

TOWN OF PENETANGUISHENE

Municipal Snow Storage Location

Municipal Class Environmental Assessment Study

Environmental Study Report

July 2024



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1 INTRODUCTION

A Municipal Class Environmental Assessment ('MCEA') has been initiated by the Town of Penetanguishene ('Town') for the determination of a new storage location for snow that is removed from the downtown area. This report proposes several snow storage location options and evaluates each according to the Schedule 'B' Class Environmental Assessment ('Class EA') guidelines. The Town retained Greenland International Consulting Ltd. ('Greenland') to complete this assessment.

1.1 Background

The Town of Penetanguishene is a member municipality of Simcoe County and is located at the southeasterly tip of Georgian Bay. It owns and maintains 95 kilometres of road. The Town is dedicated to ensuring the road network meets the needs of the public in a safe, efficient, sustainable, and environmentally friendly manner.

During the winter months, snow accumulation on boulevards is prone to restricting sightlines and impedes on-street parking, sidewalk use and multi-use trails. As per the Town's *Snow Removal Policy (2019)*, once snow banks reach a height of 0.45 meters, the snow is to be removed from congested areas. The priority of streets in the downtown area can be seen in **Figure 1-1**.



Figure 1-1 Snow Removal Areas – Priority Map

1.1.1 Site

The Town currently operates one snow storage location that is situated on Private Property. The Town currently leases this site from the Morden Construction Gravel Pit, which has been the solitary storage area for snow since 2018. It is located on Fuller Avenue between Robilard Drive and Laurier Road in the Town of Penetanguishene, see the orange circle in **Figure 1-2**.

Prior to 2018, three (3) separate sites were utilized. These sites are referred to as the Huronia Park site, the Boat Launch site and the Waterfront Park site. The sites are denoted in yellow in **Figure 1-2**.

The Town is currently looking for a new snow storage location that will improve consistency and reduce the vulnerability of the site becoming unavailable.



Figure 1-2 Former and Current Snow Storage Locations

1.1.2 Reports

Several reports and documents were used as background information for this report. A list of the reports and documents is presented below:

- Snow Disposal Site Evaluation, Golder Associates (July 2009)
- Guidelines on Snow Disposal and De-icing Operations in Ontario, MECP (February 2017)
- Town's Snow Removal Policy, Town of Penetanguishene (April 2019)
- Snow Storage and Disposal, TAC (April 2013)

1.2 Project Scope

The scope of work for this project includes:

- 1. Prepare Notice of Commencement for circulation and posting on Town Website;
- 2. Engage all First Nations contacts and determine the preferred consultation method;
- 3. Prepare a Long List of possible snow storage locations;
- 4. Complete the following assessments at each short-listed option:
 - a. Stage 1 Archaeological Assessment;
 - b. Noise Assessment;
 - c. Natural Heritage Assessment;
 - d. Hydrogeology Assessment;
 - e. Traffic Assessment;
- 5. Complete Schedule 'B' Class EA report in accordance with the MCEA guidelines, including identification and evaluation of alternative solutions;
- 6. Engage the Public through one (1) point of contact;
- 7. Submit summary draft Report to Town for review and comment;
- 8. Revise the Report document per comments;
- 9. File Notice of Completion; and,
- 10. Respond to public questions / external input for the duration of the Schedule 'B' process, up to the Notice of Completion document.

2 STUDY APPROACH

2.1 Class EA Process

This study is being conducted in accordance with the Municipal Engineers Association (MEA) Municipal Class Environmental Assessment guidelines (October 2000, as amended in 2007, 2011 and 2015 addendum) [1]. The Class EA process looks at potential environmental, cultural, and economic effects, develops alternatives, determines preferred measures, and incorporates mitigation methods. This is an approved planning and design process under the *Ontario Environmental Assessment Act*.

Transportation improvements are classified into one of the following schedules [1]:

Schedule 'A' Projects are limited in scale, have minimal adverse environmental impacts, and include several municipal maintenance and operational activities. These projects are pre-approved and July advance to implementation without following the full Class EA process.

Schedule 'A+' Projects are similar to Schedule A projects in that they are pre-approved and can proceed to implementation without following the full Class EA process. However, they require the public to be advised before the implementation of the project.

Schedule 'B' Projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process, involving contact with the directly affected public and relevant review agencies, to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns, then the project July advance to implementation.

Schedule 'C' Projects which have the potential to have significant environmental impacts. The proponent must follow the full planning and documentation process of the Municipal Class EA document. An Environmental Study Report must be prepared for review by the public and review agencies.

As illustrated in **Figure 2-1**Error! Reference source not found., the planning and design process is c omprised of five phases [1]:

Phase 1 Identify Problem or Opportunity;

Phase 2 Identify and Evaluate Alternative Solutions to address the problem or opportunity;

Phase 3 Examine Alternative Design Concepts for the preferred solution;

Phase 4 Complete and File Environmental Study Report (ESR) for public review; and

Phase 5 Complete contract drawings and documents and proceed to Detailed Design, Construction / Operation, and Environmental Monitoring.

The Penetanguishene Snow Storage Location requires the process in **Schedule 'B'** to be followed. Therefore, based on **Figure 2-1** the Municipal Class Environmental Assessment (MCEA) flow chart, Phase 1, Phase 2, and Phase 5 will be completed as part of this Environmental Assessment process. See **Figure 2-2** for a detailed breakdown of the events that happen in each Phase.



Figure 2-1 Exhibit A.1 – Key Features of the Municipal Class EA [1]



Figure 2-2 Exhibit A.2 – Municipal Class EA Planning and Design Process

2.2 Public Consultation

2.2.1 Notice of Study Commencement

The Notice of Commencement was prepared by Greenland and released on October19th, 2022. The Town Committee of the Whole received the notice on 14 September, 2022. The Notice is also posted on the Town website (<u>click here</u>) and circulated to relevant stakeholders. The list of circulated stakeholders can be seen in **Appendix C.**

2.2.2 Notice of Public Information Centre

As part of the Class EA process, a Notice for the Public Information Centre (PIC) was prepared and circulated on December 08, 2022. A PIC, hosted by the Town, was conducted on 08 February 2024 to present the draft findings of the Class EA report and provide an opportunity for public comment on the project.

2.2.3 First Nation Consultation

The First Nations Groups that were circulated are listed below, in alphabetical order. A detailed list can be found in **Appendix C.**

- Alderville First Nation
- Beausoleil First Nation
- Chippewas of Georgiana Island First Nation
- Chippewas of Rama First Nation
- Curve Lake First Nation
- Georgian Bay Metis Council
- Hiawatha First Nation
- Metis Nation of Ontario Lands, Resources and Consultations
- MNO Midland Office
- Mississauga's of the Scugog Island
- Wahta Mohawk (Mohawks of Gibson)
- Wasauksing First Nation (Parry Island)
- Williams Treaty First Nation

3 EXISTING CONDITIONS

3.1 Study Area

The Study Area for this project is the Town of Penetanguishene. The long list of possible snow storage locations has been chosen from areas across the Town.

The Town of Penetanguishene is a member of the County of Simcoe and is located at the southeasterly tip of Georgian Bay. The downtown area is located at the south end of the Penetanguishene Harbour. The primary residential area is located to the north and the east of the downtown area and the secondary residential area is located to the south and southwest of the downtown area. The streets considered a high priority for snow removal can be seen in **Figure 1-1**.

3.2 Natural Environment

The existing Natural Environment was assessed for each of the snow storage locations that were determined to be on the shortlist using the EA process. Azimuth Natural Heritage was hired to complete this assessment on behalf of Greenland.

The Natural Environment report that contains a detailed analysis of each location on the shortlist can be found in **Appendix D**. A summary of the Natural Environment information for each of the short-listed sites can be found in **Section 9**.

3.3 Soil and Geology

3.3.1 Soil Classification

The Canada Land Inventory (CLI) classifies soils into eight (8) different categories based on their capability for agriculture, see **Table 3-1**. The soil classes were established using soil characteristics that were determined based on information gathered from soil surveys.

Classes	Description
Class 1	Soils in this class have no significant limitations in use for crops.
Class 2	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices.
Class 3	Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices.
Class 4	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices.
Class 5	Soils in this class gave very severe limitations that restrict their capability in producing perennial forage crops, and improvement practices are feasible.
Class 6	Soils in this class are capable only of producing perennial forage crops, and improvement practices are not feasible.
Class 7	Soils in this class have no capacity for arable culture or permanent pasture.
Class 0	Organic Soils (not placed in capability classes).

Table 3-1 Canada Land Inventory Soil Classes

The County of Simcoe provides information on soil classification for the region through a GIS layer on its online "Interactive Map" service. The Interactive Map tool groups the soil classes into four (4) sub-groups, as seen below:

- Class 1 Class 3
- Class 4
- Class 5 Class 7
- Organics

The distribution of soil classes across the Town of Penetanguishene can be seen in **Figure 3-1**. The Class 1 through Class 3 soils are primarily located along the east shore of the Penetanguishene Harbour and to the north and the east of St. Andrew's Lake. The Class 4 soils are predominantly located around St. Andrew's Lake, with a few smaller pockets dispersed throughout the Township. The Class 5 through Class 7 soils are primarily located in the central and the northeast areas of the Township with a few smaller areas throughout the western portion of the Township. There are two small pockets of organics, one immediately surrounding St. Andrew's Lake and another pocket in an unnamed wetland in the northeast area of the Township.



Figure 3-1 Penetanguishene Soil Classification

A summary of the total area of each soil type that is present in the Town of Penetanguishene can be seen in **Table 3-2**. Based on the information presented, the primary soil type in the Town of Penetanguishene

is Class 5 through Class 7, making up approximately half of the soil. Class 1 through Class 3 and the Class 4 soil types appear to make up the other half with slightly less being of the Class 4 type.

Soil Class	Area (ha)	Percentage (%)
Lake	62	1%
Class 1 – Class 3	1465	28%
Class 4	1025	20%
Class 5 – Class 7	2495	48%
Organics	134	3%

Table 3-2 Soil Classes by Total Area

3.3.2 Bedrock Geology

Penetanguishene is underlain by bedrock from the Gull River formation. This Ordovician age limestone is very fine-grained, light grey to brown limestone, with argillaceous to silty dolostone beds more prevalent towards the base.

3.3.3 Quaternary Geology

Penetanguishene is located in a physiographic region known as the Simcoe Uplands. The Town is almost entirely characterized by a broad sand plain, with the exception of a portion of the northeast consisting of a clay plain. The surficial soils in the Town consist primarily of coarse-textured glaciolacustrine deposits, with some areas of stone-poor, carbonate-derived silty to sandy till in the northeast and northwest and a few pockets of fine-textured lacustrine/glaciolacustrine deposits.

Along the Penetanguishene Peninsula, overburden thickness has been observed to reach an excess of 150 m, according to existing water well records.

The drainage network of the Simcoe Uplands consists of very few permanent streams. Those that do exist, primarily flow in a northward direction. Much of the surface water within the Uplands percolates into the subsurface of the sandy sediments before it can be channelled into existing streams [2].

3.4 Hydrogeology

3.4.1 Well Supply Systems & Hydrogeology

Penetanguishene's drinking water is supplied by three (3) groundwater well supply systems: the Payette system, the Robert Street West system (not currently in operation), and the Lepage Subdivision system. Water quality assurance in Ontario is regulated through Wellhead Protection Areas (WHPAs). Each subarea of a given WHPA represents a different timeline expected for surface water to replenish the water table by infiltration through soil horizons.

- WHPA-A represents a 100-meter zone around the wellhead where the land use activities have the potential to pose the most significant threat to the groundwater source.
- WHPA-B represents a time of travel of 2 years for groundwater to reach the wellhead.
- WHPA-C represents a time of travel of 5 years for groundwater to reach the wellhead.
- WHPA-D represents a time of travel of 25 years for groundwater to reach the wellhead.

The wellhead protection area (WHPA) from the Lepage and Robert Street W systems extend into Tiny Township, however, there are no WHPAs from other neighbouring municipalities that impact the Town of Penetanguishene.

The majority of water in the Town of Penetanguishene is supplied by the Payette system, located at 64 Payette Drive. This well system consists of three (3) wells and is the primary consideration of the potential to impact groundwater sources when considering the Town's future snow storage location. Its WHPA extends from St. Andrews Lake southwest to Penetanguishene Harbour and south to the merger of County Rd 93 and Main Street. The delineation of the WHPA is shown in **Figure 3-2**. Groundwater Vulnerability for the Payette Water supply was delineated for the Severn Sound Source Protection Area Approved Assessment Report [3], and Vulnerability Scores were assigned within the WHPA. The Vulnerability Scores are shown in **Figure 3-3**.



Figure 3-2 Town of Penetanguishene Wellhead Protection Areas

The Payette wells are constructed in aquifer A3, which is combined with aquifer A2 in this area. Aquifer A3 is the major aquifer unit in the study area and ranges from fine sand to coarse gravel. Aquifer A3 is directly underlain by bedrock in the vicinity of the Payette wellfield. Aquifer A2 is confined in the vicinity of the Payette wellfield, and unconfined in the Penetanguishene Harbour area and the central part of the Town.



Figure 3-3 Town of Penetanguishene Wellhead Vulnerability

Chloride concentrations have been increasing over the past several decades at the Payette water supply system, however, are not expected to increase above the ODWS in the next 40 years. Despite this, the impact of chlorides on the wellfield was considered during the evaluation of snow storage locations.

The Robert Street W well field has been out of production due to contamination since 1991. However, recent testing (2022) has shown that TCE levels have been decreasing, which July allow the wellfield to act as a secondary source of water supply in the next decade. Thus the potential impact on the Robert Street W wellfield must also be considered during the selection and evaluation of potential snow storage locations. WHPAs within the Town have been delineated, as required by the drinking water source protection act, shown in **Figure 3-2**. The WHPA is located in the southwest corner of the Town, just south of Penetanguishene Harbour and extends into Tiny Township. Groundwater Vulnerability for the Robert Street W supply was delineated for the Severn Sound Source Protection Area Approved Assessment Report (2011), and Vulnerability Scores were assigned within the WHPA. The Vulnerability Scores are shown in **Figure 3-3**.

The Robert Street wells are also constructed in Aquifer A3, however, in the vicinity of the wellfield, aquifers A2 and A3 are distinct from each other. The A3 aquifer is directly underlain by bedrock in the area of the Robert Street wells. Both aquifer A2 and aquifer A3 are confined and under artesian conditions in the Robert Street area.

3.4.2 Significant Groundwater Recharge Area

A Significant Groundwater Recharge Area is an area where an aquifer is significantly replenished from:

- Natural processes, such as the infiltration of rainfall and snowmelt, and the seepage of surface water from lakes, streams, and wetlands;
- From human interventions, such as the use of stormwater management systems; and,
- A recharge area where the recharge rate exceeds a threshold specified in the regulations.

There are large portions of the Town which serve as groundwater recharge areas. In particular, much of the land west and south of Penetanguishene Harbour is a significant groundwater recharge area (SGRA), with large portions highly vulnerable. In addition, the is an SGRA for much of the area surrounding the Payette well field, extending further east toward St. Andrews Lake. SGRAs within the Town are shown in **Figure 3-4**, and have been considered during the evaluation process of the snow storage location.



Figure 3-4 Town of Penetanguishene Significant Groundwater Recharge Area

3.5 Snow Storage

The Town currently operates one snow storage location that is situated on Private Property. The Town currently leases this site from the Morden Construction Gravel Pit, which has been the solitary storage area for snow since 2019. It is located on Fuller Avenue between Robillard Drive and Laurier Road in the Town of Penetanguishene, see the orange circle in **Figure 1-2**.

- Risk/challenge of leasing the land.

3.5.1 Social

A concentrated snow storage site can also have social impacts on the surrounding community. One of the main concerns is the potential for the site to create noise and air pollution during the snow removal and storage process, which can impact nearby residents and businesses. In addition, if the site is located in a residential area, it can impact the quality of life for residents due to the visual impact of large piles of snow and the potential for increased traffic and congestion. However, if the site is located appropriately and managed properly, it can help ensure the safety and accessibility of roads and walkways during the winter months, which can support the mobility and well-being of the community.

3.5.2 Economic

A concentrated snow storage site can also have economic impacts to the Town and residents as an extension. One of the main costs is associated with the operation and maintenance of the site, including snow removal and transport, storage, and eventual disposal. This can be a significant expense for municipalities and businesses that need to manage large amounts of snow and the resulting contaminants left over. The majority of snow removal takes place during the evening and night hours and as such, the economic impact to local businesses is reduced.

3.5.3 Environmental

A concentrated snow storage site can have significant environmental impacts if not managed properly. One of the main concerns is the potential for pollution of nearby waterways, as the melting snow can carry pollutants such as road salt, oil, and debris into lakes, streams and rivers. In addition, there is also the risk of contamination of groundwater if the snowmelt is allowed to infiltrate into the ground with a shallow groundwater elevation. There is also the possibility of damage to vegetation and wildlife habitats if the snow storage site is not located or designed carefully. To minimize these impacts, it is important to properly manage the site and ensure that it is located in an appropriate location with proper drainage and environmental controls in place.

4 PROBLEM AND OPPORTUNITY

The Town of Penetanguishene requires a location to store snow that has been removed from the downtown streets. The Town currently has an arrangement with Morden Construction Inc. to store the snow in their gravel pit during the winter. The purpose of this Schedule 'B' Class EA is to determine a new snow storage location that will reduce the vulnerability of the site becoming unavailable and provide consistency. The Town is looking for an environmentally conscious, sustainable solution that will respect noise levels in residential areas.

5 ALTERNATIVE DESIGN CONCEPTS: LONG LIST

The 'Long List' consists of eight (8) potential snow storage locations, which include the current snow storage location, the three (3) former locations and four (4) new locations provided by the Town. The locations can be seen in **Figure 5-1** and are described in **Sections 5.1** through **Section 5.8**.





5.1 Option 1: Do Nothing – Morden Gravel



The "Do Nothing" option is the baseline approach and must always be considered as part of the EA process.

This option would see the snow storage location remain at the Morden Construction Inc. gravel pit. The Town included this location in their list of options to consider, outside of the "Do Nothing" Option. This snow storage location is on private property at 905 Fuller Avenue, Penetanguishene Ontario.

Figure 5-2 Location – Morden Construction Gravel Pit

5.2 Option 2: Waterfront Park

The Waterfront Park location was included in the *Snow Disposal Site Evaluation Report* [4] in Area A. It is also a former snow storage location. This storage location is located at the north end of Owen Street, along the waterfront. The street address is 8 Owen Street, Penetanguishene Ontario.



Figure 5-3 Location – Waterfront Park

5.3 Option 3: The Boat Launch



Figure 5-4 Location – Boat Launch

The Boat Launch location was included in the *Snow Disposal Site Evaluation Report* [4] in Area A. It is also a former snow storage location. This is located in the boat launch parking lot, east of Main Street, and north of the Pollution Control Plant, along the waterfront.

5.4 Option 4: Huronia Park

The Huronia Park location was included in the *Snow Disposal Site Evaluation Report* [4] in Area B. It is also a former snow storage location. It is located in the Huronia Park parking lot on the west side of Fox Street. This location was also The street address is 250 Fox Street, Penetanguishene Ontario.



Figure 5-5 Location – Huronia Park

5.5 Option 5: Correctional Centre



The Central North Correctional Centre falls into Area C: Sandy Point Road in the *Snow Disposal Site Evaluation Report* [4]. The report did not specifically mention this location along Sandy Bay Road, however, for the purpose of this report, it will be considered. The street address of this location is 1501 Fuller Avenue, Penetanguishene Ontario, using the north access road by Oak Ridge Drive.

Figure 5-6 Location – Correctional Centre

5.6 Option 6: Thompsons Road

The Thompsons Road location falls under Area D: Thompsons Road in the Snow Disposal Site Evaluation Report [4]. The report did not specifically mention this location along Thompsons Road, however, for the purpose of this report, it will be considered. The snow storage location consists of a treed lot with an abandoned parking lot. It is the quadrant southeast of the intersection of Robert Street East and Thompsons' Road. This site is located on private property, specifically at 160 Robert Street East, Penetanguishene Ontario.



Figure 5-7 Location – Thompsons Road

5.7 Option 7: Tinney's Septic



Figure 5-8 Location – Tinney's Septic

The Tinney's Septic Service & Construction location was included in the Snow Disposal Site Evaluation Report [4] in Area E: Tay Point Road. The report did not specifically mention this location along Tay Point Road, however, for the purpose of this report, it will be considered. This site is located on private Fuller property at 693 Avenue, Penetanguishene Ontario.

5.8 Option 8: Fox Street

The forested lot across from the Penetanguishene Pollution Plant was included at the request of the Town. This property is owned by the Town. The street address is 151 Fox Street, Penetanguishene Ontario.



Figure 5-9 Location – Fox Street

6 ANALYSIS AND EVALUATION CRITERIA

The long list of options presented in **Section 5** will be evaluated using a two (2) phase process. The first phase will include assessing each of the options against the constraints outlined in **Section 6.1**. For an option to be considered as a potential final solution, it **MUST** meet all of the constraints.

The options which meet all of the constraints will then be subjected to additional screening using the criteria outlined in **Section 6.2**. Options which can meet the criteria without significant detrimental impacts will be added to the short list of options. Criteria numbers '1' through '6' were taken from the *Guidelines on Snow Disposal and De-icing Operations in Ontario, MECP* [5]. Criteria numbers '7' through '9' were taken from the *Snow Disposal Sites Evaluation, Golder Associates* [4].

The shortlist of options will then be evaluated on the Criteria outlined in Section 6.3.

6.1 Constraints

The preferred location must:

- 1. <u>Size</u>: Be large enough to store the total volume of snow (minimum 0.8 ha / 2 ac).
- 2. <u>Surface Water</u>: Not negatively impact surface water quality.
- 3. <u>Ground Water</u>: Not negatively impact sub-surface water quality.

6.2 Criteria

When possible, the preferred design concept should:

- 1. <u>Alternative, Previous, and Future Uses of the Site(s)</u>: consider repercussions of increased chloride concentrations.
- 2. <u>Surface Drainage</u>: evaluate the environmental effects of surface drainage from the site.
- 3. <u>Subsurface Drainage</u>: evaluate environmental effects on groundwater infiltration from the site.
- 4. <u>Stability of Soil</u>: assess soil infiltration, loading and slope potential.
- 5. <u>Impact on Neighbouring Wells</u>: evaluate the impact on the down-gradient aquifer used as a water supply.
- 6. <u>Noise</u>: consider surrounding land types, and minimize the noise in residential areas.
- 7. <u>Visual Consideration</u>: ideally shielded from public view.
- 8. <u>Public Safety</u>: potential impacts on public safety.
- 9. <u>Accessibility</u>: provide appropriate road access, and minimize the distance from the main road network.
- 10. <u>Vulnerability</u>: reduce the vulnerability of the site becoming unavailable.

Please note that the criteria above are not listed in any specific order.

6.3 Detailed Evaluation Criteria

- 1. Natural Environment Impacts
- 2. Social / Cultural Impacts
- 3. Technical / Operational Impacts
- 4. Economic / Logistical Considerations

7 EVALUATION: LONG LIST

The long list of options is to be evaluated against the constraints laid out in **Section 6.1**. Each option will get a 'Y' or 'A' or 'N' for each of the constraints. The definition of each letter is outlined below.

- Y Yes, the site meets the constraint
- A Site alteration to meet constraints would be possible
- N No, the site does not meet the constraint

Option 1:	Do Nothing – Morden Gravel	
Size:	This location has an area greater than 0.8 ha and therefore would be able to provide storage for all of the snow that is removed from the downtown area.	Y
Surface Water:	This location drains to the north towards the St. Andrew's wetland. However, there is room for surface water controls to be put in place.	А
Ground Water:	 Over top of a highly vulnerable aquifer Within the WHPA No potential for private domestic wells to be present 	A
Option 2:	Waterfront Park	
Size:	This location has an area of 0.43 ha and in 2015 a portion was converted into an outdoor amphitheater. This location is not able to store all of the snow that is removed from the downtown area.	Ν
Surface Water:	The location is tile drained with the outlet flowing to a stormwater management pond before discharging to the Penetanguishene Harbour.	Y
Ground Water:	 Over top of a highly vulnerable aquifer Outside the WHPA 	Δ

• No potential for private domestic wells to be present

Option 3:	Boat Launch	
Size:	This location has an area of 0.54 ha and therefore cannot store all of the snow that is removed from the downtown area.	N
Surface Water:	This location drains to a ditch along the eastern edge of the parking lot which conveys flows directly to the Penetanguishene Harbour.	Ν
Ground Water:	 Over top of a highly vulnerable aquifer Outside the WHPA No potential for private domestic wells to be present 	A

Option 4:	Huronia Park	
Size:	This location has an area of 0.32 ha and therefore cannot store all of the snow that is removed from the downtown area.	Ν
Surface Water:	This location drains into swales that discharge into the Penetanguishene Harbour.	Ν
Ground Water:	 Over top of a highly vulnerable aquifer Outside the WHPA No potential for private domestic wells to be present 	A

Option 5:	Correctional Centre	
Size:	This location has an area greater than 0.8 ha and therefore would be able to provide storage for all of the snow that is removed from the downtown area.	Y
Surface Water:	The west half of this location, which would be used for the snow storage, drains to the west towards Fuller Avenue. It is unclear where surface water is conveyed once it reached Fuller Avenue.	А
Ground Water:	 Not over top of a highly vulnerable aquifer Outside the WHPA Potential for private domestic wells to be present 	А

Option 6:	Thompsons Road	
Size:	This location has an area of 4.0 ha. This site has enough room to provide storage for all of the snow that is removed from the downtown area.	Y
Surface Water:	This location drains to the southeast. There are no environmentally sensitive features noted in this area.	Y
Ground Water:	 Northwest portion of the site is over a highly vulnerable aquifer Northwest portion of the site is in the WHPA Potential for private domestic wells to be present 	A
Option 7:	Tinney's Septic	
Size:	This location has an area greater than 0.8 ha and therefore would be able to provide storage for all of the snow that is removed from the downtown area.	Y
Surface Water:	This location drains to the south. There are no environmentally sensitive features noted in the immediate area, however, drainage from this area could feed into a nearby wetland.	A
Ground Water:	 Over top of a highly vulnerable aquifer Outside the WHPA Potential for private domestic wells to be present *thickness of upper confining material of aquifer is limited* 	A
Option 8:	Fox Street	
Size:	This location has an area greater than 0.8 ha and therefore would be able to provide storage for all of the snow that is removed from the downtown area.	Y
Surface Water:	This location drains to the west towards the Penetanguishene Harbour through an unevaluated wetland.	Ν
Ground Water:	 Not over top of a highly vulnerable aquifer Edge of the WHPA No potential for private domestic wells to be present 	A

Town of Penetanguishene *July 2024*



Figure 7-1 Constraint Map

8 SHORT LIST OPTIONS

Option No.	Description
Option 1	Morden Gravel
Option 6	Thompsons Road
Option 7	Tinney's Septic
Option 5*	Correctional Centre*

Table 8-1 Short List Options

Note:* While the Correctional Centre location meets the constraints portion of the long list, the land is owned by the Province of Ontario (Infrastructure Ontario), and is currently being used as their snow storage site. In addition, as the Town would need to acquire the lands, the Towns typical powers of expropriation do not apply as it is owned by the Province. The Province has indicated that there is no desire to agree to transfer the land to the Town and as such will not be considered further in the short listed options for further evaluation.

9 EVALUATION: SHORTLIST

9.1 Option 1: Morden Gravel

9.1.1 Natural Environmental Impacts

Alternative, Previous, and Future Uses of the Site(s) (effects of chloride)

The Morden Gravel parcel appears to have been largely stripped of topsoil, which now appears to be stockpiled at the center of the parcel. Lands to the south and east remain wooded, and to the north is a wetland complex. Based on the current land uses of the surrounding area, the snow storage could present a potential issue from chlorides if not properly contained (i.e. St. Andrews Wetland). A design to contain, or treat the snow storage for chlorides will likely be required, as well as grading to ensure any runoff is directed away from sensitive features.

Surface Drainage

Surface runoff from the Modern Gravel area is expected to be controlled and directed to the shallow roadside ditch along Fuller Avenue or contained on site for treatment. Surface drainage should be kept from migrating towards the St. Andrews Wetland, a potentially sensitive receiver (see Hydrogeological report for further details).

Subsurface Drainage

Regional Groundwater flow around Morden Gravel is directed to the southeast towards the Midland Bay. This area is located within WHPA-C & D (Wellhead Protection Area), a Significant Groundwater Recharge (SGR) area and a Highly Vulnerable Aquifer (HVA) area with a score of 6. Based on this, the vulnerability score for this site does not represent a significant threat in this area. Furthermore, this area is at least partially situated within WHPA Q1/Q2 area, which would mean groundwater recharge at the site will need to be maintained and it would limit activities in this area where water is removed without returning it to the same source (see Hydrogeological report for further details). Based on this, the Morden Gravel snow storage facility does not significantly pose a threat to the subsurface drainage.

Stability of Soil

The north portion of Morden gravel is classified as Tioga series Loamy Sand, which is considered to be a Class A soil. The south section of this area has Vasey Series Sandy Loam, which is considered to be a Class AB soil.

Class A soils have good drainage, low runoff potential, and high infiltration rates even when thoroughly wet. They consist of deep, well to excessively drained sand or gravel. Class B soil has good drainage, with moderately low infiltration rates when thoroughly wet and consists of moderately fine to moderately coarse textures.

Based on soil types in this area, there are no snow melt or precipitation runoff concerns for this area (see Hydrogeological report for further details).

Impact on Neighbouring Wells

The existing well records show that there is one well located within the 250 m radius of the Morden Gravel area. There is no clear information about the current usage of this well for potable water supply. However, since it is located outside of the municipally serviced area, it is assumed that it is being used as a potable water source. This snow storage area is not an issue contributing area (ICA) for sodium and chloride (see Hydrogeological report for further details).

9.1.2 Social / Cultural Impacts Archaeological Consideration

An archaeological analysis was completed at the Morden Gravel site in 2011 in preparation for the original gravel pit. The area was assessed using visual inspection at 5 m intervals. This assessment method complies with the 2011 *Standards and Guidelines (MTC 2011)*. No archaeological resources were identified during the 2011 inspection and the site was cleared of all archaeological concerns.

