Mountains dated November 14, 2016;
- Blue Mountains Landfill Site's Elevation profiles;
- 2014 Annual Water Monitoring Report, the Blue Mountains Solid Waste Disposal Site;
- 2014 Annual Solid Waste Report, the Blue Mountains Solid Waste Disposal Site;
- 2013, 2014 and 2015 Annual performance Reports, Thornbury WPCP and Expansion of Thornbury WPCP; septic/leachate/wastewater treatment practices and the considered co-treatment options of the leachate management;
- Amended Environmental Compliance Approval (ECA) for Blue Mountains Landfill Sited issued by Ministry of Environment and Climate Change (MOE CC); and
- Amended ECA for Thornbury WPCP issued By MOE CC.

Based on the review of all previously-noted information, please see below the SON's **Class EA Leachate Management at Blue Mountains Landfill Site** review comments that were prepared for the meeting with the Town of Blue Mountains and the Town's Consultant-BM Ross representatives, scheduled for January 18, 2017:

In the Consultant presentations for the Class EA for Leachate Management to the Committee of Whole of the Town of Blue Mountains, dated November 14, 2016 and at the Public Information Meeting (PIM) on November 24, 2016, BM Ross outlined in general principals the following major issues:

- *Background Information* review was undertaken, completed and included, but was not limited to, technical/engineering/environmental planning reports and the cost estimation reviews of approximately five (5) major reports associated with the Blue Mountains Landfill Site within a period time of 2008-2015, and in 2016 the consultant proceeded with an initiation of the Class EA for Leachate Management at the Blue Mountains Landfill Site.

- *Problem/Opportunity Statement* was developed and identified, and which identified that due to high rainfall volume and low waste volume, the production of leachate volumes at this landfill site increased more than originally estimated, as well as due to the high cost of leachate trucking to the Town wastewater treatment facility, other options of leachate management to lowering cost of leachate trucking shall be considered and evaluated.

- *Main Objectives* were developed and identified, in accordance with EA process requirements, reasonable (viable) alternatives in order to select a recommended preferred alternative to address leachate management at the Town Landfill Site, as well as to evaluate

various pump routing leachate alternatives and to select a preferred alternative to pump leachate potentially to the existing Town wastewater treatment facility.

- *Class EA Alternatives* (viable reasonable) were developed and the Consultant identified approximately eleven (11) alternatives. Among these alternatives, **five (5)** were identified **as Somewhat Preferred Alternatives.** Each of these include a component of Pump to Plant Routes **(Pump to Plant Routes 1A, 2A, 2B, 3A and 4A)**, which is varied for each of these alternatives by the specific route selection from the pump location at the Blue Mountain Landfill Site to the Town wastewater treatment facility, and the second component common for all these options is a leachate treatment at the Town wastewater treatment facility.

- *Cost Comparison of Class EA Alternatives* was developed as well and included the estimated cost for each of these **five (5) Somewhat Preferred Alternatives in the amount of $2,460,000-$2,756,000**.

- *Recommended Preferred Alternative* has not been outlined in the Consultant presentations

- Further detailed review of this Class EA is required by SON as soon as this information becomes available

SON is concerned that:

- geotechnical, hydrogeological, environmental/natural heritage reports, the 2015 Annual Water Monitoring, and the Solid Waste reports for the Blue Mountains were not forwarded by the Consultant for SON's preliminary technical/engineering/environmental/planning reviews to assess potential impacts of this Class EA Leachate Management project on First Nations' rights and land claims, in order to undertake all required consultation and discussions with SON leadership and to proceed with implementation and monitoring of any agreements which will arise from SON's leadership discussions. **SON is looking for clarity on why these studies were not included in the information received from BM Ross.**

- based on our preliminary review, SON is under an opinion, that in this Class EA Leachate Management a correlation between the wastewater/leachate discharges from the composting facilities into the Stormwater Management Facility (SWF) and potential impacts on the leachate management, as well as on the surface and groundwater specifically under the wet weather conditions at the site at the Blue Mountains Landfill Site and adjacent lands were not addressed.

- in accordance with the site inspection on September 17, 2014, conducted by MOE CC staff and MOE CC's Site Inspection Report that acknowledged that in some site locations **"The landfill has resulted in slight impact to the upper and lower aquifer below the site. Exceedances of the Reasonable Use Criteria (RUC) were noted at several locations surrounding the Landfill for nitrate, manganese and iron" and some locations ammonia.** The surface water quality samples that were collected the Indian Brook upstream and downstream of the landfill are not considered to be impacted by the landfill

operation. However, in accordance with Condition 8(19) of ECA, "By April 15, 2014 and every five years hereafter, the Owner shall hire the services of a specialist to conduct benthic monitoring of the Indian Brook and submit detailed results and analysis to the District Manager for approval. There is some reference that Golder Associates undertook the benthic monitoring in 2013 for the Indian Brook system, however, SON were not able to obtain the report. The 2014 Annual Water Monitoring Report also has no references to the benthic monitoring report conclusions and recommendations. SON is under an opinion, it is extremely important to conduct the benthic monitoring program that represent one of the best method to assess the environmental/ecological health of fishery and aquatic life in correlation of ensuring the required water quality of the Indian Brook system. **Please provide SON within this benthic monitoring program information.**

- the Class EA Leachate Management's presented alternatives, which proposed co-treatment at the Town wastewater facility, the collected wastewater is a combination of landfill leachate, and industrial/residential septic wastewater that is intended to be pumped and transported from the storage tanks at an equalized flow rate to the Town wastewater treatment facility. SON is under the opinion that additional monitoring requirements need to be considered that will include, but would not be limited to, monitoring of the pumped hauled sewage and leachate, prior to proceeding with the wastewater treatment, for BOD_5, *COD*, Total Suspended Solids, Total Phosphorus, Total Kjeldahl Nitrogen and heavy metals. Also, it is required to include quarterly effluent monitoring for Acute Lethality to Trout and Daphnia magna (sampling frequency may be reduced to annual) to be taken during the period from July 1 to September 30 of each year following one (1) year of acceptable toxicity analysis results and written approval from the District Manager. Any unacceptable subsequent result may create MOE CC requirements to reinstate the quarterly sampling requirement for an additional one (1) year).

- the proposed leachate management and treatment process principals of receiving leachate by the Town wastewater facility shall be identified in more details in this Class EA report for review, although, the wastewater treatment capacity at the Town wastewater facility is deemed to be available. However, there are no references to **the design wastewater treatment capacity during the wet weather conditions and potential impact of the leachate treatment on this treatment facility under these conditions.** Also in this Class EA, the water quality monitoring of the effluent discharges to the Beaver River from this facility outlet, to protect water quality and fishery in the open water, should be reviewed and upgraded if deemed a necessary. Also, SON is under the opinion that some mitigation measures may be required to be developed and implemented to ensure that the wastewater treatment loadings adjusted to accommodate leachate treatment will not be adversely impact the biological treatment performance, given the long HRT (4pprox.. 20 hours), and long SRT (>45 days), and the fact that peak day would be expected to occur in summer when nitrification is most efficient. Although, this leachate daily peak flow may be acceptable at the Thornbury WWTP, SON suggests that the Town need to ensure that this wastewater treatment facility performance will not be adversely affected by the leachate treatment during the wet weather conditions and would not create overflow to the open water, as well as environmental/ecological health of water management resources including the surface and/or ground water will not be adversely effected.

First Nation – SON Consultation Plan

1. Meet the EA requirements as 'duty to consult ' in accordance with the EA Act and SON's consultation practices as outlined in our letter dated October 25, 2016.;
2. If further funds are required, SON and TOBM will enter into an agreement to participate further and be a part of solution for this EA;
3. Consult and conduct meetings with SON during all EA project stages successfully completed this Class EA Leachate Management Project; and
4. Obtain SON acceptance for the recommended solution

SON expectations from MOE CC

1. MOE CC will direct and ensure that that Town of the Blue Mountains will meet all obligations of the 'duty to consult' under the EA Act with SON; and
2. MOE CC will ensure that SON's consultation practices and vision/traditional knowledge be incorporated into this project.

Respectfully,
Saugeen Ojibway Nation Environment Office

[redacted]

Doran Ritchie

c. Jeffery Fletcher

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
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p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

Job No. 16129

TOWN OF THE BLUE MOUNTAINS
CLASS EA FOR LEACHATE MANAGEMENT

Saugeen Ojibway Nation (SON) Meeting Notes
January 18, 2017

Group: Saugeen Ojibway Nation
Location: Town of the Blue Mountains Municipal Office
Time Started: 1:00 p.m. **Time Ended:** 2:25 p.m.

In Attendance: Doran Ritchie (Saugeen Ojibway Nation)
William (Bill) Armstrong (Environmental Expert)
Berta B. Krichker (Engineering Expert)
Kelly Vader (BMROSS)
Jeffery Fletcher (Town of the Blue Mountains)

Meeting Details:

Jeff Fletcher began the meeting by welcoming everyone and asking all those in attendance to introduce themselves.

Jeff then presented some background information on the project and explained why the Town of the Blue Mountains (TOBM) undertook the Class EA process to deal with management of the leachate at the Blue Mountains Landfill Site.

Berta Krichker asked if the Thornbury Sewage Treatment Plant (STP) had sufficient capacity to accept the leachate.

Jeff indicated that the plant did have sufficient hydraulic capacity.

Jeff explained about the potential for partnering with adjacent agricultural manufacturing operations if the pumping option is selected as the preferred alternative for the EA. He indicated that two adjacent businesses are considering the possibility of using the leachate pipe for their own waste material, if the pipe goes through their property.

Bill noted that waste from apple processors would be very high in organics and questioned whether this had been considered as part of the EA.

Jeff explained that he had not yet received detailed waste descriptions from the processors and that that potential impacts on the STP would be evaluated once a preferred route was selected during the detailed design phase.

Bill explained that a primary concern of SON is that the leachate not negatively impact the water quality at the plant and that the current treatment objectives remain unimpaired. Impacts to fish habitat and water quality in the Beaver River cannot be negatively impacted by the project.

Berta asked if it would be possible for SON to review the hydrogeologic and geotechnical reports for the project.

Kelly explained that no additional hydrogeologic or geotechnical work has been completed as part of the leachate management EA, however reports completed during the Landfill Mining and Expansion Environmental Studies could be provided.

Jeff indicated that he could also provide information related to the current composition of the landfill leachate, based on recent water quality analysis of the leachate collected at the site.

Kelly provided an update on the status of the Class EA investigations. She confirmed that the EA process was determined to be a Schedule B undertaking and that the TOBM is anticipating concluding the process in the next several months. Kelly explained that a preferred alternative for management of the leachate would be selected by the TOBM and that there was a preference for the leachate pumping alternative, which would see leachate pumped, via forcemain, to the Thornbury STP. Kelly explained that the TOBM would not select a preferred route for the forcemain until negotiations with adjacent property owners were concluded.

Bill asked of there was any consideration given to allowing residential connections to the forcemain.

Jeff indicated that the TOBM was not considering permitting residential connections. He noted that the proposed pipe would be 100 mm (4”) in diameter and could be installed using directional drilling technology, which would help to minimize impacts during construction.

Kelly explained that, once a draft Screening Report was compiled, it could be forwarded to SON for their review before finalizing the EA report for formal publication.

Doran indicated that this was acceptable and indicated that a 45 day review period should be sufficient for their review.

Berta asked for more information related to the composting facility at the Landfill Site, specifically the stormwater management pond that currently receives discharges from the composting area.

Jeff explained that the pond was only used for runoff from the composting area and that there was no outlet from the pond. If the volume in the pond became elevated, the TOBM arranged to have the pond pumped out and sent to a treatment plant for treatment. He also showed the location of the pond on an aerial photo and indicated that it was not located in close proximity to the leachate collection area which is the subject of the current Class EA process.

Berta indicated that she would understand the operations of the pond better after having reviewed the geotechnical and hydrogeologic information from the site.

Bill indicated that SON was concerned with the wet weather operations at the Thornbury STP. They want to ensure that, during wet weather conditions, the plant can still function properly and will not be negatively impacted by the additional leachate volumes coming to the plant.

Doran provided a brief summary of the meeting results and reviewed the current status of the budget for expert reviews of the information. He also provided Jeff with an example of a Step 2 letter, which would be the next phase of their review, when the project moves into the detailed design phase.

It was agreed that Kelly would prepare meeting notes and circulate them to the group for review prior to finalization.

Meeting Notes Prepared by:

Kelly Vader, Environmental Planner

B. M. ROSS AND ASSOCIATES LIMITED

MC:bf

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File No. 16129

February 15, 2017

Attention: Project Stakeholder

Re: Town of The Blue Mountains
Class EA to Address Leachate Management
The Blue Mountains Landfill Site

The Blue Mountains initiated a Class Environmental Assessment (Class EA) process in August 2016 to consider alternatives to address leachate management at The Blue Mountains Landfill Site (see key plan). Currently, leachate is collected within the lined waste cell and then trucked to the Town's Craigleith wastewater treatment facility for treatment and disposal. The study considered a range of alternatives to address long term management of the leachate, including the following: i) Do nothing, continue to truck leachate, ii) On-site treatment and infiltration of leachate, iii) On-site treatment and discharge of leachate to Indian Brook, and iv) Pump leachate via forcemain to the existing sanitary collection system servicing Thornbury. Opportunities to partner wastewater servicing with adjacent commercial/industrial operations was also examined in conjunction with each of the alternatives being considered. The Class EA process investigated and evaluated each of the alternatives described above, including an analysis of life cycle costs for each over a 20 year time frame.

The planning for this project is following the environmental screening process set out for Schedule 'B' activities under the Municipal Class Environmental Assessment (Class EA) document. The purpose of the Class EA screening process is to identify any potential environmental impacts associated with the proposed works and to plan for appropriate mitigation of any identified impacts. This process includes consultation with the public, stakeholders and government review agencies.

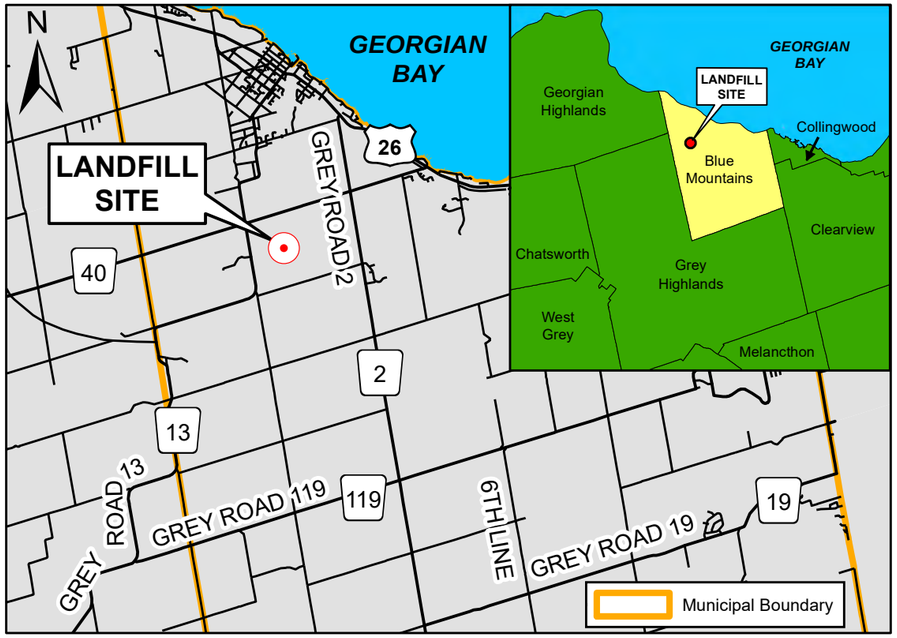
As a property owner located along potential forcemain route 4 (see key plan), you have been identified as possibly having an interest in this project. If you have any concerns or questions regarding this project, please contact The Blue Mountains (519-599-3131 x238 or jfletcher@thebluemountains.ca) by March 15, 2017 or the undersigned at 1-888-524-2641 or by e-mail at kvader@bmross.net.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, RPP, MCIP
Environmental Planner

KLV:hv
Encl.
c.c. Jeffery Fletcher, Town of The Blue Mountains



KEY PLAN
NOT TO SCALE

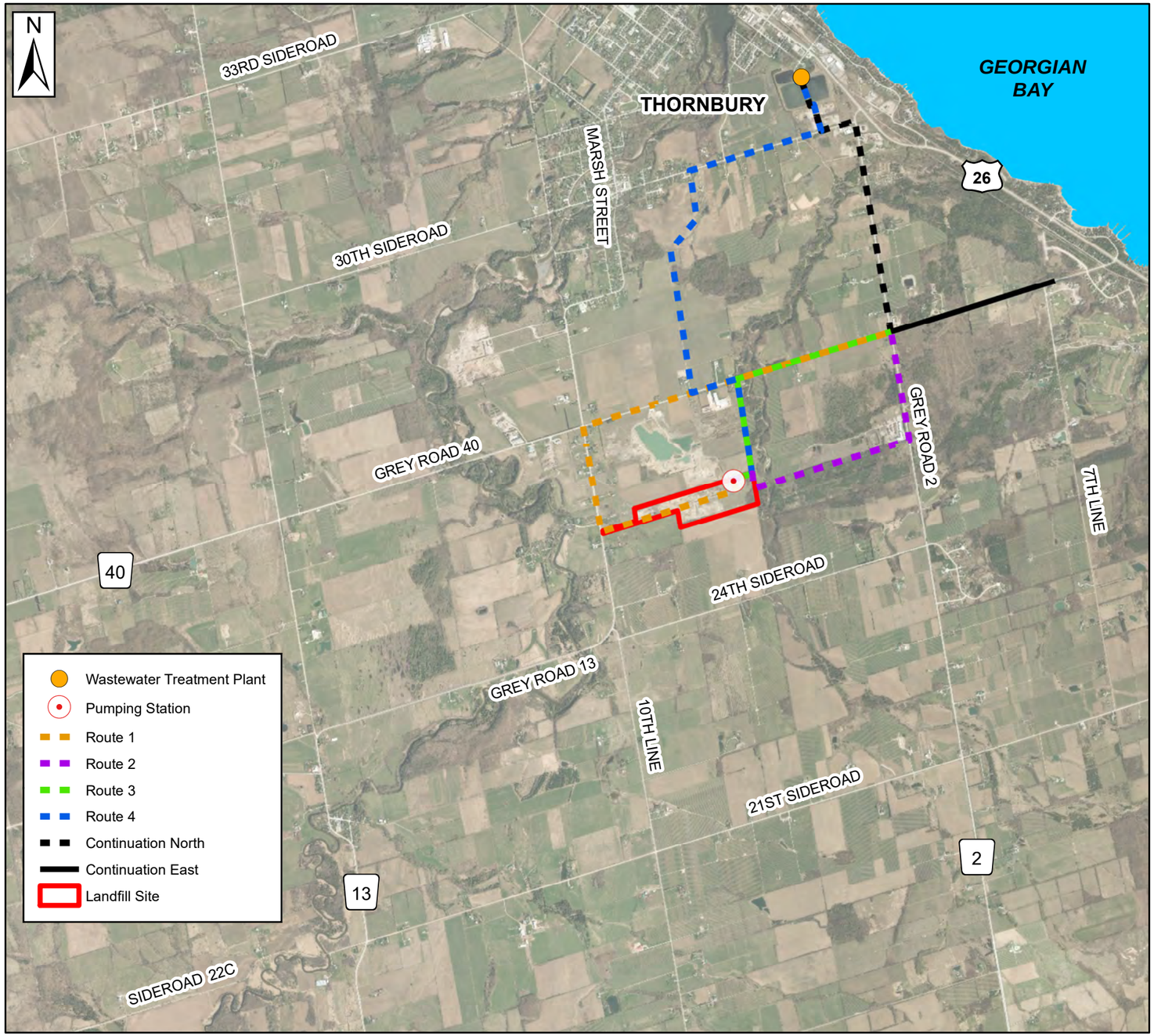
LEACHATE COLLECTION CHAMBER

LINED PORTION OF LANDFILL

EXISTING LANDFILL SITE

INDIAN BROOK AT COUNTY ROAD CROSSING

SITE PHOTOS TAKEN ON AUGUST 9, 2016



AERIAL PHOTOGRAPHY OF PROJECT AREA
SCALE 1 : 40,000

BMROSS engineering better communities

TOWN OF THE BLUE MOUNTAINS
CLASS EA TO ADDRESS LEACHATE MANAGEMENT AT THE BLUE MOUNTAINS LANDFILL
GENERAL LOCATION PLAN

DATE	PROJECT No.
FEB. 15, 2017	16129
SCALE	FIGURE No.
AS SHOWN	2.2

February 17, 2017

Mr. Jeffrey Fletcher

Manager of Solid Waste and Environmental Initiatives

Town of The Blue Mountains, 32 Mills Street, Thornbury, ON

Re: Town of The Blue Mountains Class Environmental Assessment for Leachate Management.

Dear Mr. Fletcher

Further to my discussion with you with respect to Leachate Management I have asked George Powell P. Eng. Vice Chair of the BMWTF's Watershed Action Committee for his opinion regarding the Town of The Blue Mountains treatment of landfill leachate at the Town's wastewater treatment facility. He has a previous experience with leachate treatment and was involved in the treatment of leachate for municipalities of Barrie, Brockville and Chatham.

Based on the presentation to the Committee on the Whole on November 14, 2016 followed up by the Public Open House on November 24, 2016, we understand that currently the Town is trucking the leachate material to the Town's wastewater treatment plant. The Town is conducting a study to find the most sustainable and practical method of managing leachate generated at the Town Disposal Site.

According to the annual MOE monitoring reports, there is an excess of the reasonable use conditions (RUC) of sulphates and volatile organics and nitrides. Chlorides and potassium are frequently observed and are presently bellow the RUC.
High organic strength and toxic substances such as heavy metals can have serious

impact on the Town's aeration, digestion and organic solid removal process. Have these concerns been addressed?

The Town's environmental Compliance Approval for the landfill and the waste treatment facilities will have to change to acknowledge the proposed leachate treatment system. This may not in certain instances be treated in the Town's waste treatment facility since it may impact on off shore water quality.

The volume of leachate will vary depending on rainfall and the groundwater level. As long as the leachate is pumped as proposed it should be well mixed and not shock the load.

We understand that the only part of the landfill has been lined and assume that the Town will continue to monitor the site for its potential impact on the groundwater, Indian Brook and the Beaver River surface waters. Can this be confirmed?

Has the Town's future planning considered the eventual need for a new landfill because of a growing population?

We would like to meet with you and discuss our comments in the near future. We understand and agree that the cost of the management of the landfill and the leachate removal and transportation to another facility for a treatment play a pivotal part in this matter, however in order to protect the environment and ensure the clean watershed in the area, we would like to start a proactive dialogue with you.

Respectfully,

[redacted]

Blanka Guyatt
BMWTF Director

[redacted]

George Powell P. Eng.
Vice Chair WAG BMWTF

cc. BMWTF Directors
BMWTF WAG Committee

CHIEFS AND COUNCILS
SAUGEEN OJIBWAY NATION

Chippewas of Saugeen, RR 1, Southampton ON N0H 2L0 519-797-2781
Chippewas of Nawash, 135 Lakeshore Blvd, Neyaashiinigmiing ON N0H 2T0 519-534-1689

February 27, 2017

Kelly Vader, MCIP, RRP
Environmental Planner
BM Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich ON N7A 2T4

Dear Mrs. Vader:

Re: Saugeen Ojibway Nation Finalized Preliminary Review Comments for Stage 1 SON Consultation Process for Class EA Leachate Management at Blue Mountains Landfill Site

We thank the Town of Blue Mountains and BM Ross Associates Limited for providing the Saugeen Ojibway Nation (SON) with all additional reports and documentation for the Municipal Class Environmental Assessment for Leachate Management (Schedule 'B') at the Town of Blue Mountain Landfill Site (Class EA Leachate Management).

SON would like to reaffirm our appreciation for engagement in the Consultation Process of this Class EA Leachate Management study at the initial stages. As identified at the meeting on January 18, 2017, the main objectives of the SON Consultation Process are to ensure there are no potential, adverse impacts on fishery, environmental/ecological health, terrestrial and/or water resources systems.

Also as agreed upon at this meeting, SON and its experts undertook scientific/environmental/ engineering reviews of all reports and documentation provided to finalize SON's **preliminary review comments for Stage 1 of the SON Consultation Process for this project**.

Below is a list of all reports and documents received digitally and by hard copy in January and February 2017:

1. Water Quality Assessment of Indian Brook - MOE (1995)
2. Water Quality Assessment of Indian Brook - Tarandus Associates Ltd (1999)

3. Water Quality Assessment of Indian Brook - Tarandus Associates Ltd (2004)
4. Benthic sampling 2003 and 2008
5. 2015 Annual Solid Waste Report for the Town of Blue Mountains Solid Waste Disposal Site - Golders (April 2016)
6. 2015 Annual Water Monitoring Report for the Town of Blue Mountains Solid Waste Disposal Site - Golders (April 2016)
7. Water Quality Assessment of Indian Brook - for the Town of Blue Mountains Solid Waste Disposal Facility - Golders (March 2014)
8. The Blue Mountains Landfill, Proposed Expansion and Mining Environmental Screening Report - Golders (April 2016)
9. Blue Mountains Landfill, Flow and Mass Transport Modelling (Appendix 9)-Golders (April 2010)
10. Certificate of Analysis - SGS Canada Inc. Final Report, April 22, 2016
11. The Thornbury PCP Toxicity Testing Completed in 2016;
12. Thornbury Wastewater Treatment Plant Phase 1 Expansion Preliminary Design - Stantec (April 2009).

