PROJECT DESCRIPTION REPORT
RENEWABLE ENERGY APPROVAL
LFG UTILIZATION BY ELECTRICITY PRODUCTION
MERRICK LANDFILL SITE

NORTH BAY HYDRO
NORTH BAY, ONTARIO

Prepared For:
North Bay Hydro
PREAMBLE

Conestoga-Rovers & Associates on behalf of North Bay Hydro has prepared the following documentation in support of the Renewable Energy Approval for the proposed Landfill Gas (LFG) Utilization Facility (Project) at the Merrick Landfill Site, North Bay, Ontario.

Currently, a landfill gas collection and flare system is operated at the Merrick Landfill Site to provide long-term control of LFG emissions. The proposed Project will use the collected LFG to generate electricity using a reciprocating engine and electrical generator (Gen Set module). The electricity produced will be sold under the Feed-in Tariff Program administered by the Ontario Power Authority (OPA) that provides long-term guaranteed pricing contracts for energy generated - with renewable resources.

The REA Application supporting documentation has been prepared in accordance with Ontario Regulation (O. Reg. 359/09) which defines the Project as a biogas facility.

Documentation submitted in support of the REA Application is organized as follows:

<table>
<thead>
<tr>
<th>Report Title</th>
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<tr>
<td><strong>1. Project Description Report, Renewable Energy Approval, LFG Utilization by Electricity Production, Merrick Landfill Site, North Bay, Ontario</strong></td>
<td>CRA June 2010 (Updated September 2010)</td>
</tr>
<tr>
<td>The Project Description Report outlines the project location, the energy sources to be used at the Facility, the technology used at the Facility, the name plate capacity, the ownership of the land on which the Facility will be developed and any negative environmental effects that may result from engaging in the project.</td>
<td></td>
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<td><strong>2. Supporting Technical Reports, Renewable Energy Approval, LFG Utilization by Electricity Production, Merrick Landfill Site, North Bay, Ontario</strong></td>
<td>CRA September 2010</td>
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<td><strong>TAB 1 Design and Operations Report</strong></td>
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<td>The Design and Operations (D&amp;O) report outlines the site location as well as the conceptual plans, specifications, and descriptions relating to the design and operations of the facility</td>
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<td><strong>TAB 2 Emission Summary and Dispersion Modelling Report</strong></td>
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<td>The ESDM report was prepared in accordance with s.26 of O. Reg. 419/05 to support the Application for REA as required by O. Reg. 359/09. In addition, guidance in the Ministry publication &quot;Procedure for Preparing an Emission Summary and Dispersion Modelling Report&quot; dated March 2009 (ESDM Procedure Document) was followed as appropriate.</td>
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<td><strong>TAB 3 Noise Screening Questionnaire</strong></td>
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<td>The noise assessment was completed in accordance with the MOE’s Basic Comprehensive Certificates of Approval (Air &amp;</td>
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Noise) – User Guide. Based on the results of the noise screening questionnaire, in accordance with the guideline a full assessment is not required.

**TAB 4 Odour Study Report**
The odour study outlines the potential sources of odour and the odour mitigation that has been included in the Project design.

**TAB 5 Construction Plan Report**
The construction report outlines the various activities that will be included in the construction of the Facility.

**TAB 6 Decommissioning Report**
The decommissioning report outlines the various activities that will be included in the event that decommissioning of the Project is required. This includes decommissioning of the Project during construction.

**TAB 7 Consultation Report**
The consultation report provides a summary of public consultation activities undertaken as part of REA process and identify concerns raise and how each of the concerns were resolved.

Attached is the Final Supporting Technical Reports, Renewable Energy Approval, LFG Utilization by Electricity Production, Merrick landfill Site, North Bay, Ontario (CRA, July 2010) and the Renewable Energy Approval Application.
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APPENDIX D REVISED NATURAL HERITAGE ASSESSMENT AND WATER ASSESSMENT IN SUPPORT OF THE RENEWABLE ENERGY APPLICATION, MERRICK LANDFILL SITE
APPENDIX E LETTER FROM CITY OF NORTH BAY REGARDING PROTECTED PROPERTY REVIEW
1.0 INTRODUCTION

Conestoga-Rovers & Associates has prepared this Project Description Report (PDR) on behalf of North Bay Hydro in support of an application for Renewable Energy Approval (REA) for the Merrick Landfill Site Landfill Gas Utilization Facility (Project).

This PDR has been structured in accordance with and addressed the requirements of the Technical Bulletin One, Guidance for Preparing the Project Description Report as part of an application under O. Reg. 359/09 (Guidance Report).

A site location map for the Merrick Landfill is provided on Figure 1. A Project location map is provided on Figure 2.
2.0 DEFINITIONS AND ABBREVIATIONS

2.1 DEFINITIONS

The Guidance Report, identified several key definitions for terms common to PDRs. For clarity in this report, key terms with project specific definitions are described below.

**Renewable Energy Generation Facility:** A reciprocating engine that generates electricity from landfill gas, including associated and ancillary equipment, systems, and electrical transmission equipment and lines.

**Renewable Energy Project:** The series of activities with respect to the construction, installation, use, operation, changing, or retiring of the above noted Renewable Energy Generation Facility.

**Project Location:** Land and air space occupied during the life of the above noted Renewable Energy Project, which is described Section 3.1 and shown, plan view, on Figure 2 - Project Location Map.

2.2 ABBREVIATIONS

The following is a list of abbreviations utilized within the PDR.

CH₄  methane  
CIA  Connection Impact Assessment  
C of A  Certificate of Approval  
CO₂  carbon dioxide  
db (A)  decibels  
ekW  equivalent kilowatts  
EPA  Environmental Protection Act  
FiT  Feed-in Tariff  
ha.  hectares  
Hz  hertz  
H₂S  hydrogen sulphide  
kPa  kilo Pascal  
km  kilometres
<table>
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<tr>
<td>LFG</td>
<td>landfill gas</td>
</tr>
<tr>
<td>LV</td>
<td>low voltage</td>
</tr>
<tr>
<td>MCC</td>
<td>motor control centre</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of the Environment</td>
</tr>
<tr>
<td>NMOCs</td>
<td>non-methane organic carbons</td>
</tr>
<tr>
<td>O. Reg.</td>
<td>Ontario Regulation</td>
</tr>
<tr>
<td>PDR</td>
<td>Project Description Report</td>
</tr>
<tr>
<td>PLC</td>
<td>programmable logic controller</td>
</tr>
<tr>
<td>psi</td>
<td>pounds per square inch</td>
</tr>
<tr>
<td>REA</td>
<td>Renewable Energy Approval</td>
</tr>
<tr>
<td>TSSA</td>
<td>Technical Standards and Safety Authority</td>
</tr>
<tr>
<td>UIP</td>
<td>utility interface panel</td>
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3.0 GENERAL REQUIREMENTS FOR RENEWABLE ENERGY GENERATION FACILITIES

3.1 GENERAL INFORMATION

Name of Project

The project is referenced herein and will be referenced during the Renewable Energy Approval Process as the Merrick Landfill Site Landfill Gas (LFG) Utilization Project (Project).

Project Location

The Project Location is within the Merrick Landfill Site. The Merrick Landfill Site is located on part of Annulled Lots 10, 11, and 12, Concessions IV and V and part of Annulled Lots 10 and 11, Concession VI, in the Unorganized Township of Merrick, District of Nipissing, approximately 21 kilometres (km) north of urban North Bay. The Site presently comprises an area of approximately 360 hectares (ha.) of which 16.4 ha. is approved for landfilling. A site location map for the Merrick Landfill Site is provided on Figure 1.

The Merrick Landfill is located in a rural area. The landfill is approved to receive waste from the City, the Township of North Himsworth (now the Municipality of Callander) and several surrounding unorganized territories. A trailer park and a few motels exist approximately 8 km south of the Merrick Landfill Site. A sewage plant and pumping station exist approximately 11 km south of the Site. The main TransCanada Pipeline, Ltd. pipeline runs west of Highway 11. There is a power line that runs approximately 8 km east of the Site, as well as a power line that runs to the Site to provide the power needed for landfill operations, including the existing LFG Flare Station Compound.

The Project Location within the Merrick Landfill Site is presented on Figure 2. The Project is located west of the landfill in the landfill buffer zone. The Project is located south of the existing LFG Flare Station Compound, which is presently used to combust the LFG collected at the Merrick Landfill Site. Access to the Project Location will be by way of existing provincial and municipal roads and roads within the Merrick Landfill Site.
3.2 CONTACT INFORMATION

Applicant

The application for the Project is North Bay Hydro. Contact information is provided below.

Contract: Mr. Todd Wilcox, Chief Operating Officer
North Bay Hydro
74 Commerce Crescent
North Bay, ON P1B 8Y
Phone: 705-474-8100 ext. 305
Fax: 705-474-1188
Email: twilcox@northbayhydro.com

Project Consultant

The Project consultant is Conestoga-Rovers & Associates Limited. Contact information is provided below.

Contact: Ms. Christine Skirth, C.E.T., PMP
Conestoga-Rovers & Associates
179 Colonnade Road, Suite #400
Ottawa, ON K2E 7J4
Phone: (613) 727-0510 ext. 212
Fax: (613) 727-0704
Email: cskirth@craworld.com

3.3 AUTHORIZATIONS REQUIRED

This section summarizes the relevant permits, licenses, and authorizations that the applicant will obtain before proceeding with the Project.

3.3.1 MINISTRY OF THE ENVIRONMENT

Renewable Energy Approval (REA). A REA application and supporting documentation will be prepared and submitted to the Ministry of the Environment (MOE) in accordance with Part V.01 Section 47.3 of the Environmental Protection Act (EPA).
3.3.2 HYDRO ONE

Connection Impact Assessment (CIA): A CIA will be completed and submitted to Hydro One to assess the impact of connecting the generator to system. The CIA will be completed in accordance with the Feed-In Tariff (FiT) Program guideline.

3.3.3 TECHNICAL STANDARDS AND SAFETY AUTHORITY (TSSA)

Approval for Digester and Landfill Gas Installations: During the design and construction phases of the Project, approval from the TSSA will be obtained for the installation of the equipment.

3.3.4 CITY OF NORTH BAY

Building Permit: During the design and construction phase of the Project, a review of the building design will be completed by the City of North Bay.

3.4 FEDERAL INVOLVEMENT

This Project is not subject to a Federal Environmental Assessment.
4.0 PROJECT INFORMATION

4.1 ENERGY SOURCES

The LFG collected from the Merrick Landfill Site will be used to generate electricity for this Project. The LFG is presently collected by the existing landfill gas and flaring system at the Merrick Landfill Site. For the Project LFG will be diverted from the flare to the reciprocating engine (generator). The following sections provide an overview of landfill production and the existing LFG collection and flaring system.

4.1.1 LFG OVERVIEW

The Merrick Landfill Site is presently approved for the disposal of domestic, commercial, and non-hazardous solid industrial wastes, including digested sewage sludge from the North Bay Wastewater Pollution Control Plant. Typical of a municipal solid waste landfill site, LFG is produced at the Merrick Landfill Site.

LFG is produced as a result of the anaerobic biological decomposition of solid waste placed in a landfill. The composition of LFG is highly variable and is dependent on a number of site-specific conditions which include solid waste composition, density, moisture content, and age. However, LFG is primarily composed of two gases, methane (CH₄) and carbon dioxide (CO₂), approximately 50 percent each by volume (v/v), with other trace constituents including sulphur compounds, volatile organic compounds (VOC), and other non-methane organic carbons (NMOCs) (typically less than 1 percent v/v). In addition, the LFG is typically saturated with moisture.

Release of LFG into the atmosphere may also contribute to odours in the vicinity of a landfill and may add GHGs into the atmosphere. LFG odours are primarily a result of the presence of hydrogen sulphide (H₂S) and mercaptans. These compounds may be detected by sense of smell at very low concentrations [0.005 and 0.001 parts per million (ppm)]. It is generally recognized that impacts related to these compounds are nuisance odours. A common odour management strategy is to collect and combust LFG. The combustion of LFG through this Project will provide the Merrick Landfill Site with odour control. There are no known environmental concerns relating to LFG odour issues at the Merrick Landfill Site and the landfill is not required to collect and manage LFG under the existing Site approvals.
4.1.2 **LFG COLLECTION AND FLARING SYSTEM**

The LFG for the Project will be obtained from the transfer piping between the existing LFG collection system blower and flare. Essentially, LFG that is currently combusted in the flare will be directed to the generator and will be combusted to generate electricity. The source of the LFG for the Project, which is limit of the Project, is identified on Figure 3.

The existing LFG collection and flaring system is presently comprised of the following three major components:

1. LFG collection field - to remove LFG from the waste through extraction wells located within the limit of waste and include collection piping to convey LFG from the collection field to the LFG management facility.
2. LFG management facility - to house mechanical and electrical components required for the extraction and delivery of LFG for disposal by flaring.
3. Condensate management system – to remove liquid condensate from the LFG collection system and to direct the condensate to the on-Site groundwater pump station.

The existing C of A (Air) No. 8033-6SXL82 for the Merrick Landfill Site was issued August 24, 2006 for the LFG collection and flare system. A copy of the existing C of A (Air) for the Merrick Landfill Site is provided in Appendix A.

4.2 **PROJECT COMPONENTS**

This Section provided a description of the facilities, equipment, and technology that will be used to convert the LFG to electricity.

The permanent key components of the Project include:

- Gas Conditioning Module
- Generator Set (Gen Set) Module
- Electrical Module
- Electrical Sub-Station
- Transmission Lines
General infrastructure associated with the Project will include:

- Perimeter chain link fence and a vehicle gate
- Gravel surfaced compound
- Gravel surfaced access driveway for vehicles
- Above ground stainless steel LFG piping
- LFG analyzer
- LFG flow meter

Information presented below is based on the technical proposal submitted by the successful proponent for this project, Tormont Cat Power Systems (Toromont).

4.2.1 LANDFILL GAS CONDITIONING EQUIPMENT

The LFG will be conditioned prior to be used by the generator set module. The landfill gas, when received from the landfill collection system, will be fully saturated at approximately 25 to 30 degrees Celsius. A suction separator will remove liquids prior to the inlet of the blower. The LFG will pass through the blower discharge silencer to the air cooled heat exchanger and a condensate separator before entering the engine. As well as managing the gas temperature, the removal of moisture has the additional benefit of removing any soluble chemicals in the gas stream.

The LFG conditioning equipment will be located in a steel container structure mounted on a skid. The skid will be placed at the Project Location on a reinforced concrete slab. The container will be approximately 1.5 metres long by approximately 1.5 metres wide with a roof height of approximately 3 metres. The steel container will have access through two doors. The container will contain:

- LFG Plant Piping: LFG will be conveyed to the LFG gas conditioning equipment from the tap point on the existing LFG piping to the flare.
- Blower: One roots-type blower. The blower will be designed to produce compressed gas of up to approximately 48 kPa (7 psi) controlling constant pressure supply to the engine at variable loads to meet the needs of the generator set fuel system. Blower appurtenances will include emergency shut off valve, isolation valves, check valves, and flexible couplings. The blower will be monitored and controlled through a programmable logic controller (PLC) driven control panel located in the electrical...
module. Remote annunciation of alarms and shutdowns will alert operations staff such that prompt intervention can occur.

- Moisture Separator: Located immediately after the blower. The moisture separator will to remove any condensate from the LFG.

### 4.2.2 GENERATOR SET MODULE AND APPURTENANCES

A sound-attenuated generator set will be supplied, containing a Caterpillar model G3520C generator set. The generator set will be a 1600 ekW, 600V, 3 phase, 4 wire, 60 Hz generator. This module will be factory built, pre-assembled, tested, and shipped to site with minimal site fabrication required. The power module will be installed on a slab on grade.

The enclosure of the module will be similar to a large shipping container type structure (the drop-over type) measuring approximately 3.6 metres wide, with generous room to fully walk around and service the generator set without the need to open hatches to access equipment and expose the electrical generator and engine to the weather.

The generator set will contain ancillary equipment required to support power generation including:

- Starting and control batteries
- Battery chargers
- Lube oil
- Jacket water heater for the engine
- Automatic lubricating oil make-up system
- Aftercooler coolant expansion tanks, level switches and sight gauges to allow coolant systems to operate through out all engine temperature ranges
- Radiator motor(s) with variable frequency drives to maximized electrical output by automatically matching the requirements of the engine
- Exhaust silencer mounted horizontally on the roof of the power module with 3 metre stack

Infrastructure associated with the generator set includes:

- Electric unit heaters
• Ventilation systems
• Lighting systems
• Fire detection linked back to the control system and associated annunciation equipment
• Exterior expanded metal gratings and stairs will be provided (as required) for access into the module

4.2.3 ELECTRICAL MODULE AND APPURTEANCES

The electrical module will consist of a steel structure directly attached to the generator module that will be enclosure and mounted on the same reinforced concrete slab as the generator set. The module will be 3.6 metres long and 3.6 metres wide. The electrical module will have access through two doors. The module will be insulated and have interior cladding.

The electrical module will house the motor control centre (MCC) and lighting panels to service the generator set module and the LFG conditioning equipment. The MCC consists of breakers (small normal loads), combination starters (ventilation fans) and variable frequency drives (jacket water radiator motors) and starters (blower).

The electrical module will house the generator set PLC and a central PLC for the Project. The PLC system will be designed to control the blowers and flare for unattended operation of the gas plant. Remote annunciation will be provided to alert operations staff of a plant alarm or shutdown.

Synchronizing and paralleling of the power generated will take place through the low voltage (LV) (600V) utility-grade switchgear mounted in the electrical module. This switchgear will include any necessary metering & protection to satisfy Hydro One Networks Inc. parallel generation standards.

The electrical module will also house the Utility Interface Panel (UIP) for integration of the Project with the North Bay Hydro for purposes of protection and controls.

Infrastructure associated with the electrical module includes:

• electric space heating
• combustible gas detection system
• ventilation

4.2.4 **ELECTRICAL SUB-STATION**

The electrical sub-station will consist of an outdoor, bus-connected, pad-mount transformer. The sub-station equipment will also include a pad-mounted station service transformer (approx. 200 kVA) to supply 600 V to plant loads such as pumps, chiller, blowers and other loads.

4.2.5 **TRANSMISSION LINES**

The electrical energy generated from the Project will be transmitted to the electrical utility via existing transmission electrical lines. New transmission lines will be required between the Project Location and the existing transmission line servicing the adjacent LFG Flare Station Compound. All new transmission lines will be located within the boundary of the Merrick Landfill Site.

4.3 **RENEWABLE ENERGY GENERATION FACILITY CLASSES**

The LFG fueled reciprocating engine for this Project is not specifically classified in the EPA, O. Reg. 359/99, Part II Classes of Renewable Energy Generation Facilities.

The REA process requirements for this bio-gas Project are detailed in the Guidance Report, Appendix 4 – REA Requirement Summary Tables for Renewable Energy Facilities by Technology.

4.4 **PROJECT ACTIVITIES**

The regulated activities (i.e., construction, installation, use, operation, changing, and retiring) for the Project are described are outlined below. The emissions anticipated during the Project and the water taking requirements are also outline. The general schedule for the Project is also provided.
4.4.1 DESCRIPTION OF REGULATED ACTIVITIES

At this time the following regulated activities are anticipated for the Project and are further described below:

- Construction / Installation
- Use/Operation
- Retiring

Changes to the Project are not anticipated at this time during the first 10 year’s of operation, which is the length of the current contract awarded for the operation of the Project. Note that routine maintenance or replacement of existing components is not considered a change to the facility.

Construction / Installation

Construction/installation activities will occur following receipt of required regulatory approvals. The Project will be designed and constructed by a Design/Builder retained by North Bay Hydro. The Design/Builder will install the key components of the Project as described in Section 4.2.

In general the construction/installation activities will include:

- Civil works including: earthworks to create a gravel surfaced compound area, installation of concrete pads for the various project components, and installation of Project Location compound fencing
- Mechanical and electrical works including: installation of the various modules and components for the Project, landfill gas piping connections between the Project and the LFG Flare Station Compound and within the Project Location, and electrical and control system connection with the Project Location and to the existing electrical transmission line infrastructure at the Merrick Landfill Site.

Use/Operation

The Project will be operated by an Operator retained by the North Bay Hydro. The operator will be required to operate and maintain the Project in accordance with its applicable regulatory approvals. During operation the Project will produce electrical power that will be transmitted to the local electrical grid.
Retiring

The retiring of the infrastructure for the Project is not yet scheduled. The Project is anticipated to operate in excess of 10 years. When the Project infrastructure is retired the associated infrastructure will be removed from the Project Location. The modules will be removed for reuse or appropriate disposal in accordance applicable provincial regulations, including O.Reg. 347 General - Waste Management under the EPA. Above ground infrastructure will be similarly removed from the Project Location and reused or sent for appropriate disposal. Subsurface infrastructure will be removed to a depth of at least 150 mm below ground surface and the infrastructure extending beyond 150 mm in depth with be suitably capped.

4.4.2 EMISSIONS AND MANAGEMENT

The following emissions are anticipated from the Project:

- noise
- air contaminants
- condensate

The noise and air emissions during operation of the generator will be in compliance with the REA obtained for the operation of the Project. Noise emissions are anticipated to be consistent with the generator set manufacture’s technical specification, provided in Appendix B. Air emissions contaminants will include products of combustion and volatile organic compounds. Sections 4.7.4 and 4.7.5 provides a discussion of the management of noise and air emissions.

Air emissions (dust) generated during the construction and retiring of the Project will be managed consistent with good construction practices as described in Section 4.7.4.

Condensate will be collected during operation of the Project from the moisture separate in the LFG conditioning module and will be transferred from the Project Location to the adjacent LFG Flare Station Compound. The condensate will be transferred to the existing and previously approved condensate management system at the Flare Station Compound.
4.4.3 WATER TAKING ACTIVITIES

The Project will not require the use of any groundwater. No water taking activities are associated with this Project. A Permit to Take Water is not required for this Project.

4.4.4 SCHEDULE

The key Project milestones are indicated below. The design and construction phases for the project have been grouped together as these activities will be undertaken by the Design/Builder retained by North Bay Hydro.

**Project REA Preparation**
- First Public Consultation: May 27, 2010
- Second Public Consultation: October 2010
- REA Submission to MOE: October 2010

**Regulatory Approvals**
- CIA Approval: Jun 2010 to May 2011
- TSSA Approvals: Within Design and Construction
- Building Permit: Within Design and Construction

**Design and Construction by Design/Builder**
- 9 months following REA approval

**Operation**
- > 10 years

**Decommissioning**
- To be determined based on availability of the energy resource (LFG).

4.5 NAMEPLATE CAPACITY

The nameplate capacity of the Caterpillar G3520C landfill generator set is 1600 kWe. Technical information provided by Caterpillar on this generator set is provided in Appendix B.
4.6 **LAND OWNERSHIP**

The Land to be used for the Project is owned by the Corporation of the City of North Bay. An Agreement will be established between North Bay Hydro and The City of North Bay for use of this land for the Project.

4.7 **DESCRIPTION OF ENVIRONMENTAL EFFECTS**

Conestoga-Rovers & Associates has completed numerous site visits to the Merrick Landfill Site and was the design engineer for Updated design of the landfill Site and the existing LFG collection and flaring system. The Flare Station Compound is located adjacent to the proposed Project Location.

Landfilling operations commenced at the Merrick Landfill Site on July 1, 1994 subsequent to issuance of Provisional C of A for a Waste Disposal Site No. A530116. The C of A was issued by the MOE on November 1, 1993, under Part V of the EPA following the successful completion of an Environmental Assessment. There have been eight subsequent notices issued documenting changes in the approvals for the operation of the Merrick Landfill Site. A copy of the existing C of A (Waste Disposal Site) for the Merrick Landfill Site is provided in Appendix A.

4.7.1 **HERITAGE AND ARCHAEOLOGIC RESOURCES**

Dr. John Pollack of Woodland Heritage Services Limited was retained to complete an assessment of the Project Location with respect to heritage and archaeologic resources. The assessment concluded that no areas of archaeological or cultural heritage potential were identified. A copy of the assessment is provided in Appendix C.

4.7.2 **NATURAL HERITAGE RESOURCES**

A Natural Heritage was carried out at the Project Location by Knight Piésold Consulting. No significant natural heritage features were found and no significant problems with respect to natural heritage are anticipated as a result of the Project with respect to natural heritage. The Natural Heritage Assessment is presented in Appendix D.
4.7.3 WATER BODIES

A Water Assessment was carried out at the Project Location by Knight Piésold Consulting. No significant water features were found and no significant problems are anticipated as a result of the Project with respect to water bodies. The Water Assessment is presented in Appendix D.

4.7.4 AIR, ODOUR, DUST

During the construction and retiring of the Project dust emissions consistent with transportation and civil construction earthworks by mechanical means are anticipated. Consistent with good construction practices, the dust and particulate control measures, such as a water misting system and limiting the maximum speed of vehicles on access roads, will be implemented as required to minimize the generation of dust and particulate.

During the operation of the project air emissions, such as products of combustion (i.e., carbon dioxide, water) and volatile organic compounds, are anticipated from the generator set exhaust. The G3520 engine exhaust system consists of outboard mounted insulated exhaust manifolds that gather the combustion exhaust from each cylinder and direct the exhaust to the forward-mounted turbocharger. The turbocharger turbine section is spun by the exhaust gas flow and expansion. The turbine is directly connected to the compressor wheel that compresses the combustion air as it is drawn through a high efficiency replaceable element air cleaner.

A study (modelling) of the air emissions will be undertaken in accordance with requirement 6 in Table 1 of O. Reg. 359/09. The air emissions study will meet the requirements of O. Reg. 419/05 of the EPA and will be undertaken to demonstrate compliance with the MOE Point of Impingement criteria under O. Reg. 419/05.

Dust emissions are not anticipated during the operation of the facility. No earthworks are required during the operation of the facility.