Timmins Martel Heritage Consultants (TMHC) completed a desktop review of the Morden Gravel Site in 2022. Based on this assessment, it was determined that no further archaeological assessments are required at this time.

Noise Consideration

As per the MECP guideline (Publication NPC-300), the sensitive land use areas around the Morden Gravel site are considered to be Class 2 and 3 classification areas (see Noise report for further details). The areas located near Fuller Avenue and Roberts Street East would be considered as Class 2 area classifications. Class area for some receptor locations along Tay Point Road and further south at more than 50 m from the major roads are considered to be a Class 3 area classification.

In snow storage sites, the potential noise effects from two components of the operation of the site should be considered:

- Off-site movement of tandem trucks
- On-site source vehicles (equipment, on-site movement of tandem trucks and other vehicles)

Off-Site: According to snow hauling routes noise modeling for Tandem Trucks traveling through Robert Street East, Fuller Avenue to Tay Point Road, and into the snow storage site, the off-site sounds levels of tandem trucks hauling the snow July exceed the noise-sensitive areas sound levels limits at times (see Noise report for further details).

On-Site: Based on the sound level results (see Noise report for further details), the total sound level results from Morden Gravel site are expected to exceed the sound level limits of 45 dBA / 50 dBA during the daytimes and 40 dBA / 45 dBA during the night times at some of the receptor locations. Therefore, noise mitigation measures are required for this snow storage site. A 3.0 m high earth berm/barrier for the north portion of the snow storage site and a 2.5 m high berm for the south portion are required on Morden site to reduce the sound levels from the snow storage activities.

Visual Consideration

This site fronts onto Fuller Avenue, which is an arterial road making it more visible than other sites. Fuller Avenue, however, is more of a transportation route for business and industrial areas of the Town and is not generally traveled by tourists and will not affect the Town's aesthetics from this point of view.

Public Safety

Public safety is generally minimized at this site as it is located far from any tourist attractions and in the industrial area. The only public safety concerns are from a traffic perspective and groundwater infiltration which are ranked low risks.

Traffic Impacts

The Traffic Impacts Analysis used three criteria to analyse the short-listed snow disposal sites.

- 1. Hauling Distance
- 2. Proximity to Sensitive Land Uses
- 3. General Route Operability

Considering the reference point of snow collection as the Town Hall (10 Robert Street West), the shortest distance to the subjected area (Modern Gravel) runs through Robert Street and Fuller Street with a 3.5 km magnitude. Fuller Street is not significantly sensitive to the snow-hauling truck traffic due to most of the industrial land use. However, the west portion of Robert Street is populated by denser residential and significantly sensitive uses such as Covenant Christian Community Church, YMCA Child Care, etc.

The alternative route for Modern Gravel is via Cambridge Street and Church Street is not only 3.7 km long but also features equivalent land use properties and is thus considered a pool alternative.

The impact and proximity to sensitive land uses of this site are not significantly different from the other two Options, since most of the potentially impacted land uses are located on segments of Robert Street East that are shared by all three routes. Furthermore, there is no clearly defined advantage attributed to this site when compared to the others in terms of general route operability (see Traffic report for further details).

9.1.3 Technical / Operational Impacts Difficulty to Construct or Implement

Morden Gravel area has lower construction and operational difficulties for snow storage sites due to its current condition and usage. Morden Gravel site is a partially- cleared area of trees and consists of a large soil stockpile. Therefore, this site does not need substantial earthworks and clearing. In addition, its current usage is appropriate for what is needed from a snow storage site (see Archaeological report for further details). Morden Gravel area has a good solid base based on its soil types. It allows heavy trucks and graders to drive repeatedly over the wet ground without getting stuck. In addition, just 3.0 m and 2.5 m high earth berms along the north and south portions for noise control are required for this site which would make construction slightly easier than the other two options from this point of view.

Operation and Maintenance Efficiency

Maintenance of Machinery, equipment, and trucks is required in this option. Also, maintenance of earth berms that will use for noise control should be considered for this option. Since Morden Gravel site runs through Robert Street and Fuller Street which are arterial roads, Night-time dumping July require at this site to help prevent accidents and increase public safety. In addition, the stability, driving surface, and drainage channel of this site should be monitored for erosion because of its soil types. Based on the soil types in the north of this site with high infiltration rates, surface replacement should be considered more than other options.

Accessibility

This site provides appropriate road access. Modern Gravel site has access to Fuller Avenue and Robert Street which are main roads. Distance from the Downtown for this site is more than two other options.

9.1.4 Economic / Logistical Consideration

Capital / Construction Cost

Capital costs anticipated for Modern Gravel site are:

- Cost to purchase land
- Berm construction cost
- Design and Construction of Snow Storage Facility

The cost of purchasing land for this site will be similar to two other options since the three options are located approximately in the same area. Since Morden Gravel site needs, just 3.0 and 2.5m high earth berms along the north and south portions, the cost of berm construction is lower than the two other options.

Site Vulnerability (i.e. Town-owned)

To reduce the vulnerability of this option, the Town will need to enter into property taking negotiations with the current land owner to purchase a portion of their property. The current land owner has expressed that they are not interested in having the permanent snow storage location on their property.

Operation and Maintenance Cost

The cost of maintenance of berms for this option is slightly lower than the other options. In addition, the haul distance is an important criterion to consider as operation cost. Snow-hauling costs are more than

two other options on this site since Morden gravel site is located far from the snow removal site (see Traffic report for further details). The cost of a surface replacement should be considered for this option. Maintenance costs for machinery, equipment, and truck from this site will be similar to the two other options.

Payment Structure / Cost Recovery Option / Phasing Flexibility

Payment structure will be subject to the agreement between the Town and the Owner. Cost recovery option is not expected as this is a municipal service and paid for through local taxes. The project is not expected to require phasing as the facility will be needed in whole.

9.2 Option 6: Thompsons Road

9.2.1 Natural Environmental Impacts

Alternative, Previous, and Future Uses of the Site(s) (effects of chloride)

The Thompsons Road parcel is a dense woodlot in the western two-thirds, with some cleared and some treed land in the easterly third by 1987. By 2008, there are no appreciable changes within the Thompsons Road parcel. By 2018, the only notable change to the Thompsons Road property is the infilling of the previously cleared lands with full forest. Based on previous uses of this area, this snow storage area has not an issue contributing area (ICA) for chloride. Furthermore, this area will not be used for other purposes in the future, so there is no concern for chloride contaminant loading from this point of view.

Surface Drainage

Surface drainage from Thompsons Road is expected to follow the local topographic decline to the southeast with surface runoff being directed to a wetland and associated tributary area approximately 350 m southeast of the proposed snow storage area. There are no environmentally sensitive features noted in the immediate parcel area (see Hydrogeological report for further details).

Subsurface Drainage

Regional Groundwater flow around the Thompsons Road area is directed to the west towards the Penetanguishene Harbour. Thompsons Road area borders a WHPA-D immediately north of the storage area, is not within an SGR, and is partially within a HVA with a score of 6. Based on this, the vulnerability score for this site does not represent a significant threat in this area.

The Thompsons Road area is at least partially situated within WHPA Q1/Q2 area, which would mean groundwater recharge at the site will need to be maintained and it would limit activities in this area where water is removed without returning it to the same source (see Hydrogeological report for further details).

Stability of Soil

Thompsons Road area has Vesey Series Sandy Loam soil, which is considered to be a Class AB soil.

Class A soils have good drainage, low runoff potential, and high infiltration rates even when thoroughly wet. They consist of deep, well to excessively drained sand or gravel. Class B soil has good drainage, with moderately low infiltration rates when thoroughly wet and consists of moderately fine to moderately coarse textures.

Similar to Morden Gravel Option, there are no snow melt or precipitation runoff concerns for this area (see Hydrogeological report for further details).

Impact on Neighbouring Wells

The well records for the area around the Thompsons Road snow storage area shows that there are two wells within the 250 m radius. The status of these two wells is unknown, however they likely represent monitoring wells as they were drilled in 2018 in a municipally serviced area. This snow storage area is not an issue contributing area (ICA) for sodium and chloride (see Hydrogeological report for further details).

9.2.2 Social / Cultural Impacts

Archaeological Consideration

An archaeological analysis was completed for a portion of the Thompsons Road site in 1999. The area was assessed using visual inspection at 10 m intervals. This assessment method does not comply with the 2011 *Standards and Guidelines (MTC 2011)*.

Timmins Martel Heritage Consultants (TMHC) completed a desktop review of the Thompsons Road Site in 2022. The parcel contains a mature woodlot that appears to be in a natural state with no obvious visual signs of land alteration. Based on the TMHC assessment and the treed nature of the site, it was determined that a Stage 2 archaeological assessment with test pits at a 5 m interval is required for this site to be used as the new snow storage area for the Town of Penetanguishene.

Noise Consideration

As per the MECP guideline (Publication NPC-300), the sensitive land use areas around the Morden Gravel site are considered to be Class 2 and 3 classification areas (see Noise report for further details). The areas located near Fuller Avenue and Roberts Street East would be considered as Class 2 area classifications. Class area for some receptor locations along Tay Point Road and further south at more than 50 m from the major roads are considered to be a Class 3 area classification.

In snow storage sites, the potential noise effects from two components of the operation of the site should be considered:

- Off-site movement of tandem trucks
- On-site source vehicles (equipment, on-site movement of tandem trucks and other vehicles)

Off-Site: Based on the snow hauling routes noise modeling that was carried out for Tandem trucks traveling through Robert Street East, Tay Point Road, and Fuller Avenue on the Thompsons Road for this site, off-site sounds levels of tandem trucks hauling the snow July exceed the noise sensitive areas sound levels limits at times (see Noise report for further details).

On-site: Based on the sound level results (see Noise report for further details), the total sound level results from Thompsons Road site are expected to exceed the sound level limits of 45 dBA / 50 dBA during the daytimes and 40 dBA / 45 dBA during the night times at some of the receptor locations. Therefore, noise mitigation measures are required for this snow storage site. For this site the following earth berms/ barriers are required on-site to reduce the sound levels: a 3.0 m high earth berm/ barrier is required along the northwest portion of the snow storage site and a 4.0 high berm is required along the southeast portion.

Visual Consideration

This site fronts onto Robert Street and Thompsons Road. Robert Street and Thompsons Road, are mainly used as a transportation route for business and industrial areas of the Town and not generally traveled by tourists and will not affect the Town's aesthetics from this point of view similar to Morden Gravel Option.

Public Safety

Similar to Option 1, this site is far from any tourist attractions and in the industrial area, public safety concerns are generally minimized. The only public safety concerns are from a traffic perspective and groundwater infiltration which are ranked low risks.

Traffic Impacts

The Traffic Impacts Analysis used three criteria to analyse the short-listed snow disposal sites.

- 1. Hauling Distance
- 2. Proximity to Sensitive Land Uses
- 3. General Route Operability

Considering the reference point of snow collection as the Town Hall (10 Robert Street West), the shortest distance to the subjected area (Thompsons Road) runs along a segment of Robert Street East that is populated by industrial uses in its eastern portion and some commercial and residential uses on the segment between Centennial Drive / Thompsons Road and Lecarron Avenue with a 1.8 km magnitude which is 25% and 48% shorter than the other Options. In the segment west of Lecarron Avenue, there are denser residential uses and some sensitive uses such as the Covenant Christian Community Church and YMCA Child Care St Ann's. The segment closer to the Town Hall has sensitive use such as Georgian Bay Retirement Home, the First Presbyterian Church, and the Penetanguishene Public Library.

The alternative route via Thompsons Road or even Brunelle Side Road is not only longer than 1.8 km but also features equivalent land use properties and thus are considered poor alternatives.

The impact and proximity to sensitive land uses of this site are not significantly different from the other two Options, since most of the potentially impacted land uses are located on segments of Robert Street East that are shared by all three routes. Furthermore, there is no clearly defined advantage attributed to this site when compared to the others in terms of general route operability (see Traffic report for further details).

9.2.3 Technical / Operational Impacts Difficulty to Construct or Implement

Construction is more difficult for Thompsons Road than the two other options due to the current usage. Thompsons Road area is a treed parcel and appears to be in a natural state, with no obvious visible land alterations. Therefore, Substantial earthworks and clearing are required for this site. (See Archaeological report for further details). Similar to Morden Gravel area, this site has a good solid base based on its soil type. It allows heavy trucks and graders to drive repeatedly over the wet ground without getting stuck. All parts of this site are covered with sandy loam soil with a high cohesion rate. Therefore, based on high shear strength, this site can remain firm more than option one to support vehicle loads even after the
frost has gone out of the ground and can store a heavier snow load. In addition, 3.0 and 4.0 m high earth berms along to north and south portions are required for this site which would make construction slightly more difficult than Modern Gravel and easy than Tinney's Septic from this point of view.

Operation and Maintenance Efficiency

Similar to the Morden Gravel option, maintenance of machinery, equipment, and trucks should be considered for this option. Also, maintenance of berms should be considered for this option, berms in this site are higher than option one. Since Thompsons Road site runs through Robert Street which is an arterial road, Night-time dumping July require in this site to help prevent accidents and increase public safety similar to option one, monitoring the surface of this site for erosion should be considered.

<u>Accessibility</u>

Thompsons Road site has access to Robert Street East which provides appropriate road access for this area. Furthermore, this site has minimized distance from Downtown compared to the two other options.

9.2.4 Economic / Logistical Consideration

Capital / Construction Cost

Similar to Morden Gravel site, capital costs for Thompsons Road site are:

- Cost to purchase land
- Berm construction cost
- Design and Construction of Snow Storage Facility

As mentioned for Morden Gravel option, the cost of purchasing land for this site will be similar to the two other options since the three options are located approximately in the same area. Since this site needs, 3.0 and 4.0 m high earth berms along the north and south portions, the cost of berm construction is higher than Morden Gravel and lower than Tinney's Septic.

<u>Site Vulnerability (i.e. town-owned)</u>

To reduce the vulnerability of this option, the Town will need to enter into property taking negotiations with the current land owner to purchase a portion of their property.

Operation and Maintenance Cost

The cost of maintenance of berms for this option is slightly more than the Morden Gravel site. In addition, Snow-hauling costs are lower than the two other options on this site since this option is located closer to the snow removal site (see Traffic report for further details). Maintenance costs for machinery, equipment, and truck for this site will be similar to the two other options.

Payment Structure / Cost Recovery Option / Phasing Flexibility

Payment structure will be subject to the agreement between the Town and the Owner. Cost recovery option is not expected as this is a municipal service and paid for through local taxes. The project is not expected to require phasing as the facility will be needed in whole.

9.3 Option 7: Tinney's Septic

9.3.1 Natural Environmental Impacts

Alternative, Previous, and Future Uses of the Site(s) (effects of chloride)

This area was used for aggregate extraction and stockpiling in 2008. Based on previous uses of this area, this snow storage area is not an issue contributing area (ICA) for chloride contamination similar to options 1 and 6. Furthermore, this area will not be used for other purposes in the future, so there is no concern for chloride contaminant loading from this point of view.

Surface Drainage

Tinney's Septic storage area is located in relatively close proximity to an evaluated wetland segment that drains into the St. Andrews Wetland. The St. Andrews Wetland is a Provincially Significant Wetland (PSW) and is located approximately 180 m northeast of the proposed snow storage area. Similar to previous options, surface drainage will be required to be directed to proper outlets away from any wetlands. The location and topography of this site will provide challenges with regard to directing surface runoff towards municipal owned infrastructure (ditches, storm sewer) (see Hydrogeological report for further details).

Subsurface Drainage

Regional Groundwater flow around Tinney's Septic is directed to the southeast towards the Midland Bay. This area is partially within a Significant SGRA with a score between 4 and 6; however it is not within an HVA or WHPA A, B, C, or D. Based on this, the vulnerability score for this site does not represent a significant threat in this area.

This area is at least partially situated within WHPA Q1/Q2 area, which would mean groundwater recharge at the site will need to be maintained and it would limit activities in this area where water is removed without returning it to the same source (see Hydrogeological report for further details).

Stability of Soil

Tinney's Septic has Vesey Series Sandy Loam soil, which is considered to be a Class AB soil.

Class A soils have good drainage, low runoff potential, and high infiltration rates even when thoroughly wet. They consist of deep, well to excessively drained sand or gravel. Class B soil has good drainage, with moderately low infiltration rates when thoroughly wet and consists of moderately fine to moderately coarse textures.

Similar to the other two Options, there are no snow melt or precipitation runoff concerns for this area (see Hydrogeological report for further details).

Impact on Neighbouring Wells

The existing well records show that there are two wells located within the 250 m radius of the Tinney's Septic area. There is no clear information about the current usage of this well for potable water supply. However, since it is located outside of the municipally serviced area, it is assumed that it is being used as a potable water source. Similar to the other two Options, this snow storage area is not an issue contributing area for sodium and chloride (see Hydrogeological report for further details).

9.3.2 Social / Cultural Impacts

Archaeological Consideration

Timmins Martel Heritage Consultants (TMHC) completed a desktop review of the Tinney's Septic Site in 2022. There are two types of land categories on this site, treed and cleared. According to historical aerial photography, the cleared area has undergone significant disturbance from previous gravel extraction. The disturbed are has a low archaeological potential. The treed area of the parcel contains a mature woodlot that appears to be in a natural state with no obvious visual signs of land alteration.

The TMHC assessment concluded that if the snow storage was contained to the area that had already been disturbed, then no additional archaeological assessment would be required. However, if any trees needed to be removed for the snow storage, that area would require a Stage 2 assessment with test pits at 5 m intervals.

Noise Consideration

As per the MECP guideline (Publication NPC-300), the sensitive land use areas around the Morden Gravel site are considered to be Class 2 and 3 classification areas (see Noise report for further details). The areas located near Fuller Avenue and Roberts Street East would be considered as Class 2 area classifications. Class area for some receptor locations along Tay Point Road and further south at more than 50 m from the major roads are considered to be a Class 3 area classification.

In snow storage sites, the potential noise effects from two components of the operation of the site should be considered:

- Off-site movement of tandem trucks
- On-site source vehicles (equipment, on-site movement of tandem trucks and other vehicles)

Off-Site: According to snow hauling routes noise modeling for Tandem Trucks traveling through Robert Street East, Fuller Avenue to Tay Point Road, and into the snow storage site, the off-site sounds levels of tandem trucks hauling the snow July exceed the noise-sensitive areas sound levels limits at times (see Noise report for further details).

On-Site: Based on the sound level results (see Noise report for further details), the total sound level results from Tinney's Septic site are expected to exceed the sound level limits of 45 dBA / 50 dBA during the daytimes and 40 dBA / 45 dBA during the night times at some of the receptor locations. Therefore, noise mitigation measures are required for this snow storage site. Using a 5.5 m high earth berm along the north, west, and east side of this snow storage site would expect to meet the sound level criteria.

Visual Consideration

Tinney's Septic is located on Tay Point Road which is considered a local road. This site is removed from the downtown core of Penetanguishene and is less visible than other sites. Therefore, it will not affect the Town's aesthetics.

Public Safety

Similar to Options 1 and 2, Public safety is generally minimized at this site as it is located far from any tourist attractions and in the industrial area. The only public safety concerns are from a traffic perspective and groundwater infiltration which are ranked low risks.

Traffic Impacts

The Traffic Impacts Analysis used three criteria to analyse the short-listed snow disposal sites.

- 1. Hauling Distance
- 2. Proximity to Sensitive Land Uses
- 3. General Route Operability

For this site the shorter route of 2.4 km runs along a segment of Fuller Avenue that is populated by somewhat recessed residential uses, however, they are not particularly sensitive to the impact of snow-hauling truck traffic either during the commercial hours of weekdays or overnight/ weekends. The segment along Robert Street East is populated by industrial uses in its eastern portion, and some commercial and residential uses on the segment between Centennial Drive / Thompsons Road and Lecarron Avenue. In the segment west of Lecarron Avenue and the segment closer to the Town Hall, there are some denser residential uses and sensitive uses.

The alternate route via Brunelle side road and Murry Road is not only longer but also features equivalent issues regarding the disturbance of sensitive land uses and residential uses and is thus considered a poor alternative.

The impact and proximity to sensitive land uses of this site are not significantly different from the other two Options, since most of the potentially impacted land uses are located on segments of Robert Street East that are shared by all three routes. Furthermore, there is no clearly defined advantage attributed to this site when compared to the others in terms of general route operability (see Traffic report for further details).

9.3.3 Technical / Operational Impacts

Difficulty to Construct or Implement

Tinney's Septic area has lower construction and operational difficulties for snow storage sites due to its current condition and usage compared to Thompsons Road option. Similar to Morden Gravel area, this site is a partially- cleared area of trees and consists of large soil stockpiles. Therefore, as same as Morden Gravel option, this site does not need substantial earthworks and clearing. Also, its current usage of this area is appropriate for what would be required for the snow storage site. Similar to the other two options, this site also has a good solid base based on its soil type. It allows heavy trucks and graders to drive repeatedly over the wet ground without getting stuck. As same as Thompsons Road option, all parts of this site are covered with sandy loam soil with a high cohesion rate. Therefore, based on high shear strength, this site can remain firm more than option one to support vehicle loads even after the frost has gone out of the ground and can store a heavier snow load. In addition, just 5.5 high earth berms along to north, west, and east portions for noise control are required for this site which would make construction slightly more difficult than the other two options from this point of view.

Operation and Maintenance Efficiency

Similar to other options, maintenance of machinery, equipment, and trucks is necessary for this option. Also, maintenance of berms should be considered for this option, berms in this site are higher than the two other options. Similar to the two other options, Night-time dumping and monitoring of the site's surface should be considered.

Accessibility

Similar to Morden Gravel option, Tinney's Septic site has access to Fuller Avenue and Robert Street which would provide appropriate road access for this site. Furthermore, this site has approximately 2.4 Km from Downtown which is more than Thompsons Road and lower than Morden Gravel option.

9.3.4 Economic / Logistical Consideration

Capital / Construction Cost

Similar to two other options, capital costs for this site are:

- Cost to purchase land;
- Berm construction cost; and
- Design and Construction of Snow Storage Facility.

As mentioned for two other options, the cost of purchasing land for this site will be similar to the two other options. Since this site needs, 5.5 m high earth berms along to north, west, and east side of this snow storage site, the cost of berm construction is higher than the two other options.

Site Vulnerability (i.e. town-owned)

To reduce the vulnerability of this option, the Town will need to enter into property taking negotiations with the current land owner to purchase a portion of their land. The current land owner has been cooperative throughout the EA process.

Operation and Maintenance Cost

The cost of maintenance of berms for this option is more than the two other options. In addition. Snowhauling costs are lower than Morden Gravel option and more than Thompsons Road in this option (see Traffic report for further details). The maintenance cost for machinery, equipment, and truck for this site will be similar to the two other options.

Payment Structure / Cost Recovery Option / Phasing Flexibility

Payment structure will be subject to the agreement between the Town and the Owner. Cost recovery option is not expected as this is a municipal service and paid for through local taxes. The project is not expected to require phasing as the facility will be needed in whole.

9.4 Decision Matrix

The following decision matrix in Error! Reference source not found. summarizes all the criteria discussed in each of the previous short listed option sections. Impact rated scores were attributed to each criterion with one (1) being very low impact (good) and nine (9) being very high impact (bad). Percentage weighted calculations were provided to conclude an overall score for each of the three (3) shortlisted options.

		Impact Rating (1 -9, with 1 being the Best)			Weighted Matrix (Lowest Weighted Impact is Best)		
Evaluation Criteria	Weight	Option 1 Morden Gravel	Option 2 Thompsons Road	Option 3 Tinney's Septic	Option 1 Morden Gravel	Option 2 Thompsons Road	Option 3 Tinney's Septic
Natural Environment Impacts	-						
Alternative, Previous, and Future Uses of the Site(s) (effects of chloride)	6%	7	3	7	0.42	0.18	0.42
Surface Drainage quality implications	8%	5	3	7	0.40	0.24	0.56
Subsurface Drainage quality implications	8%	3	3	3	0.24	0.24	0.24
Stability of Soil	3%	3	3	3	0.09	0.09	0.09
Impact on Neighbouring Wells	5%	5	1	5	0.25	0.05	0.25
Natural Environment Overall Rating	30%	23	13	25	1.40	0.80	1.56
Social / Cultural Environment Impacts	-						
Archaeological Consideration Impacts	8%	3	7	5	0.24	0.56	0.40
Noise Impacts	6%	3	5	5	0.18	0.30	0.30
Impacts on Visual landscape/Aesthetic impacts	3%	3	1	1	0.09	0.03	0.03
Impact on Public Safety	3%	1	1	1	0.03	0.03	0.03
Traffic Impacts	5%	5	3	3	0.25	0.15	0.15
Social / Cultural Environment Overall Rating	25%	15	17	15	0.79	1.07	0.91
Technical/Operational Considerations							
Difficulty to Construct or Implement	10%	3	7	5	0.30	0.70	0.50
Operation & Maintenance Efficiency	5%	3	3	3	0.15	0.15	0.15
Accessibility from Downtown	5%	7	3	7	0.35	0.15	0.35
Technical/Operational Considerations Rating	20%	13	13	15	0.80	1.00	1.00
Economic Impacts	1		1				
Capital/construction costs	8%	3	7	5	0.24	0.56	0.40
Operation and Maintenance Cost	5%	3	3	3	0.15	0.15	0.15
Site Vulnerability (i.e. Town Owned)	7%	7	5	5	0.49	0.35	0.35
Payment Structure / Cost Recovery Option / Phasing Flexibility	5%	3	3	3	0.15	0.15	0.15
Economic Ranking	25%	16	18	16	1.03	1.21	1.05
	T						
Overall Impact Score	100%				4.02	4.08	4.52

		Impact Rat	ting (1 -9, with 1 being	the Best)	Weighted Ma	trix (Lowest
Evaluation Criteria	Weight	Option 1 Morden Gravel	Option 2 Thompsons Road	Option 3 Tinney's Septic	Option 1 Morden Gravel	Opti Thompso

t Weighted Impact is Best)

tion 2 Option 3 sons Road Tinney's Septic

Town of Penetanguishene July 2024

Municipal Snow Storage Location Municipal Class Environmental Assessment

Natural Environment Impacts					•		-
Alternative, Previous, and Future Uses of the Site(s) (effects of chloride)	6%	7	3	7	0.42	0.18	0.42
Surface Drainage quality implications	8%	5	3	7	0.40	0.24	0.56
Subsurface Drainage quality implications	8%	3	3	3	0.24	0.24	0.24
Stability of Soil	3%	3	3	3	0.09	0.09	0.09
Impact on Neighbouring Wells	5%	5	1	5	0.25	0.05	0.25
Natural Environment Overall Rating	30%	23	13	25	1.40	0.80	1.56
Social / Cultural Environment Impacts							
Archaeological Consideration Impacts	8%	3	7	5	0.24	0.56	0.40
Noise Impacts	6%	3	5	5	0.18	0.30	0.30
Impacts on Visual landscape/Aesthetic impacts	3%	3	1	1	0.09	0.03	0.03
Impact on Public Safety	3%	1	1	1	0.03	0.03	0.03
Traffic Impacts	5%	5	3	3	0.25	0.15	0.15
Social / Cultural Environment Overall Rating	25%	15	17	15	0.79	1.07	0.91
Technical/Operational Considerations							
Difficulty to Construct or Implement	10%	3	7	5	0.30	0.70	0.50
Operation & Maintenance Efficiency	5%	3	3	3	0.15	0.15	0.15
Accessibility from Downtown	5%	7	3	7	0.35	0.15	0.35
Technical/Operational Considerations Rating	20%	13	13	15	0.80	1.00	1.00
Economic Impacts							
Capital/construction costs	8%	3	7	5	0.24	0.56	0.40
Operation and Maintenance Cost	5%	3	3	3	0.15	0.15	0.15
Site Vulnerability (i.e. Town Owned)	7%	7	5	5	0.49	0.35	0.35
Payment Structure / Cost Recovery Option / Phasing Flexibility	5%	3	3	3	0.15	0.15	0.15
Economic Ranking	25%	16	18	16	1.03	1.21	1.05
Overall Impact Score	100%				4.02	4.08	4.52

10 PREFERRED SOLUTION

Based on the above evaluation matrix, the Morden Site has been selected as the preferred alternative solution as it has the lowest impact score of 4.02. The preferred location is an approximately 2.5-acre site with an additional 1.5 acres reserved for future expansion (approx. 4 acres), a small portion of the overall Morden Gravel Pit property. The Morden site is already being used by the Town as a snow storage site and in this case represents the do-nothing option with the exception of the Town acquiring the land, instead of renting it. A Town owned site significantly reduces the risk to the Town in the sense that the long-term viability of the site is stable. In addition, the Town July further use this site as a Class 2 soil management facility with a usable amount of space to store material from Town owned projects.

11 DESIGN CONSIDERATIONS

The conceptual design for the snow storage site at the Morden Site is to create a low-lying, pond like area to contain snow melt as well as grade the site gently such that all meltwater is directed to the ponded area for infiltration into the ground. In accordance with Ministry of Environment Conservation and Parks ('MECP') direct disposal of snow to water courses should be eliminated where ever possible and disposal on properly selected land sites is considered in most cases, the best solution. The MECP states the land disposal preferred objectives are as follows:

- a) Refuse collected with snow is retained and can be collected and properly disposed of after thaw;
- b) Particulate solid input to a water course are reduced or eliminated;
- c) Other contaminants, such as heavy metals and phosphorus July be reduced by mechanisms such as ion exchange and absorption (depending on soil characteristics);
- d) While most soluble salts will ultimately reach the surface or ground waters in the vicinity of the disposal sire, the rate of discharge July be averaged out over time, avoiding concentrated input as is experience with direct disposal; and,
- e) Oxygen demanding loadings can be largely reduced or eliminated by the retention of organic particulate matter at the site or BOD satisfaction in surface drainage toward the watercourse.

While the Morden site is within the Well head protection area of the Payette Well system, it is considered not a significant threat to the well based on the 10-to-25-year time of travel ('TOT') to the well.

