Ecological Work Plan
Future Solid Waste Disposal Needs Environmental Assessment Study
St. Marys, Ontario

The Corporation of the Town of St. Marys

(Note: Work Plans were provided as draft reports only. Comments provided by agencies, Indigenous communities and the public were directly incorporated into the implementation as described in Volume I, Section 10.0, Consultation Summary)

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1.0 Introduction

The Town of St. Marys is conducting an Individual Environmental Assessment under the *Environmental Assessment Act* to review alternative means to managing solid waste in the town over a forty year planning period. The existing St. Marys landfill site (the Site), Environmental Compliance Approval (ECA) Number A150203, is located at 1221 Water St. South, St. Marys, Ontario. The 37 ha Site was part of a former clay pit that was used by St. Marys Cement in cement manufacturing and contains an approved fill area of 8 ha. The landfill is nearing its approved fill capacity and a new means to manage post-diversion solid waste is required. The location of the existing landfill is illustrated on Figure 1.

Terms of Reference (TOR) were approved by the Minister of Environment and Climate Change on December 29, 2014. The TOR laid out a strategy for completing the EA. The TOR also included a summary of pre-planning work which had been done to eliminate a number of *Alternatives to the Undertaking*. Those *Alternatives* which were eliminated due to a variety of technical, financial and environmental criteria included:

- Do Nothing;
- Energy From Waste;
- Enhanced waste diversion, and,
- Constructing a new landfill site at a new location in the Town.

A further assessment is currently being conducted to evaluate the preference for transporting waste to a landfill in another jurisdiction over expanding the current landfill site. This assessment is not yet complete.

Included in the TOR was a requirement to develop Work Plans should Expansion of the Existing Landfill be identified as the preferable *Alternative to the Undertaking*. Work Plans are to provide a detailed methodology for completing the evaluation of *Alternative Methods for Carrying out the Undertaking*, the next step in the EA process. Work Plans are to be prepared for a variety of disciplines, including:

- Terrestrial and Aquatic Ecology;
- Hydrogeology;
- Socio-Economic Environment;
- Air Quality; and,
- Others.

This Work Plan provides the framework for evaluating the *Alternative Methods for Carrying out the Undertaking* based on factors associated with the terrestrial and aquatic environment.

A preferred Alternative to the Undertaking has not yet been identified (i.e., whether waste will be transported to another landfill or whether the St. Marys site will be

expanded). The work outlined in this work plan will only be required if the landfill expansion option is selected. Nonetheless, the Town has elected to be proactive and prepare for possible fieldwork in the spring of 2015. This decision has been made because there are specific timing windows within which several ecological field investigations must be completed and the Town does not wish to delay the EA by waiting for a suitable timing window next year, if required.

2.0 Study Parameters

The Study will be completed using the parameters described in the following sections.

2.1 Study Purpose

If it is decided to expand the existing landfill, the Undertaking will be defined as:

> *The expansion of the St. Marys landfill in order to provide the necessary capacity to fulfill the Town's post-diversion solid waste disposal needs for the next 40 years.*

The purpose of this study is, therefore:

> *To evaluate a variety of Alternative Methods for expanding the St. Marys landfill in order to fulfill the Town's post-diversion solid waste disposal needs for the next 40 years.*

2.2 Alternatives to be Assessed

Alternative Methods are technically, economically and environmentally feasible ways of doing, or implementing, the same activity. Assuming that the preferred *Alternative to the Undertaking* is to expand the existing landfill, the *Alternative Methods* will include various design options associated with the expansion. Increased waste diversion will be considered for the preferred Alternative Method but will not constitute part of the undertaking.

Therefore, the *Alternative Methods* to be reviewed will include those identified in Table 1.

Table 1: Alternative Methods for Carrying Out the Undertaking

Method		Description
1	Vertical Expansion of the Existing Landfill	This Method involves an expansion in the vertical direction within the existing footprint of the landfill.
2	Horizontal Expansion of the Existing Landfill	This involves an expansion outside of the existing landfill footprint. There may be a number of options as to the direction of the horizontal expansion (i.e., expansion could occur to the north, west or east).

Method		Description
3	A Combination of Vertical and Horizontal Expansion	This Method would involve partial vertical expansion along with some horizontal expansion of the landfill footprint, basically a mixture of Methods 1 and 2.
4	Other Options Which May be Identified During the EA Process	Other Methods may be identified during public, Aboriginal and agency consultation.

2.3 Study Area

Two specific Study Areas have been identified which will be used as the basis for defining and characterizing the natural environment which may be potentially affected by the expansion.

The Study Areas are as follows:

- On-site Study Area- includes all lands associated with the existing St. Marys landfill, the 37 ha site located as 1221 Water St. South, St. Marys; AND,
- Study Area Vicinity- all lands within a 1,000 m radius of the on-site Study Area.

Both Study Areas are shown on Figure 2.

2.4 Study Timeframe

The EA will consider the potential effects on various environmental components over two time periods:

- Construction and operation of the expanded landfill:
  - Construction is currently anticipated to commence in 2016 or 2017; and,
  - Operations would then occur over a 40 year period, ending in year 2057.
- Closure and post-closure of the landfill.

2.5 Features of the Natural Environment to be studied

Section 1(1) of the *EA Act* broadly defines the environment as:

> *"(a) air, land or water,*
> *(b) plant and animal life, including human life,*
> *(c) the social, economic and cultural conditions that influence the life of humans or a community,*
> *(d) any building, structure, machine or other device or thing made by humans,*
> *(e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or*
> *(f) any part or combination of the foregoing and the interrelationships between any two or more of them."*

This portion of the study will focus primarily on the plant and animal life component of the environment. The study will specifically consider natural features of provincial significance, as outlined in Section 2.1 of the Provincial Policy Statement and features of local significance, as outlined in municipal Official Plans. Climate change has also been included at the request of the MOECC. Therefore, components of the environment to be studied include:

- Significant wetlands/ significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Significant Areas of Natural and Scientific Interest;
- Fish habitat;
- Habitat of Endangered and Threatened species;
- Locally significant natural features; and,
- Climate change.

3.0 Preliminary Observations

Preliminary observations about the On-site Study Area and Study Area Vicinity have been made based on air photo interpretation and a general site reconnaissance completed during the Terms of Reference stage.

Through these initial observations it was determined that the On-site Study Area has the following characteristics:

- Widespread disturbance from previous clay extraction and previous and on-going landfilling;
- Active landfill and composting areas;
- Regular vehicle use of the area at the public drop-off area and use of machinery to move compost to the compost area, garbage truck unloading and landfill covering within the active cells;
- Small isolated patches of trees, shrubs and hedgerows along portions of the west and south side;
- Old field meadow/grassy areas on previously disturbed areas;
- Four small ponded areas that collect stormwater; and,
- A watercourse through the site. The reach running through the landfill property was altered and potentially realigned by St. Marys Cement during their operations on the site. This section has been allowed to naturalize as part of the Town's efforts to manage lands in an ecologically sustainable manner.

The Study Area Vicinity has the following features and characteristics:

- Disturbed lands to the north and north west from St. Marys Cement operations;
- Agricultural activities to the south;

- Residential properties to the west;
- Wooded areas along the Thames River to the west; and,
- Some small wooded areas in parklands to the north beyond St. Marys Cement operations.

4.0 Methodology

The study will be carried out in accordance with the Natural Heritage Reference Manual (MNR, 2010) and will include the following steps:

- Step 1 - Review and compile background information from existing data sources;
- Step 2 - Complete Ecological Land Classification;
- Step 3 - Identify Features of Significance or Candidate Significance;
- Step 4 - Conduct Field Studies to Confirm Significance; and,
- Step 5 - Evaluate Alternatives and Assess Potential Impacts.

Each step is described in the following sections.

4.1 Step 1 - Background Data Collection

A number of secondary source data sets will be reviewed in order to compile all known information about the Study Area. Data sources to be reviewed are identified in Table 2.

Table 2: Data Sources

Database	Website
Species, Habitat Natural Area Records	
Natural Heritage Viewer	http://www.giscoeapp.lrc.gov.on.ca/web/MNR/NHLUPS/NaturalHeritage/Viewer/Viewer.html
Interactive Map of Species at Risk by County/Region	http://www.ontario.ca/environment-and-energy/find-species-risk-your-area
Ontario Breeding Bird Atlas	http://www.birdsontario.org/atlas/squareinfo.jsp?lang=en
Conservation Authority/DFO Aquatic Species at Risk mapping	http://www.conservation-ontario.on.ca/projects/DFO.html
Canada-Important Bird Areas	http://www.bsc-eoc.org/iba/canmap.jsp
Land and Soils Data	
Soil Surveys of Ontario	http://sis.agr.gc.ca/cansis/publications/surveys/on/index.html
Agricultural Capability/Soils Classification	http://www.omafra.gov.on.ca/english/landuse/gis/soil_data/nts.htm

Database	Website
CA Regulations	
Upper Thames Region Conservation Authority	http://maps.thamesriver.on.ca/
Official Plans	
Town of St. Marys Official Plan	http://www.townofstmarys.com/uploadedFiles/Town_Services/Permits_and_Zoning/OfficialPlan.pdf
Perth County Official Plan	http://www.perthcounty.ca/Official_Plan_Sechdules_of_Detailed_Maps
Thames River Background Documents	
Aquatic Species at Risk in the Thames River Watershed (Cudmore et.al., 2004)	http://www.dfo-mpo.gc.ca/Library/316802.pdf
Aquatic Ecosystem Recovery in the Thames River Watershed (Taylor, 2004)	http://www.arlis.org/docs/vol1/69415913/taylori_edited_final.pdf
The Thames River, Ontario Canadian Heritage Rivers System Ten Year Monitoring Report 2000 - 2012	http://thamesriver.on.ca/wp-content/uploads/Publications/CHRS-10YearReport.pdf
Plover Mills Watershed Report Card 2012	http://thamesriver.on.ca/wp-content/uploads//WatershedReportCards/RC_PloverMills.pdf

In addition to background documents, relevant agencies will also be contacted to provide additional records not previously identified. Agencies to be consulted are listed in Table 3.