No significant odour emissions are anticipated during the operation of the Project. The Project will combust landfill gas, which is a common LFG odour management control measure. There are no known environmental concerns relating to LFG odour issues at the Merrick Landfill Site.
4.7.5 **NOISE**

The proposed generator set will have a sound attenuated to a noise level of 86 db (A) at 3 metres for the generator module. Noise from the generator is managed by a silencer that is connected to the turbocharger outlet. The Project will comply with the applicable MOE noise criteria in Section 9 of the EPA.

Consistent with requirement 8 of Table 1 in O. Reg. 359/09, a noise study will be undertaken to ensure that the Project will comply with the MOE noise criteria. The noise study will be prepared in accordance with Appendix A of the Ministry of the Environment publication entitled “Basic Comprehensive Certificates of Approval (Air) – Users Guide”, dated April 2004.

4.7.6 **LAND USE AND RESOURCES**

The current land use for the Project Location and 300 metres radius from the Project Location is active landfill which operates under a C of A issued by the MOE. Prior to establishing the landfill the site the lands comprising the Merrick Landfill Site were undeveloped land owned by the Crown. No potential negative effect of the availability of resources will result from the Project.

4.7.7 **PROVINCIAL AND LOCAL INFRASTRUCTURE**

During construction of the Project, material will be hauled to the Site using provincial and local roads. The truck volume is expected to be minimal (i.e., less than 100 trucks over the nine month construction period) as such no potential negative environmental impact is required and a permit is not required.

All other services and infrastructure required for the works will be obtained from on-Site.

During operation of the Project there is no potential for negative environmental impact on provincial or local infrastructure.
4.7.8 **PUBLIC HEALTH AND SAFETY**

There are no anticipated public health and safety issues associated with the construction, operation, or retiring of this project.

4.7.9 **AREAS PROTECTED UNDER PROVINCIAL PLANS AND POLICIES**

The City of North Bay conducted a review of natural heritage resources at the Project Location. It has been determined that the project location is not on a property described in Section 19 of O. Reg. 359/09. Therefore there are no Protected Property Requirements and no written authorization is required to meet the requirements described in Section 19 of O. Reg. 359/09. A copy of the letter providing this confirmation from the City of North Bay is provided in Appendix E.

For clarification, the Project Location is located outside of the:

- Protected Countryside / Natural Heritage System
- Oak Ridges Moraine Conservation Plan Area
- Niagara Escarpment Plan Area
- Lake Simcoe Watershed Plan Area

4.8 **PROJECT LOCATION MAP**

A Project Location Map is provided on Figure 2. As requested in Section 4.9 of the Guidance Report, the following features are identified on Figure 2 for the Project:

- Land uses on the Project Location
- Off-site land uses with 300 metres of the Project Location
- Relevant features identified in the PDR

The Project is located within the buffer zone of the Merrick Landfill Site. Land uses within 300 metres of the Project Location includes: landfill fill area and landfill buffer zone.

The setbacks from features identified in Appendix 5 of the Guidance Report are indicated on Figure 2. The setback distanced for natural features and water bodies
identified in O. Reg. 359/09 have been reviewed. All natural features identified in Appendix 5 of the Guidance Document are discussed below.

**Wetlands**

The Project Location is south of the northern limit of Eco Regions 5E, 6E and 7E as shown in Figure 1 in the Provincial Policy Statement¹ (Provincial Policy Statement). As such, setback distances from southern wetlands apply to this Project.

The nearest wetland is located greater than 400 metres from the Project Location. This wetland is outside of the set back distance required by Section 38(1)2 of O. Reg. 359/09.

**Areas of Natural or Scientific Interest (ANSI)**

There are no areas of natural or scientific interest or significant with in 50 metres (earth science) or 120 metres (life science) of the Project Location. As such, the Project is permissible under Section 38(1)4 and 38(1)5 of O. Reg. 359/09.

**Valleyland and Woodlands**

The Project Location is outside of the area described by the Provincial Policy Statement as being south and east of the Canadian Shield.

The setback distanced for valleylands and woodlands, identified in Sections 38(1)6 and 38(1)7 of O. Reg. 359/09, do not apply to this Project.

**Provincial Parks and Conservation Reserves**

There are no provincial parks or conservation reserves within 120 metres of the Project Location. As such, the Project is permissible under Section 38(1)9 and 38(1)10 of O. Reg. 359/09.

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¹ Issued under Section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005
**Water Bodies**

The Project Location is more than 400 metres from the Little Sturgeon River, which is a permanent river. Figure 2 indicates the setback distance of the Project Location from this watercourse.

The Project Location is beyond the setback distance of 30 metres from the average annual high water mark of a permanent or intermittent stream identified in Section 39(1)2 of O. Reg 359/09 or 120 metres from the average annual high water mark of a permanent or intermittent stream identified in Section 40(1)3 of O. Reg 359/09.

The set-back distances for greenbelts (Sections 41 of O.Reg 359/09), the Oak Ridges Moraine (Section 42 to 46 of O.Reg 359/09) do not apply to this Project.
CONESTOGA-ROVERS & ASSOCIATES

All of Which is Respectfully Submitted

Victoria Shortreed, P.Eng.

Tej Gidda, Ph.D., P. Eng.

Christine Skirth, C.E.T., PMP
APPENDIX A

EXISTING MERRICK LANDFILL SITE APPROVALS
AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A530116

Ontario

The Corporation of the City of North Bay
200 McIntyre Street East, P.O. Box 360
North Bay, Ontario
P1B 8V6

Site Location: Merrick Landfill Site
Part of annulled Lots 10, 11 and 12, Concessions IV and V
Part of annulled Lots 10 and 11, Concession VI
Unorganized Township of Merrick, District of Nipissing

You have applied in accordance with Section 27 of the Environmental Protection Act for approval of:

the use and operation of a 16.4 hectare landfilling area within a 360 hectare landfill site to be used for the
landfilling of domestic, commercial and non-hazardous solid industrial waste including digested sewage sludge
from within the designated service area.

Note: Use of the site for any other type of waste is not approved under this Certificate and requires obtaining a
separate approval amending this Certificate.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following
definitions apply:

DEFINITION OF TERMS

1. In this Provisional Certificate of Approval:

   a) "Certificate" means this Provisional Certificate of Approval as amended from time to time,
      including all Schedules attached to and forming part of this Certificate;

   b) "City" or "Owner" means the Corporation of the City of North Bay;

   c) "Director" means one or more persons who from time to time are appointed under Section 5 of
      the Environmental Protection Act;

   d) "MOE" means the Ministry of the Environment.

   e) "Regional Director" means the Director, MOE, Northern Region;

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"District Manager" means the District Manager of the Ministry of the Environment, Timmins/North Bay District;

"Site" means the entire waste disposal site including the landfilling area, buffer lands and attenuation zones approved by this Certificate of Approval;

"EPA" means the Environmental Protection Act, R.S.O. 1990, c. E.19, as amended;

"OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O.40, as amended,

"Reg. 347" means Regulation 347 - R.R.O. 1990, General - Waste Management, as amended, made under the EPA;

"PWQO" means the Provincial Water Quality Objectives, dated July 1994 (and as amended);

"Reasonable Use Guideline" means the Ministry Guideline B-7 entitled "Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities", dated April 1994, as amended;

"30Q20 Flow" means the 30 day low flow recurring, on average once every 20 years; and

"Property" means the Site.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below.

GENERAL PROVISIONS

2. The City shall allow MOE personnel, or MOE authorized representative(s), upon presentation of credentials, to carry out any and all inspections authorized by the EPA, the OWRA or the Pesticides Act, as amended from time to time, of any place to which this Certificate relates and without restricting the generality of the foregoing:

i) enter upon the premises or the location where the records required by the Conditions of this Certificate are kept;

ii) have access to and copy, at any reasonable time, any records required by the Conditions of this Certificate;

iii) inspect at reasonable times any facilities or equipment (including monitoring and control equipment), practices or operations required by the Conditions of this Certificate; and

iv) sample and monitor at reasonable times for the purposes of assessing compliance with the Conditions of this Certificate.
3. This waste disposal Site shall be designed and operated in accordance with the documents listed in the attached Schedule "A" and with the conditions in this Certificate of Approval. Should there be any discrepancies between any of the Schedules and the conditions in this Certificate, the Conditions shall take precedence. Should there be discrepancies between the documents listed in Schedule "A", the document bearing the most recent date shall take precedence.

4. This Certificate revokes all previously issued Provisional Certificates of Approval issued under Part V of the EPA for this Site. The approval given herein including the terms and conditions set out, replaces all previously issued approvals and related terms and conditions under Part V of the Act for this Site.

5. The requirements specified in this Certificate are minimum requirements and do not abrogate the need for the City to take all reasonable steps to avoid violating the provisions of all other applicable legislation.

6. The requirements of this Certificate are severable. If any requirement of this Certificate, or the application of any requirement of this Certificate, to any circumstances, is held invalid, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected thereby.

NOTIFICATION

7. The Owner shall notify the Director, in writing, of any of the following changes within thirty (30) days of the occurrence of the change:
   a) change of owner or operator of the Site or both;
   b) change of address or address of new owner;
   c) change of name of the Owner or any change of business name or style; and

The Notification shall include a copy of the most current "Initial Notice or Notice of Change" filed under the Corporations Information Act, R.S.O. 1990, as amended from time to time, or if that Act is not applicable, a copy of the most recent registration under the Business Names Act, R.S.O. 1990, as amended from time to time.

8. The City shall ensure that all communication made pursuant to this Certificate will refer to this Certificate No. A 530116

PROHIBITION/REGISTRATION ON TITLE

9. Pursuant to Section 197 of the Environmental Protection Act, neither the Owner nor any person having an interest in the Property shall deal with the Property in any way without first giving a copy of this Certificate to each person acquiring an interest in the Property as a result of the dealing.

POTABLE WATER:

10. No water obtained from a well constructed on site shall be used for drinking purposes.
11. Any water supply system on site which obtains water from a well on site shall be clearly marked to indicate that the water is not potable.

12. A supply of potable water from off-site shall be maintained on site.

CONSTRUCTION, INSTALLATION and PLANNING

Major Works
13. For the purposes of this Certificate the following are Major Works:
   a. gas management system;
   b. leachate management system;
   c. groundwater management system; and
   d. liner.

14. A final detailed design shall be prepared for each Major Work to be constructed at the Site consistent with the conceptual design of the Site as outlined in the Design and Operations Report and Items 12 and 13 on Schedule "A".

15. The final detailed design of each Major Work shall include the following:
   a. design drawings and specifications;
   b. a detailed quality assurance / quality control (QA/QC) program for construction of the major work, including necessary precautions to avoid disturbance to the underlying soils; and
   c. details on the monitoring, maintenance, repair and replacement of the engineered components of the major work, if any.

16. Any design optimization or modification that is inconsistent with the conceptual design shall be clearly identified, along with an explanation of the reasons for the change.

17. Prior to commencement of construction on site, the final detailed design of each Major Work shall be submitted to the Director, with copies to be provided to the District Manager.

18. No construction of a Major Work shall commence prior the Director approving, in writing, the final detailed design of that Major Work. Each major work shall be constructed in accordance with the approved final detailed design and the QA/QC procedures shall be implemented as approved by the Director.

19. As-built drawings for all Major Works shall be retained at the City of North Bay offices and made available to Ministry staff for inspection.

Closure Plan
20. At least 2 years prior or when 90% of the site capacity is reached, whichever comes first, the Owner shall submit to the Director for approval, with copies to the District Manager, a detailed
site closure plan pertaining to the termination of landfilling operations at this Site, post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:

a. a plan showing Site appearance after closure;
b. a description of the proposed end use of the Site;
c. descriptions of the procedures for closure of the Site, including:
   i. advance notification of the public of the landfill closure;
   ii. posting of a sign at the Site entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
   iii. completion, inspection and maintenance of the final cover and landscaping;
   iv. site security;
   v. removal of unnecessary landfill-related structures, buildings and facilities;
   vi. final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
   vii. a schedule indicating the time-period for implementing sub-conditions i) to vi)
above.

viii. descriptions of the procedures for post-closure care of the Site, including:
d. operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
e. record keeping and reporting; and
f. complaint contact and response procedures;
g. an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and,
h. an updated estimate of the contaminating life span of the Site, based on the results of the monitoring programs to date.

21. The Site shall be closed in accordance with the closure plan as approved by the Director.

Proper Operation

22. Except as otherwise provided by these conditions, the Site shall be constructed, operated and developed in accordance with the Design and Operations Report as amended by item 12 and 13 in Schedule "A" of this Certificate.

23. The Site shall be properly operated and maintained at all times. All waste shall be managed and disposed of in accordance with the EPA, Regulation 347 and the requirements of this Certificate. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

24. The Owner shall deposit waste in a manner that minimizes exposure area at the landfill working face to no more than 30 metres and all waste shall be compacted before cover is applied.

Operations Manual

25. To assist the Site operating personnel, the City shall ensure that a manual is kept on site at all
times following the commencement of landfilling describing the day to day operation of the Site. A copy of the manual shall be provided to the District Manager. The manual shall be reviewed and updated annually and any changes shall be provided in the Annual Report.

**Vermin, etc.**

26. The Site shall be operated and maintained such that the vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

27. No scavenging is to occur at the Site.

**Dust**

28. The Owner shall control fugitive dust emissions from on-site sources including but not limited to on-site roads, stockpiled cover material and, closed landfill area prior to seeding especially during times of dry weather conditions. If necessary, major sources of dust shall be treated with water and/or dust suppression materials to minimize the overall dust emissions from the site.

**Noise**

29. The Owner shall comply with noise criteria in MOE Guideline entitled “Noise Guidelines for Landfill Sites.”

**Burning of Waste:**

30. Burning of waste at the Site is prohibited.

**LANDFILL GAS:**

31. All buildings are to be free of any landfill gas accumulation. The Owner shall provide adequate ventilation systems to relieve landfill gas accumulations in buildings if necessary.

32. Combustible gas alarms shall be installed in any enclosed on-site buildings.

33. The City shall install a landfill gas probe between the landfill footprint and the weigh scale prior to the construction of Cell 8. The City shall also submit to the District Manager a gas monitoring program for the landfill gas probe six (6) months prior to active landfilling in Cell 8.

**SURFACE WATER:**

34. The Owner shall take all appropriate measures to minimize surface water from coming in contact with waste.

35. Storm water drainage works shall not be constructed at the Site except in accordance with a Certificate of Approval issued under Section 53(4) of the Ontario Water Resources Act, R.S.O.
1990.

LITTER CONTROL:

36. The Owner shall take all practical steps to prevent escape of litter from the site. Periodic pick-up of litter around the Site and along the Site perimeter road, access road and along Sand Dam Road from the Site to Highway 11 shall be carried out as required and biweekly as a minimum. Property adjacent to the fill area shall be inspected weekly. All loose, windblown litter shall be collected and disposed of at the landfill working face.

Waste Type

37. Only municipal waste and digested sewage sludge from an approved facility within the site service area shall be accepted at the Site.

38. Any waste type not listed in the previous condition shall not be accepted at the Site.

Weigh Scales:

39. The City shall monitor the weight of all waste received for disposal by the use of weigh scales except for waste delivered in small quantities where a procedure for making this determination has been previously developed in consultation with the District Manager. Where the weigh scales are temporarily out of operation, estimates of waste volumes and density shall be used to estimate the weight of waste received for disposal.

Capacity

40. Waste may only be disposed of within the 16.4 hectares fill area as described in the Design and Operations Report and Items 12 and 13 on Schedule "A".

41. The maximum amount of waste, daily cover, intermediate cover and final cover which may be deposited at the site within the fill area shall not exceed 2,848,000 cubic metres.

42. No waste shall be received for disposal at the Site after the final waste disposal landform contours, as defined in the Design and Operations Report and Items 12 and 13 on Schedule "A", are reached.

Service Area

43. Only waste from the following municipalities and unorganized territories may be accepted at the site:
   City of North Bay
   Municipality of Collander
   Merrick Township
   Stewart Township
Gladman Township
Hammell Township
Lyman Township
Notman Township
Blyth Township

Contaminant Attenuation

44. Soil which is relied upon for contaminant attenuation, or which may be relied upon for contaminant attenuation under the contingency plan, and which is located on any part of the Site outside of the fill area shall not be excavated.

Daily and Intermediate Cover

45. Cover material shall be applied as follows:
   a. Daily Cover - At the end of each working day, the entire working face shall be covered with a minimum thickness of 150 mm of soil cover or an approved thickness of alternative cover material in a manner that ensures that no waste is exposed; and,
   b. Intermediate Cover - In areas where landfilling has been temporarily discontinued for three (3) months or more, a minimum thickness of 300 mm of soil cover or an approved thickness of alternative cover material shall be placed.

Final Cover:

46. Within twelve (12) months of any part of the fill area having reached its limit of fill, final cover material shall be applied and compacted. The compacted cover material shall be at least 0.9 metres thick which shall include a minimum 0.75 metre thick layer of material with an in place hydraulic conductivity of less than $4.7 \times 10^{-8}$ m/s to $1 \times 10^{-4}$ m/s and a 0.15 metre thick layer of material such as topsoil, which will sustain vegetation.

47. Alternatively, the City may utilize a Geosynthetic Clay Liner (GCL) as a final cover material. Prior to installation of the GCL the City shall provide the following information to the Director:
   
   a. engineering properties of the GCL including Atterberg limits, organic carbon content, mineralogy, shear strength, hydraulic conductivity and hydrated thickness under field stress conditions;
   b. procedures for visually inspecting the suitability of the subgrade;
   c. methods of protecting the GCL during shipping, storage and handling;
   d. deployment of the GCL at the construction site including a panel layout plan, seam preparation, seaming methods and how the opening of seams will be avoided;
   e. a description of the inspection, sampling, testing methods and frequencies to be employed to assure that the GCL meets the design requirements; and,
   f. a demonstration that there will be adequate shear strength both within the GCL and between the GCL and other components of the liner system so that slippage and sloughing does not occur on side slopes.

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48. A progressive revegetation program shall be carried out each fall season in areas where final contours have been reached and vegetation not yet established. The revegetation shall be done using drought resistant low nutrient requirement grass and legume blends which regenerate annually.

Alternative Cover Materials:

49(a) A polyethylene landfill cover may be used as an alternative material to soil as a daily cover at the Site for an indefinite period in accordance with Items 7 and 8 on Schedule "A".

49(b) Adequate soil cover material shall be kept available for use should the polyethylene landfill cover be damaged, ineffective or otherwise prove unsuitable.

50. With the exception of a polyethylene tarp, only natural earth materials such as soil shall be used for daily cover unless a monitoring program has been established at the Site in accordance with the Ministry's document entitled "Guidance Manual for Landfill Sites Receiving Municipal Waste" dated November, 1993.

51. Waste which is dewatered sewage sludge may only be used for daily, intermediate or final cover at the Site if it is passively dried and mixed with sand at a ratio of between four and six parts (by weight) sand for each part sewage sludge.

52(a) For the purpose of this Condition, "Alternative material" means wood chips, sawdust, compost or contaminated fill that does not produce leachate exceeding any contaminant concentration specified in Schedule 4, Ontario Regulation 558/01 (amendment to Regulation 347), or a mixture of dewatered sewage treatment plant sludge mixed in a ratio of 1:4 (by volume) with clean fill from within the site service area.

52(b) Notwithstanding Conditions 45, 51 and 52, the owner or operator is allowed to use an alternative material to soil as a daily cover at the Site for an indefinite period.

52(c) Sufficient soil daily cover material or other approved daily cover material shall be available for use, either when Site conditions do not permit use of alternative daily cover material, or if performance of the material is unsatisfactory; and

52(d) The performance and impact of the use of the alternative daily cover material shall be detailed as a part of the annual report required under condition 90 of this Certificate to be submitted by April 15th of each year.

53. The use of any other alternative materials as daily or intermediate cover material is subject to approval by the Director.

Site Security and Access
54. During non-operating hours, the Site entrance and exit gates shall be locked and the Site shall be secured against access by unauthorized persons.

55. Except for drop-off boxes located outside the Site gate, no waste shall be accepted, landfilled or removed from the Site unless a Site supervisor is present and supervises the operation.

56. The Site is deemed to be closed when a Site supervisor is not present at the Site.

Employees and Training

57. The City shall ensure that all supervisors of the Site have been adequately trained with respect to the following without limitation:

- the relevant waste management legislation including EPA, O Reg. 347 and 558, regulations and guidelines;
- major environmental and occupational health and safety concerns pertaining to the waste to be handled;
- the proper handling of wastes;
- the management procedures including the use and operation of equipment for the processes and wastes to be handled;
- the emergency response procedures;
- the terms, conditions and operating requirements of this Certificate and,
- proper inspection, receiving and recording procedures and the activities to be undertaken during and after a load rejection.

GROUNDWATER MONITORS

58. The Owner shall ensure all groundwater monitoring wells are properly capped, locked and protected from damage. Tamper proof casings and caps on all monitoring wells shall be maintained by the City.

59. In areas where landfiling is to proceed around monitoring wells, suitable extensions shall be added to the wells and they shall be properly re-secured.

60. Any groundwater monitoring wells included in the monitoring program shall be assessed, repaired, replaced or decommissioned as required.

61. The Owner shall repair or replace any monitoring well which is destroyed or in any way made inoperable for sampling such that no more than one sampling event is missed.

62. All monitoring wells that are no longer required as part of the groundwater monitoring program and have been approved by the Director for abandonment, shall be decommissioned in accordance with good standard practice that will prevent contamination through the abandoned well and in accordance with Ontario Regulation 903. A report on the decommissioning shall be provided in the annual monitoring report for the period during which the well was
decommissioned.

NEW LINED CELLS:

63. Approval is hereby granted to construct Cells 5-10 subject to the information provided in Schedule "A" provided there is no groundwater infiltration or seepage into the cells.

CLAY LINER

64. The clay liner shall consist of clay material that has a hydraulic conductivity of $1 \times 10^{-6}$ m/s or lower, shall be compacted in lifts of not more than 0.15 metres in thickness and compacted to 95% SPD.

65. The City shall conduct appropriate Quality Assurance/Quality Control testing in accordance with item 32 on Schedule "A" to ensure the material meets the specifications for a clay liner.

66. Any material that does not meet the specifications for a clay liner shall be removed and suitable replacement material shall be installed.

67. The City shall take precautions during installation of the clay liner to:
   i. control soil properties and water content;
   ii. ensure the breakup of clods;
   iii. control lift thickness and compaction;
   iv. remove stones larger than 100 millimetres;
   v. prevent desiccation of the compacted clayey liner;
   vi. prevent damage to the compacted clayey liner due to freezing;
   vii. prevent damage to the compacted clayey liner from vehicular traffic;
   viii. prevent damage to the compacted clayey liner due to rodents; and,
   ix. prevent damage to the compacted clayey liner due to differential settlement.

LEACHATE COLLECTION SYSTEM:

68(a). The City shall install 200 mm diameter perforated leachate collection pipes with perforations located at the 10:30, 4:30, 1:30 and 7:30 positions. Prior to commencement of construction of the leachate collection system, Item 23 on Schedule "A" shall be revised and copies provided to the Director.

68(b). The stone for the leachate collection system shall have the following specifications:
   (i) $D_s$ shall be greater than 37 mm where $D_s$ is described as the stone diameter such that, when measured by weight, 85% of the stones in the layer have a smaller diameter;
   (ii) $D_w$ shall be greater than 19 mm where $D_w$ is the stone diameter such that, when measured by weight, 10% of the stones in the layer have a smaller diameter;
   (iii) $D_s/D_w$ shall be less than 2; and,
   (iv) One per cent (1%) of the stones may pass a #200 sieve.
69. The leachate collection piping shall be inspected, cleaned and flushed on at least a semi-annual basis.

Updated Site Monitoring Program

70. Within 180 days of issuance of this Certificate, the City shall provide to the Director with copies to the District Manager, an updated report for groundwater quality, leachate scarp quality, surface water, groundwater levels, invertebrate and fish monitoring at the site. The updated report shall include the following:
   a. protocols to be used in the execution of various components of the monitoring program;
   b. quality assurance/quality control procedures;
   c. frequency of sampling;
   d. locations of sampling;
   e. parameters to be sampled; and
   f. trigger mechanisms and additional sampling.

CONTINGENCY PLANS:

71. Prior to the use of the contingency infiltration system or any other contingency leachate management practice or facility including those described in the Design and Operations Report, the City shall submit to the Director for approval, a report which describes a predictive groundwater and surface water monitoring program which will determine the effectiveness of the contingency measure.

LEACHATE REINFILTRATION:

72. The City may use leachate reinfiltation in accordance with this conditions in this Certificate and the items listed in Schedule "A" for a five year period. The Director may at any time, terminate leachate reinfiltation at the Site if, in the Ministry's opinion, adverse effects on the environment are observed. Extension of leachate reinfiltration at the site after the five year period would be subject to the Director's approval.

73. Prior to the commencement of leachate reinfiltation, the City shall conduct tests to determine the actual field capacity of waste in situ. The City shall provide the Director and the District Manager with copies of the field capacity testing results and not commence leachate recirculation until the Director's approval is received.

74. Prior to commencement of leachate reinfiltation, the City shall provide to the Director with copies to the District Manager, quantitative and qualitative trigger mechanisms and contingency plans for the termination of leachate reinfiltation.

75. Before starting leachate reinfiltation, the City shall install the appropriate number of wells in the waste in order to ascertain the effectiveness of the leachate reinfiltation process. Prior to installation of the wells, the City shall provide the Director with the number and the location of the proposed wells.
76. Prior to the start of leachate reinfiltration activities at the site, the City shall submit to the
director with copies to the District Manager, the location of monitoring wells to be installed
downgradient of the interceptor trenches and upgradient of the landfill areas. Within 90 days
after installation of the proposed wells, the City shall provide to the Director and the District
Manager a proposed monitoring program for the wells.