The Severn Sound Environmental Association('SSEA') has tested the upper 10cm soil of the Morden site and results show elevated levels of calcium, sodium and chlorides, which are to be expected. The remainder of the nutrients and heavy metals do not show an increase over the control. The site should continue to be sampled and soil with very high concentrations can be scraped off and removed and replaced by fresh native soil.

Based on the noise report, there are two (2) noise berms at the north and south ends of the site which are to be constructed. The North Berm is to be 3m in height and the south berm to be 2.5m in height. These berms are proposed to be constructed out of soil and stabilized with a native seeding mix.

An dedicated access to the snow storage site will be required from Fuller Ave and will favour the North side to allow traffic movements within the site and around the snow storage.

The conceptual design low lying infiltration area has a water volume 2,600 m³ which is approximately equivalent to 10,400m³ of snow-water equivalent, depending on compaction levels. As the snow will be

in various stages of melting and infiltrating, the snow storage site as a whole can accommodate more snow than noted above. Lastly, for high meltwater events which are induced by precipitation, an overflow to the Fuller Roadside ditch is required to outlet the site. The Fuller Ditch travels overland where it crosses to flow along Tay Point Rd. and ultimately to a wetland just to the south east of Tay Point Rd. In this overflow scenario, the snow storage meltwater will be mixed with the precipitation and diluted to reduce any effects of high chloride concentrations. The long and relatively flat overland flow path will also promote infiltration prior to discharging to the wetland.

12 IMPLEMENTATION SCHEDULE

Projects associated with the preferred site selection generally include the acquisition of land, detailed design of snow storage area, and construction of the approved design. The requirements of the projects have been addressed by this Schedule 'B' Class EA and the Town July proceed to seek council approval and negotiate with the private land owner.

Task	Timeline
Land Acquisition	6 Months
Detailed Design	3 Months
Construction	2 Months

Table 12-1 - Timing of Project Upon Conclusion of Class EA

12.1 Data Gaps and Additional Studies

It is recommended the following additional information and/or investigations be initiated at the conclusion of this Class EA to assist with detailed design and completion of the project.

Table 12-2-Summary of De	ata Gaps
--------------------------	----------

Data Gap	Additional Studies or Investigations
Survey of proposed Land Taking	Legal and topographic survey of acquisition area
Appraisal of Land	Appraisal Report
Land Agreement	Draft Land Acquisition Purchase Agreement and complete transaction
Geotechnical Investigation	To confirm soil permeability and constructability
Detailed Design	Detailed Design of Snow Storage Area

13 CLOSURE

The Town of Penetanguishene Class EA has been completed to determine the preferred site selection for snow storage and Class 2 soil management site.

Through a comprehensive EA process, a preferred site has been selected which is the Morden Site to be purchased by the Town and continued as the snow storage location and class 2 soil management site. The concept design features a sunken infiltration area for land disposal in accordance with MECP guidelines and reduces risk to surrounding sensitive wetland features.

We trust the foregoing Class EA meets with the Town of Penetanguishene's requirements and goals for addressing this issue within the Town.

GREENLAND INTERNATIONAL CONSULTING LTD.

Prepared by:

Brad Parker, P.Eng Project Manager

Appendix A: Concept Drawing Appendix B: Background Reports Appendix C: Public Involvement Appendix D: Natural Heritage Report

14 REFERENCES

- [1] Municipal Engineers Association (MEA), "Municipal Environmental Assessment," 2015.
- [2] A. F. Bajc, "Quaternary Geology of the Huntsville-Penetanguishene Area, Central Ontario," Ontario Geological Survey, Open File Report 5882, 1994, p. 134.
- [3] Golder, "Severn Sound Source Protection Area Approved Assessment Report; Chapter 8: Town of Penetanguishene," Golder, 2011.
- [4] M. Fairbanks and P. Dewaele, "Snow Disposal Sites Evaluation," Golder Associates, Town of Penetanguishene, 2009.
- [5] MECP, "Guidelines on Snow Disposal and De-icing Operations in Ontario," © Queen's Printer for Ontario, 2017, 2021.







Municipal Re	eview	10/12/23	BP	
Revisi	on	Date	Initial	Stamp
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Environmental Assessments & Approvals

April 24, 2023

AEC 22-256

Greenland Consulting Engineers c/o Brad Parker (Project Engineer) 120 Hume Street Collingwood, ON L9Y 1V5

Re: Hydrogeological Assessment for Three (3) Potential Snow Storage Sites, Morden Gravel, Tinney's Septic, Thompsons Road, Town of Penetanguishene

Dear Mr. Parker:

The purpose of this letter as requested by the Township of Penetanguishene is to provide a review of the hydrogeological conditions at three (3) impending snow storage areas to assess any potential constraints for the purpose of snow storage disposal site selection.

The study area consists of three separate potential snow storage areas that are named as follows; Morden Gravel, Thompsons Road, and Tinney's Septic. For the sake of the report, the three storage areas collectively will be referenced as "the Site" (Figure 1). The following report provides a preliminary hydrogeological evaluation of the Site and identifies potential constraints.

Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Alan Turner, Dipl.T. (Env) Environmental Technician Colin Ross, B.Sc., P.Geo. Senior Hydrogeologist

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 MECP Water Well Database Summary (300 m radius from Storage Areas).3

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1.0 INTRODUCTION

The purpose of this Preliminary Hydrogeological Assessment is to provide background information for the three (3) impending snow storage areas to assess any potential constraints for the purpose of snow storage disposal site selection.

The study area consists of three separate potential snow storage areas that are named as follows; Morden Gravel, Thompsons Road, and Tinney's Septic. For the sake of the report, the three storage areas collectively will be referenced as "the Site" (Figure 1).

Morden Gravel is approximately 42 ha in size and comprised of a gravel pit covering approximately 50% of the total site area. The Thompson Road Site is approximately 4 ha in size and currently has parking lot along the northern section, while the remainder of the Site is forested. The Tinney's Septic Site is approximately 33 ha that is currently utilized for commercial purposes.

2.0 ENVIRONMENTAL SETTING

2.1 Soil

The soils at Morden Gravel are differentiated between the north and south portions of the proposed storage area. The north soils are classified as Tioga Series loamy sand (Hoffman *et al*, 1962) which has good drainage and is classified within hydrologic soil group "A". The south section of Morden Gravel, along with Thompsons Road and Tinney's Septic proposed storage areas are also Vasey Series sandy loam (Hoffman *et al*, 1962). This material has good drainage and is classified within hydrologic soil group "AB'. Group A soils have low runoff potential and high infiltration rates even when thoroughly wet, and consist of deep, well to excessively drained sand or gravel. Group B soils have moderately low infiltration rates when thoroughly wet and consist of moderately fine to moderately coarse textures.

The soil material at the Site and surrounding area is shown on Figure 2.

2.2 Physiography

According to Chapman and Putnam (1984) the Site falls within the Simcoe Uplands physiographic region. The Simcoe Uplands comprise a series of broad, rolling till plains separated by steep-sided flat-floored valleys. The rolling till plains are encircled by numerous shorelines, indicating that they were previously islands in glacial Lake Algonquin. The till in these upland areas consists of a gritty loam, becoming more sandy toward the north.



The regional physiographic areas for the Site and surrounding area are shown on Figure 3.

2.3 Topography and Drainage

The topographic relief at the Morden Gravel proposed storage area is limited with an elevation of approximately 236 masl throughout the area. Any surface runoff exiting the area is expected to be directed to the shallow roadside ditch along Fuller Avenue or south towards a small wetland feature located south of the proposed snow storage area.

The topographic relief at the Thompsons Road proposed storage area is also quite limited with elevations ranging between approximately 237 masl at the southeast and 240 masl at the northwest of the proposed storage area. The current drainage is expected to follow the local topographic decline to the southeast with surface runoff being directed to a wetland and associated tributary area approximately 350 m southeast of the proposed snow storage area.

Tinney's Septic proposed storage area has an elevation of approximately 229-234 masl, while the overall property location declines to the east and northeast where a wetland area is located, which is connected to the larger St. Andrews Wetland. The St. Andrews Wetland is a Provincially Significant Wetland (PSW), approximately 180 m northeast of the proposed snow storage area (Figure 1) as identified in the Azimuth, 2022 Natural Heritage Constraints Summary. This feature is connected to St. Andrews Lake. Ultimately, all surface runoff from the proposed snow storage area will be directed into this wetland feature.

Topographic contours of the Site and surrounding area is provided on Figure 4.

2.4 Bedrock Geology

The underlying bedrock geology has been described by the Ontario Geologic Survey (OGS) as being composed of limestone and dolostone (towards base) of the Gull River Formation of the Simcoe Group (OGS, 2022). The Simcoe Group is Middle Ordovician in age.

Figure 5 shows the surficial bedrock units of the Site and surrounding area.

2.5 Quaternary Geology

According to Barnett *et al* (1991) the surficial material at all three Sites consists of glaciolacustrine deposits consisting of gravel and sand. The stratigraphy is dominated by sands and gravels with near shore and beach deposits. As a result, the overburden is



characterized by a complex of layered, coarse-grained sediments with sand, gravelly sand and gravel.

The surficial material at the Site and surrounding area is shown on Figure 6.

2.6 Well Records

The Ontario Ministry of Environment, Conservation, and Parks (MECP) Water Well Records were referenced for any recorded well information within the vicinity of the proposed storage areas individually (300 m) (MECP, 2022). All three proposed storage areas are located on rural parcels, although they are along the periphery of the municipally serviced area of Penetanguishine, such that there are limited well records in the area. However, well records can be used to gain subsurface information which can provide insight into shallow geological formation within the area. The well records found in the vicinity of the three proposed storage areas that are pertinent to this assessment are summarized in Table 1. These well locations are illustrated on Figure 7 and the well records that are available have been included in Appendix B.

Table 1:	MECP Water Well Database Summary	(300 m radius from Storage
Areas)		

					Borehole	Ground
	MECP Well				Depth	Elevation
Storage Area	Record No.	Drill Date	Status	Well Type	(mbgs)	(masl)
Morden Gravel	5718955	28-Oct-83	Uknown	Domestic Water Supply	52.7	236.0
	7309979 /					
*Thompsons Road	A235931	12-Mar-18	Uknown	Unknown	-	240.0
	7334304 /					
*Thompsons Road	A248645	06-Sep-18	Uknown	Unknown	-	237.0
Tinney's Septic	5718269	28-Oct-82	Active	Domestic Water Supply	42.3	224.0
Tinney's Septic	5719318	05-Jul-83	Active	Domestic Water Supply	59.4	234.5

* Assumed to represent test holes as wells are located in municipally serviced areas

The surrounding wells in the MECP well record database were drilled for monitoring and municipal water supply. The wells were drilled to depths between 42.3 and 59.4 mbgs. Given the location of these wells are beyond the municipally serviced area (Figure 2), it is assumed that these wells are currently still used for potable water supply on the adjacent properties. Based on the details in the well records, they are noted to target a deep confined aquifer as a confining layer is present between 3 and 15 mbgs. Not all actual well records were available online, but those that were available for download have been included in Appendix B. It is assumed that the two records with unknown status likely represent monitoring wells as they are located in a municipally serviced area



and were drilled in 2018. The soils identified in these records were primarily sand and gravel, which matches the geological literature outlined above.

2.7 Hydrogeology

The Oak Ridges Groundwater Management Program (ORMGP) interactive map was reviewed to obtain information on the water table condition and ground water flow direction within the Site and surrounding area. The ORMGP water table information was created by contouring the static water levels from all wells where the well screen in less than 20 m deep. Due to seasonal fluctuations in the water table, the information provided by ORMGP is considered an average condition. The actual water table at any given time may be up to 2 or 3 m higher or lower than the map provided.

Information obtained from the ORMGP database suggests that there is a ground water flow divide within the Penetanguishene area, with the western portion flowing west towards Penetang Harbour and the eastern portion flowing east toward Midland Bay. Based on this information, the regional flow is in a south east direction at Modern Gravel and Tinney's Septic, and in a west direction at Thompsons Road. Local ground water flow direction can be impacted by Site specific features such a topography, geology, and surface water features.

3.0 SOURCE WATER PROTECTION

A Source Water Protection Area review was completed for the Site through the use of the MECP Source Protection Information Atlas. Snow storage is considered a significant drinking water threat under subsection 2(1) of the *Clean Water Act, 2006*, while the South Georgian Bay Lake Simcoe Source Protection Plan identifies snow storage as a significant threat if the area is greater than 1 ha and has a vulnerability score of 10. Due to this designation, a Risk Management Plan (RMP) may be required if the activity is completed within a Wellhead Protection Area (WHPA).

The review indicates that the Morden Gravel proposed storage area is located within a WHPA-C & D, a Significant Ground Water Recharge Area (SGRA), and a Highly Vulnerable Aquifer Area (HVA) with a score of 6. The Thompsons Road proposed storage area borders a WHPA-D immediately north of the proposed storage area and is not within a SGRA; however, is partially within a HVA with a score of 6. Tinney's Septic storage area is partially within a Significant SGRA with a score between 4 and 6; however it is not within an HVA or WHPA A, B, C, or D. Based on this review, the vulnerability scores for these Sites do not represent a significant threat; however, the Town Risk Management Official should be consulted to confirm this and identify any potential restrictions or requirements to operate the Sites as snow storage facilities.



All three locations are at least partially situated within a WHPA Q1/Q2 area, which would mean ground water recharge at the Site will need to be maintained and it would limit activities in this area where water is removed without returning it to the same source. As such this would not affect the proposed snow storage areas. It is also noted that none of the proposed snow storage areas are located within an Issues Contributing Area (ICA) for sodium or chloride.

Given the above noted details related to each location, there are no defined limitations with respect to the proposed activities relating to source water protection. For reference, a map illustrating the source water protection areas have been appended (Appendix C).

4.0 CONCLUSION

Using the information provided above it is our opinion that with the overburden material which is characterized as course-grained soils; this allows for good drainage of any snow melt and precipitation thus there is no run off concerns for either Morden Gravel, Thompsons Road and Tinney's Septic proposed snow storage sites. Furthermore, none of the proposed snow storage areas mentioned in this letter have locations within an Issues Contributing Area (ICA) for sodium or chloride so any potential road salt residue is not an issue.

5.0 REFERENCES

- Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. Quaternary Geology of Ontario, Ontario Geological Survey, Map 2556, Scale 1:1,000,000.
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APPENDICES

Appendix A:FiguresAppendix B:MECP Well RecordsAppendix C:Source Water Protection Mapping



APPENDIX A

Figures

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

















APPENDIX B

MECP Well Records

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

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APPENDIX C

Source Water Protection Mapping

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Source Water Protection Mapping



Ontario (© King's Printer for Ontario, 2022

Map Created: 12/5/2022 Map Center: 44.7811 N, -79.91092 W



Environmental Assessments & Approvals

March 3, 2023

AEC22-256

Greenland Consulting Engineers c/o Brad Parker (Project Engineer) 120 Hume Street Collingwood, ON L9Y 1V5

Re: Natural Environmental Constraints Summary for Three (3) Potential Snow Storage Sites, Morden Gravel, Tinney's Septic, Thompsons Road, Town of Penetanguishene

Dear Mr. Parker:

Azimuth Environmental Consulting, Inc. (Azimuth) was retained to complete a Natural Environmental Constraints Analysis and provide a preliminary assessment of potential natural heritage features requiring consideration in the evaluation of three (3) potential snow storage locations for the Town of Penetanguishene (Town). Potential locations for snow storage are explored as part of this analysis within the identified study areas as provided by Greenland Consulting Engineers (Greenland) and depicted in Figure 1. The review of preliminary constraints is presented in this Natural Environmental Constraints Summary letter, as they relate to Key Natural Heritage Features (KNHFs), as defined by provincial and municipal planning policy. KNHFs may include woodlands, wetlands, valleylands, Significant Wildlife Habitat (SWH), fish habitat, and habitat for Species at Risk (SAR) protected under Ontario's *Endangered Species Act*, 2007 (ESA).

The proposed snow storage sites and adjacent lands (*i.e.* lands within approximately 120 metres (m) of the proposed snow storage sites) were the focus of this evaluation; however, the entirety of the property in which a proposed snow storage site resides was evaluated for a comprehensive understanding of potential KNHFs. As such the study area includes lands within the property limits and adjacent lands within 120m of a proposed snow storage site.

This letter report includes a summary of recommendations to be considered for future stages of the project including recommendations for additional environmental field study and property evaluation, dependent upon the ultimate proposed location for the snow



storage. These recommendations would be fulfilled through the completion of an Environmental Impact Study (EIS).

Information provided herein may be included in an EIS report once the site location and design details are understood, in order to adequately identify mitigation requirements for natural heritage protection, and potential permitting requirements from the regulatory agencies. Recommendations herein may be time sensitive given the seasonality of inventory studies for various natural heritage disciplines. Such recommendations require consideration during project planning stages to ensure EIS deliverables can be achieved within expected timelines.

1.0 POLICY CONTEXT

Azimuth has prepared this Natural Environmental Constraints Summary relative to the following federal, provincial, and municipal planning policies with potential applicability to the property:

- Provincial Policy Statement (MMAH, 2020);
- Endangered Species Act, 2007 (ESA);
- County of Simcoe Official Plan;
- Town of Penetanguishene Official Plan; and
- Federal Fisheries Act.

2.0 BACKGROUND INFORMATION

A review of the following background documents provided information on site characteristics, habitat, wildlife, rare species and communities, and general cultural/historical aspects of the three study areas:

- Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC; MNRF, 2023);
- Atlas of the Breeding Birds of Ontario (OBBA; Cadman et al., 2007);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2020);
- Ministry of the Environment, Conservation Parks (MECP)'s Species at Risk Ontario list (MECP, 2023);
- iNaturalist (NHIC) Rare Species of Ontario (iNaturalist, 2023);
- Air photos available for the Project Area (Google, VuMap);
- Government of Canada's Species at Risk Public Registry; and,
- Atlas of the Mammals of Ontario (Dobbyn, 1994).



3.0 STUDY APPROACH

Classification of habitats was undertaken using recent air photo imagery for an area encompassing the study areas (*i.e.* property limits and adjacent lands within approximately 120m of a proposed storage site). A single site assessment was completed for the Tinney's Septic and Thompson Road sites by two Azimuth Ecologists on February 16, 2023, and environmental features mapping illustrate information derived from a combination of desktop mapping resources and field study conclusions. Site access for Mordon Gravel was not granted at the time of the site visit, as such, a roadside evaluation was completed for the proposed site. Vegetation units were generally classified using Ecological Land Classification for Southern Ontario (ELC; Lee *et al.*, 1998) protocols as illustrated in Figure 2A-2C, noting that the site assessment survey occurred outside of the growing season and was therefore limited to a "high level" review of natural conditions on the properties.

A detailed survey including a screening for Butternut (*Juglans cinerea*; Endangered) and Black Ash (*Fraxinus nigra*; Endangered) was also conducted within each study area.

4.0 SUMMARY OF NATURAL HERITAGE CONDITIONS

4.1 <u>Vegetation and Vegetation Communities</u>

The study areas include several natural heritage components including woodlands, wetlands and meadows that are intermixed with rural residential and commercial/industrial lands. Excluding the anthropogenic land uses (*i.e.* disturbed areas, maintained lands, industrial land uses), a total of nine (9) vegetation communities were identified by Azimuth in 2023 (Figure 2A-2C), classified at a high level based on an out-of-season assessment.

Woodland and mapped wetland features have been identified within all three study area (Figure 2A-2C). Many of the woodlands within the study areas are part of larger contiguous woodland communities that extend beyond the study area.

Mordon Gravel

The Mordon Gravel study area comprises of Deciduous Forest (FOD), Mixed Forest (FOM), Coniferous Forest (FOC) vegetation communities; alongside an active quarry operation and recently disturbed areas. The disturbed areas on site exhibit recent vegetation removal and tree clearing, with small patches of meadow vegetation remaining. The proposed snow storage site is currently utilized for snow and fill placement.



The eastern FOD woodland community is designated a Significant Woodland as per Section 3.10.6.1 and Schedule B1 (Policy Overlays) of the Town's Official Plan (OP; Town of Penetanguishene, 2016) presented in the attached Appendix. Schedule B1 illustrates the woodland as "Environmental Protection", however Section 3.10.6.1 clarifies that Significant Woodlands receive this designation under Schedule B1.

Two unevaluated wetlands are mapped within the Mordon Gravel property limits, located approximately 110m east of the potential snow storage location. Notably, an unevaluated wetland occurs within the southwest corner of the proposed snow storage location (Figure 2A). Note that field verification did not occur as property access was not granted at the time of the site investigation.

Tinney's Septic

The Tinney's Septic property contains multiple vegetation communities including, FOM, FOC, Coniferous Plantation (TAGM1), Dry-Fresh Sugar Maple Deciduous Forest (FODM5), Deciduous Swamp (SWD), Thicket Swamp (SWT), and a deciduous hedgerow (Figure 2B). The FODM5, FOM, TAGM1, and SWD communities adjacent to the storage location are designated as Significant Woodland as shown in Schedule B1 (Policy Overlays) within the Town's OP (attached). No Butternut (Endangered) trees were identified within the study area during Azimuth's field investigation.

Two MNRF unevaluated wetlands are mapped approximately 23m and 65m east of the proposed snow storage site (Figure 2B). These wetland features were confirmed during the February 16, 2023 site visit and an approximate wetland boundary was established to the extent seasonal constraints allowed. In-season work (approx. May-August) would be required to provide a detailed delineation of the wetland feature when ground-layer vegetation is identifiable. One (1) Black Ash stem was observed within the SWD community approximately 65m from the proposed snow storage location (Figure 2B).

Notably, the St. Andrews Wetland, a Provincially Significant Wetland (PSW) is located in the northeast corner of the Tinney's Septic property, approximately 170m from the proposed snow storage location. Wetlands that are not mapped by the province but continuous with PSWs are generally considered to be part of the PSW, therefore the wetlands identified on the property should be treated as a component of the St. Andrews Wetland PSW.

Within the property there are maintained lands with residential and commercial buildings associated with Tinney's Septic Service and Construction (excavation contractor).



Thompson Road

The Thompson Road study area is entirely wooded, with the exception of a commercial parking lot on the north side of the study area. The woodland is classified as Dry-Fresh Red Oak Deciduous Forest (FODM1-1) and Dry-Fresh White Birch Deciduous Forest (FODM3-2); and are designated a Significant Woodland as shown in Schedule B1 (Policy Overlays) within the Town's OP (Appendix). No Butternut (Endangered) or Black Ash (Endangered) trees were identified within the study area during Azimuth's field investigation.

As the general tree size and stage of decay of Thompson Road woodland communities are not conducive for bat "snag" trees (trees with cracks, holes, cavities, loose bark, *etc.*), a minimal number of potential bat snag features were observed within the study area. No high quality bat snag trees were observed (*i.e.* presence of high quality features distributed on a high and unobstructed area of a tree). As such, there were a limited number of suitable snag trees that could potentially be utilized by bats for maternity and/or day roosts during the summer period.

Two unevaluated wetlands exist on adjacent lands and within 120m to the proposed snow storage site (Figure 2C). One unevaluated wetland is located on the west side of Thompson Road approximately 35m from the property, the second unevaluated wetland occurs approximately 105m south of the proposed snow storage site. No wetland features were observed within the Thompson Road property.

4.2 <u>Wildlife and Wildlife Habitat</u>

The field survey conducted on February 16, 2023, included the collection of incidental wildlife observations (tracks, scat, vocalizations, *etc.*) within the property boundaries. No Threatened, Endangered, or provincially rare species were observed during the site investigation; however seasonal conditions were not conducive to identify some taxa. The following species and signs thereof were observed within the study area limits during site investigations:

Tinney's Septic

- White-tailed Deer
- Northern Raccoon
- Northern Flicker
- Black-capped Chickadee

Thompson Road

Porcupine

- Coyote
- Eastern Cottontail
- Red Squirrel
- Coyote



- Striped Skunk
- Pileated Woodpecker
- Black-capped Chickadee

- Raven
- Red Squirrel

A review of the MNRF NHIC database identified records of provincially Endangered, Threatened, Special Concern, and provincially rare wildlife in proximity to each proposed snow storage site.

Mordon Gravel

The 1 x 1 kilometre (km) squares 17KN8659, and 17KN8559 encompassing the property identified records as follows:

- Bobolink (Threatened)
- Eastern Meadowlark (Threatened)

- Massasauga (Threatened)
- Snapping Turtle (Special Concern)

Tinney's Septic

The 1 x 1km squares 17KN8658, 17KN8759, 17KN8659, and 17KN8758 encompassing the property identified records as follows:

- Bobolink (Threatened)
- Eastern Meadowlark (Threatened)
- Massasauga (Threatened)

- Eastern Milksnake (S4)
- Blanding's Turtle (Threatened)
- Snapping Turtle (Special Concern)

Thompson Road

The 1 x 1km squares 17NK8558 and 17KN8658 encompassing the property identified records as follows:

- Bobolink (Threatened)
- Eastern Meadowlark (Threatened)

• Massasauga (Threatened)

4.3 <u>Watercourses and Fish Habitat</u>

Mordon Gravel

The St. Andrews Lake, an Area of Scientific Interest (ANSI), occurs in the northeast corner Mordon Gravel property. As this waterbody occurs approximately 650m from the location of the proposed snow storage site (Figure 2A), the KNHF should be considered beyond the area of influence of the proposed works and is not considered further in this evaluation. If the location of the Mordon Gravel site is altered in future planning stages and proposed in proximity to St. Andrews Lake, further consideration may be required.



No tributaries or other drainage features with potential to provide fish habitat occur within the study area. As such, no tributaries or drainage features that require further consideration were identified within the study areas through background mapping (NHIC 2023; OHN, 2023).

Tinney's Septic

An unnamed tributary is located south of Tinney's Septic, ending at the southern property boundary at an existing pond, approximately 230m from the proposed snow storage location (Figure 2B). The unnamed tributary is anticipated to occur beyond the area of influence of the proposed works and as such, it is not considered further in this evaluation.

A drainage feature was observed within the SWD community and adjacent to the existing disturbed area (Figure 2B). The small drainage feature flows in an easterly direction with poorly defined banks and appears to diffuse into the SWD feature. The features morphology included a wetted width of 0.3m on average, an average depth of 0.05m, and a sand/silt substrate with organic material. This drainage feature was not mapped on background mapping resources and it is unclear if this is a permanent feature or the result of seasonal snowmelt and run-off from the elevated disturbed area. Given the shallow water depth, lack of pool features, and poorly defined banks, the drainage feature would be characterized as an intermittent feature and is not anticipated to support direct/indirect fish habitat. In-season field investigations may be required for a comprehensive understanding of this drainage feature.

Thompsons Road

There were no features with potential to provide fish habitat within the study area of the proposed snow storage location. As such, no tributaries or drainage features that require further consideration were identified within the study areas during the field investigation or through background mapping (NHIC 2023; OHN, 2023).

5.0 SUMMARY OF CONSTRAINTS AND OPPORTUNITIES

Azimuth has outlined three categories of potential environmental constraints for the proposed site locations based on a desktop review of site conditions and potential restrictions outlined in municipal and provincial policies. Based on our assessment, areas of low, moderate, and high development constraint have been identified within the three study areas. Areas of low development constraint are generally congruent with development and site alteration with few limiting environmental factors. Areas of moderate development constraint contain features that may be of environmental significance, but require further study to determine the extent and tolerance to



development. Areas of high developmental constraint typically preclude any development, and are further subject to minimum setbacks to avoid indirect impacts from adjacent works.

5.1 <u>Mordon Gravel</u>

Low Constraint

The Disturbed Area (Figure 2A) (with the exception of the potential wetland – discussed below) is classified as a low developmental constraints area as the area appears to be the site of earthworks and generally void of vegetation. Similarly, the existing Quarry Operation lacks any natural heritage features that could pose a constraint to development.

Moderate Constraint

The small, isolated woodland features (non-significant woodland areas; Figure 2A) are classified as a low-moderate development constraint area based on the potential presence of the following:

- Potential Habitat for Threatened and Endangered Species
 - o Little Brown Myotis, Northern Myotis, Tri-colored Bat
 - o Butternut, Black Ash
- Candidate Significant Wildlife Habitat
 - Habitat for Special Concern and Rare Wildlife Species
 - Eastern Wood-pewee, Wood Thrush

High Constraint

The extensive, connected woodland features (FOC, FOD, FOM; Figure 2A) are classified as moderate-high developmental constraint areas based on confirmed or potential presence of the following:

- Other Wetlands
- Significant Woodland
- Candidate Significant Wildlife Habitat
 - Bat Maternity Colonies
 - o Woodland Raptor Nesting Habitat
 - o Woodland Area-Sensitive Bird Breeding Habitat
 - Amphibian Breeding Habitat (Woodland)
 - o Habitat for Special Concern and Rare Wildlife Species
 - Canada Warbler, Eastern Wood-Pewee, Wood Thrush, Olive-sided Flycatcher
 - Snapping Turtle
- Potential Habitat for Threatened and Endangered Species
 - o Little Brown Myotis, Northern Myotis, Tri-colored Bat



- o Butternut, Black Ash
- o Massasauga

5.2 <u>Tinney's Septic</u>

Low Constraint

The maintained lands and disturbed area (Figure 2B) are classified as a low developmental constraints area as the area is utilized for material storage area and generally void of vegetation.

