Appendix H

Natural Environment Assessment Report

Port Fuels & Materials Services, Inc

Hamilton Energy-From-Waste Project

Natural Environment Assessment Report

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December 2014
Ref. No. 084692 (3)

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Section 1.0 Introduction

This Natural Environment Report has been prepared by Conestoga-Rovers & Associates (CRA) on behalf of Leveraged Green Energy LP (LGE), for Port Fuels & Materials Services Inc. (PFMSI), a subsidiary of LGE. PFMSI is proposing to design, construct, and operate a facility that will utilize a combination of Gasplasma® and gasification and conventional Direct Plasma to process waste materials that would otherwise be landfilled or disposed of using conventional disposal technologies. The proposed Energy-From-Waste (EFW) facility will, in addition to providing full recovery of recyclable materials, will produce energy with the Gasplasma® process to support its own energy requirements, with excess energy supplied for sale to the local distribution grid or for internal use within Hamilton Port Authority (HPA). The EFW facility will also provide enhanced metals/minerals recovery and provide treatment of inorganic waste, such as contaminated soils and/or low-calorific value waste by utilizing the integrated Direct Plasma system. The EFW facility will receive and process up to 170,000 tonnes per year of non-hazardous waste using the Gasplasma® process and 30,000 tonnes per year using the direct plasma process.

The Gasplasma® process is an advanced thermal conversion technology developed to treat wastes and convert them into synthetic gas (syngas) and electrical energy. The core technology is the conversion of waste materials to a clean syngas that can be used directly for production of heat, for the generation of electricity, or to substitute for natural gas. The Gasplasma® process is an energy efficient process, minimizing energy inputs through innovative process design, and capturing excess energy for re-utilization. Gasplasma® technology has the capability to process a wide variety of waste streams, and for the purposes of this undertaking, the EFW facility would receive a mix of industrial, commercial, and institutional (ICI) waste, construction and demolition waste (C&D), biomass, biosolids, non-recyclable tire residue, municipal solid waste (MSW), and other non-hazardous waste streams.

The Direct Plasma process is essentially similar technology to the Gasplasma® system but uses the second component of the process (i.e., plasma), and will be used for metal recovery and disposal of inorganic materials.

This report documents the following as it relates to the Natural environment:

- Baseline/existing conditions (i.e., what exists in absence of the proposed project)
- Potential effects on the environment, mitigation measures and net effects
- Future monitoring requirements to be implemented

The Study Areas (Figure 1) reviewed for the Natural Environment assessment was as follows:

- **On-Site** – the site itself, which is the 17 acre parcel of leased land on Pier 15 in the Port of Hamilton.
- **Site-Vicinity** – the lands in the vicinity of the site extending approximately 500 m in all directions

Section 2.0 Screening Process and Criteria Checklist

2.1 Screening Process

In March of 2007, the Ontario Government enacted Ontario Regulation (O. Reg.) 101/07, the Waste Management Projects Regulation, made under the *Ontario Environmental Assessment Act* (*EA Act*). The purpose of the regulation was to bring some types of private sector waste projects under the *EA Act* and to establish new environmental assessment requirements for waste projects consistent with the potential significance of such projects. O. Reg. 101/07 provides for three waste project environmental assessment processes:

1. Projects exempt from Part II of the *EA Act*. Such projects are generally of small scale and are known, through past experience, to have insignificant environmental effects.
2. Projects exempt from Part II of the *EA Act*, subject to the legal requirement of completion of the Environmental Screening Process. Such projects are of moderate scale and are considered to have predictable environment effects that can be readily reduced to acceptable levels through the application of mitigation measures.
3. Projects designated under the *EA Act* that must undergo an individual environmental assessment. Such projects tend to be complex and major in scale with potentially far-reaching environmental effects requiring significant levels of assessment and mitigation.

The proposed undertaking by PFMSI is a moderate scale project identified under O. Reg. 101/07 as one that is exempt from Part II of the *EA Act* subject to completion of the Environmental Screening Process. As such, PFMSI has chosen to assess the project under the available Environmental Screening Process.

This Natural Environment Assessment Report has been prepared in accordance with the requirements for a project which is being carried out under the Environmental Screening Process (O. Reg. 101/07 & Guide to Environmental Assessment Requirements for Waste

Management Projects). An Environmental Screening is an approvals process for projects that have predictable environmental effects that can be readily mitigated. This report will form an appendix to the overall Environmental Screening Report, which will be prepared and released for public and agency review.

2.2 Screening Criteria Checklist

At the beginning of the Environmental Screening, the Screening Criteria Checklist (provided as Schedule I, pp 62 – 64, to the "Guide to Environmental Assessment Requirements for Waste Management Projects") is to be completed based on the information provided in the Project Description. The Screening Criteria reflect the broad definition of "environment" contained in the *EA Act*.

As noted in the Guide:

"The Screening Criteria are presented in the form of a checklist with the option of a "Yes" or "No" response. Mitigation measures **are not** to be considered in concluding whether there is "No" potential environmental effect. That is, the proponent is required to answer "Yes" even if the proponent believes that a potential environmental effect could likely be mitigated. The reason for requiring a "Yes" is to ensure that mitigation measures are open to discussion and review. Another reason for this approach is that further discussion and review of a potential effect may reveal that there is no actual effect, in which case no mitigation is required. Where a "yes' has been identified, the proponent is to provide additional information in the Environmental Screening Report, explaining the potential effect(s), methods to mitigate or address the effect(s), any net effects that are anticipated and if so, their significance. Even where the proponent indicates that no environmental effects are anticipated, it is recommended that additional information is provided in the Environmental Screening Report in order to support the "no effects" conclusion".

Each criterion is based on a question which is prefaced with the phrase, "***Might the Project…***" The table below was completed as the first step of the Environmental Screening Process and is a summary of the criterion for the Natural Environment discipline:

Table 2.1 Natural Environment Screening Criteria Checklist

	Natural Environment Criterion	YES	NO	Additional Information
Might the project …				
4.1	Cause negative effects on rare (vulnerable), threatened or endangered species of flora or		X*	No rare (vulnerable), threatened or endangered species of flora or fauna or their habitat are

Table 2.1	Natural Environment Screening Criteria Checklist			
	Natural Environment Criterion	**YES**	**NO**	**Additional Information**
Might the project …				
	fauna or their habitat?			expected to be within the Study Area. The Natural Environment Study will confirm this.
4.2	Cause negative effects on protected natural areas such as, ANSIs, ESAs or other significant natural areas?		X	No protected natural areas such as, ANSIs, ESAs or other significant natural areas within the Study Area.
4.3	Cause negative effects on designated wetlands?		X	No construction is proposed within or near provincially or non-provincially significant wetlands.
4.4	Cause negative effects on wildlife habitat, populations, corridors or movement?		X	No habitat within the vicinity of the Study Area with respect to wildlife populations, corridors or movement. The Natural Environment Study will confirm this.
4.5	Cause negative effects on fish or their habitat, spawning, movement or environmental conditions (e.g., water temperature, turbidity, etc.)?		X	While the site is located within proximity to Hamilton Harbour, we do not anticipate a negative effect occurring to fish and fish habitat within the harbor. Surface water will be managed according to appropriate regulations from a quality perspective.
4.6	Cause negative effects on locally important or valued ecosystems or vegetation?		X	No locally important or valued ecosystems or vegetation exist within the Study Area.
4.7	Increase bird hazards within the area that could impact surrounding land uses (e.g., airports)?		X	No airports within 15 km of the Site. All waste materials will be enclosed within Facility buildings. No outdoor storage.

* Following the Natural Environment Study it was determined that mitigation measures would be required in order to prevent negative effects on rare (vulnerable), threatened or endangered species of flora or fauna or their habitat and, therefore, that this criteria should be changed to a "yes".

Given that all of the screening criteria questions were answered as a "no" response, Section 4.0 of this report will provide a rationale as backup.

Section 3.0 Existing Conditions

The following subsections describe the existing conditions that are found within the On-Site and Site Vicinity of the proposed project.

3.1 Methodology

3.1.2 Available Secondary Source Information Collection and Review

Available secondary sources of information were collected and reviewed by the Natural Environment Study Team to determine existing Natural Environment conditions within the Study Areas. The following sources of secondary information were collected and reviewed.

Table 3.1 Secondary Source Information Reviewed

Source	Information Reviewed
Ministry of Natural Resources (MNR)	• Species at Risk • Natural Heritage Features data layers from Land Information Ontario
Fisheries and Oceans Canada (DFO)	• Species at Risk Fish and Mussel Maps
Hamilton Conservation Authority (HCA)	• Terrestrial and Aquatic Environment Records
Comprehensive Study Report – Randle Reef Sediment Remediation Project (RRTG, 2012)	• Aquatic Environment • Terrestrial Environment • Species at Risk
Urban Hamilton Official Plan (2013, amended March 2014)	• Schedule B – Natural Heritage System • Schedule B-1 – Life Science ANSI • Schedule B-2 – Significant Woodlands • Schedule B-3 – Alvar and Tallgrass Prairie • Schedule B-4 – Wetlands • Schedule B-5 – Lakes and Littoral Zone • Schedule B-6 – Environmentally Significant Areas • Schedule B-8 – Streams
Hamilton Port Authority Official Land Use Plan (HPA, 2002)	• Pier 15 • Randle Reef • Sherman Inlet

3.1.3 Site Visit and Process Undertaken

CRA obtained secondary source information from the agencies and sources identified in Table 3.1 to ascertain whether any features of conservation concern are located within the Study Areas. Features searched for included Provincially Significant Wetlands (PSW), Areas of Natural or Scientific Interest (ANSI), Significant Ecological Areas (SEA), Species at Risk (SAR), and local natural heritage features. The information was used to guide the Site investigation and assessment.