77. During leachate reinfiltration, the City shall inspect the Landfill for evidence of leachate seeps,
vegetative stress, ponded water and settlement on at least a monthly basis.

LEACHATE TREATMENT

78. If annual leachate flows exceed 10,000 cubic metres and the average COD concentrations of the
leachate are greater than 2,000 mg/L, the City shall submit to the Director within 60 days, a
proposed long term leachate treatment system for the Site.

79. Within twelve (12) months of approval of the long term leachate treatment system, the City shall
install and operate the long term leachate treatment system.

80. Within 54 months after the date of this Certificate, the City shall submit to the Director, with
copies provided to the District Manager, plans for a proposed permanent leachate treatment
system.

Complaints Procedure

81. If at any time, the Owner receives complaints regarding the operation of the Site, the Owner
shall respond to these complaints according to the following procedure:

a) The Owner shall record and number each complaint, either electronically or in a log book,
and shall include the following information: the nature of the complaint, the name, address
and the telephone number of the complainant if the complainant will provide this information
and the time and date of the complaint;

b) The Owner, upon notification of the complaint, shall initiate appropriate steps to determine
all possible causes of the complaint, proceed to take the necessary actions to eliminate the
cause of the complaint and forward a formal reply to the complainant; and

c) The Owner shall complete and retain on-site a report written within one (1) week of the
complaint date, listing the actions taken to resolve the complaint and any recommendations
for remedial measures, and managerial or operational changes to reasonably avoid the
recurrence of similar incidents.

82. The Owner shall designate a person to receive any complaints and to respond with a written
notice of action as soon as possible. The Owner shall post site complaints procedure at site
entrance. All complaints and the Owner’s actions taken to remedy the complaints must be
summarized in the Annual Report.

Daily Records

83. Daily records of site operations shall be made and shall be kept at the City of North Bay offices for a period of two years from the date of the record. The daily records shall include but not be limited to the following:

(a) The type, hauler and quantity (by weight) of all waste received at the Site.
(b) All complaints from the public received by the City and an indication of the action taken in response by the City.
(c) A calculation of the total quantity (by weight) of waste received at the Site for each day.
(d) A record of litter collection activities and site inspections.
(e) Results of any tests done to determine the acceptability of waste at the Site.

Record Retention

84. Except as authorized in writing by the Director, all records required by this Certificate shall be retained at the City of North Bay offices for a minimum of two (2) years from their date of creation.

85. The Owner shall retain all documentation listed in Schedule "A" for as long as this Certificate is valid.

86. The Owner shall retain employee training records as long as the employee is working at the site.

EMERGENCY SITUATIONS:

87. In the event of a fire or discharge of a contaminant to the environment, site staff shall contact the MOE Spills Action Centre (1-800-268-6060) and the District Office of the MOE.

88. The Owner shall submit to the District Manager a written report within 3 days of the spill or incident, outlining the nature of the incident, remedial measures taken and measures taken to prevent future occurrences at the Site.

89. The Owner shall ensure that adequate fire fighting and contingency spill clean up equipment is available and that emergency response personnel are familiar with its use and location.

Annual Report

90. A written report on the development, operation and monitoring of the Site, shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the District Manager by April 15th of each year and shall include the following:

a. the results and an interpretive analysis of the results of all leachate, groundwater, surface
water, biological and landfill gas monitoring, including an assessment of the need to 
amend the monitoring programs;

b. an assessment of the operation and performance of all engineered facilities, the need to 
amend the design or operation of the Site, and the adequacy of and need to implement the 
contingency plans;

c. site plans showing the existing contours of the Site; areas of landfilling operation during 
the reporting period; areas of intended operation during the next reporting period; areas of 
excavation during the reporting period; the progress of final cover, vegetative cover, and 
any intermediate cover application; previously existing site facilities installed during the 
reporting period; and site preparations and facilities planned for installation during the 
next reporting period;

d. calculations of the volume of waste, daily and intermediate cover, and final cover 
deposited or placed at the Site during the reporting period and a calculation of the total 
volume of Site capacity used during the reporting period;

e. a calculation of the remaining capacity of the Site, an estimate of the remaining site life 
and a comparison of actual capacity used to approved site capacity;

f. a summary of any complaints received and the responses made;

g. a discussion of any operational problems encountered at the Site and corrective action 
taken;

h. an update summary of the amount of financial assurance which has been provided to the 
Director;

i. a report on the status of all monitoring wells and a statement as to compliance with 
Ontario Regulation 903;

j. any other information with respect to the site which the District Manager or Regional 
Director may require from time to time.

k. A statement of compliance with all conditions of this Certificate of Approval and other 
relevant Ministry groundwater and surface water requirements;

l. A special section on the maintenance of the infiltration trenches with information such as 
seasonal snow/ice removal methodology to reduce the occurrence of biofouling, 
microbial activity and the clogging/mating of soil pores in or near the trench surfaces.

m. Additional information such as chemical data and analyses in support of the geochemical 
process for the treatment of leachate contaminated groundwater and the hydraulic 
characteristics of the soils to support the long term infiltration/recharge rate into the 
ground subsurface.

n. Summary of inspections undertaken at the site;

o. A summary of the effectiveness of the leachate reinfiltiration program,

p. Any changes in operations, equipment or procedures employed at the site; and,

q. Recommendations regarding any proposed changes in operations of the site.

Ditch surrounding Cells 1-4:

91. Prior to the construction of the ditch surrounding Cells 1-4, the City shall provide the Director 
with a revised grading plan replacing Item 28 on Schedule "A". All ditch elevations shall be 
provided such that a minimum 0.5% positive drainage slope is maintained.
SCHEDULE "A"

1. Application for a Certificate of Approval (Landfill) dated April 6, 1993 signed by Robert F. Barton, Clerk.
6. Letter with attachments dated February 8, 2002 from Peter Bullock, City of North Bay to Michael Williams, MOE, re: Request for amendments to Provisional Certificate of Approval No. A530116 - Merrick Landfill Site. Owned by the City of North Bay to renew lapsed approval to use tarp and to use alternative materials for daily cover.
9. Letter application from P. Bullock, Manager of Environmental Services, City of North Bay to A. Dominski, MOE regarding the establishment of base cell floor elevation for cell No. 4, dated July 6, 2000.
11. Letter dated October 6, 1994 from Mr. D.R. Brown, Golder Associates Limited to Mr. P. Bullock, City of North Bay, regarding hydrogeological assessment of contingency plans, City of North Bay landfill site, Township of Merrick.
The reasons for the imposition of these terms and conditions are as follows:

1. The reason for Condition 1 is to define the specific meaning of terms and simplify the wording of conditions in this Certificate of Approval.

2. The reason for Condition 2 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this
Certificate of Approval. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the and OWRA.

3. The reason for Condition 3 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

4. The reason for Conditions 4, 5, 6, 8, 22, 25 and 63 is to clarify the legal rights and responsibilities of the Owner under this Certificate of Approval.

5. The reasons for Condition 7 are to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

6. Condition 9 is included, pursuant to subsection 197(1) of the EPA, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.

7. Conditions 10, 11 and 12 have been included to ensure that non-potable water is not consumed by staff at the Site.

8. The reason for Conditions 13, 14, 15, 16, 17 and 18 is to ensure that the Site is designed, constructed and operated in an environmentally acceptable manner, based on the conceptual design and operations for the Site. Condition 18 has been specifically included to allow for optimization of design for subsequent stages based on operating experience and monitoring results and to ensure that any necessary remedial action is undertaken before landfiling may proceed in the next stage.

9. The reason for Condition 19 is to ensure the availability of as-built drawings for inspection and information purposes.

10. The reasons for Conditions 20 and 21 are to ensure that final closure of the Site is completed in an aesthetically pleasing manner and to ensure the long-term protection of the natural environment.

11. The reasons for Conditions 24, 28 and 36 are to ensure that the Site is operated and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

12. The reason for Condition 25 is to guarantee that a set of procedures is available for operations at the Site and that the District Manager is aware of any changes in operation.

13. The reasons for Conditions 26 and 27 are the protection of public health and safety and minimization of the potential for damage to environmental control, monitoring and other works at the landfill Site. Scavenging is the uncontrolled removal of material from waste at a landfill site.

14. The reason for Condition 29 is to ensure that noise from or related to the operation of the landfill is
kept to within Ministry limits and does not result in a hazard or nuisance to any person.

15. The reason for Condition 30 is that open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.

16. Conditions 31, 32 and 33 have been added in order to guarantee that landfill gas does not cause a hazard or nuisance to the natural environment or any person.

17. Condition 34 has been included in order to ensure that surface water does not come in contact with waste and pose a hazard to the natural environment or any person.

18. The reason for Condition 35 is to specify other approvals required for works and activities related to the operation of this Site as a landfill.

19. The reason for Conditions 37 and 38 is to ensure that only waste specified by the Director can be disposed of at the Site.

20. Condition 39 has been added in order to ensure that the City and the Ministry is aware of the amount of waste that is present on Site.

21. The reason for Conditions 40, 41 and 42 is to specify restrictions on the extent of landfilling at this Site based on the Owner’s application and supporting documentation. These limits define the approved volumetric capacity of the site. Approval to landfill beyond these limits would require an application with supporting documentation submitted to the Director.

22. The reason for Conditions 43 is to specify the approved areas from which waste may be accepted at the Site and the types and amounts of waste that may be accepted for disposal at the Site, based on the Owner’s application and supporting documentation.

23. The reason for Condition 44 is to ensure that there is adequate space around the perimeter of the waste fill area in which contaminant attenuation may occur and various monitoring, maintenance and environmental control activities can take place.

24. The reason for Condition 45, 46, 47 and 48 is to ensure that landfilling operations are conducted in an environmentally acceptable manner. Daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access on the site, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the site.

25. The reason for Conditions 49, 50, 51, 52 and 53 is to specify the approval requirements for use of alternative cover material at the Site.

26. The reasons for Conditions 54, 55 and 56 are to specify site access to/from the Site and to ensure the controlled access and integrity of the Site by preventing unauthorized access when the Site is closed.
and no site attendant is on duty.

27. The reason for Condition 57 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

28. The reasons for Conditions 58, 59, 60, 61 and 62 are to ensure protection of the natural environment and the integrity of the groundwater monitoring network.

29. Conditions 64, 65, 66 and 67 are necessary in order to specify the requirements of the clay liner at the Site thus ensuring that waste disposal at the Site does not constitute a hazard or a nuisance to the natural environment or any person.

30. The reasons for Condition 68 (a) is to ensure that the perforations in the leachate collection pipes promote steady flow, blockage by sedimentation is minimized and the structural integrity of the pipes are maintained.

31. Condition 68(b) has been included to ensure that the stone for the leachate collection system is in accordance with the Ministry's specifications.

32. The reasons for Condition 69 are to minimize the potential for clogging of leachate collection pipes and to ensure effective operation of the leachate collection system components for as long as they are required. Failure to clean out these components on a regular basis may result in a decrease in their service lives. Regular cleaning of the leachate collection pipes is especially important during stages of landfilling when the level of both organic and inorganic constituents in the leachate is high and, consequently, the potential for clogging due to encrustation is greatest. As the landfill reaches the more stable methane producing stage, pipe cleaning may be required less frequently.

33. The reason for Condition 70 is to demonstrate that the landfill site is performing as designed and that the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

34. The reason for Condition 71 is to ensure that a monitoring program is provided for the contingency infiltration system or any other contingency leachate management practice or facility so that the effectiveness of the proposed contingency works can be evaluated.

35. Conditions 72, 73, 74, 75, 76 and 77 have been added in order to specify the requirements for leachate re-infiltration in accordance with the Ministry's requirements.

36. Condition 78, 79 and 80 has been included to ensure that an approved facility is available for long-term treatment of leachate generated at this Site.

37. The reason for Conditions 81 and 82 is to establish a forum for the exchange of information and public dialogue on activities carried out at the landfill Site. Open communication with the public
and local authorities is important in helping to maintain high standards for site operation and environmental protection.

38. The reasons for Conditions 83, 84, 85 and 86 are to provide for the proper assessment of effectiveness and efficiency of site design and operation, their effect or relationship to any nuisance or environmental impacts, and the occurrence of any public complaints or concerns. Record keeping is necessary to determine compliance with this Certificate of Approval, the EPA and its regulations.

39. The reasons for Condition 87 are to ensure that the Ministry is informed of any spills or fires at the Site and to provide public health and safety and environmental protection.

40. Condition 88 is contained in the Certificate to guarantee that appropriate measures are taken by the County to prevent future occurrences of spills or fires at the site and to protect public health and safety and the environment.

41. The reasons for Condition 90 are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

42. The reason for Condition 91 is to ensure that adequate drainage is provided in the ditch surrounding Cells 1-4 in accordance with general engineering standards.


In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;
And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2303 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 39, Environmental Protection Act
Ministry of Environment and Energy
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L9

* Further information on the Environmental Review Tribunal’s requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4596 or www.ert.gov.on.ca

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 30th day of June, 2004

[Signature]

Ian Parrott, P.Eng.
Director
Section 39, Environmental Protection Act

G:

District Manager, MOE North Bay
Rick Mosher, Conestoga-Rovers & Associates
Christine Robertson, Conestoga-Rovers and Associates
Peter Bullock, Manager of Environmental Services, City of North Bay
Bruce Bethune, MOE, North Bay
Debra Abbott, MOE, Technical Support, Northern Region
The Corporation of the City of North Bay
200 McIntyre Street East, P.O. Box 360
North Bay, Ontario
P1B 8H8

Site Location: Merrick Landfill Site
Part of Annulled Lots 10, 11 and 12, Concessions IV and V
Part of Annulled Lots 10 and 11, Concession VI
Merrick Unorganized Township, District of Nipissing

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

- one (1) drum type enclosed flaring system, equipped with one (1) temperature controlling system, one (1) continuous temperature monitoring and recording system and one (1) landfill gas burner, burning at a maximum rate of 0.28 cubic metre per second of landfill gas from enclosed extraction wells, exhausting into the atmosphere through a stack, having an exit diameter of 1.5 metres and extending 12.2 metres above grade;

all in accordance with the Application for Approval (Air & Noise) signed by John Simmonds of The Corporation of the City of North Bay, dated September 19, 2005, the supporting documentation submitted by Conestoga-Rovers & Associates Ltd. with the application and the additional information provided by Conestoga-Rovers & Associates Ltd. dated August 21, 2006.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

1. "Act" means the Environmental Protection Act.
2. "Certificate" means this Certificate of Approval (Air), including Schedule "A", issued in accordance with Section 9 of the Act.
3. "Company" means The Corporation of the City of North Bay.
4. "Equipment" means the flaring system described in the Company's application, this Certificate and in the supporting documentation referred to herein, to the extent approved by this Certificate.
(5) "Manual" means a document or a set of documents that provide written instructions to staff of the Company.

(6) "Ministry" means Ontario Ministry of the Environment.

(7) "Publication NPC-205" means the Ministry Publication NPC-205, “Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)”, October 1995, as amended.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. The Company shall ensure that the noise emissions from the Equipment comply with the limits determined in accordance with Publication NPC-205.

2. The Company shall maintain the temperature in the combustion chamber of the Equipment, as recorded by the continuous monitoring and recording system, at a minimum of 875 degrees Celsius at all times, when landfill gas incineration is in progress.

3. The residence time of the combustion gases in the combustion chamber shall be not less than 0.75 second at a temperature of not less than 875 degrees Celsius.

4. The Company shall ensure that the Equipment, including the continuous monitoring and recording system, is properly operated and maintained at all times. The Company shall:

   (1) prepare, not later than three (3) months after the operation of the Equipment and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:

      (a) the routine and emergency operating and maintenance procedures recommended by the Equipment and the continuous monitoring and recording system suppliers;

      (b) the calibration procedures of the continuous monitoring and recording system;

      (c) the operator training which is to be provided by individuals experienced with the Equipment;

      (d) the procedures for optimizing the operation of the Equipment to minimize emissions from the Equipment;

      (e) the periodic inspection of the Equipment which is to be conducted by individuals experienced with the Equipment;
(f) the procedures for recording of and responding to environmental complaints;

(2) implement the recommendations of the Manual.

5. The Company shall continuously monitor and record the temperatures in the combustion chamber of the Equipment, when the Equipment is in normal operation. The continuous temperature monitoring and recording system shall comply with the requirements outlined in Schedule "A".

6. The Company shall retain for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the operation of the Equipment, and the monitoring and recording activities required by this Certificate. These records shall be made available to staff of the Ministry upon request. The Company shall retain:

(1) all records on maintenance, repair and inspection of the Equipment;

(2) daily records of the actual operating temperature in the combustion chamber of the Equipment;

(3) all records on operator training;

(4) all records on the environmental complaints; including as a minimum:

(a) a description, time and date of each incident to which the complaint relates,

(b) wind direction at the time of the incident to which the complaint relates, and

(c) a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.
SCHEDULE "A"

PARAMETER:

Temperature

LOCATION:

The sample point for the continuous temperature monitor shall be located in the combustion chamber where the minimum retention time of the combustion gases at a minimum temperature of 875 degrees Celsius for at least 0.75 second is achieved.

PERFORMANCE:

The continuous temperature monitor shall meet the following minimum performance specifications for the following parameters.

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>shielded &quot;K&quot; type thermocouple, or equivalent</td>
</tr>
<tr>
<td>Accuracy:</td>
<td>± 1.5 percent of the minimum gas temperature</td>
</tr>
</tbody>
</table>

DATA RECORDER:

The data recorder must be capable of registering continuously the measurements of the monitor without a significant loss of accuracy and with a time resolution of 1 minute or better.

RELIABILITY:

The monitor shall be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the time for each calendar quarter.
The reasons for the imposition of these terms and conditions are as follows:

1. Condition Nos. 1, 2 and 3 are included to outline the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Equipment.

2. Condition No. 4 is included to emphasize that the Equipment must be operated and maintained according to a procedure that will result in compliance with the Act, the regulations and this Certificate.

3. Condition No. 5 is included to require the Company to gather accurate information so that the environmental impact and subsequent compliance with the Act, the regulations and this Certificate can be verified.

4. Condition No. 6 is included to require the Company to retain records and provide information to the Ministry so that the environmental impact and subsequent compliance with the Act, the regulations and this Certificate can be verified.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the works are located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 9, Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5
* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of August, 2006

THIS CERTIFICATE WAS MAILED
ON Aug 30, 2006
(Signed)

Victor Low, P.Eng.
Director
Section 9, Environmental Protection Act

KW/
c: District Manager, MOE North Bay
Guy Treadwell, Conestoga-Rovers & Associates Ltd.


APPENDIX B

MANUFACTURE'S TECHNICAL SPECIFICATIONS
FOR GENERATOR
CONTINUOUS
1600 ekW @ 1200 RPM
60 Hz (Low Energy Fuel)

Caterpillar® is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

BENEFITS

EMISSIONS
• Meets most worldwide emissions requirements down to 0.5 g/bhp-hr NOx level without aftertreatment

FULL RANGE OF ATTACHMENTS
• Wide range of bolt-on system expansion attachments, factory designed and tested

SINGLE-SOURCE SUPPLIER
• Fully Prototype Tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT
• With over 1,800 dealer branch stores operating in 166 countries, you’re never far from the Caterpillar part you need.
• 99.5% of parts orders filled within 48 hours. The best product support record in the industry.
• Caterpillar dealer service technicians are trained to service every aspect of your electric power generation system.
• Customer Support Agreements offer back-to-back services from scheduled inspections and preventive maintenance to before-failure overhauls and Total Cost-Per-Hour Guarantees.

CAT® G3520C GAS ENGINE
• Robust high speed diesel block design provides prolonged life and lower owning and operating costs.
• Designed for maximum performance on low pressure pipeline natural gas.
• Simple open chamber combustion system for reliability and fuel flexibility.
• Leading edge technology in ignition system and air/fuel ratio control for lower emissions and higher engine efficiency.
• One electronic control module handles all engine functions: ignition, governing, air fuel ratio control, and engine protection.
• Factory-designed systems built at Caterpillar ISO9001:2000 certified facilities.

CAT SR4B GENERATOR
• Designed to match performance and output characteristics of Caterpillar engines.
• Optimum winding pitch for minimum total harmonic distortion and maximum efficiency.
• Segregated low voltage (AC/DC) accessory box provides single point access to accessory connections.

CAT CONTROL MODULE
• Designed to meet individual customer needs:
  Gas Engine Control Module provides full-featured, engine management and control functions, purge cycle, staged shutdown logic, plus programmable protective relaying functions.
• Remote control and monitor capability options
**SPECIFICATIONS**

**CAT SR4B GENERATOR**
- **Frame size**: 868
- **Excitation**: Permanent magnet
- **Pitch**: 0.75
- **Number of poles**: 6
- **Number of bearings**: 2
- **Number of leads**: 6
- **Insulation**: UL 1446 Recognized Class H Insulation
- **IP rating**: Drip proof IP22
- **Alignment**: Pilot shaft
- **Overspeed capability**: Less than 125%
- **Wave form**: Less than 5% deviation
- **Paralleling kit droop transformer**: Standard
- **Standard Voltage regulator**: 3-phase sensing with adjustable 1:1 or 2:1 Volts/Hz, UL 508A Listed
- **TIF**: 6
- **THD**: Less than 3%
- **Consult your Caterpillar dealer for available voltages.**

**CAT ENGINE**
- **G3520C SCAC, 4-stroke-cycle watercooled Gas**
  - **Bore — mm (in)**: 170 (6.7)
  - **Stroke — mm (in)**: 190 (7.5)
  - **Displacement — L (cu in)**: 86 (5248)
  - **Compression ratio**: 11.3:1
  - **Aspiration**: Turbocharged Separate Circuit Aftercooled
  - **Fuel system**: Low Pressure
  - **Governor type**: Electronic (ADEM™ III)

**CAT CONTROL PANEL**
- **24 Volt DC Control**
  - NEMA 1, IP22 enclosure
  - Electrically dead front
  - Lockable hinged door
  - Generator instruments meet ANSI C-39-1
  - Terminal box mounted
  - Single location customer connector point
  - EC compliant — segregated AC/DC connections and wiring
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Generator Set — 1200 rpm/60 Hz/480 Volts</th>
<th>DM5740</th>
<th>DM5739</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G3520C Gas Generator Set (Low Energy Fuel)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emission level (NOx)</td>
<td>g/bhp-hr</td>
<td>0.5</td>
</tr>
<tr>
<td>Aftercooler SCAC</td>
<td>Deg C</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>Deg F</td>
<td>54</td>
</tr>
<tr>
<td><strong>Package Performance (1)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical efficiency @ 1.0 pf (5)</td>
<td>ekW</td>
<td>1617</td>
</tr>
<tr>
<td>Power rating @ 1.0 pf</td>
<td>ekW</td>
<td>1600</td>
</tr>
<tr>
<td>Power rating @ 0.8 pf</td>
<td>kVA</td>
<td>2000</td>
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<tr>
<td>Mechanical Power</td>
<td>bkW hp</td>
<td>1665</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1665</td>
</tr>
<tr>
<td><strong>Fuel Consumption (2)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Heat Value (LHV) fuel input (ISO3046/1)</td>
<td>kW Btu/min</td>
<td>4032</td>
</tr>
<tr>
<td>100% load without fan</td>
<td>N•m/hr scf/hr</td>
<td>408</td>
</tr>
<tr>
<td>75% load without fan</td>
<td>N•m/hr scf/hr</td>
<td>318</td>
</tr>
<tr>
<td>50% load without fan</td>
<td>N•m/hr scf/hr</td>
<td>226</td>
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<tr>
<td><strong>Altitude Capability (3)</strong></td>
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<td></td>
</tr>
<tr>
<td>At 25° C/77° F ambient</td>
<td>m</td>
<td>420</td>
</tr>
<tr>
<td></td>
<td>ft</td>
<td>880</td>
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<tr>
<td><strong>Cooling System</strong></td>
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</tr>
<tr>
<td>Ambient air temperature</td>
<td>Deg C</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Deg F</td>
<td>25</td>
</tr>
<tr>
<td>Jacket Water temperature (maximum outlet)</td>
<td>Deg C</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Deg F</td>
<td>110</td>
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<tr>
<td><strong>Exhaust System</strong></td>
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<tr>
<td>Combustion air inlet flow rate</td>
<td>N•m/min scfm</td>
<td>113</td>
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<td></td>
<td>Deg C</td>
<td>480</td>
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<td></td>
<td>Deg F</td>
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<tr>
<td>Exhaust gas stack temperature</td>
<td>N•m/min scf/hr</td>
<td>122</td>
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<tr>
<td></td>
<td>in</td>
<td>117</td>
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<tr>
<td>Exhaust gas flow rate</td>
<td>N•m/min scf/hr</td>
<td>226</td>
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<tr>
<td></td>
<td>mm</td>
<td>110</td>
</tr>
<tr>
<td>Exhaust flange size (internal diameter)</td>
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<td></td>
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<tr>
<td><strong>Heat Rejection (4)</strong></td>
<td></td>
<td></td>
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<tr>
<td>Heat rejection to Jacket Water and AC — Stage 1</td>
<td>kW Btu/min</td>
<td>676</td>
</tr>
<tr>
<td></td>
<td>kW Btu/min</td>
<td>657</td>
</tr>
<tr>
<td>Heat rejection to oil cooler and AC — Stage 2</td>
<td>kW Btu/min</td>
<td>339</td>
</tr>
<tr>
<td></td>
<td>kW Btu/min</td>
<td>332</td>
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<tr>
<td>Heat rejection to exhaust (LHV to 350° F)</td>
<td>kW Btu/min</td>
<td>1158</td>
</tr>
<tr>
<td></td>
<td>kW Btu/min</td>
<td>1141</td>
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<tr>
<td>Heat rejection to atmosphere from engine</td>
<td>kW Btu/min</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>kW Btu/min</td>
<td>127</td>
</tr>
<tr>
<td>Heat rejection to atmosphere from generator</td>
<td>kW Btu/min</td>
<td>47.7</td>
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<tr>
<td><strong>Generator</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor starting capability @ 30% voltage dip*</td>
<td>kVA</td>
<td>3663</td>
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<tr>
<td>Frame</td>
<td>868</td>
<td>868</td>
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<tr>
<td>Temperature rise</td>
<td>Deg C</td>
<td>105</td>
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<tr>
<td><strong>Lube System</strong></td>
<td></td>
<td></td>
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<tr>
<td>Refill volume with filter change for standard sump</td>
<td>L Gal</td>
<td>541</td>
</tr>
<tr>
<td></td>
<td>L Gal</td>
<td>541</td>
</tr>
<tr>
<td>**Emissions **</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOx</td>
<td>g/bhp-hr</td>
<td>0.5</td>
</tr>
<tr>
<td>CO (nominal) (6)</td>
<td>g/bhp-hr</td>
<td>2.5</td>
</tr>
<tr>
<td>HC (total)</td>
<td>g/bhp-hr</td>
<td>5.34</td>
</tr>
<tr>
<td>HC (non-methane)</td>
<td>g/bhp-hr</td>
<td>0.81</td>
</tr>
<tr>
<td>Exhaust O2 (dry)</td>
<td>%</td>
<td>8.5</td>
</tr>
</tbody>
</table>

*Assume synchronous driver.
**Emissions data measurements are consistent with those described in EPA CFR 40 Part 89 Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state engine operating conditions of 25° C (77° F), 96.28 kPa (28.43 in Hg) and fuel having a LHV of 17.7 MJ/N•m³ (456 Btu/cu ft) at 101.60 kPa (30.00 in Hg) absolute and 0° C (32° F). Emission data shown is subject to instrumentation, measurement, facility, and engine fuel system adjustments.