Review Comments and Concerns

On January 3, 2017, SON issued a letter that outlined the Summary of SON's Class EA Leachate Management at Blue Mountains Landfill Site Consultation Process Stage 1 preliminary review draft comments prepared for the meeting with The Town of Blue Mountains and the Town's Consultant, BM Ross, on January 18, 2017. Based on the meeting discussions and review of all listed reports and documentation, please see the following final preliminary review comments of Stage 1 - SON Consultation Process that represents completion of the preliminary review - Stage 1 for the Class EA Leachate Management:

All requested reports and documentation related to geotechnical, hydrogeological, environmental reports, the 2015 Annual Water Monitoring Report, and the Solid Waste report for the Blue Mountains were received by SON for the Class EA Leachate Management.

Biological Monitoring and Water Quality

BioMAP (2013) monitoring results, which were presented in the 2014 Golders Water Quality Assessment of Indian Brook Report, identified that Station 1 (downstream) remains "unimpaired", Station 2 (upstream) is **"undetermined"** and Station 3 (just downstream of the site) is showing signs of ecological impacts and it is "**impaired"** for **these portions of the Indian Brook-cold water fishery system**. Also, in "2013 Station 3 had fair water quality with fairly significant organic pollution". Also, at Station 3 there were elevated concentrations of **magnesium, phosphorous, iron and turbidity, nitrate, nitrite was relatively higher as well.**

In Section 4.0 Summary of Recommendations of this report stated that "**Benthic invertebrate density and EPT Index were lowest at Station 3, when compared to the other stations". "Water quality results were noticeably different at Station 3. Higher concentrations at Station 3 may be directly related to runoff from the waste disposal facility and surrounding agriculture"**. We agree with the reports conclusions that all presented information identified differences in the benthic invertebrate community and water quality results at Station 3 and it may indicate that water quality at Station 3 is being influenced by the waste disposal facility and higher turbidity at this station indicated that this area is receiving higher runoff than the other two stations and influenced by some surface/stormwater discharges from the subject site.

SON agrees with the 2014 Golders Water Quality Assessment of Indian Brook report recommendations to expand the annual water monitoring program and to add 1-2 station(s) immediately downstream of the site. Also, SON recommends that:

1. BioMAP monitoring shall be done every 2 year instead of 5 years interval as identified in August 5, 2016, Amended Environmental Compliance Approval (ECA); and

2. Effective robust erosion control measures required to be implemented as soon as possible at the site to protect water quality of the Indian Creek - Cold water fishery system.

Correlation among Water Resources Components and impact on Water Quality

In the provided information, reports and documentation there are very limited references regarding the functionality of the existing site runoff/stormwater discharges/management and correlation/influences of these functions with wastewater/leachate discharges from the composting facilities into the existing Stormwater Management Facility (SWF). The 2015 Golder's Annual Solid Waste Report in Section 2.1.4 identified that "The Composting facility is located at the western portion of the licensed Site property boundary. The Composting facility is underline by an asphalt compost storage within the sub-catchment E1 of the stormwater drainage system, which drains to on a site pond in the southeast corner of sub-catchment."

Also, it is our understanding that in 2015, a new perimeter stormwater ditch, as an Interim Stormwater System, was constructed. Based on the description in the 2015 Annual Solid Waste Report in Section 5.4, it identified that "This ditch divert the surface water run-off away from new cell and conveys around the north of the cell towards Indian Brook of the landfill. To prevent surface water runoff inflow to the new cell along southern limits, a drainage swale was constructed to divert surface water inflow run-off east". We are the under opinion there is no clear understanding of the surface water functions as a **system** for this site and how it is connected and influences the runoff and surface flows, groundwater, water quality and discharges.

Therefore, to minimize/reduce any potential impacts of the subject site on the surface water, underlying groundwater water quality and ultimately its discharges downgradient to surface water (the Indian Brook) or other adjacent lands, water resources systems and specifically under wet weather conditions,

3. SON recommends that the correlation/influences of these functions will be addressed and included in the Final Draft of the Class EA Leachate Management.

Water Quality

Based on water quality results reflected within the Water Quality Monitoring Reports of the last few years and as previously identified that:

- water quality of groundwater system and surface water within the subject site, including Upper and Lower Aquifers, and Station 3 at the Indian Brook was potentially influenced by the operational practices;

- there are elevated levels of some pollutants in the ground and surface water; and

- as reported, MOE CC's site inspection on September 17, 2014 and its subsequent Site Inspection Report confirmed that in some site locations, **"The landfill has resulted in slight impacts to the upper and lower aquifer below the site. Exceedances of the Reasonable Use Criteria (RUC) were noted at several locations surrounding the Landfill for nitrate, manganese and iron" and at some locations ammonia".**

4. SON recommends to expand the annual water monitoring program for the site and main principal of proposed modifications to include in the Final Draft of the Class EA Leachate Management.

Thornbury Water Pollution Control Plant Issues

The Class EA Leachate Management's preliminary presented alternatives have proposed co-treatment at the Town wastewater facility, where the collected wastewater is a combination of landfill leachate, and industrial/residential septic wastewater that is intended to be pumped and transported from the storage tanks at an equalized flow rate to the Town wastewater treatment facility. Although, it was suggested in the 2009 Stantec Report -Thornbury Wastewater Treatment Plant Phase 1 Expansion Preliminary Design that the wastewater treatment capacity at the Town wastewater facility is deemed to be available, there are no specific references to an evaluation of the wastewater treatment capacity availability for projected leachate volumes during dry and/or wet weather conditions. However, the same report provided some references to very large inflow/infiltration/wet weather flows that may be affecting this facility (section 2.3) and required to be taken into consideration in any assessment of the wastewater treatment capacity availability.

SON is of the opinion that:

- *The proposed leachate management and treatment process principals of receiving leachate by the Town wastewater facility shall be reaffirmed and a more detailed evaluation be provided by the final draft Class EA for Leachate Management on availability of the required treatment capacity during the wet weather flows conditions in order to minimize/eliminate potential overflows from this facility into the Beaver River that may adversely impact the aquatic life and fishery.*

- *Additional monitoring requirements for the leachate management needs to be considered that will include, but would not be limited to, monitoring of the pumped hauled sewage and leachate, prior to proceeding with the wastewater treatment, for BOD_5, COD, Total Suspended Solids, Total Phosphorus, Total Kjeldahl Nitrogen and heavy metals. Also, it is required to include quarterly effluent monitoring for Acute Lethality to Rainbow Trout and Daphnia magna (sampling frequency may be reduced to annual) to be taken during the period from July 1 to September 30 of each year following one (1) year of acceptable toxicity analysis results and written approval from the District Manager. Any unacceptable subsequent result may create MOE CC requirements to reinstate the quarterly sampling requirement for an additional one (1) year).*

- *The water quality monitoring of the effluent discharges to the Beaver River from this facility outlet, to protect water quality, aquatic life and fishery in the open water, should be reviewed and upgraded if deemed necessary.*

- *Mitigation measures may be required to be developed and implemented to ensure that the wastewater treatment loadings adjusted to accommodate leachate treatment will not adversely impact the biological treatment performance. Although, this leachate daily peak flow may be acceptable at the Thornbury WWTP, SON suggests that the Town needs to ensure this wastewater treatment facility performance will not be adversely affected by the leachate treatment during wet weather conditions and would not create overflows to the open water. Also, assurance needs to be given that the environmental/ecological health of water management resources including surface and/or ground water will not be adversely effected.*

First Nation - SON Consultation Plan

1. Meet the EA requirements as 'duty to consult ' in accordance with the EA Act , SON's consultation practices and vision/traditional knowledge;
2. Provide SON's fund capacity and the required agreements to participate and be a part of solution for this EA;
3. Consult and conduct meetings with SON and MOE CC during all EA project stages successfully completed of this Class EA Leachate Management Project; and
4. Obtain SON acceptance for the recommended solution.

SON expectations from MOE CC

1. MOE CC will direct and ensure that that Town of Blue Mountains will meet all obligations of the 'duty to consult' under the EA Act with SON; and
2. MOE CC will ensure that SON's consultation practices and vision/traditional knowledge be incorporated in the consultation for this project.

As previously identified, all expenses incurred by SON to participate in this Municipal Class EA Consultation Process are the responsibility of the proponent. We can proceed with a letter of agreement on this matter.

If, at the time of SON's technical final review completion, the SON Environment Office and leadership determine that no negative impacts will occur within its Territory or adjacent lands/water resources system, and/or those impacts can be sufficiently mitigated, SON will be agreeable to providing a letter withdrawing any objections to proceeding. If the review determines that negative impacts will occur, SON will proceed with a draft consultation and accommodation/economical plan and a meeting with the proponent to discuss the matter further.

We look forward to working together and to receiving your response.

Respectfully,
Saugeen Ojibway Nation Environment Office

[redacted]

Doran Ritchie
Land use Planning Coordinator

cc: Jeffery Fletcher, Town of Blue Mountains
Craig Newton, MOE CC

CHIEFS AND COUNCILS
SAUGEEN OJIBWAY NATION

Chippewas of Saugeen, RR 1, Southampton ON N0H 2L0 519-797-2781
Chippewas of Nawash, 135 Lakeshore Blvd, Neyaashiinigmiing ON N0H 2T0 519-534-1689

April 28, 2017

Kelly Vader, MCIP, RRP
Environmental Planner
BM Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich ON N7A 2T4

Dear Mrs. Vader:

Re: Saugeen Ojibway Nation Comments for the Draft Report for Town of The Blue Mountains, Municipal Class Environmental Assessment To Address Leachate Management at the Blue Mountains Landfill Site

Thank you very much for providing the Saugeen Ojibway Nation (SON) with a Draft Report for the **Town of The Blue Mountains, Municipal Class Environmental Assessment To Address Leachate Management at the Blue Mountains Landfill Site (Schedule 'B') Study (Class EA Leachate Management)** for review and comments. We appreciate your engagement with SON for this Class EA study consultation and comprehensive, open and effective dialogue.

SON and its experts reviewed the Draft Report for the Class EA Leachate Management provided by BM Ross on February 27, 2017, and developed our review comments presented below under the requirements of the Consultation Process between a proponent and First Nations Communities under the Environmental Assessment Act (EAA).

These review comments will assist the SON Environment Office and SON leadership in making decisions about the project relative to Treaty Rights, cultural heritage, and Traditional Territory. As identified by SON in previous letters, there are three stages in SON's consultation process:

1. technical environmental assessment of all applicable documentation including, but not limited to, archaeological, environmental, hydrogeology and legal reports, which sometimes include a legal review of potential impacts of the project on rights and land claims;

2. final review of EA project, SON Environmental Office staff recommendations and to SON leadership regarding all critical technical/environmental aspects of the project; SON will determine reasonable, suitable consultation, the required economical accommodation, undertake all necessary discussions with the proponent and SON leadership and/or if necessary (environmental) protection agreement short or long term; and;

3. implementation and monitoring of any agreements which arise from the SON leadership discussion.

As discussed and agreed upon at the meeting of January 18, 2017, SON undertook the following:

- the ecological and archaeological and potentially legal reviews were deferred from Stage 1to the next stages of the SON Consultation Process for this EA;

- SON utilized the existing review funding allocations of all deferred review items for Stage 1 of SON's Consultation Process in order to complete additional review for the initial stage of the Class EA Consultation;

- SON finalized review and developed comments for Stage 1 of the SON Consultation Process and forwarded to BM Ross, the Town of Blue Mountains and MOECC on February 27, 2017.

At the same meeting, SON requested a 45-day review period for development of the SON review comments for the Draft Report of the Class EA Leachate Management study under Stage 2 of the SON Consultation Process that we received on February 27, 2017. However, taking into consideration the project schedule, SON was able to finalize Stage 2 review comments in advance of the previously identified review time. Please see below SON's review comments and concerns under Stage 2 of SON's Consultation Process for the Draft Report of the Class EA Leachate Management study under EAA.

Within the next week, SON will forward to the proponent, the Town of Blue Mountains, the estimated reviews and meeting budget for Stage 2 of SON's Consultation Process. As previously identified, all expenses incurred by SON to participate in this Municipal Class EA Consultation Process are the responsibility of the proponent. We can also proceed with a letter of agreement on this matter immediately.

Previous SON Issued Comments

As identified above, SON issued the preliminary review comments letters on January 3 and February 27, 2017, to BM Ross and the Town of the Blue Mountains that outlined SON's comments and concerns of Stage 1, SON Consultation Process for the initial stage of the Class EA Leachate Management study. To date, SON has not received any formal responses from BM Ross and the Town of the Blue Mountains on the above-noted review comments. Although in a few sections of the Draft Report of the Class EA Leachate Management study, BM Ross made some effort to acknowledge some of SON's concerns, in our opinion, this is not sufficient. SON's review comments presented below make references to the presented information by BM Ross, which in our opinion, is not sufficient.

Also, we want to point out that SON has not received meeting notes for the meeting on January 18, 2017 from BM Ross and/or the Town of the Blue Mountains, nor was this information included in the Appendices of this Draft Report.

Review Comments and Concerns

SON and its experts reviewed the Draft Report of the Class EA Leachate Management study and following are SON's review comments that also reaffirm SON's previously-outlined review comments, which were not addressed or were addressed inadequately in this draft report:

'The duty to consult' with First Nations represents under EAA

'The duty to consult' with First Nations represents one of the major requirements of the EA process, and Aboriginal consultation is a legal requirement that goes beyond "stakeholders engagement" (as there are different and additional requirements under the EA Act, federal and provincial funding agreement for the project if any matching federal and provincial funds are being used, and under the common law applying to Aboriginal right contexts). General 'stakeholders' information is not sufficient for the Aboriginal consultation processes' and the Draft Report has not adequately addressed the Consultation Process requirements between the proponent and the First Nations under EAA, and in particular has not reflected the SON Consultation Process.

The draft report suggests that the requirement for consultation with First Nation is based on there being communities or reserves in the immediate vicinity of the subject lands. This approach fails to recognize territory which Aboriginal Peoples historically utilized and continue to exert rights and interests therein.

The Final Report of this Class EA will need to adequately present the Consultation Process requirements with First Nations Communities and the SON Consultation Process.

Protection of Water Resources and Environmental Ecological Areas

Taking into consideration, that:

- The project study area is located within the Beaver River and the Indian Brook watershed and these two watercourses discharge to Georgian Bay.
- The Beaver River is located west of the landfill site, immediately west of the Grey Road 13 corridor, which forms the west limit of the landfill property.
- Indian Brook is located immediately east of the landfill property, crossing Grey Road 10 and Grey Road 2 before discharging to the Bay, south of Thornbury.
- The primary soil type within the study area is Brighton Sand with small intrusions of Tecumseth Sand, Wiarton Loam and Granby Sand and these soils *are typically well draining.*
- These types of soils are not considered the best for the landfill operations and require the landfill liners to protect water resources (aquifers/ground water and subsurface/surface water) from potential landfill site contaminations within the vicinity of these land areas. Specifically, it would apply to this landfill site that is located in the immediate proximity to the cold water fishery open watercourse system such as the Indian Brook Creek.

- Based on the Ontario Ministry of Natural Resources and Forestry (MNRF) Natural Heritage information Centre (NHIC) database that identified the four significant features within a 10 km radius in relation to the project study area such:

- **(i) Beaver Valley Lowlands,** which are located approximately 8 km southwest of the projected study area along the Beaver River valley system, designated as a Provincially- Significant Wetland (PSW) as well as a Provincially-Significant Life Science and Earth Science Area of Natural and Scientific Interest (ANSI).

- **(ii) Banks Moraine Provincially Significant Earth Science** - ANSI is a provincially-significant earth science Area of Natural and Scientific Interest (ANSI) located approximately 10 km southeast of the landfill site.

- **(iii)The East Meaford Creek** - is a provincially-significant earth science ANSI located approximately 9 km northwest of the landfill site.

- **(iv) Blue Mountain Slopes** - Provincially Significant Life Science ANSI and located approximately 4 km east of the landfill site.

Source Water Protection Plan

As identified in this draft report, the landfill site and several of the proposed alignments of foreceman routes are located within the Source Water Protection vulnerable areas. Within the vicinity of this project is located the Highly Vulnerable Aquifers (HVA's)-ground water aquifers that are situated close to the surface or with little overburden to protect groundwater supplies and Significant Groundwater Recharge Areas (SGRA's), which are also comprised with highly permeable soils that allow high rates of surface water infiltration. This Class EA study, recommends that the consultation "with the local Source Water Protection Region will be undertaken to ensure that the proposed project does not negatively impact on groundwater supplies within the area."

SON is under the opinion that this consultation shall be undertaken prior to this Class EA being finalized to ensure source water protection matters have been fully addressed in the selection and evaluation of preferred alternatives.

Water Quality Monitoring

Based on water quality results within the Water Quality Monitoring Reports of the last few years and as previously identified:

- water quality of ground water system and surface water within the subject site, including Upper and Lower Aquifers, and Station 3 at the Indian Brook was potentially influenced by the operational practices;

- there are elevated levels of some pollutants in the ground and surface water; and

- as reported, MOECC's site inspection on September 17, 2014, and its subsequent Site Inspection Report confirmed that in some site locations, **"The landfill has resulted in slight impacts to the upper and lower aquifer below the site. Exceedances of the Reasonable Use Criteria (RUC) were noted at several locations surrounding the Landfill for nitrate, manganese and iron and at some locations ammonia".**

SON recommends to expand the annual water quality monitoring program for the subject site, Indian Brook and for areas that may be affected. The commitment to incorporate SON's proposed points in this monitoring program shall be included in the Final Report of the Class EA Leachate Management.

Correlation among Water Resources Components and impact on Water Quality

As stated previously, the Draft Report made minimum references regarding to the functionality of the existing site runoff/stormwater discharges/management and correlation/influences of these functions with wastewater/leachate discharges from the composting facilities into the existing Stormwater Management Facility (SWF), as well the surface water/runoff containment management on the landfill site.

SON is of the opinion that:

- *There is no clear understanding of the surface water functions as a system for this site and how it is connected and influences the runoff and surface flows, groundwater, water quality and discharges.*

- Therefore, to minimize/reduce any potential impacts of the subject site on the surface water system underlying groundwater water quality and ultimately its discharges downgradient to surface water (the Indian Brook), other adjacent lands, as well as water resources systems and specifically under wet weather conditions, the correlation/influences and management of water resource functions need to be addressed.

SON recommends that the correlation/influences of water resources functions will be addressed and included in the Final Report of the Class EA Leachate Management.

Water Quality Environmental/Ecological BioMAP Monitoring Program

BioMAP (2013) monitoring results, which were presented in the 2014 Golders Water Quality Assessment of Indian Brook Report, identified that Station 1 (downstream) remains "unimpaired", Station 2 (upstream) is **"undetermined"** and Station 3 (just downstream of the site) is showing signs of ecological impacts and it is **"impaired"** for **these portions of the Indian Brook-cold water fishery system**. Also, in "2013 Station 3 had fair water quality with fairly significant organic pollution". At Station 3, there were elevated concentrations of **magnesium, phosphorous, iron and turbidity, nitrate, nitrite was relatively higher as well.** Summary of Recommendations of this report stated that: "**Benthic invertebrate density and EPT Index were lowest at Station 3, when compared to the other stations". "Water quality results were noticeably different at Station 3. Higher concentrations at Station 3 may be directly related to runoff from the waste disposal facility and surrounding agriculture**". As stated previously, SON agrees with Golders reports conclusions that identified *the benthic invertebrate community and water quality results at Station 3 are different than at Stations 1 and 2, and suggested/indicated that water quality at Station 3 is being influenced by the waste disposal facility. The higher turbidity at this station indicated that this area is receiving higher runoff than the other two stations and influenced by some surface/stormwater discharges from the subject site.*

SON agrees with the 2014 Golders Water Quality Assessment of Indian Brook report recommendations to expand the annual water monitoring program and to add 1-2 station (s) immediately downstream of the site. Also, SON recommends that:

SON recommends that BioMAP monitoring shall be done every 2 years instead of 5 year intervals as identified in the August 5, 2016, Amended Environmental Compliance Approval (ECA) and this commitment needs to be incorporated in the Final Report of the Classe EA Leachate Management; and

Effective robust erosion control measures are required to be implemented as soon as possible at the site to protect the water quality of the Indian Creek - Cold water fishery system.

Projections of Leachate Volume and Strength

Although, the Class EA study Draft report has not provided any technical justifications or calculations to support the presented assumptions that the annual leachate volume would be 18,000 m3 (or 49,315 L/day) and the resultant area of the leaching bed would be about 1.2 ha. as we understand, it also assumes that the leaching bed would be located generally north of the "Blue Mountains Landfill" portion of the landfill limit.

Based on the current leachate quality data (laboratory report from April 21, 2016) provided by the Town of The Blue Mountains (TBM), the leachate currently generated is extremely diluted (BOD5= 5 mg/L, chloride = 7 mg/L, total ammonia = 0.1 mg/L, iron = 0.2 mg/L). This sample was taken from the lined waste cell is only a small fraction of the total cell area and SON opinion is that this sample is not representative of the actual average leachate strength. This Class EA study identified that over "time the leachate strength will definitely increase as the volume of waste in the cell increases, which will change the treatment requirements from what they currently are. The draft report also suggests that subsurface disposal would be in the form of a leaching bed similar to the septic systems.

Also, the draft report acknowledges that potential complication in siting the works in this area that may occur, due to the property to the north of the landfill site related to an existing attenuation zone and therefore groundwater flow paths in the area would have the treated leachate flowing, within the subsurface, to the north of the site. Further, the draft report suggests that the hydrogeological assessment may determine this to be environmentally unsuitable, especially as leachate strength increases, but at this time it is assumed that the approach could theoretically work.

The Thornbury WWTP currently discharges treated effluent to the Beaver River, *which has sensitive fish habitat features. Potential impacts to fish habitat, which may result from the additional volumes of leachate to the plants sewage stream, has also been identified as a potential concern based on consultation with SON.*

Thornbury Water Pollution Control Plant Issues

The Draft Report of the Class EA Leachate Management identified that the option 4 is a draft preferred option, which includes the proposed co-treatment at the Thornbury Wastewater Treatment Plant, where the collected wastewater is a combination of landfill leachate, and industrial/residential septic wastewater that is intended to be pumped and transported from the storage tanks at an equalized flow rate to the Town wastewater treatment facility.

In the 2009 Stantec Report -Thornbury Wastewater Treatment Plant Phase 1 Expansion Preliminary Design was suggested that the wastewater treatment capacity at the Town wastewater facility is deemed to be available. However, there was no specific references to any engineering evaluations of the wastewater treatment capacity availability for projected leachate volumes during dry and/or wet weather conditions.

In this Draft Report for the Leachate Management, Section 5.4 - **Hydraulic Plant Capacity**, BM Ross, identifies, *that is partly in the response to SON review comments regarding questions of the Hydraulic Plant Capacity calculations*, that the Thornbury WWTP is currently operates at 61% capacity, which we assumed is based on the previous (2010-2015) 5 year average daily flow (ADF) of 2,183 m3/day with the Plant's built capacity is 3,580 m3/day. The expansion of this plan is planned to be commenced, when the Plant reaches 80% capacity of the average daily flow and it anticipates by 2026, subject to level of developments, new connections and service use.

However, BM Ross acknowledges also that there is additional 459 m3/day for a total of 2,642 m3/day of the committed flows and this bring to 73% Plant Capacity, which leaves approximately 938 m3/day ADF or an equivalent of 888 units. The landfill leachate forcemain connection projected capacity has been identified as the equivalent of 47 units (18,000 m3/per year). However, this information is not supported by any engineering calculations for a suggested projections of leachate volumes and it may that actual quality of leachate may require plant treatment process modifications. As stated in this report, the treatment capacity needs to consider both hydraulic and contaminant loading to the plant.

Wet Weather Conditions

The 2009 Stantec Report -Thornbury Wastewater Treatment Plant Phase 1 Expansion Preliminary Design provided some references to very large inflow/infiltration/wet weather flows that may be affecting this facility (section 2.3) and required to be taken into consideration in any assessment of the wastewater treatment capacity availability. Although BM Ross added the additional information regarding the inflow/infiltration/wet weather conditions and partly addressed the SON's previously provided review comment, we are still under the opinion that the inflow/infiltration/wet weather conditions are still require further considerations and need to be addressed adequately with the degree of engineering details required to address this issue.

The completion of additional analyses at the Thornbury WWTP to ensure that the leachate received by this plant in addition to the sanitary waste stream flows will not result in negative impact to water quality or fish habitat/aquatic life in Beaver River and/or Georgian Bay.

SON is of the opinion that:

- *The proposed leachate management and treatment process engineering specifics of receiving leachate by the Town wastewater facility shall be reaffirmed and a more detailed evaluation be provided by the final draft Class EA for Leachate Management on availability of the required treatment capacity during the wet weather flows conditions in order to minimize/eliminate potential overflows from this facility into the Beaver River that may adversely impact the aquatic life and fishery.*

- *Additional monitoring requirements for the leachate management need to be included in the Final Report, but would not be limited to, monitoring of the pumped hauled sewage and*

leachate, prior to proceeding with the wastewater treatment, for BOD_5, COD, Total Suspended Solids, Total Phosphorus, Total Kjeldahl Nitrogen and heavy metals. Also, it is required to include quarterly effluent monitoring for Acute Lethality to Rainbow Trout and Daphnia magna (sampling frequency may be reduced to annual) to be taken during the period from July 1 to September 30 of each year following one (1) year of acceptable toxicity analysis results and written approval from the District Manager. Any unacceptable subsequent result may create MOE CC requirements to reinstate the quarterly sampling requirement for an additional one (1) year).