CRA staff conducted a site investigation on June 25, 2014 to identify aquatic and terrestrial habitat and features present within the Study Areas. A list of all observed plants was prepared, and used to classify all plant communities within the Study Areas under Ecological Land Classification nomenclature (Lee et al., 1998; updated with 2nd approximation classifications). Incidental wildlife observations were also collected. It is acknowledged that these are not comprehensive lists of flora and fauna for the site as they were compiled based on the observations from a single day and no species-specific searches were conducted.

Site inspection access was limited to the Site and public roadways. Aerial photos were used to interpret vegetation polygons in the absence of direct access.

3.2 Description of Existing Conditions

3.2.1 General Site Conditions

The Site (**Figure 1**) is located within the Pier 15 industrial development along the Port of Hamilton. Surrounding land use includes a combination of employment lands and heavy industry. The Site is divided roughly in half by an active rail line that transverses the Site in an east west direction. The only existing building on the property, a multi-storey vacant industrial facility, occupies much of the southern half of the Site. The balance of Site land use includes a combination of former outdoor gravel storage areas, paved access roads, and remnant concrete slabs from former industrial buildings. Limited storage of tractor trailers was observed at the time of the site investigation.

3.2.2 Aquatic Environment

There are no aquatic features within the on-Site Study Area. The aquatic features within the Site vicinity Study Area are Hamilton Harbour (approximately 210 metres (m) west) and Sherman Inlet (approximately 220 m southwest). According the Urban Hamilton Official Plan (OP), the entirety of Hamilton Harbour is deemed a *Core Area* of the Natural Heritage

System. This is attributed to the classification of Hamilton Harbour and Sherman Inlet as *Key Hydrologic Features (Lakes and Littoral Zones)*.

In 1985, Hamilton Harbour was identified as an Area of Concern under the Canada-United States Great Lakes Water Quality Agreement (EC, 2013). The section of Hamilton Harbour that borders Pier 15 is known as Randle Reef. Biological indications that Randle Reef is a stressed and degraded habitat include little to no aquatic vegetation present; a low diversity benthic macroinvertebrate community dominated by pollution-tolerant organisms; and smaller and short-lived fish species indicating communities exhibiting effects of habitat stress (RRTG, 2012). Sediment toxicity testing within Randle Reef as part of the RRTG 2012 Comprehensive Study Report indicated the sediments were toxic or severely toxic.

One DFO fisheries monitoring station (H47) is situated within Randle Reef. Fish community records from Station H47 provided by Hamilton Conservation Authority (HCA) are summarized in Table 3.2.

Table 3.2 Station H47 Fish Records – 1984 and 1985

Species		***1984***	***1985***
Alosa pseudoharengus	Alewife	X	X
Ameiurus nebulosus	Brown bullhead	NR	X[1]
Anguilla rostrata	American eel	X[1]	NR
Carassisus auratus	Goldfish	X[1]	NR
Dorosoma cepedianum	Gizzard shad	NR	X
Lepomis gibbosus	Pumpkinseed	X[1]	X[1]
Morone americana	White perch	NR	X
Morone chrysops	White bass	NR	X
Notropis hudsonius	Spottail shiner	NR	X
Osmerus mordax	Rainbow smelt	X	X
Perca flavenscens	Yellow perch	X[1]	NR
Pomoxis nigromaculatus	Black crappie	NR	X[1]

Notes:
No information is available regarding methods of collection or effort
X[1] – Only one individual recorded
NR – No record

3.2.2.1 Restoration of Randle Reef

Randle Reef is considered to be one of the more complex and highly contaminated sediment sites throughout the Canadian Areas of Concern in the Great Lakes. Randle Reef sediments contain polycyclic aromatic hydrocarbons (PAHs) in very high concentrations in coal tar

(RRTG, 2012). While many improvements have been made to reduce pollution in Hamilton Harbour, the problem of contaminated sediments remains (EC, 2013).

The proposed clean-up of Randle Reef involves constructing an engineered containment facility on top of a portion of the most contaminated sediment, then dredging and placing most of the remaining contaminated sediment in the facility. In total, this project will address 675,000 cubic metres of sediment contaminated with coal tar (polycyclic aromatic hydrocarbons) and heavy metals (EC, 2013). The construction and dredging required for project completion is expected to take approximately 8 years, with the completion in 2022 (RRTG, 2012). While these are proposed activities and not reflective of existing conditions at the time this report is prepared, it is worth acknowledging that an extensive operation to improve the aquatic habitat within the Site vicinity may be initiated in the near future.

3.2.3 Terrestrial Environment

The terrestrial environment of the Study Areas was assessed and classified using both secondary source resources (aerial photography, natural features records), and direct Site observations based on a Site visit conducted by CRA on June 25, 2014. A summary list of Study Area vegetation is provided in Table 3.3. Although this does not represent an exhaustive vegetation inventory and is based on a single site visit, it is representative of the vegetation communities present within the Study Areas.

Vegetation units and associated classification is provided on Figure 2. Site Study Area ELC units include:

- CVC_2 – Light Industry
- CWOD – Cultural Woodland*
- CVC – M3 – Cultural Mixed Meadow*

(* classifications created to reflect Site conditions; not ELC units)

The ELC system is focused on describing natural systems, therefore not all anthropogenically-influenced vegetation communities are well represented by ELC. As such, CWOD and CVC-M3 are new units which have been created to best classify the function of these areas using the framework of ELC. Each of these Site Study Area units is described briefly in the following paragraphs.

CVC_2 – Light Industry

The majority of the Site lands are occupied by existing structures, concrete pads of former buildings, asphalt and/or compacted gravel access roads, and rail lines, and therefore classified as light industry.

CWOD – Cultural Woodland*

A small portion in the southwest corner of the Site is classified as CWOD as it is a highly disturbed area supporting successional vegetation such as balsam poplar (*Populus balsamifera*), Russian olive (*Elaeagnus angustifolia*), staghorn sumac (*Rhus typhina*), and goldenrod (*Solidago* sp.).

CVC – M3 – Cultural Mixed Meadow*

The entire Site footprint has been used to support industry at one point or another. As the Site has been less-used and/or vacant in recent years, succession of some opportunistic and hardy vegetation has occurred in some areas across the Site. These include former outdoor storage areas, parking areas, and building footprints. Vegetation in these areas is growing in soil conditions that are combinations of hard pack gravel, Site debris, deteriorating asphalt, deteriorating concrete slabs. Despite the poor soil conditions, these areas represent the naturalized areas of the Site. These CVC-M3 units are dominated by opportunistic vegetation common to disturbed upland, which includes white sweet clover (*Melilotus albus*), chicory (*Cichorium intybus*), goldenrod (*Solidago* sp.), vipers bugloss (*Echium vulgare*), grass species, and common milkweed (*Asclepias syriaca*), many of which are non-native plants. Trees within this unit total less than 10 percent cover, and are limited to tree of heaven (*Ailanthus altissima*) and manitoba maple (*Acer negundo*).

There are a total of eight additional ELC units represented within the Site Vicinity Study Area. These include:

- CGL_2 – Constructed Parkland
- CVC_3 – Heavy Industry
- TAGM2 – Mixed Treed Plantation
- MEMM3 – Mixed Meadow Ecosite
- FOMM8-1 – Fresh – Moist Poplar Mixed Forest Type
- FODM4 – Dry – Fresh Upland Deciduous Forest
- FODM7 – Fresh – Moist Lowland Deciduous Forest
- OAW – Open Water Area

As within the Site Study Area, the majority of the Site Vicinity Study Area is classified as industrial, either light (CVC_2) or heavy (CVC_3). While there are limited landscaped areas on-Site, there are numerous landscaped areas within the Site-vicinity Study Area. Based on the small size of these landscape features, they represent inclusions in the constructed light and heavy industry lands. However, as vegetation is limited within this industrial area, they are important to identify within the Study Areas and are clearly identified on Figure 2.

The naturalized ELC units unique within the Study Areas are found in proximity to Hamilton Harbour and Sherman's Inlet. These four units are:

- MEMM3 – Mixed Meadow Ecosite
- FOMM8-1 – Fresh – Moist Poplar Mixed Forest Type
- FODM4 – Dry – Fresh Upland Deciduous Forest
- FODM7 – Fresh – Moist Lowland Deciduous Forest

MEMM3 – Mixed Meadow Ecosite

Examples of this ecosite are located adjacent to the riparian vegetation of Sherman's Inlet, southwest of the Site. This vegetation community includes herbaceous species such as goldenrod, daisy fleabane (*Erigeron hyssopifolius*), pigweed (*Chenopodium album*), nodding thistle (*Carduus nutans sp. nutans*), Canada thistle (*Cirsium arvense*), and teasel (*Dipsacus fullonum*). Woody vegetation is limited and includes staghorn sumac, tree of heaven, European buckthorn (*Rhamnus cathartica*), and rose (*Rosa* sp.).

FOMM8-1 – Fresh – Moist Poplar Mixed Forest Type

This narrow unit is present along the waterfront at the south end of Pier 15. Trembling aspen (*P. tremulodies*) are the dominant tree species, co-occurring with a few specimens of silver maple (*A. saccharinum*), Manitoba maple, and wych elm (*Ulmus glabra*).