Moderate Constraint

The small, isolated woodland features (non-significant woodland areas; Figure 2B) are classified as low-moderate developmental constraints areas based on the potential presence of the following:

- Potential Habitat for Threatened and Endangered Species
 - o Little Brown Myotis, Northern Myotis, Tri-colored Bat
- Candidate Significant Wildlife Habitat
 - Eastern Wood-pewee, Wood Thrush

High Constraint

The St. Andrews Wetland within the property limits of Tinney's Septic is classified as a high development constraint areas based on its designation as a PSW and potential presence of the following:

- Candidate Significant Wildlife Habitat
 - Bat Maternity Colonies
 - Woodland Raptor Nesting Habitat
 - Woodland Area-Sensitive Bird Breeding Habitat
 - Amphibian Breeding Habitat (Woodland)
 - Waterfowl Nesting Area
 - Marsh Breeding Bird Habitat
 - Terrestrial Crayfish
 - o Habitat for Special Concern and Rare Wildlife Species
 - Snapping Turtle
- Potential Habitat for Threatened and Endangered Species
 - Blanding's Turtle (Category 2 and 3 habitat)
 - o Massasauga

The significant woodland communities (FOD, FOM, TAGM1; Figure 2B) and the SWD are classified as high developmental constraint areas based on confirmed or potential presence of the following:



- Other Wetlands continuous with PSW
- Significant Woodlands
- Candidate Significant Wildlife Habitat
 - o Bat Maternity Colonies
 - Amphibian Breeding Habitat (Woodland)
 - o Habitat for Special Concern and Rare Wildlife Species
 - Canada Warbler, Eastern Wood-Pewee, Wood Thrush, Olive-sided Flycatcher
 - Snapping Turtle
- Potential Habitat for Threatened and Endangered Species
 - o Little Brown Myotis, Northern Myotis, Tri-colored Bat
 - o Massasauga
 - Black Ash (SWD)
- Drainage Feature

5.2.1 Significant Woodland

The Town of Penetanguishene OP clarifies the following:

"Development or site alteration shall not be permitted <u>on land adjacent</u> to a Significant Woodland feature unless it has been demonstrated that there will be no negative impacts on the Significant Woodland feature or on their ecological functions that cannot be adequately mitigated. For the purpose of this policy, the extent of adjacent land shall be 120m from the edge of the Significant Woodland"

The FOM, FODM5, TAGM1, and SWD woodland features associated with the Tinney's Septic proposed snow storage site qualify as significant according to the Towns OP (as discussed in section 4.1), and the above policy applies. As such, an EIS may be required during future planning stages when the location and configurations of proposed works are known to confirm the above. Regardless of the above, it is generally defensible to propose works within existing disturbed areas where they occur in proximity to Significant Woodland boundaries.

5.3 <u>Thompsons Road</u>

High Constraint

The deciduous forest (FODM1-1, FODM3-2; Figure 2C) communities are classified as high developmental constraint areas based on confirmed or potential presence of the following:

- Significant Woodlands
- Candidate Significant Wildlife Habitat



- Woodland Raptor Nesting Habitat
- o Woodland Area-Sensitive Bird Breeding Habitat
- Amphibian Breeding Habitat (Woodland)
- Habitat for Special Concern and Rare Wildlife Species
 - Canada Warbler, Eastern Wood-pewee, Wood Thrush, Olive-sided Flycatcher
- Potential Habitat for Threatened and Endangered Species
 - o Little Brown Myotis, Northern Myotis, Tri-colored Bat

5.3.1 Significant Woodland

The expansive woodland feature within the Thompson Road proposed snow storage site qualify as significant according to the Towns OP (as discussed in section 4.1). It is Azimuth's recommendation an EIS occurs during future planning stages when the location and configurations of proposed works are known to confirm the above.

6.0 **RECOMMENDATIONS**

The following ecological surveys are recommended for all three proposed snow storage sites (Mordon Gravel, Tinney's Septic, Thompson Road) if vegetation removal is required, in support of the completion of an EIS:

- Spring/summer (May-August) vegetation inventory to further characterize the limits and extent of vegetation communities within the study area;
- Complete two (2) dawn breeding bird surveys (June) to to confirm the presence/absence of diurnal birds.

6.1 Mordon Gravel Site Specific Recommendations

The following additional ecological surveys are recommended for the proposed Mordon Gravel site, in support of the completion of an EIS:

- Complete one (1) wetland delineation exercise (spring/summer) to determine the limits of the unevaluated wetland within the disturbed area; and,
- Complete one (1) evening amphibian survey (late April), with the potential for two (2) additional surveys (late May and June) dependent on initial findings.

6.2 <u>Tinney's Septic Site Specific Recommendations</u>

The following additional ecological surveys are recommended for the proposed Tinney's Septic site, in support of the completion of an EIS:

- Complete one (1) wetland delineation exercise (spring/summer) to determine the limits of the PSW and SWD in relation to the snow storage site; and,
- Complete one (1) evening amphibian survey (late April), with the potential for two (2) additional surveys (late May and June) dependent on initial findings.



6.3 <u>Thompson Road Site Specific Recommendations</u>

The vegetation inventory (described above) should be directed to spring (May-June) to capture the suite of vegetation species present during the early-late spring period in woodland communities.

7.0 ADDITIONAL CONSIDERATIONS

Buffers

Although not identified within the constraints above, typically protected natural heritage features are protected in addition to a buffer/setback that would be maintained adjacent to the feature. A buffer of up to 30m from a KNHF would be determined through the completion of an EIS and through consultation with the review agencies. A buffer would be composed of native, self-sustaining vegetation. It is notable that where works are proposed in close proximity to KNHFs but within the limits of previously disturbed areas, buffers/setbacks are generally reduced or not required providing an acceptable mitigation program is proposed to protect adjacent ecological communities.

Additional Studies

Although additional studies for the completion of an EIS are highlighted in Section 6 above, additional studies may also be required based on consultation with review agencies.

Detailed Design Considerations

If the proposed development does not require vegetation removal or tree clearing at the proposed Mordon Gravel or Tinney's Septic sites (*i.e.* works are confined to existing disturbed areas), it may be reasonable to conclude that the proposed works would avoid potential impacts to KNHFs adjacent to the proposed development footprint. Additional field studies through the completion of an EIS may not be required depending on the detailed design of the proposed development and whether the development footprint remains within an existing disturbed area.

8.0 CONCLUSIONS

Based on our initial assessment areas of Low, Moderate, and High Development Constraints have been identified within the three proposed snow storage sites. From an ecological perspective, an application for future development on any of the three proposed properties would likely require a Scoped EIS, whereby surveys for vegetation, birds, and potential SAR specific surveys would be required. However, if the development footprint remains within a disturbed area and no vegetation removal or tree clearing is required for the proposed development, impacts to KNHFs on the properties may be avoidable through application of suitable mitigation and exclusion measures.



Should you have any additional questions or concerns, or wish to discuss further please do not hesitate to contact the undersigned.

Yours truly, AZIMUTH ENVIRONMENTAL CONSULTING, INC. **DRAFT**

Jordan Wrobel, B.Sc. Terrestrial Ecologist

Attach: Figure 1, Figure 2A-2C Photographic Record Schedule B1 of Penetanguishene Official Plan



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LEGEND:	
	APPROX. PROPERTY BOUNDARY
	- WATERCOURSE (MNRF, 2021)
	ST.ANDREWS PROVINCIALLY SIGNIFICANT WETLAND (PSW; MNRF, 2021)
¥, ¥,	UNEVALUATED WETLAND (MNRF, 2021)
	AREAS OF NATURAL AND SCIENTIFIC INTEREST (ANSI; MNRF, 2022)
	ELC UPLAND COMMUNITIES:
CVC	COMMERCIAL SECTOR
FOC	CONIFEROUS FOREST
FOD	DECIDUOUS FOREST
FODM1-1	DRY-FRESH RED OAK DECIDUOUS FOREST
FODM3-2	DRY-FRESH WHITE BIRCH DECIDUOUS
FODM5	DRY-FRESH SUGAR MAPLE DECIDUOUS FOREST
ME	MEADOW
MEM	MIXED MEADOW
SWD	DECIDOUS SWAMP
SWT	THICKET SWAMP
TAGM1	CONIFEROUS PLANTATION
	SIGNIFICANT WOODLAND (TOWN OF PENETANGUISHENE, 2019)
	POTENTIAL SNOW STORAGE SITE

DATE ISSUED:	FEBRUARY 2023	Figure No.
CREATED BY:	A.L.	20
PROJECT NO .:	22-256	20
REFERENCE:	SIMCOE COUNTY	



community (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023





AEC 22-256 Penetanguishene Snow Storage February 2023



Photograph 6: View of snowmobile trail within the TAGM1 community at Tinney's Septic (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023



Photograph 8: View of SWT community along Tinney's Septic southern property edge, facing east (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023



facing east (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023



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Photograph 14: View of the defined banks of the drainage feature within Tinney's Septic SWD community (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023



Photograph 16: View of Tinney's Septic WODM5-1 community adjacent to disturbed area, facing west (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023



Photograph 18: View of the slope between Tinney's Septic disturbed area and the surrounding woodland, facing southeast (February 16, 2023).



AEC 22-256 Penetanguishene Snow Storage February 2023





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ENVIRONMENTAL NOISE ASSESSMENT MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

SNOW STORAGE LOCATION

TOWN OF PENETANGUISHENE

PREPARED FOR:

GREENLAND CONSULTING ENGINEERS

March 2023 Y2227

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APPENDIX	2	N	OISE GUIDELINE

1.0 INTRODUCTION

This report has been prepared in support of the Municipal Class Environment Assessment for the Snow Storage location in the Town of Penetanguishene. This report evaluates the noise impact from several potential locations and considers noise mitigation requirements as per the Ministry of Environment (MECP) Guidelines and Transport Association of Canada (TAC) Guidelines.

The three locations of the study area are indicated in the Figure 1 below.



As per the MECP Guidelines, snow hauling and snow disposal operations can produce an objectionable noise level, particularly as they are commonly undertaken at night. A basic criterion is that any snow disposal and road access to and from the site should not be in a location where noise of the operation will be objectionable to nearby residents.

A snow disposal on level ground is recommended to be at least 1,000 feet (300m) from a residential area. A site in a hollow or other location where natural or man-made barriers will baffle the sound may be located closer to residences without creating a nuisance. The snow pile itself can be situated in such a way as to create a sound barrier.

As per the Transportation Association of Canada (TAC) – Snow Storage and Disposal Management Practices - The snow storage sites should be located and operated to minimize the noise impacts on adjacent and nears receptors. Noise complaints may increase along residential area routes. Attempt should be made so that the layout of the site minimizes the requirements for trucks to back-up to reduce the back-up beeper use.

In accordance with the Town of Penetanguishene Noise Control By-law 2011-66, the snow removal/storage operations are exempt from the provisions of the By-law.

STATIONARY NOISE SOURCES CRITERIA

As per the MECP guidelines (Publication NPC-300), the sensitive land use areas are considered to be Class 2 and 3 classification areas.

These levels are expressed in terms of the One Hour Equivalent Sound Level (Leq).

The areas located near Fuller Avenue and Roberts Street East would be considered a Class 2 area classification. The class area for some receptor locations along Tay Point Road and further south at more than 50m from the major roads are considered to be a Class 3 area classification.

<u>Class 2:</u> The noise produced by a stationary source at the plane of window for noise sensitive spaces is the energy equivalent sound level (L_{EQ}), 50 dBA during daytime and evening time (0700-2300) or 45 dBA during night-time (2300-0700).

For outdoor receptors, the energy equivalent sound level (L_{EQ}) is 50 dBA during daytime (0700-1900) or 45 dBA during evening-time (1900-2300).

<u>Class 3:</u> The noise produced by a stationary source at the plane of window for noise sensitive spaces is the energy equivalent sound level (L_{EQ}), 45 dBA during daytime and 40 dBA during evening time (0700-2300) and night-time (2300-0700).

For outdoor receptors, the energy equivalent sound level (L_{EQ}) is 45 dBA during daytime (0700-1900) or 40 dBA during evening-time (1900-2300).
Should the environment be dominated by noise sources from human activity, such as industry, commerce or road transportation, which produce sound in excess of the above limits, the higher sound levels may be used as the limit, provided noise abatement is not required for these other sources.

For impulsive sound, the applicable sound level limit at a Point of Reception expressed in terms of the Logarithmic Mean Impulse Sound Level (LLM) is 45 dBAI for daytime and 40 dBAI for night-time for the Class 3 area. and 50 dBAI for daytime and 45 dBAI for night-time for the Class 2 area.

Noise sources associated with the operation of snow storage sites fall into two categories: construction equipment operation, including on-site movement of trucks and vehicles; and off-site movement of waste trucks and vehicles.

On-Site Source Vehicles

Facilities or equipment being used at the site, are considered to be stationary noise sources. The applicable sound level limits are those established for the assessment of stationary sources in MECP Guidelines NPC-300.

Off-Site Source Vehicles

For a site employing off-site source vehicles (i.e., vehicles hauling snow) that constitute a predominant component of the background noise, an access route should be selected which will result in a minimum noise impact. The selection process should be based on a detailed quantitative assessment of noise impact on individual receptors and the number of affected receptors along the alternative routes.

3.0 NOISE SENSITIVE AREAS

Noise Sensitive Areas (NSA) are defined as a building that has an outdoor recreational and living areas such as residential developments, hospitals nursing/retirement homes. It does not include vacant buildings, institutional or commercial establishments.

All receivers are taken to be 1.5m above the ground at the outdoor amenity areas and at 4.5m above ground for the buildings and/or the dwelling units. Residential developments at similar setbacks and orientation are expected to have the similar sound exposures and residential developments further from the noise source are expected to have lower sound exposures due to distance attenuation.

Lands within the study area are designated mainly employment areas with commercial, industrial, open spaces, institutional uses, rural and some residential uses. See Figure 2 showing the Town of Penetanguishene Land Use Official Plan.



FIGURE 2 – TOWN OF PENETAGUISHENE OFFICIAL PLAN - LAND USE STRUCTURE

POTENTIAL SNOW STORAGE LOCATIONS

As shown on Figure 1, this noise study evaluates three potential snow storage locations in the Town of Penetanguishene area:

- 1. Morden Gravel (905 Fuller Ave, Penetanguishene, ON, L9M 1G7)
- 2. Tinney's Septic (693 Fuller Ave, Penetanguishene, ON, L9M 2E8)
- 3. Thompsons Road (160 Robert St East, Penetanguishene, ON, L9M 2E9)

RECEPTOR LOCATIONS

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The closest noise sensitive receptors for each location are further indicated below in Table 1 and shown on Figures 3 to 5.

TABLE 1 - RECEPT	OR LOCATIONS AND DISTANCES TO SNOW STORAGE SITES
RECEIVER ID	LOCATION DESCRIPTION
Morden Gravel	
R1	Existing Residential - 220 m to the north
R2	Existing Residential - 270 m to the northwest
R3	Existing Residential - 350 m to the northwest
R4	Existing Residential - 430 m to the south
R5	Existing Residential -450 m to the south
R6	Existing Residential – 820 m to the southeast
R7	Existing Residential – 1,100 m to the east
R15	Existing Residential – 630 m to the west
R19	Existing Residential – 520 m to the west
Tinney's Septic	
R1	Existing Residential – 1,010 m to the north
R4	Existing Residential - 480 m to the west
R5	Existing Residential - 300 m to the west
R6	Existing Residential - 100m to the northeast
R7	Existing Residential – 820 to the northeast
R8	Existing Residential - 420 m to the west
R9	Existing Residential - 250 m to the west
R10	Existing Residential - 750 m to the southeast
R11	Existing Residential - 650 m to the south
Thompsons Road	
R4	Existing Residential - 320 m to the east
R12	Existing Residential - 310 m to the east
R13	Existing Residential - 360 m to the east
R14	Existing Residential - 300 m to the northwest
R15	Existing Residential - 320 m to the northwest
R16	Existing Residential - 310 m to the west
R17	Existing Residential - 400 m to the west
R18	Existing Residential - 850 m to the southeast
R19	Existing Residential - 620 m to the northwest



FIGURE 3 – MORDEN GRAVEL LOCATION NEAREST RECEPTOR LOCATIONS



FIGURE 4 – TINNEY'S SEPTIC LOCATION NEAREST RECEPTOR LOCATIONS



FIGURE 5 – THOMPSON ROAD LOCATION NEAREST RECEPTOR LOCATIONS

4.0 NOISE ASSESSMENT

In snow storage sites, the potential noise effects from two components of the operation of the site should be considered: off-site movement of tandem trucks, the operation itself (including equipment and on-site movement of tandem trucks and other vehicles).

OFF SITE - SNOW HAULING ROUTES

The snow hauling routes for each location are expected to be on Robert Street East (west of Fuller Avenue), Tay Point Road (east of Fuller Avenue), Fuller Avenue (north and south of Robert Street East, and Tay Point Road and Thompsons Road (south of Robert Street East).

Robert Street East and Fuller Avenue are considered to be Major Roads as per the Official Plan - Transportation Networks with higher traffic volumes. Tay Point Road is considered to be a local road.



FIGURE 6 – TOWN OF PENETAGUISHENE OFFICIAL PLAN – TRANSPORTATION NETWORK

Snow Hauling Routes noise modelling was carried out for the following:

- **Morden Grave**: Tandem trucks travelling through Robert Street East, Tay Point Road and mostly along Fuller Avenue into the snow disposal site.
- **Tinney's Septic**: Tandem trucks travelling through Robert Street East, Fuller Avenue on to Tay Point Road and into the snow storage site.
- **Thompsons Road**: Tandem trucks travelling through Robert Street East, Tay Point Road and Fuller Avenue on to Thompsons Road into the snow storage site.

ON SITE - SNOW STORAGE SITES

Based on information provided by the Town, the following truck volumes, equipment and activities are expected to operate at and in/out of the snow storage sites:

- Tandem Trucks movement and unloading.
- Five thousand (5,000) tandem trucks trips per season.
- Front-End Loaders movements within the site.
- Backup Beepers.
- 24 hours per day periods.

With snow removal season taken to be 5 months a year, 1,000 tandem trucks per months have been considered.

For noise analysis purposes, 30 to 50 tandem trucks were considered over the daytime and night-time hours for the major routes, although the truck volumes are expected to be less the majority of times.

The Sound Power Levels were based on sample sound measurements of similar equipment and based on the MTO publication Noise Emission Levels for Vehicles in Ontario for truck pass bys.

The Sound Power Level for the on-site equipment were based on sound measurements conducted for similar types of equipment.

The Front-End Loader Sound Power Levels was taken to be 98dBA operating 75% of the times and the backup beepers were taken to be 99dBA operating at 50% of the times. Several unloading activities Sound Power Levels were taken to be 89 dBA each operating 50% of the times and the impulsive sounds were considered to be 110dBAI for 10 to 20 minutes per hour.

The tandem Truck movements Sound Power Levels are taken to be 110dBA on the roads. The truck distribution has been considered based on the location of each site.

The sound levels were calculated using the CadnaA Version 2021 computer program using the International Standard ISO 9613-2.

Snow Storage Location (Town of Penetanguishene) Municipal Class Environmental Assessment (Noise Assessment)

TABLE 2 - UMMITIGATED SOUND LEVELS, Leq 1 hour (dBA)											
RECEPTOR	Daytime/ Evening	Sound Level	Exceedance	Night-time (2300 - 0700)	Sound Level	Exceedance					
	(0700 - 2300)	Limits			Limits						
Modern Grave	el										
R1	52.3	50	2.3	50	45	5.0					
R2	50.0	50	-	47	45	2.0					
R3	48.0	50	-	45	45	-					
R4	48.2	50	-	45	45	-					
R5	44.9	45	-	42	40	2.0					
R6	42.8	45	-	38	40	-					
R7	42.6	45	-	37	40	-					
R14	47.8	50	-	40	45	-					
R15	43.1	50	-	39	45	-					
R19	44.2	50	-	42	45	-					
Tinney's Sept	tic										
R1	36.9	50	-	34.5	45	-					
R4	48.9	50	-	45.2	45	0.2					
R5	48.5	45	3.5	46.0	40	6.0					
R6	54.9	45	9.9	52.7	40	12.7					
R7	44.1	45	-	41.1	40	1.1					
R8	45.7	50	-	43.2	45	-					
R9	46.8	45	1.8	44.5	40	4.5					
R10	38.3	45	-	35.9	40	-					
R11	37.4	45	-	35.1	40	-					
R15	36.7	50	-	33.0	45	-					
Thompsons F	Road										
R1	42.3	50	-	39.7	45	-					
R4	50.3	50	0.3	47.9	45	2.9					
R5	45.6	45	0.6	43.3	40	3.3					
R8	47.9	50	-	45.7	45	0.7					
R12	50.9	50	0.9	48.6	45	3.6					
R13	49.1	50	-	46.7	45	1.7					
R14	50.5	50	0.5	48.1	45	3.1					
R15	48.7	50	-	46.6	45	1.6					
R16	48.9	50	-	46.6	45	1.6					
R17	45.0	50	-	42.9	45	-					
R18	44.9	50	-	42.0	45	-					
R19	43.4	50	-	41.3	45	-					

The following Table 2 summarizes the unmitigated sound levels at the nearby receptor locations:

Based on the sound level results in the above Table 2, the total sound level results from all the Snow Storage Sites are expected to exceed the sound level limits of 50dBA/45dBA during the daytimes and 45dBA/40dBA during the night times at some of the nearest receptor locations.

Therefore, noise mitigation measures are required for all potential snow storage sites. See Figures 7A, 8A and 9A for unmitigated noise contour lines.

5.0 RECOMMENDED NOISE MITIGATION MEASURES

For each potential site, the following earth berms/ barriers are required on site to reduce the sound levels from the Snow Storage Sites activities:

Morden Gravel:

- A 3.0m high earth berm/barrier is required along the north portion of the Snow Storage Site as shown on the attached Figure 7C; and
- A 2.5m high berm is recommended along the south portion of the Snow Storage Site as shown on the attached Figure 7C.

Tinney's Septic:

• A 5.5m high earth berm is required along the north, west and east side of the Snow Storage Site as shown on the attached Figure 8C.

Thompsons Road:

- A 3.0m high earth berm/barrier is required along the northwest portion of the Snow Storage Site as shown on the attached Figure 9C; and
- A 4.0m high berm is required along the southeast portion of the Snow Storage Site as shown on the attached Figure 9C.

TABLE 3 - MITIGATED SOUND LEVELS, Leq 1 hour (dBA)											
RECEPTOR	Daytime/ Evening	Sound Level	Exceedance	Night-time (2300 - 0700)	Sound Level	Exceedance					
	(0700 - 2300)	Limits			Limits						
Modern Grave	el										
R1	45.9	50	-	43	45	-					
R2	45.1	50	-	42	45	-					
R3	44.5	50	-	40	45	-					
R4	46.5	50	-	42	45	-					
R5	42.0	45	-	39	40	-					
R6	42.3	45	-	38	40	-					
R7	42.5	45	-	37	40	-					
R14	47.8	50	-	40	45	-					
R15	43.1	50	-	39	45	-					
R19	44.2	50	-	42	45	-					
Tinney's Sept	tic										
R1	31.1	50	-	28.0	45	-					
R4	47.9	50	-	43.5	45	-					
R5	42.3	45	-	38.7	40	-					
R6	43.7	45	-	39.8	40	-					
R7	43.1	45	-	39.9	40	-					
R8	40.1	50	-	36.8	45	-					
R9	40.3	45	-	37.5	40	-					
R10	37.2	45	-	34.7	40	-					
R11	37.4	45	-	35.1	40	-					
R15	34.9	50	-	30.1	45	-					
Thompsons F	Road										
R1	42.2	50	-	39.7	45	-					
R4	46.7	50	-	43.9	45	-					
R5	42.5	45	-	39.8	40	-					
R8	44.0	50	-	41.6	45	-					
R12	47.3	50	-	44.6	45	-					
R13	48.5	50	-	46.0	45	1.0*					
R14	48.4	50	-	45.9	45	0.9*					
R15	47.1	50	-	44.9	45	-					
R16	46.7	50	-	44.1	45	-					
R17	43.9	50	-	41.7	45	-					
R18	44.9	50	-	42.0	45	-					
R19	42.4	50	-	40.2	45	-					

The following Table 3 summarizes the mitigated sound levels at the nearby receptor locations as per the recommendations noted:

* Slight sound level exceedance due to snow hauling truck activity on the Major Roads. However, receptors adjacent to the major roads are expected to have a higher sound level limits due to higher background noise than the MOE Criteria.

Based on the sound level results in the above Table 3, the total sound level results from all the Snow Storage Sites are expected to meet the sound level limits of 50dBA/45dBA during the daytimes and 45dBA/40dBA during the night times at some of the nearest receptor locations.

See Figures 7B, 8B and 9B for mitigated noise contour lines.

6.0 NOISE MANAGEMENT PLAN

As per the Town of Penetanguishene Noise Control By-law 2011-66, the snow removal/storage operations are exempt from the provisions of the By-law.

However, good operation and maintenance procedures at the snow disposal site is a component of the overall design to ensure the environmental control and monitoring works continue to function as designed and for as long as they are needed.

Good operational procedures are also important for minimizing potential nuisance impacts.

The following noise control measures are recommended to minimize the noise impact during the snow disposal period:

- 1. Maintenance of machinery / equipment / trucks (Inspect and ensure the equipment is in good working condition, lubricated to avoid rattling and excessive noise).
- 2. It is recommended that the equipment/ trucks minimize idling time.
- 3. Implement complaint response plan to address any public concerns with on and offsite operations.

7.0 SUMMARY AND CONCLUSION

SUMMARY

TABLE 4 –SUMMAR	RY OF NOISE MITIGATION MEASURES
SITE	NOISE MITIGATIONS REQUIRED
Morden Gravel	3.0m high berm to be located at the north part of the site ¹
	2.5m high berm to be located at the south part of the site ¹
Tinney's Septic	5.5m high berm to be located at the north, east and west of the site 2
Thompsons Road	3.0m high berm to be located at the northwest corner of the site ³
	4.0m high berm to be located at the southeast corner of the site ³

1 Morden Gravel Site required noise mitigation measures shown on the attached Figure 7C.

2 Tinney's Septic Site required noise mitigation measures shown on the attached Figure 8C.

3 Thompsons Road Site required noise mitigation measures shown on the attached Figure 9C.

CONCLUSION

Based on the sound level results for the Snow Storage Site options, the noise modeling determines that the on-site sound levels at the noise sensitive receptors near all locations are expected to meet the sound level criteria with berms indicated in Table 4 and as shown on Figures 7C, 8C and 9C.

The off-site sound levels of tandem trucks hauling the snow may exceed the noise sensitive areas sound level limits at times for all sites.

However Option 1 (Morden Gravel) is acoustically the preferable location with the implementation of the noise mitigation measures noted in this report with the least off-site noise impact on nearby receptors.