- *The water quality monitoring of the effluent discharges to the Beaver River from this facility outlet, to protect water quality, aquatic life and fishery in the open water, should be reviewed and upgraded if deemed necessary.*

- *Mitigation measures may be required to be developed and implemented to ensure that the wastewater treatment loadings adjusted to accommodate leachate treatment will not adversely impact the biological treatment performance. Although, this leachate daily peak flow may be acceptable at the Thornbury WWTP, SON suggests that the Town needs to ensure this wastewater treatment facility performance will not be adversely affected by the leachate treatment during wet weather conditions and would not create overflows to the open water. Also, assurance needs to be given that the environmental/ecological health of water management resources including surface and/or ground water will not be adversely effected.*

Option 4 Pipe Alignment Route

Opinion 4 pipe alignment is proposed to cross the Indian Brook potential wet land SAR Habitat (Snapping Turtles) and if it is confirmed SAR Habitat, the previously identified set back of 30 m from this wetland may be required substantially increased.

SON is under opinion that to ensure the Terrestrial and Sensitive Species Habitat will not be adversely impacted in the areas of the proposed pressure pipe alignment, the additional evaluation and mitigation measure works will be required to be undertaken by the proponent.

SON is concerned of potential dewatering of wetlands, or alteration of subsurface drainage system and other disruption of present flow pattern as the results of adverse impacts of trenching/excavation of the proposed forcemain via directional drilling through wetland have may have some potential disruptive impact. The Final Report of the Class EA Leachate management requires to include a commitment to protect these resources and identify specific measures required to manage and mitigate adverse impact if it is needed.

3. First Nation - SON Consultation Plan

1. The proponent is required to meet the EA requirements as 'duty to consult ' in accordance with the EA Act , SON's consultation practices and vision/traditional knowledge;
1. The proponent is required to provide SON's fund capacity and the required agreements to participate and be a part of solution for this EA;
1. The proponent is required to continue conduct the Consultation Process and meetings with SON and MOECC during all EA project stages successfully completed of this Class EA Leachate Management Project; and

2. Obtain SON acceptance for the recommended solution.

SON expectations from MOE CC

1. MOE CC will direct and ensure the Town of Blue Mountains meet all obligations of the 'duty to consult' under the EA Act with SON; and
1. MOE CC will ensure that SON's consultation practices and vision/traditional knowledge be incorporated in the consultation for this project.

As previously identified, all expenses incurred by SON to participate in this Municipal Class EA Consultation Process are the responsibility of the proponent. We can proceed with a letter of agreement on this matter.

If, at the time of SON's technical final review completion, the SON Environment Office and leadership determine that no negative impacts will occur within its Territory or adjacent lands/water resources system, and/or those impacts can be sufficiently mitigated, SON will be agreeable to providing a letter withdrawing any objections to proceeding.

If the review determines that negative impacts will occur, SON will proceed with a draft consultation and accommodation/economical plan and a meeting with the proponent to discuss the matter further.

We look forward to working together and receiving your response.

Respectfully,

Saugeen Ojibway Nation Environment Office

[redacted]

Doran Ritchie
Land use Planning Coordinator

cc: Jeffery Fletcher, Town of Blue Mountains
Craig Newton, MOE CC

Kelly Vader

From: Carl Seider <c.seider@waterprotection.ca>
Sent: May 9, 2017 9:27 AM
To: Kelly Vader
Cc: Jeffery Fletcher (jfletcher@thebluemountains.ca); RMO Mailbox; Andrew Sorensen
Subject: RE: Town of the Blue Mountains - Class EA
Attachments: MAP_5_2_BM_T_1_THORNBURY_EVENTS_POLICY.pdf

Hi Kelly,

Thanks for the email concerning the proposed forcemain routes to handle leachate. Under the Source Water Protection program, an Events-based Area for fuel handling/storage threats were identified for the town of Tornbury (see map attached). The only threat of concern in this Area is fuel handling/storage greater than 50,000L.

Also, you will notice on the map that the propose routes all fall outside the source water protection area, therefore, we do not have any comments regarding these options.

Please note that comments may still be required from Grey Sauble Conservation regarding CA Act Regulations.

Regards,

Carl Seider, Risk Management Official

Grey Sauble Conservation
Risk Management Office
237897 Inglis Falls Road, RR 4
Owen Sound, Ontario, N4K 5N6
Phone: 519-470-3000 Ext. 102
Toll Free: 877-470-3001
Fax: 519-470-3005
c.seider@greysauble.on.ca

Celebrating 60 Years
Grey Sauble Conservation

From: Kelly Vader [mailto:kvader@bmross.net]
Sent: Monday, May 08, 2017 4:40 PM
To: Carl Seider <c.seider@waterprotection.ca>
Cc: Jeffery Fletcher (jfletcher@thebluemountains.ca) <jfletcher@thebluemountains.ca>
Subject: Town of the Blue Mountains - Class EA

Mr. Seider:

Our office has been undertaking a Class EA process, on behalf of The Town of the Blue Mountains, to address the management of leachate at the Blue Mountains landfill site.

The preferred alternative reached through the EA process is to pump leachate that is collected within lined portions of the landfill site, to the existing Thornbury Wastewater Treatment Plant for treatment, via a forcemain.

Several of the possible routes for the forcemain are located within the IPZ-2 for the Thornbury water intake. We are seeking your input on this project in order to identify potential concerns related to the Source Water protection that can be incorporated into the final route selection process for the forcemain route or the detailed design phase of the project.

I have attached one of the figures from the draft EA report that shows the proposed forcemain routes in relation to sensitive areas associated with Source Water Protection. These layers were provided to us by the Town of the Blue Mountains.

Thanks very much for your assistance with this project.

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

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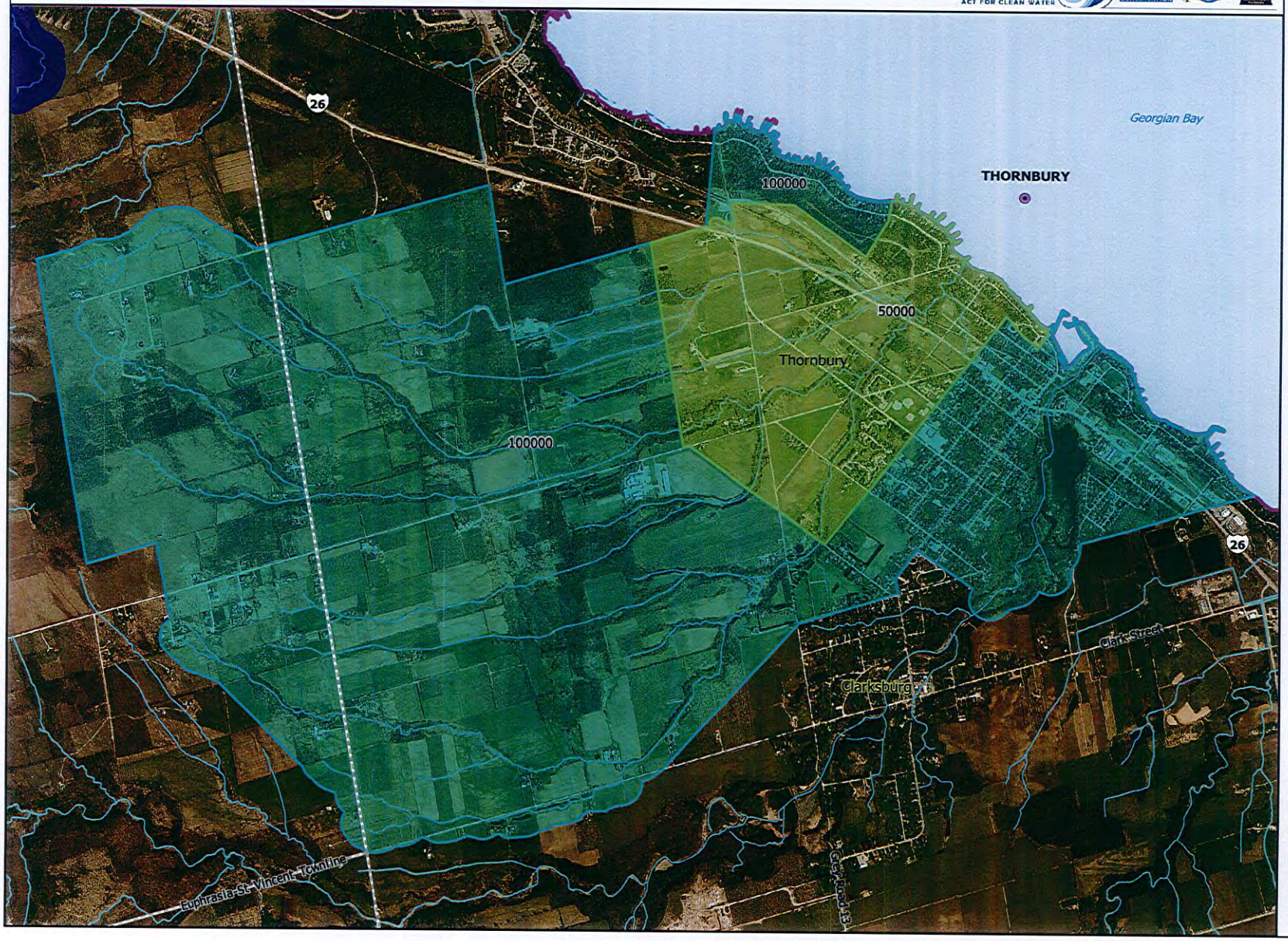
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

MAP 5.2.BM.T.1 THORNBURY DRINKING WATER SYSTEM EVENTS-BASED AREA POLICY COMPONENTS

Amended Source Protection Plan



- Municipal Intake
- Watercourse
- Source Protection Region Boundary
- Neighbouring Events-Based Area
- Lake

Events-Based Area Policy Components

- EBA-50000
- EBA-100000

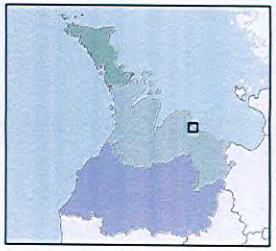
5000 Minimum Volume Required for Policies to Apply (Litres)

0 — 1000 m

1 : 22,000

Projection:
UTM NAD 83 Zone 17

N W E S



DRAFT

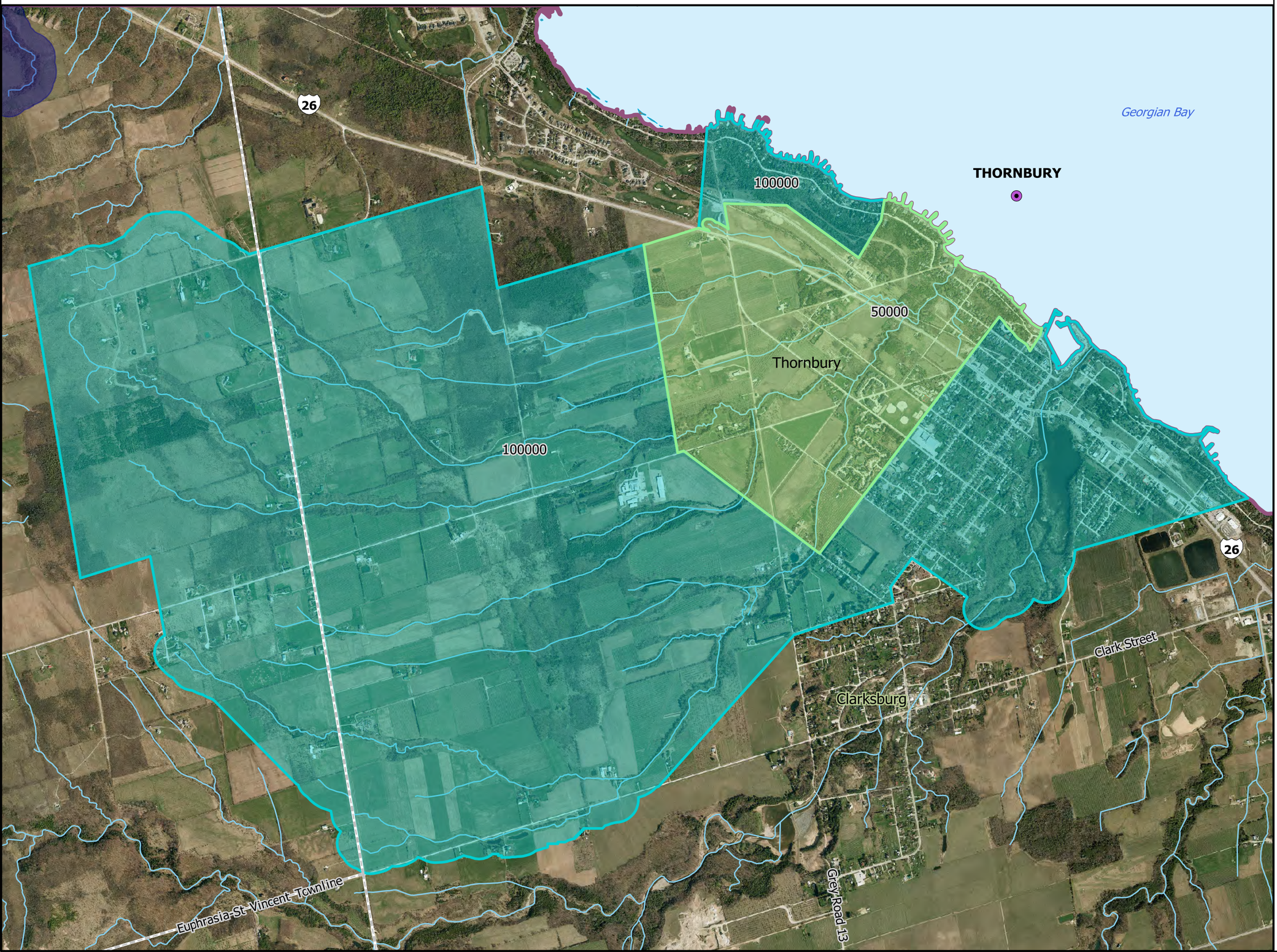
November 27, 2015

Events-Based Area and Events-Based Area Policy Components delineated by DWSP Staff based on Technical Studies completed by Baird & Associates.

Disclaimer: This map has been compiled from various sources and is intended for illustrative purposes only. It should not be used as a precise indicator of routes nor as a guide to navigation.

MAP 5.2.BM.T.1 THORNBURY DRINKING WATER SYSTEM EVENTS-BASED AREA POLICY COMPONENTS

Amended Source Protection Plan



Municipal Intake

Watercourse

Source Protection Region Boundary
Neighbouring Events-Based Area
Lake

Events-Based Area Policy Components
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EBA-100000

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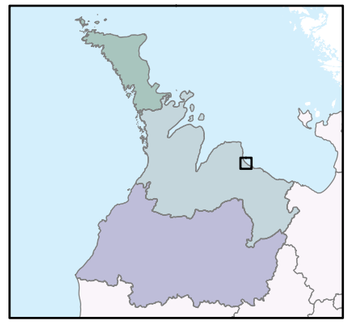

DRAFT

November 27, 2015

From: Kelly Vader
To: Carl Seider
Cc: Jeffery Fletcher; RMO Mailbox; Andrew Sorensen
Subject: Re: Town of the Blue Mountains - Class EA
Date: Tuesday, May 9, 2017 9:34:09 AM

Thanks very much Carl. The CA was circulated as part of the Class EA process.

Kelly Vader

Sent from my BlackBerry 10 smartphone on the Bell network.

From: Carl Seider
Sent: Tuesday, May 9, 2017 9:30 AM
To: Kelly Vader
Cc: Jeffery Fletcher (jfletcher@thebluemountains.ca); RMO Mailbox; Andrew Sorensen
Subject: RE: Town of the Blue Mountains - Class EA

From : Carl Seider [c.seider@waterprotection.ca]
To : Kelly Vader [kvader@bmross.net]
Cc : Jeffery Fletcher (jfletcher@thebluemountains.ca) [jfletcher@thebluemountains.ca], RMO Mailbox [rmo@greysauble.on.ca], Andrew Sorensen [a.sorensen@greysauble.on.ca]
Date : Tuesday, May 9 2017 09:26:58

Hi Kelly,

Thanks for the email concerning the proposed forcemain routes to handle leachate. Under the Source Water Protection program, an Events-based Area for fuel handling/storage threats were identified for the town of Tornbury (see map attached). The only threat of concern in this Area is fuel handling/storage greater than 50,000L.

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Regards,

CSeider_email_60years_GSCA

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Email: info@thebluemountains.ca
Website: www.thebluemountains.ca

May 18, 2017

Doran Ritchie
Land Use Planning Coordinator
Saugeen Ojibway Nation
Environment Office

Via email: d.ritchie@saugeenojibwaynation.ca

RE: Response to SON Comments from April 28, 2017 Letter

Dear Mr. Ritchie:

Thank you for forwarding concerns and comments on the Class Environmental Assessment to address leachate management at the Blue Mountains Landfill Site (EA). The Town has completed a review of your April 28th letter and has address each section of your letter in the list of comments below.

1. Meeting Notes: Record of the January 18, 2017 in-person meeting was forwarded to SON May 8th, 2017. These will also form part of the Final EA Report.

2. Previous SON Comments: Town addressed SON's preliminary comments in the Draft EA Report. This specific content was added to address comments and detail the specifics of the plant and leachate generation. Once a route is selected and a detailed design process is initiated, more refined numbers can be reviewed and specific mitigation measures proposed and put in place.

3. Duty to Consult: The Town has broad respect for the requirements and principles of the duty to consult and will continue to provide the support and time needed to meet these requirements. To date the Town has: initiated direct contact with SON; provided SON with copies of any and all requested reports; entered into a consultation agreement and provided the associated financial capacity; held an in-person meeting with SON and their consultants; and responded to EA related comments with specific sections in the EA Report to address comments and concerns. The Final Report will summarize the First Nations and SON consultation process and explain more thoroughly the requirements related to the duty to consult.

4. Protection of Water Resources and Environmental Ecological Areas: As part of the EA process, an evaluation of Terrestrial and Aquatic Resources was completed. Specifically the study examined how each route interacts with wetlands, woodlands, areas of natural and scientific interest (ANSI) and more. During the preliminary design phase of the project, a detailed assessment of the preferred route(s) will be done to identify sensitive species or habitats potentially impacted by the forcemain construction to inform the route selection and to avoid and mitigate potential impacts.

5. Source Water Protection Plan: The Draft EA has identified piping the leachate as the preferred option. Several possible routes are located within vulnerable areas identified as part of the Source Water Protection Plan prepared by the Grey Sauble Source Water Protection Area. Input has been sought from Source Water Protection staff and they have confirmed that none of the routes are located within areas identified for protection through the Source Protection Plan. A copy of their correspondence is appended to this letter.

6. Water Quality Monitoring: The Town has increased monitoring (from one sampling round to 3 sampling rounds per year on 31 monitoring wells and 3 stream locations) in conjunction with the recent landfill upgrades and will continue to follow compliance requirements and consider recommendations as monitoring continues. The Town will also be sampling leachate quarterly to assist in understanding trends in leachate quality. The Town recognizes both ground and surface water influences identified in the 2014 Reports, however the 2015 and 2016 Reports identify that all parameters are typical of background quality and the Indian Brook is not considered to be impacted by landfill operations. The 2015 and 2016 reporting years increased the testing to 3 times per year and this will continue for 2017. The Site's Landfill Reclamation Project was in part undertaken to assist in reducing the potential impacts on the Indian Brook and the local groundwater. The Project included increasing the buffer to the Brook and adding a liner and leachate collection system. It is expected that the trend of reducing water impacts will continue with leachate collection and treatment.

7. Correlation among Water Resources Components and Impact on Water Quality: The Draft EA did not make reference to the function of existing storm water systems as the project's focus is on managing leachate – which would not be achieved through storm water systems. The Site Design and Operations Plan approved under the ECA prepared a hydrologic model dividing the Site into pre and post drainage areas. The Site design and construction completed in 2015, maintains separation between water impacted by waste (leachate) and surface water. A newly constructed surface water swale terminates 70 metres from the Indian Brook and is not connected to waste impacted water. A section will be added to the EA Report explaining the current Site's surface water runoff conditions and how it relates to the leachate being collected within lined portions of the Site for collection and treatment.

   The 2014 Benthic Report does indicate that impacts at station 3 may be related to runoff from the Disposal Site, however there is presently no surface water conveyance directly to the Indian Brook. The surface water swale constructed as part of the 2014/2015 expansion project terminates 70 metres from the Brook's channel and into a gabion mattress designed to eliminate erosion. The 70 metre distance beyond the swale termination is also well vegetated which prevents erosion and the transport of turbidity from landfill operations. The attached drawings illustrate (page 2) existing stormwater conditions at the Landfill Site and the location of the current outlet structure (gabion mattress).

   Erosion control measures are in place in accordance with the Design and Operations Plan and will continue to be utilized in operations and future construction projects.

8. Water Quality Environmental/Ecological BioMAP Monitoring Program: We note that the study referenced in this section of SON's correspondence was completed in 2013, prior to completion of the landfill expansion and mining upgrades to the Site. Upgrades completed in conjunction with the landfill expansion are expected to result in significant improvements to

groundwater and surface water quality within Indian Brook and adjacent lands. Specific improvements incorporated into the upgrades were as follows:

- Mining and removal of waste from the former Thornbury Landfill which was located immediately adjacent to Indian Brook at the east extent of the Landfill Site;
- Adjustment to the landfill boundary adjacent to Indian Brook to increase the buffer to 130 metres;
- Water tight lining of the disposal cell located closest to Indian Brook so that all leachate is collected for disposal rather than undergoing natural attenuation within the underlying groundwater layer.
- Introduction of a surface water drainage system around the perimeter of the lined cell to prevent surface water flows from interacting with the active cell. Discharge of surface drainage some distance from Indian Brook to a gabion mattress to encourage energy dissipation, prevent erosion and discourage concentrated flow paths from forming.
- The Town added an additional water quality monitoring station immediately downstream of the Landfill in Indian Brook starting in the 2014 monitoring year, as per recommendations from the 2013 Water Quality Assessment Report, Golder 2014. This station will continue to be sampled as part of the ongoing Site monitoring program for both water quality perimeters and benthic study in accordance with provincial regulation and the Town Environmental Compliance Approval.

We are unsure of the SON reference to the August 5, 2016 amended ECA, which was for the Thornbury WWTP, not the Landfill Site. The February 26, 2014 ECA for The Blue Mountains Landfill Site does not include a recommendation for BioMAP monitoring every 2 years, instead recommends a continuation of the 5 year sampling protocol currently in place. The Town suggests that this recommendation be reevaluated following completion of the 2018 benthic sampling event, which will provide an updated analysis of the benefits that the above-noted site improvements may have had on water quality within Indian Brook.

9. <u>Projections of Leachate Volume and Strength and Thornbury Water Pollution Control Plant:</u>

The technical justification for leachate volume is based on that found in the attached assessment and model.

The calculation is summarized here:

> 2D surface area of liner (17,493 m) X Annual Average Rain Fall (991.3mm)
> = 17,341 m3/year (47.5 m3/day)

The July 2012 Landfill Expansion and Mining Environmental Screening Report estimated that annual leachate volumes collected within the newly lined cell after a few years would average 6,000 m^3/year. Following the initial year of operation, leachate volumes have averaged closer to 18,000 m^3/year due to the lack of waste material within the lined cell to absorb rainfall, which is also consistence with 100% capture expressed in the Golder “HELP” model. It is anticipated that the annual volume of leachate collected within the cell will continue to decline over time as waste deposition continues.

A blended annual flow for the life of the cell (14 years) is expressed as 9,578 m3 per year and the attached memo “Annual Leachate Generation Update Calculation”, May 4, 2017 outlines

the calculations to support an average annual flow of 9,578 m3 or 26.24 m3 per day flow. This memo also outlines the calculation used to determine equivalent units, this calculation is based on the findings in the Town 2016 Annual Wastewater Report and a five year rolling average based on total annual flows.

10. Due to the low waste volumes, the leachate is currently extremely dilute and would require little additional treatment. The Town anticipates that the leachate quality will strengthen over time. It is proposed that the leachate would be sampled quarterly to monitor changes over time as waste volumes increase. The current Thornbury WWTP EA addendum process is ongoing and is anticipated to be completed by the fall of 2017. This work is being completed by a different engineering consultant and is separate from the Class EA for Leachate Management process. The consultant completing the EA addendum and subsequent ECA application has been advised of the anticipated addition of leachate to the waste stream and is including an analysis of potential impacts related to the addition of leachate to the WWTP, in their assessment. This will include a consideration of potential quantity and quality impacts and will ensure that the Plant has the capacity to treat incoming landfill leachate without detrimental impacts to plant operations or the receiving water body. The Plant's effluent will be in compliance with all regulations and the new ECA.

    Using the blended daily flow of 26.24 m3 per year identified in the above section 9, the Plant hydraulic capacity would be in the range of 75% or an increase of less than 2 percentage points. This represents a relatively low impact on Plant flows.

11. Wet Weather Conditions: As noted above, the Town is in the process of completing an EA addendum for renewal of the Thornbury Wastewater Plant ECA. This amendment is reviewing treatment capacity related to leachate volume and treatment and how the additional flow may impact operations and the need for additional monitoring if any. The Town is committed to addressing potential flow and treatment concerns, as they relate to the receipt of leachate and other wastewater streams at the Thornbury WWTP.