Table 3: Agencies to be contacted

Agency	Contact
Ministry of Natural Resources	Mr. Dave Marriot District Planner 1 Stone Rd West Guelph ON N1G 4Y2
Upper Thames Region Conservation Authority	Ms. Tracy Annett Land Use Planner 1424 Clarke Road London ON N5V 5B9

Agency	Contact
Town of St. Marys	Mr. David Blake Environmental Coordinator 408 James St. South PO Box 998 St. Marys ON N4X 1B6
Perth County	Mr. Allan Rothwell Director of Planning & Development 1 Huron St. Stratford ON N5A 5S4

Additional input regarding natural features obtained from First Nations and stakeholders through the consultation process will also be documented and included in the summary of background information.

4.2 Step 2 - Complete Ecological Land Classification

Vegetation communities will be mapped in accordance with the Ecological Land Classification (ELC) for Southern Ontario (Lee et. al., 1998). All communities within the On-site Study Area will be mapped using the full protocol. Communities within the Study Area Vicinity will be mapped using the full protocol on public and City-owned lands. Privately owned lands will be mapped from the nearest road or publicly accessible vantage point and will therefore be classified using only those characteristics which are visible.

Results will include:

- Plant species lists, species abundance, community structure and characteristics;
- Documentation of any evidence of wildlife or wildlife habitat features; and,
- Documentation of any disturbed or degraded areas.

4.3 Step 3 -Identify Features of Significance or Candidate Significance

The results of the ELC mapping will be used to:

- Confirm the boundaries of features of known significance; and,
- Identify features which may be significant (these are known as Candidate Significant Features).

Significant and Candidate Significant Features will be identified in accordance with the Natural Heritage Reference Manual (MNR, 2010), the Significant Wildlife Habitat Technical Guide (MNR, 2000) and the Draft EcoRegion Criteria Schedule for EcoRegion 6E (MNR, February 2012).

With respect to species at risk, the MNR provided lists of rare, threatened and endangered species which may be present in the vicinity of the Study Area (see

Appendix A). ELC mapping will also be used to determine whether suitable habitat exists for any of the species at risk listed. Candidate habitats will be identified in the manner described above.

4.4 Step 4 - Confirm Significance of Candidate Features

There are two ways in which Candidate Features will be addressed, depending on their location.

- Within the On-site Study Area- Field studied will be conducted to confirm significance;
- Within the Study Area Vicinity - Candidate Features will be assumed to be significant and will be treated as such during the impact assessment.

Significance will be based on the Natural Heritage Reference Manual (MNR, 2010), the Significant Wildlife Habitat Technical Guide (MNR, 2000) and the Draft EcoRegion Criteria Schedule for EcoRegion 6E (MNR, February, 2012). If any species at risk are found in suitable habitat, the habitat will be considered significant.

A preliminary assessment has been made based on air photo interpretation and a general site reconnaissance completed during the Terms of Reference stage. Appendix B provides a determination of which rare species may be present based on a preliminary assessment of the presence of suitable habitat.

Based on this preliminary description provided in Section 3.0, it is our opinion that the following natural features are present or may be present within the On-site Study Area and/or Study Area Vicinity and may require further study to confirm their presence:

- Significant Valleyland;
- Area of Natural and Scientific Interest;
- Significant Woodland;
- Fish Habitat:
  - Thames River; and,
  - Watercourse on the landfill property (altered/realigned by St. Marys Cement during their excavation of the property).
- Habitat of Endangered and Threatened Species:
  - Various threatened and endangered fish, mussel and turtle species in the Thames River;
  - Eastern meadowlark;
  - Bobolink;
  - Barn swallow;
  - Northern bobwhite; and,
  - Butternut.

- Significant Wildlife Habitat:
  - Amphibian Breeding Habitat (Wetlands);
  - Open Country Bird Breeding Habitat;
  - Shrub/Early successional Bird Breeding Habitat; and,
  - Special Concern and Rare Wildlife Species:
    - Milksnake;
    - Red-headed woodpecker; and,
    - Monarch.

A preliminary list of field studies to confirm the presence or absence of these features is listed in Table 4 and the locations of proposed sampling stations are shown on Figure 2. It is anticipated that the list of field studies may change subsequent to completion of the background data collection and ELC mapping exercise, described in Steps 1 and 2. Additional features or species may be identified during Steps 1 and 2. Additional studies will be added, as required. In addition, some studies may be eliminated if suitable conditions are not found. Any significant features or species observed incidentally will be brought forward to Step 5 for assessment.

We note that milksnake is a difficult species to detect. At least three years of searching are required to confirm their absence from a site. The EA is currently scheduled to be completed in early 2016. However, construction is not likely to occur for some time due to the need for detailed design and permitting. As such, snake surveys will continue for at least three years. Mitigation will be included in the EA to be implemented if milksnake are found. If, after three years of searches, milksnake are not found, the mitigation proposed will not be required. If snakes are found before the end of the three year period and habitat can be confirmed, searches may be halted early.

It is noted that amphibian call surveys were completed in the spring of 2014 at the small stormwater ponds on-site (Figure 3). The protocols used are described in Table 4. Findings have not yet been analyzed and additional work (e.g., ELC mapping) is required before the significance of the ponds as amphibian breeding habitat can be determined. This work will be completed through the process described in Step 5.

As previously noted, it has not yet been determined whether the preferred alternative is to expand the landfill. As such, a design for an expanded landfill has not been created. However, based on a cursory review, it appears as though it may be necessary to alter or re-align the watercourse, if the landfill is expanded. Because this is a possibility, a detailed assessment of the watercourse will be completed.

The current geomorphology of the watercourse (i.e., shape, materials and flow characteristics) will be determined. Work will be completed by a sub-consultant, Parish Geomorphic who will collect data such as, bank-full channel dimensions, areas of bank erosions and instability, characteristics of the bed and banks and other features that affect flow and sediment movement. If necessary, a re-aligned channels will be

designed that has appropriate and improved hydrology, sediment transport and aquatic and riparian habitat. A detailed methodology is provided in Appendix E.

Burnside completed a preliminary assessment of fish habitat within the watercourse crossing the landfill property using the MTO/MNR/DFO Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings (2006). This protocol involves collecting observations such as:

- Channel shape and dimensions;
- Material on the channel bed;
- Presence of pools, riffles, runs etc.:
- Condition of banks (signs of erosion, slumping etc.);
- Presence and characteristics of vegetation along the channel banks and riparian zone;
- Fish observations;
- Presence of habitat features (logs, overhanging banks, egg-laying sites etc.); and,
- Other relevant observations.

Further assessment of fish and fish habitat will occur throughout the EA process, as described in Table 4. Based on the preliminary assessment, it appears as though the channel is too deep to safely electro-fish as a means to characterize the fish community; water was murky and the channel bottom could not be observed. At this time, it is thought that the most effective method for identifying the fish species within the watercourse is to set minnow traps. If the geomorphological assessment finds that the channel is shallower than aniticipated, electro-fishing may be considered as an alternative.

Table 4: Preliminary Field Studies Proposed

Feature Potentially Present	Type of Feature	Record	Proposed Field Study	Methodology	Location	Timing
Study Area Vicinity						
Significant Valleyland	Thames River Valley	Aerial Photography	No study proposed.	N/A	N/A	N/A
Significant Area of Natural and Scientific Interest (ANSI)	St. Marys Cement Co Provincially Significant Earth Science ANSI	MNR Records	No study proposed. Feature is known to be significant.	N/A	N/A	N/A
Habitat of Endangered and Threatened Species	Rare Fish, Mussel and Turtle species in the Thames River	MNR Records	No sampling proposed as records in the Thames River are well documented. Significant Habitat identified by the UTRCA and DFO will be assumed to be correct.	N/A	N/A	N/A
Significant Woodlands	Wooded Areas	Aerial Photography	No sampling proposed. Woodlands along the Thames River will be assumed to be significant.	N/A	N/A	N/A
On-site Study Area						
Habitat of Endangered and Threatened Species	Eastern Meadowlark, THR Bobolink, THR Barn Swallow, THR Northern Bobwhite, END	MNR Records	Eastern Meadowlark/Bobolink Surveys	Following parallel transects and taking point counts at 250 m intervals along each transect. See protocol attached in Appendix C.	Throughout grassland areas. See protocol attached in Appendix C	Three surveys between June 1 to July 7 with a week between each survey. Between 30 minutes after dawn and 9 am. See protocol attached in Appendix C.
	Butternut, END	MNR Records	Systematic visual survey. To be completed during ELC mapping.	Walk slowly and systematically along hedgerows and small wooded patches pausing every 30 m for a detailed scan of trees within sight.	Throughout the On-site Study Area	Spring 2015
Significant Wildlife Habitat	Species of Conservation Concern - Milksnake	MNR Records	Cover board survey	Place coverboards near suitable habitat areas (e.g., near rock piles, woody debris piles etc.). Search under boards for snakes three times per year for up to three years. Supplement coverboard searches with active hand searches, turning over rocks and other suitable cover along transects to search for snakes. See protocol attached in Appendix D.	Throughout inactive area of the landfill site (i.e., not within active landfill cells). See protocol attached in Appendix D.	Three surveys at least two weeks apart between April 1 and October 15. Surveys will continue for up to three years. May be halted earlier if milksnakes are found and habitat is confirmed present. See protocol attached in Appendix D.