Respectfully submitted,



8.0 **REFERENCES**

- 1. "Environmental Noise Guideline Stationary and Transportation Sources -Approval and Planning, Publication NPC-300", August 2013
- 2. "Ministry of the Environment, Conservation and Parks Guidelines for Snow Disposal and De-icing Operations in Ontario", February 2011
- "Transportation Association of Ontario" Syntheses of Best Practices Road Salt Management - 8.0 Snow Storage and Disposal – April 2013
- 4. "Town's Snow Policy Removal"- Town of Penetanguishene Policy/Procedure, April 2019
- 5. Ministry of Environment "Noise Guidelines for Landfill Sites," October 1998
- 6. "Salt Management Plan 2014 Corporation of the Town of Penetanguishene", Revision 2 January 2014
- 7. "By-law 2011-66 as amended, The Town of Penetanguishene Noise Control Bylaw, Revised September 29, 2013
- 8. "Environmental Noise Guideline, Construction Equipment- Publication NPC-115", August 2013
- 9. MTO/MOE Protocol , Ontario Ministry of Transportation/Ontario Ministry of Environment", 1986
- 10. PC Cadna A, "Computer Program Version 2021 using the International Standard ISO 9613-2.
- 11. "Town of Penetanguishene Official Plan", Schedule 'A' Land Use Structure, February 2019
- 12. Town of Penetanguishene Official Plan", Schedule 'B1' Policy Overlays, February 2019
- 13. Town of Penetanguishene Official Plan", Schedule 'C' Transportation Network, February 2019

APPENDIX 1 SOUND LEVEL CALCULATIONS

MORDEN GRAVEL SITE SUMMARY OF SOUND LEVEL RESULTS

Receiver Table (Option 1)

Name	ID	Leve	el Lr	Limit.	Value	Height		(Coordinates	
		Day	Night	Day	Night			Х	Y	Z
		(dBA)	(dBA)	(dBA)	(dBA)	(m)		(m)	(m)	(m)
R1	R1	45.9	43.1	50.0	45.0	4.50	r	798.87	696.58	4.50
R2	R2	45.1	41.8	50.0	45.0	4.50	r	712.57	768.27	4.50
R3	R3	44.5	40.4	50.0	45.0	4.50	r	722.45	872.84	4.50
R4	R4	46.5	41.6	50.0	45.0	4.50	r	786.88	-72.03	4.50
R5	R5	42.0	38.6	45.0	40.0	4.50	r	997.05	-104.03	4.50
R6	R6	42.3	37.6	45.0	40.0	4.50	r	1545.57	-60.81	4.50
R7	R7	42.5	36.9	45.0	40.0	4.50	r	2052.45	434.32	4.50
R10	R10	41.1	38.8	50.0	45.0	4.50	r	202.22	803.77	4.50
R15	R15	43.1	39.5	50.0	45.0	4.50	r	85.40	214.01	4.50
R14	R14	47.8	40.0	50.0	45.0	4.50	r	8.64	94.53	4.50
R19	R19	44.2	41.9	50.0	45.0	4.50	r	215.84	522.19	4.50

Point Source Table (Option 1)

Name	F	Result. PWL	-		Lw / Li	Ope	rating Tin	ne	Freq.	Heig	ht	C	oordinates	
	Day	Evening	Night	Туре	Value	Day	Special	Night				Х	Y	Z
	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	(m)		(m)	(m)	(m)
TUnload	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r	777.33	467.80	2.00
TUnload2	88.7	88.7	88.7	Lw	TruckUnloading	360.00	180.00	240.00		2.00	r	799.65	444.04	2.00
TUnload4	88.7	88.7	88.7	Lw	TruckUnloading	540.00	180.00	240.00		2.00	r	801.36	468.64	2.00
TUnload5	88.7	88.7	88.7	Lw	TruckUnloading	360.00	180.00	240.00		2.00	r	793.08	429.04	2.00
TUnload3	88.7	88.7	88.7	Lw	TruckUnloading	360.00	180.00	240.00		2.00	r	770.32	430.97	2.00
BckBpr1	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r	811.07	452.65	2.00
BckBpr12	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r	783.46	405.62	2.00
Impulse	110.0	110.0	110.0	Lw	110	20.00	10.00	10.00	500	2.00	r	785.14	451.49	2.00

Line Source Table (Option 1)

Name	R	esult. PW	/L	Re	esult. PW	/L'		Lw / Li	Op	perating ⁻	Time	Freq.		Moving Pt. Src		
	Day	Even	Night	Day	Even	Night	Туре	Value	Day	Special	Night		Number		Speed	
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	Day	Even	Night	(km/h)
Т3	105.5	103.8	100.8	76.9	75.1	72.1	PWL-Pt	TruckTravel1	20.00	10.00	5.00		30.0	20.0	10.0	60.0
T2	102.4	99.4	99.4	75.9	72.9	72.9	PWL-Pt	TruckTravel1	10.00	5.00	5.00		20.0	10.0	10.0	50.0
T1	104.6	101.6	101.6	75.1	72.1	72.1	PWL-Pt	TruckTravel1	10.00	5.00	5.00		20.0	10.0	10.0	60.0
T5	92.2	90.5	90.5	68.3	66.5	66.5	PWL-Pt	FrontEndLoader	540.00	180.00	360.00		30.0	20.0	20.0	30.0
T4	98.9	95.9	95.9	72.1	69.1	69.1	PWL-Pt	TruckTravel1	5.00	2.00	2.00		10.0	5.0	5.0	60.0
T6	105.4	105.4	102.4	72.9	72.9	69.9	PWL-Pt	TruckTravel1	5.00	5.00	2.00		10.0	10.0	5.0	50.0

Partial Level – Day (Option 1)

S	ource	e					Part	tial Level	Day				
Name	Μ.	ID	R1	R2	R3	R4	R5	R6	R7	R19	R10	R15	R14
TUnload		TUnload	24.7	22.9	20.8	25.3	24.0	24.0	20.2	29.6	25.2	26.7	25.0
TUnload2		TUnload2	28.9	27.4	25.6	25.7	24.6	24.4	20.4	29.1	27.3	26.5	24.9
TUnload4		TUnload4	26.0	24.0	22.0	27.0	26.2	26.0	22.2	30.9	22.7	28.1	26.5
TUnload5		TUnload5	30.0	28.4	26.5	25.8	24.6	19.7	20.4	29.2	27.3	26.7	25.1
TUnload3		TUnload3	30.0	28.7	26.6	25.9	24.5	19.8	20.2	29.6	27.6	27.0	25.3
BckBpr1		BckBpr1	36.7	35.1	33.4	34.8	34.2	33.4	29.2	38.1	32.6	35.3	33.6
BckBpr12		BckBpr2	39.8	38.1	35.9	33.0	32.4	28.6	29.0	38.5	36.2	35.9	34.2
Impulse		Impulse	41.1	39.3	37.3	37.1	35.8	31.5	28.0	36.4	34.6	33.8	32.3
Т3		Т3	23.7	23.2	21.6	36.1	28.3	18.2	11.8	28.9	23.4	38.2	47.1
T2		T2	25.4	25.0	21.8	30.4	24.7	15.2	9.5	21.2	18.0	19.4	17.6
T1		T1	27.3	26.0	22.9	42.9	30.1	18.0	11.4	21.9	18.7	20.9	19.7
T5		T5	34.3	32.6	30.6	30.6	29.7	28.5	25.4	34.4	31.6	31.8	30.3
T4		T4	36.0	39.4	41.3	8.7	5.7	5.0	2.9	14.8	15.2	9.8	7.5
T6		T6	13.2	11.7	10.7	38.1	35.0	40.2	41.7	10.5	7.6	10.8	9.9

S	ourc	е					Parti	al Level N	light				
Name	Μ.	ID	R1	R2	R3	R4	R5	R6	R7	R19	R10	R15	R14
TUnload		TUnload	23.0	21.1	19.1	23.5	22.2	22.3	18.5	27.8	23.5	24.9	23.3
TUnload2		TUnload2	27.1	25.6	23.8	23.9	22.8	22.7	18.7	27.4	25.5	24.7	23.1
TUnload4		TUnload4	22.5	20.5	18.5	23.5	22.7	22.5	18.7	27.4	19.2	24.6	23.0
TUnload5		TUnload5	28.2	26.7	24.7	24.1	22.9	18.0	18.6	27.4	25.5	24.9	23.3
TUnload3		TUnload3	28.2	26.9	24.9	24.2	22.7	18.1	18.4	27.9	25.8	25.2	23.6
BckBpr1		BckBpr1	35.0	33.4	31.6	33.0	32.4	31.6	27.5	36.3	30.8	33.5	31.9
BckBpr12		BckBpr2	38.1	36.4	34.1	31.3	30.6	26.9	27.2	36.7	34.5	34.2	32.5
Impulse		Impulse	38.1	36.3	34.3	34.1	32.8	28.5	25.0	33.3	31.6	30.8	29.3
Т3		Т3	12.9	12.4	10.8	25.3	17.5	7.4	1.0	18.1	12.6	27.4	36.3
T2		T2	19.4	19.0	15.8	24.4	18.7	9.2	3.5	15.2	12.0	13.4	11.6
T1		T1	21.3	20.0	16.9	36.9	24.1	12.0	5.4	15.9	12.7	14.9	13.7
T5		T5	30.8	29.1	27.0	27.1	26.2	25.0	21.9	30.9	28.0	28.3	26.8
T4		T4	29.0	32.4	34.3	1.7	-1.3	-2.0	-4.1	7.8	8.2	2.8	0.5
T6		T6	6.2	4.7	3.7	31.1	28.0	33.2	34.7	3.5	0.6	3.8	2.9

Partial Level Table – Night (Option 1)

Result Table (Option 1) – Unmitigated

Recei	ver	Limiting	Limiting		rel. Axis		Lr w/o Noise	Lrw/o Noise	dL req.	dL req.
		Value	Value				Control	Control		
Name	ID	Day	Night	Station	Distance	Height	Day	Night	Day	Night
		dB(A)		m	m	m	dB(A)	dB(A)	dB(A)	dB(A)
R1	R1	50	45	190	54.69	2.00	52.3	50	2.3	5.0
R2	R2	50	45	261	32.05	2.00	50.0	47	-	2.0
R3	R3	50	45	366	22.81	2.00	48.0	45	-	-
R4	R4	50	45	1736	39.82	2.50	48.2	45	-	-
R5	R5	45	40	1525	72.87	2.50	44.9	42	-	2.0
R6	R6	45	40	977	32.38	2.50	42.8	38	-	-
R7	R7	45	40	28	21.93	2.50	42.6	37	-	-
R14	R14	50	45	726	38.40	2.00	47.8	40	-	-
R15	R15	50	45	649	157.55	2.00	43.1	39	-	-
R19	R19	50	45	517	465.17	2.00	44.2	42	-	-

Result Table (Option 1) – Mitigated (with 3.0m & 2.5m high berm/barrier)

Recei	ver	Limiting	Limiting Value		rel. Axis		Lr w/o Noise	Lrw/o Noise	dL req.	dL req.
		Value					Control	Control		
Name	ID	Day	Night	Station	Distance	Height	Day	Night	Day	Night
		dB(A)		m	m	m	dB(A)	dB(A)	dB(A)	dB(A)
R1	R1	50	45	190	54.69	2.00	45.9	43	-	-
R2	R2	50	45	261	32.05	2.00	45.1	42	-	-
R3	R3	50	45	366	22.81	2.00	44.5	40	-	-
R4	R4	50	45	1736	39.82	2.50	46.5	42	-	-
R5	R5	45	40	1525	72.87	2.50	42.0	39	-	-
R6	R6	45	40	977	32.38	2.50	42.3	38	-	-
R7	R7	45	40	28	21.93	2.50	42.5	37	-	-
R14	R14	50	45	726	38.40	2.00	47.8	40	-	-
R15	R15	50	45	649	157.55	2.00	43.1	39	-	-
R19	R19	50	45	517	465.17	2.00	44.2	42	-	-



FIGURE 7A MORDEN GRAVEL LOCATION (OPTION) NOISE CONTOUR LINES (UNMITIGATED)



TINNEY'S SEPTIC SITE SUMMARY OF SOUND LEVEL RESULTS

Receiver Table (Option 2)

Name	ID	Leve	el Lr	Limit.	Value	Height		(Coordinates	
		Day	Night	Day	Night			Х	Y	Ζ
		(dBA)	(dBA)	(dBA)	(dBA)	(m)		(m)	(m)	(m)
R1	R1	31.1	28.0	50.0	45.0	4.50	r	797.14	709.50	4.50
R4	R4	47.9	43.5	50.0	45.0	4.50	r	791.77	-52.18	4.50
R5	R5	42.3	38.7	45.0	40.0	4.50	r	1006.69	-104.65	4.50
R6	R6	43.7	39.8	45.0	40.0	4.50	r	1549.84	-69.94	4.50
R7	R7	43.1	39.9	45.0	40.0	4.50	r	2066.03	462.73	4.50
R8	R8	40.1	36.8	50.0	45.0	4.50	r	870.16	-237.96	4.50
R9	R9	40.3	37.5	45.0	40.0	4.50	r	956.21	-331.36	4.50
R10	R10	37.2	34.7	45.0	40.0	4.50	r	2112.70	-870.25	4.50
R11	R11	37.4	35.1	45.0	40.0	4.50	r	1905.79	-1120.11	4.50
R15	R15	34.9	30.1	50.0	45.0	4.50	r	87.78	216.32	4.50

Point Source Table (Option 2)

Name	F	Result. PWL			Lw / Li	Op	perating Tim	ne	Freq.	Height	С	oordinates	
	Day	Evening	Night	Туре	Value	Day	Special	Night			Х	Y	Ζ
	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	(m)	(m)	(m)	(m)
TUnload	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r 1444.90	-224.69	2.00
TUnload2	88.7	88.7	88.7	Lw	TruckUnloading	540.00	180.00	360.00		2.00	r 1389.61	-188.78	2.00
TUnload4	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r 1445.52	-176.78	2.00
TUnload5	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r 1345.22	-194.95	2.00
TUnload3	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r 1405.62	-223.64	2.00
BckBpr1	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r 1456.31	-195.40	2.00
BckBpr12	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r 1346.45	-214.09	2.00
Impulse	110.0	110.0	110.0	Lw	110	20.00	10.00	10.00	500	2.00	r 1391.37	-217.77	2.00

Line Source Table (Option 2)

Name	Re	sult. PW	/L	Re	esult. PW	Έ'		Lw / Li	Ope	erating Ti	me	Freq.		Moving	g Pt. Src	
	Day	Even	Night	Day	Even	Night	Туре	Value	Day	Special	Night		l	Numbe	r	Speed
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	Day	Even	Night	(km/h)
Т3	103.8	100.8	100.8	75.1	72.1	72.1	PWL-Pt	TruckTravel1	10.00	5.00	5.00		20.0	10.0	10.0	60.0
T1	106.4	103.3	103.3	75.9	72.9	72.9	PWL-Pt	TruckTravel1	7.00	5.00	5.00		20.0	10.0	10.0	50.0
T5	91.9	87.1	87.1	66.2	61.4	61.4	PWL-Pt	FrontEndLoader	540.00	180.00	360.00		30.0	10.0	10.0	30.0
T4	99.2	96.2	96.2	72.9	69.9	69.9	PWL-Pt	TruckTravel1	5.00	2.00	2.00		10.0	5.0	5.0	50.0
T2	104.6	102.9	102.9	74.7	72.9	72.9	PWL-Pt	TruckTravel1	7.00	5.00	5.00		15.0	10.0	10.0	50.0

Partial Level Table – Day (Option 2)

S	ource	e					Partial Le	evel Day				
Name	М.	ID	R1	R4	R5	R6	R7	R8	R9	R10	R11	R15
TUnload		TUnload	16.3	22.3	24.7	24.5	15.8	23.7	30.8	24.1	23.1	14.0
TUnload2		TUnload2	10.4	18.6	21.0	24.4	14.6	21.9	23.5	25.0	24.2	13.8
TUnload4		TUnload4	7.1	16.9	19.2	20.9	7.1	23.0	24.5	17.8	22.6	11.4
TUnload5		TUnload5	4.1	10.3	14.2	22.3	12.8	13.8	15.3	22.9	22.3	3.5
TUnload3		TUnload3	16.1	21.4	23.3	25.4	18.2	22.3	25.4	23.7	22.9	14.3
BckBpr1		BckBpr1	22.0	30.7	32.9	31.8	19.2	32.7	33.8	28.1	31.7	22.6
BckBpr12		BckBpr2	18.8	21.7	25.3	33.5	26.0	23.1	24.7	31.9	31.2	16.1
Impulse		Impulse	28.3	33.1	35.4	38.9	30.5	34.0	35.2	30.9	30.2	26.9
Т3		T3	18.8	32.0	23.3	13.4	6.8	24.4	21.2	4.8	5.1	33.3
T1		T1	18.5	47.5	39.8	28.0	13.8	36.1	31.9	8.6	10.9	18.0
T5		T5	20.3	25.9	28.4	31.6	22.4	27.5	28.9	28.3	27.9	19.6
T4		T4	6.7	11.8	16.4	39.2	12.5	12.7	12.6	7.5	5.6	1.6
T2		T2	9.5	10.3	13.3	26.2	42.6	10.6	11.2	11.0	7.9	2.5

S	ource	9					Partial Le	vel Night				
Name	М.	ID	R1	R4	R5	R6	R7	R8	R9	R10	R11	R15
TUnload		TUnload	14.6	20.6	23.0	22.7	14.0	21.9	29.1	22.3	21.4	12.3
TUnload2		TUnload2	8.6	16.8	19.3	22.7	12.8	20.2	21.8	23.3	22.4	12.1
TUnload4		TUnload4	5.4	15.2	17.5	19.2	5.3	21.3	22.7	16.1	20.9	9.6
TUnload5		TUnload5	2.4	8.6	12.4	20.5	11.0	12.1	13.5	21.2	20.5	1.7
TUnload3		TUnload3	14.3	19.6	21.6	23.6	16.5	20.5	23.6	21.9	21.1	12.6
BckBpr1		BckBpr1	20.2	28.9	31.1	30.0	17.5	30.9	32.1	26.4	29.9	20.8
BckBpr12		BckBpr2	17.0	20.0	23.5	31.7	24.2	21.3	23.0	30.2	29.5	14.4
Impulse		Impulse	25.3	30.1	32.4	35.9	27.5	31.0	32.2	27.9	27.2	23.9
Т3		Т3	12.7	25.9	17.2	7.3	0.8	18.3	15.2	-1.2	-0.9	27.3
T1		T1	14.0	43.0	35.3	23.5	9.3	31.6	27.5	4.1	6.4	13.5
T5		T5	13.8	19.4	21.9	25.1	15.9	21.0	22.4	21.7	21.4	13.1
T4		T4	-0.3	4.8	9.4	32.2	5.5	5.7	5.6	0.5	-1.4	-5.4
T2		T2	6.3	7.1	10.1	23.0	39.4	7.4	8.0	7.8	4.7	-0.7

Partial Level Table – Night (Option 2)

Result Table (Option 2) – Unmitigated

Recei	ver	Limiting	Limiting		rel. Axis		Lr w/o Noise	Lrw/o Noise	dL req.	dL req.
		Value	Value				Control	Control		
Name	ID	Day	Night	Station	Distance	Height	Day	Night	Day	Night
		dB(A)		m	m	m	dB(A)	dB(A)	dB(A)	dB (A)
R1	R1	50	45	0	653.26	2.00	36.9	34.5	-	-
R4	R4	50	45	480	21.73	2.00	48.9	45.2	-	0.2
R5	R5	45	40	696	72.32	2.00	48.5	46.0	3.5	6.0
R6	R6	45	40	205	37.72	2.00	54.9	52.7	9.9	12.7
R7	R7	45	40	750	35.85	4.50	44.1	41.1	-	1.1
R8	R8	50	45	220	131.98	2.00	45.7	43.2	-	-
R9	R9	45	40	127	218.51	2.00	46.8	44.5	1.8	4.5
R10	R10	45	40	424	907.35	2.00	38.3	35.9	-	-
R11	R11	45	40	41	996.28	2.50	37.4	35.1	-	-
R15	R15	50	45	646	159.85	2.00	36.7	33.0	-	-

Result Table (Option 2) – Mitigated (With 5.5m high berm/barrier)

Recei	ver	Limiting	Limiting		rel. Axis		Lr w/o Noise	Lrw/o Noise	dL req.	dL req.
		Value	Value				Control	Control		
Name	ID	Day	Night	Station	Distance	Height	Day	Night	Day	Night
		dB(A)		m	m	m	dB(A)	dB(A)	dB(A)	dB (A)
R1	R1	50	45	0	653.26	2.00	31.1	28.0	-	-
R4	R4	50	45	480	21.73	2.00	47.9	43.5	-	-
R5	R5	45	40	696	72.32	2.00	42.3	38.7	-	-
R6	R6	45	40	205	37.72	2.00	43.7	39.8	-	-
R7	R7	45	40	750	35.85	4.50	43.1	39.9	-	-
R8	R8	50	45	220	131.98	2.00	40.1	36.8	-	-
R9	R9	45	40	127	218.51	2.00	40.3	37.5	-	-
R10	R10	45	40	424	907.35	2.00	37.2	34.7	-	-
R11	R11	45	40	41	996.28	2.50	37.4	35.1	-	-
R15	R15	50	45	646	159.85	2.00	34.9	30.1	-	-





THOMPSONS ROAD SITE SUMMARY OF SOUND LEVEL RESULTS

Receiver Table (Option 3)

Name	ID	Leve	el Lr	Limit.	Value	Height		(Coordinates	
		Day	Night	Day	Night			Х	Y	Ζ
		(dBA)	(dBA)	(dBA)	(dBA)	(m)		(m)	(m)	(m)
R1	R1	42.2	39.7	50.0	45.0	4.50	r	1807.48	711.08	4.50
R4	R4	46.7	43.9	50.0	45.0	4.50	r	1794.03	-96.48	4.50
R5	R5	42.5	39.8	45.0	40.0	4.50	r	2005.44	-129.40	4.50
R8	R8	44.0	41.6	50.0	45.0	4.50	r	1859.62	-256.59	4.50
R12	R12	47.3	44.6	50.0	45.0	4.50	r	1774.37	-174.29	4.50
R13	R13	48.5	46.0	50.0	45.0	4.50	r	1771.13	-440.45	4.50
R14	R14	48.4	45.9	50.0	45.0	4.50	r	1050.93	73.95	4.50
R15	R15	47.1	44.9	50.0	45.0	4.50	r	1119.11	188.50	4.50
R16	R16	46.7	44.1	50.0	45.0	4.50	r	941.55	11.62	4.50
R17	R17	43.9	41.7	50.0	45.0	4.50	r	774.75	-134.80	4.50
R18	R18	44.9	42.0	50.0	45.0	4.50	r	1766.43	-1089.45	4.50
R19	R19	42.4	40.2	50.0	45.0	4.50	r	1209.37	530.52	4.50

Point Source Table (Option 3)

Name	F	Result. P\	NL		Lw / Li	Op	erating Tin	ne	Freq.	Heigh	t	C	Coordinates	
	Day	Evenin	Night	Туре	Value	Day	Special	Night				Х	Y	Z
		g												
	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	(m)		(m)	(m)	(m)
Impulse	110.0	110.0	110.0	Lw	110	20.00	10.00	10.00	500	2.50	r	1386.45	-160.43	2.50
TUnload	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r	1438.82	-122.77	2.00
TUnload2	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r	1389.61	-188.78	2.00
TUnload4	88.7	88.7	88.7	Lw	TruckUnloading	540.00	180.00	360.00		2.00	r	1445.52	-176.78	2.00
TUnload5	88.7	88.7	88.7	Lw	TruckUnloading	360.00	120.00	240.00		2.00	r	1299.55	-173.11	2.00
TUnload3	88.7	88.7	88.7	Lw	TruckUnloading	540.00	180.00	360.00		2.00	r	1388.64	-126.19	2.00
BckBpr1	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r	1448.17	-142.28	2.00
BckBpr12	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r	1331.02	-125.07	2.00
BckBpr12	98.5	98.5	98.5	Lw	BckBpr	360.00	120.00	240.00		2.00	r	1396.94	-154.23	2.00

Line Source Table (Option 3)

Name	R	esult. PV	VL .	R	esult. PW	/L'		Lw/Li	Or	perating Tir	ne	Frea.		Moving	Pt. Src	
	Day	Even	Night	Day	Even	Night	Туре	Value	Day	Special	Night			Number		Speed
	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			(min)	(min)	(min)	(Hz)	Day	Even	Night	(km/h)
T1	106.9	105.1	105.1	74.7	72.9	72.9	PWL-Pt	TruckTravel1	7.00	5.00	5.00		15.0	10.0	10.0	50.0
T5	94.7	92.9	92.9	68.2	66.4	66.4	PWL-Pt	FrontEndLoader	540.00	180.00	360.00		30.0	20.0	20.0	30.0
T4	103.2	101.4	101.4	74.7	72.9	72.9	PWL-Pt	TruckTravel1	7.00	5.00	5.00		15.0	10.0	10.0	50.0
T2	102.8	101.1	101.1	73.9	72.1	72.1	PWL-Pt	TruckTravel1	7.00	5.00	5.00		15.0	10.0	10.0	60.0
Т3	100.6	97.6	97.6	72.9	69.9	69.9	PWL-Pt	TruckTravel1	7.00	5.00	5.00		10.0	5.0	5.0	50.0

Partial Level Table – Day (Option 3)

S	ourc	е						Partial L	evel Day					
Name	Μ.	ID	R1	R4	R5	R8	R12	R13	R14	R15	R16	R17	R18	R19
Impulse		Impulse	31.0	39.3	35.4	37.9	39.8	38.2	39.5	38.8	38.1	35.7	30.6	34.2
TUnload		TUnload	24.3	29.4	26.0	26.1	26.5	26.9	32.2	32.0	30.5	23.5	23.0	27.4
TUnload2		TUnload2	23.3	27.5	23.9	29.5	28.1	31.7	27.7	27.3	31.0	28.6	23.5	26.6
TUnload4		TUnload4	25.5	28.5	25.6	27.7	28.8	34.3	29.7	32.8	27.3	29.5	25.3	28.3
TUnload5		TUnload5	18.2	26.2	22.5	27.4	26.6	30.0	34.3	28.2	33.0	30.3	22.9	22.7
TUnload3		TUnload3	25.7	29.9	26.8	28.0	29.9	32.7	30.3	34.5	28.7	26.1	24.6	29.3
BckBpr1		BckBpr1	33.0	34.5	32.6	34.7	36.0	37.3	41.1	40.8	35.7	36.8	32.0	36.1
BckBpr12		BckBpr2	32.5	36.1	33.7	34.5	36.5	39.2	35.4	33.1	35.4	33.3	31.3	28.6
BckBpr12		BckBpr2	32.6	36.8	33.1	35.6	37.3	40.7	37.4	41.4	35.7	37.7	32.0	36.2
T1		T1	17.9	40.7	28.7	35.0	43.4	43.7	22.9	23.5	20.8	17.3	43.6	19.7
T5		T5	31.2	35.1	31.6	34.2	35.5	38.6	37.4	38.0	35.8	35.9	31.2	34.4
T4		T4	13.3	18.7	14.3	15.6	18.5	15.7	44.2	33.2	43.1	30.2	6.5	21.6
T2		T2	38.6	25.5	20.7	19.3	22.4	14.9	14.8	16.7	12.6	9.2	4.6	19.3
Т3		Т3	13.5	38.9	36.0	27.5	30.7	20.7	11.1	11.8	9.6	7.0	9.3	10.6

S	ource	Э						Partial Le	vel Night					
Name	М.	ID	R1	R4	R5	R8	R12	R13	R14	R15	R16	R17	R18	R19
Impulse		Impulse	28.0	36.3	32.4	34.9	36.7	35.2	36.5	35.7	35.1	32.7	27.6	31.2
TUnload		TUnload	22.5	27.7	24.2	24.4	24.8	25.1	30.5	30.2	28.8	21.7	21.2	25.6
TUnload2		TUnload2	21.5	25.8	22.1	27.7	26.4	30.0	25.9	25.5	29.2	26.9	21.7	24.9
TUnload4		TUnload4	23.7	26.7	23.9	25.9	27.1	32.6	28.0	31.0	25.5	27.7	23.6	26.6
TUnload5		TUnload5	16.5	24.4	20.7	25.6	24.9	28.2	32.6	26.4	31.2	28.5	21.1	20.9
TUnload3		TUnload3	24.0	28.2	25.0	26.2	28.2	30.9	28.5	32.7	27.0	24.3	22.8	27.6
BckBpr1		BckBpr1	31.2	32.8	30.8	32.9	34.2	35.5	39.4	39.0	33.9	35.0	30.3	34.3
BckBpr12		BckBpr2	30.7	34.4	31.9	32.7	34.8	37.4	33.6	31.3	33.6	31.6	29.5	26.8
BckBpr12		BckBpr2	30.8	35.0	31.4	33.9	35.6	38.9	35.6	39.6	34.0	35.9	30.2	34.4
T1		T1	14.7	37.4	25.5	31.8	40.2	40.5	19.7	20.3	17.6	14.1	40.3	16.5
T5		T5	27.7	31.6	28.1	30.7	32.0	35.1	33.9	34.5	32.3	32.4	27.7	30.9
T4		T4	10.1	15.5	11.1	12.4	15.3	12.5	41.0	30.0	39.9	27.0	3.2	18.3
T2		T2	35.4	22.2	17.4	16.0	19.2	11.7	11.5	13.5	9.3	6.0	1.4	16.0
Т3		Т3	9.0	34.4	31.5	23.0	26.2	16.2	6.6	7.3	5.1	2.5	4.9	6.1

Partial Level Table - Night (Option 3)

Result Table (Option 3) – Unmitigated

Recei	ver	Limiting	Limiting		rel. Axis		Lr w/o Noise	Lrw/o Noise	dL req.	dL req.
		value	value				Control	Control		
Name	ID	Day	Night	Station	Distance	Height	Day	Night	Day	Night
		dB(A)		m	m	m	dB(A)	dB(A)	dB(A)	dB (A)
R1	R1	50	45	653	57.94	4.50	42.3	39.7	-	-
R4	R4	50	45	541	44.94	2.00	50.3	47.9	0.3	2.9
R5	R5	45	40	330	77.82	2.00	45.6	43.3	0.6	3.3
R8	R8	50	45	908	118.42	2.00	47.9	45.7	-	0.7
R12	R12	50	45	989	32.68	2.00	50.9	48.6	0.9	3.6
R13	R13	50	45	723	31.02	2.00	49.1	46.7	-	1.7
R14	R14	50	45	362	28.18	2.00	50.5	48.1	0.5	3.1
R15	R15	50	45	430	142.64	2.00	48.7	46.6	-	1.6
R16	R16	50	45	252	34.00	2.00	48.9	46.6	-	1.6
R17	R17	50	45	85	180.19	2.00	45.0	42.9	-	-
R18	R18	50	45	74	30.18	2.00	44.9	42.0	-	-
R19	R19	50	45	521	484.53	2.00	43.4	41.3	-	-

Result Table (Option 3) – Mitigated (With 4.5m high berm/barrier)

Receiver		Limiting	Limiting	rel. Axis		Lr w/o Noise	Lrw/o Noise	dL req.	dL req.	
		Value	Value				Control	Control		
Name	ID	Day	Night	Station	Distance	Height	Day	Night	Day	Night
		dB(A)		m	m	m	dB(A)	dB(A)	dB(A)	dB (A)
R1	R1	50	45	653	57.94	4.50	42.2	39.7	-	-
R4	R4	50	45	541	44.94	2.00	46.7	43.9	-	-
R5	R5	45	40	330	77.82	2.00	42.5	39.8	-	-
R8	R8	50	45	908	118.42	2.00	44.0	41.6	-	-
R12	R12	50	45	989	32.68	2.00	47.3	44.6	-	-
R13	R13	50	45	723	31.02	2.00	48.5	46.0	-	1.0
R14	R14	50	45	362	28.18	2.00	48.4	45.9	-	0.9
R15	R15	50	45	430	142.64	2.00	47.1	44.9	-	-
R16	R16	50	45	252	34.00	2.00	46.7	44.1	-	-
R17	R17	50	45	85	180.19	2.00	43.9	41.7	-	-
R18	R18	50	45	74	30.18	2.00	44.9	42.0	-	-
R19	R19	50	45	521	484.53	2.00	42.4	40.2	-	-











MINISTRY OF THE ENVIRONMENT CONSERVATION AND PARKS

ENVIRONMENTAL NOISE GUIDELINE Stationary and Transportation Sources - Approval and Planning Publication NPC-300

August 2013

TABLE B- 1 Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA) Outdoor Points of Reception

Time of Day	Class 1 Area Class 2 Area		Class 3 Area	Class 4 Area
07:00-19:00	50	50	45	55
19:00 -23:00	50	45	40	55

TABLE B- 2 Exclusion Limit Values of One-Hour Equivalent Sound Level (Leq dBA) Plane of Window of Noise Sensitive Spaces

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00-19:00	50	50	45	60
19:00 -23:00	50	50	40	60
23:00-07:00	45	45	40	55

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

Table B-3Exclusion Limit Values for Impulsive Sound Level (LLM, dBAI)Outdoor Points of Reception

 Table B-4

 Exclusion Limit Values for Impulsive Sound Level (L_{LM}, dBAI)

 Plane of Window – Noise Sensitive Spaces (Day/Night)

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

Stage I Archaeological Assessment Municipal Class Environmental Assessment Municipal Snow Storage Location Alternatives Part of Lots 117 and 115, Concession 2 EPR Part of Lot 115, Concession 1 EPR Town of Penetanguishene Geographic Township of Tay County of Simcoe, Ontario

Original Report

Submitted to: Ministry of Citizenship and Multiculturalism

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Licensee:Matthew Beaudoin, PhD (P324)PIF No:P324-0811-2022Project No:2022-207Draft Dated:February 14, 2023



EXECUTIVE SUMMARY

The Town of Penetanguishene is undertaking a Municipal Class Environmental Assessment (MCEA) to facilitate the selection of a municipal snow storage site, with the ability to house 0.8 ha or 2 acres of snow in addition to temporarily store granular or excavated material. A number of potential snow storage sites were considered during preliminary planning, the following three were short listed for more detailed evaluation:

- Thompsons Road (2.20 ha);
 - Treed parcel on the east side of Thompsons Road, south of Robert Street East;
 - Lot 115, Concession I East of Penetanguishene Road (EPR), Township of Tay;
- Tinney's Septic (5.87 ha);
 - A partially-cleared, former extraction and soil stockpiling area east of Fuller Avenue and south of Tay Point Road;
 - o Lot 115, Concession 2 East of Penetanguishene Road (EPR), Township of Tay; and
- Morden Gravel (1.03 ha);
 - A partially-cleared area associated with an existing aggregate pit on the east side of Fuller Avenue, north of Laurier Road;
 - Lot 117, Concession 1 East of Penetanguishene Road, Township of Tay.