    The leachate EA Report highlights the significant storage the landfill liner has which can be used if a need to reduce flows to the treatment Plant ever occurs.

12. Option 4 Pipe Alignment Route: Once a preferred route is selected, detailed habitat assessments will be completed in order to identify sensitive habitats such as wetlands or habitat that may support species at risk. If identified, site specific mitigation measures will be developed and incorporated into the engineering drawings and contract documents to ensure that impacts to these sensitive areas are avoided.

    The Town is committed to minimizing disruption to wetlands during future construction and will develop a plan to mitigate impacts during forcemain construction and operation. Additional text has been added to the EA Project File documenting this commitment.

13. First Nation – SON Consultation Plan: The Town is committed to continued consultation with SON through the design stage.

The Town looks forward to advancing this project and views the work as a step towards improving the environmental performance of the Disposal Site. The Town looks forward to meeting with SON on May 23, and discussing the project further.

Sincerely,
The Blue Mountains

Jeffery Fletcher
Manager of Solid Waste and Environmental Initiatives

Cc: Kelly Vader, BM Ross and Associates Limited
Craig Newton, Ministry of Environment and Climate Change

Appendix 1

Meeting Notes
Leachate Management Municipal Class EA, Schedule 'B'

Date: May 23, 2017

Location: The Blue Mountains Landfill Site & the Offices of the Town of the Blue Mountains

Attended by: **The Town of the Blue Mountains:**
Reg Russwurm - Director of Engineering and Public Works
Jeffery Fletcher - Manager of Solid Waste and Environmental Initiatives

SON:
Doran Ritchie - Environmental Planner
Bill Armstrong - SON Expert
Berta Krichker - SON Expert

DISCUSSION ITEMS:

The Town of the Blue Mountains (the Town) informed SON that:

- The Notice of Completion for the Leachate Management Municipal Class EA (Schedule B) at the Blue Mountains Landfill Site is intended to be issued in June 2017.

- The Town obtained confirmation that the Source Water Protection Areas are not located within the project area. **SON recommends that this information be included in the Leachate Management Class EA Final Draft Report.**

- The 2018 Water Quality Assessment of the Indian Brook-cold water fishery system, including the BioMap monitoring program, is scheduled to be undertaken in 2018 by Golders.

- The proposed Indian Brook crossing is intended to be constructed by directional drilling. Should Option #4, as recommended by this Class EA Draft Report Route Alignment, be confirmed at the project design stage upon completing the detailed cost assessment of this option, this construction method should substantially minimize potential environmental adverse impacts on this cold water fishery system. SON supports this proposed construction method for the subject crossing. **SON recommends that this information be included in the Leachate Management Class EA Final Draft Report.**

- The Town initiated a Municipal Class EA Addendum for the Thornbury Wastewater Treatment Plant (TWTP) and this Addendum is intended to review TWTP existing and proposed capacities and include the estimated leachate volumes, loading/strength for this plant treatment under dry and wet weather conditions. SON welcomed this Class EA Addendum commencement. Also, SON is under the opinion that this study would have an opportunity to address SON comments/concerns regarding engineering/technical justifications to reaffirm the preliminary evaluation of TWTP treatment capacity under all above noted conditions. **SON requests to review this Municipal Class EA Addendum for TWTP, upon the Town receiving this information.**

- Further leachate testing and monitoring continue and the current testing results identified that the leachate strength has increased. **SON recommends that this information be included in the Leachate Management Class EA Final Draft Report and the Town should consider including this information in the ongoing Municipal Class EA Addendum for TWTP.**

- Consideration to combine the leachate and the apple industry wastewater discharges into the Leachate Management Class EA's proposed conveyance collection system has been reviewed, but it will not be implemented. Therefore, this proposed conveyance collection system is intended to serve the proposed leachate flows. **SON recommends that this information be included in the Leachate Management Class EA Final Draft Report.**

Discussions also took place about the following various definitions of phases/stages that were used in reference to this project such as:

- Phases of Municipal Class EA process,
- Stages and phases of this project, and
- SON's Consultation Process Phases/Stages

All agreed that the Municipal Class EA process consists of 5 Phases and is subject to the Municipal Class EA project schedule and other considerations.

It should be noted that:

- SON's correspondence on January 3 and February 27, 2017 reiterated all major intent and requirements of the SON Consultation Process for Stages 1, 2 and 3 and included the SON's preliminary review comments for Stage 1 of all preliminary information/documents/reports provided by the Town and BM Ross, prior to receiving the Class EA Leachate Management Draft Report.

- Generally, the Class EA proponent receives the review comments for the Municipal Class EA projects after issuing by the proponent a Notice of Completion of the Class EA and after or during the compulsory 30-day Municipal Class EA review period, which commences only after EA projects completed. The preliminary reviews and comments give an opportunity to find mutually acceptable resolutions and to complete the project successfully in an efficient and timely manner. SON and MOECC staff are under the opinion that preliminary consultation (pre-submission consultation) with First Nations Communities initiated by a proponent is beneficial and more effective in the consultation process.

- The SON Consultation Process, as identified in SON's previous correspondence, consists of 3 stages and we are working to complete Stage 2 of this process.

The Saugeen Ojibway Nation (SON) advised the Town that:

Based on the Town's information that the 2018 Water Quality (Biological-BioMap and Basic Chemistry Monitoring) Assessment of Indian Brook cold water fishery system is scheduled to be undertaken in 2018 by Golders, SON agreed that the requested expansion of this Water Quality Assessment Monitoring Program of Indian Brook shall be postponed until the Town receives the 2018 Water Quality Assessment and monitoring report results, subject to the following conditions:

Should the 2018 Golders Water Quality Assessment of Indian Brook report monitoring results identifies water quality improvements for this cold water fishery system, SON, upon reviewing and accepting these results, will withdraw any request for further improvements and expansion of this monitoring program.

Should the 2018 BioMap monitoring program not show improvements in water quality conditions compared to the 2014 Golders Water Quality Assessment of the Indian Brook report, and specifically, based on the BioMap monitoring results, SON will recommend to expand this Water Quality Monitoring Program as follows:

- To add 1-2 station(s) immediately downstream of the site, as recommended by the 2014 Golders Water Quality Assessment of Indian Brook report; and
- BioMAP monitoring shall be undertaken every 2 years instead of 5-year intervals, as identified in the Amended Environmental Compliance Approval (ECA) dated August 5, 2016.

SON requests that this information be included in the Leachate Management Class EA Final Draft Report. SON requests a copy of the 2018 Golders Water Quality Assessment of Indian Brook report with BioMap monitoring report be forwarded to SON for review as soon as possible.

It should be noted that:

In accordance with SON's comments on February 27 and April 28, 2017, based on the review of the BioMAP (2013) monitoring results presented in the 2014 Golders Water Quality Assessment of Indian Brook Report, SON recommended to expand this monitoring program, due to the following water quality deficiencies:

- Station 2 (upstream) is "undetermined", although Station 1 (downstream) remains "unimpaired";
- Station 3 (just downstream of the site) is showing signs of ecological impacts and it is "impaired" for these portions of the Indian Brook-cold water fishery system;
- Station 3, in 2013, had fair water quality with fairly significant organic pollution;
- Station 3 had elevated concentrations of magnesium, phosphorous, iron and turbidity, nitrate, nitrite was relatively higher as well; and
- 2014 Golders Water Quality Assessment of the Indian Brook report recommended to expand the annual water monitoring program and to add 1-2 station(s) immediately downstream of the site.

A new ECA Addendum will be required to be issued by MOECC to incorporate the above-noted modifications.

Effective robust erosion control measures are required to be implemented as soon as possible at the site to protect the water quality of the Indian Creek - cold water fishery system.

Next Steps

1. The Town will undertake the required level of archaeological evaluations for the Leachate Management Class EA preferred Route Alignment Options and discuss all archaeological options with SON to obtain acceptance of the recommended option prior to proceeding with the design and construction of these works.

2. SON will submit for the Town of the Blue Mountains approval the estimated budget for completion of Stage 2 and Stage 3 of the SON Consultation Process for the Leachate Management Class EA Final Report and the implementations-design and construction of these works.

3. Upon accepting and including SON's recommendations and requests, as well as providing funding capacity for SON to complete the SON Consultation Process for this Class EA, SON will issue an acceptance letter for the recommended solution and recommended works.

First Nation/SON Consultation Plan Expectations

1. The Town meet the EA requirements as 'duty to consult' in accordance with the EA Act in relation to SON's consultation practices and vision/traditional knowledge.

2. The Town provide SON's funding capacity and the required agreements to participate and be part of the solution for this EA.

3. The Town incorporate SON recommendations in the Leachate Management Class EA Final Report and receive the SON acceptance for the recommended solution.

SON Expectations From MOE CC

1. MOECC direct and ensure that the Town meet all obligations of the 'duty to consult' with SON under the EA Act.

2. MOECC ensure that SON's vision/traditional knowledge be included in the consultation for this project.

June 30, 2017

Mr. Reg Russwurm MBA P.Eng.
Director of Engineering and Public Works
The Town of the Blue Mountains
32 Mill Street, PO Box 310
Thornbury ON N0H 2P0

Dear: Mr. Russwurm:

Re: Town of the Blue Mountains - Municipal Class Environmental Assessment Schedule "B" for Leachate Management at the Blue Mountains Landfill Site

On behalf of the Saugeen Ojibway Nation (SON), I would like to thank you for an informative meeting, and well-organized field visits to the Blue Mountains Landfill Site and the Route Alignment sites which are recommended in the Municipal Class Environmental Assessment (EA) Leachate Management Draft Report.

We appreciate your engagement with SON in this Class EA study consultation and the comprehensive, open and effective dialogue.

At the meeting on May 23, 2017, we discussed SON's review comments for the Leachate Management Class EA Draft Report forwarded to the Town on April 28, 2017. Please see the attached meeting notes (Appendix 1) developed by SON which includes the main discussion items and recommended, mutually acceptable resolutions in order to finalize this Class EA in a timely manner.

As discussed, SON's main objective is to ensure there are no potential adverse impacts on the fishery, terrestrial/aquatic, environmental/ecological health and water resources system, specifically on the Cold Fishery systems such as the Indian Brook and the Beaver River by the Class EA Leachate Management proposed solution/options.

All recommendations included in the attached meeting notes, together with all SON correspondence for this project, are required to be included in the Leachate Management Class EA Final Draft Report as part of the consultation process records with SON. Also, all SON recommendations are to be included in the Commitments Section of the Leachate Management Class EA Draft Final Report.

As previously identified in SON correspondence, all expenses incurred by SON to participate in this Municipal Class EA Consultation Process are the responsibility of the proponent and the SON Consultation Process for the Class EA Leachate Management consists of 3 Stages as follows:

Stage 1 - in the initial phase of this Class EA study includes environmental/technical assessment of all applicable documentation including archaeological, natural heritage-terrestrial/aquatic, environmental, ecological, hydrogeology, water resources, geotechnical and legal reports, which sometimes include a legal review of the potential impacts of the project on rights and land claims.

- SON completed the Stage 1 review of all provided information/reports for the initial pre-consultation phase (prior to the Class EA Draft Report being finalized) of this Class EA study, and forwarded the preliminary review comments to the proponent on February 27, 2017. Stage 1 of the SON

Consultation Process budget was approved by the Town and funds were received by SON. The natural heritage-terrestrial/ aquatic/archaeological and legal (if required) components were postponed to Stage 2.

➢ As discussed and agreed upon at the meeting on the January 18, 2017, SON reallocated the approved Stage 1 Budget funding for all uncompleted components to finalize the SON preliminary review comments under the pre-submission consultation for Stage 1 of the SON Consultation Process for all additional technical/environmental reports and information provided in January-February 2017 by BM Ross and the Town of the Blue Mountains.

Stage 2 - The final review of the EA project, SON Environmental Office staff recommendations and to SON leadership regarding all critical technical/environmental aspects of the project; SON will determine reasonable, suitable consultation, the required economical accommodation, undertake all necessary discussions with the proponent and SON leadership and/or if necessary (environmental) protection agreement short or long term.

➢ SON is presently working to complete Stage 2. The SON Consultation Process Stage 2 budget is attached for the Town's approval.

Stage 3 - The implementation and monitoring of any agreements which arise from the SON leadership discussion.

➢ Stage 3 will start upon the acceptance of this Class EA by the public, First Nations Communities, approval agencies and commencement of project implementation. Stage 3 of the SON Consultation Process budget will be submitted upon completion of Stage 2.

Upon receiving the Stage 2 SON Consultation Process funding (Appendix 2 - Consultation Process, Stage 2 Estimated Budget) from the Town and finalizing SON's review of the Leachate Management Class EA Draft Final Report, which will include all of SON's technical/environmental recommendations and mitigation measures (if necessary) identified in the Meeting Notes (Appendix 2), the SON Environmental Office will recommend SON leadership to be agreeable and provide a letter withdrawing any objections to the Leachate Management Class EA Draft Final Report's solution.

We look forward to working together to complete successfully this project.

Respectfully,

Saugeen Ojibway Nation Environment Office

Doran Ritchie
Land Use Planning Coordinator

Attach – Appendix 1-Consultation Process Stage 2 Estimated Budget
Appendix 2 – Meeting Notes

cc: Jeffery Fletcher, Town of Blue Mountains

Craig Newton, MOECC

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TOWN OF THE BLUE MOUNTAINS
CLASS EA FOR LEACHATE MANAGEMENT

Saugeen Ojibway Nation (SON) Meeting Notes
July 12, 2017

Group: Saugeen Ojibway Nation
Location: Town of The Blue Mountains Municipal Office via telephone conference

Time Started: 3:00 p.m. **Time Ended:** 4:00 p.m.

In Attendance:
Doran Ritchie (Saugeen Ojibway Nation)
Reg Russwurm (Town of The Blue Mountains)
Allison Kershaw (Town of The Blue Mountains)
Kelly Vader (BMROSS)
Jeffery Fletcher (Town of The Blue Mountains)

Meeting Details:

Reg began the meeting by welcoming everyone. Reg outlined that the Town is general in agreement with the discussion in the Meeting Notes from May 23, 2017 (Appendix 1 from the June 30, 2017 letter). However, Reg did note that some of the requests may be difficult for the Town to commit to and that the concept of gaining consent from SON is new to the process and not anticipated.

Reg gained clarification of the use of the $8,400 in Stage 1 from Doran and asked if the Stage 2 requested amount would also be covering work completed in Stage 1.

Doran confirmed that the $6,200 would cover cost over runs from Stage 1 and completion of Stage 2 and that a summary document accounting for the use of funds would be provided to the Town.

Reg then began to review the Meeting Notes and associated requests/comments provided in Appendix 1.

On page 1 bullet 3 a discussion was had related to directional drilling, Reg noting that this is preferred. Kelly pointed out that one thing that is unknown at this time and could prevent

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directional drilling is the presence of bedrock. Doran asked about the process if bedrock is found. Reg noted that early in the route selection work geotechnical work will be completed to understand the conditions and if bed rock is found alternatives would be offered and considered.

The last item on the 1st page of Appendix 1 dealt with the Municipal Class EA addendum for the Thornbury Wastewater Treatment Plant. Reg noted that early notification would be sent to SON and the draft addendum, to allow SON advanced time to review the addendum prior to the 30 day notice. This is likely to occur in the next couple of weeks as the ECA renewal must be in place prior to 2018.

Doran requested that the Class EA draft addendum be sent directly to SON's consultants, Reg confirming that would be arranged. Reg also noted that the concept of adding leachate to the Thornbury Plant was examined in the addendum work and it was found that the volume of anticipated leachate would only account for around 1% of the Plant's total flow.

Reg noted in relation to bullet 1 on page 2 that the leachate sample results have been informing the Plant addendum work.

With regard to bullet 2 on page 2 one of the apple related industrial units has expressed an interest in future connect but connection would likely come at a later date and would be treated like any other industrial connection.

It was noted that the remaining information on page 3 were points of discussion and no actions were attached.

On page 3 bullet 1 reference was made to the Town's benthic monitoring of the Indian Brook. Jeff indicated that the Golder report referenced does recommend adding station 3 (the station immediately downstream of the Landfill) to the annual surface water sampling program. Jeff noted that this station was added in 2014 and continues to be sampled.

Doran mentioned that he would review this with his Consultants. Post Meeting Note: Doran did review with his consultants and has agreed to remove the request to add more benthic sampling stations in the Indian Brook.

This section also dealt with 2018 benthic sampling, SON would like to review the results and request that more frequent sampling be done if impairment is shown.

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A discussion was had regarding the concept of committing to having the MOECC incorporate the "above-noted" into either a Plant addendum or a Landfill Site amendment – the Town's position was this cannot be committed to because the Town cannot control what the MOECC includes as conditions. Post Meeting Note: Doran committed to having his consultants speak with Craig Newton of the MOECC with regard to this point and when the MOECC may be able to comment on the EA.

Jeff then discussed the point regarding erosion control and the thought that this concern, that the Landfill was contributing to Indian Brook sedimentation, was ruled out during the Site visit on May 23, 2017. Post Meeting Note: Doran confirmed that due to the well-established buffer and the condition of the Disposal Site that the Site was not contributing to brook sedimentation.

Reg then review next steps covered in the Appendix and confirmed the plan to involve SON early on in the route selection process and that consultation with SON regarding archaeology and environment has been written into the design work plan.

A discussion was then had around the concept of SON's "acceptance" of the design. Doran noted that SON would accept the Town's route regardless, however if a less desirable route is selected it may cost the Town more in the long run related to mitigation and archeological investigation. Reg also pointing out that the Town recognizes these concerns from SON and other influences on route selection and that these multiple influences will all be taken into consideration, and getting SON's input early in the route selection process will help the Town greatly.

Doran indicated that once the Town has some proposed preferred route(s) that SON can review with their expert to assist the decision process.

Further to the next steps, Reg noted that the Town is putting together a cheque for the Stage 2 funding request. Reg also requested that with that funding support that SON commit to a 2 to 3 week turn-a-round on the final draft review so that the Town can, in a timely way, proceed to the 30 notice of completion. Doran suggested he would put a fast track review in place. Post Meeting Note: Doran has committed to a 3 and maximum 5 day review time.

Kelly noted she will post the report to an FTP site for Doran and the SON consultants to download.

On page 4 of the appendix 1 again the concept of SON "acceptance" was noted. Doran outlined that use of that term is not related to acceptance of the overall project. It is related to the

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Town's acceptance of SON's input and SON's acceptance of the project's consultation record i.e.: is the consultation record accurate.

Kelly noted that when all are reviewing the final draft any changes from the last version have been highlighted to allow ease of review. And, a proposed notice of completion date will be mid-August.

Reg took the time to indicate to Doran that a route selection/design RFP would soon be released by the Town and perhaps prior to the finalization of the EA. This is to get ahead of the 2018 construction season and allow for some fall survey work and winter design.

The meeting then ended.

CHIEFS AND COUNCILS
SAUGEEN OJIBWAY NATION

Chippewas of Saugeen, RR 1, Southampton ON N0H 2L0 519-797-2781
Chippewas of Nawash, 135 Lakeshore Blvd, Neyaashiinigmiing ON N0H 2T0 519-534-1689

July 25, 2017

SENT VIA EMIAL

Mr. Reg Russwurm MBA P.Eng.
Director of Engineering and Public Works
The Town of the Blue Mountains
32 Mill Street, PO Box 310
Thornbury ON N0H 2P0

Dear: Mr. Russwurm:

Re: Town of the Blue Mountains - Municipal Class Environmental Assessment Schedule "B" for Leachate Management at the Blue Mountains Landfill Site

On behalf of the Saugeen Ojibway Nation (SON), I would like to thank you for providing SON with the Second Draft Report of the Municipal Class Environmental Assessment (EA) Leachate Management for the Blue Mountains Landfill Site (Second Draft).

SON and its experts reviewed the Second Draft provided by BM Ross on July 19, 2017. We are pleased to acknowledge that SON's comments (as part of the SON Consultation Process - Phases 1 and 2 - and under the Consultation Process between the Proponent, The Town of the Blue Mountains, and First Nations Communities under the Environmental Assessment Act) were incorporated into the Second Draft.

This Second Draft also identified the Town's commitment to undertake an Archaeological Investigation Stage 2 along the preferred forcemain route, and to undertake all required consultation with SON for this investigation once the preferred forcemain route is selected, as discussed and agreed upon at the meeting on May 23, 2017.

Furthermore, the Second Draft identified that:

- a new Alternative of the forcemain route was added and a preliminary evaluation was undertaken;

- this added forcemain route Alternative mostly represents the modified forcemain route of Alternative # 4, however, this new forcemain route is intended potentially to reduce a number of the water crossings (Alternative # 4 was previously identified as the preliminary preferred forcemain route);
- a final selection of the preferred forcemain route alternative will be undertaken by the Town and its consultant at the detailed design stage of this project; and
- an additional detailed habitat assessment will be undertaken along the selected preferred forcemain route at the detailed design stage of this project, and this assessment is intended to identify sensitive habitat and species, evaluate potential impacts during construction activities and identify mitigation measures in the engineering design and material selections to address the potential impacts.

Therefore, based on the above-noted additional information identified in the Second Draft, SON requests that the Town, upon completing the selection and evaluation of the preferred forcemain route and completion of the detailed habitat assessment along the finalized preferred forcemain route at the detailed design stage of this project, will forward this information for review and comments to SON to continue the SON Consultation Process (**Stage 3**) for the successful completion of this work.

Please provide confirmation of this commitment to SON in the form of a letter so it may be incorporated in the Appendix of the SON Consultation of the Final Report of this EA.

We appreciate your engagement with SON in this Class EA study consultation, the comprehensive, open and effective dialogue, as well as the Town's commitment to Consultation with SON.

We look forward to working together to successfully complete this project.

Respectfully,

[redacted]

Doran Ritchie
Saugeen Ojibway Nation Environment Office
Land Use Planning Coordinator

cc: Jeffery Fletcher, Town of the Blue Mountains
Craig Newton, MOECC

Town of The Blue Mountains
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July 26, 2017

Delivered Via: Email

Doran Ritchie
Saugeen Ojibway Nation Environment Office
25 Maadookii Subdivision, Neyaashiinigmiing, ON, N0H 2T0

RE: The Blue Mountains – Municipal Class EA for Landfill Leachate Management
Stage 3 Consultation Commitment

Dear Mr. Ritchie,

Thank you for your comments with regard to the SON review of the final draft of the Class EA Project File. The Town will incorporate your letter from July 25, 2017 in the file consultation record. As requested in your letter, the Town will resume consultation with SON as part of a "Stage 3" Consultation Process once additional investigative work (archaeological and natural habitat) is complete associated with route selection.

The Town believes that the Class EA project has achieved meaningful engagement with SON and looks forward to a continued dialogue through the design stage. The Town will be posting the 30 day notice of completion for the Leachate Management Class EA, forthwith.

Sincerely,

Jeffery Fletcher
Town of The Blue Mountains
Manager of Solid Waste and Environmental Initiatives

CC: Reg Russwurm, Director of Infrastructure and Public Works
Kelly Vader, BM Ross

TOWN OF THE BLUE MOUNTAINS

CLASS ENVIRONMENTAL ASSESSMENT TO ADDRESS LEACHATE MANAGEMENT AT THE BLUE MOUNTAINS LANDFILL

NOTICE OF COMPLETION

THE PROJECT:

The Town of The Blue Mountains initiated a Class Environmental Assessment (Class EA) process in August 2016 to consider alternatives to address leachate management at The Blue Mountains Landfill site (see key plan). Currently, leachate is collected within the lined waste cell and then trucked to the Town's Craigleith wastewater treatment facility for treatment and disposal. The study considered a range of alternatives to address long term management of the leachate, including the following: i) Do nothing, continue to truck leachate, ii) On-site treatment and infiltration of leachate, iii) On-site treatment and discharge of leachate to Indian Brook, and iv) Pump leachate via forcemain to the existing sanitary collection system servicing Thornbury. Opportunities to partner wastewater servicing with adjacent commercial/industrial operations was also examined in conjunction with each of the alternatives being considered. The Class EA process investigated and evaluated each of the alternatives described above, including an analysis of life cycle costs for each over a 20 year time frame. From the investigation, the following preferred solution has been selected:

- Pump leachate via forcemain to the existing sanitary collection system servicing Thornbury

THE ENVIRONMENTAL SCREENING PROCESS:

This project is following the planning process established for Schedule 'B' activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to the completion of a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders, Aboriginal communities, and review agencies. The environmental assessment process has now been completed. There were no negative impacts identified with the project that could not be mitigated.

PUBLIC INVOLVEMENT:

A Project File documenting the Environmental Assessment process completed for this project is available for public review at The Town of the Blue Mountains municipal office (32 Mill Street, Thornbury ON) during normal business hours. A copy of the report has also been placed on the Town's website: http://www.thebluemountains.ca. For further information on this project, or to review the Class EA process, please contact the project engineers: B. M. Ross and Associates Ltd., 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (888) 524-2641. Fax (519) 524-4403. Attention: Kelly Vader, Environmental Planner. E-mail: kvader@bmross.net.

If environmental concerns arise regarding the project which cannot be resolved in discussion with the Town of The Blue Mountains, a person or party may request that the Minister of the Environment and Climate Change make an order for the project to comply with Part II of the Environmental Assessment Act which addresses individual environmental assessments. Requests must be received at the address below within 30 calendar days of this Notice. A copy of the request must also be sent to the project engineers and Town at the above addresses. If there is no request received by **September 4, 2017,** the project will proceed as planned.