### RATING DEFINITIONS AND CONDITIONS

1. **Ratings** are based on low energy methane-based gas having a LHV of 17.7 MJ/N•m³ (456 Btu/cu ft) and 120 MN without fan. For values in excess of the altitude, temperature, inlet/exhaust restriction, or different from the conditions listed, contact your local Caterpillar dealer.

2. **Ratings and fuel consumption** are based on ISO3046/1 standard reference conditions of 25° C or 77° F and 100 kPa (29.61 in Hg) with 0,+5% fuel tolerance.

3. **Altitude** capability is based on 2.5 kPa inlet and 5.0 kPa exhaust restriction.

4. **Heat Rejection** — values based on ISO3046/1 with fuel tolerance of ±3% and 2.5 kPa inlet and 5.0 kPa exhaust restriction.

5. **Efficiency** of standard generator is used. For higher efficiency generators, contact your local Caterpillar dealer.

6. **Nominal Value** — emissions from a new engine during first 100 hrs of operation. Contact local dealer for more information.
Note: Do not use for installation design. See general dimension drawings for detail (Drawing # 267-7367).

Package Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>6367.1 mm</td>
<td>250.67 in</td>
</tr>
<tr>
<td>Width</td>
<td>1996.5 mm</td>
<td>78.60 in</td>
</tr>
<tr>
<td>Height</td>
<td>2465.1 mm</td>
<td>97.05 in</td>
</tr>
<tr>
<td>Shipping Weight</td>
<td>18 350 kg</td>
<td>40,437 lb</td>
</tr>
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</table>
### Engine Data

<table>
<thead>
<tr>
<th><strong>FUEL CONSUMPTION</strong></th>
<th>(ISO 3046/1)</th>
<th>MJ/bkW-hr</th>
<th>8.78</th>
<th>9.21</th>
<th>9.39</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FUEL CONSUMPTION</strong></td>
<td>(NOMINAL)</td>
<td>MJ/bkW-hr</td>
<td>9</td>
<td>9.43</td>
<td>9.62</td>
</tr>
<tr>
<td>AIR FLOW (0 °C, 101.3 kPa)</td>
<td>(7)</td>
<td>Nm3/bkW-hr</td>
<td>4.04</td>
<td>4.07</td>
<td>4.2</td>
</tr>
<tr>
<td>AIR FLOW</td>
<td>(7)</td>
<td>kg/bkW-hr</td>
<td>5.22</td>
<td>5.26</td>
<td>5.43</td>
</tr>
<tr>
<td>COMPRESSOR OUT PRESSURE</td>
<td>kPa (abs)</td>
<td>347</td>
<td>263</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>COMPRESSOR OUT TEMPERATURE</td>
<td>°C</td>
<td>186</td>
<td>147</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>AFTERCOOLER AIR OUT TEMPERATURE</td>
<td>°C</td>
<td>60</td>
<td>59</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>INLET MAN. PRESSURE</td>
<td>(8)</td>
<td>KPaA</td>
<td>306</td>
<td>233</td>
<td>163</td>
</tr>
<tr>
<td>INLET MAN. TEMPERATURE</td>
<td>(MEASURED IN PLENUM)</td>
<td>°C</td>
<td>60</td>
<td>59</td>
<td>57</td>
</tr>
<tr>
<td>TIMING</td>
<td>(10)</td>
<td>°BTDC</td>
<td>27</td>
<td>27</td>
<td>27</td>
</tr>
<tr>
<td>EXHAUST GAS FLOW (0 °C, 101.3 kPa)</td>
<td>(12)</td>
<td>Nm3/bkW-hr</td>
<td>4.37</td>
<td>4.41</td>
<td>4.55</td>
</tr>
<tr>
<td>EXHAUST MASS FLOW</td>
<td>(12)</td>
<td>kg/bkW-hr</td>
<td>5.83</td>
<td>5.91</td>
<td>6.08</td>
</tr>
</tbody>
</table>

### Emissions Data

| **NOx (as NO2)** (corr. 5% O2) | (13) | mg/Nm3 (dry) | 440 | 440 | 440 |
| NTE CO (corr. 5% O2) | (14) | mg/Nm3 (dry) | 2115 | 2095 | 2061 |
| NOMINAL CO (corr. 5% O2) | (15) | mg/Nm3 (dry) | 1100 | 1100 | 1100 |
| THC (corr. 5% O2, molecular weight of 15.84) | (14) | mg/Nm3 (dry) | 2522 | 2716 | 3120 |
| NMHC (corr. 5% O2, molecular weight of 15.84) | (14) | mg/Nm3 (dry) | 379 | 408 | 468 |
| EXHAUST O2 | (16) | % DRY | 8.7 | 8.4 | 8.3 |
| LAMBDA | (16) | | 1.67 | 1.61 | 1.63 |

### Heat Balance Data

| **LHV INPUT** | (17) | KW | 4159 | 3271 | 2223 |
| HEAT REJECTION TO JACKET | (18) | KW | 509 | 459 | 375 |
| HEAT REJECTION TO ATMOSPHERE | (19) | KW | 127 | 106 | 85 |
| HEAT REJECTION TO LUBE OIL | (20) | KW | 178 | 167 | 157 |
| HEAT REJECTION TO EXHAUST (LHV to 25°C) | (21) | KW | 1273 | 1081 | 672 |
| HEAT REJECTION TO EXHAUST (LHV to 120°C) | (21) | KW | 1176 | 957 | 683 |
| HEAT REJECTION TO A/C - STAGE 1 | (22) | KW | 220 | 78 | -3 |
| HEAT REJECTION TO A/C - STAGE 2 | (23) | KW | 153 | 96 | 69 |

### Conditions and Definitions

Engine rating obtained and presented in accordance with ISO 3046/1. Data represents conditions of 25°C, 100 kPa barometric pressure, 30% relative humidity, 2.5 kPa air filter restriction, and 5 kPa exhaust stack pressure. Engine efficiency and fuel consumption specifically noted as ISO 3046/1 are represented with 1.25 kPa air filter restriction and 0 kPa exhaust stack pressure. Consult altitude curves for applications above maximum rated altitude and/or temperature. No overload permitted at rating shown.

Emissions levels are based on the engine operating at steady state conditions and adjusted to the specified NOx level at 100% load. Emission tolerances specified are dependent upon fuel quality. Methane number cannot vary more than ± 3. Published part load data is with Lambda control.

Engine rating is with 2 engine driven water pumps. Pump power is not included in heat balance data.

For notes information consult page three.
Aftercooler heat rejection is given for standard conditions of 25°C and 152 m altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail. For 2 Stage Aftercoolers with separate circuits, the 1st stage will collect 90% of the additional heat.

Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual engine rating for the engine at the conditions specified.

Altitude/Temperature deration and Low Energy Fuel deration are not cumulative. They are not to be added together. The same is true for the Low Energy Fuel deration and the Fuel Usage Guide deration.

ACTUAL ENGINE RATING:
It is important to note that the Altitude/Temperature deration and the Fuel Usage Guide deration are not cumulative. They are not to be added together. The same is true for the Low Energy Fuel deration (reference the Caterpillar Methane Number Program) and the Fuel Usage Guide deration. However, the Altitude/Temperature deration and Low Energy Fuel deration are cumulative; and they must be added together in the method shown below. To determine the actual power available, take the lowest rating between 1) and 2).

1) (Altitude/Temperature Deration) + (Low Energy Fuel Deration)
2) Fuel Usage Guide Deration

Note: For NA's always add the Low Energy Fuel deration to the Altitude/Temperature deration. For TA engines only add the Low Energy Fuel deration whenever the Altitude/Temperature deration is less than 1.0 (100%). This will give the actual rating for the engine at the conditions specified.

AFTERCOOLER HEAT REJECTION FACTORS:
Aftercooler heat rejection is given for standard conditions of 25°C and 152 m altitude. To maintain a constant air inlet manifold temperature, as the air to turbo temperature goes up, so must the heat rejection. As altitude increases, the turbocharger must work harder to overcome the lower atmospheric pressure. This increases the amount of heat that must be removed from the inlet air by the aftercooler. Use the aftercooler heat rejection factor to adjust for ambient and altitude conditions. Multiply this factor by the standard aftercooler heat rejection. Failure to properly account for these factors could result in detonation and cause the engine to shutdown or fail. For 2 Stage Aftercoolers with separate circuits, the 1st stage will collect 90% of the additional heat.

SOUND DATA:
Data determined by methods similar to ISO Standard DIS-8528-10. Accuracy Grade 3. SPL = Sound Pressure Level.

<table>
<thead>
<tr>
<th>FREE FIELD MECHANICAL &amp; EXHAUST NOISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% Load Data</td>
</tr>
<tr>
<td>Distance From the engine (Meters)</td>
</tr>
<tr>
<td>Free Field Mechanical</td>
</tr>
<tr>
<td>1 108.5 51.5 78.7 88.2 92.9 99.9 97.3 93.2 99.2</td>
</tr>
<tr>
<td>7 91.6 34.6 59.0 68.1 74.0 83.0 79.4 75.1 85.2</td>
</tr>
<tr>
<td>15 85.0 28.0 55.2 64.7 69.4 76.4 73.8 69.7 75.7</td>
</tr>
<tr>
<td>Free Field Exhaust</td>
</tr>
<tr>
<td>1.5 106.1 67.5 86.5 96.0 88.5 88.7 90.1 95.6 92.7</td>
</tr>
<tr>
<td>7 92.7 76.0 88.5 88.7 91.1 95.6 92.7 92.7 92.7</td>
</tr>
<tr>
<td>15 86.1 47.5 66.5 76.0 68.5 68.5 70.1 75.6 72.7</td>
</tr>
<tr>
<td>Overall SPL</td>
</tr>
<tr>
<td>63 Hz 50 Hz 125 Hz 250 Hz 500 Hz 1 kHz 2 kHz 4 kHz 8 kHz</td>
</tr>
<tr>
<td>Octave Band Center Frequency (OBCF)</td>
</tr>
</tbody>
</table>

FUEL USAGE GUIDE:
This table shows the derate factor required for a given fuel. Note that deration occurs as the methane number decreases. Methane number is a scale to measure detonation characteristics of various fuels. The methane number of a fuel is determined by using the Caterpillar Methane Number Calculation program.

ALTITUDE DERATION FACTORS:
This table shows the deration required for various air inlet temperatures and altitudes. Use this information along with the fuel usage guide chart to help determine actual engine power for your site.

INLET AND EXHAUST RESTRICTION CORRECTIONS FOR ALTITUDE CAPABILITY:
To determine the appropriate altitude derate factor to be applied to this engine for inlet or exhaust restrictions differing from the standard conditions listed on page 1, a correction to the site altitude can be made to adjust for this difference. Add 43 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 86 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 56 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 10 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 30 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 60 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 90 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 120 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 150 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 180 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 210 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 240 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 270 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 300 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 330 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 360 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 390 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 420 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 450 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 480 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 510 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 540 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 570 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 600 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 630 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 660 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 690 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 720 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 750 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 780 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 810 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 840 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 870 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 900 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 930 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 960 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 990 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1020 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1050 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1080 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1110 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1140 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1170 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1200 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1230 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1260 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1290 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1320 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1350 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1380 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1410 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1440 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1470 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions. Add 1500 meters to the site altitude for each additional KPA of exhaust stack pressure greater than spec sheet conditions.
NOTES

1. ENGINE RATING IS WITH 2 ENGINE DRIVEN WATER PUMPS. TOLERANCE IS ± 3% OF FULL LOAD.

2. GENERATOR POWER DETERMINED WITH AN ASSUMED GENERATOR EFFICIENCY OF 96.1% AND POWER FACTOR OF 0.8 [GENERATOR POWER = ENGINE POWER x GENERATOR EFFICIENCY].

3. ISO 3046/1 ENGINE EFFICIENCY TOLERANCE IS (+)0, (-)5% OF FULL LOAD % EFFICIENCY VALUE. NOMINAL ENGINE EFFICIENCY TOLERANCE IS ± 2.5% OF FULL LOAD % EFFICIENCY VALUE.

4. THERMAL EFFICIENCY: JACKET HEAT + STAGE 1 A/C HEAT + EXH. HEAT TO 350°F.

5. TOTAL EFFICIENCY = ENGINE EFF. + THERMAL EFF. TOLERANCE IS ± 10% OF FULL LOAD DATA.

6. ISO 3046/1 FUEL CONSUMPTION TOLERANCE IS (+)5, (-)0% OF FULL LOAD DATA. NOMINAL FUEL CONSUMPTION TOLERANCE IS ± 2.5 % OF FULL LOAD DATA.

7. UNDRIED AIR. FLOW TOLERANCE IS ± 5 %

8. INLET MANIFOLD PRESSURE TOLERANCE IS ± 5 %

9. INLET MANIFOLD TEMPERATURE TOLERANCE IS ± 5°C.

10. TIMING INDICATED IS FOR USE WITH THE MINIMUM FUEL METHANE NUMBER SPECIFIED. CONSULT THE APPROPRIATE FUEL USAGE GUIDE FOR TIMING AT OTHER METHANE NUMBERS.

11. EXHAUST STACK TEMPERATURE TOLERANCE IS (+)35°C, (-)30°C.

12. WET EXHAUST. FLOW TOLERANCE IS ± 6 %

13. NOX TOLERANCES ARE ± 18 % OF SPECIFIED VALUE.

14. NTE CO, CO2, THC, and NMHC VALUES ARE "NOT TO EXCEED".

15. NOMINAL CO IS A NOMINAL VALUE AND IS REPRESENTATIVE OF A NEW ENGINE DURING THE FIRST 100 HOURS OF ENGINE OPERATION.

16. O2% TOLERANCE IS ± 0.5; LAMBDA TOLERANCE IS ± 0.05. LAMBDA AND O2 LEVEL ARE THE RESULT OF ADJUSTING THE ENGINE TO OPERATE AT THE SPECIFIED NOX LEVEL.

17. LHV RATE TOLERANCE IS ± 2.5%.

18. TOTAL JW HEAT (based on treated water) = JACKET HEAT + STAGE 1 A/C HEAT + 0.90 x (STAGE 1 + STAGE 2) x (ACHRF-1). TOLERANCE IS ± 10 % OF FULL LOAD DATA.

19. RADIATION HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 50% OF FULL LOAD DATA.

20. LUBE OIL HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 20% OF FULL LOAD DATA.

21. EXHAUST HEAT RATE BASED ON TREATED WATER. TOLERANCE IS ± 10% OF FULL LOAD DATA.

22. STAGE 1 A/C HEAT (based on treated water) = STAGE 1 A/C HEAT + 0.90 x (STAGE 1 + STAGE 2) x (ACHRF-1). TOLERANCE IS ± 5 % OF FULL LOAD DATA.

23. STAGE 2 A/C HEAT (based on treated water) = (STAGE 2 A/C HEAT + (STAGE 1 + STAGE 2) x 0.10 x (ACHRF - 1)) + LUBE OIL HEAT. TOLERANCE IS ± 5 % OF FULL LOAD DATA.
Preliminary Drawings
APPENDIX C

STAGE ONE ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCE ASSESSMENT OF PROPOSED METHANE FUELLED GENERATION FACILITY AT THE NORTH BAY LANDFILL
WOODLAND HERITAGE SERVICES LIMITED
STAGE ONE PROJECT REPORT

STAGE 1 ARCHAEOLOGICAL AND CULTURAL HERITAGE RESOURCE ASSESSMENT OF A PROPOSED METHANE FUELLED GENERATION FACILITY AT THE NORTH BAY LANDFILL, MERRICK TOWNSHIP, CITY OF NORTH BAY, DISTRICT OF NIPISSING, ONTARIO.

Prepared for
North Bay Hydro
74 Commerce Crescent
North Bay, ON
P1B 8Y3

Attention: Mr. Todd Wilcox
Tel. 705 474 8100
TWilcox@northbayhydro.com

c/o
City of North Bay
200 McIntyre St. E.
PO Box 360.
P1B 8H8

Attention: John Severino
Manager, Environmental Services
Telephone: 705-474-0626 x.2309
Email: john.severino@cityofnorthbay.ca

Submitted by
WOODLAND HERITAGE SERVICES LIMITED
17 Wellington Street, Box 2529
New Liskeard, Ontario
P0J 1P0

Attention: Dr. John W. Pollock Ph.D,
Telephone: 705-647-8833
Fax: 705-647-7026
E-mail: jpollock@woodlandheritage.com
Province of Ontario Archaeological Licence #PO16
MTC PIF # P016-269-20109
Our Project # J2010-16
FIT# - FIPPZEV

June 9, 2010
June 9, 2010.

Attention: Todd Wilcox and John Severino,

Re: Stage 1 Archaeological and Cultural Heritage Resource Assessment of a Proposed Methane Fuelled Generation Facility at the North Bay Landfill, Merrick Township, City Of North Bay, District of Nipissing, Ontario.

Please find attached three copies of an Archaeological and Heritage Impact Assessment Report for the above captioned project.

For licence and regulatory purposes, we will be sending an additional three copies on your behalf to the following offices:

Administrative Coordinator
Culture Programs Unit
Programs & Services Branch
Ministry of Tourism and Culture
400 University Avenue,
4th Floor Toronto ON M7A 2R9

We were pleased to have assisted you with this project and hope to be of continuing service with your future undertakings.

Yours truly,
WOODLAND HERITAGE SERVICES LIMITED.

__________________________
Ryan Primrose B.A. (Hons), M.A., B.Ed.
RP/jp, Enclosures
Executive Summary

A Stage 1 archaeological and cultural heritage assessment was carried out a property owned by the City of North Bay which is located within the existing Merrick Township landfill site boundaries (see Figures 1 and 2). A visual inspection was performed on the entire property and GPS coordinates and photographs were taken. As this area had been intensively and extensively disturbed through the development of the existing landfill site, no areas of archaeological or cultural heritage potential were identified.

It is recommended that North Bay Hydro be allowed to continue with their development of the methane generation facility in Merrick Township without additional archaeological or cultural heritage concerns.

Project Personnel

Dr. John Pollock, P016 - Project Director, Report Author
Ryan Primrose, P208 - Field Director, Report Author

Acknowledgements

Woodland Heritage Services Limited would like to acknowledge the help of John Severino and John Miller (City of North Bay) for providing background material and helping with the site inspection.
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1.0 PROJECT BACKGROUND

This section of the project report provides the context for the archaeological fieldwork. The project background section covers three areas: development context, historical context, and archaeological context.

1.1 Development context

The archaeological and cultural heritage field work was required as part of the environmental assessment site development process. The archaeological and cultural heritage Stage 1 assessment work was performed in advance of any additional ground-disturbing activities relating to the installation of the hydro generation facility.

The City of North Bay is planning to install a methane based hydro generation facility at the Merrick landfill site, in front of the existing flare unit (see Figure 2). The development consists of pouring a concrete pad and installing the engine and generator.

Woodland Heritage Services received permissions to pass on the property and perform all activities related to archaeological and cultural heritage assessments.

1.2 Historical context

The landfill is located approximately 20 kilometres north of the City of North Bay and Lake Nipissing. Lake Nipissing (including Trout Lake, the La Vase River, and the Mattawa River) is one of the most historically active areas in the greater North Bay area. The La Vase River served as the prominent travel route between the Ottawa River and the Great Lakes, and was used by First Nations people, Samuel De Champlain, and a host of other Europeans historically.
North Bay Prehistory and Early History

Shield Archaic Peoples (5.500 B.C. - 500 B.C.)
The Shield Archaic peoples are represented by the Environmental Frontiersman's theme. One of the theme developments is the Abitibi Narrows Phase and Mattawa Archaic (developmental aspects of themes are based on technological and stylistic differences and variations in raw materials as well as the geographic distribution of technology, style, etc ...) see Ontario, A Topical Organization of Ontario History 1975:14, 15). The Shield Archaic peoples (which may involve one or more separate cultural phases or groups) were widespread across northern Ontario and may have evolved their culture and technology from the preceding peoples who lived in the Thunder Bay and Manitoulin Island areas.

Laurel Peoples (500 B.C. - A.D. 500)
Laurel peoples are represented by the Indigenous Settlers, Traders and Potters Theme (Ontario, A Topical Organization of Ontario History n.d.: 22). This phase marks the first appearance of pottery in the North Bay region. Laurel sites tend to be found along major lakes and rivers. Moose and beaver were important food sources as were fish.

Late Prehistoric Peoples (A.D. 500 - A.D. 1600)
These peoples were the groups who lived in Northeastern Ontario just prior to the arrival of Etienne Brule and other Europeans (Father La Caron, Samuel de Champlain, Brother Gabriel Sagard and Alexander MacKenzie) along with European trade goods. Many of these late prehistoric groups are known on the basis of their pottery vessels and distinctive decorations found on them. Some of these pottery traditions found in the area are Blackduck and Ontario Iroquois. These peoples were the ancestors of the present day Anishnabeg (Nipissing) people who still reside in the area. The Anishnabeg people have shared this area for three hundred and eighty-two years (1610-1992) with European settlers. However, their history in the area goes back a minimum of 6,000 years and perhaps several thousand years earlier to the days of the glacial lake. The
entire North Bay and La Vase watershed area was utilized even the small creeks during this lengthy time period.

1.2.1 Historical Overview Of North Bay (1610 To 1880) First Nations.
Current members of the Nipissing First Nation - whose Reserve (# 1 0) on the north shore of the lake was set apart under the 1850 Robinson-Huron Treaty - call themselves Ojibwa or Ojibway. In their own language, however, they call themselves "Anishnabeg," which means "real people" or "human beings" (Rogers 1978:768-69). The self-designation Anishnabeg is common to a number of tribal groupings, all of whom speak dialects of the Ojibwa language.

The Nipissings.
In the seventeenth and eighteenth centuries, the inhabitants of the Lake Nipissing region were known as Nipisiriniens or Nipissings, rather than as Ojibwa. They were among the first aboriginal people encountered by early French explorers and missionaries like Samuel de Champlain and the Recollect Fathers (Day 1978:786-788). Like many of their neighbours, the Nipissing were affected by the Iroquois devastation of Huronia in the mid-seventeenth century. Some Nipissings fled westward as far as Lake Nipigon, only returning to their homelands after 1667 (Day 1978:789).

The Nipissings never formed a single tribal grouping. For example, Champlain suggested that there were seven or eight hundred of them- Father Jerome Latemant wrote in 1641 that the Nipissing nation contained as many wandering as sedentary people, and that they seemed to have as many abodes as the year has seasons." In the spring, he stated, "some of them remain at the best fishing places, while others go to trade with peoples who come together on the shores of the north or frozen sea" -, i.e., James Bay, It was only in summer that they all assembled on the route the Hurons took to the French - that is to say on Lake Nipissing. There, said the Jesuits, they cultivated some land, but more for pleasure than for support (Thwaites 1896-1901, 21 :239-241). There seems to
have been more than one early historic village site on Lake Nipissing. In 1615, Champlain implied that at least some of the Nipissings were then living at the mouth of the Sturgeon River (Biggar 1971, IV:233-234). And it was probably at this village that the French trader Jean Nicollet de BelIebome passed the years 1620-1629 (Thwaites 1896-1901, 18:229-231).

But there was also a village site on the opposite side of the lake. The map illustrating the narrative of the Sulpicians Dollier de Casson and de Brehant de Galinee - who explored Lakes Erie and Huron in 1669-70, returning to Montreal by way of the French River - notes that the "NipissiriniensI had their "usual village at the bottom of a small bay ("ance") just past the Chaudiere falls portage on the French River (Coyne 1903:86-87). From the fact that this village appeared before Lake Nipissing proper, it was probably in either Sand Bay or Satchels Bay. In 1686, however, French cartographer Claude Bemou placed a village of "Nipissiniens" at the bottom of South Bay on Lake Nipissing - so it is possible that this was the actual site. Bemou also identifies the Nipissing village at the mouth of the Sturgeon River on his map (NMC H3/902-1686). The Nipissings were famous warriors, aiding the French in their attacks on the English and Iroquois of what is now New York State. Both before and after the 1701 peace with the Iroquois, Christian Nipissings were in the habit of spending their summers with Sulpician missionaries – first at the western end of Montreal Island, then on nearby Ile aux Tourtes. In 1721, the Sulpicians founded a new mission on Lake of Two Mountains for the Nipissings, the Algonquin and some of the Christian Iroquois (Day 1978:789-790). The mission was known in the Ojibwa language as Oka -"pickerel" - and in Iroquois as Kanasetake (Thompson 1991). It is clear that not all Nipissings were converts to Christianity. The Sulpician missionaries at Oka documented the existence, throughout the eighteenth century, of pagan "Nipissing des terres" - or inland Nipissings (Registres 1786-1843). Most seem to have remained in the vicinity of the lake itself. For example, a 1736 enumeration of Native tribes in alliance with the French states that there was still a
village on Lake Nipissing. This must have been the village at the mouth of the Sturgeon River, because it is indicated on a 1725 map of New France (NMC Ph-90011725).