All three sites are located on the southeast urban periphery of the Town of Penetanguishene, in the general proximity of the intersection of Robert Street East and Fuller Avenue. Two of these have been targeted because they are currently utilized for a similar purpose or have been previously disturbed by aggregate extraction.

Greenland Consulting Engineers is coordinating the MCEA on behalf of the Town and contracted TMHC Inc. to conduct a desktop Stage I archaeological assessment for the three short-listed potential snow storage sites. The Stage I archaeological assessment was undertaken in accordance with the *Environmental Assessment Act* and follows the guidance of the *County of Simcoe Archaeological Management Plan*. The purpose of the Stage I archaeological assessment was to evaluate the archaeological potential of each of the potential snow storage sites, identify any known archaeological resources within them, and establish potential impacts to archaeological resources from the intended new land use.

The Stage I background study included a review of current land use, historic and modern maps, past settlement history for the area, and a consideration of topographic and physiographic features, soils and drainage. It also involved a review of previously registered archaeological resources within I km of the subject properties and previous archaeological assessments within 50 m.



Based on this Stage I map-based archaeological assessment the following recommendations are made:

- Thompsons Road
 - This parcel has archaeological potential and requires Stage 2 archaeological assessment to meet the 2011 *Standards and Guidelines* (MTC 2011).
 - $\circ~$ The parcel consists of treed lands which must be subject to assessment via test pitting at a 5 m interval.
- Tinney's Septic
 - Based on historic and contemporary aerial photography, this parcel has witnessed significant disturbance from prior gravel extraction; the disturbed area (3.48 ha) is considered to have low archaeological potential.
 - The property also contains treed areas that have not witnessed substantial alteration (2.39 ha).
 If the treed areas will be ultimately impacted, these will require Stage 2 assessment via test pitting at a 5 m interval as they have archaeological potential.
- Morden Gravel
 - This parcel was previously assessed using methodologies that comply with the 2011 Standards and Guidelines (MTC 2011) and cleared of archaeological concern.
 - \circ $\;$ No further assessment is recommended.

These recommendations are subject to the conditions laid out in Section 6.0 and to the MCM's review and acceptance of this report into the provincial register.



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PROJECT PERSONNEL

Project Managers	Holly Martelle, PhD (P064)	
	Matthew Beaudoin, PhD (P324)	
Project Administrators	Kellie Theaker, CHRP	
	Breanne Reibl, MSc (R1292)	
GIS Mapping Technician	David Gostick, BA	
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	Megan DeVries, MA	
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ACKNOWLEDGEMENTS

Kirsten McFarlane	Environmental Analyst Greenland Consulting Engineers
Hannah Toews	Project Analyst Greenland Consulting Engineers



TERRITORIAL ACKNOWLEDGEMENT

The candidate snow storage sites are located on the traditional lands of the Anishinaabek (Ah-nish-in-a-bek), Three Fires Confederacy, and the Huron-Wendat peoples on lands connected with the Penetanguishene Purchase (Treaty No. 5). The Anishinaabek peoples of the Three Fires Confederacy continue to steward their traditional and treaty territories from the nearby Williams Treaties communities of Beausoleil First Nation (Chimnissing), Chippewas of Georgina Island First Nation, and Chippewas of Rama First Nation. This land continues to be home to diverse Indigenous peoples (e.g., First Nations, Métis, and Inuit) whom we recognize as contemporary stewards of the land.



ABOUT TMHC

Established in 2003 with a head office in London, Ontario, TMHC Inc. (TMHC) provides a broad range of archaeological assessment, heritage planning and interpretation, cemetery, and community consultation services throughout the Province of Ontario. We specialize in providing heritage solutions that suit the past and present for a range of clients and intended audiences, while meeting the demands of the regulatory environment. Over the past two decades, TMHC has grown to become one of the largest privately-owned heritage consulting firms in Ontario and is today the largest predominately woman-owned CRM business in Canada.

Since 2004, TMHC has held retainers with Infrastructure Ontario, Hydro One, the Ministry of Transportation, Metrolinx, the City of Hamilton, the City of Barrie, and Niagara Parks Commission. In 2013, TMHC earned the Ontario Archaeological Society's award for Excellence in Cultural Resource Management. Our seasoned expertise and practical approach have allowed us to manage a wide variety of large, complex, and highly sensitive projects to successful completion. Through this work, we have gained corporate experience in helping our clients work through difficult issues to achieve resolution.

TMHC is skilled at meeting established deadlines and budgets, maintaining a healthy and safe work environment, and carrying out quality heritage activities to ensure that all projects are completed diligently and safely. Additionally, we have developed long-standing relationships of trust with Indigenous and descendent communities across Ontario and a good understanding of community interests and concerns in heritage matters, which assists in successful project completion.

TMHC is a Living Wage certified employer with the <u>Ontario Living Wage Network</u> and a member of the <u>Canadian Federation for Independent Business</u>.



KEY STAFF BIOS

Holly Martelle, PhD - Principal

Holly Martelle earned a PhD from the University of Toronto based on her research on Iroquoian populations in southern Ontario. In addition to 16 years of experience in the road building and aggregate industries, Dr. Martelle has worked as a Heritage Planner at the now MCM and has taught at several universities throughout the province. In 2003, she founded TMHC with Dr. Peter Timmins and in 2013 the firm was honored with the Ontario Archaeological Society's award for Excellence in Cultural Resource Management.

Holly is an experienced Project Manager and has demonstrated throughout her career the ability to manage complex projects, meeting project deliverables cost effectively and to the highest standard of quality. Under her leadership, TMHC has made a commitment to innovation, creating solutions that meet the project specific goals and also address the long-term needs of our clients.

Holly is a skilled relationship builder with longstanding relationships with the Indigenous communities throughout Ontario, and other Descendant communities and organizations including the Ontario Black History Society. Ongoing and sustained communication with communities has proven an effective means of ensuring participation from Descendant communities in meeting and exceeding consultation requirements. Through her work on several high level and sensitive provincial projects she has developed an understanding of what works in the consultation process to ensure that it is effective in providing the client and the project with the information needed to be successful.

Holly is a Past-President of the Ontario Archaeological Society, and is also an active member of the Canadian Archaeological Association, the Society for Historic Archaeology, the Ontario Association for Impact Assessment, and the Council for Northeastern Historical Society.

Matthew Beaudoin, PhD - Principal

Matthew received a PhD in Anthropology from Western University in 2013 and has a professional archaeological license with the Province of Ontario (P324). During his archaeological career, Matthew has conducted extensive field research and artifact analysis in Labrador and Ontario, and has taught the Field Methods Course and Principals of archaeology courses as a part-time faculty member at Western University. Matthew has also conducted ethnographic projects in Labrador, and has volunteered with the OAS to provide archaeological training to several Indigenous communities throughout the province.

Over the course of his career, Matthew has supervised over 600 archaeological assessments in Ontario, including Stages I-4, under a variety of regulatory triggers including provincial and municipal Environmental Assessments, Green Energy projects, development projects under the *Planning Act*, and as due diligence process. Matthew has extensive experience managing large and complex archaeological projects in conjunction with other disciplines, specialists, and Indigenous communities including Enbridge Line 10 Westover Segment, Imperial Oil from Waterdown to Finch, and Highway 3 Widening in Kingsville. Since joining TMHC in 2008, Matthew has also been involved with several notable projects, such as the archaeological assessment of Stoney Point/Camp Ipperwash. For these and other projects, Matthew works closely with heritage staff at TMHC and with heritage staff employed by clients and stakeholder communities.

Matthew is an active member of the Canadian Archaeological Association, the Ontario Archaeological Society, the Society for American Archaeology, and the Society for Historical Archaeology.



STATEMENT OF QUALIFICATIONS AND LIMITATIONS

The attached Report (the "Report") has been prepared by TMHC Inc. (TMHC) for the benefit of the Client (the "Client") in accordance with the agreement between TMHC and the Client, including the scope of work detailed therein (the "Agreement").

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

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents TMHC's professional judgment in light of the Limitation and industry standards for the preparation of similar reports;
- may be based on information provided to TMHC which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context; and
- was prepared for the specific purposes described in the Report and the Agreement.

TMHC shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. TMHC accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

TMHC agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but TMHC makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Except (1) as agreed to in writing by TMHC and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

TMHC accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of TMHC to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

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:

Katelyn Mather, MA (R443) Report Writer/Staff Archaeologist

Report reviewed by:

Holly Martelle, PhD (P064) Principal

Report reviewed by:

Matthew Beaudoin, PhD (P324) Principal, Licensee



I PROJECT CONTEXT

I.I Development Context

I.I.I Introduction

The Town of Penetanguishene is undertaking a Municipal Class Environmental Assessment (MCEA) to facilitate the selection of a municipal snow storage site, with the ability to house 0.8 ha or 2 acres of snow in addition to temporarily store granular or excavated material (Town of Penetanguishene 2022). A number of potential snow storage sites were considered during preliminary planning, the following three were short listed for more detailed evaluation (Maps I to 3):

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All archaeological assessment activities were performed under the professional archaeological license of Matthew Beaudoin, PhD (P324) and in accordance with the 2011 Standards and Guidelines for Consultant Archaeologists (MTC 2011, "Standards and Guidelines"). Permission to enter the property and carry out all required archaeological activities, including collecting artifacts when found, was given by Hannah Toews of Greenland Consulting Engineers.



1.1.2 Purpose and Legislative Context

The Ontario Heritage Act (R.S.O. 1990) makes provisions for the protection and conservation of heritage resources in the Province of Ontario. Heritage concerns are recognized as a matter of provincial interest in Section 2.6.2 of the Provincial Policy Statement (PPS 2020) which states:

development and site alteration shall not be permitted on lands containing archaeological resources or areas of archaeological potential unless significant archaeological resources have been conserved.

In the PPS, the term conserved means:

the identification, protection, management and use of *built heritage resources, cultural heritage landscapes* and *archaeological resources* in a manner that ensures their cultural heritage value or interest is retained. This may be achieved by the implementation of recommendations set out in a conservation plan, archaeological assessment and/or heritage impact assessment that has been approved, accepted or adopted by the relevant planning authority and/or decision-maker. Mitigative measures and/or alternative development approaches can be included in these plans and assessments.

The planning for this project is following the environmental screening process set out for activities under the Municipal Class Environmental Assessment (Class EA) document. The Class EA process involves consultation with the public and review agencies to ensure that the project can be carried out in an environmentally-sound manner.

The Environmental Assessment Act provides for the protection and conservation of the environment. In this case, the environment is widely defined to cover "cultural heritage" resources, which includes archaeological resources. Section 5(3)(c) of the Act stipulates that heritage resources to be affected by a proposed undertaking be identified during the environmental screening process. Within the EA process, the purpose of a Stage I background study is to determine if there are known archaeological resources within the affected lands, or potential for such resources to exist. Subsequently, it can act as a planning tool by identifying areas of concern that, where possible, could be avoided to minimize environmental impact. It is also used to determine the need for a Stage 2 field assessment involving the search for archaeological sites.

The County of Simcoe Archaeological Management Plan is a planning tool developed to assist in the protection of archaeological resources (ASI 2019a). By identifying areas where there is potential for archaeological sites to exist, local and regional planning authorities can integrate archaeological assessment into the development application or municipal project approval process. If properties are deemed to have potential for archaeological sites, a Stage I and 2 archaeological assessment is required. The purpose of a Stage I background study is to determine if there is potential for archaeological resources to be found on a property for which a change in land use is pending. If a property is found to have potential for archaeological resources, a Stage 2 assessment is required, involving a search for archaeological sites.



2 STAGE I BACKGROUND REVIEW

2.1 Research Methods and Sources

A Stage I overview and background study was conducted to gather information about known and potential archaeological resources within the subject properties. According to the *Standards and Guidelines*, a Stage I background study must include a review of:

- an up-to-date listing of sites from the Ministry of Citizenship and Multiculturalism's (MCM's) PastPortal for 1 km around the property;
- reports of previous archaeological fieldwork within a radius of 50 m around the property;
- topographic maps at 1:10,000 (recent and historical) or the most detailed scale available;
- historical settlement maps (e.g., historical atlas, survey);
- archaeological management plans or other archaeological potential mapping when available; and,
- commemorative plaques or monuments on or near the property.

For this project, the following activities were carried out to satisfy or exceed the above requirements:

- a database search was completed through MCM's PastPortal system that compiled a list of registered archaeological sites within 1 km of the subject properties (completed November 19, 2022);
- a review of known prior archaeological reports for the property and adjacent lands;
- Ontario Base Mapping (1:10,000) was reviewed through ArcGIS and mapping layers under the Open Government Licence Canada and the Open Government Licence- Ontario;
- detailed mapping provided by the client was also reviewed;
- The County of Simcoe Archaeological Management Plan (ASI 2019a) was reviewed;
- Early 20th century archaeological reports pertaining to the County of Simcoe were reviewed; and,
- a series of historic maps and photographs was reviewed related to the post-1800 land settlement.

Additional sources of information were also consulted, including modern aerial photographs, local history accounts, soils data provided by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), physiographic data provided by the Ontario Ministry of Northern Development and Mines, and detailed topographic data provided by Land Information Ontario.

When compiled, background information was used to create a summary of the characteristics of the subject properties, in an effort to evaluate its archaeological potential. The Province of Ontario (MTC 2011; Section 1.3.1) has defined the criteria that identify archaeological potential as:

- previously identified archaeological sites;
- water sources;
 - o primary water sources (e.g., lakes, rivers, streams, creeks);
 - o secondary water sources (e.g., intermittent streams and creeks, springs, marshes, swamps);
 - features indicating past water sources (e.g., glacial lake shorelines, relic river or stream channels, shorelines of drained lakes or marshes, cobble beaches);
 - o accessible or inaccessible shorelines (e.g., high bluffs, sandbars stretching into a marsh);
- elevated topography (e.g., eskers, drumlins, large knolls, plateau);
- pockets of well-drained sandy soils;



- distinctive land formations that might have been special or spiritual places (e.g., waterfalls, rock outcrops, caverns, mounds, promontories and their bases);
- resource areas, including:
 - o food or medicinal plants (e.g., migratory routes, spawning areas, prairies);
 - o scarce raw materials (e.g., quartz, copper, ochre, or chert outcrops);
 - early industry (e.g., fur trade, logging, prospecting, mining);
- areas of early 19th-century settlement, including:
 - early military locations;
 - o pioneer settlement (e.g., homesteads, isolated cabins, farmstead complexes);
 - wharf or dock complexes;
 - pioneer churches;
 - early cemeteries;
- early transportation routes (e.g., trails, passes, roads, railways, portage routes);
- a property listed on a municipal register, designated under the Ontario Heritage Act, or that is a federal, provincial, or municipal historic landmark or site; and,
- a property that local histories or informants have identified with possible archaeological sites, historical event, activities, or occupations.

In Southern Ontario (south of the Canadian Shield), any lands within 300 m of any of the features listed above are considered to have potential for the discovery of archaeological resources.

Typically, a Stage I assessment will determine potential for Indigenous and 19th-century period sites independently. This is due to the fact that lifeways varied considerably during these eras, so the criteria used to evaluate potential for each type of site also varies.

It should be noted that some factors can also negate the potential for discovery of intact archaeological deposits. The *Standards and Guidelines* (MTC 2011; Section 1.3.2) indicates that archaeological potential can be removed in instances where land has been subject to extensive and deep land alterations that have severely damaged the integrity of any archaeological resources. Major disturbances indicating removal of archaeological potential include, but are not limited to:

- quarrying;
- major landscaping involving grading below topsoil;
- building footprints; and,
- sewage and infrastructure development.

Some activities (agricultural cultivation, surface landscaping, installation of gravel trails, etc.) may result in minor alterations to the surface topsoil but do not necessarily affect or remove archaeological potential. It is not uncommon for archaeological sites, including structural foundations, subsurface features and burials, to be found intact beneath major surface features like roadways and parking lots. Archaeological potential is, therefore, not removed in cases where there is a chance of deeply buried deposits, as in a developed or urban context or floodplain where modern features or alluvial soils can effectively cap and preserve archaeological resources.



2.2 Project Context: Archaeological Context

2.2.1 Subject Properties: Overview and Physical Setting

The three short-listed snow storage sites are located in the southeast urban periphery of the Town of Penetanguishene, in the Geographic Township of Tay, Town of Penetanguishene, County of Simcoe, Ontario (Maps I to 3).

The Thompsons Road property is roughly rectangular in shape, measures 2.20 ha (5.44 ac), and contains a mature woodlot. It is located west of Thompsons Road and south of Robert Street East. It falls within Lot 115, Concession I East of Penetanguishene Road. The parcel is bounded to the north, south and east by woodlot, and to the west by Thompsons Road. It appears to be in a natural state, with no obvious visible land alterations.

The Tinney's Septic property is oval in shape, measures 5.87 ha (14.5 ac). The property is associated with Tinney's Septic Service and Construction, an septic system installation and excavation company. The proposed snow storage site has been used by Tinney's for soil excavation, stockpiling, and storage related to their operations. Its boundaries incorporate an extensively disturbed area utilized for a similar purpose as what would be required for the snow storage site. The extraction area has been extensively disturbed in the past. Treed lands surround the disturbed extraction area. The property is located east of Fuller Avenue and south of Tay Point Road. It also has an access roading leading southeast from Tay Point Road. Contemporary aerial imagery indicates that it has been entirely cleared of trees and contains graded areas and soil stockpiles. It falls within Lot 115, Concession 2 East of Penetanguishene Road. The parcel is bounded on all sides by woodlot or overgrown grassed areas.

The Morden Gravel property is roughly rectangular in shape, measures 1.03 ha (2.55 ac). The property is associated with the Charles Morden Construction Inc. and Morden Sand and Gravel and is associated but not part of a licensed aggregate pit. While once a cleared agricultural parcel, based on aerial imagery the potential snow storage site has been at least partially cleared of trees and soil and contains large soil stockpiles. Again, its current usage is appropriate for what is needed from a snow storage site. It falls within Lot 115, Concession I East of Penetanguishene Road. The parcel is bounded to the west by Fuller Avenue, to the north and south by woodlot, and to the north by a laneway leading to the aggregate pit.

The potential snow storage sites are situated within the Simcoe Uplands physiographic region (Chapman and Putnam 1984; Map 4), consisting of broad rolling till plains with steep sided, flat-floored valleys. The land surface in the Penetang Peninsula is primarily boulder pavement, sand and silt, originating from the inundation of this region by glacial Lake Algonquin. Glacial strandlines are present within the Peninsula. Along the shoreline of Georgian Bay, the surface consists predominantly of gritty-loam till formed from Precambrian rock. Soil texture becomes sandier to the north. The candidate sites more specifically fall within a sand plain, with a series of shore bluffs, beach bridges and shorecliffs present throughout the Penetang Peninsula, lining the shores along Georgian Bay. Based on the high-level physiographic mapping shown in Map 4, one shore bluff or scarp falls less than 300 m from the Thompsons Road property and a glacial Lake Algonquin beach falls roughly I km to the west of the Morden Gravel property. However, the more detailed contour mapping depicted in Map I, indicates a break in slope crossing through the east portion of the Thompsons property and another crossing through the Tinney's Septic site. These breaks in slope may relate to former glacial shorelines. Former glacial shorelines are significant physiographic features for determining archaeological potential, as they were the preferred locations for many Indigenous short- and long-term settlements.



The soils within the subject properties consist of Vasey Sandy Loam (stony phase) a well-draining soil developed on till (Hoffman et al. 1962) (Map 5). A small portion of the Morden Gravel property contains Tioga Loamy Sand, a well-draining soil type developed on outwash material.

The candidate snow storage sites are drained by a series of small unnamed watercourses that flow downslope to Georgian Bay (Map I). The Thompsons Road parcel is in close proximity to three mapped wetlands, with one to the east, south and west. The closest watercourse is an unnamed stream approximately 500 m to the southeast which drains into Georgian Bay. The Tinney's Septic property is immediately adjacent to wetlands to the northeast, at the base of a glacial slope. The closest watercourse is between 250 and 300 m to the southwest and is an unnamed stream that flows south and eventually drains into Georgian Bay. Mapped wetlands are also present within 300 m west, south and east of the Morden Gravel site, which is also 500 m from St. Andrew's Lake (historically known as Lake Penetang) to the northeast. The lake is the closest watercourse/waterbody to this potential snow storage site.

2.2.2 Summary of Registered or Known Archaeological Sites

According to PastPortal (accessed November 19, 2022) there are registered archaeological sites within roughly I km of the potential snow storage sites (Table I). No sites are known within 300 m, based on the centroid data in the MCM database. The two sites of note are:

- BeGx-28 Penetang Lake, Late Woodland village of further CHVI
 - Approximately 1.2 km to Thompsons property;
 - Approximately 1.1 km to Tinney's Septic property;
 - Approximately 300 m from the Morden Gravel property;
 - First documented in 1977; registered by Roberta O'Brien of what is now the MCM in 1982 and revisited during an archaeological assessment for a development project by Archaeological Services Inc. (ASI) in 2022 (report pending acceptance in register);
 - Likely attributable to the Huron-Wendat (Bear Nation)
- BeGx-76 Ahatsistari (Williams/Allen Tract), Late Woodland village of further CHVI
 - Approximately 2.2 km from the Thompsons property;
 - Approximately I km to Tinney's Septic property;
 - Approximately 1.7 km to Morden Gravel property;
 - Dates to the Contact Period;
 - Attributed to the Huron-Wendat (Bear Nation);
 - Candidate for the historically-referenced village of Carhagouha, visited by Samuel de Champlain
 c. 1615-1616 AD;
 - Investigated during research studies undertaken by the Huronia Chapter of the Ontario Archaeological Society (Hawkins 2012) and Wilfrid Laurier University's field school – Tay Point Archaeology Project (Glencross et al. 2021).



Borden Number	Site Name	Time Period	Affinity	Site Type	Status
BeGx-28	Penetang Lake	Woodland, Late		village	Further CHVI
BeGx-76	Ahatsistari	Post-Contact	Aboriginal,	village	Further
			Huron-Wendat		CHVI

 Table I: Registered Archaeological Sites within I km

In addition to registered archaeological sites, a review of survey work done by Andrew Hunter in the early 20th century was conducted in order to determine whether any unregistered sites have been documented near the subject properties. Hunter was a historian and self-taught archaeologist who wrote extensively about archaeological sites within the County of Simcoe (1909a; 1909b), and the townships within Simcoe County including Tiny and adjacent parts (1899) and Tay (1900; 1911). In his 1899 Notes of Sites of Huron Villages in the Township of Tiny (Simcoe County) and Adjacent Parts, Hunter provides a map (SD Map 2), which includes several sites in the Penetanguishene area. Based on this map, one site is roughly 600 m southeast of the Thompsons Road property: Site 19, the "William Pratt" site, on Lot 113, Concession 1 in the Township of Tay. The site was reported to have a circular stone feature and a "bone pit" (Hunter 1899:27).

Research presented in prior archaeological reports (ASI 2010; AMICK 2011) have also identified oral accounts of six Métis burials in close proximity to St. Andrews Lake.

It is further acknowledged that there is one unregistered and highly significant contact period Huron-Wendat village within 500 m of the Tinney Septic parcel. This is the "Caughey" Site, which has been partially destroyed by early, unlicensed aggregate extraction (Jamie Hunter, personal communication).

2.3 Summary of Past Archaeological Investigations within 50 m

During the course of this study, records were found for five archaeological investigations within 50 m of the candidate snow storage sites. However, it should be noted that the MCM currently does not provide an inventory of archaeological assessments to assist in this determination.

2.3.1.1 Stage I & 2 Archaeological Assessment – CCL Container Property (Map 6)

In 1999, D.R. Poulton & Associates Inc. conducted a Stage I and 2 archaeological assessment for the CCL Container property, in anticipation of the proposed development on the south side of Robert Street East, in the Town of Penetanguishene, Ontario. The property had been rezoned and By-Law 1998-47 passed to permit the construction of an industrial manufacturing plant in the future. The subject property is described in the report as "square in shape" and measuring 203 m by 203 m (D.R. Poulton & Associates Inc. 1999:2), although the report map depicts a rectangular property. The Stage I background research determined that the property retained archaeological potential and Stage 2 assessment was recommended. The Stage 2 survey consisted of a test pit survey at 10 m intervals of the 4.12 ha (10 ac) wooded property. No archaeological materials or sites were identified during the Stage 2 archaeological assessment. The results of this assessment are presented in a report entitled *The 1999 Stage 1-2 Archaeological Assessment of the CCL Container Property, By-Law Amendment 1998-47, South Side of Robert Street East, Town of Penetanguishene, Ontario (D.R. Poulton & Associates Inc. 1999; PIF 1999-031-042). A portion of the Thompsons Road candidate site was surveyed during this assessment, although the survey methodology does not meet current provincial standards.*



2.3.1.2 Stage I and 2 Archaeological Assessment – Proposed Fuller Avenue Aggregate Pit (Map 7 and SD Map I)

In 2010, AMICK Consultants Limited (AMICK) was contracted to conduct a Stage I-2 Archaeological Assessment in support of an application to the Ministry of Natural Resources (MNR) for a license to open a gravel pit within Lot I17, Concession 2 in the Township of Tay. The application applies to the current Morden Gravel pit, containing the Morden Gravel potential snow storage location. The study area had been previously assessed by ASI in a Draft Stage I Background Research Study¹, which identified the area as having archaeological potential (ASI 2010 as cited in AMICK 2011). As such, a Stage 2 survey was carried out for the property. Prior to fieldwork, AMICK was advised of the previously registered site known as the Penetang Lake Site (BeGx-28), which was identified on an adjacent property and potentially destroyed by the presence of a former quarry on the lot. An intensified test pit survey at 2.5 m intervals within the vicinity of the site was undertaken, and at 5 m intervals for the remainder of the study area. Pedestrian survey adjacent to the site was done at a 1 m interval, with the fields away from the site surveyed at a 5 m interval. The study area consisted of agricultural fields which were subject to pedestrian survey, wooded and grassed areas which were test pitted, an existing disturbed gravel pit, and low and wet areas associated with St. Andrew's Lake.

The Stage 2 assessment resulted in the identification of surface finds, of which 127 artifacts were collected. The large scatter of largely Indigenous pottery was identified as the Penetang Lake Site (BeGx-28). Given the site represents a large Late Woodland Village site, AMICK concluded that the site required Stage 4 mitigation, either through excavation and documentation of the site, or avoidance and protection measures, prior to any ground disturbance. The results of this assessment are presented in a report entitled: *Stage 1-2 Archaeological Assessment, Proposed Fuller Avenue Aggregate Pit, Part of Lot 117, Concession 2, Township of Tay (& Town of Penetanguishene), County of Simcoe* (AMICK 2010; Licensee Michael B. Henry, PIF P058-674-2010).

After filing their 2010 Stage 1-2 archaeological assessment report, AMICK completed an addendum, after it was determined that there were 19th century Métis burials documented in close proximity to the proposed aggregate pit. Additional research into the property and surrounding area indicated that a cricket ground had existed, likely to the north of the subject property near St. Andrew's Lake, which was used in the mid-19th century by military personnel stationed in Penetanguishene. Several sources reported that numerous graves existed near the old cricket ground, and that the gravesite may have been used by the Métis community, who moved into the area in the early 19th century. AMICK therefore concluded that, with the exception of the existing gravel pit, the study area was identified as having archaeological potential. Furthermore, historical research indicated that potential existed for the reported gravesite to fall within the study area. Topsoil stripping, monitored by a licensed archaeological, was recommended prior to any ground-disturbance outside of the existing pit area, in order to investigate whether any burials were present. This was presented in an addendum entitled: *Report Addendum to Stage 1-2 Archaeological Assessment, Proposed Fuller Avenue Aggregate Pit, Part of Lot 117, Concession 2, Township of Tay (& Town of Penetanguishene), County of Simcoe* (AMICK 2011: Licensee Michael B. Henry, PIF P058-674-2010).

In 2015, AMICK was once again contracted to provide an assessment for the property within Lot 117, Concession 2. A 3.78 ha portion of the study area was subject to Stage 2 archaeological monitoring (SD Map I), consisting of the monitoring of both hand excavation and backhoe excavation of trenches. The excavations were carried out in order to assess whether early 19th century burials existed within the study area. No

¹ TMHC made an attempt to review this document; however, the project was cancelled and the report was not submitted to the MCM.



archaeological resources or burials were identified within the study area during the monitoring of mechanical topsoil removal. No further work was recommended within the area subject to topsoil stripping and monitoring; however, further archaeological concern was found to exist outside of this area, and any area of deep ground disturbance. The results of this assessment are presented in a report entitled: Stage 2 Archaeological Assessment, Fuller Ave. TPS. Part of Lot 117, Concession 2, (Geographic Township of Tay, Town of Penetanguishene), County of Simcoe (AMICK 2017: Licensee Kayleigh MacKinnon, PIF P384-0246-2014).

Of note is the fact that the report on the 2015 AMICK assessment indicates that the proposed licensing area for the Fuller Avenue gravel pit had been significantly reduced to lands largely in the east portion of the original survey area. This area is now under extraction by Charles Morden Construction. The report also denotes a portion of the newly defined license are as still requiring monitoring of topsoil stripping. TMHC Inc. could not find a report in the provincial database for the required assessment report, although it is possible that it has not yet been filed with MCM.