The Minister of the Environment and Climate Change
11th Floor, 77 Wellesley St. W., Toronto, ON M7A 2T5
Fax: 416-314-8452

This Notice Issued August 4, 2017
Jeffery Fletcher, Manager of Solid Waste and Environmental Initiatives
Town of The Blue Mountains

APPENDIX D

ROUTE ASSESSMENT MEMO
TERRESTRIAL & AQUATIC HABITAT

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R3 • T 519.822.1609 • F 519.822.5389 • www.dougan.ca

Town of the Blue Mountains – Class EA to Address Leachate Management Route Option Ranking – Terrestrial and Aquatic Resources – October 2016

Introduction

Dougan & Associates, Ecological Consulting and Design (D&A) has coordinated the following review and assessment of the Options being considered, based on a desktop review of available aerial imagery, background information, and in consultation with B.M. Ross & Associates who have conducted a field review. D&A has assessed potential terrestrial constraints such as known wetlands, woodlands, and potential habitat for Species at Risk (SAR) within 120 metres of option alignments. Cam Portt, Senior Fisheries Biologist from C. Portt and Associates, provided input on potential aquatic habitat constraints, including number end extent of sensitive stream crossings, and potential aquatic Species at Risk.

Information Received and Reviewed to Date:

- Natural Heritage Information Centre database query for records of Species at Risk (SAR) and species of conservation concern (provincial Sranks of S1 to S3).
- Grey-Sauble Conservation Authority (GSCA) Regulation mapping.
- Niagara Escarpment Plan (2005)
- Ministry of Natural Resources and Forestry (MNRF) LIO mapping, which includes Wetlands, Waterbodies, Areas of Natural and Scientific Interest (ANSI), Land Management units, Greenbelt, Natural Areas, etc. (see Figure 1).
- MNRF Significant Wildlife Habitat (SWH) documents (OMNR 2000; OMNRF 2015).
- MNRF Species at Risk list (MNRF 2016).
- Fisheries and Oceans Canada information regarding aquatic Species at Risk listed under the Species at Risk Act (email from A. Geraghty, Fisheries and Oceans Canada, to K. Vader, B.M. Ross & Associates, September 7, 2016).

Information Requested but not Received to Date:

- Site specific Species at Risk (SAR) records and Endangered Species Act guidance from MNRF.
- Records of potential species of conservation concern (provincial Sranks of S1 to S3 and locally rare), or supplementary terrestrial/wetland data from Grey-Sauble Conservation Authority.
- Past Environmental Assessments or Environmental Impact Studies related to previous infrastructure projects by the Town or County.

Summary of Known Resources and Option Ranking

Figure 1 summarizes resource mapping based on the background sources summarized above. Table 1 provides the Terrestrial and Aquatic ranking of options based on known resources. All options contain treed areas that may be impacted (roadside, ornamental, hedges etc.); those options affecting woodlands are noted in Table 1. Table 2 summarizes the screening of Species at Risk that are known in the region, and their potential occurrences in the landscape and features that are present within the Study Area.

Conclusions and Recommendations

1. Seasonal studies of preferred options are required to avoid / mitigate impacts.
2. Potential bedrock or aquifer interactions during and post construction may affect aquatic habitat and wetlands; geotechnical assessment is recommended for preferred options.
3. Erosion control measures are required to protect sensitive features during construction.
4. Targeted SAR surveys may be required by MNRF; SAR impacts can likely be avoided or mitigated.
5. Open Country bird SAR (Barn Swallow, Bobolink, and Eastern Meadowlarks) and their habitats are not considered in the ranking of options; they will not be adversely impacted by forcemain construction if the nesting period is avoided (May 1 to Aug 1).
6. Significant Wildlife Habitat (SWH) has not been mapped by MNRF, Grey County, or the Town; therefore candidate or confirmed SWH was not considered in the ranking of options. Roadside options likely will have lower impacts to SWH than cross-country options.
7. Migratory Bird Convention Act (MBCA) compliance requires vegetation clearing outside the nesting period (May 1 to Aug 1).
8. Roadside trees are present under all options; tree surveys may be required for detail design in some areas where preliminary design indicates close proximity to trees.

References

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2016. COSEWIC Species Assessments (detailed version), October 2015. http://www.cosewic.gc.ca/eng/sct0/rpt/ dsp_booklet_e.htm

Fisheries and Oceans Canada. 2016. Information regarding aquatic Species at Risk listed under the Species at Risk Act; email from A. Geraghty, Fisheries and Oceans Canada, to K. Vader, B.M. Ross & Associates, September 7, 2016.

MBCA (Migratory Birds Convention Act). 1994. Available at: http://laws-lois.justice.gc.ca/eng/acts/M-7.01/

NHIC (Natural Heritage Information Centre). 2016. Srank Definitions. http://nhic.mnr.gov.on.ca/MNR/ nhic /glossary/srank.cfm

OMNR (Ontario Ministry of Natural Resources). 2000. Significant Wildlife Habitat Technical Guide. 151 pp

OMNRF (Ontario Ministry of Natural Resources and Forestry). 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E. January 2015. 41 pp

OMNRF (Ontario Ministry of Natural Resources and Forestry). 2016. Species at Risk in Ontario (SARO) List. Updated June 20, 2016. Available at: http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

Table 1 – Terrestrial and Aquatic Ranking of Forcemain Route Options from Landfill to Grey Roads 2 & 40 (four options) and Route Continuance (two options)

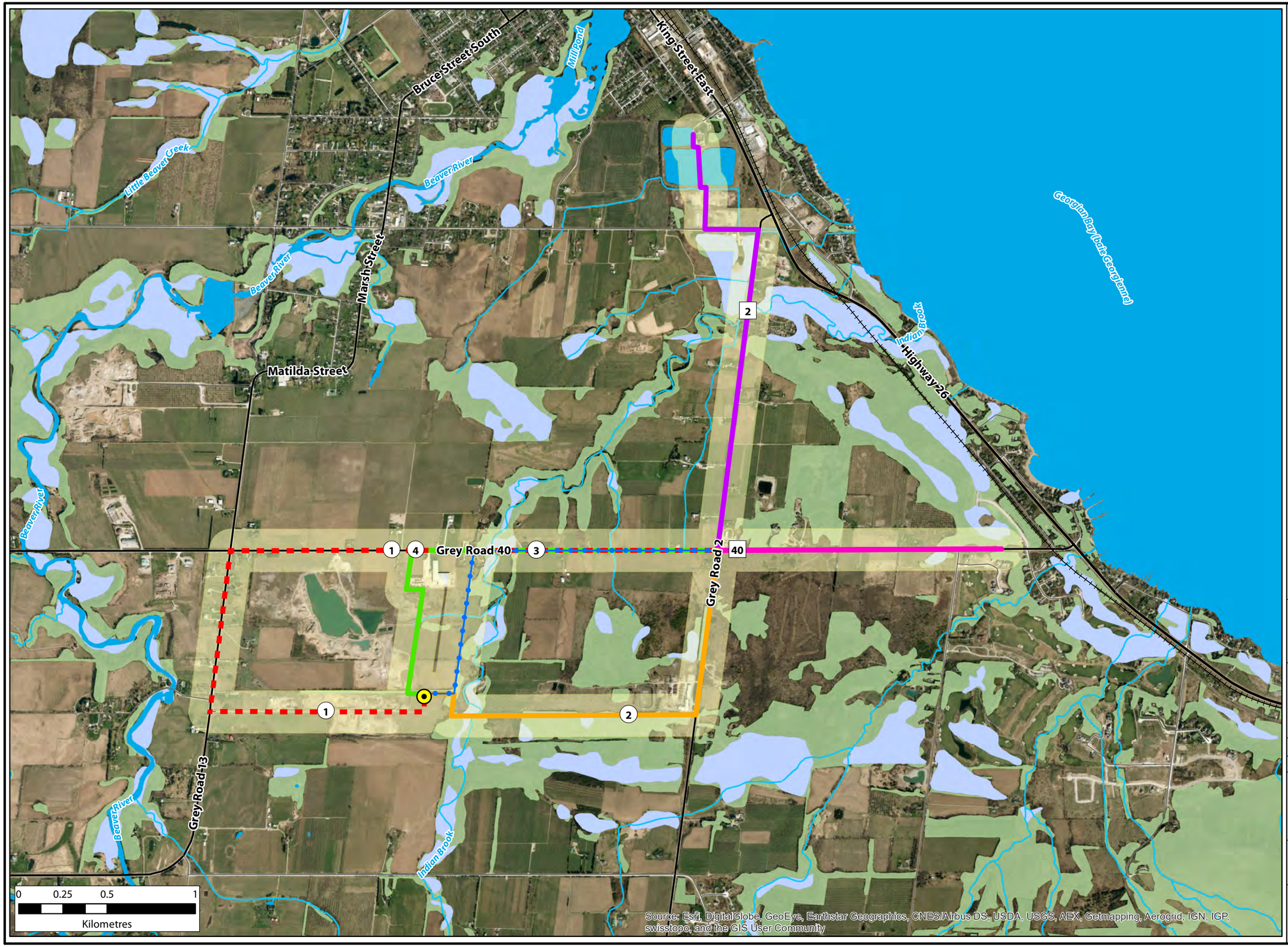
Option	Summary of Terrestrial Constraints	Summary of Aquatic Constraints	Ranking (1= most preferred)
From Landfill to intersection of Grey Road 2 and Grey Road 40:			
1	• Crosses wetland at Indian Brook • Potential wetland SAR Habitat (Snapping Turtle)	• Crosses Indian Brook (coldwater) and one other watercourse • Crosses four headwater features (no watercourse) • All six watercourses / headwater features regulated by GSCA	**1**
2	• Crosses wetland at Indian Brook • Within 30 m of two small wetlands and two areas of woodland/ravine • Within 120 m of small wetland • Potential SAR Habitat: Snapping Turtle and. Eastern Wood-Pewee	• Crosses Indian Brook (coldwater) • Crosses two headwater features (no watercourse) • All three watercourses / headwater features regulated by GSCA	**4**
3	• Crosses wetland at Indian Brook • Within 120 m of two other wetlands • Within 30 m of woodlands associated with Indian Brook • Potential SAR Habitat: Snapping Turtle and. Eastern Wood-Pewee	• Crosses Indian Brook (coldwater), and two other watercourses (one not shown on GSCA Regulation mapping) • Crosses three headwater features (no watercourse) • Five of the six watercourses shown on GSCA mapping as regulated	**3**
4	• Crosses wetland at Indian Brook • Potential wetland SAR Habitat (Snapping Turtle)	• Crosses Indian Brook (coldwater) and two other watercourses (one not shown on GSCA Regulation mapping) • Crosses three headwater features (no watercourse) • Five of the six watercourses / headwater features shown on GSCA mapping as regulated	**2**
Route Continuance Options:			
Grey Road 2	• Within 30 m of two large wetlands • Within 30 m of woodlands • Potential SAR Habitat: Snapping Turtle and. Eastern Wood-Pewee	• Crosses Indian Brook (coldwater) and two other watercourses • Crosses one headwater feature (no watercourse) • All four watercourses / headwater features regulated by GSCA	**2**
Grey Road 40	• Within 30 m of small wetland • Within 120 m of wetland • Potential Wetland SAR Habitat (Snapping Turtle) • Partly within NEP area	• Crosses four headwater features (no watercourses) • All four headwater features regulated by GSCA • "Escarpment Recreational" uses	**1**

Table 2 - Species at Risk Screening for Blue Mountains Landfill Servicing EA

SPECIES	MNRF SAR Designation	Status in Grey County & Surrounding Regions (as of June 20, 2016)	Key Habitats Used By Species	Status for Blue Mountains Landfill Servicing EA route options and adjacent lands (within 120 metres)
BIRDS				
Bald Eagle (*Haliaeetus leucocephalus*)	Special Concern	Known to Occur	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; they roost in super canopy trees such as pine.	**May be present along Georgian Bay shoreline during migration and winter; not likely to nest in vicinity of roadsides and fields where forcemains will be located.**
Bank Swallow (*Riparia riparia*)	Threatened (federal only)	Known to Occur	Low areas along rivers, streams, coasts or reservoirs; nest in natural bluffs and eroding streamside banks, also sand and gravel quarries and road cuts	**Limited habitat may be available along Indian Brook or in temporary sand piles, etc. Unlikely to be negatively impacted by works associated with forcemain construction.**
Barn Swallow (*Hirundo rustica*)	Threatened	Known to Occur	Prefers farmland, lake/river shorelines, wooded clearings, urban populated areas, rocky cliffs, and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves, etc.	**Likely present in open habitats along proposed alternative forcemain routes; forcemain construction will not remove any foraging habitat nor will it remove any nesting structures. Records from 2005 onwards in NHIC database.**
Black Tern (*Childonias niger*)	Special Concern	Known to Occur	Generally prefers freshwater marshes and wetlands; nests either on floating material in a marsh or on the ground very close to water.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Bobolink (*Dolichonyx oryzivorus*)	Threatened	Known to Occur	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands.	**Likely present in open agricultural areas (e.g. hayfields) in the vicinity of the proposed forcemain routes; however, no breeding habitat will be removed as part of the construction activities. Record from 2004 in NHIC database.**
Canada Warbler (*Wilsonia canadensis*)	Threatened (federal) / Special Concern (provincial)	Suspected to Occur	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	**Potential habitat may be present in woodlands along route 2 (red); however, the forcemain routes will be confined to the roadside and should not impact any potential breeding habitat for this species.**
Cerulean Warbler (*Dendroica cerulea*)	Endangered (federal) / Threatened (provincial)	Historically Known to Occur	Generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Chimney Swift (*Chaetura pelagica*)	Threatened	Known to Occur	Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys.	**May be present foraging over the general vicinity. Any chimneys that are present are not slated for demolition; no suitable nesting trees (50+ cm DBH) will be removed as part of the forcemain construction.**
Common Nighthawk (*Chordeiles minor*)	Threatened (federal) / Special Concern (provincial)	Known to Occur	Generally prefers open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nests on flat roof-tops).	**No suitable habitat present in vicinity of alternate forcemain routes.**
Eastern Meadowlark (*Sturnella Magna*)	Threatened	Known to Occur	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	**Likely present in open agricultural areas (e.g. hayfields) in the vicinity of the proposed forcemain routes; however, no breeding habitat will be removed as part of the construction activities. Records from 2004 in NHIC database.**
Eastern Whip-poor-will *(Caprimlugus vociferus)*	Threatened	Known to Occur	Generally prefers semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred. In winter they occupy primarily mixed woods near open areas.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Eastern Wood-Pewee (*Contopus virens*)	Special Concern (federal only)	Known to Occur	Found in deciduous, mixed woods, or pine plantations; also found in mature woodlands, urban shade trees, roadsides, and orchards; usually found in clearings and forest edges.	**May be present along woodland edges; if present, the habitat will not be impacted by construction activities. Construction could disturb nesting birds; avoid the breeding bird window (approximately May 1 to Aug 1).**
Golden-winged Warbler (*Vermivora chrysoptera*)	Special Concern	Known to Occur	Generally prefers areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Grasshopper Sparrow (*Ammodramus savannarum*)	Special Concern (federal only)	Known to Occur	Open grasslands and prairie with patches of bare ground.	**May be present in open agricultural areas in the vicinity of the proposed forcemain routes; however, no breeding habitat will be removed as part of the construction activities.**
Henslow's Sparrow *(Ammodramus henslowii)*	Endangered	Historically Known to Occur	Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material.	**Suitable habitat potentially present in area; however, this species is considered extremely rare in southern Ontario and is extirpated from the local region.**
King Rail (*Rallus elegans*)	Endangered	Historically Known to Occur	Freshwater and brackish marshes and rice fields.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Least Bittern *(Ixobrychus exilis)*	Threatened	Known to Occur	Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Louisiana Waterthrush *(Seiurus motacilla)*	Special Concern	Known to Occur	Generally inhabits mature forests along steeply sloped ravines adjacent to running water. Prefers clear, cold streams and densely wooded swamps.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Northern Bobwhite (*Colinus virginianus*)	Endangered	Historically Known to Occur	Generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	**Suitable habitat potentially present in area; however, this species is now confined to Walpole Island and is extirpated from the local region.**
Peregrine Falcon (*Falco peregrinus*)	Special Concern	Known to Occur	Mountain ranges, coastlines, river valleys, and increasingly in cities.	**No suitable habitat present in vicinity of alternate forcemain routes.**
Red-headed Woodpecker *(Melanerpes erythrocephalus)*	Threatened (federal) / Special Concern (provincial)	Known to Occur	Generally prefers open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks.	**Potential habitat may be present in woodlands and other habitats along various forcemain routes; however, the forcemain routes will be confined to the roadside and should not impact any potential breeding habitat for this species.**
Short-eared Owl *(Asio flammeus)*	Special Concern	Known to Occur	Generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields.	**No suitable breeding habitat in the vicinity of the forcemain routes; may be found during migration and in winter in suitable agricultural fields and other open habitats.**
Wood Thrush (*Hylocichla mustelina*)	Special Concern (federal only)	Known to Occur	Breeds in mature deciduous and mixed forests; nests less successfully in fragmented forests and suburban parks with enough large trees for a territory; ideal habitat includes trees over 50 feet tall, a moderate understory of saplings/shrubs, an open floor with moist soil and decaying leaf litter, and water nearby.	**May be present in woodlands; this habitat will not be impacted by construction. Construction could disturb nesting birds; avoid the breeding bird window (approximately May 1 to Aug 1).**
Yellow-breasted Chat *(Icteria virens)*	Endangered	May Occur	Generally prefers dense thickets around wood edges, riparian areas, and in overgrown clearings.	**No suitable habitat present in vicinity of alternate forcemain routes.**
FISH				
Northern Brook Lamprey (*Ichthyomyzon fossor*)	Special Concern (incl. federally)	Known to Occur	Clear, coolwater streams. The larval stage requires soft substrates such as silt and sand which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel.	**Potentially present; known from nearby Beaver Creek.**
INSECTS				
Monarch *(Danaus plexippus)*	Special Concern	Known to Occur	Exist primarily wherever milkweed and wildflowers exist, such as abandoned farmland, along roadsides, and other open spaces.	**May occur during migration in non-significant numbers; likely breeds in vicinity as Common Milkweed is likely present. This species will not be negatively impacted by construction activities.**
West Virginia White (*Pieris virginiensis*)	Special Concern	Known to Occur	Generally prefer moist, deciduous woodlands; the larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	**No suitable habitat present on site or in adjacent lands.**

Table 2 - Species at Risk Screening for Blue Mountains Landfill Servicing EA

MAMMALS				
American Badger (*Taxidea taxus*)	Endangered	May Occur	Occurs primarily in grasslands and open areas with grasslands, which can include parklands, farms, and treeless areas; also found in forest glades and meadows, marshes, brushy areas, hot deserts, and mountain meadows	**Potential habitat available in general area; not known to occur and no historical records known. If present, forcemain construction is unlikely to cause adverse impacts to this species and its habitats.**
Eastern Small-footed Myotis (*Myotis leibii*)	Endangered	Known to Occur	Overwintering habitat: caves and mines that remain above 0 degrees Celsuis; Maternal roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses, and under tree bark.	**No suitable overwintering habitat in site vicinity. Any large trees with snags that may be utilized for roosting during migration and summer (maternity) will not be impacted by the forcemain construction. No suitable human-made structures will be demolished as part of this project.**
Little Brown Myotis (*Myotis lucifugus*)	Endangered	Known to Occur	Overwintering habitat: caves and mines that remain above 0 C; Maternal roosts: Often associated with buildings (attics, barns, etc.). Occasionally found in trees (25-44 cm dbh).	**No suitable overwintering habitat in site vicinity. Any large trees with snags that may be utilized for roosting during migration and summer (maternity) will not be impacted by the forcemain construction. No suitable human-made structures will be demolished as part of this project.**
Northern Myotis (*Myotis septentrionalis)*	Endangered	Known to Occur	Overwintering habitat: caves and mines that remain above 0 C; Maternal roosts: often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns, etc.)	**No suitable overwintering habitat in site vicinity. Any large trees with snags that may be utilized for roosting during migration and summer (maternity) will not be impacted by the forcemain construction. No suitable human-made structures will be demolished as part of this project.**
Tri-coloured Bat (*Perimyotis subflavus*)	Endangered	Known to Occur	Overwintering habitat: caves and mines that remain above 0 degrees Celsius; Maternal roosts: can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	**No suitable overwintering habitat in site vicinity. Any large trees with snags that may be utilized for roosting during migration and summer (maternity) will not be impacted by the forcemain construction. No suitable human-made structures will be demolished as part of this project.**
REPTILES				
Blanding's Turtle *(Emydonidea blandingii)*	Threatened	Known to Occur	Generally occurs in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. Prefers shallow water, rich in nutrients, with organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae.Nests in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwinters in permanent pools that average about one metre in depth, or in slow-flowing streams.	**No suitable wetlands are present in the vicinity of the forcemain routes.**
Eastern Hog-nosed Snake (*Heterodon platirhinos*)	Threatened	Known to Occur	Generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water.	**May occur in the vicinity of the forcemain routes, especially in the forested areas along Option 2 and the northerly part of Grey Road 2. No significant habitat (i.e., foraging, basking, nesting, or overwintering) impacted forcemain construction. General mitigation would include silt fencing to exclude animals from intensive work areas.**
Eastern Musk Turtle (Stinkpot) (*Sternotherus odoraturs*)	Threatened	Known to Occur	Occurs in rivers, lakes and ponds with a slow-moving current, soft bottom, and shallow water	**No suitable rivers, lakes or ponds are present in the vicinity of the forcemain routes. Indian Brook unlikely to support this species.**
Eastern Ribbonsnake *(Thamnophis sauritus)*	Special Concern	Known to Occur	Generally occurs along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	**May occur in area, especially along Indian Brook; may forage along roadsides in vicinity of forcemain routes, especially around wet areas. General mitigation would include using silt fencing to ensure animals are not injured during construction activities.**
Massasauga Rattlesnake (*Sistrurus catenatus*)	Threatened	Known to Occur	Generally occurs in tall grass prairie, bogs, marshes, shorelines, forests and alvars.	**May occur in the vicinity of the forcemain routes, especially in the forested areas along route 2 and the northerly part of Grey Road 2. No significant habitat (i.e., foraging, basking, nesting, or overwintering) will be lost due to the forcemain construction. General mitigation would include using silt fencing to ensure animals are not injured during construction activities.**
Northern Map Turtle (*Graptemys geographica*)	Special Concern	Known to Occur	Found in large rivers and lakes with slow-moving currents and soft bottoms	**No suitable large rivers or lakes are present in the vicinity of the forcemain routes. Indian Brook unlikely to support this species.**
Snapping Turtle *(Chelydra serpentina)*	Special Concern	Known to Occur	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	**Likely present in the study area, along any shallow waters including roadside ditches. Suitable nesting habitat, including roadside gravel, are present in area. No suitable habitat for foraging or overwintering will be impacted by the forcemain construction and maintenance. General mitigation would include the erection of silt fencing, especially in late May to early June (females nesting) and late August to September (young turtles emerging from nests). Record from 1989 in NHIC database.**
Vascular Plants				
American Ginseng (*Panax quinquefolius*)	Endangered	Known to Occur	Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	**Potential habitat in deciduous woodlands. Unlikely to be impacted as forcemain will not traverse forested areas.**
Broad Beech Fern (*Phegopteris hexagonoptera*)	Special Concern	Known to Occur	Generally inhabits shady areas of beech and maple forests where the soil is moist or wet.	**Potential habitat in deciduous woodlands. Unlikely to be impacted as forcemain will not traverse forested areas.**
Butternut (*Juglans cinerea*)	Endangered	Known to Occur	Generally grows in rich, moist, and well-drained soils, along streams. It may also be found on well-drained gravel sites, especially with limestone. It is also found on dry, rocky and sterile soils. Butternut generally grows alone or in small groups in deciduous forests and hedgerows.	**Potentially present as single trees, in hedgerows, or forest edges. May be impacted if forcemain construction requires tree removal on roadsides, in hedgerows, or along forest edges.**



Legend

- Pump Station
- Railway
- Watercourse (MNRF)

Route Option

- Option 1
- Option 2
- Option 3
- Option 4

Route Continuance Option

- Grey Road 2
- Grey Road 40
- Option 120m Buffer
- Waterbody (MNRF)
- Wooded Area (MNRF)
- Wetland not evaluated per OWES (MNRF)

Blue Mountains Landfill Servicing EA

Route and Route Continuance Options

Terrestrial and Aquatic Features

DOUGAN & ASSOCIATES
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APPENDIX E

STAGE 1 ARCHAEOLOGICAL ASSESSMENT

Ministry of Tourism, Culture and Sport

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Ontario

Dec 21, 2016

Adria Grant (P131)
AECOM
426 Ridout London ON N6C 4A1

RE: Review and Entry into the Ontario Public Register of Archaeological Reports: Archaeological Assessment Report Entitled, "Stage 1 Archaeological Assessment Town of Blue Mountains Landfill Site Expansion Part of Lots 26- 31, Concessions 7-11, Geographic Township of Collingwood, now The Blue Mountains, Grey County, Ontario ", Dated Oct 3, 2016, Filed with MTCS Toronto Office on Dec 12, 2016, MTCS Project Information Form Number P131-0005-2016, MTCS File Number 0005584

Dear Ms. Grant:

This office has reviewed the above-mentioned report, which has been submitted to this ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18.[1] This review has been carried out in order to determine whether the licensed professional consultant archaeologist has met the terms and conditions of their licence, that the licensee assessed the property and documented archaeological resources using a process that accords with the 2011 Standards and Guidelines for Consultant Archaeologists set by the ministry, and that the archaeological fieldwork and report recommendations are consistent with the conservation, protection and preservation of the cultural heritage of Ontario.