FODM4 – Dry – Fresh Upland Deciduous Forest

This upland forested area is situated as a transition from the riparian vegetation of Sherman's Inlet to the adjacent mixed meadow to light industry and road infrastructure. It is comprised of various tree species including Manitoba maple, littleleaf linden (*Tilia cordata*), white mulberry (*Morus alba*), and Siberian elm (*U. pumila*). These appear to be mid-age specimens, with those closest to Industrial Road having been planted as landscape features, as evidenced by the distinct linear alignment of the littleleaf lindens and white mulberry. Understory vegetation is a

combination of stunted herbaceous vegetation of the adjacent meadow unit (MEMM3) and canopy tree saplings.

FODM7 – Fresh – Moist Lowland Deciduous Forest

This is the most naturalized of the vegetation communities within the Study Areas. It is situated on lands that have progressively been infilled along Sherman's Inlet over the course of the last century. The tree canopy is dominated by Manitoba maple, tree of heaven, silver maple, and willow (*Salix* sp.). Other vegetation includes European buckthorn, white mulberry, Austrian pine (*Pinus nigra*), and riverbank grape (*Vitis riparia*). The tree riparian vegetation provides aerial coverage of the perimeter of Sherman's Inlet, an open water inclusion within FODM7. A stand of cattails (*Typha* sp.) situated within the inlet is another inclusion within this unit.

Based on a review of the Hamilton Urban Official Plan, land use documents, and MNR natural heritage records, there are no wetlands, Areas of Natural and Scientific Interest (ANSI) or Significant Ecological Areas (SEA) are present within the 500 m Site vicinity Study Area (Figure 3). Within a regional scale of 5 km from the Site, there are Significant Woodlands (City of Hamilton, 2009), Key Hydrologic Features (Wetlands), and Environmentally Significant Areas present (Figure 4). None of these features are connected to any on-Site or Site vicinity natural features.

3.2.3.1 Wildlife

Incidental wildlife observations from the Study Areas are summarized in Table 3.4.

Table 3.4 Study Areas Wildlife Species

Species		***Global Rank***	***Provincial Rank***	***Area***		***Observation Type***
				Site	***Site-vicinity***	
Birds						
Spotted Sandpiper	*Actitis macularia*	G5	S5		X	Single
Red-winged Blackbird	*Agelaius phoeniceus*	G5	S4	X	X	Vocal
Mallard	*Anas platyrhynchos*	G5	S5		X	Single
Killdeer	*Charadrius vociferus*	G5	S5B,S5N	X	X	Territorial
Barn Swallow	*Hirundo rustica*	G5	S4B	X	X	Multiple, foraging
Ring-billed Gull	*Larus delawarensis*	G5	S5B,S4N	X	X	Multiple, flying
Black-crowned Night-Heron	*Nycticorax nycticorax*	G5	S3B,S3N		X	Multiple, roosting
European Starling	*Sturnus vulgaris*	G5	SNA	X	X	Multiple
Tree Swallow	*Tachycineta bicolor*	G5	S4B	X	X	Multiple, territorial
Mourning Dove	*Zenaida macroura*	G5	S5	X		Vocal

Table 3.4 Study Areas Wildlife Species

Species	*Global Rank*	*Provincial Rank*	*Area*		*Observation Type*
			Site	*Site-vicinity*	
Birds					

Notes:
S3 Vulnerable; due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation
S4 Common in Ontario; apparently secure with over 80 occurrences in the province
S5 Demonstrably secure; species is widespread in Ontario
SNA Not applicable; the species is not a suitable target for conservation activities
Rank qualifiers (e.g. S1B,S2N) are used for some migratory or transitory species to indicate different conservation status at specific times of the year, such as during the breeding (B) and non-breeding (N) seasons
G5 Secure—Common; widespread and abundant

Birds observed on-Site are all common breeding birds in Ontario, generally associated with urban environments. The additional bird species observed in the Site-vicinity Study Area were all observed along Sherman Inlet in units FODM7 or MEMM3, and are reflective of the proximity to aquatic habitat.

3.2.4 Species at Risk

There are no identified mussel Species at Risk (SAR) in the area. The harbour shoreline in the vicinity of Randle Reef is identified as habitat for American eel and redside dace, two fish species currently under consideration for protection under the federal Species at Risk Act (SARA). Both of these species are protected under the provincial Endangered Species Act (SARO) as endangered species.

None of the terrestrial flora observed in the Study Areas are currently protected either under SARA (GC, 2012) or SARO (MNR, 2014). Only one observed bird species, barn swallow (*Hirundo rustica*) is protected under SARO as a threatened species and also listed by COSEWIC as threatened federally; the remaining observed wildlife species are not currently protected under either SARA or SARO. While not protected by SAR regulation, black-crowned night heron (a species observed along Sherman Inlet), is considered vulnerable provincially (S-rank S3) for both breeding and non-breeding populations.

A summary of NHIC Rare Occurrences is provided in Figure 5. Based on correspondence with the MNR, HCA, and review of Natural Heritage Information Centre (NHIC) information, a number of SAR are known to be or have the potential to be present within the vicinity of the Site. A complete listing of potential terrestrial SAR in the Site vicinity, including potential for Site presence, is provided in Table 3.5. A summary of SAR with potential Site presence is provided in Table 3.6.

Table 3.6 Summary of Species at Risk (SAR) with Potential for Site Presence		
Species		***Potential to be on Site***
Milksnake	*Lamprpeltis triangulum*	Low - no connectivity to larger natural features; poor on Site nesting habitat
Snapping Turtle	*Chelydra serpentine*	Moderate - limited Site gravel areas for nesting
Barn Owl	*Tyto alba*	Moderate - potential roosting habitat in building
Barn Swallow	*Hirundo rustica*	High - observed flying and foraging on Site
Chimney Swift	*Chaetura pelagic*	High - would require existing chimneys to not be capped
Peregrine falcon	*Falco peregrines*	Low - Site buildings lack suitable ledges
Little Brown Myotis	*Myotis lucifugus*	Moderate - potential roosting habitat in building
Northern Myotis	*Myotis septentrionalis*	Low - prefer subterranian space
Monarch	*Danaus plexippus*	Moderate - sporadic milkweed is present
Brainerd's Hawthorn	*Crataegus brainerdii*	Low - hawthorn is only located in a younger area of Site
Northern Hawthorn	*Crataegus pruinosa var. dissona*	Low - hawthorn is only located in a younger area of Site

Subsequent to the work completed in June, 2014, further studies and observations were conducted by HPA to determine the potential for SAR to be present on-site (i.e. Barn Swallow and Chimney Swift within the vacant building). The work completed determined that there were no SAR utilizing the existing vacant building.

Section 4.0 Potential Effects, Mitigation Measures & Net Effects

A Project Description, which includes a Site Plan, was prepared so that potential environmental effects and mitigation measures could be identified. Figure 6 is provided as the Site Plan and the following is a general summary of the proposed undertaking:

- Total processing capacity of the Gasplasma® system will be 170,000 tonnes per year of incoming materials. The total processing capacity of the Direct Plasma system will be 30,000 tonnes per year.
- Accepted waste for the Gasplasma® system may consist of:
  - Industrial, Commercial and Institutional (IC&I[1]) waste
  - Construction and Demolition (C&D)
  - Refuse-Derived Fuels (RDF)

[1] It should be noted that IC&I is a source of waste originating from the IC&I sectors and is not a waste category. IC&I falls under the definition of Municipal Solid Waste (MSW) as per O. Reg 347, which states: "(a) Any waste, whether or not it is owned, controlled or managed by a municipality, except hazardous waste, liquid industrial waste or gaseous waste and solid fuel, whether or not it is waste, that is derived in whole or in part from the waste included in clause (a)."

  - Municipal Solid Waste (MSW)
  - Biomass (clean wood, leaf and yard waste, agricultural materials)
  - Biosolids (limited to 15% of total waste input)
  - Tires (limited to 20% of total waste input)
  - Liquid wastes streams
- Accepted waste for the Direct Plasma system may consist of:
  - Scrap metals with precious residues for recovery
  - Contaminated soils
- The primary areas and building structures at the site will include the following:
  - Roadways around the site for delivery of waste and reagents and for removal of product from the Site. The roadways will include provision for vehicle queuing.
  - Inbound and outbound weigh scales with scale house
  - Administrative support offices and employee and visitor parking
- Main processing areas for Gasplasma® system:
  - Building to house the waste reception, fuel preparation area and material recovery facility (MRF), and RDF storage areas
  - Building to house the fluidized bed gasifier (FBG) and plasma converter
  - Control room (part of main processing facility)
- Direct Plasma system facilities
- Ancillary facilities including:
  - Power transformation/ distribution
  - Plasma converter maintenance building
  - Plasmarok® cooling and storage area
  - Power island (gas engines)
  - Syngas cooling and cleaning system
  - Air Pollution Control (APC) system
  - Oxygen and nitrogen generation plant
  - Water and wastewater treatment facilities
  - Stormwater management system
  - Rail transport facilities
- Waste may be received up to 282 business days per year (6 days a week, excludes statutory holidays and planned facility shutdowns)