Feature Potentially Present	Type of Feature	Record	Proposed Field Study	Methodology	Location	Timing
	Species of Conservation Concern – Red-headed Woodpecker	MNR Records	Breeding Bird Surveys	Point counts throughout areas of the On-site Study Area not covered by Bobolink surveys. Count all birds seen and heard during a five minute period at each point count station.	Location of point count stations to be determined upon completion of ELC mapping and identification of shrub habitat.	Two surveys, ten days apart between May 24 and July 10. To be completed between dawn and five hours after dawn.
	Species of Conservation Concern - Monarch	MNR Records	ELC and Visual search	Completion of ELC to identify areas with substantial milkweed growth. Visual searches for monarch within identified habitats.	Within areas where suitable habitat has been identified (i.e., significant concentrations of milkweed and other meadow wildflowers.	Spring/summer
	Amphibian Breeding Habitat (Wetlands)	Aerial photography indicates presence of several small ponds	Amphibian Call Surveys (Completed in 2014)	Point counts at surveys stations adjacent to the small ponds. Identify amphibian calls within a 100 m semi-circle of the station. Identify the call level and number of call, if possible, as follows: 1. Individuals can be counted; call not simultaneous. 2. Call distinguishable; some simultaneous calling. 3. Full chorus; calls continuous and overlapping.	Adjacent to four small stormwater ponds. See Figure 3.	Spring 2014 April 30, 2014 (2030 - 2130 hrs.) May 20, 2014 (2115 - 2215 hrs.) June 24, 2014 (2115 - 2215 hrs.)
	Open Country Bird Breeding Habitat	Aerial photography	Species using this habitat will be captured in the Eastern Meadowlark/Bobolink Surveys as habitat overlaps.	See Eastern Meadowlark/Bobolink Survey protocol in Appendix C.	See Eastern Meadowlark/Bobolink Survey protocol in Appendix C.	See Eastern Meadowlark/Bobolink Survey protocol in Appendix C.
	Shrub/Early Successional Bird Breeding Habitat	Aerial photography	Breeding Bird Surveys	Point counts throughout the On-site Study Area. Count all birds seen and heard during a five minute period at each point count station.	Location of point count stations to be determined upon completion of ELC mapping and identification of shrub habitat.	Two surveys, ten days apart between May 24 and July 10. To be completed between dawn and five hours after dawn.
Fish Habitat	Watercourse on landfill property.	Aerial photography	Fish Habitat Characterization	MTO/MNR/DFO Protocol (2006)	Downstream of culvert at east end of the site.	April 30, 2014
			Fish Community Sampling	Set minnow traps in various locations along the length of the tributary and check the capture 12 hrs. after being set. Record species and enumerate capture.	Within the sections of watercourse on-site and upstream of the hanging culvert under Water St.	Traps will be checked within 12 hrs. of being set. May/June 2015
			Stream Morphology	Collect detailed stream measurements and characteristics. See methodology attached in Appendix E.	Within the sections of watercourse on-site.	Spring 2015

4.5 Step 5 - Evaluate Alternatives and Assess Potential Impacts

4.5.1 Evaluation of Alternative Methods for Landfill Expansion

Natural heritage data will be used in the evaluation of alternative methods for landfill expansion. The advantages and disadvantages of the various alternatives, described in Section 2.2 will be determined based on their potential impact on significant natural features present in the Study Area and Study Area Vicinity.

An overall preferred alternative will be determined based on a review of the advantages and disadvantages of a broader set of criteria, including factors associated with the natural, cultural, social, economic and built environments.

4.5.2 Impacts and Mitigation

Once the preferred alternative is selected, a comprehensive list of potential impacts and proposed mitigation specific to that alternative will be described.

Potential impacts may include:

- Direct Impacts:
  - Footprint of the expansion; and
  - Any re-alignment or alternation to the on-site watercourse.
- Indirect Impacts:
  - Accidents, malfunctions, spills;
  - Changes to noise, light, vibration;
  - Changes to air quality, odour;
  - Changes to surface water/groundwater quality;
  - Introduction of invasive species; and,
  - Climate change;
- Effects of the natural environment on the project:
  - Natural hazards; and,
  - Climate change.

Effects will be evaluated primarily using a qualitative assessment, using professional judgment. Input from agencies, stakeholders and First Nations will also be documented and considered. The following questions will be used as the basis for determining impacts:

- What is the significance, sensitivity and resilience of the features present?
- What is the quantity of any direct losses (area of land or # of stems etc.)?
- What is the magnitude, duration and reversibility of potential impacts?
- Are impacts predictable or are effects not well known or understood?
- Can impacts be mitigated?
- Are there net effects that cannot be mitigated?

- Is enhancement of previously degraded areas possible?

A list of mitigation measures will be provided to eliminate or minimize potential effects. Any net effects will be documented. Any net effects which cannot be mitigated will also be documented.

4.5.3 Permits and Authorizations

A list of any permits or authorizations which may be required prior to construction will be included. Permits and authorizations associated with the natural environment could include:

- Conservation Authority Regulations;
- *Endangered Species Act*;
- *Fisheries Act*;
- *Navigable Waters Protection Act*; and,
- Others to be determined.

5.0 Public and First Nation Input

It is recognized that local landowners and First Nation communities may have specific knowledge of the site and surrounding area. Local and Aboriginal knowledge can positively contribute to studies such as this by adding observations and historical information which may not be included in public records. Public and First Nation input will be obtained in the following manner:

- The Work Plan will be posted to the Town's website for public comment prior to initiating field work;
- The Work Plan will be sent to First Nation who have expressed an interest in the project for comment prior to initiating fieldwork;
- First Nation communities with an interest in the project will be invited to participate in field studies, where practical and safe;

6.0 Conclusions

The preferred method for managing post-diversion solid waste within the Town of St. Marys will be determined through an evaluation of a number of social, environmental, technical and financial criteria. Potential impacts to natural features are an important component of the environmental evaluation. The landfill property and surrounding lands are relatively disturbed from landfilling and aggregate resources extraction activities. Nonetheless some significant natural features may be present. The Thames River, in particular, is an important feature on the landscape and work will be competed to identify and mitigate any potential impacts to the river or the aquatic habitat it provides to many rare fish, mussel and turtle species. Other features will be identified and assessed through detailed fieldwork to be completed over the spring and summer of 2015. This

Work Plan has outlined how field work will be conducted and how any natural features encountered will be addressed.

7.0 References

Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, S. McMurray, 1998. Ecological Land Classification for Southern Ontario, First Approximation and Its Application. SCSS Field Guide, FG-02.

Ministry of Transportation, Ministry of Natural Resources, Fisheries and Oceans Canada, 2006. MTO/MNR/DFO Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings.