The report documents the assessment/mitigation of the study area as depicted in Figures 6 and 7 of the above titled report and recommends the following:

AECOM's Stage 1 archaeological assessment of several proposed alternative forcemain route options and landfill site expansion in the Town of Blue Mountains in Grey County, Ontario has determined that the potential for the recovery of both archaeological resources is high. As a result of extensive, deep land alterations, archaeological potential has been removed from the landfill site and areas of ROW disturbance as described in Section 2.1.3 of this report. However, portions of the study area on private property that are in agricultural field or manicured lawn, and areas of ROW with no clear evidence of previous disturbance have been identified as areas where archaeological potential remains intact (Figure 6). Based on these findings, Stage 2 archaeological assessment is required for all land not demonstrated to be previously disturbed within the study area limits.

It should be noted that this Stage 1 assessment is a preliminary study that has included several proposed forcemain route alternatives. As such, the study area boundaries include land that may not be impacted during construction and ground disturbing activities. Once the project impacts and details are determined,

only the land that will be affected by this project will require Stage 2 archaeological assessment where identified in Figure 6.

The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in the Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011), including:

Pedestrian survey at 5 m intervals where ploughing is possible (e.g., agricultural fields). This assessment will occur when agricultural fields have been recently ploughed, weathered, and exhibit at least 80% surface visibility;

Test pit survey at 5 m intervals in all areas of potentially undisturbed lands that will be impacted by the project; and,

Poorly drained areas, areas of steep slope, and areas of confirmed previous disturbance (e.g. building footprints, ROW, and areas with identifiable land alterations below topsoil level) are to be mapped and photo-documented, but do not require Stage 2 survey.

During the Stage 1 background research study, a small historic church, which still stands today at 828411 Grey Road 40, was identified on the 1880 map on Lot 28, Concession 8 within the current study area boundaries. Although no cemetery is marked on the 1880 map, historic churches have an elevated potential for the presence of unmarked graves associated with them. Given the proximity of the church to the present-day ROW along Grey Road 40, as a precautionary measure, it is recommended that Stage 3 mechanical topsoil removal be conducted for land to be impacted by the proposed forcemain route along Grey Road 40 in the vicinity of this historic church. Should any ground disturbing activities occur along the north side of Grey Road 40 within 10 m of the historic church, the following activities must be conducted to determine if any unmarked grave shafts are present in this portion of the study area (Figure 7):

Prior to construction and/or ground disturbance in the vicinity of the church, temporary fencing must be erected adjacent to the church which includes a 10 m buffer, and will be marked as a no-construction area (Figure 7);

All construction and ground disturbing activities that may be required within the 10 m buffer area around the church must be monitored by a licensed archaeologist. Upon completion of ground disturbing activities, the area must be inspected and assessed by a licensed archaeologist for evidence of potential grave shafts; and,

If grave shafts and/or human remains are encountered during construction, work must cease immediately, the police or Regional Coroner should be contacted, as well as the Registrar of the Cemeteries Regulation Unit of the Ministry of Consumer Services.

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports thereby concurring with the recommendations presented herein. As further archaeological assessments may be required, archaeological concerns have not fully been addressed for the portions of the study area as outlined above.

Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 Standards and Guidelines for Consultant Archaeologists and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports. Please note that the ministry makes no representation or warranty as to the completeness, accuracy or quality of reports in the register.

Should you require any further information regarding this matter, please feel free to contact me.

B.M. Ross & Associates Limited

Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
Part of Lots 26- 31, Concessions 7-11, Geographic Township of Collingwood, now The Blue Mountains, Grey County, Ontario

Prepared by:

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September, 2016

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Revision History

Revision #	Date	Revised By:	Revision Description

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The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

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- represents AECOM's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
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- must be read as a whole and sections thereof should not be read out of such context;
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This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

Quality Information

Report Prepared By:

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Jennifer Morgan, PhD
Archaeologist and Skeletal Biologist

Report Reviewed By:

[redacted]

Adria Grant, MA, CAHP (R131)
Manager, Cultural Resources

Executive Summary

AECOM Canada Ltd. (AECOM) was contracted by B.M Ross & Associates Limited (B.M. Ross) to conduct a Stage 1 archaeological assessment for several proposed alternative forcemain route options for a landfill site expansion in the Town of Blue Mountains in Grey County, Ontario. The alternative forcemain route options are located on parts of lots 26-31 on Concessions 7-11, Geographic Township of Collingwood, now The Blue Mountains, Grey County, Ontario (Figures 1 and 2).

The Stage 1 archaeological assessment was conducted as part of a Municipal Class Environmental Assessment (EA) and was triggered by the requirements of the *Environmental Assessment Act* in accordance with subsection 11(1) (Ontario Government 1990a). This project is also subject to the *Ontario Heritage Act* (Ontario Government 1990b).

AECOM's Stage 1 archaeological assessment of several proposed alternative forcemain route options and landfill site expansion in the Town of Blue Mountains in Grey County, Ontario has determined that the potential for the recovery of both archaeological resources is high. As a result of extensive, deep land alterations, archaeological potential has been removed from the landfill site and areas of ROW disturbance as described in Section 2.1.3 of this report. However, portions of the study area on private property that are in agricultural field or manicured lawn and areas outside of disturbed ROW have been identified as areas where archaeological potential remains intact (Figure 6). Based on these findings, **Stage 2 archaeological assessment is required for all land not demonstrated to be previously disturbed within the study area limits.**

It should be noted that this Stage 1 assessment is a preliminary study that has included several proposed forcemain route alternatives. As such, the study area boundaries include land that may not be impacted during construction and ground disturbing activities. Once the project impacts and details are determined, only the land identified herein that will be affected by this project will require Stage 2 archaeological assessment.

The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in the *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011), including:

- Pedestrian survey at 5 m intervals where ploughing is possible (e.g., agricultural fields). This assessment will occur when agricultural fields have been recently ploughed, weathered, and exhibit at least 80% surface visibility;
- Test pit survey at 5 m intervals in all areas of potentially undisturbed lands that will be impacted by the project; and,
- Poorly drained areas, areas of steep slope, and areas of confirmed previous disturbance (e.g. building footprints, roadways, areas with identifiable land alterations below topsoil level) are to be mapped and photo-documented.

During the Stage 1 background research study, a small historic church, which still stands today at 828411 Grey Road 40, was identified on the 1880 map on Lot 28, Concession 8 within the current study area boundaries. Although no cemetery is marked on the 1880 map, historic churches have an elevated potential for the presence of unmarked graves associated with them. Given the proximity of the church to the present-day ROW along Grey Road 40, as a precautionary measure, it is recommended that Stage 3 mechanical topsoil removal be conducted for land to be impacted by the proposed forcemain route along Grey Road 40 in the vicinity of this historic church. Should any ground disturbing activities occur along the north side of Grey Road 40 within 10 m of the historic

church, the following activities must be conducted to determine if any unmarked grave shafts are present in this portion of the study area (Figure 7):

- Stage 3 mechanical topsoil removal must be conducted for all lands included in the study area that fall within a 10 m buffer area around the historic church. Mechanical topsoil removal must be completed using an excavator with a straight-edged ditching bucket and only under the supervision of a licensed archaeologist; and,

- If grave shafts and/or human remains are encountered during construction, work must cease immediately, the police or Regional Coroner should be contacted, as well as the Registrar of the Cemeteries Regulation Unit of the Ministry of Consumer Services.

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports thereby concurring with the recommendations presented herein. As further archaeological assessments may be required, archaeological concerns have not fully been addressed for the portions of the study area as outlined above.

Project Personnel

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GIS Analyst	Ben Clark, BAA

Acknowledgements

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Ministry of Tourism, Culture, and Sport	Tarah Hill, Robert von Bitter

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1. Project Context

1.1 Development Context

AECOM Canada Ltd. (AECOM) was contracted by B.M Ross & Associates Limited (B.M. Ross) to conduct a Stage 1 archaeological assessment for several proposed alternative forcemain route options for a landfill site expansion in the Town of Blue Mountains in Grey County, Ontario. The alternative forcemain route options are located on parts of lots 26-31 on Concessions 7-11, Geographic Township of Collingwood, now The Blue Mountains, Grey County, Ontario (Figures 1 and 2).

The Stage 1 archaeological assessment was conducted as part of a Municipal Class Environmental Assessment (EA) and was triggered by the requirements of the *Environmental Assessment Act* in accordance with subsection 11(1) (Ontario Government 1990a). This project is also subject to the *Ontario Heritage Act* (Ontario Government 1990b).

The Town of Blue Mountains Landfill site is located at 788090 Grey Road 13, south of the intersection with Grey Road 40. The landfill site expansion study area subject to Stage 1 archaeological assessment includes a number of proposed alternative forcemain routes for pumping waste leachates from the landfill site to the Town's sewage collection system. The study area includes several existing road allowances along Grey Roads 2, 13 and 40 and 30th Sideroad, as well as a section of private property currently under agriculture. The portions of the study area comprised of existing road allowances include a 50 metre (m) buffer centred along the travelled road lanes (Figure 2).

1.1.1 Objectives

The objective of the Stage 1 background study is to document the archaeological and land use history and present conditions within the current study area. This information will be used to support recommendations regarding cultural heritage value or interest as well as assessment and mitigation strategies. The Stage 1 research information is drawn in part from:

- MTCS's Archaeological Sites Database (ASDB) for a listing of registered archaeological sites within a 1 kilometre (km) radius of the study area;
- Reports of previous archaeological assessments within 50 m of the study area;
- Recent and historical maps of the study area; and
- Archaeological management plans or other archaeological potential mapping, where available.

The Stage 1 archaeological assessment has been conducted to meet the requirements of the Ministry of Tourism Culture, and Sport's (MTCS) *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011).

1.2 Historical Context

Years of archaeological research and assessments in southern Ontario have resulted in a well-developed understanding of the historic use of land in Grey County, from the earliest First Nation people to the more recent

Euro-Canadian settlers and farmers. **Error! Reference source not found.** provides a breakdown of the cultural and temporal history of past occupations in Grey County.

Table 1: Cultural Chronology for Grey County

Archaeological Period	Characteristics	Time Period	Comments
Early Paleo	Fluted Points	9000-8400 BC	Arctic tundra and spruce parkland, caribou hunters
Late Paleo	Holcombe, Hi-Lo and Lanceolate Points	8400-8000 BC	Slight reduction in territory size
Early Archaic	Notched and Bifurcate base Points	8000-6000 BC	Growing populations
Middle Archaic	Stemmed and Brewerton Points, Laurentian Development	6000-2500 BC	Increasing regionalization
Late Archaic	Narrow Point	2000-1800 BC	Environment similar to present
	Broad Point	1800-1500 BC	Large lithic tools
	Small Point	1500-1100 BC	Introduction of bow
Terminal Archaic	Hind Points, Glacial Kame Complex	1100-950 BC	Earliest true cemeteries
Early Woodland	Meadowood Points	950-400 BC	Introduction of pottery
Middle Woodland	Dentate/Pseudo-scallop Ceramics	400 BC – AD 500	Increased sedentism
	Princess Point	AD 550-900	Introduction of corn horticulture
Late Woodland	Early Ontario Iroquoian	AD 900-1300	Agricultural villages
	Middle Ontario Iroquoian	AD 1300-1400	Increased longhouse sizes
	Late Ontario Iroquoian	AD 1400-1650	Warring nations and displacement
Contact First Nations	Various Algonkian and Iroquoian Groups	AD 1600-1875	Early written records and treaties
Historic	French and English Euro-Canadian	AD 1749-present	European settlement

Notes: Taken from Ellis and Ferris (1990)

The following sections provide a detailed summary of the archaeological cultures that have settled in the vicinity of the study area over the past 11,000 years.

1.2.1 Pre-Contact First Nation Settlement

As Chapman and Putnam (1984) illustrate, the modern physiography of southern Ontario is largely a product of events of the last major glacial stage and the landscape is a complex mosaic of features and deposits produced during the last series of glacial retreats and advances prior to the withdrawal of the continental glaciers from the area. Southwestern Ontario was finally ice free by 12,500 years ago. With continuing ice retreat and lake regressions the land area of southern Ontario progressively increased while barriers to the influx of plants, animals, and people steadily diminished (Karrow and Warner 1990). .

The Paleo Period

The first human settlement can be traced back 11,000 years; these earliest well-documented groups are referred to as Paleo, which literally means old or ancient. Paleo people were non-agriculturalists who depended on hunting and gathering of wild food stuffs, they would have moved their encampments on a regular basis to be in the locations where these resources naturally became available and the size of the groups occupying any particular location would vary depending on the nature and size of the available food resources (Ellis and Deller 1990). The picture that has emerged for the early and late Paleo is of groups at low population densities who were residentially mobile and made use of large territories during annual cycles of resource exploitation (Ellis and Deller 1990).

The Archaic Period

The next major cultural period following the Paleo is termed the Archaic, which is broken temporally into the Early, Middle, and Late Archaic periods. There is much debate on how the term Archaic is employed; general practice bases the designation off assemblage content as there are marked differences in artifact suites from the preceding Paleo and subsequent Woodland periods. As Ellis *et al.* (1990) note, from an artifact and site characteristic perspective the Archaic is simply used to refer to non-Paleo manifestations that pre-date the introduction of ceramics. Ellis *et al.* (1990) stress that Archaic groups can be distinguished from earlier groups based on site characteristics and artifact content.

Early Archaic sites have been reported throughout much of southwestern Ontario and extend as far north as the Lake Huron Basin region and as far east as Rice Lake (Deller *et al.* 1986). A lack of excavated assemblages from southern Ontario has limited understandings and inferences regarding the nature of stone tool kits in the Early Archaic and tool forms other than points are poorly known in Ontario; however, at least three major temporal horizons can be recognized and can be distinguished based on projectile point form (Ellis *et al.* 1990). These horizons are referred to as Side-Notched (*ca.* 8,000-7,700 BC), Corner-Notched (*ca.* 7,700-6,900 BC), and Bifurcated (*ca.* 6,900-6,000 BC) (Ellis *et al.* 1990). Additional details on each of these horizons and the temporal changes to tool types can be found in Ellis *et al.* (1990).

The Middle Archaic period (6,000-2,500 BC), like the Early Archaic, is relatively unknown in southern Ontario. Ellis *et al.* (1990) suggest that artifact traits that have come to be considered as characteristic of the Archaic period as a whole, first appear in the Middle Archaic. These traits include fully ground and polished stone tools, specific tool types including banner stones and net-sinkers, and the use of local and/or non-chert type materials for lithic tool manufacture (Ellis *et al.* 1990).

The Late Archaic begins around approximately 2,000 BC and ends with the beginning of ceramics and the Meadowood Phase at roughly 950 BC. Much more is known about this period than the Early and Middle Archaic and a number of Late Archaic sites are known. Sites appear to be more common than earlier periods, suggesting some degree of population increase. True cemeteries appear and have allowed for the analysis of band size, biological relationships, social organization, and health. Narrow and Small point traditions appear as well as tool recycling wherein points were modified into drills, knives, end scrapers, and other tools (Ellis *et al.* 1990). Other tools including serrated flakes used for sawing or shredding, spokeshaves, and retouched flakes manufactured into perforators, gravers, micro-perforators, or piercers. Tools on coarse-grained rocks such as sandstone and quartz become common and include hammerstones, net-sinkers, anvils, and cobble spalls. Depending on preservation, several Late Archaic sites include bone and/or antler artifacts which likely represent fishing toolkits and ornamentation. These artifacts include bone harpoons, barbs or hooks, notched projectile points, and awls. Bone ornaments recovered have included tubular bone beads and drilled mammal canine pendants (Ellis *et al.* 1990).

Throughout the Early to Late Archaic periods the natural environment warmed and vegetation changed from closed conifer-dominated vegetation cover, to the mixed coniferous and deciduous forest in the north and deciduous vegetation in the south we see in Ontario today (Ellis *et al.* 1990). During the Archaic period there are indications of increasing populations and decreasing size of territories exploited during annual rounds; fewer moves of residential camps throughout the year and longer occupations at seasonal campsites; continuous use of certain locations on a seasonal basis over many years; increasing attention to ritual associated with the deceased; and, long range exchange and trade systems for the purpose of obtaining valued and geographically localized resources (Ellis *et al.* 1990).

The Woodland Period

The Early Woodland period is distinguished from the Archaic period primarily by the addition of ceramic technology, which provides a useful demarcation point for archaeologists but is expected to have made less difference in the lives of the Early Woodland peoples. The settlement and subsistence patterns of Early Woodland people shows much continuity with the earlier Archaic with seasonal camps occupied to exploit specific natural resources (Spence *et al.* 1990). During the Middle Woodland well-defined territories containing several key environmental zones were exploited over the yearly subsistence cycle. Large sites with structures and substantial middens appear in the Middle Woodland associated with spring macro-band occupations focussed on utilizing fish resources and created by consistent returns to the same site (Spence *et al.* 1990). Groups would come together into large macro-bands during the spring-summer at lakeshore or marshland areas to take advantage of spawning fish; in the fall inland sand plains and river valleys were occupied for deer and nut harvesting and groups split into small micro-bands for winter survival (Spence *et al.* 1990). This is a departure from earlier Woodland times when macro-band aggregation is thought to have taken place in the winter (Ellis *et al.* 1988; Granger 1978).

The period between the Middle and Late Woodland period was both technically and socially transitional for the ethnically diverse populations of southern Ontario and these developments laid the basis for the emergence of settled villages and agriculturally based lifestyles (Fox 1990). The Late Woodland period began with a shift in settlement and subsistence patterns involving an increasing reliance on maize horticulture. Corn may have been introduced into southwestern Ontario from the American Midwest as early as 600 AD; however, it did not become a dietary staple until at least three to four hundred years later. A more sedentary lifestyle was adopted by the Ontario Iroquoians and villages with longhouses and palisades were occupied by large numbers of people. Increased warfare is inferred from the defensive placement of village walls and recorded changes over time in village organization are taken to indicate the initial development of the clans which were a characteristic of the historically known Iroquoians.

The Late Woodland period began with a shift in settlement and subsistence patterns involving an increasing reliance on corn horticulture. Corn may have been introduced into southwestern Ontario from the American Midwest as early as 600 AD; however, it did not become a dietary staple until at least three to four hundred years later. The first agricultural villages in southwestern Ontario date to the 10th century AD. Unlike the riverine base camps of the Middle Woodland period, these sites are located in the uplands, on well-drained sandy soils. Categorized as "Early Ontario Iroquoian" (900-1300 AD), many archaeologists believe that it is possible to trace a direct line from the Iroquoian groups which inhabited southwestern Ontario at the time of first European contact, to these early villagers

Village sites dating between 900 and 1300 AD, share many attributes with the historically reported Iroquoian sites, including the presence of longhouses and sometimes palisades. However, these early longhouses were actually not all that large, averaging only 12.4 m in length. It is also quite common to find the outlines of overlapping house structures, suggesting that these villages were occupied long enough to necessitate re-building. The Jesuits reported that the Huron moved their villages once every 10-15 years, when the nearby soils had been depleted by farming and conveniently collected firewood grew scarce. It seems likely that Early Ontario Iroquoians occupied their villages for considerably longer, as they relied less heavily on corn than did later groups, and their villages were much smaller, placing less demand on nearby resources.

Judging by the presence of carbonized corn kernels and cob fragments recovered from sub-floor storage pits, agriculture was becoming a vital part of the Early Ontario Iroquoian economy. However, it had not reached the level of importance it would in the Middle and Late Ontario Iroquoian periods. There is ample evidence to suggest that more traditional resources continued to be exploited, and comprised a large part of the subsistence economy. Seasonally occupied special purpose sites relating to deer procurement, nut collection, and fishing activities, have all been identified. While beans are known to have been cultivated later in the Late Woodland period, they have yet to be identified on Early Ontario Iroquoian sites.

The Middle Ontario Iroquoian period (1300-1400 AD) witnessed several interesting developments in terms of settlement patterns and artifact assemblages. Changes in ceramic styles have been carefully documented, allowing the placement of sites in the first or second half of this 100-year period. Moreover, villages, which averaged approximately 0.6 hectares (ha) in extent during the Early Ontario Iroquoian period, now consistently range between one and two ha.

House lengths also change dramatically, more than doubling to an average of 30 m, while houses of up to 45 m have been documented. This radical increase in longhouse length has been variously interpreted. The simplest possibility is that increased house length is the result of a gradual, natural increase in population. However, this does not account for the sudden shift in longhouse lengths around 1300 AD. Other possible explanations involve changes in economic and socio-political organization. One suggestion is that during the Middle Ontario Iroquoian period small villages were amalgamating to form larger communities for mutual defense. If this was the case, the more successful military leaders may have been able to absorb some of the smaller family groups into their households, thereby requiring longer structures. This hypothesis draws support from the fact that some sites had up to seven rows of palisades, indicating at least an occasional need for strong defensive measures. There are, however, other Middle Ontario Iroquoian villages which had no palisades present. Another researcher has suggested that the longest houses may be associated with families that were more successful in trade and other forms of economic activity. More research is required to evaluate these competing interpretations.
The lay-out of houses within villages also changes dramatically by 1300 AD. During the Early Ontario Iroquoian period villages were haphazardly planned at best, with houses oriented in various directions. During the Middle Ontario Iroquoian period villages are organized into two or more discrete groups of tightly spaced, parallel aligned, longhouses. It has been suggested that this change in village organization may indicate the initial development of the clans which were a characteristic of the historically known Iroquoian peoples.

Initially at least, the Late Ontario Iroquoian period (1400-1650 AD) continues many of the trends which have been documented for the proceeding century. For instance, between 1400 and 1450 AD house lengths continue to grow, reaching an average length of 62 m. After 1450 AD, house lengths begin to decrease, with houses dating between 1500-1580 AD averaging only 30 m in length. Why house lengths decrease after 1450 AD is poorly understood, although it is believed that the even shorter houses witnessed on historic period sites can be at least partially attributed to the population reductions associated with the introduction of European diseases such as smallpox.

1.2.2 Post-Contact Period Settlement

The post-contact occupation of southern Ontario was heavily influenced by the dispersal of Iroquoian speaking peoples, such as the Huron, Petun and Neutral by the New York State Confederacy of Iroquois, followed by the arrival of Algonkian speaking groups from northern Ontario. The Ojibwa of southern Ontario date from about 1701 and occupied the territory between Lakes Huron, Erie and Ontario (Schmalz 1991). This is also the period in which the Mississaugas are known to have moved into southern Ontario and the Great Lakes watersheds (Konrad 1981) while at the same time the members of the Three Fires Confederacy, the Chippewa, Ottawa and Potawatomi were immigrating from Ohio and Michigan (Feest and Feest 1978).

As European settlers encroached on their territory the nature of First Nation population distribution, settlement size and material culture changed. Despite these changes it is possible to correlate historically recorded villages with archaeological manifestations and the similarity of those sites to more ancient sites reveals an antiquity to documented cultural expressions that confirms a long historical continuity to Iroquoian systems of ideology and thought (Ferris 1009).

This area first entered historical documentation as part of Treaty No. 18, signed on October 17th, 1818 (Figure 3). The land included as part of Treaty No. 18 is described as:

> Treaty No. 18 ... was a provisional agreement made the 17th day of October, 1818 between the Honourable William Claus on behalf of His Majesty the King and the Principal Men of the Chippewa Nation of Indians, inhabiting the northern parts of the unpurchased lands, within the Home District, on consideration of a yearly payment of twelve hundred pounds by His Majesty to the Chippewa Indians, the said tract being described as follows: Bounded by the District of London on the west, by Lake Huron on the north, by the Penetanguishene purchase (made in 1815) on the east; by the south shore of Kempenfeldt Bay; the western shore of Lake Simcoe and Cooks Bay and the Holland River to the north west angle of the Township of King.
>
> Morris 1943: 23-24

This treaty is referred to as the Lake Simcoe-Nottawasaga Treaty No.18 and it was agreed that these lands would be surrendered in exchange for the sum of twelve hundred pounds currency in goods paid yearly, for every year, to the Chippewa First Nation (AANDC 2013).

1.2.3 Euro-Canadian Settlement

Grey County and the Township of Collingwood

The first substantial European settlement in Grey County was in the vicinity of Collingwood and Meaford in what would later become the Township of Collingwood. Early settlers arrived from York in 1825 by travelling the Holland River into Lake Simcoe. From there, they traveled by land to the Nottawasaga River into Georgian Bay. One of the first European settlers to arrive in the area that would become Grey County was Charles Rankin in 1833. He was a government surveyor who was given the task of surveying the majority of the county. The County of Grey became a provisional County in 1852 (Marsh 1931).

Collingwood Township was the first township to be surveyed in Grey County. The point of the “Blue Hills”, also known as the Blue Mountain peak along the shore of Georgian Bay, attracted early explorers and settlers to Grey County and Collingwood Township. Before the arrival of Europeans, the point was in use as a lookout by First Nations in the area (Marsh 1931). Several small communities had already begun to develop in the township before the land was surveyed into Grey County including Thornbury, Clarkesburg, and Heathcote.

After being surveyed in 1833, 900 acres of town plots lay vacant for years until early settler Solomon Homestead arrived in 1848. Homestead was to become the first mill operator and operated a large mill on the Beaver River in the northern portion of the township. This was the impetus for the development of the community of Thornbury which was to grow rapidly after the arrival of the Northern Railway in 1856. Placed just south of Thornbury, the small community of Clarkesburg would develop around the first woolen mill built by W.A. Clark in 1861. This mill would grow to become the most important mill in the district producing blankets, tweed, flannel, and other high end clothes. Heathcote, originally named Williamstown, was home to the district’s first post office and the first postmaster, William Rorke, arrived in the Heathcote area as early as 1847. By 1856, the town boasted enough residents to throw its first fair (Thornbury and Clarksburg 2016).