- The Gasplasma® system may receive up to 1,200 tonnes of waste per day, but is expected to receive, on average, 605 tonnes per regular business day
- The Direct Plasma system may receive up to 220 tonnes of waste per day, but is expected to receive, on average, 110 tonnes per regular business day
- Feedstock will come via truck, rail, or barge. Plasmarok® and any other by-products may be removed via truck, railcar, and barge.
- The Gasplasma® process is an advanced thermal conversion technology developed to treat waste streams and to convert them into synthetic gas (syngas) and a solid non-leachable commercial product. The Gasplasma® system is comprised of four distinct processes:
  - Fuel Preparation
    - Waste is sorted and separated to remove undesirable materials (such as inert materials), recover valuable recyclable material, and to reduce the size of the wastes to the appropriate design size where it can be efficiently processed within the gasification process
    - The final material passing through the MRF equipment is directed to a wet-RDF storage area to undergo steam drying prior to storage as dry-RDF
  - Syngas Production
    - Preprocessed waste (RDF) is fed into the FBG along with steam and oxygen to convert the materials into a crude syngas
    - The crude syngas is then passed into a separate plasma converter. The intense heat from the plasma arc and the ultraviolet light of the plasma cracks the hydrocarbons in the crude syngas to produce a clean syngas.
    - The inorganic by-products from the FBG and plasma converter are vitrified
  - Syngas Cleaning
    - The gas cooling system comprises a heat recovery boiler designed to reduce syngas temperatures from approximately 1,200^{o}C to 160°C and generate saturated steam. The steam generated is used in the Gasplasma® process and for RDF drying. Surplus steam may be used for onsite heating needs or exported off-site for other users.
    - The dry gas cleaning system, operates between 150°C to 180°C and removes fine particulate materials from the syngas stream, neutralizes acid gases, and captures heavy metals.
    - From the dry gas cleaning system, the syngas is further cooled by direct contact with scrubbing liquor in a condenser scrubber. The unit will be used to drop the syngas temperature to approximately 35°C and will operate as an acid scrubber to absorb ammonia. Supplemental wet gas cleaning systems utilizing alkali and acid scrubbers may be utilized to further enhance gas cleaning.

  - The syngas leaving the wet gas cleaning system is clean syngas ready for use in power generation
- Power Generation
  - The power island is fed by the clean syngas from the gas cleaning system and generates electrical power from the combustion of clean syngas in gas engines or turbines and the generation of steam from cooling the engine exhaust gas. At maximum capacity, the Facility will produce up to 20 megawatt electrical (MWe) with approximately 15 MWe available for sale to the electrical distribution grid.

- The Direct Plasma utilizes the intense heat from the plasma arc to breakdown the feedstock, separating precious metals/materials from the binding/carrier material (i.e., precious metal dust from steel shavings or turnings)

- Water Treatment System – Clean potable water will be supplied by the City of Hamilton's potable water system. Based on the water quality, treatment of the water may be required prior to its use as boiler feed water or for chemical mixing/dilution within the treatment systems.

- Process Water Treatment System – All process water, leachate, and wash waters will be collected and treated in an on-site wastewater treatment plant (WWTP) to meet the City of Hamilton's sewer-use by-law before discharged to the sanitary system

- Air Ventilation System

- APC System – The building will be maintained under negative pressure to prevent fugitive emission of odour or dust. An APC system will be used to treat all air emissions prior to release to the atmosphere. A Continuous Emission Monitoring System will be in place to monitor exhaust flue gases from the thermal oxidizer and the power island.

- Stormwater – Stormwater will be collected and directed at a central oil/grit separator prior to discharge into the local HPA private storm sewer system

Two other alterations associated with the Site are planned by the owner (HPA), but independent of the scope of this EA screening assessment. They include: demolition of the one existing Site structure and installation of a new storm sewer trunk main to collect stormwater from the northwest Site boundary and convey it directly to the harbour. For the purposes of the screening assessment provided herein, any natural environment impacts associated with these activities will be considered independent of the natural environment assessment associated with this EA screening.

4.1 Methodology and Investigations

The assessment of effects associated with the proposed undertaking was conducted through a series of steps that is based, in part, on the description of existing conditions as well as the Project Description and Site Plan. The assessment of effects was also undertaken within the context of the previously completed Screening Criteria Checklist, as summarized in Section 2.0 of this report.

Using the results of the Site investigation and secondary source resources identified in Section 3.1, CRA assessed the potential impacts of the proposed works to the natural environment in the context of the existing conditions. Opportunities for mitigation of any potential impacts to the natural environment and recommended monitoring of the area were considered and are presented in the following sections.

4.2 Natural Environment Net Effects

This Section provides an assessment of the potential negative environmental effects (i.e., those for which a "yes" answer was given in the Screening Criteria Checklist) for those Natural Environment criteria which might be affected by the project as identified in Section 2.0. The effects assessment describes how existing environmental conditions in the Study Areas would change as a result of the construction and operation of the proposed undertaking.

As described in Section 2.0, all Screening criteria as it relates to the Natural Environment were answered "No". However, given that the Screening process is completed up-front and iterative in nature, we have determined that the following Criteria would require mitigation measures and therefore should be changed to a "yes", namely, Criteria 4.1. Further discussion on the mitigation measures required for this specific Criteria is described in subsequent sections.

In addition, for the purposes of this report, we have provided some additional measures that may be applied as Best Management practices as it relates to all Criteria, regardless of whether they were answered "yes" or "no" in the Screening Checklist. In all cases, impact management (mitigation) measures have been identified that, when applied, will eliminate the potential environmental effects or reduce them to acceptable levels.

4.2.1 Potential Effects on Natural Environment

In the absence of appropriate mitigation measures, the following potential effects on the natural environment may be realized. It should be noted that two other alterations associated with the Site are planned by the owner (HPA), which includes demolition of the one existing Site structure and installation of a new storm sewer trunk main to collect stormwater from the

northwest Site boundary and convey it directly to the harbor. These activities have been proposed by the owner previously for this site, independent of the proposed undertaking.

1. Effects on Habitat

On-Site naturalized habitat is not high-quality habitat for the various flora and bird species observed, but is providing habitat opportunities for feeding, foraging, and nesting. Habitat within the Site-vicinity is similarly naturalized lower-quality habitat with similar function, with the exception of the riparian community surrounding Sherman's Inlet which provides a more established naturalized environment unique to the Study Areas. This may include SAR habitat of those species with the potential for Site presence (refer to Section 3.2.4).

2. Increased Truck and Train Traffic

Re-activating the use of the Site for the proposed EFW facility will increase street traffic along Sherman Avenue North and Evan McKeil Way. Rail traffic may also increase. This may dissuade use of the road and rail-side gravel areas as nesting habitat for species such as killdeer.

3. Stormwater Discharge to the Harbour

Site stormwater is currently discharged to Hamilton Harbour through an existing network of pipe infrastructure. A change in Site use and increased volume of traffic may result in degraded stormwater runoff as a result of increased oil and grease and potential for spills.

4.2.2 Mitigation Measures

Measures to mitigate the potential environmental effects outlined in Section 4.2.1 are detailed in the following sections. Best Management Practices are also identified by subject.

1. Effects on Habitat

- The potential for habitat loss associated with the proposed works is limited to the on-Site Study Area. At the time of Site investigation, the west property boundary was not clearly defined. Provision of clearly defined property boundaries will mitigate any alteration or loss of habitat outside of the Site itself.
- Remove vegetation only from Site areas where access and/or construction is required; leave undisturbed any areas that are not required to be re-purposed as part of the proposed work.
- Include landscape or naturalized features into the Site layout where and as appropriate. Planting of native species or ecologically beneficial species (e.g. flowering plants to attract insects and therefore insectivorous birds, common milkweed to support monarch) is recommended.

- Implementation of replacement structures for SAR species (e.g. artificial chimneys, overhangs and nest cups, nest boxes), as appropriate.

2. Truck and Rail Traffic
   - All traffic to and from the Site will use existing road infrastructure that is frequently used by the HPA and tenants; no new Site Vicinity roads are proposed.
   - The relocated rail line will replace an existing track; no additional rail capacity will be added.
3. Stormwater Discharge to the Harbour
   - Discharged Site stormwater quality will be designed to comply with local storm sewer and provincial requirements and regulations, as appropriate. This will include operation and stormwater discharge under a valid Environmental Compliance Approval (ECA).
   - Installation of an oils/grease/solids (OGS) separator is included in the proposed works; this will assist in mitigating any potential impact to Site stormwater discharge as a result of the proposed works.
   - Develop and implement a routine maintenance and clean-out program for the OGS unit to ensure it can operate at optimum capacity.

Additional Best Management Practices (BMPs) either included as part of the proposed works or recommended to mitigate effects of the proposed development on the Site include:

- Develop and implement a construction-period Environmental Protection Plan to address spill containment, timing of clearing and grubbing activities, and awareness of local wildlife.
- No outside storage of waste materials. All received and processed waste is to be stored within buildings.
- Develop and implement an Operations and Maintenance plan for the operational phase of the facility to address spill and secondary containment measures, OGS clean-out schedules, Site maintenance activities.

4.2.3 Net Effects

Should the mitigation measures outlined in Section 4.2.2 be implemented and maintained as appropriate for each measure, no Net Effects on the on-site Study Area or surrounding natural environment, from both a terrestrial and aquatic perspective, are anticipated.

Section 5.0 Monitoring Requirements and Additional Approvals

To ensure that the mitigation measures identified in Section 4 are implemented as envisioned, a strategy and schedule was developed for monitoring environmental effects. With these mitigation measures and monitoring requirements in mind, commitments have also been proposed for ensuring that they are carried out as part of the construction, operation, and maintenance of the proposed undertaking.