2.3.1.3 Stage I and 2 Archaeological Assessment – 138 Robert Street East (Map 8)

In 2022, ASI conducted a Stage I and 2 archaeological assessment as part of a Draft Plan of Subdivision for 138 Robert Street East, Part I, Plan 51R-43212, within part of Lots 114 and 115, Concession I East of Penetanguishene Road, in the Township of Tay, Simcoe County, Town of Penetanguishene. The Stage I background research determined that the 32-hectare property retained archaeological potential and Stage 2 assessment was recommended. The Stage 2 survey consisted of a test pit survey at 5 m intervals of a large woodlot and a low grassed mound, and pedestrian survey at 5 m intervals of a ploughed fallow field. A small portion of the subject property was test pitted at 10 m intervals in order to confirm disturbance of the low grassed mound. No archaeological materials or sites were identified during the Stage 2 archaeological assessment of 138 Robert Street East, Part 1, Plan 51R-43212, Parts of Lots 114 and 115, Concession I East of Penetanguishene Road, Township of Tay, Simcoe County, Town of Penetanguishene (ASI 2022; Licensee Robb Bhardwaj, PIF P449-0597-2022).



2.4 Project Context: Historical Context

2.4.1 Indigenous Settlement in Simcoe County

The Simcoe County area attracted considerable Indigenous settlement in the past. Numerous archaeological sites ranging in date from the end of the last glacial maximum through to the modern era are situated throughout the area. Despite an improved understanding of past Indigenous land use and settlement patterns through various cultural resource management surveys and archaeological research projects, our knowledge remains incomplete. This is partially due to a lack of archaeological investigation in many areas prior to urban development. However, using existing data and regional syntheses, it is possible to propose a generalized model of Indigenous settlement in the Simcoe County area. The general themes, time periods and cultural traditions of Indigenous settlement, based on archaeological evidence, are provided below and in Table 2.

Table 2:	Chronology	of Indigenous	Settlement in	Simcoe	County
Table 1.		or margemous	Sectionent in	Sincoc	County

Period	Time Range	Diagnostic Features	Archaeological Complexes	
Early Paleo	9000-8400 BCE	fluted projectile points	Gainey, Barnes, Crowfield	
Late Paleo	8400-8000 BCE	non-fluted and lanceolate points	Holcombe, Hi-Lo, Lanceolate	
Early Archaic	8000-6000 BCE	serrated, notched, bifurcate base points	Nettling, Bifurcate Base Horizon	
Middle Archaic	6000-2500 BCE	stemmed, side & corner notched points	Brewerton, Otter Creek, Stanley/Neville	
Late Archaic	2000-1800 BCE	narrow points	Lamoka	
Late Archaic	1800-1500 BCE	broad points	Genesee, Adder Orchard, Perkiomen	
Late Archaic	1500-1100 BCE	small points	Crawford Knoll	
Terminal Archaic	1100-950 BCE	first true cemeteries	Hind	
Early Woodland	950-400 BCE	expanding stemmed points, Vinette pottery	Meadowood	
Middle Woodland	400 BCE-500 CE	dentate, pseudo-scallop pottery	Saugeen	
Transitional Woodland	500-900 CE	first corn, cord-wrapped stick pottery	Princess Point	
Late Woodland	900-1300 CE	first villages, corn horticulture, longhouses	Glen Meyer, Pickering	
Late Woodland	1300-1400 CE	large villages and houses	Uren, Middleport, Lalonde	
Late Woodland	1400-1650 CE	tribal emergence, territoriality	Petun-Tionontati, Huron- Wendat, Odawa	
Contact Period - Indigenous	1650 CE-present	treaties, mixture of Indigenous & European items	Odawa, Ojibway	
Contact Period - Settler	1796 CE-present	industrial goods, homesteads	pioneer life, municipal settlement	



2.4.1.1 Paleo Period

The first human populations to inhabit the area came to the region between 10,000 and 12,000 years ago, coincident with the end of the last period of glaciation. Climate and environmental conditions were significantly different than they are today; local environs were inhospitable to anything but short-term settlement. Commonly referred to as Paleoindians, these people would have crossed the landscape in small groups (i.e., bands or family units) searching for food, particularly migratory game species. In this area, caribou may have provided a dietary staple, supplemented by wild plants, small game and fish. Given the low density of populations on the landscape at this time and their mobile nature, sites from this period are small and ephemeral. They are usually identified by the presence of distinctive fluted projectile points, usually manufactured on high quality raw materials, including Onondaga chert from the Niagara Escarpment and Fossil Hill chert from Blue Mountains. Paleo Period sites have commonly been found in association with relic glacial lakeshores throughout Ontario.

2.4.1.2 Archaic Period

The subsequent Archaic Period (ca. 8,000 to 950 BCE) is poorly represented in this region, but there remains the potential for such sites to exist, particularly in the dry, elevated areas adjacent to watercourses and wetlands. In other parts of the province, settlement and subsistence patterns changed significantly during the Archaic period as both the landscape and ecosystem adjusted to the retreat of the glaciers. Building on earlier patterns, early Archaic populations continued the mobile lifestyle of their predecessors. Through time and with the development of more resource rich local environments, these groups gradually reduced the size of the territories they exploited on a regular basis. A seasonal pattern of warm season riverine or lakeshore settlements and interior cold weather occupations has been documented in the archaeological record. The large cold-weather mammals that formed the basis of the Paleoindian subsistence pattern became extinct or moved northward with the onset of warmer climate conditions. Thus, Archaic populations had a more varied diet, exploiting a range of plant, bird, mammal and fish species. Over time, reliance on specific food resources like fish, deer and nuts became more pronounced and the presence of more hospitable environments and resource abundance led to the expansion of band and family sizes. This is evident in the archaeological record in the form of larger sites and aggregation camps, where several families or bands would come together in times of plenty. The change to more preferable environmental circumstances led to a rise in population density. As a result, Archaic sites are more plentiful than those from the earlier period. Artifacts typical of these occupations include a variety of stemmed and notched projectile points, chipped stone scrapers, ground stone tools (e.g., celts, adzes) and ornaments (e.g., bannerstones, gorgets), bifaces or tool blanks, animal bone (where and when preserved) and waste flakes, a by-product of the tool making process.

2.4.1.3 Early, Middle and Transitional Woodland Periods

Significant changes in cultural and environmental patterns are witnessed in the Early, Middle and Transitional Woodland periods (ca. 950 BCE to 1000 CE). Occupations became increasingly more permanent in this period, culminating in major semi-permanent villages by 1,000 years ago. Archaeologically, one of the most significant changes by Woodland times is the appearance of artifacts manufactured from modeled clay and the emergence of more sedentary villages. The Woodland Period is often defined by the occurrence of pottery, storage facilities and residential areas similar to those that define the early agricultural or Neolithic period in Europe. The earliest pottery was made by the coiling method and early house structures were simple oval enclosures. Both the Early and Middle Woodland sub-periods are characterized by an elaborate burial complex that in some areas in Ontario involved the construction of large burial mounds. Trade in exotic



items, including rare stone and shell objects, became common at this time, reflecting interconnections between Ontario populations and those in the Ohio and Mississippi river valleys to the south.

2.4.1.4 Late Woodland Period

Beginning circa 1000 BCE. the archaeological record documents the emergence of more substantial, semipermanent settlements and the adoption of corn horticulture. These developments are most often associated with Iroquoian-speaking populations, the ancestors of the Wendat (Huron), Tionontati (Petun or Tobacco Nation) and Attawandaron (Neutral) nations, who were known to have resided in the province upon the arrival of the first European explorers and missionaries. Villages incorporated a number of longhouses, multifamily dwellings that contained several families related through the female line. Sites dating to the end of the Late Woodland Period may be identified by a predominance of well-made pottery decorated with various simple and geometric motifs, triangular projectile points, clay pipes and ground stone artifacts. Sites postdating European contact are recognized through the appearance of various items of European manufacture. The latter include materials acquired by trade (e.g., glass beads, copper/brass kettles, iron axes, knives and other metal implements) in addition to the personal items of European visitors and Jesuit missionaries (e.g., finger rings, stoneware, rosaries, glassware).

Historically, the Lake Simcoe environs formed part of the territory of the Wendat (Huron), a confederacy of groups that included the Attignawantan or Bear Nation of the Penetang Peninsula, the Tahontaenrat or Deer or White Lodge Nation of the southern village of Scanonaenrat, the Attigneenongnahac or People of the Cord (or Net) in the area of the Mount St. Louis Ridge, the Arendahronon or Rock Nation in the vicinity of Bass Lake and Lakes Couchiching and Simcoe and, after 1637 CE, the Ataronchronon or People Who Dwelt Beyond the Fens, from the area associated with Northern Huronia near the mouth of the Wye and Sturgeon Rivers (Thwaites 1898a:61; 1898b:39; 1898c:87-89; 1898d:125, 167; 1898e:21). Numerous Wendat village and camp sites have been identified throughout Simcoe County, including near Barrie and Orillia where recent CRM investigations have occurred in advance of major urban and infrastructure expansion. These and earlier research-based investigations have revealed significant evidence of earlier populations whose settlement and material culture patterns are similar to Middle Late Woodland Period evidence elsewhere in Ontario or include unique ceramic "high collared" variants known as Lalonde that raise questions regarding both in situ development of local Wendat populations and earlier migrations from points south and east of their late-16th and early-17th century settlement area.

During the 16th and 17th centuries local Anishinaabe populations actively lived, hunted and fished within the Simcoe County environs and played a critical roll in the trade of beaver pelts to the French. As allies and alliances in trade, Anishinaabe nations lived among the Wendat or established independent occupation sites nearby. Jesuit missions were established in some parts of Wendake, particularly its eastern region, to administer to the faith to these groups specifically. When epidemic diseases devastated Wendake villages in the 17th century, Anishinaabe populations dispersed north. Wendat and Tionontati were further hit by Iroquois raiding parties that destroyed settlements, killing residents or taking them as prisoners. By 1649 AD the surviving Wendat and Tionontati began an exodus out their environs, with some travelling north and others following the Jesuits east to Quebec. Once hostilities settled and the Iroquoian raiders returned south, Anishinaabe populations returned to the Lake Simcoe environs. It would be the Anishinaabe that served as guides for early government scouting parties and surveyors and with whom the British Crown would sign treaties.



2.4.2 Indigenous Landscapes

Since time immemorial, Indigenous peoples use and management of land differed greatly from the much more recent era of colonial development. Instead of roads and highways cut through the landscape, Indigenous travel, especially in this region, focused on waterways and the portages between them. In addition to fish and other animals, Indigenous communities harvested wild rice, and actively managed and maintained nut and berry resources for food (Williams 2018). They maintained fields of corn, beans, and squash. Far from the pristine wilderness often characterized in popular culture, Indigenous landscapes included actively managed meadows (*Mishkodeh*) and forests (such as Black Oak Savannas) shaped and maintained by controlled burns and other interventions (MCIK n.d.). This system of land management is often framed in terms of kinship between people and landscape, a mutual responsibility for each to promote and maintain the health of the other.

Indigenous responsibility to and kinship with the land contrasted strongly with subsequent colonial treatment of these landscapes. Early colonial development typically looked to impose, rather than embed, itself on the landscape. As a result, colonial activities often displaced, interrupted, or destroyed Indigenous land management and subsistence activities. Waterways were dammed for mills or canalized with locks, blocking Indigenous highways and interrupting trade routes and fisheries. Meadows and fields maintained by Indigenous communities for generations were occupied by colonial settlements and farms. When these spaces were no longer sufficient or convenient, forests were cleared. The systems and relationships between Indigenous people and landscapes that had been refined over thousands of years were increasingly being broken during the height colonization, often within a single generation. Treaties isolated Indigenous communities to relatively small reserves and colonial land development including the privatization of property increasingly limited the accessibility of lands outside of these reserves for subsistence activities. Residential schools further damaged these traditional lifeways by systematically preventing the transfer of Indigenous knowledge from one generation to the next. Despite all these challenges, contemporary Indigenous communities are increasing undertaking to revitalize their traditional histories and systems of land management including their relationships and responsibility to the landscape (MCIK n.d.).

2.4.3 Indigenous Community – Shared Histories

There is no single, monolithic version of Indigenous or Ontario history. In the past, the histories of Indigenous communities, of Ontario, and of Canada, have been presented through a single colonial perspective with inherent biases. Although its focus is reconstructing the past through material remains, archaeology has inherited many of the cultural prejudices and perspectives of the colonial histories that have shaped current understanding of the origins, movements, and activities of contemporary Indigenous communities. The archaeological chronology and summary presented earlier in this report presents only one version of the past.

Indigenous communities have long contested elements of both colonial and archaeological histories. As a means to combat these colonial versions of their past, Indigenous communities have been sharing their own histories shaped by oral history, community memory, culturally-informed readings of historical events and documents, language, and tradition. These histories survive in traditional knowledge, stories, and the remembrances of elders; they persist despite the long-term effects of residential schools and government programs aimed to erase Indigenous culture. In the spirit of the Truth and Reconciliation Commission Calls to Action, community-based histories are included here as a way for Indigenous groups to share their own versions of the past.



Each Indigenous community maintains its own histories. These may represent not only the historical narratives of particular interest to a community (such as reserve histories and treaty negotiations), but also their unique perspectives on shared stories, events, places, and people (such as conflicts and migration stories). As such, different Indigenous community histories may approach the same subject in different, and sometimes contradicting, ways. Individual communities may not agree on the same series of events, the use of territories, or on various impetus for change, for example. Some draw on archaeological knowledge and some do not. These differences do not diminish the value of these histories. Instead, they emphasize the distinct languages, experiences, and priorities of different Indigenous communities and nations. Together, they offer a multitude of perspectives on Ontario's past and offer important counterpoints to colonial narratives.

The following section includes project-relevant community histories from Chippewas of Rama First Nation and Huron-Wendat Nation.

2.4.4 Community History of the Chippewas of Rama First Nation

The Chippewas of Rama First Nation are an Anishinaabe (Ojibway) community located at Rama First Nation, Ontario. Our history began with a great migration from the East Coast of Canada into the Great Lakes region. Throughout a period of several hundred years, our direct ancestors again migrated to the north and eastern shores of Lake Huron and Georgian Bay. Our Elders say that we made room in our territory for our allies, the Huron-Wendat Nation, during their times of war with the Haudenosaunee. Following the dispersal of the Huron-Wendat Nation from the region in the mid-1600s, our stories say that we again migrated to our territories in what today is known as Muskoka and Simcoe County. Several major battles with the Haundenosaunee culminated in peace being agreed between the Anishinaabe and the Haudenosaunee, after which the Haudenosaunee agreed to leave the region and remain in southern Ontario. Thus, since the early 18th century, much of central Ontario into the lower parts of northern Ontario has been Anishinaabe territory.

The more recent history of Rama First Nation begins with the creation of the "Coldwater Narrows" reserve, one of the first reserves in Canada. The Crown intended to relocate our ancestors to the Coldwater reserve and ultimately assimilate our ancestors into Euro-Canadian culture. Underlying the attempts to assimilate our ancestors were the plans to take possession of our vast hunting and harvesting territories. Feeling the impacts of increasingly widespread settlement, many of our ancestors moved to the Coldwater reserve in the early 1830s. Our ancestors built homes, mills, and farmsteads along the old portage route which ran through the reserve, connecting Lake Simcoe to Georgian Bay (this route is now called "Highway 12"). After a short period of approximately six years, the Crown had a change of plans. Frustrated at our ancestors continued exploiting of hunting territories (spanning roughly from Newmarket to the south, Kawartha Lakes to the east, Meaford to the west, and Lake Nipissing to the north), as well as unsuccessful assimilation attempts, the Crown reneged on the promise of reserve land. Three of our Chiefs, including Chief Yellowhead, went to York under the impression they were signing documents affirming their ownership of land and buildings. The Chiefs were misled, and inadvertently allegedly surrendered the Coldwater reserve back to the Crown.

Our ancestors, then known as the Chippewas of Lakes Simcoe and Huron, were left landless. Earlier treaties, such as Treaty 16 and Treaty 18, had already resulted in nearly 2,000,000 acres being allegedly surrendered to the Crown. The Chippewas made the decision to split into three groups. The first followed Chief Snake to Snake Island and Georgina Island (today known as the Chippewas of Georgina Island). The second group followed Chief Aissance to Beausoleil Island, and later to Christian Island (Beausoleil First Nation). The third



group, led by Chief Yellowhead, moved to the Narrows between Lakes Simcoe and Couchiching and eventually, Rama (Chippewas of Rama First Nation).

A series of purchases, using Rama's own funds, resulted in Yellowhead purchasing approximately 1,600 acres of abandoned farmland in Rama Township. This land makes up the core of the Rama Reserve today, and we have called it home since the early 1840's. Our ancestors began developing our community, clearing fields for farming and building homes. They continued to hunt and harvest in their traditional territories, especially within the Muskoka region, up until the early 1920's. In 1923, the Williams Treaties were signed, surrendering 12,000,000 acres of previously unceded land to the Crown. Once again, our ancestors were misled, and they were informed that in surrendering the land, they gave up their right to access their seasonal traditional hunting and harvesting territories.

With accessing territories difficult, our ancestors turned to other ways to survive. Many men guided tourists around their former family hunting territories in Muskoka, showing them places to fish and hunt. Others worked in lumber camps and mills. Our grandmothers made crafts such as porcupine quill baskets and black ash baskets, and sold them to tourists visiting Simcoe and Muskoka. The children were forced into Indian Day School, and some were taken away to Residential Schools. Church on the reserve began to indoctrinate our ancestors. Our community, along with every other First Nation in Canada, entered a dark period of attempted genocide at the hands of Canada and the Crown. Somehow, our ancestors persevered, and they kept our culture, language, and community alive.

Today, our community has grown into a bustling place, and is home to approximately 1,100 people. We are a proud and progressive First Nations community.

2.4.4.1 History of the Nation Huronne-Wendat

As an ancient people, traditionally, the Huron-Wendat, a great Iroquoian civilization of farmers and fishermenhunter-gatherers and also the masters of trade and diplomacy, represented several thousand individuals. They lived in a territory stretching from the Gaspé Peninsula in the Gulf of Saint Lawrence and up along the Saint Lawrence Valley on both sides of the Saint Lawrence River all the way to the Great Lakes. Huronia, included in Wendake South, represents a part of the ancestral territory of the Huron-Wendat Nation in Ontario. It extends from Lake Nipissing in the North to Lake Ontario in the South and Île Perrot in the East to around Owen Sound in the West. This territory is today marked by several hundred archaeological sites, testifying to this strong occupation of the territory by the Nation. It is an invaluable heritage for the Huron-Wendat Nation and the largest archaeological heritage related to a First Nation in Canada.

According to our own traditions and customs, the Huron-Wendat are intimately linked to the Saint Lawrence River and its estuary, which is the main route of its activities and way of life. The Huron-Wendat formed alliances and traded goods with other First Nations among the networks that stretched across the continent.

Today, the population of the Huron-Wendat Nation is composed of more than 4000 members distributed onreserve and off-reserve.

The Huron-Wendat Nation band council (CNHW) is headquartered in Wendake, the oldest First Nations community in Canada, located on the outskirts of Quebec City (20 km north of the city) on the banks of the Saint Charles River. There is only one Huron-Wendat community, whose ancestral territory is called the Nionwentsïo, which translates to "our beautiful land" in the Wendat language.



The Huron-Wendat Nation is also the only authority that have the authority and rights to protect and take care of their ancestral sites in Wendake South.

2.4.5 Treaty History

The candidate snow storage sites are encompassed by the Penetanguishene Purchase (Treaty No. 5), which was signed provisionally signed on May 19, 1795 and concluded on May 22, 1798 (Canada 1891).

Newly appointed Lieutenant Governor of Upper Canada, John Graves Simcoe, visited Penetanguishene in 1793, marking the official arrival of the British in the area. Simcoe's quest was to secure a safe trade route to the west and he set out to explore Georgian Bay first-hand in an effort to identify strategic and suitable shipping and military ports. Upon arriving in the area, he immediately realized the strategic importance of the Penetanguishene Harbour and began advocating for its use as a naval and military base for supplies and defence (Surtees 1984).

In 1795, Simcoe began negotiating a treaty with the "Chippeway" for a tract of land encompassing the harbour. However, Commander-in-Chief Lord Dorchester had altered the rules for treaty negotiations by issuing instructions that future treaties must include a sketch of the land in question and that the documents would need to be reviewed and approved by the Commander-in-Chief himself to determine the price to be paid (Surtees 1984). Although Simcoe could not complete these requirements before the arrival of the Chippewas, he proceeded with negotiations for the northern tip of the peninsula at Penetanguishene and the island in the harbour regardless. The deal was provisional upon the payment of goods, which needed to be shipped from Britain. This would not occur until 1798, by which time both Simcoe and Dorchester had left Upper Canada (Surtees 1984). The new Commander-in-Chief, Robert Prescott, finalized the treaty with the Chippewas, supported by the Superintendent of Indian Affairs, William Claus.

Penetanguishene served as a depot for receiving and distributing British payment to the signatories of the 1798 treaty. Between 1830 and 1835 the distribution of the "King's Bounty" took place at Penetanguishene; hundreds of Indigenous people would arrive, usually in early July, to receive treaty payment in the form of cloth, food, muskets, articles of adornment and other utilitarian items.

Beausoleil First Nation (Chimnissing), Chippewas of Georgina Island First Nation, and Chippewas of Rama First Nation, also known as the Chippewa Tri-Council (CTC), are the modern descendants of the signatories to Treaty No. 5. In 1986 and 1990, the CTC submitted a claim to the government alleging that the Crown took an additional 20,200 hectare (50,000 acres) of land that was not part of the Penetanguishene Purchase (Boileau 2022). This claim was rejected by Canada's Specific Claims Branch, but then included in the 2018 Williams Treaties Settlement Agreement. The government unilaterally included the CTC's claim in the Settlement Agreement, which they viewed as one that should be handled on its own (Boileau 2022). From the perspective of the CTC, this claim remains unresolved.



2.4.6 Nineteenth-Century and Municipal Settlement

Historically the potential snow storage sites fell within the Geographic Township of Tay and outside of the historic settlement centre of the Town of Penetanguishene, County of Simcoe, Ontario. A brief discussion of 19th-century settlement and land use in the township is provided below in an effort to identify features signaling archaeological potential.

2.4.6.1 Simcoe County

The lands comprising Simcoe County were originally part of the Nassau and Hesse Districts in the Province of Quebec. In 1792, the district names were changed to Home and Western Districts, respectively by the first Lieutenant-Governor of Upper Canada, John Graves Simcoe. The district boundaries were amended in 1798 and by 1800 all of Simcoe County was within the jurisdiction of the Home District. Simcoe County was officially formed in 1798 and was made a separate district in 1838. The District was abolished along with the district system in 1849. The lands and townships that comprise Simcoe County have changed throughout its history. The Townships of Artemisia, Collingwood, Euphrasia, Osprey, and St. Vincent were originally part of Simcoe County, but were transferred to Grey County in 1851. Mono and Mulmur Townships were also originally part of Simcoe County, but were transferred to Dufferin County in 1874. Part of West Gwillimbury Township was transferred to York County and annexed to East Gwillimbury. Finally, the townships of Mara and Rama, were originally part of York County, transferred to Ontario County in 1849 and subsequently transferred to Simcoe County in 1974.

During the 17th century French explorers and missionaries traveled into Huronia – Wendake encompassing the area that would become Simcoe County. In 1639, the Jesuits established a mission on the banks of the Isaraqui (Wye) River near the present-day town of Midland. The mission was named Sainte-Marie among the Hurons and lasted until 1649 when it was abandoned due to increased conflict in the area (Hunter 1909a:7). Although Sainte-Marie among the Hurons is considered the first European community in Ontario, it was short lived. Further settlement did not occur until the turn of the 19th century. Initial European interests focused on Penetanguishene; a harbour site used by the British as early as 1799 (H. Belden & Co. 1881:4). The area was also a centre for early trade due to its location along established transportation routes linking Georgian Bay to areas further south and east through Lake Simcoe. As early as 1802, Quetton St. George had established a trading post at the Narrows of Lakes Simcoe and Couchiching near the present-day City of Orillia (Hunter 1909a:23). In 1811, Samuel S. Wilmot received instructions to survey a road of communication between Kempenfeldt Bay and Penetanguishene Harbour and to lay out lots for settlement along the road as well as town plots at Kempenfeldt Bay and Penetanguishene Harbour. These instructions came at the same time that the Lake Simcoe Purchase (Treaty No. 16) negotiations were ongoing, spurred by increasing hostilities with the Americans in the lead up to the War of 1812. As a consequence of the War of 1812, the government established a several military installations in Simcoe County including a military station and dockyard at Penetanguishene, Fort Nottawasaga near the mouth of the Nottawasaga River, and Willow Fort at the terminus of the Nine-Mile Portage at Willow Creek (Hunter 1909a:37-38). Outside of the lots surveyed along the Penetanguishene or "Military" Road by Wilmot, the townships of Simcoe County were surveyed between 1820 and 1835 (Hunter 1909a:41).

Early settlers in Simcoe County included the sons and daughters of United Empire Loyalists and settlers from Great Britain and Ireland. In addition, lands were made available in Simcoe County for Black loyalists and those who had served in the Coloured Corp during the War of 1812 (ASI 2019b). Other Black settlers included



natives of Upper Canada who were "freed" upon attaining the age of 21, and freedom-seekers from the United States. Many of the Black settlers gained property in Oro Township near Wilberforce Street.

Until rail service reached Simcoe County in 1853, transportation in the area focused on steamer travel on Lake Simcoe and Georgian Bay as well as settlement roads which often followed long established Indigenous trails (Hunter 1909a; SD Map 2). Once the railroad arrived, settlement and industry grew rapidly through the county, including the timber industry. By 1861, the total population of Simcoe County was 44,720 inhabitants primarily of English, Scottish, or Irish ancestry (ASI 2019b).

2.4.6.2 Tay Township

The first settlers to the Township of Tay were fur-traders, who settled in the township in the late 18th to early 19th century (Hunter 1909a:193). In the later part of the century, settlers came from other counties, particularly Durham County, or adjacent townships. Following 1828, an estimated 75 Métis families moved to the Penetanguishene area from Drummond Island (ASI 2019a:17). Overall, Tay Township had few settlers until the Midland Railway was constructed in the 1870s. The township, which was surveyed by James G. Chewett (Hunter 1909b:43), was one of three in the county named for the pet dogs of Lady Sarah Maitland, the wife of the Lieutenant Governor of Upper Canada (wikipedia.org). Tay was connected with Tiny Township for municipal purposes until 1869.

The early settlement to the township occurred along the Penetanguishene Road, an early roadway initially built for military purposes and fur traders. The road proved more useful for opening up the townships along it to settlement, with Samuel S. Wilmot surveying the lots along the road beginning in 1811, and continuing to laid out into the 1820s (Hunter 1909a:95; Hunter 1909b:40). The road was the vision of John Graves Simcoe, then Lieutenant Governor of Upper Canada, to link military supply lines between Kempenfelt Bay and Penetanguishene Harbour. Simcoe also hoped to establish a military base on the Penetanguishene Harbour, although his goal was slow to develop.

2.4.6.3 Town of Penetanguishene

Governor Simcoe first recognized the harbour at Penetanguishene as a good spot for a fort in 1793 during his journey northward from the Humber River (Hunter 1909b:13, 28). Penetanguishene was first mapped in 1794 by Alexander Aitken, who sketched the shoreline, harbour and "French ruins" (ASI 2019b:49). The area was noted in 1805 as an excellent spot for settlement, and the Surveyor General instructed that a town plot be laid out in 1811; this began in 1812. The naval establishment at Penetanguishene began in 1814; by 1822, 18 structures were reported.

The first post office in the settlement was opened 1829. The name Penetanguishene was derived from an Ojibwa word meaning the "place of the white rolling sands" (ASI 2019b:50). The town saw growth throughout the 1830s, with a population of largely military pensioners. By the 1850s, the settlement contained a blacksmith, a number of sawmills, tanneries, churches, stores, hotels, and telegraph office, and a number of other businesses and government offices. By 1859 the population of Penetanguishene stood at roughly 1,000 inhabitants, and by 1895, the population numbered just over 2,000 inhabitants.



2.4.7 Review of Historic Maps

The candidate snow storage sites are located in the Geographic Township of Tay, Town of Penetanguishene, County of Simcoe, Ontario. The Thompsons Road property is within Lot 115, Concession I East of Penetanguishene Road, the Tinney's Septic property is within Lot 115, Concession 2 East of Penetanguishene Road, and the Morden Gravel property is within Lot 117, Concession I East of Penetanguishene Road.

According to the 1871 Hogg's Map of the County of Simcoe, the candidate snow storage sites fall within or just outside of the southern and eastern historic settlement core of the Town of Penetanguishene (Map 9). The Thompsons Road parcel falls within the southeastern portion of the town plot, covering three small rectangular town lots. The Morden Gravel and Tinney's Septic parcels fall to the east of the town plot, within larger rural lots. No owners' names are associated with Thompsons Road and Morden Gravel, while Tinney's Septic is associated with Robert J. Kennedy. No structures are depicted as within or in close proximity of the properties. Robert Street East and Fuller Avenue are both shown as open at this time. No sources of water are shown on this map within close proximity to the candidate sites.

According to the 1881 Illustrated Historical Atlas of the County of Simcoe, Ont, the Thompsons Road property is once again shown within several town lots in the southeastern portion of Penetanguishene (Map 10). The Morden Gravel and Tinney's Septic parcels fall east of and outside the town plot, within rural lots. No owner names or structures are shown in association with the parcels. Robert Street East and Fuller Avenue are both shown as open at this time, and an unopened roadway between lots 115 and 116 is also shown, likely the predecessor of Tay Point Road. It should be noted that the atlas depicts the limits of the military and naval reserve as extending to the northwest corner of Lot 117, however, it is not known if the lands were ever used for military purposes. St Andrew's Lake is shown north of the Morden Gravel parcel, and the unnamed tributary south of the Thompsons Road and Tinney's Septic parcels is depicted.