In 2001, the present-day Town of Blue Mountains was formed through the amalgamation of the town of Thornbury and the Township of Collingwood.

Land Settlement of Lots 26-28, Concessions 7-11

The 1880 *Illustrated Atlas of the Dominion of Canada, Grey Supplement* (H. Belden & Co. 1880) was reviewed to identify the potential for the recovery of 19th century archaeological resources within the study area during the early

settlement of Collingwood Township. Table 2 provides information for the lots and concessions included in the current study area that include 19th century landowners and/or historic features that are listed on the 1880 map.

Table 2: 19th Century Landowners and Historic Features

Lot	Concession	Landowner(s)	Historic Feature(s)
26	11	Not listed	Historic road to sawmill Saw mill on Beaver River
27	11	W.M. Cumming	Homestead in northeast corner of lot
28	10	Not listed	Large farmhouse/possible schoolhouse
31	9	Not listed	Present-day Highway 26 Northern Railway
28	8	Not listed	Church Schoolhouse
29	8	Not listed	Present-day Highway 26 Northern Railway
30	8	Not listed	Present-day Highway 26 Northern Railway
31	8	Not listed	Present-day Highway 26 Northern Railway
27	7	Not listed	Present-day Highway 26 Northern Railway
28	7	Not listed	Present-day Highway 26 Northern Railway

The remaining lots and concessions included in the study area do not contain listed landowners nor are there any structures or historic features illustrated; however, it is important to note that historical atlases were often funded by subscription fees and landowners who did not subscribe were not always listed on the maps nor were structures on those properties properly illustrated.

The early communities of Thornbury and Clarksburg are illustrated lots adjacent to the study area on Concessions 9 and 10 and a number of sawmills are noted in the area. Several town halls and post offices are scattered across the township, indicating significant settlement in this portion of Grey County by 1880. Historic transportation routes in the area are constructed along the original surveyed lot and concession lines including present-day Grey Roads 2, 13 and 40 and 30th Sideroad. Present day Highway 26 and the Northern Railway are also illustrated on the 1880 map and follow the shoreline of Georgian Bay immediately east of the current study area (Figure 4).

In addition to a review of the 1880 map, a search of the Ontario Historical Maps Database indicated the presence of two historical plaques north of the study area along Bay Street East in Thornbury – “Major Charles Stuart 1783-1865” and “Charles Rankin 1797-1886”. These plaques read as follows:

Major Charles Stuart 1783-1865

Son of a British army officer, Stuart was born in Jamaica. After fourteen years service as a commissioned officer in the service of the East India Company, he came to Upper Canada in 1817. Devoutly religious, Stuart found an outlet for his humanitarian zeal in vigorous anti-slavery activity. Although most of his written works are polemical tracts denouncing slavery, his "The Emigrants Guide to Upper Canada" is a useful summary of the progress of areas most suited to settlement. In 1851 he moved to this area where he encouraged the

establishment of a small settlement at Lora Bay. On his death in 1865 he was buried at Lora Bay but was later removed to the nearby Thornbury-Clarksburg cemetery.

Charles Rankin 1797-1886

This pioneer surveyor was the pathfinder who opened much of this region to settlement. Born in Enniskillen, Ireland, Rankin came to Upper Canada with his family at an early age. He was appointed a deputy provincial surveyor in 1820 and at first worked in the southwestern section of the province. In 1833 he began surveying the Nottawasaga Bay area and settled on some 80 ha of land west of the present town of Thornbury. His more important surveys included; several townships in the present county of Grey; the Garafraxa Colonization Road; the town plot of Sydenham (Owen Sound); the Toronto-Owen Sound Road; the Muskoka Road; and the town plot of Southampton

These plaques denote the early settlement of Township of Collingwood and the larger area included in Grey County (Ontario Historical Plaques 2016).

1.2.4 Reports with Relevant Background Information

To inform the current Stage 1 background research and further establish the archaeological context of the study area, a search of the ASDB was completed AECOM on September 8 and 14, 2016 to determine if any previous archeological work has been completed within the current study area or for lands within 50 m of the study area limits. Results of this search indicated that there are no previous archaeological reports on file with the MTCS for land included in the study or within 50 m of the study area limits. However, one report was noted further afield on part of Lot 27, Concession 7 approximately 500 m to the south of the current study area limits.

In 2013, Amick conducted a Stage 1-2 archaeological assessment on part of Lot 27, Concession 7 in the Town of Blue Mountains, Ontario. This report is entitled *Stage 1-2 Archaeological Assessment of Georgian Bay Villas Added Lands, Part of Lot 27, Con 7, and Block 2 of RP 1157 and Block 42 of RP 16M-6 9, (Geographic Twp of Collingwood), Town of The Blue Mountains, County of Grey* and is on file with the MTCS under PIF P384-0097-2013. The study area was assessed by test pit survey and no archaeological resources were identified. Based on these findings, no further archaeological work was recommended.

To the best of our knowledge, there are no other reports concerning archaeological work conducted within 50 m of the current study area; however, it should be noted that the MTCS does not maintain a database of all properties that have had past archaeological investigations, particularly those properties where no archaeological resources were documented. In consequence, the only way a consulting archaeologist will know that a past assessment has been conducted in a given area is if they have personal knowledge of it, or if the assessment resulted in the discovery and registration of one or more archaeological sites.

1.3 Archaeological Context

1.3.1 Natural Environment

The modern physiography of southern Ontario is largely a product of events of the last major glacial stage, the Wisconsinan and Late Wisconsinan time (ca. 25,000-10,000 BP) (Ellis and Ferris 1990). The study area falls along the estimated location of the original shorelines of glacial Lakes Algonquin and Nippissing, which would have

provided an attractive area for pre-contact First Nation settlement during the Paleo period. Chapman and Putnam (1984:34) provide an approximate location of the shorelines of Lake Algonquin and Lake Nippissing based on the presence of shorecliffs and beaches along Georgian Bay in the Collingwood and Owen Sound areas. Figure 5 illustrates the approximate location of the ancient shorelines for glacial Lake Algonquin and Lake Nippissing.

The study area is located in the Beaver Valley physiographic region, which Chapman and Putnam (1984: 122-124) describe as a well-defined region of 77 square miles, occupying a sharply cut indentation in the Niagara questa, opening upon Georgian Bay. The greater part of the valley's erosional history occurred in pre-glacial times when the precursor of the Beaver River was a tributary to the larger stream which carved the deep valley of Georgian Bay. The primary soil type within the study area is Brighton sand with small intrusions of Tecumseth sand, Wiarton loam, and Granby sand. With the exception of Grandy sand, which is poorly drained, these soil types are all well drained and well suited for agriculture.

The Beaver Valley physiographic region also features a significant source of exploitable raw materials in the form of chert outcrops, which occur in beds within the Niagara escarpment. Fossil Hill chert, also referred to as Collingwood chert, occurs in beds within northern Niagara Escarpment near Collingwood approximately 8km south of the current study area limits.

The closest source of potable water to the study area includes the Beaver River located approximately 200m west of the study area limits along Grey Road 13, a tributary of which runs through the study area boundaries. The shores of Georgian Bay are also located approximately 500m east of the northern limits of the study area and would have been a major thoroughfare during pre-contact times as well as during the contact period fur trade, and early Euro-Canadian industry.

1.3.2 Known Archaeological Sites

A request was made to the Ontario MTCS' Sites Data Coordinator, Robert von Bitter, on September 8, 2016 to determine if any registered archaeological sites are located within the study area and/or within 1 km of the current study area boundaries. A response was received on September 12, 2016 which indicated that there are four registered archaeological sites within 1 km of the study area boundaries. After this time, additional forcemain route options were added to the study area which extended the study area boundaries to the north. As such, AECOM conducted an additional search of the ASDB on September 14, 2016. Results of this search indicated the presence of one additional site. Table 3 provides the details on the registered archaeological sites within 1 km of the current study area boundaries.

Table 3: Registered Archaeological Sites within 1 km of the Study Area

Borden #	Site Name	Time Period	Cultural Affinity/Site Type	Development Status	Proximity to Study Area
BdHc-17	Goldsmith Site	Late Woodland	Not provided	Unknown	~925m west
BdHc-14	Indian Brook	Late Woodland	Not provided	Unknown	~930m east
BdHc-3	Goff-Idle	Late Woodland	Not provided	Site was not found after 1966	~900m northwest
BdHc-2	Fulford	Late Woodland	Small campsite	Unknown	~125m north
BdHc-1	Field-Ardiel	Pre-Contact	Small campsite	Unknown	~785m south

No registered sites were identified within the study area boundaries with the closest site, Fulford (BdHc-2), located approximately 125 m north of the study area boundaries along Grey Road 40 east of Grey Road 13. Fulford (BdHc-2) was identified on the southern portion of Lot 28, Concession 10 and is described as a small campsite

dated to the Late Woodland period. The site was originally documented by Fred Birch in 1903 and was most recently documented in a 1985 archaeological site record form filed by Charles Garrad under licence 85-42. The 1985 site record form describes Fulfrod (BdHc-2) as a small deposit of artifacts and surface lithics; however, it is noted that most of the site likely extends under Grey Road 40 and to the south where it has been destroyed by gravel removal.

As with Fulford (BdHc-2), archeological sites Field-Ardiel (BdHc-1) and Goff-Idle (BdHc-3) were also investigated by Charles Garrad under License 85-42. Field-Ardiel (BdHc-1) was originally recorded in a 1966 report by Carrie MacGillivray, based on an account provided by Thomas Field (MacGillivray 1966). The 1985 site record form filed by Charles Garrad two decades later indicates that the site is a small seasonal campsite with only a small sample of non-diagnostic lithic artifacts recovered. A small collection of artifacts from Goff-Idle (BdHc-3) was documented by Thomas Idle in 1952; however, the site record form submitted by Charles Garrad in 1985 notes that the site could not be relocated and is not a confirmed archaeological site.

Indian Brook (BdHc-14) was identified in 1978 by Charles Garrad under license report 78-D-0250. The artifact collection includes an incised ceramic body sherd, several plain body sherds, a projectile point, and lithic flakes and was dated to the Late Woodland period. Finally, the Goldsmith Site (BdHc-17) was recorded by Michael Kirby in 1986 as a Late Woodland site on Lot 26, Concession 11. The site was comprised of 127 pieces of material including 33 potsherds, 19 pieces of bone and teeth, three scrapers, two adzes, and a number of lithic flakes.

A request for the reports associated with Charles Garrad's site record forms under licence 85-42 and Michael Kirby's 1986 report on the Goldsmith Site (BdHc-17) was made to the MTCS on September 12, 2016. A response was received the same day which indicated that there are no reports on record for license 85-42; however, the site record forms submitted from 1982-1985 were provided. Michael Kirby is no longer licensed with the MTCS and, given the age of this report, it could not be located for review.

1.3.3 Existing Conditions

The current study area is located in a rural setting in the Town of Blue Mountains, Grey County Ontario and includes the Town of Blue Mountains Landfill Site at 788090 Grey Road 13, a large section of private property currently used for agriculture, and existing road allowances for Grey Roads 2, 13 and 40 and 30th Sideroad. The portions of the study area comprised of existing road allowances include a 50 m buffer centred along the travelled road lanes. The portions of the study area included in the 50 m road buffer include the travelled road lanes, right-of-way (ROW), and portions of private property comprised almost entirely of agricultural fields. Presently the study area is used for agricultural, transportation, and industrial purposes.

2. Analysis and Conclusions

2.1 Determination of Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the Ontario MTCS (Ontario Government 2011) to determine areas of archaeological potential include:

- Proximity to previously identified archaeological sites;
- Distance to various types of water sources;
- Soil texture and drainage;
- Glacial geomorphology, elevated topography and the general topographic variability of the area;
- Resource areas including food or medicinal plants, scarce raw materials, and early Euro-Canadian industry;
- Areas of early Euro- Canadian settlement and early transportation routes;
- Properties listed on municipal register of properties designated under the *Ontario Heritage Act* (Government of Ontario 1990b);
- Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants; and
- Historic landmarks or sites.

Distance to modern or ancient water sources is generally accepted as the most important element for past human settlement patterns and when considered alone may result in a determination of archaeological potential. In addition any combination of two or more of the criteria listed above, such as well drained soils or topographic variability, may indicate archaeological potential.

2.1.1 Pre-Contact and Contact First Nation Archaeological Resources

The potential for the recovery of pre-contact and contact period First Nation archaeological resources is determined to be high based on the immediate proximity of the Beaver River and Georgian Bay, which would have been important thoroughfares and significant sources of marine resources and potable water. The land around the study area also possesses a number of other environmental characteristics that would have made this area attractive to pre-contact First Nation populations, including the once diverse forest life, well drained and cultivable soils, and the proximity of the Fossil Hill bedrock formation - a raw material resource area. Archaeological potential is also elevated by the proximity of the study area to ancient glacial lake shorelines, which would have been ideal locations for settlement during the pre-contact Paleo period, as well as the presence of five registered pre-contact First Nation sites within 1 km of the study area.

2.1.2 19th Century Euro-Canadian Resources

The potential for the recovery of 19th century Euro-Canadian resources is also judged to be high based off of the early settlement of Grey County and, particularly, Collingwood Township. Features which elevate archaeological potential within and around the current study area include early sawmill industry along the Beaver River, the presence of several homesteads, churches and schoolhouses fronted on Grey Roads 13 and 40, as evident on the 1880 map, and the proximity of the early settlements of Thornbury and Clarkesburg to the north. Additionally, the study area falls along historic lot and concession lines, which were the earliest roads constructed in the Township, and the eastern portion of the study area is located in proximity to the former Northern Railway.

2.1.3 Areas where Archaeological Potential has been Removed

Certain features can indicate that archaeological potential has been removed, such as land that has been subject to extensive and intensive deep land alterations that have severely damaged the integrity of any archaeological resources. This includes landscaping that involves grading below the topsoil level, building footprints, quarrying, and sewage and infrastructure development (Ontario Government 2011).

Archaeological potential has been removed in the portion of the study area that includes the Town of Blue Mountains Landfill site, which comprises approximately 23.1 ha and includes the active Blue Mountains Landfill and the former closed Thornbury Landfill. This landfill consists of waste fill placed in worked out aggregate extraction pits resulting in deep land alterations that have severely impacted the integrity of any archaeological resources that may have been present.

Archaeological potential has also been removed in any part of the road allowances for Grey Roads 2, 13 and 40 and 30th Sideroad that includes paved lands and shoulders and extends to the toe of the fill slope, the top of the cut slope, or the outside edge of any drainage ditches, whichever is furthest from the centreline of the roadway. ROW disturbance may be found to extend beyond the typical disturbed ROW area, generally including areas with additional grading, cutting and filling, additional drainage ditching, watercourse alteration, intensive landscaping, and/or heavy construction traffic. ROW areas and land outside of the ROW that do not fit the descriptions provided above may remain intact and, therefore, retain archaeological potential.

2.2 Conclusions

AECOM's Stage 1 background study of the study area for several proposed alternative forcemain route options for a landfill site expansion in the Town of Blue Mountains in Grey County, Ontario has determined that the potential for the recovery of archaeological resources is high given the proximity of the study area to numerous major water sources, significant raw material resources, and historic settlements and industry. Areas where archaeological potential has been removed include the landfill site where extensive land alterations have significantly compromised the recovery of archaeological materials, as the roadways and portions of the ROW that display significant road development alterations.

3. Recommendations

AECOM's Stage 1 archaeological assessment of several proposed alternative forcemain route options and landfill site expansion in the Town of Blue Mountains in Grey County, Ontario has determined that the potential for the recovery of both archaeological resources is high. As a result of extensive, deep land alterations, archaeological potential has been removed from the landfill site and areas of ROW disturbance as described in Section 2.1.3 of this report. However, portions of the study area on private property that are in agricultural field or manicured lawn and areas outside of disturbed ROW have been identified as areas where archaeological potential remains intact (Figure 6). Based on these findings, **Stage 2 archaeological assessment is required for all land not demonstrated to be previously disturbed within the study area limits.**

It should be noted that this Stage 1 assessment is a preliminary study that has included several proposed forcemain route alternatives. As such, the study area boundaries include land that may not be impacted during construction and ground disturbing activities. Once the project impacts and details are determined, only the land identified herein that will be affected by this project will require Stage 2 archaeological assessment.

The Stage 2 archaeological assessment must be conducted by a licensed archaeologist and must follow the requirements set out in the *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011), including:

- Pedestrian survey at 5 m intervals where ploughing is possible (e.g., agricultural fields). This assessment will occur when agricultural fields have been recently ploughed, weathered, and exhibit at least 80% surface visibility;
- Test pit survey at 5 m intervals in all areas of potentially undisturbed lands that will be impacted by the project; and,
- Poorly drained areas, areas of steep slope, and areas of confirmed previous disturbance (e.g. building footprints, roadways, areas with identifiable land alterations below topsoil level) are to be mapped and photo-documented.

During the Stage 1 background research study, a small historic church, which still stands today at 828411 Grey Road 40, was identified on the 1880 map on Lot 28, Concession 8 within the current study area boundaries. Although no cemetery is marked on the 1880 map, historic churches have an elevated potential for the presence of unmarked graves associated with them. Given the proximity of the church to the present-day ROW along Grey Road 40, as a precautionary measure, it is recommended that Stage 3 mechanical topsoil removal be conducted for land to be impacted by the proposed forcemain route along Grey Road 40 in the vicinity of this historic church. Should any ground disturbing activities occur along the north side of Grey Road 40 within 10 m of the historic church, the following activities must be conducted to determine if any unmarked grave shafts are present in this portion of the study area (Figure 7):

- Stage 3 mechanical topsoil removal must be conducted for all lands included in the study area that fall within a 10 m buffer area around the historic church. Mechanical topsoil removal must be completed using an excavator with a straight-edged ditching bucket and only under the supervision of a licensed archaeologist; and,

- If grave shafts and/or human remains are encountered during construction, work must cease immediately, the police or Regional Coroner should be contacted, as well as the Registrar of the Cemeteries Regulation Unit of the Ministry of Consumer Services.

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports thereby concurring with the recommendations presented herein. As further archaeological assessments may be required, archaeological concerns have not fully been addressed for the portions of the study area as outlined above.

4. Advice on Compliance with Legislation

This report is submitted to the Ontario Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented or deeply buried archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

Archaeological sites recommended for further work or protection remain subject to Section 48(1) of the *Ontario Heritage Act* and may not be altered, or have artifact removed from them, except by a person holding an archaeological license.

The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Consumer Services.

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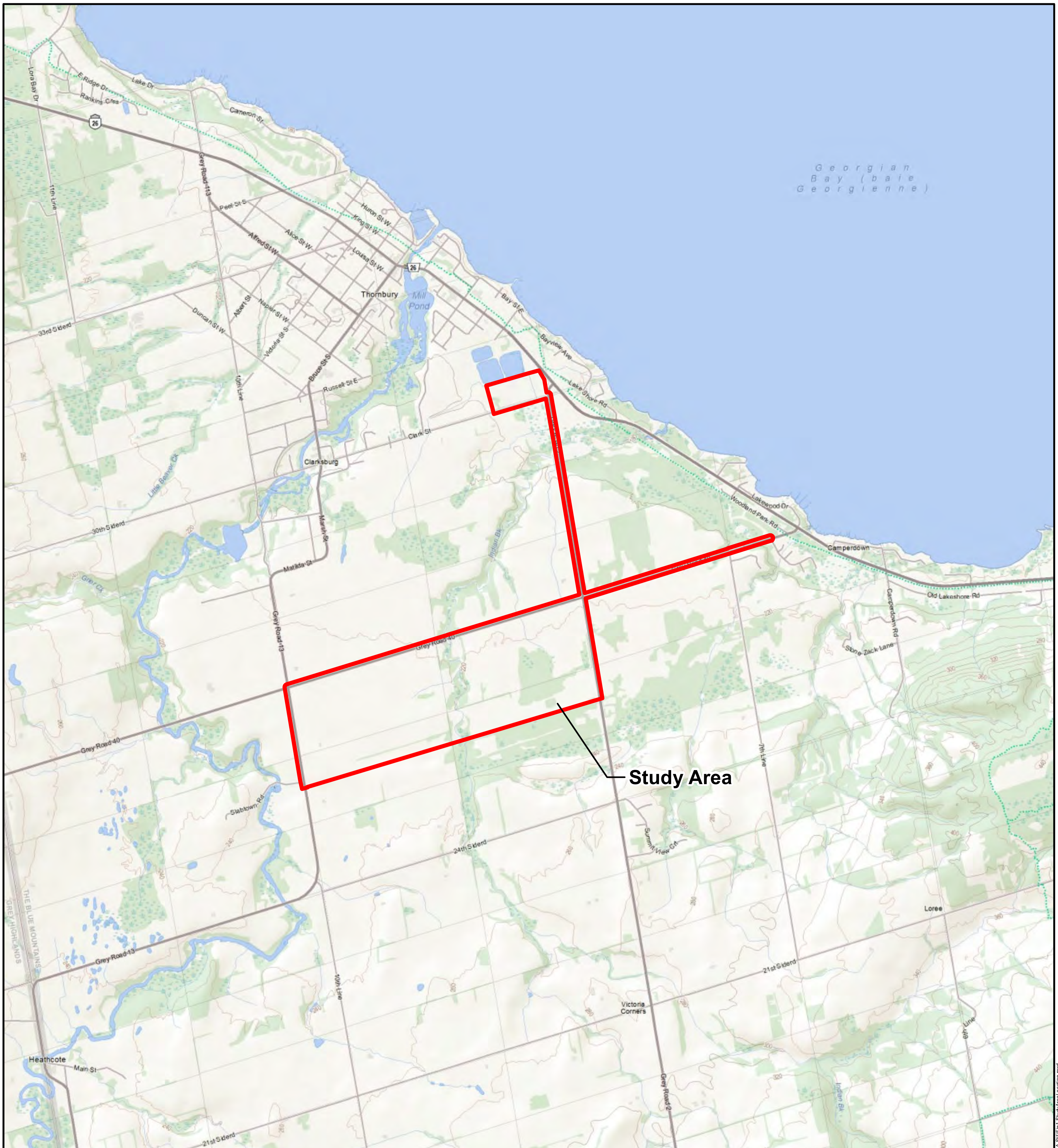
6. Figures

All figures pertaining to the Stage 1 archaeological assessment conducted for the proposed alternative forcemain route options for a landfill site expansion in the Town of Blue Mountains in Grey County, Ontario are provided on the following pages.