In 1761, a year after the surrender of Montreal to British troops, the fur trader Alexander Henry met several canoes of Indians on Lake Nipissing. They told him they lived on the north-western side of the lake (Henry 1901:30).

1.3 Archaeological Context

Before initiation of fieldwork, the site files and catalogued reports at Woodland Heritage Services Ltd. and/or the offices of the Archaeological Data Coordinator, Ministry of Culture were checked to determine if any pre contact or historic archaeological sites had been previously recorded either in or near the study area. The following archaeological sites are found associated with the La Vase River travel route (see Figure 3).

The proposed development lies north of the CbGu Borden Block where the bulk of archaeological sites (29 registered sites) have been recorded in the North Bay area. This is not to say that concentrations of archaeological sites do not exist outside of the CbGu block, it is more likely a reflection of the general lack of archaeological surveys outside of the CbGu block area.

1.3.1 Prehistoric Site Distribution and Settlement Patterns

Table 1 presents a summary of the location and condition of the sites mentioned above. There has not been enough archaeological work undertaken on Lake Nipissing and the North Bay area to comment on any distinctive settlement patterns. However, it does appear that there were significant use and occupation of the area (Le., City of North Bay.
Municipal Area) including the islands and shoreline of Lake Nipissing and the mouths and shorelines of tributary creeks and watersheds such as the La Vase River. as well as Parks, Chippewa and Duchesnay Creeks. Sites vary in age from prehistoric to historic with the possibility of locating very early prehistoric sites along the old former Glacial Lake Nipissing shorelines and outflow channels (Nipissing Phase of the Glacial Great Lakes). These uplifted shoreline features are present throughout the North Bay area and especially in the general vicinity of Highway 11 where the shoreline of Lake Nipissing used to be some five thousand years ago.

Table 1. List of Registered Archaeological Sites Associated with the La Vase River.

<table>
<thead>
<tr>
<th>Borden #</th>
<th>Site Name</th>
<th>Type and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CbGu-1</td>
<td>La Vase North Bank Site, at Champlain Park, La Vase River Mouth</td>
<td>Find spot recorded by J.V. Wright, 1961</td>
</tr>
<tr>
<td>CbGu-2</td>
<td>Palferman Site, Dugas Bay, Trout Lake</td>
<td>Rock structure, recorded by Allan Tyyska, 1972</td>
</tr>
<tr>
<td>CbGu-3</td>
<td>Palferman 2 site</td>
<td>Stone construction, recorded by Allan Tyyska, 1972</td>
</tr>
<tr>
<td>CbGu-4</td>
<td>La Vase Park Site</td>
<td>Historic building Complex with prehistoric component may be early Laronde, recorded by J. Pollock and settlers (pre 1880) or perhaps Fort Peter Bullock 1991.</td>
</tr>
<tr>
<td>CbGu-5</td>
<td>La Vase Island Site</td>
<td>Historic and prehistoric site near what is now an island at the mouth of the La Vase River. Site underwater during most of the year. Could represent the Orirenal Ft. Laronde Site recorded by J. Pollock and Peter Bullock 1992.</td>
</tr>
<tr>
<td>Site Code</td>
<td>Site Name</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>CbGu-6</td>
<td>Parks Creek Site 1</td>
<td>Prehistoric site on Parks Creek (Pollock &amp; Bullock, 1992)</td>
</tr>
<tr>
<td>CbGu-7</td>
<td>Parks Creek Site 2</td>
<td>Prehistoric site on Parks Creek (Pollock &amp; Bullock, 1992)</td>
</tr>
<tr>
<td>CbGu-8</td>
<td>Parks Creek Site 3</td>
<td>Prehistoric site on Parks Creek (Pollock &amp; Bullock, 1992)</td>
</tr>
<tr>
<td>CbGu-9</td>
<td>Parks Creek Site 4</td>
<td>Prehistoric site on Parks Creek (Pollock &amp; Bullock, 1992)</td>
</tr>
<tr>
<td>CbGu-10</td>
<td>La Vase River Portage</td>
<td>Historic portage landing south end</td>
</tr>
<tr>
<td>CbGu-11</td>
<td>La Vase River Portage</td>
<td>Fur trade dam site, north end of Portage and historic late 1800's occupation (Pollock &amp; Bullock 1992, ASI 1995)</td>
</tr>
<tr>
<td>CbGu-12</td>
<td>Wasi Falls</td>
<td>Historic foundations, etc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollock (1993)</td>
</tr>
<tr>
<td>CbGu-13</td>
<td>Wasi Falls</td>
<td>Prehistoric Campsite</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollock (1993)</td>
</tr>
<tr>
<td>CbGu-14</td>
<td>Chippewa Creek</td>
<td>Campsite and trail</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollock (1994)</td>
</tr>
<tr>
<td>CbGu-15</td>
<td>Delaney (Mud) Lake</td>
<td>Prehistoric site</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollock (1994)</td>
</tr>
<tr>
<td>CbGu-16</td>
<td>McLean Lake Site</td>
<td>Portage campsite</td>
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<tr>
<td></td>
<td></td>
<td>Pollock (1994)</td>
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<tr>
<td>CbGu-17</td>
<td>Delaney (Mud) Lake</td>
<td>Sawmill foundation</td>
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<tr>
<td></td>
<td></td>
<td>Pollock (1994)</td>
</tr>
<tr>
<td>CbGu-18</td>
<td>Twin Lakes Narrows</td>
<td>Cabin foundation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pollock (1994)</td>
</tr>
<tr>
<td>CbGu-19</td>
<td>La Vase River Upper</td>
<td>Prehistoric and historic</td>
</tr>
<tr>
<td>Stage 1 Archaeological and Cultural Heritage Resource Assessment of a Proposed Methane Fuelled Hydro Generation Facility at the North Bay Landfill, Merrick Township, City Of North Bay. MTC PIF P016-269-2010.</td>
<td></td>
<td></td>
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<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td>Portage</td>
<td>ASI (1995)</td>
<td></td>
</tr>
<tr>
<td>CbGu-21</td>
<td>Dugas Bay Site Prehistoric site ASI (1995)</td>
<td></td>
</tr>
<tr>
<td>CbGu-22</td>
<td>The Champlain Cross Site Prehistoric and historic ASI (1995)</td>
<td></td>
</tr>
<tr>
<td>CbGu-24</td>
<td>Bowles Island Site Prehistoric ASI (1995)</td>
<td></td>
</tr>
<tr>
<td>CbGu-25</td>
<td>Fish Weir or Dam Historic/Prehistoric, Pollock and Bullock (1996)</td>
<td></td>
</tr>
<tr>
<td>CbGu-26</td>
<td>J.B. Smith railway bridge Historic 1900 - 1960, Pollock and Bullock (1996)</td>
<td></td>
</tr>
<tr>
<td>CbGu-27</td>
<td>La Vase River Prehistoric campsite, Pollock and Bullock (1996)</td>
<td></td>
</tr>
<tr>
<td>CbGu-28</td>
<td>La Vase River Prehistoric campsite, Pollock and Bullock (1996)</td>
<td></td>
</tr>
<tr>
<td>CbGu-29</td>
<td>La Vase River - Middle Portage Prehistoric campsite, Pollock and Bullock (1996)</td>
<td></td>
</tr>
</tbody>
</table>
1.3.2. Current Land Use(S), Field Conditions, Soils And Topography
The lands directly associated with the property in question are used exclusively as a landfill site by the City of North Bay.

The property in question has already been intensively and extensively disturbed through landfill site development activities.

The soils in the area range from medium / fine sand with some gravel and cobbles interspersed.

1.3.3. Field Work Schedule
The field work was carried out on Friday May 28th, 2010.

1.3.4. Past Fieldwork
Previous archaeological work has been undertaken in the North Bay area for many years. Work by Wright and Saunders (1980) concentrated along the lower La Vase River but did not locate the Fort Laronde post on Bothwell Island at the mouth of the La Vase River. Allan Tyyska and James Bums reported on the North Bay to Mattawa area (1973) as did P. and M. Wright (1975). Also in 1975, A. Tyyska described the Palferman Site in a Canadian Archaeological Association Paper (Tyyska 1975). In 1980, Morris J. Brizinski completed his M.A. thesis at McMaster University (Brizinski 1980) following up on earlier work by Frank Ridley at the Frank Bay Site (Ridley 1954). Also, during the mid 1980's. Beverely Smith undertook a brief survey of the Manitou Islands in Lake Nipissing. However, overall there has been little work in the North Bay area. The Parks Creek study undertaken by John Pollock in 1991-2 located four sites and indicated that the North Bay area had a high potential to contain additional sites (Settlement Surveys Ltd. 1992). The Chippewa Creek study also undertaken by Pollock in 1994 recorded a further four sites (Settlement Surveys Ltd. 1994). In Archaeological Services Inc. In 1995, undertook a
survey along portions of the La Vase River and recorded a total of six new sites with excavations in the Champlain Park area. (Archaeological Services Inc. 1996). Also, in 1996. Laurentian University conducted an archaeological field school at the Champlain Park. Finally, in 1966 Settlement Surveys Ltd. (John Pollock) located a further five sites (described in this report). All this work clearly indicates that further archaeological site inventory and field work should be undertaken in the La Vase watershed prior to any development projects.

1.3.5. Physical features affecting fieldwork strategy, decisions or the identification of artifacts or cultural features.
N/A

2.0 Stage 1 Assessment Background

2.0.1 Property Inspection
The property inspection included but was not limited to the detailed examination of the lands to be developed. A general inspection was carried out for the entire project limit. The extent of the property was visually inspected and photographs and GPS coordinates were taken (see Figures 2-6).

2.1 Stage 1 Analysis and Conclusions

2.1.1 Identify and describe areas of archaeological potential within the project area.
Due to the initial and continued development of the North Bay Merrick Landfill Site, intensive and extensive disturbances occurred in, and throughout, the area planned for development. As such, no areas of archaeological potential exist within the study area.
2.1.2 Identify and describe areas that have been subject to extensive and deep land alterations.

Through the property inspection it was determined that the entire study area has been intensively and extensively disturbed.

2.2 Stage 1 Recommendations

2.2.1 Make recommendations regarding the potential for the property.

The property can be classified as being of low archaeological potential.

It is recommended that North Bay Hydro be allowed to continue with their development of the methane generation facility at the City of North Bay Merrick Landfill Site without any further archaeological or cultural heritage work or concerns.

2.3 Advice on compliance with legislation

Advice on compliance with legislation is not part of the archaeological record. However, for the benefit of the proponent and approval authority in the land use planning and development process, the report must include the following standard statements:

a. This report is submitted to the Minister of Culture 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 the licensed consultant archaeologist has met the terms and conditions of their archaeological licence, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario.

b. Should previously undocumented 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 sec. 48 (1) of the Ontario Heritage Act.

c. The Cemeteries Act requires that any person discovering human remains must notify the police or coroner and the Registrar of cemeteries, Ministry of Small Business and Consumer Services.

*Reports recommending further archaeological fieldwork or protection for one or more archaeological sites must include the following standard statement: ‘Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act. and may not be altered, or have artifacts removed, except by a person holding an archaeological licence’.

3.0 Figures (Maps and Images) (on following pages)
Figure 1. Project Location Map
Figure 2. Plan of the proposed methane fuelled generator station.
Figure 3. Photograph looking west at the site area to house the generator facility.

Figure 4. The site area in front of the flare unit is where the generator will be installed.
Figure 5. Looking west at the flare unit and future site of the generator.

Figure 6. Looking south at the site of the future generator.
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Thompson, John

Thwaites, Rueben Gold (ed.)

Vidal and Anderson

Woodland Heritage Services Limited (Dr. John Pollock)
1999 Archaeological and Cultural Heritage Resources Study Hwy. 69 Preliminary Design and EA From Sudbury Southerly 20 Km to Burwash, W. P. 327-91-00

2000 Archaeological and Heritage Impact Assessment of Highway 63- From 1.0 Km North of the Junction with highway 533, northerly to the Quebec border, 23.5 Km, W.P. 167-90-00. Earth Tech (Canada Inc.).

2001 Archaeological Assessment of Highway 69 Interchanges, from 0.3 km North of Highway 537, Northerly 8.8 km. G.W.P. 327-91-00, Consultant Agreement No. 5005-A-000163, TSH Project # 42-91 022.

2001  Archaeological and Cultural Heritage Resource Assessment of Highway 69 from Deux Rivières Easterly 19.0 Km, to Bissett Creek, District 54, Sudbury. MTO Project # G.W.P. 16-84-01, MTO Agreement Number PO 5005-A-000039


2003  Stage One and Stage Two Archaeological / Cultural Heritage Site Assessment of Highway 69 From Stonecliffe Easterly 12.7 km, District 54, Sudbury. MTO Agreement Number PO 5005-A-000156, W.P. 83-89-00

2003  Archaeological and Heritage Impact Assessment of the Commanda Stone Piles, Nipissing Forest Management Unit

Wright, J.V.


Zaslow, Morris
APPENDIX D

REVISED NATURAL HERITAGE ASSESSMENT AND WATER ASSESSMENT IN SUPPORT OF THE RENEWABLE ENERGY APPLICATION, MERRICK LANDFILL SITE
NORTH BAY HYDRO
MERRICK LANDFILL

NATURAL HERITAGE ASSESSMENT AND WATER ASSESSMENT IN SUPPORT OF
THE RENEWABLE ENERGY APPLICATION FOR THE MERRICK LANDFILL SITE

PREPARED FOR
North Bay Hydro
74 Commerce Court
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December 23, 2010

Knight Piésold
CONSULTING
NORTH BAY HYDRO
MERRICK LANDFILL

NATURAL HERITAGE ASSESSMENT AND
WATER ASSESSMENT IN SUPPORT OF
THE RENEWABLE ENERGY APPLICATION
FOR THE MERRICK LANDFILL SITE
(REF. NO. NB103-308/1-1)

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NORTH BAY HYDRO
MERRICK LANDFILL

NATURAL HERITAGE ASSESSMENT AND
WATER ASSESSMENT IN SUPPORT OF
THE RENEWABLE ENERGY APPLICATION
FOR THE MERRICK LANDFILL SITE
(REF. NO. NB103-308/1-1)

EXECUTIVE SUMMARY

A natural heritage assessment and a water assessment as required by O.Reg. 359/09 of the Ontario Environmental Assessment Act were carried out on a property owned by the City of North Bay, which is located within the existing Merrick Landfill site. A records review and a site investigation, including the use of satellite imagery, showed that only 1.4 ha of the 6.8 ha study area (footprint and 120 m buffer areas) is natural or semi-natural habitat. This study also found that no significant natural heritage or water features are present within the study area. In addition, no significant problems are anticipated as a result of considering the natural heritage-related approvals and permitting for renewable energy development projects required by the Ministry of Natural Resources. It is recommended that North Bay Hydro be permitted to continue with their development of the methane generation facility without additional natural heritage or water assessment concerns.
# NORTH BAY HYDRO
MERRICK LANDFILL

NATURAL HERITAGE ASSESSMENT AND WATER ASSESSMENT IN SUPPORT OF THE RENEWABLE ENERGY APPLICATION FOR THE MERRICK LANDFILL SITE (REF. NO. NB103-308/1-1)

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Appendix B NRVIS Data Layer Review for Merrick Landfill (Completed by the North Bay MNR, August 2010)
Appendix C Field Notes
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Appendix E List of Plant Species Observed during the Site Investigation (Not Exhaustive)
Appendix F List of Potential Wildlife Habitat
Appendix G Species at Risk in the North Bay, Ontario Region
SECTION 1.0 - INTRODUCTION

This report presents the results of a revised Natural Heritage Assessment and Water Assessment carried out on behalf of North Bay Hydro presented in a report dated September 9, 2010. This revision is based on a letter from Ministry of Natural Resources, North Bay District Office dated November 22, 2010. This revised report also addresses other natural heritage-related permitting requirements of the Ministry of Natural Resources. These assessments were conducted by Dr. Peter Quinby, Certified Senior Ecologist (see resume in Appendix A) of Knight Piésold Ltd. (KP).

The City of North Bay and North Bay Hydro are proposing to install a methane-powered electricity generator at the Merrick Landfill Site, located in Merrick Township approximately 20 km north of North Bay (see Figure 1.1). The new generator will be housed in a shipping container that will be 60 feet long by 10 feet wide, and will be positioned at the location of the current methane burner within the project footprint as shown on Figure 1.2. Construction activities within the footprint area will be minimal and will consist of: (1) earthworks and application of gravel for concrete pads, (2) installation of concrete pads, and (3) installation of fencing surrounding the facility. Operational activities will not change significantly from existing operational activities. Figure 1.2 shows the project footprint area and the 120 m buffer areas, which taken together, make up the project study area.

In accordance with O.Reg. 359/09 (of the Ontario Environmental Protection Act), this report presents the results of the natural heritage assessment and the water assessment. As a result of the records review and the site investigations for both assessments, no significant natural heritage or water features were found.
SECTION 2.0 - NATURAL HERITAGE AND WATER BODIES RECORDS REVIEW

2.1 NATURAL HERITAGE ASSESSMENT

As required by O.Reg. 359/09, KP reviewed information from numerous sources in order to identify whether the proposed methane-powered electricity generator is located: within 120 m of a provincial park or conservation reserve, in a natural feature, within 50 m of an area of natural or scientific interest (ANSI) related to earth science; or within 120 m of a natural feature that is not an ANSI related to earth science. The sources used included Biodiversity Explorer from the NHIC (species at risk), LIO, NRCan 1:50,000 base map, vegetation types (EOSD, CFSNet), the City of North Bay, and a NRVIS data review completed by the North Bay District Ministry of Natural Resources. The results of this review include the following.

2.1.1 Provincial Parks/Conservation Reserves

No provincial parks or conservation reserves are located within the study area.

2.1.2 Natural Features

A search of the MNR Natural Heritage Information Centre (NHIC) database by KP and a search of the NRVIS database by the Ministry of Natural Resources did not show the presence of any natural features in the study area (see Appendix B for MNR results). The results of these searches are summarized below. Text in quotes was taken from O.Reg. 359/09 or MNR’s Natural Heritage Assessment Guide.

*Earth Science ANSI (area of natural and scientific interest-earth science)* – “an area that has earth science values related to protection, scientific study or education”

**RESULTS: NONE PRESENT IN THE STUDY AREA**

*Life Science ANSI (area of natural and scientific interest-life science)* – “an area that has life science values related to protection, scientific study or education”

**RESULTS: NONE PRESENT IN THE STUDY AREA**

*Coastal Wetland* – “a wetland that is located, (a) on Lake Ontario, Lake Erie, Lake Huron, Lake Superior or Lake St. Clair, (b) on the St. Mary’s, St. Clair, Detroit, Niagara or St. Lawrence River, or (c) subject to subsection (3), on a tributary to any water body mentioned in clause (a) or (b) and, either in whole or in part, downstream of a line located two kilometres upstream of the 1:100 year floodline of the water body”

**RESULTS: NONE PRESENT IN THE STUDY AREA**

*Northern Wetland* – “a wetland located north of the northern limit of Ecoregions 5E, 6E and 7E as shown in Figure 1 in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005”
RESULTS: NONE PRESENT IN THE STUDY AREA

Southern Wetland – “a wetland located south of the northern limit of Ecoregions 5E, 6E and 7E as shown in Figure 1 in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005”

RESULTS: NONE PRESENT IN THE STUDY AREA

Valleyland – “a natural area, (a) that is south and east of the Canadian Shield as shown in Figure 1 in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005, and (b) that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year”

RESULTS: NONE PRESENT IN THE STUDY AREA

Wildlife Habitat – “an area where plants, animals and other organisms live or have the potential to live and find adequate amounts of food, water, shelter and space to sustain their population, including an area where a species concentrates at a vulnerable point in its annual or life cycle and an area that is important to a migratory or non-migratory species”

RESULTS: PRESENT IN THE STUDY AREA: ADDRESSED IN THE SITE INVESTIGATION SECTION

Woodland – “land, (a) that is south and east of the Canadian Shield as shown in Figure 1 in the Provincial Policy Statement issued under section 3 of the Planning Act and approved by the Lieutenant Governor in Council by Order in Council No. 140/2005, (b) that has, per hectare, at least, (i) 1,000 trees of any size, (ii) 750 trees measuring over five centimetres in diam, measured in accordance with subsection (7), (iii) 500 trees measuring over 12 centimetres in diam, measured in accordance with subsection (7), or (iv) 250 trees measuring over 20 centimetres in diam, measured in accordance with subsection (7), and (c) that does not include a cultivated fruit or nut orchard or a plantation established for the purpose of producing Christmas trees”

RESULTS: NONE PRESENT IN THE STUDY AREA

Sand Barrens – “land (not including land that is being used for agricultural purposes or no longer exhibits tallgrass prairie characteristics) that: (a) has sparse or patchy vegetation that is dominated by plants that are: i.) adapted to severe drought and low nutrient levels; and ii.) maintained by severe environmental limitations such as drought, low nutrient levels and periodic disturbances such as fire; (b) has less than 25 per cent tree cover; (c) has sandy soils (other than shorelines) exposed by natural erosion, depositional process or both; and (d) has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time.”
RESULTS: NONE PRESENT IN THE STUDY AREA

Savannah – “land (not including land that is being used for agricultural purposes or no longer exhibits savannah characteristics) that: (a) has vegetation with a significant component of non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both; (b) has from 25 per cent to 60 per cent tree cover; (c) has mineral soils; and (d) has been further identified, by the Ministry of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time”

RESULTS: NONE PRESENT IN THE STUDY AREA

Tallgrass Prairie – “land (not including land that is being used for agricultural purposes or no longer exhibits tallgrass prairie characteristics) that: (a) has vegetation dominated by non-woody plants, including tallgrass prairie species that are maintained by seasonal drought, periodic disturbances such as fire, or both (b) has less than 25 per cent tree cover; (c) has mineral soils; and (d) has been further identified, by the Minister of Natural Resources or by any other person, according to evaluation procedures established by the Ministry of Natural Resources, as amended from time to time”

RESULTS: NONE PRESENT IN THE STUDY AREA

Alvar – “a naturally open area of thin or no soil over essentially flat limestone, dolostone or marble rock, supporting a sparse vegetation cover of mostly shrubs and herbs”

RESULTS: NONE PRESENT IN THE STUDY AREA

2.1.3 Crown in Right of Canada

Not applicable, the proposed development is not on, or within 120 m of any Crown Land.

2.1.4 Conservation Authority

Not applicable, the proposed development is not on lands under the authority of a conservation authority.

2.1.5 Local and Upper-Tier Municipality

Merrick Township is an unorganized township and the Merrick Landfill is a legally-permitted landfill approved in the City of North Bay Official Plan.

2.1.6 Planning Board

Not applicable; the City of North Bay is responsible for the proposed development site.
2.1.7 Municipal Planning Authority
Not applicable; the City of North Bay is responsible for the proposed development site.

2.1.8 Local Roads Board
Not applicable; the City of North Bay is responsible for the proposed development site.

2.1.9 Local Services Board
Not applicable.

2.1.10 Niagara Escarpment Commission
Not applicable.

2.2 WATER BODIES ASSESSMENT

As required by O.Reg. 359/09, Knight Piésold reviewed the same information sources that were reviewed for the natural heritage assessment (described above) in order to identify whether the project location is located in a water body; within 120 metres of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity; within 300 metres of the average annual high water mark of a lake trout lake that is at or above development capacity; within 120 metres of the average annual high water mark of a permanent or intermittent stream; or within 120 metres of a seepage area. The results of this records review showed that the Project is not located in or within 120 metres of any of these water bodies.

2.3 SUMMARY

The natural heritage assessment – records review indicated that some types of wildlife habitat are present in the study area. These wildlife habitat features are addressed in the natural heritage assessment – site investigation section of this report. The water bodies assessment - records review did not show any water bodies within the study area.
SECTION 3.0 - NATURAL HERITAGE SITE INVESTIGATION

3.1 INTRODUCTION

A natural heritage site investigation was undertaken on July 27, 2010 (8:25 am to 9:48 am) by Dr. Peter Quinby, which focused on natural features within 120 m of the proposed development site (see Figure 1.2). The weather during the site investigation was sunny and warm (~25 degrees C). In addition to looking for potential wetlands in the field, a number of wildlife habitat features were also specifically targeted for observation in the field and were selected from the following groups: (1) animal concentration areas, (2) rare vegetation communities or specialized habitats for wildlife, (3) habitats of species of conservation concern, and (4) habitat associated with animal movement corridors as described in MNR’s Significant Wildlife Habitat Technical Guide.

3.2 COARSE-SCALE HABITAT TYPES IN THE STUDY AREA

Figure 1.2 shows the location and types of habitat in the study area and Table 3.1 provides areas (ha) associated with these habitat types. A total of 79% of the study area is made up of habitat types that have been highly disturbed by human activity leaving only 21% or 1.4 ha of natural or semi-natural habitat. The most common habitat type in the study area is exposed land, which occupies 3.7 ha or 54.4% of the study area. The other highly disturbed habitat type is roadway, which covers 0.8 ha or 11.8% of the study area. The Jack Pine forest (ES15), which is very young (~20 yrs. old), has also been disturbed primarily by logging. This habitat type covers 0.9 ha or 13.2% of the study area. The remaining habitat types include Poplar-White Birch-White Spruce-Balsam Fir forest (ES18) covering 0.8 ha (11.8%), and Black Spruce-Pine (ES16), which occupies 0.6 ha or 8.8% of the study area.