5.1 Monitoring Requirements

Recommended monitoring requirements to mitigate effects on the natural environment are generally associated with conscientious Site management, and outlined as follows:

- Provide a mechanism for Site staff (both construction and operations) to document Site wildlife sightings (e.g., comments on daily site inspection forms).
- Monitor Site vegetation one year following completion of Site plan works to confirm specified vegetation is the dominant vegetation growing on Site. This can be completed as part of the warranty inspection associated with construction.
- Monitor any artificial habitat structures for a minimum of 2 years following construction to document use of structures.
- Conduct annual inspection of OGS to assess if clean-out is required, or more frequently as needed; document inspections and maintain records on Site.

5.2 Additional Approvals

As outlined in Section 4.2, there are Site works proposed that are outside of the EA process for the proposed undertaking. This includes demolition of the one remaining Site structure and installation of a new trunk sewer to convey storm water to Hamilton Harbour, immediately north of Evans McKeil Way.

The existing Site building provides potential suitable habitat for the barn swallows (observed on Site), and possible roosting or nesting habitat for other rare, threatened or endangered birds or mammals. Species specific surveys in advance of building demolition are recommended to evaluate if the building is providing habitat for any rare or SAR species.

Should use of the building by any SAR species be confirmed, approvals may be needed from MNR or Environment Canada to proceed with Site preparation activities in advance of the proposed Site redevelopment works presented in Figure 6.

Section 6.0 Conclusion

The Site is a vacant industrial property situated within an industrial development associated with Pier 15, Hamilton Harbour. Natural environmental features within the Site Study Area are limited to cultural meadow habitat dominated by opportunistic and non-native vegetation common to disturbed sites.

The natural environment of Site Vicinity Study Area is comparable with the addition of some border landscape features and an established naturalized riparian corridor surrounding Sherman's Inlet, approximately 200 m southwest of the Site.

Based on the assessment of the existing Site conditions, understanding of the proposed development, and implementation of mitigation measures outlined herein, No Net Effects to the natural environment within the Study Areas are anticipated as a result of the proposed Site redevelopment.

Section 7.0 References

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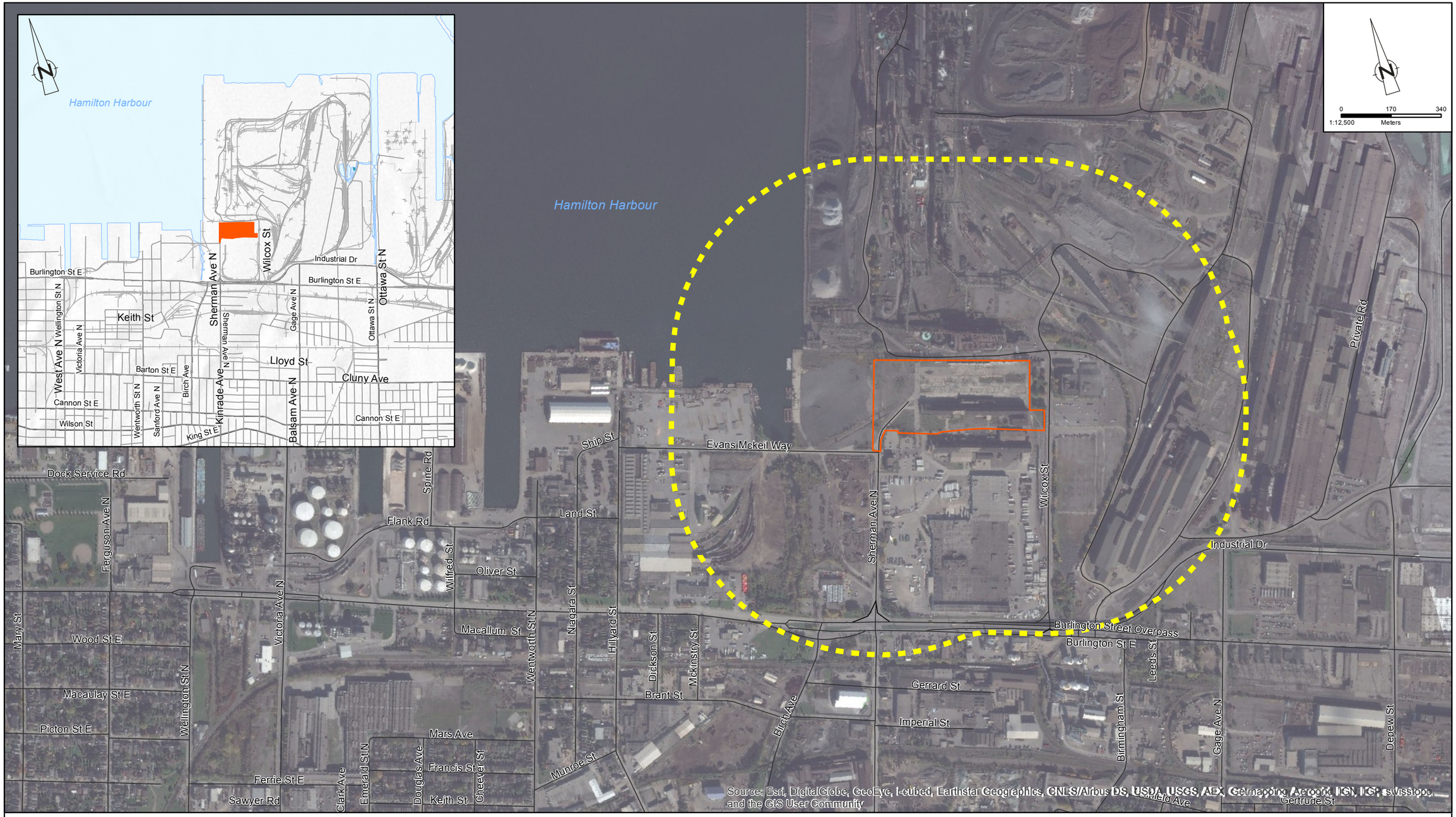


Source: MNR NRVIS, 2013. Produced by CRA under licence from Ontario Ministry of Natural Resources, © Queen's Printer 2014;
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

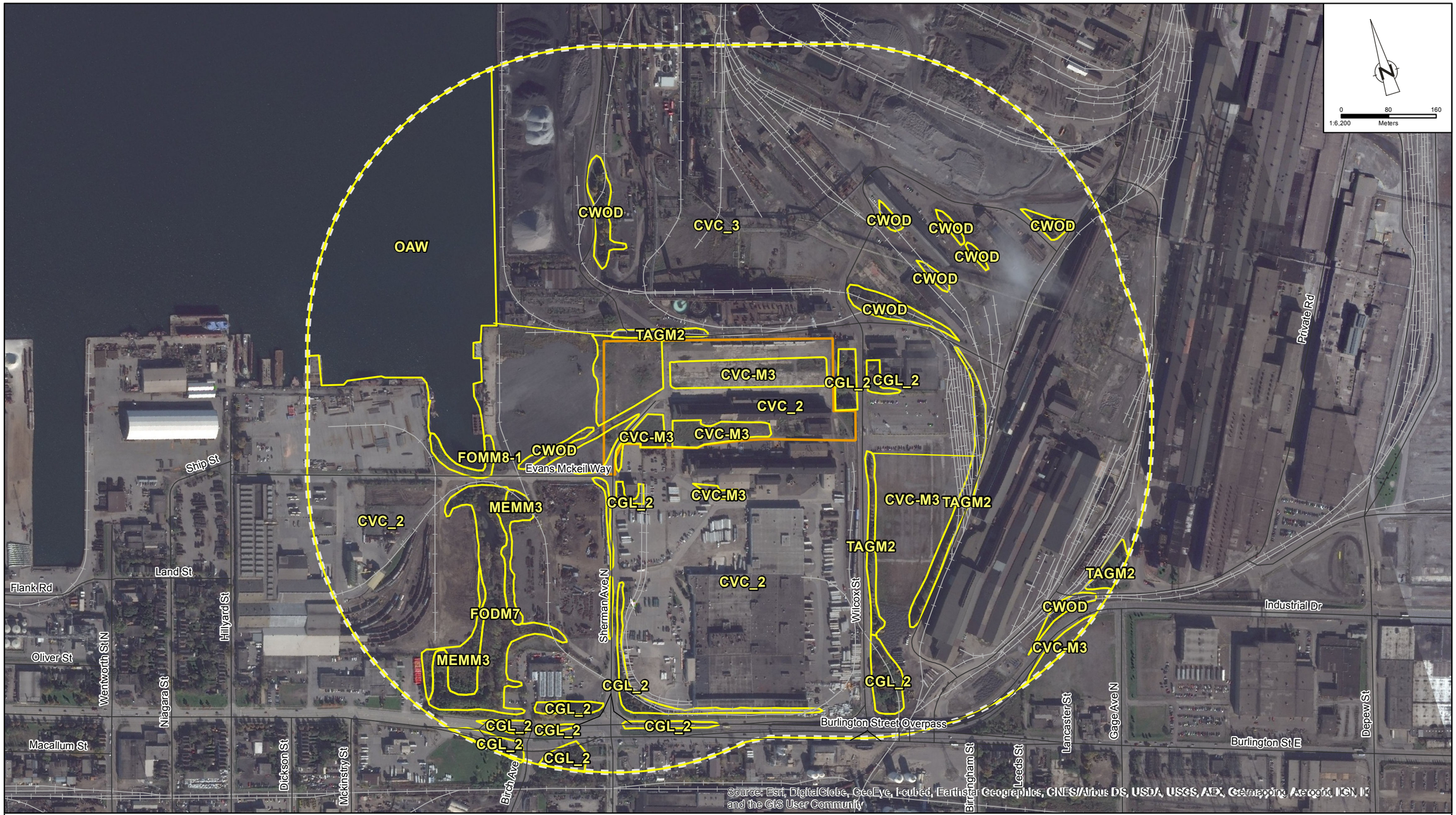
LEGEND

- Site Location
- Site Vicinity Study Area (500m Buffer)

figure 1

Site Location
Natural Environment Assessment
Port Fuels and Materials Services Inc
Pier 15, Hamilton, Ontario