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Study Area

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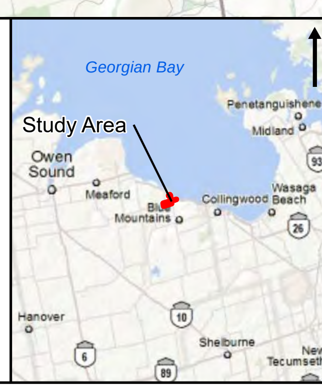

Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

Location of Study Area

September 2016	1:50,000	Datum: NAD 83 Zone 17 Source: Web Mapping Service www.giscoecache.lrc.gov.on.ca
P#: 60517700	V#:	

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Study Area

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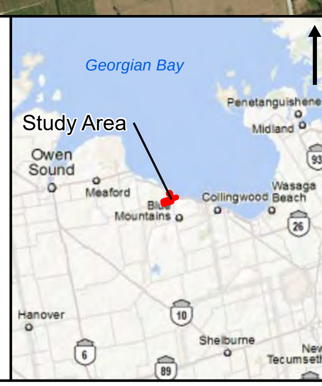


Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

Study Area in Detail

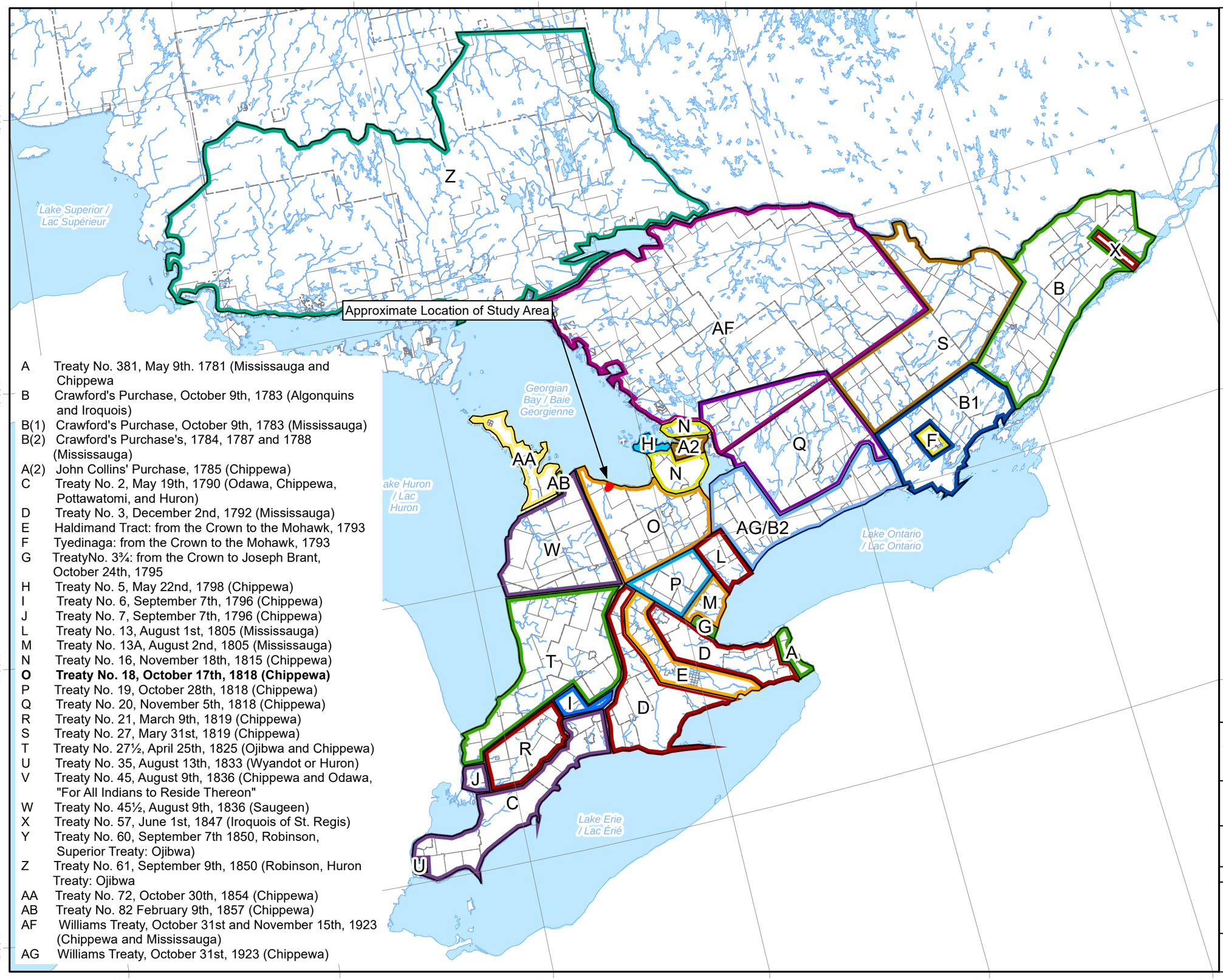
September 2016	1:25,000	Datum: NAD 83 Zone 17 Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User
P#: 60517700	V#:	

AECOM

Figure 2

0 250 500 1,000
Metres

Map location: P:\60517700 BM Ross-St 1 AA Blue Mtn\900-CAD, GIS\920-929 (GIS-Graphics)\Design\01_Reports\AA St1\Fig2-StudyArea.mxd
Date Saved: 27/09/2016 4:47:17 PM User Name: clarkb



A Treaty No. 381, May 9th. 1781 (Mississauga and Chippewa
B Crawford's Purchase, October 9th, 1783 (Algonquins and Iroquois)
B(1) Crawford's Purchase, October 9th, 1783 (Mississauga)
B(2) Crawford's Purchase's, 1784, 1787 and 1788 (Mississauga)
A(2) John Collins' Purchase, 1785 (Chippewa)
C Treaty No. 2, May 19th, 1790 (Odawa, Chippewa, Pottawatomi, and Huron)
D Treaty No. 3, December 2nd, 1792 (Mississauga)
E Haldimand Tract: from the Crown to the Mohawk, 1793
F Tyedinaga: from the Crown to the Mohawk, 1793
G TreatyNo. 3¾: from the Crown to Joseph Brant, October 24th, 1795
H Treaty No. 5, May 22nd, 1798 (Chippewa)
I Treaty No. 6, September 7th, 1796 (Chippewa)
J Treaty No. 7, September 7th, 1796 (Chippewa)
L Treaty No. 13, August 1st, 1805 (Mississauga)
M Treaty No. 13A, August 2nd, 1805 (Mississauga)
N Treaty No. 16, November 18th, 1815 (Chippewa)
O Treaty No. 18, October 17th, 1818 (Chippewa)
P Treaty No. 19, October 28th, 1818 (Chippewa)
Q Treaty No. 20, November 5th, 1818 (Chippewa)
R Treaty No. 21, March 9th, 1819 (Chippewa)
S Treaty No. 27, Mary 31st, 1819 (Chippewa)
T Treaty No. 27½, April 25th, 1825 (Ojibwa and Chippewa)
U Treaty No. 35, August 13th, 1833 (Wyandot or Huron)
V Treaty No. 45, August 9th, 1836 (Chippewa and Odawa, "For All Indians to Reside Thereon"
W Treaty No. 45½, August 9th, 1836 (Saugeen)
X Treaty No. 57, June 1st, 1847 (Iroquois of St. Regis)
Y Treaty No. 60, September 7th 1850, Robinson, Superior Treaty: Ojibwa)
Z Treaty No. 61, September 9th, 1850 (Robinson, Huron Treaty: Ojibwa
AA Treaty No. 72, October 30th, 1854 (Chippewa)
AB Treaty No. 82 February 9th, 1857 (Chippewa)
AF Williams Treaty, October 31st and November 15th, 1923 (Chippewa and Mississauga)
AG Williams Treaty, October 31st, 1923 (Chippewa)

Legend

- Study Area
- Waterbody
- Watercourse
- Municipality Boundary - Lower
- Municipality Boundary - Upper
- Treaty Boundary

N

0 30 60 120
Kilometres

Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

Treaties and Purchases,
Adapted from Morris (1943)

September 2016	1:3,000,000	Datum: NAD83 CSRS Canada Atlas Lambert Source: MNR, Morris 1943
P#: 60517700	V#:	

AECOM

Figure 3

Map location: P:\60517700 BM Ross-St 1 AA Blue Mtn\800-CAD, GIS\920-929 (GIS-Graphics)\Design\01_Reports\AA St1\Fig3-TreatiesPurchases.mxd
Date Saved: 27/09/2016 4:40:09 PM User Name: clarkb

Legend

Study Area

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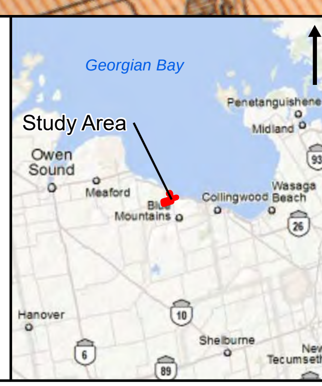


Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

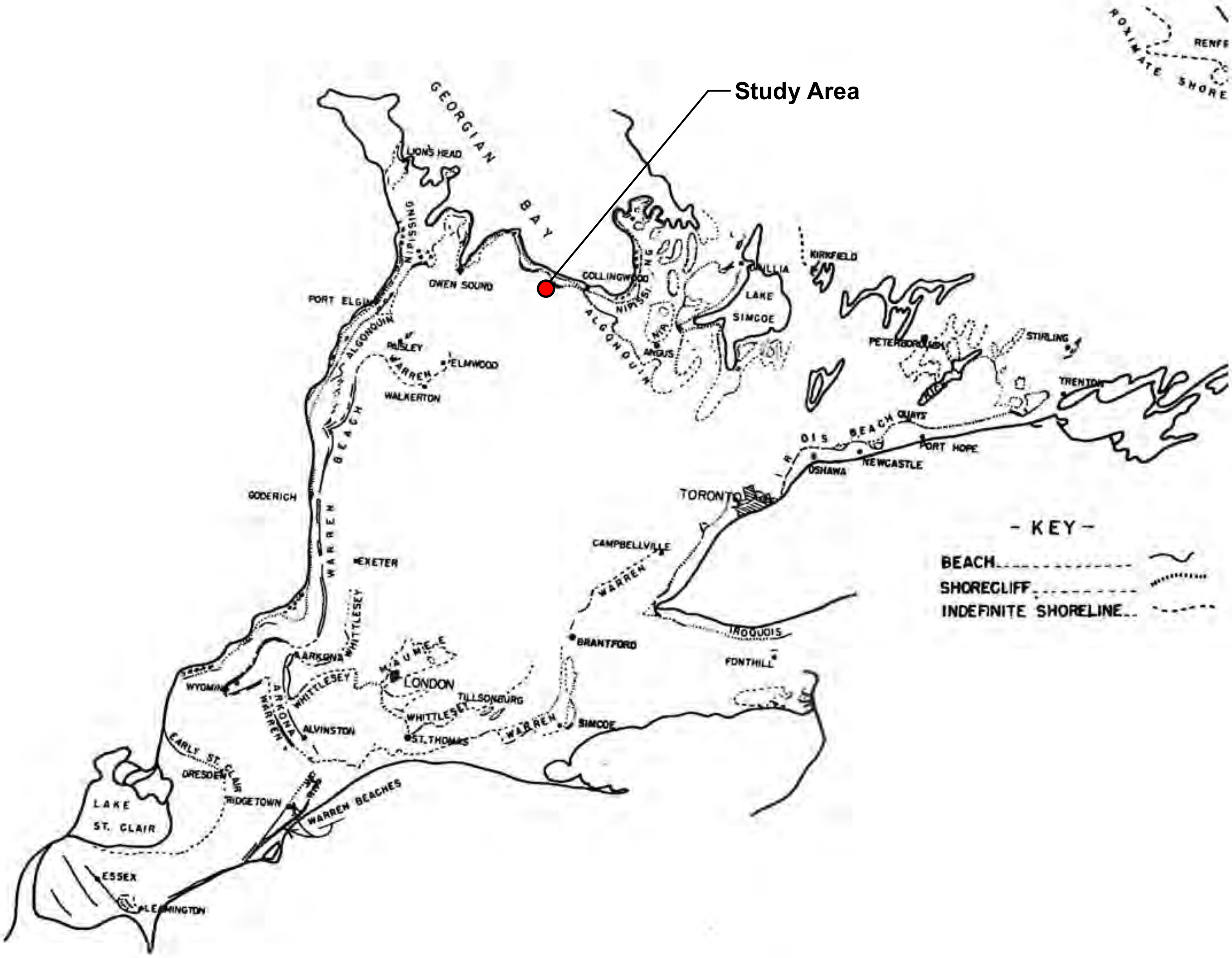
A Portion of the 1880 Map
of the Township of Collingwood

September 2016	1:40,000	Datum: NAD 83 Zone 17 Source: Illustrated Historic Atlas of Dominion of Canada, Grey Supplement (H. Beldon & Co, 1880)
P#: 60517700	V#:	

AECOM

Figure 5

0 400 800 1,600
Metres



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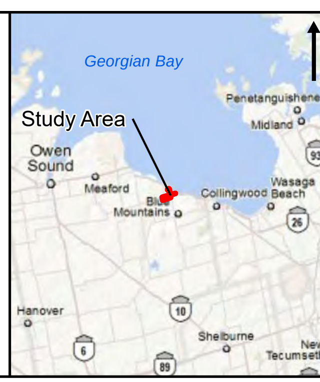


Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

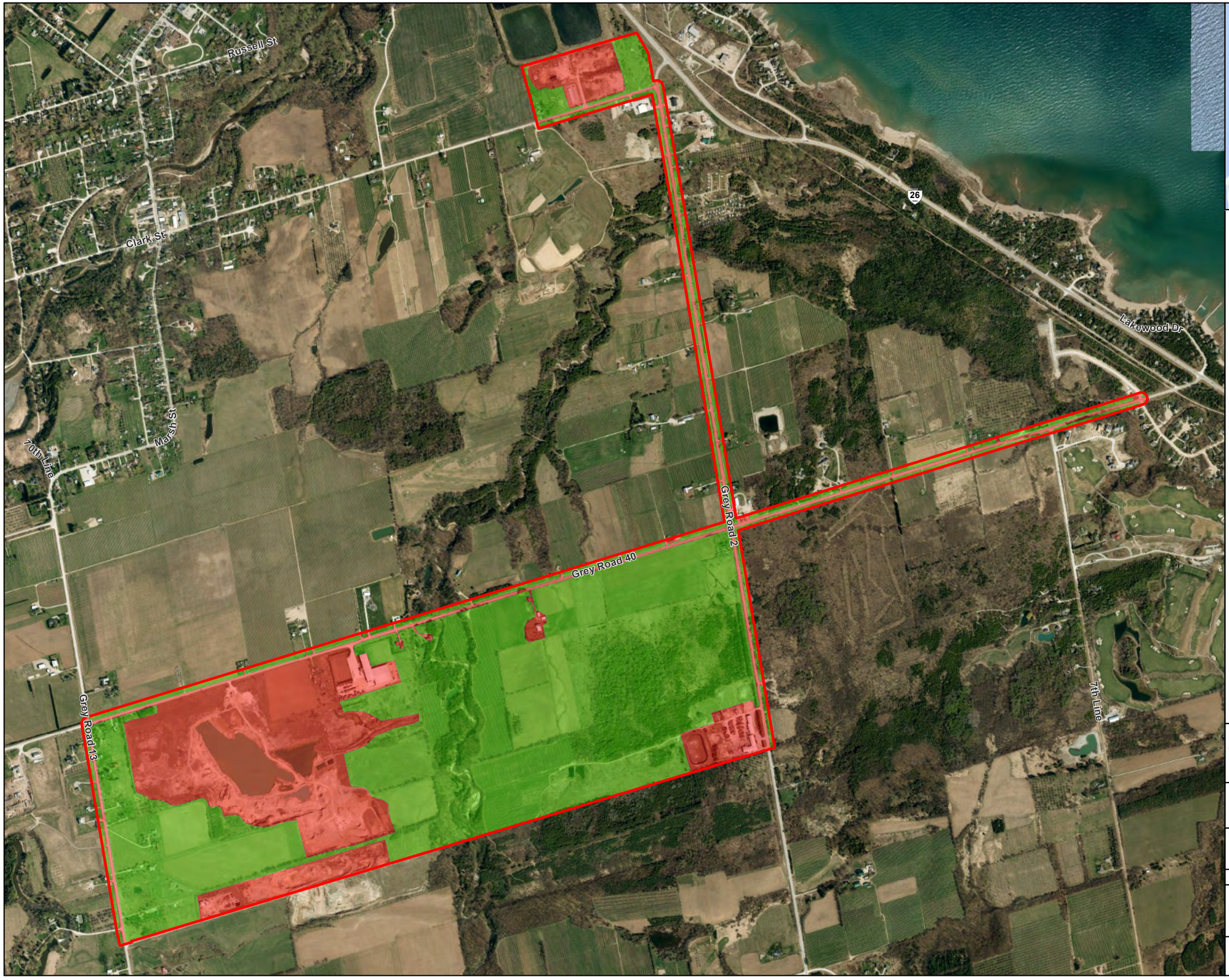
Approximate Location of Glacial Lakes Algonquin and Nipissing

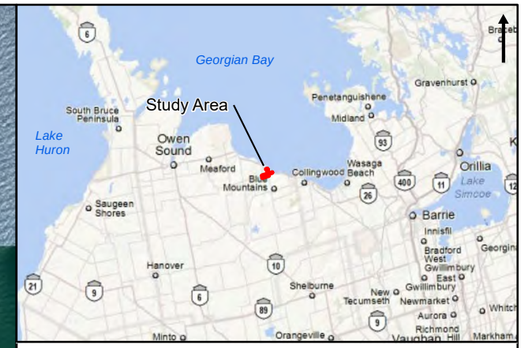
September 2016	1:50,000	
P#: 60517700	V#:	

AECOM

Figure 5

0 500 1,000 2,000
Metres





Legend

- Study Area
- Area of Archaeological Potential (Stage 2 Assessment Required)
- Low/No Archaeological Potential (No Further Work Required)

N

0 200 400 800
Meters

Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

Determination of Archaeological Potential

September 2016	1:15,000	Datum: NAD 83 Zone 17 Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
P#: 60517700	V#:	

AECOM

Figure 6

Map location: P:\60517700 BM Ross-St 1 AA Blue Mtn\900-CAD, GIS\920-929 (GIS-Graphics)\Design\01_Reports\AA St1\Fig6-ArchaeologicalPotential.mxd
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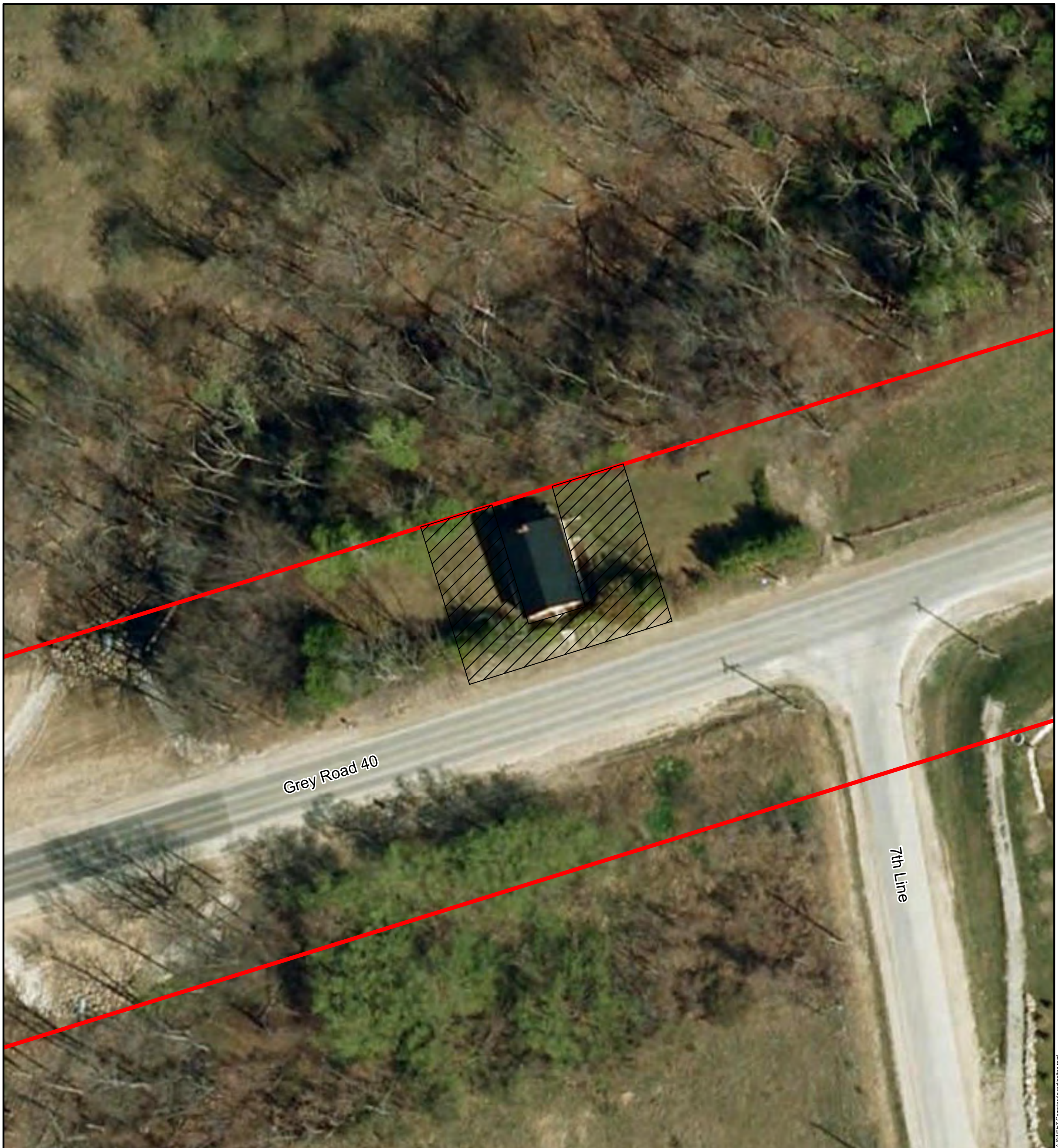
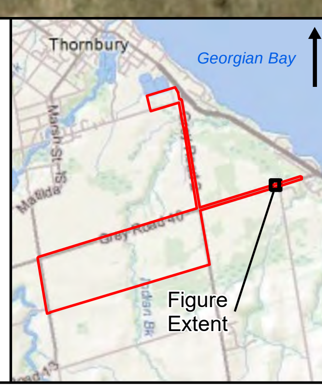


Legend

- Study Area
- Area of Mechanical Topsoil Removal

N



Stage 1 Archaeological Assessment
Town of Blue Mountains Landfill Site Expansion
The Blue Mountains, Grey County, Ontario

Limits of Stage 3 Topsoil Removal
Cemetery Investigation

September 2016	1:750	Datum: NAD 83 Zone 17 Source: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User
P#: 60517700	V#:	Figure 7

AECOM

0 5 10 20
Metres

Map location: P:\60517700 BM Ross-St 1 AA Blue Mtn\900-CAD, GIS\920-929 (GIS-Graphics)\Design\01_Reports\AA St1\Fig7-CemeteryInvestigation.mxd
Date Saved: 28/09/2016 1:57:48 PM User Name: clarkb

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As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges.

From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM companies had revenue of approximately US$19 billion during the 12 months ended June 30, 2015.

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Sincerely,

Ian Hember
Archaeology Review Officer

cc. Archaeology Licensing Officer
Kelly Vader,B.M. Ross &Associates
TBD TBD,Ministry of the Environment and Climate Change

[1]In no way will the ministry be liable for any harm, damages, costs, expenses, losses, claims or actions that may result: (a) if the Report(s) or its recommendations are discovered to be inaccurate, incomplete, misleading or fraudulent; or (b) from the issuance of this letter. Further measures may need to be taken in the event that additional artifacts or archaeological sites are identified or the Report(s) is otherwise found to be inaccurate, incomplete, misleading or fraudulent.

APPENDIX F

LEACHATE TESTING RESULTS

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

29-April-2016

Town of the Blue Mountains
Attn : Jeffery Fletcher

32 Mill Street, PO Box 310
Thornbury, ON
N0H 2P0,

Phone: 519-599-3131
Fax:pdf

Date Rec. : 22 April 2016
LR Report: **CA12782-APR16**

Copy: #1

CERTIFICATE OF ANALYSIS
Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: East Cell Landfill Leachate
Sample Date & Time					21-Apr-16 11:30
Sampled By					Jeff Fletcher
Temperature Upon Receipt [°C]	---	---	---	---	17.0
Total Suspended Solids [mg/L]	26-Apr-16	14:52	27-Apr-16	15:38	9
Biochemical Oxygen Demand (BOD5) [mg/L]	22-Apr-16	16:07	27-Apr-16	16:14	5
Alkalinity [mg/L as CaCO3]	28-Apr-16	17:54	29-Apr-16	09:44	129
Conductivity [uS/cm]	28-Apr-16	17:54	29-Apr-16	09:44	317
pH [no unit]	28-Apr-16	17:54	29-Apr-16	09:44	8.15
Carbonate [mg/L as CaCO3]	28-Apr-16	17:54	29-Apr-16	09:44	< 2
Bicarbonate [mg/L as CaCO3]	28-Apr-16	17:54	29-Apr-16	09:44	129
Chemical Oxygen Demand [mg/L]	27-Apr-16	11:50	29-Apr-16	12:30	99
Dissolved Organic Carbon [mg/L]	22-Apr-16	21:00	25-Apr-16	16:22	6.4
4AAP-Phenolics [mg/L]	26-Apr-16	14:00	27-Apr-16	12:10	0.002
Ammonia+Ammonium (N) [mg/L]	22-Apr-16	21:00	26-Apr-16	15:50	0.1
Total Kjeldahl Nitrogen [as N mg/L]	22-Apr-16	21:00	27-Apr-16	14:56	1.0
Organic Nitrogen [mg/L]	22-Apr-16	21:00	27-Apr-16	14:56	0.9
Chloride [mg/L]	27-Apr-16	16:11	28-Apr-16	14:38	7
Sulphate [mg/L]	27-Apr-16	16:11	28-Apr-16	14:38	24
Nitrite (as N) [mg/L]	26-Apr-16	11:20	27-Apr-16	13:51	< 0.03
Nitrate (as N) [mg/L]	26-Apr-16	11:20	27-Apr-16	13:51	0.46
Mercury (total) [mg/L]	26-Apr-16	06:59	26-Apr-16	09:47	< 0.00001
Hardness [mg/L as CaCO3]	26-Apr-16	12:08	27-Apr-16	14:31	167
Arsenic (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.0006
Barium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.0154
Boron (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.046
Cadmium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.000028
Calcium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	47.7
Chromium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.00048
Copper (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.00361
Iron (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.200
Lead (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.00052
Magnesium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	11.7
Manganese (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.0307
Phosphorus (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.059
Potassium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	7.07
Sodium (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	5.37

SGS Canada Inc.
P.O. Box 4300 - 185 Concession St.
Lakefield - Ontario - KOL 2HO
Phone: 705-652-2000 FAX: 705-652-6365

LR Report : **CA12782-APR16**

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: East Cell Landfill Leachate
Zinc (total) [mg/L]	26-Apr-16	12:08	27-Apr-16	14:31	0.006
Naphthalene [ug/L]	25-Apr-16	08:34	29-Apr-16	11:43	< 0.5
Benzene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
Carbon tetrachloride [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.2
1,2-Dichlorobenzene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
1,4-Dichlorobenzene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
1,1-Dichloroethane [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
Ethylbenzene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
Toluene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
Vinyl Chloride [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.2
Xylene (total) [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
o-xylene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
m/p-xylene [ug/L]	22-Apr-16	16:30	26-Apr-16	12:43	< 0.5
Cation sum [meq/L]	---	---	---	---	3.77
Anion Sum [meq/L]	---	---	---	---	3.28
Anion-Cation Balance [% difference]	---	---	---	---	6.95
Total Dissolved Solids (calculated) [mg/L]	---	---	---	---	181
Conductivity (calculated) [uS/cm]	---	---	---	---	353

[redacted]

Carrie Greenlaw
Project Specialist
Environmental Services, Analytical

OnLine LIMS

00006986990