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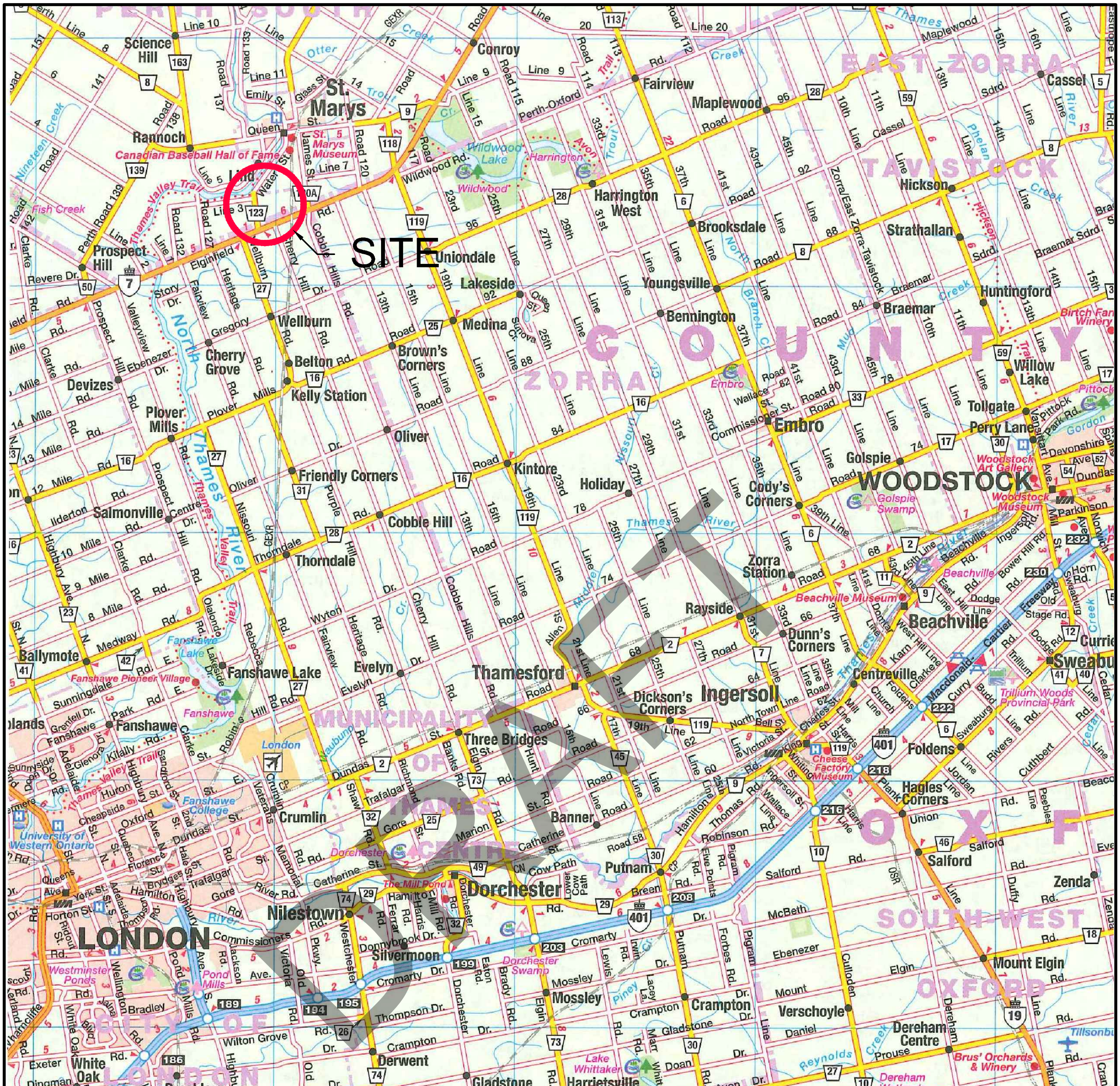
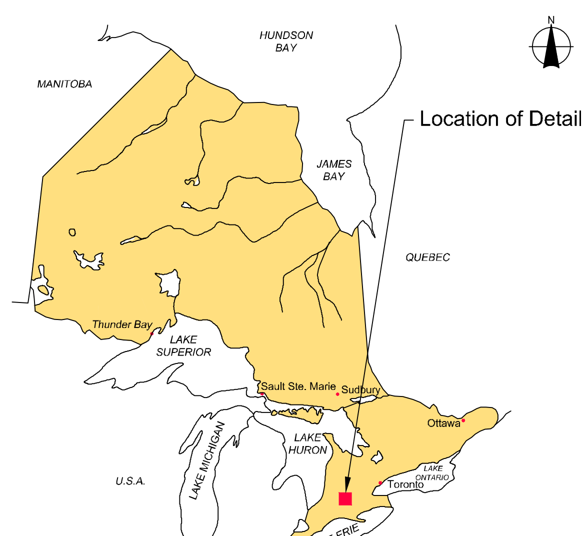
Figures





KEY MAP OF ONTARIO

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THE CORPORATION OF THE TOWN OF ST. MARYS

Figure Title

ECOLOGICAL WORK PLAN

SITE LOCATION PLAN

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CD	TR	March 2015	1
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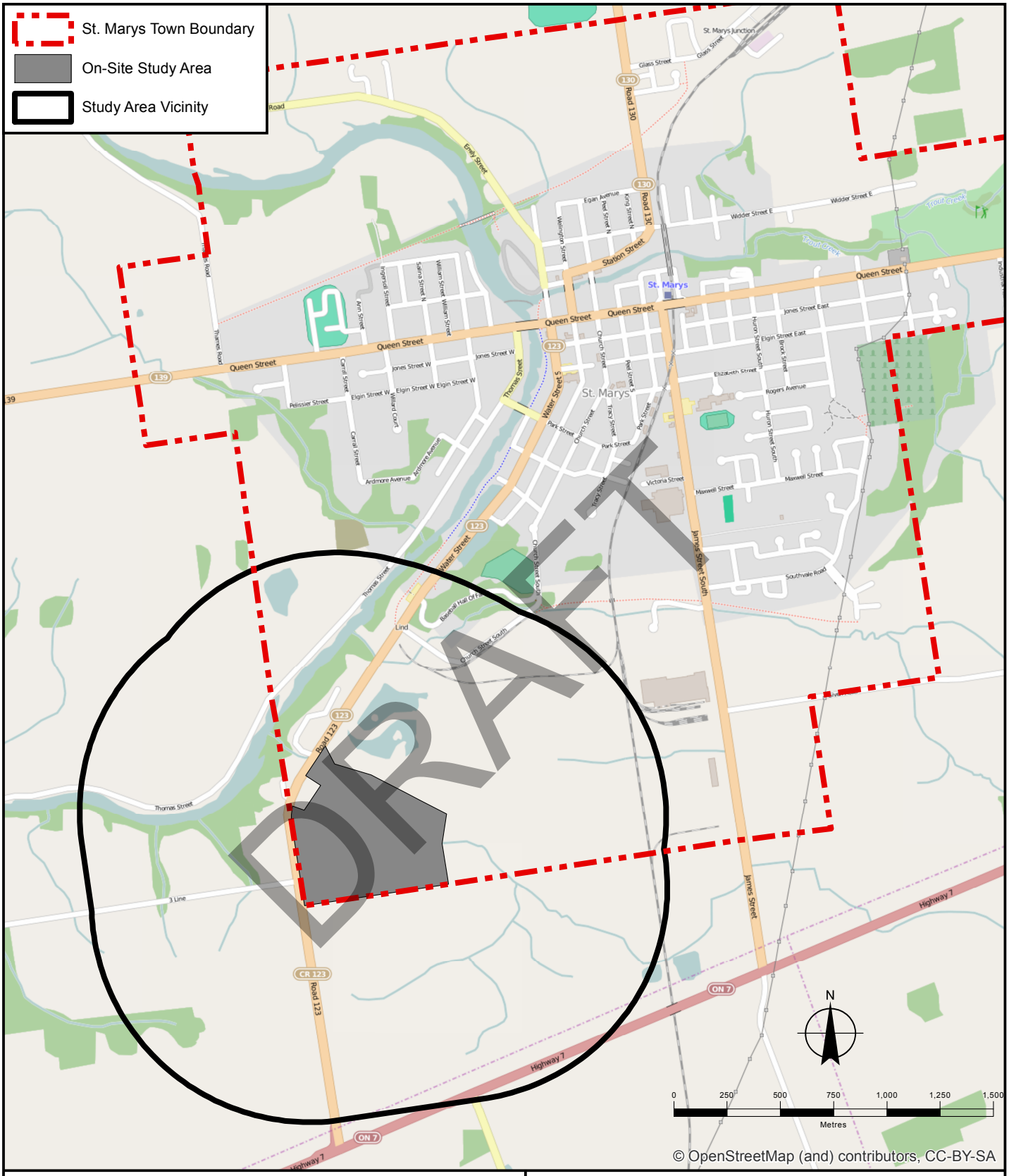

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Map Title

ECOLOGICAL WORK PLAN

STUDY AREA

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THE CORPORATION OF THE TOWN OF ST. MARYS

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LEGEND

APPROXIMATE ON-SITE STUDY AREA

AMPHIBIAN CALL SURVEY STATIONS (SPRING 2014)

Air Photo Source:
Background 2013 satellite / air photoobtained from Google Earth Professional. © Google Earth, use of products are subject to the Terms and Conditions of Licensed Google Earth Software.

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Figure Title
ECOLOGICAL WORK PLAN

AMPHIBIAN SURVEY LOCATIONS

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Appendix A

MNR Correspondence

From:	"Marriott, David (MNRF)" <David.Marriott@ontario.ca>
To:	"Tricia.Radburn@rjburnside.com" <Tricia.Radburn@rjburnside.com>
Cc:	"Timmerman, Art (MNRF)" <art.timmerman@ontario.ca>, "Buck, Graham (MNRF)" <Graham.Buck@ontario.ca>
Date:	02/24/2015 03:02 PM
Subject:	FW: St. Marys Landfill EA Request for Information

Hi Tricia,

The Ministry of Natural Resources and Forestry (MNRF) Guelph District Office has had an opportunity to review the natural heritage information and records for the St. Marys Landfill on-site study area, and the areas in the vicinity of the site. It is understood that the Town is undertaking an individual Environmental Assessment (EA) for the project, and will be completed in accordance with the reporting requirements under the *Environmental Assessment Act*. It is also understood that the existing landfill site at 1221 Water Street South is nearing its approved capacity. The purpose of the EA will be to review options to manage solid waste over the next 40 years. Based on the Notice of Commencement attached, the MNRF can provide the following information and comments for the project team's consideration.

The Ministry has developed a web application (Make a Map) that can make custom maps of select natural heritage features (https://www.ontario.ca/environment-and-energy/make-natural-heritage-area-map). This includes, provincial wetland and Areas of Natural Scientific Interest (ANSI) mapping, and tracked species information from the Natural Heritage Information Center (NHIC) etc. It is recommended that this application be reviewed by the project team.