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<tr>
<td>ES15-Jack Pine</td>
<td>0</td>
<td>0</td>
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<tr>
<td>ES18- Poplar-White Birch-White Spruce-Balsam Fir</td>
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<td>0</td>
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<tr>
<td>Roadway</td>
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<tr>
<td>ES16- Black Spruce-Pine</td>
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3.3 DESCRIPTION OF THE STUDY AREA BASED ON FIELD OBSERVATIONS

The methodology used to describe the habitats in the field consisted of visual observations made within the footprint area and within each of the 120 m buffer areas. A basic description of each buffer area is provided below. Field notes taken during the site investigation are presented in Appendix C, photos are
presented in Appendix D, and a list of plant species observed in the buffer areas during the site investigation is presented in Appendix E. No wetlands were observed in the study area.

As shown in Table 3.1, the footprint area is composed of only of gravel, sand, and roadway. This was confirmed in the field. The 120 m buffer along the eastern boundary of the proposed project location is composed primarily of gravel road and landfill. The 120 m buffer along the southern boundary is made up of young forest (~20 yrs., ~80-90% cover) and gravel road. The forest is dominated by jack pine with a minor component of white birch. Pin cherry, white spruce, black spruce, and white birch are regenerating in the understory.

The 120 m buffer along the west side of the proposed project location, progressing from the inner portion of the buffer to the outer portion of the buffer, is composed of a narrow strip of vegetation (forest and meadow) from 40 – 70 m wide, a road roughly 10 m wide, a strip of vegetation about 10 – 15 m wide and a clay stockpile extending beyond 120 m. The first strip of forest (60 – 100 yrs., 70 – 90% cover) is dominated by white birch and includes a few red maple and large white pine. The second (outer) strip of forest (50 – 70% cover, 50 – 100 yrs.) is dominated by white spruce, tamarack, and white pine.

The 120 m buffer along the north side of the proposed project location is made up of forest (60 -100 yrs., 70 – 90% cover) dominated by white birch with a minor component of red maple and large white pine except for the eastern portion of the buffer (about 50 m), which is dominated by 20-year old jack pine with 90 – 95% cover.

3.4 POTENTIAL WILDLIFE HABITAT (FINE-SCALE) AND EVALUATION OF SIGNIFICANCE

Appendix F, prepared by the MNR North Bay Office, provides a list of the specific types of wildlife habitat that occur within central Ontario forested landscapes. As determined by the MNR North Bay Office, five of these wildlife habitat types have potential to exist in the 1.4 ha of natural or semi-natural habitat in the study area and are addressed below. Those wildlife habitats that do not occur in the study area are also listed in Appendix F. Wildlife habitat descriptions provided below were taken directly from the MNR’s Significant Wildlife Habitat Technical Guide. Portions of the explanations for the potential presence or absence of these habitat types and their associated species were taken from Appendix F of this report. These five potential wildlife habitat types include the following.

3.4.1 Reptile Hibernacula

Some species of snakes and turtles overwinter in sizeable concentrations in sites known as hibernacula. These sites are often in animal burrows, rock crevices, and other areas that enable the animals to hibernate below the frost line and often in association with water to prevent desiccation. Frequently hibernacula are found among broken rocks at the base of cliffs or in karst areas because these landforms provide an abundance of suitable subterranean crevices. Few hibernacula are known and they are normally very difficult to find. Radiotelemetry studies may be required to locate them.

No known reptile hibernacula were identified in either the records review or site investigation within the 120 m project location boundary. Sites that are often associated with reptile
hibernacula including animal burrows, rock crevices, broken rocks at the base of cliffs, and karst areas were not observed in the study area. Although a portion of the study area is comprised of FEC ecotype ES18 (poplar, white birch, white spruce and balsam fir; see Figure 1.2), this ecotype is primarily associated with Five-lined Skink, whose range does not extend this far north. Also, the area is adjacent to a landfill, which has been operating for a number of years and significant numbers of reptiles have not been noted by landfill employees.

Since the proposed activities (e.g., installation of an engine to the existing methane well system and flaming tower) would not result in any forest clearing or construction in the footprint area, there is little concern regarding negative impacts of this proposed project on reptile hibernacula. This habitat type is not considered significant in the study area.

3.4.2 Woodlands Supporting Amphibian Breeding Ponds

These ponds are used for breeding by several species of frogs and salamanders. Such water bodies may be small and ephemeral but nevertheless, important to local amphibian populations, especially if they provide the only suitable habitat in the area. The best breeding ponds are unpolluted, and contain a variety of vegetation structure, both in and around the edge of the pond, for egg-laying and calling by frogs. The best adjacent habitats are closed-canopy woodlands with rather dense undergrowth that maintains a damp environment. Moist fallen logs are another important habitat component required by salamanders. Sites with several ponds and/or ponds close to creeks are especially valuable.

This habitat type was not identified in the records review or site investigation within the 120 m boundary around the project location. Most of the site location is cleared areas adjacent to an operating landfill. The small parcels of wooded area within the project location do not contain vernal pools consistent with the SWHTG Decision Support System criteria for this habitat type, such as closed canopy, moist forest with woody debris, vernal pools, which hold water long enough for larval development with emergent and submergent vegetation present. This habitat type is not considered significant in the study area.

3.4.3 Specialized Raptor Nesting Habitat and Woodland Raptor Nesting Habitat

No known raptor nests were recorded in NRVIS within the 120 m project location boundary; however, three raptor species were counted during a Breeding Bird Atlas inventory for square 17PM15, with a point count station located approximately 1.3 km from the project location. These species were Northern Harrier (Circus cyaneus), Red-tailed Hawk (Buteo jamaicensis) and Broad-winged Hawk (Buteo platypterus).

The Northern Harrier prefers large, open fields with minimal shrub or tree coverage; seems to prefer open areas that are 30 ha in area or larger, but occasionally nests in smaller habitat patches; also nests in marshes, bogs, and fens; in fields, grass cover taller than 50 cm is preferred and the nest is often situated on a small knoll.
The Red-Tailed Hawk nests in tall trees with open feeding areas nearby and it feeds mainly on small mammals (from: The Sibley Guide to Birds, 2003).

The Broad-winged Hawk nests mostly in mature, dense mixed and deciduous forests, less frequently in coniferous stands and plantations; prefers lowland stands or forests that are close to swamps or open water; appears to prefer forests 100 ha in area or larger; nests are often at the edge of forests or near an opening.

No raptor nests were identified during the site investigation within the 120 m boundary around the project location. In addition, the study area does not include large areas (>30 ha) for raptor hunting and it has few tall trees for raptor nesting.

Since the proposed activities (e.g., installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities there is little concern for this habitat type with respect to this project. Any raptors that may form new nests in the area would do so in spite of the human activity, so it is unlikely they would be impacted. This habitat type is not considered significant in the study area.

### 3.4.4 Special Concern and Rare Wildlife Species

No Special Concern species were identified within the 120 m project location boundary through NHIC, or NRVIS. However, there is a point count station (#39) for Breeding Bird Atlas Square 17PM15 approximately 1.3 km away. Three special concern bird species were recorded at this station, including: Olive-side Flycatcher (*Contopus cooperi*), Canada Warbler (*Wilsonia Canadensis*) and Golden-winged Warbler (*Vermivora chrysoptera*). Though it is reasonable to assume these species may utilize areas around the landfill or the project location, these species were not observed, nor were any nests found during the site investigation.

Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities which could impact nesting or foraging habitat, there is little concern for this habitat type with respect to this project. This habitat type is not considered significant in the study area.

### 3.5 SUMMARY

The natural heritage assessment - site investigation and the evaluation of significance confirmed the results of the records review, that no significant natural features are present within the project study area.
SECTION 4.0 - WATER BODIES SITE INVESTIGATION

A water body site investigation was carried out concurrent with the natural heritage site investigation on July 27, 2010. The results of this investigation indicated that no water bodies are located within 120 metres of the project location and that there are no lakes supporting lake trout within 300 metres of the proposed project location. The site investigation confirmed the results of the records review, that no significant water bodies are present within the project study area.
SECTION 5.0 - OTHER NATURAL HERITAGE-RELATED INFORMATION REQUIRED FOR MNR APPROVALS AND PERMITTING

5.1 FISH AND FISH HABITAT

No significant features (see water assessment above).

5.2 RARE VEGETATION COMMUNITIES

No significant features (see natural heritage assessment above).

5.3 SPECIES AND HABITAT PROTECTED UNDER THE ENDANGERED SPECIES ACT (2007)

A strategy to ensure the protection of endangered, threatened, and species at risk and their habitat will be developed and applied during both the construction and operation phases of this proposed project. The main components of this strategy will consist of an instructional manual, a field guide showing photos of species at risk (see Appendix G) and describing their habitat, field training, and program monitoring.

5.4 WILDLIFE AND THEIR HABITAT INCLUDING THE NESTS AND EGGS OF BIRDS, BEAVER DAMS, AND THE DENS OF BLACK BEARS AND SOME FUR-BEARING MAMMALS

No significant features (see natural heritage assessment above).

5.5 CROWN FOREST RESOURCES

Not applicable; the site is located within a large city-owned landfill.

5.6 MINERAL AGGREGATE RESOURCES AND PETROLEUM RESOURCES, WELLS, AND WORKS

The City of North Bay’s Provisional Certificate of Approval Number A530116 allows for the site to be used for land filling of domestic, commercial, and non-hazardous solid industrial waste. The City has no plans to change the use of the land. Appendix A of the Project Description Report includes all existing Merrick Landfill Site Approvals including the Certificate of Approval Number A530116. In addition, during the course of this study, the City stated it has no plans to apply for mineral, aggregate, or petroleum rights.

5.7 HAZARD LANDS

According to MNR’s Approval and Permitting Requirements Document for Renewable Energy Projects, renewable energy projects shall not be permitted within (a) a dynamic beach hazard; (b) defined portions of the one hundred year flood level along connecting channels (the St. Mary’s, St. Clair, Detroit, Niagara and St. Lawrence Rivers); (c) areas that would be rendered inaccessible to people and vehicles during times of flooding hazards, erosion hazards and/or dynamic beach hazards, unless it has been demonstrated that the site has safe access appropriate for the nature of the development and the natural hazard; and (d) a floodway regardless of whether the area of inundation contains high points of land not subject to flooding.
None of these four hazard conditions listed above are present at the proposed project site, therefore there should be no concerns regarding hazard lands for this proposed project.
SECTION 6.0 - CONCLUSIONS

As a result of the records review and the site investigations for both assessments, no significant natural heritage or water features were found. In addition, no significant problems are anticipated as a result of considering the additional natural heritage-related approvals and permitting for renewable energy development projects required by the Ministry of Natural Resources. Based on these natural heritage and water assessments, it is recommended that North Bay Hydro be permitted to continue with their development of the methane generation facility without additional natural heritage or water assessment concerns.
SECTION 7.0 - CERTIFICATION

This report was prepared, reviewed and approved by the undersigned.

Prepared by:
Peter A. Quinby, Ph.D., Certified Senior Ecologist
Senior Environmental Scientist

Reviewed by:
Steven R. Aiken, P.Eng.
Manager Environmental Services

Approved by:
Ken D. Embree, P.Eng.
Managing Director

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NOTES:
1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (1999) ALL RIGHTS RESERVED.
2. EXPOSED LAND BOUNDARY PROVIDED BY EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT OF FORESTS.
3. FOREST ECOSITE CLASSIFICATIONS PROVIDED BY MINISTRY OF NATURAL RESOURCES, 2010 (MODIFIED BY KNIGHT PIESOLD LTD.)
4. CO-ORDINATE GRID IS IN METRES.
   DATUM: NAD83
   PROJECTION: UTM ZONE 17 N
5. CONTOUR INTERVAL IS 10 METRES.

15-JACK PINE
16-BLACK SPRUCE-PINE
18-POPLAR-WHITE BIRCH-WHITE SPRUCE-B. FIR
ROADWAY

EARTH OBSERVATION FOR SUSTAINABLE DEVELOPMENT (EOSD)
FOREST ECOSITE CLASSIFICATION

PROJECT LOCATION
ROAD
120M BUFFER FROM PROJECT LOCATION
EXPOSED LAND

MERRICK LANDFILL
NORTH BAY HYDRO

FOREST ECOSITE CLASSIFICATION

Knight Piésold
CONSULTING

FIGURE 1.2
APPENDIX A

RESUME FOR PETER QUINBY

(Page A-1)
Dr. Quinby has been designing, conducting, and managing field studies focusing on the ecology and conservation of landscapes for 25 years. His work has spanned multiple scales of ecosystem structure and function—from the reproductive ecology of tree seedlings to the regional biogeography of habitat fragmentation and connectivity. He has addressed theoretical questions in ecology as well as applied conservation issues resulting in nearly 100 publications (authored or co-authored). Many of these publications have been widely cited by the scientific and resource conservation communities including the journals *Science, Conservation Biology, Journal of Ecology,* and *Landscape Ecology* as well as institutions including Canadian Forest Service, Environment Canada, Ontario Forest Research Institute, and the Ontario Ministry of Natural Resources. His most recent work is the co-authored book, “*Ontario’s Old-Growth Forests*”, which was published in 2009.

**Areas of Expertise**
- Landscape ecology and conservation (plants and animals)
- Baseline ecological studies for environmental assessment
- Wildlife habitat suitability modelling and multivariate statistics

**Specific Relevant Experience**
- **McFauld’s Lake Project, Northern Ontario (Ring-of-Fire)** – using satellite imagery, aerial photographs, GIS, and field studies to characterize vegetation, plant species diversity, rare plant communities, moose habitat, caribou habitat, and other special wildlife habitat for a 25,000 km² area. Results will be used to refine an ecological land classification and to identify and evaluate environmental impacts from access road construction and operation, and from mine construction and operation.
- **Mary River Project, Baffin Island, Nunavut, Canada** – developing an ecological land classification for the 25,000 km² regional study area designed to predict impacts to key wildlife populations resulting from iron ore mining development; integrating field studies, remote sensing (Landsat), statistical analysis (univariate and multivariate), and GIS to produce habitat suitability models for caribou, arctic fox, lemming, loon, snow goose, and peregrine falcon.
- **Iqaluit Hydroelectric Project, Baffin Island, Nunavut, Canada** – conducted a desktop vegetation analysis of three potential hydro-electric sites in the Frobisher Bay region of southern Baffin Island; utilized ERDAS Imagine software to produce vegetation productivity maps from Landsat imagery; integrated numerous individual studies into a final report including studies of traditional knowledge, aquatics, vegetation, wildlife, archaeology, and land use.
- **Identification and Evaluation of Hydroelectric Power Opportunities, Kivalliq, Nunavut** – carried out desktop environmental and socioeconomic studies focusing on the Kivalliq Region of Nunavut, Canada; assessed and evaluated fish species presence, caribou habitat, protected areas, and land-use/ownership to rank potential sites for hydroelectric development.
- **North Bay-Mattawa Conservation Authority, Ontario** – compiled and edited the “Assessment Report for the Source Water Protection Program” to comply with the Ontario Clean Water Act of 2006; prepared the research report: “A Preliminary Assessment of Climate Change Implications for the North Bay-Mattawa Source Water Protection Area” – addressed climate change effects on water resources, lakes, forests, wetlands, agriculture, tourism and recreation, forestry, infrastructure, and human health.
- **Hydroelectric Power and Water Park, Saskatchewan** – managed environmental baseline studies for a hydro-power project on the North Saskatchewan River; included studies of water quality, sediment quality, vegetation, fisheries, birds, mammals, and public participation; conducted desk-top studies of vegetation, birds, and mammals.
APPENDIX B

NRVIS DATA LAYER REVIEW FOR MERRICK LANDFILL
(COMPLETED BY THE NORTH BAY MNR, AUGUST 2010)

(Pages B-1 to B-3)
## NRVIS Data Layer Review for Merrick Landfill
(completed by the North Bay MNR, August 2010)

<table>
<thead>
<tr>
<th>NRVIS Feature Class</th>
<th>120 m Boundary of entire Landfill</th>
<th>120 m Boundary of Generator site</th>
</tr>
</thead>
</table>
| ANSI – Area of Scientific Interest | 2 Areas of Scientific Interest (ANSI):
    - Commanda Patterned Peatland candidate earth science ANSI approximately 8 km SW
    - Widdifield Forest candidate life science ANSI approximately 12 km SE | Same |
| ARAPOLY – Aquatic Resource Polygon | Nothing w/n 1 km | Nothing w/n 1 km |
| ARAFINE - Aquatic Resource Line | Little Sturgeon River – Coldwater, Brook trout stream – Approximately 370 m from generator’s 120 m boundary. | Little Sturgeon River – Coldwater, Brook trout stream – Approximately 340 m from generator’s 120 m boundary. |
| AQUAFED – Aquatic Feeding Area | Moderate ranked MAFA w/n 1 km (EES) but not w/n 120 m boundary. | Moderate ranked MAFA w/n 1 km (EES) but not w/n 120 m boundary. |
| CALVFAWN – Calving Fawning Site | None w/n 1 km | None w/n 1 km |
| CLACQ – Crown Land Acquisition | None w/n 1 km | None w/n 1 km |
| CLDISP – Crown Land Disposition | None w/n 1 km | None w/n 1 km |
| CONRVREG – Conservation Reserve | None w/n 1 km | None w/n 1 km |
| CONSVARE – Conservation Area | None w/n 1 km | None w/n 1 km |
### NRVIS Data Layer Review for Merrick Landfill
(completed by the North Bay MNR, August 2010)

<table>
<thead>
<tr>
<th>NRVIS Feature Class</th>
<th>120 m Boundary of entire Landfill</th>
<th>120 m Boundary of Generator site</th>
</tr>
</thead>
<tbody>
<tr>
<td>CULThERI – Cultural Heritage Site</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>DENSITE – Den Site</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>HADDPROT – Protected Area Historic Addition</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>LANDOWN – Land Ownership</td>
<td>Private (landfill) and Crown</td>
<td>Private (landfill) and Crown</td>
</tr>
<tr>
<td>MINLICK – Mineral Lick</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>MNDMINE - Mine</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>NATPARK – National Park</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>NESTING – Nesting Site</td>
<td>Unknown raptor nest approx. 3.8 km NNE</td>
<td>Unknown raptor nest approx. 4.2 km NNE</td>
</tr>
<tr>
<td>NHERVALA – Natural Heritage Values Area</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>NGONARV – NGO Nature Reserve</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>NURSAWLD – Nursery Area Wildlife</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>PATLND – Patent Land</td>
<td>No other w/n 1 km</td>
<td>No other w/n 1 km</td>
</tr>
<tr>
<td>PITQUAR – Pit or Quarry</td>
<td>Sand &amp; gravel Pit w/n approx. 720 m</td>
<td>Sand &amp; gravel Pit w/n approx. 1.2 km</td>
</tr>
<tr>
<td>PROVPREG – Prov. Park</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>SIGECOL – Significant Ecological Area</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
</tbody>
</table>
NRVIS Data Layer Review for Merrick Landfill  
(completed by the North Bay MNR, August 2010)

<table>
<thead>
<tr>
<th>NRVIS Feature Class</th>
<th>120 m Boundary of entire Landfill</th>
<th>120 m Boundary of Generator site</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAWNARE – Spawning Area</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>SPEOBSLT - Species Observation Locally Tracked</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>SPEOCCPT – Species Occurrence Prov. Tracked</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>SPRWATER - Spring</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>STAGAWLD – Staging Area Wildlife</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>TENPEN – Tenure Pending</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>WATLINE – Water Line</td>
<td>2 segments of the Little Sturgeon River w/n 1 km, none w/n 120 m boundary</td>
<td>2 segments of the Little Sturgeon River w/n 1 km, none w/n 120 m boundary</td>
</tr>
<tr>
<td>WATPOLY – Water Polygon</td>
<td>Permanent Wetland w/n 120 m boundary</td>
<td>Permanent Wetland w/n approx. 340 m boundary</td>
</tr>
<tr>
<td>WETLANDU – Wetland Unit</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>WILDRICE – Wild Rice</td>
<td>None w/n 1 km</td>
<td>None w/n 1 km</td>
</tr>
<tr>
<td>WINTERNG – Wintering Area</td>
<td>Moose Late Wintering habitat approx. 3 km NNW</td>
<td>Moose Late Wintering habitat approx. 3 km NNW</td>
</tr>
</tbody>
</table>
APPENDIX C

FIELD NOTES

(Pages C-1 to C-4)
July 27, 2010
8:25 a.m.

Notes

Rewire last kill
West Side

(a) Buffer - 30 m

(marked Bow & Sun Pk
Clover) 45-60 cm d.b.h.

WW = Birdy, Mr. St.

well-drawn

Defba under to North

8.7 Cells

J. Pride
(c) narrow buffer 60°

(b) south-facing

(ec) herbaceous cover

(d) clay stroke p/b

Sud below

beyond 120 m

40 yrs

South - Being 7

H. Bw 80-20% cov.

Sw, SChering, Sb, Sw

Bw underlying

North - Road in S

Buffer
<table>
<thead>
<tr>
<th>NO.</th>
<th>Date</th>
<th>Page</th>
</tr>
</thead>
</table>

**E Side**

- Lead All Material
- All cover

**N Side**

- 8 - 2 yrs
- Top 7 (E part) - 8 yrs
- Below - 13 same way
- In west side

**LHM**

- Birch
- Poplar
- Cherry
- Oak
- Basswood
- Maple

**BR**

- Hickory

**BR**

- Ash
- Birch
- Maple

**BR**

- Poplar
- Cherry
- Basswood
- Maple
<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Page</th>
</tr>
</thead>
</table>

| | Urban | 10% cover | | |
| | | | | a few | |
| | | | | 7 in 1 sq. yd. | |
| | | | | | |
| 1. | Bushberry | | | | |
| 2. | Blueberry | | | | |
| 3. | May moss | | | | |
| 4. | Starflower | | | | |
| 5. | Marsh Marigold (? yellow) | | | | |
| 6. | Clover | | | | |
| 7. | Oak | | | | |

See map from John @ Lady Hill - will send electronic copy!
APPENDIX D

PHOTOGRAPHS

(Page D-1)
PHOTO 1 - East side of Project Location looking north (includes current methane burner).

PHOTO 2 - East side of Project Location.

PHOTO 3 - South side of Project Location looking west.

PHOTO 4 - South side of Project Location looking east.

PHOTO 5 - West side of Project Location looking north.