084692(RPT011)GIS-WA001 July 18, 2014



Source: MNR NRVIS, 2013. Produced by CRA under licence from Ontario Ministry of Natural Resources, © Queen's Printer 2014;
Coordinate System: NAD 1983 UTM Zone 17N

LEGEND

- Site Location
- Site Vicinity Study Area Boundary (500m)
- Ecological Land Classification (ELC)

ELC Codes

CGL_2 - Constructed Parkland
CVC_2 - Light Industry
CVC_3 - Heavy Industry
CVC–M3 - Cultural Mixed Meadow*
CWOD - Cultural Deciduous Woodland
TAGM2 - Mixed Plantation
MEMM3 - Mixed Meadow Ecosite
FOMM8-1 - Fresh-Moist Poplar Mixed Forest Type
FODM4 - Dry-Fresh Upalnd Deciduous Forest
FODM7 - Fresh-Moist Lowland Deciduous Forest
OAW - Open Water Area

figure 2
Ecological Land Classification
Natural Environment Assessment

Port Fuels and Materials Services Inc
Pier 15, Hamilton, Ontario

084692(RPT011)GIS-WA004 July 18, 2014

Source: MNR NRVIS, 2013. Produced by CRA under licence from Ontario Ministry of Natural Resources, © Queen's Printer 2014;
Coordinate System: NAD 1983 UTM Zone 17N

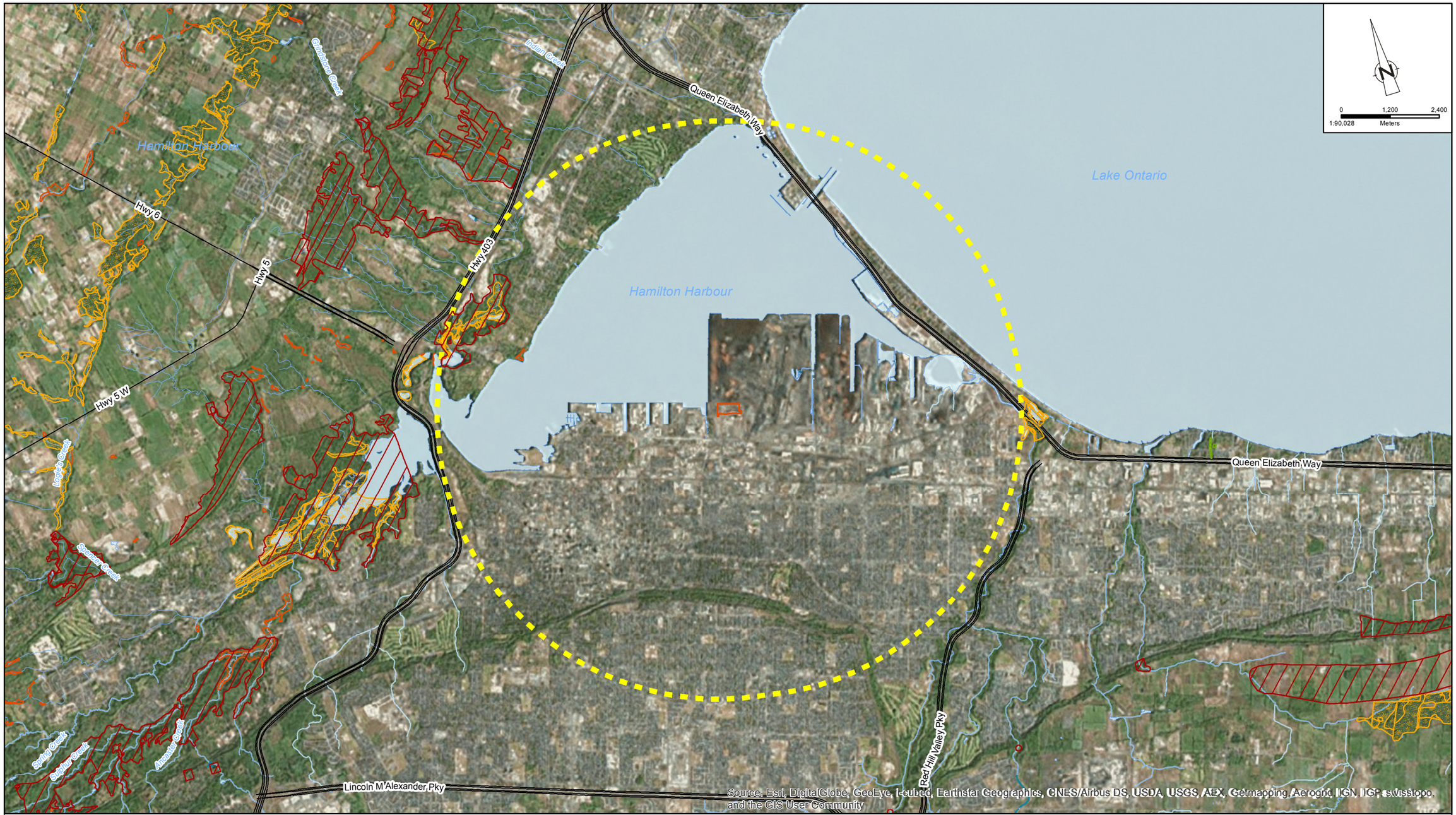
figure 3

LEGEND

- SiteLocation
- Site Vicinty Study Area Boundary (500m)
- Wetland - Evaluated
- Wetland - Provincially Significant
- Wetland - Not Evaluated
- Areas of Natural and Scientific Interest (ANSI)
- Significant Ecological Area (SEA)

Wetlands, Areas of Natural and Scientific Interest and Significant Ecological Areas
Natural Environment Assessment
Port Fuels and Materials Services Inc
Pier 15, Hamilton, Ontario

084692(RPT011)GIS-WA002 July 18, 2014



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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere

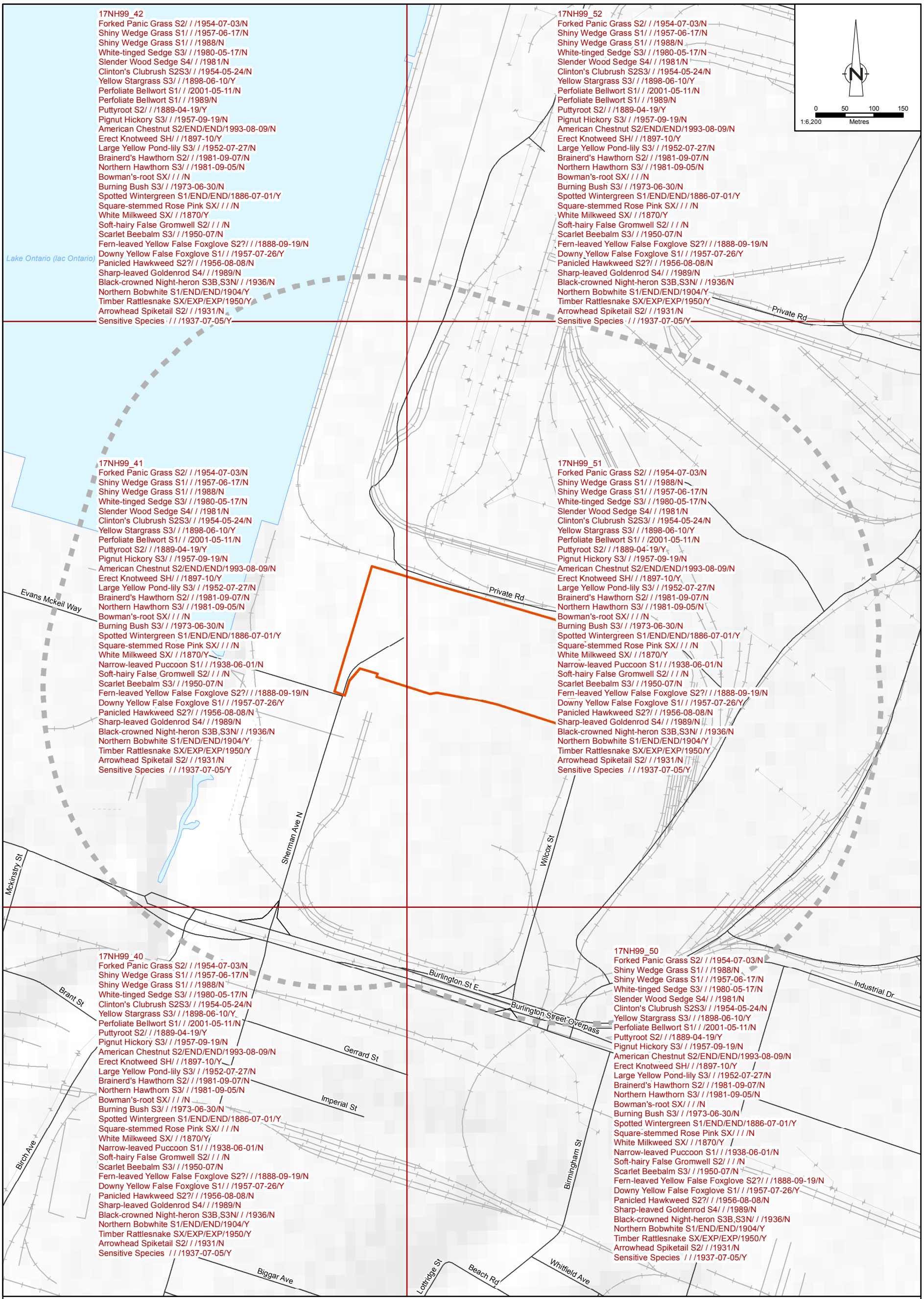
LEGEND

- SiteLocation
- Site Buffer (5km)
- Waterbody
- Watercourse
- Significant Ecological Area (SEA)
- Areas of Natural and Scientific Interest (ANSI)
- Wetland - Evaluated
- Wetland - Provincially Significant
- Wetland - Not Evaluated

figure 4

Regional Natural Heritage Features
Natural Environment Assessment
Port Fuels and Materials Services Inc
Pier 15, Hamilton, Ontario