ANSI

The St. Marys Cement Co provincially significant earth science ANSI is within the vicinity of the on-site study area (on the opposite side of the Thames River). The boundary for this feature can be mapped by using the above noted 'Make a Map' application.

Fisheries

MNRF staff notes that fisheries surveys/habitat assessments have been completed for the Thames River, and for the unnamed tributary crossing the on-site study area (at the crossing of Water Street South).

It is recommended that the project team contact Art Timmerman (Management Biologist) at (519) 826-4935 or art.timmerman@ontario.ca to review the fisheries information available for the on-site

study area, and the areas in the vicinity of the site.

Species at Risk

There are several aquatic species at risk (SAR) known within the vicinity of the on-site study area, within the Thames River. This includes, listed mussels (Wavy-rayed Lampmussel, Rainbow Mussel, and Rayed Bean), Black Redhorse, Spiny Softshell, Bald Eagle, Map Turtle, and Snapping Turtle. It is recommended that the EA demonstrate that there will be no negative impacts to these species or their habitats.

There are no known SAR records for the on-site study area. Please be advised however, that because the province has not been surveyed comprehensively for the presence of listed species, the absence of a record is not an appropriate indicator for the absence of SAR from an area. To determine the presence of SAR for a given study area, the District's recommended approach includes the following:

I. Habitat Inventory

MNRF staff recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. With respect to aquatic habitats in the study area, we recommend you collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential Species at Risk within the Study Area

A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in St. Marys and Perth South is attached for your reference. The species-specific COSEWIC status reports (www.cosewic.gc.ca) are a good source of information on habitat needs and will be helpful in determining the suitability of the study areas ecosites for a given species.

Please note that the Species at Risk in Ontario list (SARO) is a living document and is amended periodically as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO list can be accessed on the webpage https://www.ontario.ca/environment-and-energy/species-risk-ontario-list.

COSSARO also maintains a list of species to be assessed in the future. It is recommended to take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of the activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. The list can be viewed at http://www.ontario.ca/environment-and-energy/help-protect-species-risk.

SAR habitat prescribed under regulation can be accessed on the Environmental Registry and searching for postings related to Ontario Regulation 242/08 under the *Endangered Species Act* .

III. Species at Risk Surveys

Ministry staff are of the opinion that each SAR identified under Step II should be surveyed for, regardless of whether or not the species has been previously recorded in the area. The survey report should describe how each SAR was surveyed for, and provide a rationale for why certain species were not afforded a survey (e.g. habitat within the study area is not suitable for a specific SAR). Please note that some targeted surveys may require provincial authorizations.

Other information

It is recommended that you contact the local conservation authority and municipality for any additional information or records for the study area.

I hope this is of assistance.

Dave

Dave Marriott
District Planner
Ministry of Natural Resources and Forestry, Guelph District
1 Stone Road West
Guelph ON, N1G 4Y2
(P) 519-826-4926
(F) 519-826-6849
email: david.marriott@ontario.ca

From: Tricia Radburn [mailto:Tricia.Radburn@rjburnside.com]
Sent: February 20, 2015 11:47 AM
To: Marriott, David (MNRF)
Subject: Fw: St. Marys Landfill EA Request for Information

Sorry I didn't include the attachment.

Tricia

----- Forwarded by Tricia Radburn/RJB on 02/20/2015 11:46 AM -----

From: Tricia Radburn/RJB
To: david.marriott@ontario.ca
Date: 02/20/2015 11:40 AM
Subject: St. Marys Landfill EA Request for Information

Dave,

I hope all is well with you and your family. I am now back to work after my maternity leave and am getting involved in EA work once again. Attached is the Notice of Study Commencement for the St. Marys Landfill Individual EA. A copy has also been mailed to you. At this time, we are requesting any information the MNR may have regarding the existing St. Marys landfill site, including records of species at risk, ANSIs or any other natural features.

We are also requesting information on procedures for assessing the significance of features, specifically Significant Wildlife Habitat. We note that the draft Ecoregion Criteria Schedules are no longer available online. If you would like us to follow the schedules, could you please forward us a copy of the most recent version?

Any other information, concerns or recommendations you have that may be of relevance to the study would be greatly appreciated.

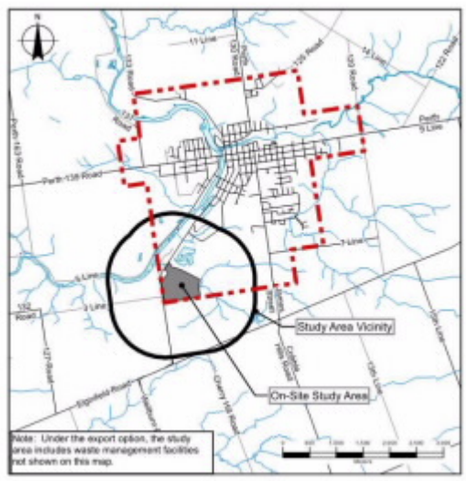
Kind Regards, 032339_Town of St. Mary's Notice of Commencement.pdf

MNRF Guelph District - Perth South SAR List.xlsxMNRF Guelph District - St Marys SAR List.xlsx

Notice of Commencement of
Future Solid Waste Disposal Needs Environmental Assessment Study
Town of St. Marys

The Town of St. Marys (Town) is undertaking an individual environmental assessment (EA) under the Environmental Assessment Act for the identification and selection of a preferred solid waste disposal option for the Town.

The St. Marys landfill site, located at 1221 Water Street South, is nearing its current approved capacity. The Town is reviewing options to manage solid waste over the next 40 years. Options include 1) closing the existing landfill and transporting waste to another disposal facility outside of the Town, or 2) expanding the existing landfill.



The Process

The first step in the EA process was the preparation of Terms of Reference (TOR), setting out the parameters of the study. In December 2014, the Ministry of Environment and Climate Change approved the TOR for the St. Mary's Future Solid Waste Disposal Needs EA. The full TOR is available for download on the Town's website: http://www.townofstmarys.com/waste-management.aspx#Special_Projects. A paper copy of the TOR may also be reviewed at the following locations:

Town Hall: 175 Queen Street East, St. Marys, ON N4X 1B6

Municipal Operations Centre: 408 James St. S., St. Marys, ON N4X 1B6

The next step is to complete the environmental assessment. This study will be carried out according to the approved TOR and the requirements of the Environmental Assessment Act. Results from this study will be documented in an environmental assessment report, which will be submitted to the Ministry of the Environment and Climate Change for review. At that time, the public, Aboriginal communities and other interested persons will be informed when and where the environmental assessment can be reviewed.

Consultation

Members of the public, agencies and other interested persons are encouraged to participate in the study by attending consultation opportunities or contacting staff directly with comments or questions. Consultation opportunities are planned throughout the study. Public Information Centres will be held during the EA process and will be advertised on the Town's website, in the St. Marys Journal Argus and the St. Marys Independent, as well as through direct communications with local landowners, Aboriginal communities, and review and utility agencies.

If you would like to be added to the project mailing list or have project-related questions, please contact either:

Dave Blake, C.E.T.
The Corporation of the Town of St. Marys
408 James Street South, PO Box 998
St. Marys ON N4X 1B6
Phone: 519-284-2340 Ext. 209
Fax: 519-284-0902
Email: dblake@town.stmarys.on.ca

James Hollingsworth
R.J. Burnside & Associates Limited
1465 Pickering Parkway, Suite 200
Pickering ON L1S 6H3
Phone: 289-545-1051
Fax: 905-420-5247
Email: St.Marys.Waste.EA@rjburnside.com

All personal information included in a submission - such as name, address, telephone number and property location - is collected, maintained and disclosed by the Ministry of the Environment and Climate Change for the purpose of transparency and consultation. The information is collected under the authority of the Environmental Assessment Act or is collected and maintained for the purpose of creating a record that is available to the general public as described in s.37 of the Freedom of Information and Protection of Privacy Act. Personal information you submit will become part of the public record that is available to the general public unless you request that your personal information remain confidential. For more information, please contact the Ministry of Environment and Climate Change's Freedom of Information and Privacy Coordinator at 416-327-1434.