PHOTO 6 - North side of Project Location looking east.
APPENDIX E

LIST OF PLANT SPECIES OBSERVED DURING THE SITE INVESTIGATION
(NOT EXHAUSTIVE)

(Page E-1)
# TABLE E.1

NORTH BAY HYDRO
MERRICK LANDFILL

NATURAL HERITAGE ASSESSMENT AND WATER ASSESSMENT IN SUPPORT OF THE RENEWABLE ENERGY APPLICATION FOR THE MERRICK LANDFILL SITE

LIST OF PLANT SPECIES OBSERVED DURING THE SITE INVESTIGATION (NOT EXHAUSTIVE)

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Growth Form</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aster</td>
<td><em>Aster</em> spp.</td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Balsam fir</td>
<td><em>Abies balsamea</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Beaked hazelnut</td>
<td><em>Corylus cornuta</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Bedstraw</td>
<td><em>Galium triflorum</em></td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Black spruce</td>
<td><em>Picea mariana</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Bracken fern</td>
<td><em>Pteridium aquilinum</em></td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Clover</td>
<td><em>Trifolium</em> spp.</td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Common Mullein</td>
<td><em>Verbascum thapsus</em></td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Fireweed</td>
<td><em>Chamerion angustifolium</em></td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Fly honeysuckle</td>
<td><em>Lonicera canadensis</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Golden rod</td>
<td><em>Solidago</em> spp.</td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Grasses</td>
<td><em>Poaceae</em> spp.</td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Orange hawkweed</td>
<td><em>Hieracium aurantiacum</em></td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Jack pine</td>
<td><em>Pinus banksiana</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Large-tooth aspen</td>
<td><em>Populus grandidentata</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Lowbush blueberry</td>
<td><em>Vaccinium angustifolium</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Moss</td>
<td><em>Bryophyta</em> spp.</td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Mountain maple</td>
<td><em>Acer spicatum</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Northern bush honeysuckle</td>
<td><em>Diervilla lonicera</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Pin cherry</td>
<td><em>Prunus pensylvanica</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Red maple</td>
<td><em>Acer rubrum</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Red oak</td>
<td><em>Quercus rubra</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Red raspberry</td>
<td><em>Rubus idaeus</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Sedges</td>
<td><em>Cyperaceae</em> spp.</td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Speckled alder</td>
<td><em>Alnus incana</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Staghorn sumac</td>
<td><em>Rhus typhina</em></td>
<td>shrub</td>
<td>understory</td>
</tr>
<tr>
<td>Starflower</td>
<td><em>Trientalis borealis</em></td>
<td>herbaceous</td>
<td>understory</td>
</tr>
<tr>
<td>Tamarack</td>
<td><em>Larix laricina</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Trembling aspen</td>
<td><em>Populus tremuloides</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>White birch</td>
<td><em>Betula papyrifera</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>White Pine</td>
<td><em>Pinus strobus</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>White spruce</td>
<td><em>Picea glauca</em></td>
<td>tree</td>
<td>overstory</td>
</tr>
<tr>
<td>Willow</td>
<td><em>Salix</em> spp.</td>
<td>shrub</td>
<td>understory</td>
</tr>
</tbody>
</table>

I:\1\03\00308\01\A\Report\Report 1, Rev 1\NEW_Appendices\APP E - List of Plant Species.xls\E.1

Print Dec/23/10 15:11:58
APPENDIX F

LIST OF POTENTIAL WILDLIFE HABITAT

(Pages F-1 to F-27)
**SIGNIFICANT WILDLIFE HABITAT TECHNICAL GUIDE (SWHTG)**

*DISCLAIMER: This is not a comprehensive list, and is provided as a general reference. This is not an official document and may contain errors and omissions. Other sources of information may be available and may need to be referenced. Habitats may not be limited to species and ELC Ecosite codes listed, as these are still under review. It is strongly encouraged to review the SWHTG Decision Support System application, located at: [http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html](http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html)*

<table>
<thead>
<tr>
<th>Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deer Wintering Areas – Sec. 4.4.1 &amp; 8.3.1</strong></td>
<td>White-tailed Deer</td>
<td>No deer wintering areas (i.e. thick stands of cedar, hemlock, pine and spruce) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation. MNR maintains records on deer yards, none of which are located in the area in question.</td>
<td>No deer wintering areas as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified 1 km of the project location.</td>
</tr>
<tr>
<td><strong>Moose Late Winter Habitat – Sec. 4.4.2 &amp; 8.3.2</strong></td>
<td>Moose</td>
<td>No moose late wintering habitat (i.e. thick stands of cedar, hemlock, balsam fir and spruce) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation.</td>
<td>No moose late wintering habitat as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review within 1 km of the project location. Moose late wintering habitat was identified approximately 3 km northwest from the project site; however, it will not be impacted in any way by the proposed activities and no mitigation measures are required.</td>
</tr>
<tr>
<td>Wildlife Habitat</td>
<td>Wildlife Species (may not be limited to those listed)</td>
<td>W/n 120 m Boundary</td>
<td>W/n 1 km of Boundary</td>
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</tr>
</tbody>
</table>
| **Colonially -Nesting Bird Breeding Habitat – Sec. 4.4.3 & 8.3.3 (Bank and Cliff)** | Bank Swallow  
Cliff Swallow  
Northern Rough-winged Swallow | No natural banks or cliffs were identified within the 120 m project location boundary during either the records review or site investigation. | While some small banks may be present within 1 km of the project location, these are primarily man made and are associated with landfill cell construction. There is no evidence that they are or could be utilized by colonially bank nesting birds, since they only exist for relatively short periods of time before the landfill cell is utilized. They would not be considered significant with respect to the direction in the SWHTG. |
| **Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs)** | Great Blue Heron  
Black-crowned Night Heron | No colonial nesting bird habitat (tree/shrub) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) appendix G or the Decision Support System (DSS) were identified within the project location during the records review or site investigation. | A wetland is present approximately 350 m from the project location boundary, which has the potential to contain heron nesting habitat. However, according to the SWHTG and DDS, associated components of this habitat type would not extend beyond 200 m of a nest point feature. Therefore, even if this habitat is present in the nearby wetland, it would be outside of the 120 m boundary established around the project location. |
| **Colonially -Nesting Bird Breeding Habitat (Ground)** | Herring Gull  
Great Black-backed Gull  
Little Gull  
Ring-billed Gull  
Common Tern  
Caspian Tern  
Brewer’s Blackbird | No colonial nesting bird habitat (ground) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG), appendix G or the Decision Support System (DSS) were identified in the records review or within the project location during site investigation. The project location is a cleared area, which is frequently | No colonial nesting bird habitat (ground) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) appendix G or the Decision Support System (DSS) were identified within 1 km of the project location. |
<table>
<thead>
<tr>
<th>Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
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<tbody>
<tr>
<td></td>
<td>crossed by heavy machinery and would not likely be used for nesting due to disturbance from the ongoing landfill operations.</td>
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<tr>
<td><strong>Waterfowl Stopover and Staging Areas – Sec. 4.4.4 &amp; 8.3.4 (Terrestrial)</strong></td>
<td>American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall</td>
<td>No waterfowl stopover and staging habitat as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation. This habitat consists of upland areas and undisturbed fields with large wetlands, preferably adjacent to large water bodies. These features are not present at the project location.</td>
<td>A wetland is present approximately 350 m from the project location boundary; however, it would not meet the criteria set out for this habitat in terms of size or proximity to large water bodies as outlined in appendixes K and Q of the SWHTG and DDS.</td>
</tr>
<tr>
<td><strong>Waterfowl Stopover and Staging Areas (Aquatic)</strong></td>
<td>Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser</td>
<td>This habitat is typically associated with major flyways and major bodies of water, such as the Great Lakes. Therefore, no waterfowl stopover and staging habitat as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location.</td>
<td>A wetland is present approximately 350 m from the project location boundary; however, it would not meet the criteria set out for this habitat in terms of size or proximity to large water bodies as outlined in appendixes K and Q of the SWHTG and DDS.</td>
</tr>
<tr>
<td>Wildlife Habitat</td>
<td>Wildlife Species (may not be limited to those listed)</td>
<td>W/n 120 m Boundary</td>
<td>W/n 1 km of Boundary</td>
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<tr>
<td></td>
<td>Common Merganser</td>
<td>project location during site investigation.</td>
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<tr>
<td></td>
<td>Lesser Scaup</td>
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<tr>
<td></td>
<td>Greater Scaup</td>
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<tr>
<td></td>
<td>Long-tailed Duck</td>
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<td></td>
<td>Surf Scoter</td>
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<td>White-winged Scoter</td>
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<td>Black Scoter</td>
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<td>Ring-necked duck</td>
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<td></td>
<td>Common Goldeneye</td>
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<td>Bufflehead</td>
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<td>Redhead</td>
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<td></td>
<td>Ruddy Duck</td>
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<td></td>
<td>Red-breasted Merganser</td>
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<td>Brant</td>
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<td>Canvasback</td>
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<td></td>
<td>Ruddy Duck</td>
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<tr>
<td>Waterfowl Nesting – Sec. 4.4.5 &amp; 8.3.5</td>
<td>See Above</td>
<td>No waterfowl nesting areas (i.e. relatively large, undisturbed upland areas with abundant ponds and wetlands) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation.</td>
<td>Though there is a wetland area within 1 km of the project location, its size and make-up are not consistent with the criteria of significant waterfowl nesting habitat as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS), nor does it have habitat components that would encroach into the 120 m boundary around the project location.</td>
</tr>
<tr>
<td>Shorebird Migratory Stopover Area – Sec. 4.4.6 &amp; 8.3.6</td>
<td>Greater Yellowlegs</td>
<td>No shorebird migratory stopover areas as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation.</td>
<td>No shorebird migratory stopover areas as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within 1 km of the project location during site investigation.</td>
</tr>
<tr>
<td></td>
<td>Lesser Yellowlegs</td>
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<tr>
<td></td>
<td>Marbled Godwit</td>
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<td></td>
<td>Hudsonian Godwit</td>
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<td></td>
<td>Black-bellied Plover</td>
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<td></td>
<td>American Golden-Plover</td>
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<td></td>
<td>Semipalmated Plover</td>
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</table>
### Seasonal Concentration Areas of Animals

<table>
<thead>
<tr>
<th>Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
</table>
| **Solitary Sandpiper** | - Solitary Sandpiper  
- Spotted Sandpiper  
- Semipalmated Sandpiper  
- Pectoral Sandpiper  
- White-rumped Sandpiper  
- Baird’s Sandpiper  
- Least Sandpiper  
- Purple Sandpiper  
- Stilt Sandpiper  
- Short-billed Dowitcher  
- Red-necked Phalarope  
- Whimbrel  
- Ruddy Turnstone  
- Sanderling  
- Dunlin | project location during site investigation. These are typically areas with large water bodies and major flyways, which are not present within the area in question. | |
| **Landbird Migratory Stopover Areas – Sec. 4.4.7 & 8.3.7** | Passerines | This habitat is associated with large water bodies and the narrow areas around them that facilitate migration over them (i.e. Point Pelee). No large water bodies or potential landbird migratory stopover areas were identified through the records review or site investigation. | None were identified within 1 km of the project location through either the records review or site investigation. |
| **Raptor Wintering Area – Sec. 4.4.8 & 8.3.8** | Rough-legged Hawk  
Long-eared Owl  
Boreal Owl  
Northern Saw-whet Owl | No raptor wintering areas were identified in the records review or site investigation. These are typically large open pastures or meadows, which are windswept and relatively free of deep snow. This habitat does not exist within the 120 m boundary around the project location. | While there are open areas within 1 km from the project location, these areas are associated with the active landfill. According to the SWHTG, significant raptor wintering areas would be at least 25 to 30 ha in size, which is much larger than the relatively small open areas located around the landfill. Therefore there is no significant raptor wintering areas within 1 km of the project location. |
<table>
<thead>
<tr>
<th>Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>W/n 120 m Boundary</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Wild Turkey Winter Range – Sec. 4.4.9 &amp; 8.3.9</td>
<td>Wild Turkey</td>
<td>The project location does not have agricultural land or fields and pastures associated with it. Also, the project location is outside of both the historic wild turkey range and breeding range as outlined in the MNR’s Wild Turkey Management Plan for Ontario (2007); therefore, this habitat type does not apply.</td>
<td>The project location does not have an agricultural land or fields and pastures associated with it. Also, it is outside of the current wild turkey range; therefore, this habitat type does not apply.</td>
</tr>
<tr>
<td>Turkey Vulture Summer Roosting Areas – Sec. 4.4.10 &amp; 8.3.10</td>
<td>Turkey Vulture</td>
<td>No turkey vulture summer roosting areas (cliffs, large dead trees in open areas, etc) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation.</td>
<td>No turkey vulture summer roosting areas (cliffs, large dead trees, etc) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project location.</td>
</tr>
</tbody>
</table>
| Reptile Hibernacula – Sec. 4.4.11 & 8.3.11           | **Snakes:** Eastern Gartersnake  
Northern Watersnake  
Red-bellied Snake  
Brownsnake  
Smooth Green Snake  
Ring-necked Snake  
**Special Concern:** Milksnake  
Eastern Ribbonsnake  
Lizard:                                                      | No known reptile hibernacula were identified in either the records review or site investigation within the 120 m project location boundary.  
Even though a portion of the project location is comprised of FEC ecotype ES18 (poplar, white birch, white spruce and balsam fir), this ecotype is primarily associated with five-lined Skink whose range does not extend this far north. Also,  
Since the proposed activities (e.g. installation of an engine to the existing methane well system and flaming tower) would not result in any forest clearing, or major construction on the land base, there    | No known reptile hibernacula were identified within 1 km of the project location boundary. Since the majority of the area is disturbed due to the existing landfill activities, and large numbers of reptiles have not been noticed by landfill staff during the spring or fall, it is unlikely that any hibernacula are present.  
Since the proposed activities (e.g. installation of an engine to the existing methane well system and flaming tower) would not result in any forest clearing, or major construction on the land base, there |
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Special Concern:</strong></td>
<td>the area is adjacent to a landfill which has been operating for a number of years and significant numbers of reptiles have not been noted by landfill employees. Since the proposed activities (e.g. installation of an engine to the existing methane well system and flaming tower) would not result in any forest clearing, or major construction on the land base, there is little concern, with respect to this project.</td>
<td>are is little concern, with respect to this project, should a hibernacula exist in the general area.</td>
<td></td>
</tr>
<tr>
<td><strong>Bat Hibernacula – Sec. 4.4.12 &amp; 8.3.12</strong></td>
<td>Big Brown Bat Little Brown Myotis Tri-colored Bat Northern Long-eared Myotis Eastern Small-footed Myotis</td>
<td>No known bat hibernacula or features associated with bat hibernacula (caves, mines, old growth trees with cavities) were identified during the records review or site investigation, nor are there other features typically associated with bats, such as water bodies or forested ridges present.</td>
<td>No known bat hibernacula or features associated with bat hibernacula (caves, mines, old growth trees with cavities) were identified within 1 km of the project location during the records review or site investigation, nor are there other features typically associated with bats, such as large water bodies or forested ridges present.</td>
</tr>
<tr>
<td><strong>Bullfrog Concentration Areas – Sec. 4.4.13 &amp; 8.3.13</strong></td>
<td>Bullfrog</td>
<td>No wetland features are located within the 120 m boundary around the project location.</td>
<td>There is a wetland area within 1 km of the project location; however, it is relatively small and not connected to larger wetland complexes and does not have habitat components that would encroach into the 120 m boundary around the project location, so it will not be impacted by the proposed activities.</td>
</tr>
</tbody>
</table>
### Seasonal Concentration Areas of Animals

<table>
<thead>
<tr>
<th>Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migratory Butterfly Stopover Area – Sec. 4.4.14 &amp; 8.3.14</td>
<td>Monarch Butterfly</td>
<td>This habitat is typically associated with large, open areas with a diversity of plant species (especially milkweed) in close proximity to the Great Lakes, which have a history of traditional use. This habitat does not occur within the project location.</td>
<td>This habitat is typically associated with large, open areas with a diversity of plant species in close proximity to the Great Lakes, which have a history of traditional use. This habitat does not occur within 1 km of the project location.</td>
</tr>
</tbody>
</table>

### Other Animal Concentration Areas to Consider

| Bat Maternity Colonies | Big Brown Bat, Tri-colored Bats, Little Brown Myotis, Silver-haired Bat, Northern Long-eared Myotis | No known or documented bat maternity colonies occur within the 120 m boundary around the project location. Structures that make suitable maternity colonies (old buildings with attics, old growth trees with large cavities, caves, mines) are also not present. | No known or documented bat maternity colonies occur within the 1 km boundary around the project location. Since the proposed activities (e.g. installation of an engine to the existing methane well system and flaming tower) would not result in any forest clearing, or impact any buildings on site, there are no concerns should a maternity colony exist in the general area. |

| Bat Migration Corridors | Hoary Bat, Eastern Red Bat, Silver-haired Bat | No known bat hibernacula or features associated with bat hibernacula (caves, mines, old growth trees with cavities) were identified during the records review or site investigation, nor are there other features such as large water bodies or forested ridges present. Therefore, it is highly unlikely that bat movement corridors of any significance are present within 1 km of the project location. | No known bat hibernacula or features associated with bat hibernacula (caves, mines, old growth trees with cavities) were identified during the records review or site investigation, nor are there other features such as large water bodies or forested ridges present. Therefore, it is highly unlikely that bat movement corridors of any significance are present within 1 km of the project location. |
### Seasonal Concentration Areas of Animals

<table>
<thead>
<tr>
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<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
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<tbody>
<tr>
<td><strong>Turtle Wintering Areas</strong></td>
<td>Midland Painted Turtle</td>
<td>No wetland features are present within the 120 m boundary around the project location.</td>
<td>The 2 nearest aquatic systems (Little Sturgeon River to the west and a wetland to the southeast) are both over 300 m away from the 120 m boundary around the project location. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities, or work near wetland areas, there are no concerns with respect to this project should a turtle wintering area exist in the general area.</td>
</tr>
<tr>
<td><strong>Special Concern:</strong></td>
<td>Northern Map Turtle</td>
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<td></td>
<td>Snapping Turtle</td>
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<tr>
<td><strong>Amphibian Breeding Habitat (Wetlands)</strong></td>
<td>Eastern Newt</td>
<td>No wetland features are present within the 120 m boundary around the project location.</td>
<td>The 2 nearest aquatic systems (Little Sturgeon River to the west and a wetland to the southeast) are both over 300 m away from the 120 m boundary around the project location. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities, or work near wetland areas, there are no concerns with respect to this project should amphibian breeding habitat exist in the general area.</td>
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<tr>
<td></td>
<td>American Toad</td>
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<td></td>
<td>Spotted Salamander</td>
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<td>Four-toed Salamander</td>
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<td>Blue-spotted Salamander</td>
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<td>Gray Treefrog</td>
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<td></td>
<td>Western Chorus Frog</td>
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<td></td>
<td>Northern Leopard Frog</td>
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<td></td>
<td>Pickerel Frog</td>
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<td>Green Frog</td>
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<td></td>
<td>Mink Frog</td>
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<td></td>
<td>Bullfrog</td>
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</tbody>
</table>

### Rare Vegetation Communities or Specialized Habitats for Wildlife

<table>
<thead>
<tr>
<th>Wildlife Habitat</th>
<th>Wildlife Species</th>
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<table>
<thead>
<tr>
<th>Rare Vegetation Community</th>
<th>ELC Ecosite Code</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alvar – Sec. 5.4.1.1</strong></td>
<td>ALO1 ALS1 ALT1 FOC1 FOC2 CUM2 CUS2 CUT2-1 CUW2 ES9</td>
<td>This habitat is not found within North Bay District, nor is the geology required for the rare vegetation communities associated with this habitat type.</td>
<td>This habitat is not found within North Bay District, nor is the geology required for the rare vegetation communities associated with this habitat type.</td>
</tr>
<tr>
<td><strong>Rationale:</strong> Alvars are extremely rare habitats in Eco-region 5E. Most alvars in Ontario are in Eco-regions 6E and 7E. Alvars in 5E are small and highly localized just north of the Palaeozoic-Precambrian contact.</td>
<td>Plus the following ecosites on very shallow soils: ES13.1 ES14.1 ES16.1 ES21.1</td>
<td></td>
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</tr>
<tr>
<td><strong>Tallgrass Prairie – Sec. 5.4.1.2</strong></td>
<td>TPO1 TPO2 ES10</td>
<td>This habitat is not found within North Bay District and is typically only found in extreme southwestern and northwestern Ontario.</td>
<td>This habitat is not found within North Bay District and is typically only found in extreme southwestern and northwestern Ontario.</td>
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<td>Indicator Spp, Spartina pectinata and Andropogon gerardii</td>
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<td>Characteristic Spp, Bromus kalmii, Ceanothus herbaceus, Lechea intermedia, Monarda fistulosa, Penstemon hirsutus, Polygala polygama, Rudbeckia hirta, Sorghastrum nutans, Viola fimbriatula,</td>
<td></td>
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</tr>
<tr>
<td><strong>Savannah – Sec. 5.4.1.3</strong></td>
<td>TPS1 TPS2</td>
<td>This habitat is not found within North Bay District</td>
<td>This habitat is not found within North Bay District and is typically only found in</td>
</tr>
<tr>
<td>Rare Vegetation Community</td>
<td>ELC Ecosite Code</td>
<td>W/n 120 m Boundary</td>
<td>W/n 1 km of Boundary</td>
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<tr>
<td>Rare Forest Type – Sec. 5.4.1.4</td>
<td>TPW1 TPW2 CUS2</td>
<td>and is typically only found in extreme southwestern Ontario.</td>
<td>extreme southwestern Ontario.</td>
</tr>
<tr>
<td>Talus Slope – Sec. 5.4.1.5</td>
<td>No talus slopes as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project.</td>
<td>No talus slopes as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project.</td>
<td></td>
</tr>
<tr>
<td>Rock Barren – Sec. 5.4.1.6</td>
<td>No rock barrens as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project.</td>
<td>No rare forest types as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project.</td>
<td></td>
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</tbody>
</table>

Characteristic flora for cliffs and talus slopes include: lichen, such as Rock Tripe Umbilicaria spp., and ferns Polypodium virginianum, Cystopteris fragilis and Woodsia ilvensis, Cryptogramma stelleri, Woodsia alpina, and Saxifraga paniculata.
<table>
<thead>
<tr>
<th>Rare Vegetation Community</th>
<th>ELC Ecosite Code</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precambrian Rock Barren – Sec. 5.4.1.6</td>
<td>RBT ES8</td>
<td>Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location.</td>
<td>Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project location.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Characteristic flora for Rock Barrens include: lichens Cladina spp. and mosses Polytrichum spp., sparse grasslands of Danthonia spicata and Deschampsia flexuosa, low shrubs (Juniperus communis, Vaccinium angustifolium, Comptonia peregrina, and stunted trees Quercus alba, Quercus rubra and Pinus strobus. Also, Pteridium aquilinum, Aralia hispida, Spiranthes casei, Saxifraga virginiensis, Gaylussacia baccata, Corydalis sempervirens, Prunus pensylvanica, and Comandra umbellata.</td>
<td></td>
</tr>
<tr>
<td>Sand Barren – Sec. 5.4.1.7</td>
<td>SBO SBS SBT ES10</td>
<td>No sand barrens were identified within the project location during either the records review or site investigation.</td>
<td>No sand barrens were identified within 1 km of the project area during either the records review or site investigation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Characteristic plant species of sand barrens</td>
<td></td>
</tr>
</tbody>
</table>
### Rare Vegetation Communities or Specialized Habitats for Wildlife

<table>
<thead>
<tr>
<th>Rare Vegetation Community</th>
<th>ELC Ecosite Code</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>in 5E include: <em>Cladina spp.</em>, Carex houghtoniana, Carex merritt-fernaldii, Comptonia peregrina, Rubus flagellaris, Selaginella rupestris, and Viola labradorica, Polygonella articulata, and <em>Stipa spartea.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Lakes Dunes – Sec. 5.4.1.8</td>
<td></td>
<td></td>
<td>The project location is not adjacent to any of the Great Lakes, nor does it contain the habitat criteria outlined within the SWHTG.</td>
</tr>
<tr>
<td>The project location is not adjacent to any of the Great Lakes, nor does it contain the habitat criteria outlined within the SWHTG.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Other Rare Vegetation Communities to Consider</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beach/ Beach Ridge/ Bar/ Sand Dunes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rationale:</strong> Uncommon to rare in Ecoregion, some of the best examples are in the North Channel (e.g. Mississagi River delta).</td>
<td>Central Ontario ELC: ES1 ES2</td>
<td>These habitat types as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were not identified in the records review or within the project location during site investigation.</td>
<td>These habitat types as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were not identified within 1 km of the project location.</td>
</tr>
<tr>
<td></td>
<td>Southern ELC: BBO BBS BBT SDO SDS SDT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Indicator Spp.</strong> Marram Grass (<em>Ammophila breviligulata</em>) Beach Pea (<em>Lathyrus japonicus</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shallow Atlantic Coastal Marsh</td>
<td>MAS1 MAS2</td>
<td>This habitat type as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were not identified in the records review or within the project location during site investigation.</td>
<td>This habitat type as described in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were not identified within 1 km of the project location.</td>
</tr>
<tr>
<td>Rare Vegetation Community</td>
<td>ELC Ecosite Code</td>
<td>W/n 120 m Boundary</td>
<td>W/n 1 km of Boundary</td>
</tr>
<tr>
<td>---------------------------</td>
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</tr>
<tr>
<td><strong>Rationale:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provincially rare communities almost entirely restricted to Eco-region 5E.</td>
<td>MAS3</td>
<td>Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) was not identified within 1 km of the project location.</td>
<td></td>
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<tr>
<td><strong>Indicator Spp.:</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Virginia Meadow-beauty (Rhexia virgininica)</td>
<td></td>
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</tr>
<tr>
<td><strong>Other Associated Spp:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rhynchospora capitellata, Xyris difformis, Panicum rigidum, Panicum spretum, Triadenum virginicum, Polygonum careyi and Juncus militaris.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bog and Fen</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rationale:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bogs and fens are a fairly common vegetation community in Ecoregion 5E with the most common community type being a leatherleaf poor fen.</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rare Forest Type:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Spruce ES 30.1</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
### Rare Vegetation Communities or Specialized Habitats for Wildlife

<table>
<thead>
<tr>
<th>Rare Vegetation Community</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Red Spruce</td>
<td>ES 30.2</td>
<td>area, none fall within 120 m of the project location.</td>
<td>records review, none fall within 1 km of the project location.</td>
</tr>
</tbody>
</table>

**Rationale:**
Rare in the Ecoregion.

---

### Rare Vegetation Communities or Specialized Wildlife Habitat

<table>
<thead>
<tr>
<th>Specialized Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
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<th>W/n 120 Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sites Supporting Area Sensitive Species – Sec. 5.4.2.1 &amp; 8.5.1</td>
<td>These are generally the largest undisturbed, unfragmented habitat types within an area (i.e. forests, grasslands, etc). The project location is immediately adjacent to a landfill and is a highly disturbed site. Therefore, this feature was not identified in either the records review or site investigation.</td>
<td></td>
<td>These are generally the largest undisturbed, unfragmented habitat types within an area (i.e. forests, grasslands, etc). The project location is immediately adjacent to a landfill and is a highly disturbed site. Therefore, this feature was not identified within 1 km of the project location.</td>
<td></td>
</tr>
<tr>
<td>Forest Stands Providing A Diversity of Habitats – Sec. 5.4.2.2 &amp; 8.5.2</td>
<td>The total amount of forested area within the 120 m project location boundary is between approximately 2 – 2.5 ha, with the remainder of the land being highly disturbed from landfill operations. This area is mainly comprised of planted Jack Pine stands, which exhibit little floral diversity. Therefore, this habitat was not identified in either the records review or site investigation.</td>
<td></td>
<td>The area within 1 km of the project location is mainly comprised of an active landfill and cleared areas. The site is highly disturbed and does not meet the criteria listed for this habitat type.</td>
<td></td>
</tr>
<tr>
<td>Old Growth or Mature Forest Stands – Sec.</td>
<td>Long-lived forest spp. within these ecosites; According to the FEC mapping for the area, none of these FEC types occur on the site, nor are the forest</td>
<td></td>
<td>According to the FEC mapping for the area, none of these FEC types occur on the site, nor are</td>
<td></td>
</tr>
</tbody>
</table>
### Rare Vegetation Communities or Specialized Wildlife Habitat