084692(INT002)GIS-WA005 July 18, 2014



Source: NHIC Rare Occurences Updated 2012/02/29, MNR NRVIS, 2013. Produced by CRA under licence from Ontario Ministry of Natural Resources, © Queen's Printer 2013;
Coordinate System: NAD 1983 UTM Zone 17N

NOTES:
NHIC label indicates provincially tracked species, vegetation types and wildlife concentration areas per 1km square. The first line indicates the 1km square identifier and subsequent lines species Common Name, S Rank / COSWIC Status / MNR Status / Last Observation Date / and Y/N flag indicated if the species is extirpated.

Some occurences are listed as "Sensitive Species", these species are at a higher risk than others to human exploitation or harm. Occurence details for these species can be obtained through local OMNR district offices.

Legend

- Site Location
- Site Vicinity Study Area (500m Buffer)
- NHIC Rare Occurences

figure 5

NHIC Rare Occurances
Natural Environment Assessment
Port Fuels and Materials Services Inc
Pier 15, Hamilton, Ontario

084692(RPT011)GIS-WA003 July 18, 2014

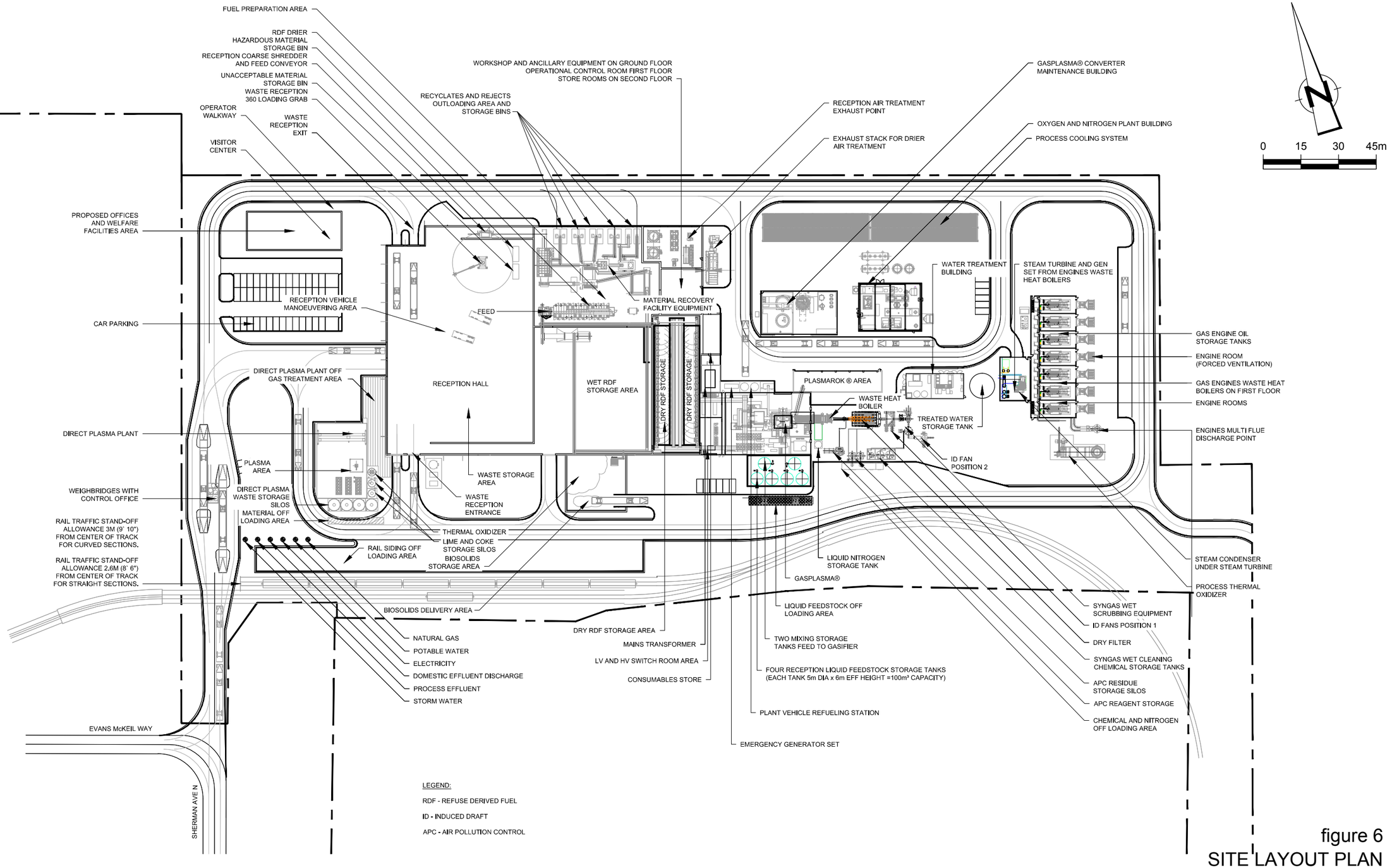


figure 6

SITE LAYOUT PLAN

PORT FUELS & MATERIALS SERVICES INC. ENERGY FROM WASTE FACILITY

530 Sherman Avenue North, Hamilton ON, Canada

84692-06(002)CI-WA003 DEC 9/2014

TABLE 3.3

VEGETATION LIST
NATURAL ENVIRONMENT ASSESSMENT REPORT
PORT FUELS MATERIAL SERVICES, INC
Hamilton, Ontario

		Global	*Provincial*	*Area*	
Species		***Status***	***Status***	***On-Site***	***Site-vicinity***
Manitoba Maple	*Acer negundo*	G5	S5	X	X
Norway Maple	*Acer platanoides*	GNR	SNA		X
Silver Maple	*Acer saccharinum*	G5	S5		X
Tree of Heaven	*Ailanthus altissima*	GNR	SNA	X	X
Garlic Mustard	*Alliaria petiolata*	GNR	SNA		X
Common Burdock	*Arctium minus*	GNR	SNA	X	
Common Milkweed	*Asclepias syriaca*	G5	S5	X	X
Northern Catalpa	*Catalpa speciosa*	G4?	SNA		X
Pigweed	*Chenopodium album*	G5	SNA	X	X
Chicory	*Cichorium intybus*	GNR	SNA	X	X
Canada Thistle	*Cirsium arvense*	GNR	SNA		X
Nodding Thistle	*Carduus nutans ssp. nutans*	GNRTNR	SNA	X	X
Hawthorn	*Crategus sp.*	-	-		X
Teasel	*Dipsacus fullonum*	GNR	SNA		X
Viper's Bugloss	*Echium vulgare*	GNR	SNA	X	X
Russian Olive	*Elaeagnus angustifolia*	GNR	SNA	X	X
Daisy Fleabane	*Erigeron hyssopifolius*	G5	S5	X	X
Grasses	*Graminoid sp.*	-	-	X	X
Impatiens cultivars	*Impatiens sp.*	-	-		X
Morning Glory	*Ipomoea purpurea*	GNR	SNA		X
Butter-and-eggs	*Linaria vulgaris*	GNR	SNA	X	
Birdsfoot Trefoil	*Lotus corniculatus*	GNR	SNA	X	
White Sweet Clover	*Melilotus albus*	G5	SNA	X	X
White Mulberry	*Morus alba*	GNR	SNA		X
Common Evening Primose	*Oenothera biennis*	G5	S5		X
White Spruce	*Picea glauca*	G5	S5		X
Blue Spruce	*Picea pungens*	G5	SNA		X
Austrian Pine	*Pinus nigra*	GNR	SNA		X
Scots Pine	*Pinus sylvestris*	GNR	SNA		X
Balsam Poplar	*Populus balsamifera*	G5	S5	X	X
Trembling Aspen	*Populus tremuloides*	G5	S5		X
Oak	*Quercus sp.*	-	-		X
European Buckthorn	*Rhamnus cathartica*	GNR	SNA		X
Staghorn Sumac	*Rhus Typhina*	G5	S5		X
Locust	*Robinia sp.*	-	-		X
Rose	*Rosa sp.*	-	-		X
Willow	*Salix sp.*	-	-		X
Goldenrod	*Solidago sp.*	-	-	X	X
False Spiraea	*Sorbaria sorbifolia*	G5	SNA		X
Eastern White Cedar	*Thuja occidentalis*	G5	S5		X
Littleleaf Linden	*Tilia cordata*	GNR	SNA		X
Yellow Goatsbeard	*Tragopogon pratensis*	GNR	SNA	X	
Cattails	*Typha sp.*	-	-		X
Wych Elm	*Ulmus glabra*	GNR	SNA		X
Siberian Elm	*Ulmus pumila*	GNR	SNA		X
Spring Vetch	*Vicia sativa*	GNR	SNA	X	
Riverbank Grape	*Vitis riparia*	G5	S5	X	X