First Published on 9-Feb-2015

PERTH - SOUTH

Jump to: List of Municipalities

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

BIRDS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Bald Eagle (*Haliaeetus leucocephalus*)	**Known to Occur**	*N/A*	prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; They roost in super canopy trees such as Pine	Breed and Nest - April or May Some Migrate South when water bodies freeze over	Follow Breeding Bird Survey Protocol
Barn Swallow (Hirundo rustica)	**Known to Occur**	*Species and General Habitat Protection*	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Follow Breeding Bird Survey Protocol
Bobolink (*Dolichonyx oryzivorus*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Canada Warbler (*Cardellina canadensis*; formerly *Wilsonia canadensis*)	**Known to Occur**	*N/A*	Generally prefers wet coniferous, decediuous and mixed forest types, all with a welldeveloped, dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Migrate South for the Winter Arrive in Ontario Early May	Follow Breeding Bird Survey Protocol
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	*Species and General Habitat Protection*	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid- May Migrate South in September or Early October	Consult: Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009
Common Nighthawk (*Chordeiles minor*)	**Known to Occur**	*N/A*	generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Migrate South for the Winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Eastern Whip-poor-will *(Caprimlugus vociferus)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	Nesting: May - July	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Golden-winged Warbler (Vermivora chrysoptera)	**Suspected to Occur**	*N/A*	generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Least Bittern *(Ixobrychus exilis)*	**Suspected to Occur**	*Species and General Habitat Protection*	generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Migrate South for the Winter	Follow Marsh Monitoring Protocol; 10 day window of male calling (variable timing). Does not respond well to playback. Very difficult to detect.
Northern Bobwhite (Colinus virginianus)	**Historically Known to Occur**	*Species and General Habitat Protection*	generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	Acitve Year Round	Follow Breeding Bird Survey Protocol
Red-Headed Woodpecker *(Melanerpes erythrocephalus)*	**Known to Occur**	*N/A*	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Active from May to September	Follow Breeding Bird Survey Protocol

FISH		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Black Redhorse *(Moxostoma duquesnei)*	**Known to Occur**	*Species and General Habitat Protection*	generally lives in moderately sized rivers and streams, with generally moderate to fast currents	Active Year Round	For information please contact your local MNR office, DFO, and Lakes and Rivers
Northern Brook Lamprey (Ichthyomyzon fossor)	**Historically Known to Occur**	*N/A*	generally inhabits small rivers and clear streams of varying sizes. Adults spawn in gravelly riffles.	Active Year Round	For information please contact your local MNR office, DFO, and Lakes and Rivers
Redside Dace *(Clinostomus elongatus)*	**Known to Occur**	*Species Protection and **Habitat Regulation***	generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradien	Spawning occurs in May	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Silver Shiner *(Notropis photogenis)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients	Spawning occurs in May and June	For information please contact your local MNR office, DFO, and Lakes and Rivers

INSECTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	*N/A*	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Migrate South for the Winter Usually in Late September and October	• Watch for adults along roadsides and in open fields • Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.
West Virginia White (Pieris virginiensis)	**Known to Occur**	*N/A*	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	• Watch for adults within moist, deciduous woodlands • Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.

MAMMALS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Little Brown Myotis (Myotis lucifugus)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0; Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Hibernates in caves and mines during winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Northern Myotis (Myotis septentrionalis)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0; Maternal Roosts: Often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Hibernates in caves and mines during winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol

MOLLUSCS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Rainbow Mussel *(Villosa iris)*	**Known to Occur**	*Species and General Habitat Protection*	most abundant in shallow, well- oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud	Active Year Round	Please reference: Mackie, G, T.J Morris, and D Ming. **"Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA).**" Fisheries and Oceans Canada. (2008): Print.
Wavy-rayed lampmussel *(Lampsilis fasciola)*	**Known to Occur**	*Species and General Habitat Protection*	generally inhabit clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable	Active Year Round	Please reference: Mackie, G, T.J Morris, and D Ming. **"Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA).**" Fisheries and Oceans Canada. (2008): Print.

MOSSES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey

PLANTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
American Ginseng *(Panax quinquefolius)*	**Suspected to Occur**	*Species and General Habitat Protection*	grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Flowering begins in June and continues until August; The fruit develop from July to August and ripen in August and September	• Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters • Use a plant field guide to distinguish from similar species
Butternut *(Juglans cinerea)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut and yearlings Look for distinctive fruit on the ground

REPTILES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Suspected to Occur**	*N/A*	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Milksnake *(Lampropeltis triangulum)*	**Known to Occur**	*N/A*	generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Active at dawn and dusk in the spring and fall, and at night in the summer. Hibernate: Late October to Early May	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Northern Map Turtle *(Graptemys geographica)*	**Suspected to Occur**	*N/A*	generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Active: At night Hibernate: October - April Hatching: Late August - Early September	• scan shoreline in spring and partially submerged logs/rocks in summer for basking turtles • Be aware that map turtles do not allow as close of approach as other turtles before leaving a basking site • Snorkel in desired aquatic habitat! • Nesting season: search suitable habitat for nests
Snapping Turtle *(Chelydra serpentina)*	**Known to Occur**	*N/A*	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	• Scan offshore rocks and logs for basking turtles (10am-2pm) • Snorkel in desired aquatic habitat! • Nesting Season: Search known or preferred nesting habitat areas for females
Spiny Softshell *(Apalone spinifera)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers	Lay eggs in June or July Hibernate over winter	• Best time to survey is during nesting season when females are active laying eggs • Visual searches should be conducted in appropriate habitat

Jump to: **List of Municipalities**

ST. MARY'S

Jump to: List of Municipalities

Species At Risk Designations
ENDANGERED
THREATENED
SPECIAL CONCERN
EXTIRPATED

BIRDS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Barn Swallow (Hirundo rustica)	**Known to Occur**	*Species and General Habitat Protection*	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Follow Breeding Bird Survey Protocol
Bobolink (*Dolichonyx oryzivorus*)	**Suspected to Occur**	*Species and General Habitat Protection*	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Canada Warbler (*Cardellina canadensis*; formerly *Wilsonia canadensis*)	**Suspected to Occur**	*N/A*	Generally prefers wet coniferous, decediuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Migrate South for the Winter Arrive in Ontario Early May	Follow Breeding Bird Survey Protocol
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	*Species and General Habitat Protection*	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid- May Migrate South in September or Early October	Consult: Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009
Common Nighthawk (*Chordeiles minor*)	**Suspected to Occur**	*N/A*	generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Migrate South for the Winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Red-Headed Woodpecker *(Melanerpes erythrocephalus)*	**Suspected to Occur**	*N/A*	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Active from May to September	Follow Breeding Bird Survey Protocol

FISH		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey

INSECTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	*N/A*	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Migrate South for the Winter Usually in Late September and October	• Watch for adults along roadsides and in open fields • Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.
West Virginia White (Pieris virginiensis)	**Known to Occur**	*N/A*	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	• Watch for adults within moist, deciduous woodlands • Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.

MAMMALS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey

MOLLUSCS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey

MOSSES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey

PLANTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Butternut *(Juglans cinerea)*	**Suspected to Occur**	*Species and General Habitat Protection*	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut and yearlings Look for distinctive fruit on the ground

REPTILES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Suspected to Occur**	*N/A*	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Milksnake *(Lampropeltis triangulum)*	**Suspected to Occur**	*N/A*	generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Active at dawn and dusk in the spring and fall, and at night in the summer. Hibernate: Late October to Early May	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Northern Map Turtle *(Graptemys geographica)*	**Known to Occur**	*N/A*	generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Active: At night Hibernate: October - April Hatching: Late August - Early September	• scan shoreline in spring and partially submerged logs/rocks in summer for basking turtles • Be aware that map turtles do not allow as close of approach as other turtles before leaving a basking site • Snorkel in desired aquatic habitat! • Nesting season: search suitable habitat for nests
Snapping Turtle *(Chelydra serpentina)*	**Known to Occur**	*N/A*	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	• Scan offshore rocks and logs for basking turtles (10am-2pm) • Snorkel in desired aquatic habitat! • Nesting Season: Search known or preferred nesting habitat areas for females
Spiny Softshell *(Apalone spinifera)*	**Historically Known to Occur**	*Species and General Habitat Protection*	generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers	Lay eggs in June or July Hibernate over winter	• Best time to survey is during nesting season when females are active laying eggs • Visual searches should be conducted in appropriate habitat

Jump to: **List of Municipalities**

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Appendix B

Preliminary Assessment of Habitat for Species at Risk

PERTH - SOUTH

Jump to: List of Municipalities

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

BIRDS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	Habitat Present within On-Site Study Area (Column Added by Burnside)	How to Conduct a Proper Survey
Bald Eagle (*Haliaeetus leucocephalus*)	**Known to Occur**	*N/A*	prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; They roost in super canopy trees such as Pine	Breed and Nest - April or May Some Migrate South when water bodies freeze over	No	Follow Breeding Bird Survey Protocol
Barn Swallow (Hirundo rustica)	**Known to Occur**	*Species and General Habitat Protection*	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Potential foraging but no barns or structures present for nesting	Follow Breeding Bird Survey Protocol
Bobolink (*Dolichonyx oryzivorus*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Potentially	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Canada Warbler (*Cardellina canadensis*; formerly *Wilsonia canadensis*)	**Known to Occur**	*N/A*	Generally prefers wet coniferous, decediuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Migrate South for the Winter Arrive in Ontario Early May	No	Follow Breeding Bird Survey Protocol
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	*Species and General Habitat Protection*	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid- May Migrate South in September or Early October	No	Consult: Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009
Common Nighthawk (*Chordeiles minor*)	**Known to Occur**	*N/A*	generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Migrate South for the Winter	No	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Potentially	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol

Eastern Whip-poor-will *(Caprimlugus vociferus)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	Nesting: May - July	No	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Golden-winged Warbler (Vermivora chrysoptera)	**Suspected to Occur**	*N/A*	generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Migrate South for the Winter	No	Follow Breeding Bird Survey Protocol
Least Bittern *(Ixobrychus exilis)*	**Suspected to Occur**	*Species and General Habitat Protection*	generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Migrate South for the Winter	No	Follow Marsh Monitoring Protocol; 10 day window of male calling (variable timing). Does not respond well to playback. Very difficult to detect.
Northern Bobwhite (Colinus virginianus)	**Historically Known to Occur**	*Species and General Habitat Protection*	generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	Acitve Year Round	Potentially	Follow Breeding Bird Survey Protocol
Red-Headed Woodpecker *(Melanerpes erythrocephalus)*	**Known to Occur**	*N/A*	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Active from May to September	Potentially	Follow Breeding Bird Survey Protocol