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</tr>
</thead>
<tbody>
<tr>
<td>5.4.2.3 &amp; 8.5.3</td>
<td>stands that are present old enough to be considered old growth. FEC stands within the 120 m boundary include ES 15 – Jack Pine; ES16 – Black spruce and pine; and ES18 – Poplar, White birch, White spruce and balsam fir.</td>
<td>ES11 ES12 ES14 ES20 ES21 ES22 ES23 ES24 ES25 ES26 ES27 ES28 ES29 ES30</td>
<td>the forest stands that are present old enough to be considered old growth. FEC stands within the 120 m boundary include ES 15 – Jack Pine; ES16 – Black spruce and pine; and ES18 – Poplar, White birch, White spruce and balsam fir.</td>
<td></td>
</tr>
<tr>
<td>Foraging Areas with Abundant Mast – Sec. 5.4.2.4</td>
<td>According to the FEC mapping for the area, none of these FEC types occur on the site. Areas that contain mast producing species such as oak, beech, cherry and mountain ash in any quantity were not present during the site investigation.</td>
<td>ES14 ES17.1 ES23 ES24 ES25 ES26 TAS RBS CUT1 CUW1-2</td>
<td>According to the FEC mapping for the area, none of these FEC types occur within 1 km of the site. Areas that contain mast producing species such as oak, beech, cherry and mountain ash in any quantity are not present within 1 km of the project location.</td>
<td></td>
</tr>
<tr>
<td>Woodlands Supporting Amphibian Breeding Ponds – Sec. 5.4.2.5 &amp; 8.5.5</td>
<td>All forested, terrestrial ecosites, ES11 – ES35. • The wetland breeding pools (including vernal pools) may be permanent, seasonal, ephemeral, large or small in size and could be located within</td>
<td>Eastern Newt Blue-spotted Salamander Spotted Salamander Eastern Red-backed Salamander Four-toed Salamander Northern Two-lined Salamander Spring Peeper Wood Frog American Toad</td>
<td>This habitat type was not identified in the records review or site investigation within the 120 m boundary around the project location. Most of the site location is cleared areas adjacent to an operating landfill. The small parcels of wooded area within the project location does not contain vernal pools consistent with the SWHTG Decision Support System criteria for this habitat type, such as closed canopy, moist forest with woody debris, vernal pools which hold water long enough for larval development. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities, or work near wetland areas, there are no concerns for this habitat type with respect to this project.</td>
<td></td>
</tr>
<tr>
<td>Specialized Wildlife Habitat</td>
<td>Wildlife Species (may not be limited to those listed)</td>
<td>ELC Ecosite Codes</td>
<td>W/n 120 Boundary</td>
<td>W/n 1 km of Boundary</td>
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</tr>
<tr>
<td>Rare Vegetation Communities or Specialized Wildlife Habitat</td>
<td>or adjacent to the woodland.</td>
<td>Areas that contain mast producing species such as oak, beech, cherry and mountain ash in any quantity were not identified through the records review and weren’t present during the site investigation.</td>
<td>Areas that contain mast producing species such as oak, beech, cherry and mountain ash in any quantity are not present in within 1 km of the project location.</td>
<td></td>
</tr>
<tr>
<td>Special Woodland Feeding Habitat – Sec. 8.5.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turtle Nesting Habitat – Sec. 5.4.2.6 &amp; 8.5.8</td>
<td>Midland Painted Turtle Special Concern Species Northern Map Turtle Snapping Turtle</td>
<td>MAM2 MAM3 MAM4 MAM5 MAM6 MAM1 MAM2 MAM3 SAS1 SAM1 SAF1 BOO1 FEO1</td>
<td>There are no wetland areas within the 120 m boundary around the project location. The project location is immediately adjacent to a landfill and is a highly disturbed site. Therefore, this feature was not identified in either the records review or site investigation.</td>
<td>Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities, or work near wetland areas, there are no concerns for this habitat type with respect to this project.</td>
</tr>
<tr>
<td>Specialized Raptor Nesting Habitat – Sec. 5.4.2.7 &amp; 8.5.7</td>
<td>No known raptor nests were recorded in NRVIS within the 120 m project location boundary; however, 3 raptor species were counted during a Breeding Bird Atlas inventory for square 17PM15, with a point count station located approximately 1.3 km from the project location. These species were Northern Harrier (Circus cyaneus), Red-tailed Hawk (Buteo jamaicensis) and Broad-winged</td>
<td>No known raptor nests were recorded in NRVIS within 1 km of the project location boundary; however, 3 raptor species were counted during a Breeding Bird Atlas inventory for square 17PM15, with a point count station located approximately 1.3 km from the project location. These species were Northern Harrier (Circus cyaneus), Red-tailed Hawk (Buteo jamaicensis)</td>
<td></td>
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</tbody>
</table>
### Rare Vegetation Communities or Specialized Wildlife Habitat

<table>
<thead>
<tr>
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<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawk (Buteo platypterus).</td>
<td></td>
<td></td>
<td></td>
<td>and Broad-winged Hawk (Buteo platypterus).</td>
</tr>
<tr>
<td>No raptor nests were identified during the site investigation within the 120 m boundary around the project location. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities there is little concern for this habitat type with respect to this project. Any raptors that may form new nests in the area would do so in spite of all the human activity, so it is unlikely they would be impacted.</td>
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</tbody>
</table>

### Moose Calving Areas – Sec. 5.4.2.8 & 8.5.9

| Moose                          | Moose                                      | No moose calving areas as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation. | No moose calving areas as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified within 1 km of the project location in the records review or during site investigation. |

### Moose Aquatic Feeding Areas – Sec. 5.4.2.9 & 8.5.9

<p>| Moose                          | Moose                                      | No aquatic feeding areas were identified within the project location through either the records review or site investigation. | A Moose Aquatic Feeding Area (ranked as moderate) was determined to be located within 1 km (southeast) of the project through the records review. It does not encroach within the 120 m boundary around the project |</p>
<table>
<thead>
<tr>
<th>Specialized Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Ecosite Codes</th>
<th>W/n 120 Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare Vegetation Communities or Specialized Wildlife Habitat</td>
<td></td>
<td></td>
<td>location. The DDS suggests that adjacent lowland coniferous forest should be included in the delineated habitat. Since no forest clearing within either the 120 m or 1 km m boundaries is proposed, there should be no impact to this feature.</td>
<td></td>
</tr>
<tr>
<td>Mineral Licks – 5.4.2.10 &amp; 8.5.9</td>
<td>Moose White-tailed Deer</td>
<td>Habitat may be found in all forested ecosites.</td>
<td>No mineral licks were identified in the records review or within the project location during site investigation.</td>
<td>No mineral licks were identified in the records review within 1 km of the project location.</td>
</tr>
<tr>
<td>Mink &amp; Otter Feeding &amp; Denning Sites/ Martin &amp; Fisher Denning Sites – Sec. 5.4.2.11 &amp; 8.5.10</td>
<td>Mink Otter Marten Fisher</td>
<td>Habitat may be found in all forested ecosites.</td>
<td>This habitat type was not identified within the 120 m project location boundary during the records review or site investigation. Mink and otter require heavily vegetated shorelines with numerous dead falls, log jams and large logs. Martin and fisher require large tracts of undisturbed forest with large trees (&gt;40 cm dbh). All these species require areas with little human disturbance. These habitat requirements are not found within the project location.</td>
<td>It is unlikely that there are denning sites located within 1 km of the project location due to the highly disturbed nature of the landscape and the amount of human activity associated with the landfill site.</td>
</tr>
<tr>
<td>Areas of High Diversity – Sec. 5.4.3 &amp; 8.5.11</td>
<td></td>
<td></td>
<td>The project location is immediately adjacent to an active landfill and has been highly disturbed (i.e. cleared); therefore, this habitat does not exist within the 120 m project location boundary.</td>
<td>The project location is immediately adjacent to an active landfill and has been highly disturbed (i.e. cleared). According to the FEC mapping there is little diversity in forest ecotypes within 1 km of the project location and the area in</td>
</tr>
</tbody>
</table>
## Rare Vegetation Communities or Specialized Wildlife Habitat

<table>
<thead>
<tr>
<th>Specialized Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
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<th>W/n 1 km of Boundary</th>
</tr>
</thead>
</table>
| Cliffs & Caves – Sec. 5.4.4 & 8.5.12 | Wild Turkey  
Ruffed Grouse  
Spruce Grouse  
Moose  
White-tailed Deer  
Salamander spp. | Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs. | Cliffs and caves were not identified in the records review or within the 120 m project location boundary during site investigation. | Cliffs and caves were not identified in the records review or within 1 km of the project location. |
| Seeps & Springs – Sec. 5.4.5 & 8.5.4 | Trumpeter Swan  
American Black Duck  
Northern Pintail  
Northern Shoveler  
Gadwall  
Blue-winged Teal  
Green-winged Teal  
Wood Duck  
Hooded Merganser  
Common Merganser  
Red-breasted Merganser  
Mallard  
Canada Goose  
American Widgeon | All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH:  
MAS1  
MAS2  
MAS3  
SAS1  
SAM1  
SAF1  
MAM1  
MAM2  
MAM3  
MAM4  
MAM5  
MAM6  
SWT1  
SWT2  
SWD1  
SWD2  
SWD3  
SWD4 | No waterfowl nesting areas (i.e. relatively large, undisturbed upland areas with abundant ponds and wetlands) as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) were identified in the records review or within the project location during site investigation. | Though there is a wetland area within 1 km of the project location, its size and make-up are not consistent with the criteria of significant waterfowl nesting habitat as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS), nor does it have habitat components that would encroach into the 120 m boundary around the project location. |

### Other Specialized Habitats for Wildlife to Consider

**Waterfowl Nesting Area**

**Rationale:** Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.

- Trumpeter Swan
- American Black Duck
- Northern Pintail
- Northern Shoveler
- Gadwall
- Blue-winged Teal
- Green-winged Teal
- Wood Duck
- Hooded Merganser
- Common Merganser
- Red-breasted Merganser
- Mallard
- Canada Goose
- American Widgeon
<table>
<thead>
<tr>
<th>Specialized Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Ecosite Codes</th>
<th>W/n 120 Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bufflehead</td>
<td>Note: includes adjacency to provincially Significant Wetlands</td>
<td>No known raptor nests were recorded in NRVIS within the 120 m project location boundary; however, 3 raptor species were counted during a Breeding Bird Atlas inventory for square 17PM15, with a point count station located approximately 1.3 km from the project location. These species were Northern Harrier (<em>Circus cyaneus</em>), Red-tailed Hawk (<em>Buteo jamaicensis</em>) and Broad-winged Hawk (<em>Buteo platypterus</em>). No raptor nests were identified during the site investigation within the 120 m boundary around the project location. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities there is little concern for nesting or foraging habitat with respect to this project. Any raptors that may form new nests in the area would not be a concern for nesting or foraging habitat with respect to this project. Any raptors that may form new nests in the area would</td>
<td>No known raptor nests were recorded in NRVIS within 1 km of the project location boundary; however, 3 raptor species were counted during a Breeding Bird Atlas inventory for square 17PM15, with a point count station located approximately 1.3 km from the project location. These species were Northern Harrier (<em>Circus cyaneus</em>), Red-tailed Hawk (<em>Buteo jamaicensis</em>) and Broad-winged Hawk (<em>Buteo platypterus</em>). No raptor nests were identified during the site investigation. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities there is little concern for nesting or foraging habitat with respect to this project. Any raptors that may form new nests in the area would not be a concern for nesting or foraging habitat with respect to this project. Any raptors that may form new nests in the area would</td>
</tr>
<tr>
<td></td>
<td>Common Goldeneye</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodland Raptor Nesting Habitat</td>
<td>Red-tailed Hawk</td>
<td>May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3</td>
<td></td>
<td>No known raptor nests were recorded in NRVIS within 1 km of the project location boundary; however, 3 raptor species were counted during a Breeding Bird Atlas inventory for square 17PM15, with a point count station located approximately 1.3 km from the project location. These species were Northern Harrier (<em>Circus cyaneus</em>), Red-tailed Hawk (<em>Buteo jamaicensis</em>) and Broad-winged Hawk (<em>Buteo platypterus</em>). No raptor nests were identified during the site investigation. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities there is little concern for nesting or foraging habitat with respect to this project. Any raptors that may form new nests in the area would not be a concern for nesting or foraging habitat with respect to this project. Any raptors that may form new nests in the area would</td>
</tr>
<tr>
<td></td>
<td>Great Horned Owl</td>
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<tr>
<td></td>
<td>Broad-winged Hawk</td>
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<tr>
<td></td>
<td>Sharp-shinned Hawk</td>
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<tr>
<td></td>
<td>Merlin</td>
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<tr>
<td></td>
<td>Barred Owl</td>
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<tr>
<td></td>
<td>Red-shouldered Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coopers Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northern Goshawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northern Harrier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red-tailed Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Great Horned Owl</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Broad-winged Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharp-shinned Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Merlin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Barred Owl</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red-shouldered Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coopers Hawk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Northern Goshawk</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rationale:**
Nests sites for these species are rarely identified; these habitats are often used annually by these species.
### Rare Vegetation Communities or Specialized Wildlife Habitat

<table>
<thead>
<tr>
<th>Specialized Wildlife Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Ecosite Codes</th>
<th>W/n 120 Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>would do so in spite of all the human activity, so it is unlikely they would be impacted.</td>
<td>do so in spite of all the human activity, so it is unlikely they would be impacted.</td>
</tr>
<tr>
<td><strong>Aquatic Feeding Habitat</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rationale:</strong></td>
<td>Aquatic Feeding Habitats are an extremely important habitat component for moose and other wildlife as they supply important nutrients.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Moose White-tailed Deer</td>
<td>Habitat may be found in all forested ecosites adjacent to water.</td>
<td>No aquatic feeding areas were identified within the project location through either the records review or site investigation.</td>
<td>A Moose Aquatic Feeding Area (ranked as moderate) was determined to be located within 1 km (southeast) of the project location through the records review. It does not encroach within the 120 m boundary around the project location. The DDS suggests that adjacent lowland coniferous forest should be included in the delineated habitat. Since no forest clearing within either the 120 m or 1 km boundaries is proposed, there should be no impact to this feature.</td>
</tr>
</tbody>
</table>

### Habitats of Species of Conservation Concern

<p>| Some Habitats to Consider |</p>
<table>
<thead>
<tr>
<th>Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Ecosite</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Marsh Bird Breeding Habitat</strong></td>
<td>American Bittern, Sora, Red-necked Grebe, Northern Shoveler, Redhead, Ring-necked Duck, Lesser Scaup, Ruddy Duck, Common Moorhen, American Coot, Wilson’s Phalarope, Common Loon, Sandhill Crane, Black-crowned Night Heron, Green Heron, Solitary Sandpiper, Sedge Wren, Marsh Wren</td>
<td>MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1, SAM1, SAF1, FEO1, BOO1</td>
<td>There are no wetland areas within the 120 m boundary around the project location. Therefore, this habitat type as outlined in the Significant Wildlife Habitat Technical Guide (SWHTG) or its associated Decision Support System (DSS) was not identified in the records review or within the project location during site investigation.</td>
<td>A wetland is present approximately 350 m from the project location boundary, which has the potential for marsh bird breeding habitat. However, due to its very small size and lack of connectivity to large wetland systems, it is unlikely to be significant. According to the SWHTG and DDS, associated components of this habitat type would not extend into the 120 m boundary established around the project location.</td>
</tr>
<tr>
<td><strong>Special Concern:</strong></td>
<td>Yellow Rail, Black Tern</td>
<td></td>
<td>For Green Heron: All SW, MA and CUM1 sites.</td>
<td></td>
</tr>
<tr>
<td><strong>Open Country Bird Breeding Habitat</strong></td>
<td>Indicator Spp: Bobolink, Upland Sandpiper, Grasshopper Sparrow, Vesper Sparrow, Common Spp: Eastern Meadowlark, American Kestrel, Northern Harrier, Savannah Sparrow</td>
<td>CUM1, CUM2</td>
<td>No open country bird breeding habitat was identified during either the records review or site investigation within the 120 m project location boundary. These habitats typically consist of large meadows, fields and grassland greater than 30 ha in size, which are not present.</td>
<td>No open country bird breeding habitat was identified within the 1 km of the project location boundary. These habitats typically consist of large meadows, fields and grassland greater than 30 ha in size, which are not present.</td>
</tr>
<tr>
<td>Habitat</td>
<td>Wildlife Species (may not be limited to those listed)</td>
<td>ELC Ecosite</td>
<td>W/n 120 m Boundary</td>
<td>W/n 1 km Boundary</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.</td>
<td><strong>Special Concern</strong> Short-eared Owl</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrub/Early Successional Bird Breeding Habitat</td>
<td>Willow Flycatcher Philadelphia Vireo House Wren Brown Thrasher Blue-winged Warbler Tennessee Warbler Prairie Warbler Eastern Towhee Clay-colored Sparrow Field Sparrow Lincoln’s Sparrow</td>
<td>CUT1</td>
<td>No shrub/early successional bird breeding habitat was identified during either the records review or site investigation within the 120 m project location boundary. These habitats typically consist of large meadows, fields and grassland greater than 30 ha in size, which have early successional shrub and thicket habitat; these characteristics are not present.</td>
<td>No shrub/early successional bird breeding habitat was identified within 1 km of the project location boundary. These habitats typically consist of large meadows, fields and grassland greater than 30 ha in size, which have early successional shrub and thicket habitat; these characteristics are not present.</td>
</tr>
<tr>
<td><strong>Special Concern and Rare Wildlife</strong></td>
<td>All Special Concern and Rare (S1-S3, SH) plant and animal</td>
<td>All plant and animal element occurrences (EO).</td>
<td>No Special Concern species were identified within the 120 m project location boundary through NHIC, or</td>
<td>No Special Concern species were identified within the 1 km of the project location boundary through</td>
</tr>
</tbody>
</table>
### Habitats of Species of Conservation Concern

#### Some Habitats to Consider

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Ecosite</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
<td>species. Lists of these species are tracked by the Natural Heritage Information Centre.</td>
<td>Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy</td>
<td>NRVIS. However, there is a point count station (#39) for Breeding Bird Atlas Square 17PM15 approximately 1.3 km away. Three special concern bird species were recorded at this station, including: Olive-side Flycatcher (<em>Contopus cooperi</em>), Canada Warbler (<em>Wilsonia Canadensis</em>) and Golden-winged Warbler (<em>Vermivora chrysoptera</em>). Though it is reasonable to assume these species may utilize areas around the landfill or the project location, these species were not observed, nor were any nests found during the site investigation. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities which could impact nesting or foraging habitat, there is little concern for this habitat type with respect to this project.</td>
<td>NHIC, or NRVIS. However, there is a point count station (#39) for Breeding Bird Atlas Square 17PM15 approximately 1.3 km away. Three special concern bird species were recorded at this station, including: Olive-side Flycatcher (<em>Contopus cooperi</em>), Canada Warbler (<em>Wilsonia Canadensis</em>) and Golden-winged Warbler (<em>Vermivora chrysoptera</em>). Though it is reasonable to assume these species may utilize areas around the landfill or the project location, these species were not observed, nor were any nests found during the site investigation. Since the proposed activities (e.g. installation of an engine, approximately the size of a cargo container to the existing methane well system and flaming tower) would not result in any land clearing activities which could impact nesting or foraging habitat, there is little concern for this habitat type with respect to this project.</td>
</tr>
</tbody>
</table>

### Animal Movement Corridors
## Some Habitats to Consider

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Eco-sites</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
</table>
| **Amphibian Movement Corridors** | Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog, Wood Frog, Northern Leopard Frog, Pickerel Frog, Green Frog, Mink Frog, Bullfrog, American Toad | Corridors may be found in all ecosites associated with water.  
  - Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1 | These habitats are associated with amphibian animal concentration areas. Since no significant amphibian concentration areas were identified through either the records review or site investigation, this habitat type is not present. | These habitats are associated with amphibian animal concentration areas. Since no significant amphibian concentration areas were identified through either the records review or site investigation, this habitat type is not present. |
| **Cervid Movement Corridors**   | White-tailed Deer, Moose                                                                                                               | Corridors may be found in all forested ecosites.  
  - No cervid wintering areas or mast producing areas were identified during the records review or site investigation. Therefore, the presence of significant cervid movement corridors within the project location is highly unlikely. | No cervid wintering areas or mast producing areas were identified during the records review or site investigation. Therefore, the presence of significant cervid movement corridors within 1 km of the project location is highly unlikely. | No cervid wintering areas or mast producing areas were identified during the records review or site investigation. Therefore, the presence of significant cervid movement corridors within 1 km of the project location is highly unlikely. |
| **Bat Movement Corridor**       | Big Brown Bat, Little Brown Myotis, Tri-coloured Bat  
  - From confirmed hibernacula and maternity                                                                 | No known bat hibernacula or features associated with bat hibernacula (caves, mines, old) | No known bat hibernacula or features associated with bat hibernacula (caves, mines, old) | No known bat hibernacula or features associated with bat hibernacula (caves, mines, old) |

**Rationale:**  
**Amphibian Movement Corridors:** Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.  
**Cervid Movement Corridors:** Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while traveling.  
**Bat Movement Corridor:** From confirmed hibernacula and maternity.
# Animal Movement Corridors

## Some Habitats to Consider

<table>
<thead>
<tr>
<th>Habitat</th>
<th>Wildlife Species (may not be limited to those listed)</th>
<th>ELC Eco-sites</th>
<th>W/n 120 m Boundary</th>
<th>W/n 1 km of Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rationale:</strong> Movement corridors for bats are essential to ensure bats can fly unimpeded from swarming areas to roost sites and feeding areas.</td>
<td>Silver-haired Bat Northern Long-eared Myotis Eastern Small-footed Myotis</td>
<td>colonies • Edge of Forested Areas and Forest Ridges are potential corridors</td>
<td>growth trees with cavities were identified during the records review or site investigation, nor are there other features such as large water bodies or forested ridges present. Therefore, it is highly unlikely that bat movement corridors of any significance are present within the project location.</td>
<td>mines, old growth trees with cavities were identified during the records review or site investigation, nor are there other features such as large water bodies or forested ridges present. Therefore, it is highly unlikely that bat movement corridors of any significance are present within 1 km of the project location.</td>
</tr>
</tbody>
</table>
TABLE G.1

NORTH BAY HYDRO
MERRICK LANDFILL

NATURAL HERITAGE ASSESSMENT AND WATER ASSESSMENT IN SUPPORT OF
THE RENEWABLE ENERGY APPLICATION FOR THE MERRICK LANDFILL SITE

SPECIES AT RISK IN THE NORTH BAY, ONTARIO REGION

<table>
<thead>
<tr>
<th>Species</th>
<th>Taxonomy</th>
<th>Status</th>
<th>Species Protected (under ESA)</th>
<th>Habitat Protected (under ESA)</th>
<th>Confirmed &lt;20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake sturgeon</td>
<td>Fish</td>
<td>Threatened</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>American eel</td>
<td>Fish</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Short-eared owl</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Eastern wolf</td>
<td>Mammals</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Whip-poor-will</td>
<td>Birds</td>
<td>Threatened</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Chimney swift</td>
<td>Birds</td>
<td>Threatened</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Snapping turtle</td>
<td>Reptiles</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Black tern</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Common nighthawk</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Spotted turtle</td>
<td>Reptiles</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Olive-sided flycatcher</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Yellow Rail</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Monarch</td>
<td>Insects</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Blanding’s turtle</td>
<td>Reptiles</td>
<td>Threatened</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Peregrine falcon</td>
<td>Birds</td>
<td>Threatened</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Wood turtle</td>
<td>Reptiles</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Eastern hog-nosed snake</td>
<td>Reptiles</td>
<td>Threatened</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Northern brook lamprey</td>
<td>Fish</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Least bittern</td>
<td>Birds</td>
<td>Threatened</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Butternut</td>
<td>Plants</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Milk snake</td>
<td>Reptiles</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Loggerhead shrike</td>
<td>Birds</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Flooded Jellyskin</td>
<td>Lichens</td>
<td>Threatened</td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Red-headed woodpecker</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>American ginseng</td>
<td>Plants</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>American white pelican</td>
<td>Birds</td>
<td>Threatened</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Common five-lined skink</td>
<td>Reptiles</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>King Rail</td>
<td>Birds</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Aurora Trout</td>
<td>Fish</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Eastern musk turtle</td>
<td>Reptiles</td>
<td>Threatened</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Eastern ribbonsnake</td>
<td>Reptiles</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Eastern Massassauga Rattlesnake</td>
<td>Reptiles</td>
<td>Threatened</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Canada Warbler</td>
<td>Birds</td>
<td>Special concern</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Eastern Cougar</td>
<td>Mammals</td>
<td>Endangered</td>
<td>yes</td>
<td>yes</td>
<td>maybe</td>
</tr>
</tbody>
</table>

NOTES:
1. THIS DOCUMENT WAS MODIFIED IN AUGUST 2010.
APPENDIX E

LETTER FROM CITY OF NORTH BAY REGARDING PROTECTED PROPERTY REVIEW
17 May 2010

To: North Bay Hydro  
P.O. Box 3240  
74 Commerce Crescent  
North Bay, ON P1B 8Y5  

Attention: Mr. Todd Wilcox – General Manager

Re: Merrick’s Landfill Gas to Energy Project

Site Location: Merrick Landfill Site.  
Part of annulled Lots 10, 11, and 12, Concession IV and V.  
Part of annulled Lots 10 and 11, Concession VI.  
Unorganized Township of Merrick, District of Nipissing

The Merrick Landfill Site operates under the Amended Provisional Certificate of Approval Waste Disposal Site Number A530116 from the Ministry of the Environment dated June 30, 2004. In addition, the Merrick Landfill Site has been approved in accordance with Section 9 of the Environmental Protection Act to operate one drum type enclose flaring system to burn landfill gas from enclosed extraction wells as described by Certificate of Approval Air Number 8033-6SXL82 issue date August 24, 2006.

It has been determined that the project location is not on a property described in Section 19 of ONTARIO REGULATION 359/09. Therefore there are no Protected Property Requirements and no written authorization is required to meet the requirements described in Section 19 of O. Reg. 359/09.

Sincerely,

John Severino, P.Eng.,  
Manager, Environmental Services  
City of North Bay

cc: Alan Korell, Managing Director, Engineering, Works, Environmental Services