Aerial photography of the general area is available beginning in 1954 (Maps 11 and 12). In this year, the candidate sites are within a rural setting. The Thompsons Road parcel is entirely woodlot at this time and Morden Gravel property is shown within a cleared agricultural field. The Tinney's Septic site includes both wooded areas and cleared agricultural land. Although all three roadways in proximity to the candidate sites are open (Robert Street East, Fuller Avenue and Tay Point Road), there are no other large developments that have taken place in the area.

By 1978, the area to the northwest of the Robert Street East and Fuller Avenue intersection has begun to develop with smaller sideroads and industrial properties visible. The Morden Gravel property is still comprised of agricultural field. The Thompsons Road parcel is dense woodlot in the western two thirds, with come cleared and some treed land in the easterly third. By this time the northwest quadrant of the Tinney's Septic parcel has witnessed grading and aggregate extraction, with a square shaped pond now present and access roads leading to Tay Point Road and to Fuller Avenue via the commercial enterprise. By 1996-1997, the area of ground disturbance and extraction has expanded significantly into the surrounding woodlot and formerly cleared agricultural lands have been reforested.

By 2008, there are no appreciable changes within the Thompsons Road and Morden Gravel parcels. However, significant changes have occurred within the Tinney's Septic parcel. By this time, a good portion of the candidate site is now in use for aggregate extraction and stockpiling, and the pond has been infilled. The extraction site is still largely surrounded by woodlot.



By 2018, the only notable change to the Thompsons Road property is the infilling of the previously cleared lands with full forest. The extraction area within the Tinney's Septic parcel has once again expanded slightly. The Morden Gravel parcel appears to have been largely stripped of topsoil, which now appears to be stockpiled at the centre of the parcel. Lands to the south and east are still wooded, and to the north are agricultural in nature.

2.4.8 Review of Heritage Properties

The Ontario Heritage Act allows for municipalities to protect properties that are considered to hold cultural heritage value or interest. There are numerous heritage properties in the Town of Penetanguishene, however, there are none in the vicinity of the candidate snow storage sites (Penetanguishene Heritage n.d.). There are no plaques located within 300 m of the candidate snow storage sites.



3 ANALYSIS AND CONCLUSIONS

As noted in Section 2.1, the Province of Ontario has identified numerous factors that signal the potential of a property to contain archaeological resources. Based on the archaeological and historical context reviewed above, the candidate snow storage sites are in proximity (i.e., within 300 m) to features that signal archaeological potential. Maps 13, 15, and 17 illustrate the Stage I archaeological assessment results and recommendations for each of the candidate snow storage sites. Map 18 presents the results of the assessment on proponent mapping and an unaltered proponent map is provided as Map 3.

3.1 Thompsons Road

The Thompsons Road parcel exhibits potential for archaeological resources due to the proximity of the following:

- mapped 19th-century thoroughfares (Robert Street East, Fuller Avenue);
- a 19th-century settlement area (Penetanguishene Town Plot and historic settlement area as depicted on historic maps);
- a mapped glacial shorelines and contours indicate the presence of such within the parcel;
- watercourses and wetlands (unnamed tributary; wetlands to the west, south, and east); and
- well-drained sandy soils.

In addition, the *County of Simcoe Archaeological Management Plan* (ASI 2019a) identifies the Thompsons Road parcel as in an area of archaeological potential.

According to contemporary mapping, the parcel consists of treed lands and retains integrity.

A portion of the Thompsons Road parcel was previously assessed by D.R. Poulton & Associates in 1999; however, the Stage 2 test pit assessment utilized a 10 m interval, which does not meet the current standard of 5 m (MTC 2011:31-32; Section 2.1.2). The Thompsons Road parcel therefore retains archaeological potential and Stage 2 assessment in compliance with the 2011 *Standards and Guidelines* is required (2.20 ha; Map 13).

3.2 Tinney's Septic

The Tinney's Septic parcel exhibits potential for archaeological resources due to the proximity of the following:

- contours indicative of the presence of a glacial scarp or shoreline;
- watercourses and wetlands (unnamed tributary; wetlands to the east); and
- well-drained sandy soils.

In addition, the *County of Simcoe Archaeological Management Plan* (ASI 2019a) identifies the Tinney's Septic parcel as in an area of archaeological potential.

No record of any prior archaeological assessment for this parcel were identified during this study.

According to historic and contemporary aerial photography, a significant portion of the Tinney's Septic parcel (5.87 ha; Map 14) has been impacted by prior aggregate extraction, grading, and soil stockpiling. The presence of extensive prior disturbance negates archaeological potential within the bounds of the former extraction site (3.48 ha). As such, no archaeological assessment is recommended for the disturbed area. However, the treed



portions (2.39 ha) of the candidate site have archaeological potential and require Stage 2 assessment in compliance with the 2011 *Standards and Guidelines*.

3.3 Morden Gravel

The Morden Gravel parcel exhibits potential for archaeological resources due to the proximity of the following:

- a mapped 19th-century thoroughfares (Fuller Avenue);
- a 19th-century settlement area (Penetanguishene Town Plot and historic settlement area as depicted on historic maps);
- a registered archaeological site (Penetang Lake BeGx-28);
- wetlands (to the west, south, and east); and
- well-drained sandy soils.

In addition, the *County of Simcoe Archaeological Management Plan* (ASI 2019a) identifies the Morden Gravel parcel as in an area of archaeological potential.

According to contemporary mapping, the parcel was largely stripped of topsoil in 2018.

The entirety of the Morden Gravel parcel (1.03 ha; Map 17) was previously assessed by AMICK (2010; Map 7) as part of original plans for a new gravel pit. The assessment method was via pedestrian survey at a 5 m interval, consistent with the requirements under the 2011 *Standards and Guidelines*. No archaeological resources were identified during the previous assessment and the area was considered free of archaeological concern. Subsequent to the assessment, the parcel was removed from the aggregate licensing area, the final boundaries of which are depicted in the AMICK 2017 report and on contemporary topographic mapping shown in Map 1. In 2018 the lands were stripped of topsoil (Map 16). In sum, the property was previously surveyed, found not to contain archaeological resources, and subsequently disturbed by topsoil stripping. No further archaeological assessment is recommended.



4 **RECOMMENDATIONS**

A Stage I map-based background study was conducted for three candidate snow storage sites in the Town of Penetanguishene. The purpose of the assessment was to evaluate the archaeological potential of the parcels and identify any known archaeological concerns, in an effort to assist in the planning and site selection.

Based on this Stage I map-based archaeological assessment the following recommendations are made:

- Thompsons Road
 - This parcel has archaeological potential and requires Stage 2 archaeological assessment to meet the 2011 Standards and Guidelines (MTC 2011).
 - The parcel consists of treed lands which must be subject to assessment via test pitting at a 5 m interval.
- Tinney's Septic
 - Based on historic and contemporary aerial photography, this parcel has witnessed significant disturbance from prior gravel extraction (3.48 ha); the disturbed area is considered to have low archaeological potential.
 - The property also contains treed areas that have not witnessed substantial alteration (2.39 ha).
 If the treed areas will be ultimately impacted, these will require Stage 2 assessment via test pitting at a 5 m interval as they have archaeological potential.
- Morden Gravel
 - This parcel was previously assessed using methodologies that comply with the 2011 Standards and Guidelines (MTC 2011) and cleared of archaeological concern.
 - \circ No further assessment is recommended.

These recommendations are subject to the conditions laid out in Section 6.0 and to the MCM's review and acceptance of this report into the provincial register.



5 SUMMARY

A Stage I map-based background study was conducted for three candidate snow storage sites in the Town of Penetanguishene: Thompsons Road, Tinney's Septic, and Morden Gravel. A map-based review established that all three parcels have archaeological potential due to the presence of or proximity to a registered archaeological site, watercourses, wetlands, well-drained sandy soils, 19th century transportation routes, and the mapped Town Plot and historic settlement area for Penetanguishene. The Thompsons Road parcel retains archaeological potential and is recommended for Stage 2 assessment via test pitting at a 5 m interval. A significant portion of the Tinney's Septic parcel has been significantly disturbed from prior aggregate extraction, grading, and soil stockpiling. The extraction area is of low archaeological potential and no further assessment is recommended. However, Tinney's Septic parcel also includes undisturbed treed lands which warrant Stage 2 assessment via test pitting at a 5 m interval. The Morden Gravel property was previously assessed during work undertaken for a new aggregate pit. No further assessment is recommended.



6 ADVICE ON COMPLIANCE WITH LEGISLATION

This report is submitted to the MCM 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 MCM, 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 archaeological 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 (i.e., unknown 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.

The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the police or coroner and Crystal Forrest, Registrar of Burial Sites, Ontario Ministry of Government and Consumer Services. Her telephone number is 416-212-7499 and e-mail address is <u>Crystal.Forrest@ontario.ca</u>.



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8 MAPS



PROJECT LOCATION



Map I: Location of the Candidate Snow Storage Sites in the Town of Penetanguishene, ON





Map 2: Aerial Photograph Showing the Location of the Candidate Snow Storage Sites

Licence - Ontario





Map 3: Proponent Map Showing the Location of the Candidate Snow Removal Sites

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Map 4: Physiography Within the Vicinity of the Candidate Snow Storage Sites





Map 5: Soils Within the Vicinity of the Candidate Snow Storage Sites



Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON



Map 6: CCL Container Property (D.R. Poulton & Associates Inc. 1999)





Map 7: Fuller Avenue Aggregate Pit Stage I and 2 Results (AMICK 2010)

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON





Map 8: 138 Robert Street East Stage I and 2 Results (ASI 2022)

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON





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Map 9: Location of the Candidate Snow Storage Sites Shown on the 1871 Hogg's Map of the County of Simcoe



1881 HISTORIC MAP



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Subject Properties

Map 10: Candidate Snow Storage Sites Shown on the 1881 Illustrated Historical Atlas of the County of Simcoe











Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON











Map 12: Location of the Candidate Snow Storage Sites Shown on 2008, 2012, 2016, 2018 Aerial Photography

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON





100 m Prepared by DG 2023-01-23 Contains information licenced under the Open Government Licence - Canada and the Open Government Licence - Ontario Subject Properties
 Contour (2m)
 Parcel Boundary
 Wetland
 Previously Assessed (Test Pit Survey, 10m Interval)

Previously Assessed (No Assessment Required)
STAGE 1 ASSESSMENT RESULTS
Areas of Archaeological Potential
Treed (Test Pit Survey 5m Required)

Map 13: Stage I Results - Thompsons Road Parcel









Map 14: Prior Grading, Excavation, and Disturbance in Tinney's Septic Parcel Shown on 1978, 2008, 2012 and 2018 Aerial Photographs

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON





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STAGE 1 ASSESSMENT RESULTS Areas of Archaeological Potential Treed (Test Pit Survey 5m Required) Areas of Low Archaeological Potential (No Assessment Required) Disturbed (Graded, Excavated, Soil Stockpiles)

Map 15: Stage I Results - Tinney's Septic Parcel







Map 16: Prior Grading, Excavation, and Disturbance in Morden Gravel Parcel Shown on 2012, 2016, 2018, and 2022 Aerial Photographs

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON





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 Parcel Boundary
 Wetland
 Previously Assessed (No Assessment Required)

Map 17: Stage I Results - Morden Gravel Property





Map 18: Stage I Results Shown on Proponent Mapping

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON

Legend

- Short List
- Property L
- Roads

STAGE 1 RESULTS & RECOMMENDATIONS
Subject Properties
Previously Assessed (No Assessment Required)
STAGE 1 ASSESSMENT RESULTS
Areas of Archaeological Potential
Treed (Test Pit Survey 5m Required)
Areas of Low Archaeological Potential (No Assessment Required)

Disturbed (Graded, Excavated, Soil Stockpiles)



200 m Prepared by DG 2023-02-14 Contains information licenced under the Open Government Licence - Canada and the Open Government Licence - Ontario Stage I Archaeological Assessment Municipal Class Environmental Assessment Municipal Snow Storage Location Alternatives Part of Lots 117 and 115, Concession 2 EPR Part of Lot 115, Concession 1 EPR Town of Penetanguishene Geographic Township of Tay County of Simcoe, Ontario

SUPPLEMENTARY DOCUMENTATION

NOT FOR PUBLIC CIRCULATION



Licensee: Matthew Beaudoin, PhD (P324) PIF No: P324-0811-2022 Project No: 2022-207 Draft Dated: February 14, 2023





SD Map 1: Fuller Avenue Aggregate Pit Stage 2 Monitoring Results (AMICK 2017)

Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON



Stage I Archaeological Assessment Municipal Class EA, Municipal Snow Storage Location Options, Penetanguishene, ON



SD Map 2: Andrew Hunter's 1899 Map of Villages in Tiny Township



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March 21, 2023

Greenland Consulting Engineers 120 Hume Street, Collingwood, Ontario L9Y 1V5 c/o Mrs. Hannah Toews, EIT

Re: <u>Proposed Snow Storage Plan for the Town of Penetanguishene, Simcoe County, Ontario –</u> <u>Preliminary Site Screening</u>

Dear Mrs. Toews,

TRANS-PLAN is pleased to submit this preliminary screening of the three candidate sites for snow disposal in Penetanguishene.

With the evidence at hand, this screening established that the preferred amongst the three sites is Thompsons Road, located at 160 Robert St East, Penetanguishene, ON, L9M 2E9. We are looking forward to your acknowledgement of these findings, so that we can proceed with the more thorough analysis of this preferred site, which shall include critical elements such as AutoTurn vehicle sweep templates, capacity analysis of the signalized intersections along the route and access & circulation review for the snow storage location itself. The analysis will also include any roadway improvements required to support the proposed snow storage location such as traffic signals, signage, and road widenings.

Sincerely,

Andre Lower, P.Eng. Sr Engineer

Trans-Plan Transportation Inc. Transportation Consultants







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1. INTRODUCTION

Trans-Plan has been retained by Greenland Consulting Engineers to complete a preliminary screening of snow disposal site options previously provided by Greenland staff.

This preliminary screening of suitable snow disposal sites is based of three select criteria – hauling distance, proximity to sensitive land uses and the general route operability. Each of those criteria will be assessed below, with conclusions indicating the ranking of the sites in order of suitability.

Snow removal operations will of course involve collection of snow through the entire road network under care by the Municipality, plus a few locations (such as malls and squares) where temporary storage at select spots is part of the municipal snow removal plan. Yet for the sake of simplicity, this analysis will assume a reference point for the snow hauling origin, meant to represent the entire area – the Town Hall. Given its geographic location, the Town Hall is assumed to provide a fair representation of the distance from the snow collection point to each of the three disposal sites targeted in our screening process.

2. ANALYSIS

Criterium #1 – Overall Hauling Distance

According to the MECP Design Criteria, the land disposal sites "must be close enough to the district where the bulk of the snow is collected to be economically practical". Assuming the Town Hall (10 Robert Street West) as the reference point where the snow loads are to be taken from, the overall hauling distance (each way) of the three options ranks as follows:

Ranking	Site Name	Site Address	Hauling Distance
1	Thompsons Road	160 Robert St East, Penetanguishene, ON, L9M 2E9	1.8 Km
2	Tinney's Septic	693 Fuller Ave, Penetanguishene, ON, L9M 2E8	2.4 Km
3	Morden Gravel	905 Fuller Ave, Penetanguishene, ON, L9M 1G7	3.5 Km

Criterium # 2 – Impact and proximity to sensitive land uses, such as residential areas

Morden Gravel

For Morden Gravel, the snow disposal would be at the southwest corner of the lot.





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The shorter route of 3.5 Km runs along a segment of Fuller Avenue that is populated by industrial uses, which are not particularly sensitive to the impact of snow hauling truck traffic either during the commercial hours of weekdays or overnight/weekends. Then there is the segment along Robert St East, which is populated by industrial uses in its eastern portion and some commercial and residential uses on the segment between Centennial Drive/Thompsons Road and Lecarron Avenue. In the segment west of Lecarron Avenue there is denser residential uses and some sensitive uses such as the Covenant Christian Community Church and the YMCA Child Care St Ann's. The segment closer to the Town Hall has sensitive uses such as the Georgian Bay retirement home, the First Presbyterian Church and the Penetanguishene Public Library.





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The alternate route via Cambridge St and Church Street is not only longer (3.7 Km) but features equivalent issues regarding disturbance of sensitive land uses – such as the Midland Senior Services, Jennings Lodge Retirement Home and the Penetanguishene Public Library. Therefore, it is considered a poor alternative to the 3.5 Km route reviewed above.

Tinney's Septic

For Tinney's Septic, the snow disposal would be at the clearing in the northern central portion of the lands, with access off Tay Point Road.



The shorter route of 2.4 Km runs along a segment of Fuller Avenue that is populated by somewhat recessed residential uses, which are not particularly sensitive to the impact of snow hauling truck traffic





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either during the commercial hours of weekdays or overnight/weekends. Then there is the segment along Robert St East, which is populated by industrial uses in its eastern portion and some commercial and residential uses on the segment between Centennial Drive/Thompsons Road and Lecarron Avenue. In the segment west of Lecarron Avenue there is denser residential uses and some sensitive uses such as the Covenant Christian Community Church and the YMCA Child Care St Ann's. The segment closer to the Town Hall has sensitive uses such as the Georgian Bay retirement home, the First Presbyterian Church and the Penetanguishene Public Library.

The alternate route via Brunelle Side Road and Murray Road is not only longer (4.4 Km) but features equivalent issues regarding disturbance of sensitive land uses – mainly residential uses with considerable frontage to the travelled roads of this route. Therefore, it is considered a poor alternative to the 2.4 Km route reviewed above.



Thompsons Road





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The shorter route of 1.8 Km runs along a segment of Robert Street East that is populated by industrial uses in its eastern portion and some commercial and residential uses on the segment between Centennial Drive/Thompsons Road and Lecarron Avenue. In the segment west of Lecarron Avenue there is denser residential uses and some sensitive uses such as the Covenant Christian Community Church and the YMCA Child Care St Ann's. The segment closer to the Town Hall has sensitive uses such as the Georgian Bay retirement home, the First Presbyterian Church and the Penetanguishene Public Library.

The alternate routes via Thompsons Road or even Brunelle Side Road are longer and feature equivalent issues regarding disturbance of sensitive land uses, so are considered poor alternatives to the 1.8 Km route reviewed above.

Criterium # 3 – General Route Operability

The route operability comprises a multitude of criteria. Only the higher-level ones will be considered at this preliminary step, on the assumption that a more thorough review (including critical elements such as AutoTurn vehicle sweep templates, capacity analysis of the signalized intersections along the route and access & circulation review for the snow storage location itself) will be provided for the preferred location that this preliminary screening will indicate. The same applies to any roadway improvements required to support the proposed snow storage location (signals, signage, road widenings, etc.)

All three screened routes involve circulation of snow-hauling trucks via Fuller Avenue and Robert Street East. Both are 2-lane cross sections with unpaved shoulders along most of the way. Both will include segments where the pavement conditions are less than ideal for heavy vehicle circulation, with fraying on the pavement edges.





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The segment of Robert Street East nearer the urban core features a considerable slope – which could pose a risk of trucks slipping under icy conditions – as well as tight lateral clearance to obstacles such as utility posts.



Turning footprints do not seem to pose a particular obstacle for any of the three screened routes. All three routes involve negotiation of traffic signals along the route, which have potential to aggravate the noise issue on account of the required stopping and starting.

Given the configuration of the municipality's urban core and the fact that the three screened routes share a considerable portion of their overall extension, there is no clearly defined advantage attributable to one route when compared to the others in terms of general route operability. This this criterion will be deemed not relevant for the ranking of the options.

3. CONCLUSIONS

According to the three select criteria examined in this preliminary screening review, the most economic and practical route is Thompsons Road, followed by Tinney's Septic and then Morden Gravel. The deciding criterion is indeed hauling distance, where trips to the first ranked site (Thompsons Road) are at least 25% shorter than to the second choice. The impact and proximity to sensitive land uses is not significantly different when the sites are compared, since most of the potentially impacted land uses are located on segments of Robert Street East that are shared by all three routes.





Town of Penetanguishene

Municipal Snow Storage Location Municipal Class Environmental Assessment

Notice of Study Commencement – August 19th, 2022

The Town of Penetanguishene ('Town') has initiated a Municipal Class Environmental Assessment (Class EA) to determine a new location for snow storage. The current snow storage location is a privately owned property. The Town is looking for a municipally owned location that meets the criteria set out in the MECP Guidelines for snow storage.

This study is being conducted in accordance with the Municipal Class EA guidelines. The Class EA process looks at potential environmental, social, and economic effects, develops alternatives, determines preferred measures, and incorporates mitigation methods.

Project updates and notices will be posted on the Towns website to inform the public of the Class EA's progress (<u>https://www.connectpenetanguishene.ca/</u>). Residents and interested parties are encouraged to regularly visit the website to find out more about the Project.

If you have any questions or concerns, and/or would like to be added to the project mailing list, please contact the study representatives listed below.



Bryan Murray, P.Eng. Director of Public Works Town of Penetanguishene

10 Robert St. W Penetanguishene, ON L9M 2G2 Tel: (705) 549-7992 Email: <u>bmurray@penetanguishene.ca</u> Brad Parker, P. Eng. Consultant Project Manager Greenland Consulting Engineers 120 Hume Street Collingwood, Ontario L9Y 1V5 Tel: (705) 444-8805

Email: <u>bparker@grnland.com</u>







Town of Penetanguishene Class Environmental Assessment Schedule 'B' Municipal Snow Storage Location NOTICE OF PUBLIC INFORMATION CENTRE

The Town of Penetanguishene ('Town') has initiated a Schedule 'B' Class Environmental Assessment (Class EA) for the selection of a Town owned storage location for snow that is removed from the road network and Town owned parking lot areas during winter maintenance operations. Currently, the Town utilizes one (1) privately owned snow storage site situated on Fuller Avenue between Robillard Drive and Laurier Road, which has been the solitary storage area for snow since 2018.

Preliminary Class EA Report:

A Preliminary Study Report has been completed and has identified a preferred snow storage location and an evaluation of multiple locations according to the Schedule 'B' Class EA guidelines. The results of the preliminary report are to be presented to the public through a Public Information Centre ('PIC').

A PIC is being held to provide an opportunity for the Public to review and provide input on the new snow storage preferred location. The PIC will consist of a short presentation followed by a question-and-answer period. Representatives from the project team will be present to provide the presentation and answer questions regarding the preliminary study report.



Figure 1 - Snow Removal Areas Priority Map

For those members of the public that wish to attend the PIC virtually, please contact Sarah Marshall, Communications and Technology Coordinator, at <u>smarshall@penetanguishene.ca</u>.

PUBLIC INFORMATION CENTRE:

Date:Thursday, February 8th 2024Time:7:00 PM to 8:00 PM (Presentation at 7:00 PM)Location:Council Chambers, 10 Robert Street West, Penetanguishene, ONIf you are unable to attend or require further information, please contact or
provide comments to:

Brad Parker, P. Eng. Consultant Project Manager Greenland Consulting Engineers 120 Hume Street Collingwood, Ontario L9Y 1V5 Tel: (705) 444-8805 Email: bparker@grnland.com Bryan Murray, P.Eng Director of Public Works Town of Penetanguishene 10 Robert Street West Penetanguishene, ON L9M 2G2 Tel: (705) 549-7992 Email:bmurray@penetanguishene.ca

Company	First Name	Last Name	Job Title	Address 1	Address 2	City	Province	Postal Code	Phone	Email
		•			•					
Ministry of the Environment Control Design				Provincial Agencies	Oth flags	Deurie	01	NADNA 414	446 226 6700	
Ministry of the Environment, Central Region	Chunmai	Lin	Pagional EA Coordinator	5775 Yonge St.	8th floor	Barrie	ON	M2M 4J1	416-326-6700	eanotifications.cregion@ontario.ca
	Chunner	LIU	Regional EA Coordinator							Chumer.Eu@ontano.ca
				Federal Agencies						
Department of Fisheries and Oceans Canada, Ontario Great										
Lakes Office				28 Waubeek Street		Parry Sound	ON	P2A 1B9	705-746-2196	info@dfo-mpo.gc.ca
Environment Canada				351 St-Joseph Blvd	Room 7114	Gatineau	QC	K1A 0H3	819-938-3860	ec.enviroinfo.ec@canada.ca
Transport Canada				330 Sparks St.		Ottawa	ON	K1A 0N5	613-990-2309	questions@tc.gc.ca
				County of Simcoe						
County of Simcoe	Mark	Aiken	CAO	1110 Highway 26		Midhurst	ON	L9X 1N6	705-726-9300 x1260	CAO@simcoe.ca
				Other Municipalities						
Town of Midland	David	Denault	640	575 Dominion Ave		Midland	ON	L/IP 1P2	705-526-4275 x2201	ddenault@midland.ca
Town of Midland	Sherri	Edgar		575 Dominion Ave		Midland			705-526-4275 x2201	
Town of Midland	Andy	Warzin	Senior Planner	575 Dominion Ave		Midland		L4R 1R2	705-526-4275 x2233	planning@midland.ca
Town Of Midland	Mitch	Sobil	Engineering	576 Dominion Ave		Midland	ON	L4R 1R3	705-526-4276 x2213	msobil@midland.ca
				Utilities						
Alectra Utilities				55 Patterson Rd		Barrie	ON	L4N 3V9	877-963-6900	not required
									1-877-362-7434	
Enbridge Gas				500 Consumers Rd.		North York	ON	M2J 1P8	416-495-6155	ombudsman@enbridge.com
Bell Canada - Right-of-Way Control Centre				140 Bayfield Street	2nd Floor	Barrie	ON	L4M 3B1	705-72-2264	charleyne.hall@bell.ca
						Dente	0.11		1 888-664-9376	
Hydro One				45 Sarjeant Dr.		Barrie	ON	L4N 4V9	416-345-5000	Regulatory@HydroOne.com
				First Nations						
										cwilson@alderville.ca:
				11696 Second Line Rd						dmowat@alderville.ca;
Alderville First Nation	Carrie	Wilson	Executive Assistant to Council			Alderville	ON	кок 2хо	905-352-2011 ext. 231	jsmoke@alderville.ca;
										lands@chimnissing.ca;
										danamonague@chimnissing.ca;
Beausoleil First Nation	Isabella	Marsden	Executive Assistant	11 O'Gemaa Miikaan		Christian Island	ON	L9M 0A9	705-247-2051	crystal@chimnissing.ca
										jl.porte@georginaisland.com;
	James L.	Porte	Invasive Species Coordinator						705-437-1337 ext. 2285	sylvia.mccue@georginaisland.com;
Chippewas of Georgiana Island First Nation	Sylvia	McCue	Lands Manager	R.R. #2	P.O. Box No. 13	Sutton West	ON	LOE 1RO	705-437-3614	donna.bigcanoe@georginaisland.com;
										evelynb@ramafirstnation.ca;
										annettes@ramafirstnation.ca;
	Evolup	Pall	640						705 225 2611	tedw@ramafirstnation.ca;
	Sharday	Ddii	CAU Community Consultation						705-325-3011 705-325-3611 evt 1633	shardavi@ramafirstnation.ca;
Chippewas of Rama First Nation	Samantha	Craig-Curnow	Associate General Counsel, Legal	5884 Rama Rd	Suite 200	Rama	ON	13V 6H6	705-325-3611 ext. 1055	consultation@ramafirstnation.ca
	Samantina		Associate General Coursel, Legal	5664 Huma Hu.	50110 200	nama			703 323 3011 CXU 1203	consultation@ramamstriation.ca
Curve Lake First Nation	Emily	Whetung-MacInne	s Chief	22 Winookeedaa Road		Curve Lake	ON	KOL 1RO	705-657-8045	keithk@curvelake.ca;
										gbmccontact@gmail.com;
										consultations@metisnation.org;
Georgian Bay Metis Council			Consultation Team	355 Cranston Cres.	P.O. Box No. 4	Midland	ON	L4R 4K6	705-526-6335	ethanr@metisnation.org
										sdavison@hiawathafn.ca;
Ulauratha Birat Nation	Char	Deview					<u></u>	101.050	705 205 4424	chietcarr@hiawathafn.ca;
Hiawatha First Nation	Shawn	Davison	Consultation Manager	431 Hiawatha Line		Hiawatha	UN	K9J 0E6	/05-295-4421	apaudasn@hiawathafn.ca;
Metis Nation of Ontario Lands, Resources and Consultations	Karen	Heisler	Region 7 Manager	66 Slater St	Suite 1100	Ottawa	ON	K1P 5H1	416-346-9230	KarenHe@metisnation org
inclis ration of ontario Lanas, resources and consultations	Nuren				Suite 1100	Juana			110 570 5230	Recence metanation org
MNO Midland Office				33 Cranston Cres.	P.O. Box No. 234	Midland	ON	L4R 4K6	705-527-1228	consultations@metisnation.org

Company	First Name	Last Name	Job Title	Address 1	Address 2	City	Province	Postal Code	Phone	Email
Mississauga's of the Scugog Island	Kelly	LaRocca	Chief	22621 Island Rd.		Port Perry	ON	L9L 1B6	905-985-3337	consultation@scugogfirstnation.com; klarocca@scugogfirstnation.com; info@scugogfirstnation.com
Wahta Mohawk (Mohawks of Gibson)	Samantha	Walker	Consultation Manager	2664 Muskoka District Road 38	P.O. Box 260	Bala	ON	POC 1A0	705-762-2354	info@wahtamohawks.ca; samantha.walker@wahtamohawks.ca
Wasauksing First Nation (Parry Island)	Michele Daniella	Ten Eyck Baker	Community Consultation Coordinator Lands Manager	1508 Geewadin Rd, Lane G	P.O. Box 250	Parry Sound	ON	P2A 2X4	705-746-2531 ext. 115 705-746-2531 ext. 2260	ccc@wasauksing.ca info@wahtamohawks.ca; samantha.walker@wahtamohawks.ca; Philip.franks@wahtamohawkscouncil.ca
Williams Treaty First Nation	Karry-Sandy	McKenzie	Process Coordinator/Negotiator	8 Creswick Court		Barrie	ON	14M 2J7	705-792-5087 (not useful)	inquiries@williamstreatiesfirstnations.ca k.a.sandy-mckenzie@rogers.com
Penetanguishene (See Attached)										