FISH		ESA Protection	**Key Habitats Used By Species**	**Timing Of Life History Events**		**How to Conduct a Proper Survey**
Black Redhorse *(Moxostoma duquesnei)*	**Known to Occur**	*Species and General Habitat Protection*	generally lives in moderately sized rivers and streams, with generally moderate to fast currents	Active Year Round	Assumed present within the Thames River, not present in the On-site Study Area	For information please contact your local MNR office, DFO, and Lakes and Rivers
Northern Brook Lamprey (Ichthyomyzon fossor)	**Historically Known to Occur**	*N/A*	generally inhabits small rivers and clear streams of varying sizes. Adults spawn in gravelly riffles.	Active Year Round	Assumed present within the Thames River, not present in the On-site Study Area	For information please contact your local MNR office, DFO, and Lakes and Rivers
Redside Dace *(Clinostomus elongatus)*	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradien	Spawning occurs in May	Assumed present within the Thames River, not present in the On-site Study Area	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Silver Shiner *(Notropis photogenis)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients	Spawning occurs in May and June	Assumed present within the Thames River, not present in the On-site Study Area	For information please contact your local MNR office, DFO, and Lakes and Rivers

INSECTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	*N/A*	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Migrate South for the Winter Usually in Late September and October	Potentially	• Watch for adults along roadsides and in open fields • Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.
West Virginia White (Pieris virginiensis)	**Known to Occur**	*N/A*	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	No	• Watch for adults within moist, deciduous woodlands • Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.

MAMMALS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Little Brown Myotis (Myotis lucifugus)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0; Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Hibernates in caves and mines during winter	No	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Northern Myotis (Myotis septentrionalis)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0; Maternal Roosts: Often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Hibernates in caves and mines during winter	No	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol

MOLLUSCS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Rainbow Mussel *(Villosa iris)*	**Known to Occur**	*Species and General Habitat Protection*	most abundant in shallow, well- oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel, sand and occasionally mud	Active Year Round	Assumed present within the Thames River, not present in the On-site Study Area	Please reference: Mackie, G, T.J Morris, and D Ming. **"Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA).**" Fisheries and Oceans Canada. (2008): Print.
Wavy-rayed lampmussel *(Lampsilis fasciola)*	**Known to Occur**	*Species and General Habitat Protection*	generally inhabit clear rivers and streams of a variety of sizes, where the water flow is steady and the substrate is stable	Active Year Round	Assumed present within the Thames River, not present in the On-site Study Area	Please reference: Mackie, G, T.J Morris, and D Ming. **"Protocol for the Detection and Relocation of Freshwater Mussel Species at Risk in Ontario Great Lakes Area (OGLA).**" Fisheries and Oceans Canada. (2008): Print.

MOSSES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey

PLANTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
American Ginseng *(Panax quinquefolius)*	**Suspected to Occur**	*Species and General Habitat Protection*	grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Flowering begins in June and continues until August; The fruit develop from July to August and ripen in August and September	No	• Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters • Use a plant field guide to distinguish from similar species
Butternut *(Juglans cinerea)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Yes	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut and yearlings Look for distinctive fruit on the ground

REPTILES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Suspected to Occur**	*N/A*	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)	Assumed present adjacent to the Thames River, not present in the On-site Study Area	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Milksnake *(Lampropeltis triangulum)*	**Known to Occur**	*N/A*	generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Active at dawn and dusk in the spring and fall, and at night in the summer. Hibernate: Late October to Early May	Yes	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Northern Map Turtle *(Graptemys geographica)*	**Suspected to Occur**	*N/A*	generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Active: At night Hibernate: October - April Hatching: Late August - Early September	Assumed present within the Thames River, not present in the On-site Study Area	• scan shoreline in spring and partially submerged logs/rocks in summer for basking turtles • Be aware that map turtles do not allow as close of approach as other turtles before leaving a basking site • Snorkel in desired aquatic habitat! • Nesting season: search suitable habitat for nests
Snapping Turtle *(Chelydra serpentina)*	**Known to Occur**	*N/A*	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	Assumed present within the Thames River and larger water bodies on St. Marys Cement property, not present in the On-site Study Area	• Scan offshore rocks and logs for basking turtles (10am-2pm) • Snorkel in desired aquatic habitat! • Nesting Season: Search known or preferred nesting habitat areas for females
Spiny Softshell *(Apalone spinifera)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers	Lay eggs in June or July Hibernate over winter	Assumed present within the Thames River, not present in the On-site Study Area	• Best time to survey is during nesting season when females are active laying eggs • Visual searches should be conducted in appropriate habitat

Jump to: **List of Municipalities**

ST. MARY'S

Jump to: List of Municipalities

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

BIRDS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	Habitat Present within On-Site Study Area (Column Added by Burnside)	How to Conduct a Proper Survey
Barn Swallow (Hirundo rustica)	**Known to Occur**	*Species and General Habitat Protection*	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Migrate South before Winter	Potential foraging but no barns or structures present for nesting	Follow Breeding Bird Survey Protocol
Bobolink (*Dolichonyx oryzivorus*)	**Suspected to Occur**	*Species and General Habitat Protection*	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Migrate South for the Winter	Potentially	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Canada Warbler (*Cardellina canadensis* ; formerly *Wilsonia canadensis*)	**Suspected to Occur**	*N/A*	Generally prefers wet coniferous, decediuous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Migrate South for the Winter Arrive in Ontario Early May	No	Follow Breeding Bird Survey Protocol
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	*Species and General Habitat Protection*	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Nesting - Late April to Mid- May Migrate South in September or Early October	No	Consult: Chimney Swift Monitoring Protocol. Bird Studies Canada, March 2009
Common Nighthawk (*Chordeiles minor*)	**Suspected to Occur**	*N/A*	generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Migrate South for the Winter	No	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	*Species and General Habitat Protection*	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Migrate South for the Winter	Potentially	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Red-Headed Woodpecker *(Melanerpes erythrocephalus)*	**Suspected to Occur**	*N/A*	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Active from May to September	Potentially	Follow Breeding Bird Survey Protocol

FISH		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey

INSECTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	*N/A*	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Migrate South for the Winter Usually in Late September and October	Potentially	• Watch for adults along roadsides and in open fields • Caterpillars feed on milkweeds: Common milkweed grows in open disturbed habitats (fields, roadsides, etc) and swamp milkweed grows in wet habitats (along streams, lakes, marshes) • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.
West Virginia White (Pieris virginiensis)	**Known to Occur**	*N/A*	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Adult butterfly emerges from pupa in late March; flies only in April and May	No	• Watch for adults within moist, deciduous woodlands • Caterpillars feed on the two-leaved toothwort: Toothwort grows in damp, open, rich hardwood woodlands and blooms from April to June. • Adults can be spotted from a distance; caterpillars must be looked for carefully on the host plant.

MAMMALS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey

MOLLUSCS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey

MOSSES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey

PLANTS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Butternut *(Juglans cinerea)*	**Suspected to Occur**	*Species and General Habitat Protection*	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Flowers from April to June. Fruits reach maturity during the month of September or October	Yes	Walk slowly and systematically in grid fashion through suitable habitat pausing every 30 meters for a detailed scan of trees within sight. Areas with dense foliage or many saplings will require a more intensive survey to detect sapling butternut and yearlings Look for distinctive fruit on the ground

REPTILES		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events		How to Conduct a Proper Survey
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Suspected to Occur**	*N/A*	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Hibernate: October - April Mating: Early Spring Hatching: Early Fall (September)	Assumed present adjacent to the Thames River, not present in the On-site Study Area	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Milksnake *(Lampropeltis triangulum)*	**Suspected to Occur**	*N/A*	generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Active at dawn and dusk in the spring and fall, and at night in the summer. Hibernate: Late October to Early May	Potentially	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Northern Map Turtle *(Graptemys geographica)*	**Known to Occur**	*N/A*	generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	Active: At night Hibernate: October - April Hatching: Late August - Early September	Assumed present within the Thames River, not present in the On-site Study Area	• scan shoreline in spring and partially submerged logs/rocks in summer for basking turtles • Be aware that map turtles do not allow as close of approach as other turtles before leaving a basking site • Snorkel in desired aquatic habitat! • Nesting season: search suitable habitat for nests
Snapping Turtle *(Chelydra serpentina)*	**Known to Occur**	*N/A*	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Nesting: Late May and June Hibernate: October - April	Assumed present within the Thames River and larger water bodies on St. Marys Cement property, not present in the On-site Study Area	• Scan offshore rocks and logs for basking turtles (10am-2pm) • Snorkel in desired aquatic habitat! • Nesting Season: Search known or preferred nesting habitat areas for females
Spiny Softshell *(Apalone spinifera)*	**Historically Known to Occur**	*Species and General Habitat Protection*	generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers	Lay eggs in June or July Hibernate over winter	Assumed present within the Thames River, not present in the On-site Study Area	• Best time to survey is during nesting season when females are active laying eggs • Visual searches should be conducted in appropriate habitat

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Appendix C

Survey Protocols

Eastern Meadowlark/Bobolink Survey Protocol

Bobolink Survey Methodology

Conditions: Surveys need to be done under field conditions with no rain, no or low wind speed and good visibility. In the course of the surveys if a nest or probable nest is encountered, the surveyor is advised not to disturb it or search an area for nests. Surveys rely on observations of birds while walking along transects through the fields.

Qualifications: Observers should be familiar with Bobolink identification by sight and sound. This includes being able to separate males from females and knowledge of Bobolink behaviour during breeding to allow it to be categorized (e.g. singing, carrying food or nesting material, foraging, territorial displays).

Pre-Survey: Set up parallel transects crossing the fields lengthwise at approximately 250 m intervals and locate point counts along the transects at 250 m intervals. Point counts should be located to give a good view of the surrounding fields. Create GPS locations for each point count. Materials needed for the survey include binoculars, notebook, GPS, compass, watch and camera.

Survey: Surveys should start 30 minutes after dawn and continue until no later than 9 am. The observer will walk the transect stopping at each point count. Undertake ten minutes of observations and listening at each point count. Record information on all Bobolink observed or heard, their sex, direction, distance, behaviour and interactions with other Bobolink or other species. On transit between point counts, record any Bobolink observed or heard if not also seen on the point counts.

Repeat visits: Complete at least three sets of point count surveys. These should take place in June or the first week of July with each survey separated by a week or more from previous surveys.

Habitat: Make notes on the general conditions of the fields at the locations where Bobolink are noted. These would include broad habitat descriptors (e.g. field, hedgerow, fence line), estimated height of the vegetation, general vegetation type (including predominate species if known), estimated percentage of grass versus broad-leaved plants, and presence of litter (i.e. thatch). It is best if the surveyor evaluates the locations from the transect or close to the transect rather than walking directly into the area where the Bobolink were found. Photos should be taken.

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Appendix D

Survey Protocols

Milksnake Survey Protocol

Milksnake Survey Protocol- MNR Guelph District

(current June 2013; Protocol may change over time if new information becomes available)

Milksnake habitat should be identified using a two-step process:

- Prior to site visits, identify potential habitat using aerial photographs, orthophotos or other available land cover information (such as Ecological Land Classification maps).
- A site visit should be carried out to assess potential habitat identified in step 1 and to confirm the presence of suitable habitat. If detailed maps or other habitat information is not available for a site, the entire site should be thoroughly searched to identify suitable habitat.

Milksnake seek refuge from the elements under various shelters such as rocks, logs, and other objects that can provide cover. Actively searching for the species by looking under and turning over potential cover objects by hand is the most effective method of confirming the presences of this species within suitable habitat. This species is rarely encountered moving around or basking, so visual encounter surveys (walking transects and watching for snakes moving around or basking) are not effective.

An active hand search can be supplemented by a cover board survey, whereby artificial cover (1m x1m wooden boards) is installed within the study area in the hopes of attracting Milksnake seeking shelter. Cover boards should be placed along farm field edges, manure piles, compost piles, near rock piles, woody debris piles, old foundations, and natural or artificial fractures in bedrock or karst features.

N.B.
Milksnakes will typically not be detected under boards until after the boards have been in place for 2-3 years. Negative results from cover board surveys are therefore inconclusive for the first two years of the survey.

1. Survey Technique:

Active Hand Search

Set up walking transects of the appropriate length and spacing so as to comprehensively cover suitable habitat within the study area. Record the location of each transect on a map. Conduct the surveys during the appropriate period and weather conditions (see below), and record the dates, times and weather conditions for each survey. Walk the line transects for the predetermined distance, thoroughly searching by hand all types of cover found within the specified width of each transect. Flip cover objects over towards you. Always replace the cover object carefully to the way it was found, to minimize disturbance of the microhabitat under it. All potential cover sites must be checked.
Record locations (UTM coordinates) of snake observations and photograph individual animals if possible. Also photograph dead specimens.

N.B. Do not flip the same cover objects repeatedly (e.g. every day), to minimize disturbance to the site and the snakes. It is recommended that a cover object remain undisturbed for a minimum of at least two weeks between examinations.

2. Survey Period:

Milksnake cannot be detected during the winter season, as they hibernate underground during this period. Surveys should take place between late April and late June. Detectability is greatly reduced in late summer and autumn.

In Guelph District, surveys should occur no earlier than April 1st and no later than October 15th, though these dates are subject to change depending on seasonal weather patterns in a given year.

3. Survey Conditions:

Searches should occur on sunny days when air temperature is between 8ºC and 25ºC, or if overcast, when temperature is above 15ºC.

Surveys should not be conducted on rainy days.

4. Search Effort Required to Determine Probable Absence:

A minimum of three surveys at least two weeks apart and spread over the targeted survey period is recommended. For the purposes of this section, one survey is the amount of effort required to thoroughly search all suitable habitat. If the site is large, several site visits or trips may be required to adequately cover the entire area and complete one survey.
It is not appropriate to draw conclusions about the absence of the species from a site if surveys occur outside of the specified survey period outlined above.

5. Required Authorizations and Approvals:

- Authorization under the *Fish and Wildlife Conservation Act*: not required for active hand search, but **required for a cover board survey**
- Authorization under the *Endangered Species Act, 2007*: not required
- Approval of an Animal Care Protocol: not required

BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix E

Geomorphological Assessment Methodology

Fee Proposal

PARISH geomorphic

TO:	Paul MacIntyre, Burnside	**DATE:**	March 20, 2014
FROM:	John Parish P.Geo	**REF:**	Proposal No. 0114054
SUBJECT:	St Marys Landfill Expansion EA (Geomorphology Component)		

Overview

We are pleased to provide this scope of work and fee estimate to undertake the evaluation of the Thames River tributary. It is understood that the proposed landfill expansion would conflict with the existing alignment of the channel. Thus, the assessment and characterization of the channel is required. The results would help inform the EA with respect to channel sensitivity and feasibility of realignment.

Work Plan

Background Review

From a geomorphic perspective, the background review would focus on any existing information that is available pertaining to the tributary in study area and local receiving area of the Thames River. This would include, but not limited to: detailed topographic mapping, floodline mapping, historic mapping including any archival and anecdotal mapping, aerial imagery including current ortho-rectified data and historic coverage, soils and geology information, flows (hydrology and hydraulics) fish habitat data, climate data and any geo-technical/hydrogeological information. Ideally, the spatial information would be in a digital format to enable efficient assessment using ArcGIS. In addition, any previous reports such as road crossings, EA reports and past development plans would be beneficial to review. The purpose is to assemble as much information as possible to avoid any redundancies in data collection and to identify data gaps that should be addressed. In addition, insight from this work would provide the context for subsequent levels of the geomorphological investigation.

Desktop Analyses/Channel Migration

Using the spatial information, channel reaches will be delineated and/or confirmed, if previous delineation has been completed. In addition, a variety of planimetric watershed metrics would be completed in order to provide some initial insight on basin function, such as the source and delivery of sediment. Using the aerial photography, both channel migration and 100-year erosion rate will be confirmed. The desktop exercise would also provide an indication of the sensitivity of the creek as well as measure of the local dynamics. This is helpful when interpreting field conditions and guiding any restoration measures.

Field Reconnaissance

To confirm and refine results of the desktop analyses, rapid field assessments and field reconnaissance will be conducted to identify and determine the physical sensitivity of the site and the dominant geomorphic forces impacting the channel. The rapid assessments will follow modified RGA and RSAT methods, which provide insight on channel stability and overall channel health and function.

Detailed Field Data Collection

In order to better quantify channel dynamics, a detailed field assessment of selected reaches is required. The field work will follow standard field protocols and will include bankfull cross-sections, a profile survey, characterization of the bed and banks, and documentation of any other features that may be affecting flow and sediment movement. The data will be of sufficient detail to enable subsequent analyses of channel processes. It is important to note that the field work would be strategically placed in order to quantify instream processes at sensitive erosion sites, such that boundary conditions and the forces acting upon them can be thoroughly assessed.

Analysis of Geomorphic Processes

At this point the collected data will be summarized, analyzed and interpreted with respect to channel process and function. This would typically include an analysis of geomorphic relations such as existing bankfull channel dimensions, bed morphology and energy gradient. These parameters would then be used to determine geomorphic thresholds for sediment transport. The calculation of geomorphic parameters will be used to determine the appropriate dimensions and substrate gradation for the proposed designs. Results from the geomorphological analyses will be used to identify a channel restoration design that promotes long-term stability and channel function.

Functional Detail Design

Once all of the data has been analyzed, the results will be interpreted using findings from all stages of the study. Ultimately, the stability of the tributary and any constraints/factors to realignment will be identified. In essence, this means that we would have a good understanding of how the tributary currently functions. This understanding includes hydrology, aquatic, terrestrial and sediment transport which, in turn, is responsible for the existing shape and form of the channel. With this understanding gained, effort is then directed towards restoration. The functional design will incorporate both the field data and background information into the proposed channel design details. The expected outcome of the design is a dynamically stable tributary that will complement the existing natural elements while providing improved channel functions.

Reporting and Meetings

This work will be summarized into reports as required. We would also participate in meetings as directed with the agencies to assist in the review process. For budget purposes, we have assumed a total of 3 meetings, which would include team meetings and regulatory agencies.

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