TABLE 3.3

VEGETATION LIST
NATURAL ENVIRONMENT ASSESSMENT REPORT
PORT FUELS MATERIAL SERVICES, INC
Hamilton, Ontario

Notes:

S5: Demonstrably secure; species is widespread in Ontario
SNA: Not applicable; the species is not a suitable target for conservation activities
G4: Apparently Secure; Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5: Secure—Common; widespread and abundant.
GNR: Unranked—Global rank not yet assessed.
T: combined with the G-rank; reserved for ranking the subspecies or varieties of a global population. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.
- : Indicates no information available

TABLE 3.5

POTENTIAL TERRESTRIAL SPECIES AT RISK IN THE SITE VICINITY
NATURAL ENVIRONMENT ASSESSMENT REPORT
PORT FUELS MATERIAL SERVICES, INC
Hamilton, Ontario

Species		*Global Rank*	*SARA*	*Provincial Rank*	*SARO*	*Habitat*	*Potential to Occur on Site*
Amphibians and Reptiles							
Blanding's Turtle	*Emydoidea blandingii*	G4	Threatened	S3	Threatened	shallow water that is rich in nutrients, dense vegetation	No suitable habitat
Eastern Hog-nosed Snake	*Heterodon platirhinos*	G5	Threatened	S3	Threatened	open habitats with sandy, well-drained soil	No suitable habitat
Eastern Ribbonsnake	*Thamnophis sauritus*	G5	Special Concern	S3	Special Concern	along edges of shallow bodies of water with dense vegetation	No suitable habitat
Jefferson Salamander	*Ambystoma jeffersonianum*	G4	Threatened	S2	Endangered	deciduous and mixed deciduous forests	No suitable habitat
Milksnake	*Lampropeltis triangulum*	G5	Special Concern	S3	Special Concern	associated with old buildings, must be near water, and suitable sites for egg-laying (rotting logs or mammal burrows)	Low
Northern Map Turtle	*Graptemys geographica*	G5	Special Concern	S3	Special Concern	lakes and slow moving rivers with muddy bottoms and abundant aquatic vegetation	No suitable habitat
Snapping Turtle	*Chelydra serpentina*	G5	Special Concern	S3	Special Concern	shallow waters; take advantage of man-made sites for nesting	Moderate - limited Site gravel areas for nesting
Spiny Softshell	*Apalone spinifera*	G5	Threatened	S3	Threatened	generally prefer marshy creeks, swift-flowing rivers, lakes, impoundments, bays, marshy lagoons, ditches and ponds near rivers	No suitable habitat
Birds							
Acadian Flycatcher	*Empidonax virescens*	G5	Endangered	S2S3B	Endangered	large areas of mature, undisturbed forest	No suitable habitat
Bald Eagle	*Haliaeetus leucocephalus*	G5	-	S2N,S4B	Special Concern	deciduous and mixed deciduous forests close to waterbodies	No suitable habitat
Barn Owl	*Tyto alba*	G5	Endangered	S1	Endangered	adaptable species; low-elevation, open country, nest on man-made structures	Moderate
Barn Swallow	*Hirundo rustica*	G5	-	S4B	Threatened	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands	Present on Site
Black Tern	*Chlidonias niger*	G4	-	S3B	Special Concern	large freshwater marshes and wetlands	No suitable habitat
Black-crowned Night-Heron	*Nycticorax nycticorax*	G5	-	S3B,S3N	-	saltmarshes, freshwater marshes, swamps, streams, rivers, lakes, ponds, lagoons, tidal mudflats, canals, reservoirs, and wet agricultural fields	No suitable habitat; observed in Site Vicinity
Bobolink	*Dolichonyx oryzivorus*	G5		S4B	Threatened	open grassland and hayfields	No suitable habitat
Canada Warbler	*Cardellina pusilla*	G5	Threatened	S4B	Special Concern	wet forests with a dense shrub layer	No suitable habitat
Cerulean Warbler	*Setophaga cerulea*	G4	Special Concern	S3B	Threatened	mature deciduous forest	No suitable habitat

TABLE 3.5

POTENTIAL TERRESTRIAL SPECIES AT RISK IN THE SITE VICINITY
NATURAL ENVIRONMENT ASSESSMENT REPORT
PORT FUELS MATERIAL SERVICES, INC
Hamilton, Ontario

Species		*Global Rank*	*SARA*	*Provincial Rank*	*SARO*	*Habitat*	*Potential to Occur on Site*
Chimney Swift	*Chaetura pelagica*	G5	Threatened	S4B,S4N	Threatened	urban areas with large, uncapped chimneys; tend to stay close to water	High dependent on whether or not chimneys are uncapped
Common Nighthawk	*Chordeiles minor*	G5	Threatened	S4B	Special Concern	open areas with little to no ground vegetation; urban areas with flat-topped roofs to nest	No suitable habitat
Eastern Meadowlark	*Sturnella magna*	G5	-	S4B	Threatened	grassy pastures, meadows, and hayfields	No suitable habitat
Eastern Whip-poor-will	*Caprimulgus vociferus*	G5	-	S4B	Threatened	semi-open deciduous forest	No suitable habitat
Golden-winged Warbler	*Vermivora chrysoptera*	G4	Threatened	S4B	Special Concern	prefer early successional habitat where young shrubs grow, surrounded by mature forest	No suitable habitat
Henslow's Sparrow	*Ammodramus henslowii*	G4	Endangered	SHB	Endangered	old fields, pastures, wet meadows	No suitable habitat
Hooded Warbler	*Setophaga citrina*	G5	Threatened	S4B	Special Concern	large tracts of mature forest	No suitable habitat
King Rail	*Rallus elegans*	G4	Endangered	S2B	Endangered	large marshes	No suitable habitat
Least Bittern	*Ixobrychus exilis*	G5	Threatened	S4B	Threatened	large marshes	No suitable habitat
Louisiana Waterthrush	*Parkesia motacilla*	G5	Special Concern	S3B	Special Concern	mature forests along ravines	No suitable habitat
Northern Bobwhite	*Colinus virginianus*	G5	Endangered	S1	Endangered	early successional habitats with small areas of forest during the winter	No suitable habitat
Peregrine Falcon	*Falco peregrinus*	G4	Special Concern	S3B	Special Concern	nest on ledges of tall buildings	Low - Site buildings lack ledges
Prothonotary Warbler	*Protonotaria citrea*	G5	Endangered	S1B	Endangered	flooded woodlands or decidious swamp forest	No suitable habitat
Red-headed Woodpecker	*Melanerpes erythrocephalus*	G5	Threatened	S4B	Special Concern	many habitats including urban	No suitable habitat
Short-eared Owl	*Asio flammeus*	G5	Special Concern	S2N,S4B	Special Concern	open habitats such as grasslands and old fields with an abundance of rodents	No suitable habitat
Yellow-breasted Chat	*Icteria virens*	G5	Special Concern	S2B	Endangered	dense thickets in wood edges	No suitable habitat
Mammals							
American Badger	*Taxidea taxus*	G5	Endangered	S2	Endangered	natural or man-made open habitats (eg. golf course)	No suitable habitat
Little Brown Myotis	*Myotis lucifugus*	G5	-	S4	Endangered	overwinters in caves and mines; associated with buildings for maternal roosts; hunts over water	Moderate
Northern Myotis	*Myotis septentrionalis*	G4	-	S3	Endangered	caves and mines, maternal roosts in large diameter trees but occassionally associated with buildings	Low - prefer subterranian space
Woodland Vole	*Microtus pinetorum*	G5	Special Concern	S3?	Special Concern	deciduous forest with soft friable soil	No suitable habitat

TABLE 3.5

POTENTIAL TERRESTRIAL SPECIES AT RISK IN THE SITE VICINITY
NATURAL ENVIRONMENT ASSESSMENT REPORT
PORT FUELS MATERIAL SERVICES, INC
Hamilton, Ontario

Species		*Global Rank*	*SARA*	*Provincial Rank*	*SARO*	*Habitat*	*Potential to Occur on Site*
Insects							
Monarch Butterfly	*Danaus plexippus*	G5	Special Concern	S2N,S4B	Special Concern	wherever milkweed exists	Moderate - sporadic milkweed is present
Arrowhead Spiketail	*Cordulegaster obliqua*	G4	-	S2	-	small swift streams and muddy seeps in forested habitats	No suitable habitat
West Virginia White	*Pieris virginiensis*	G3?	-	S3	Special Concern	moist, deciduous woodland	No suitable habitat
Plants							
American Chestnut	*Castanea dentata*	G4	Endangered	S2	Endangered	deciduous forest	No suitable habitat
American Columbo	*Frasera caroliniensis*	G5	Endangered	S2	Endangered	open deciduous forested slopes, thickets and clearings	No suitable habitat
American Ginseng	*Panax quinquefolius*	G3G4	Endangered	S2	Endangered	undisturbed mature deciduous forest	No suitable habitat
Brainerd's Hawthorne	*Crataegus brainerdii*	G5	-	S2	-	anthropogenic (man-made or disturbed habitats), forest edges, meadows and fields	Low - hawthorn is only located in a younger area of Site
Broad Beech Fern	*Phegopteris hexagonoptera*	G5	Special Concern	S3	Special Concern	beech and maple forest	No suitable habitat
Burning Bush	*Euonymus atropurpureus*	G5	-	S3	-	wooded slopes, bluffs, open woods, bottoms, moist soils along streams, thickets	No suitable habitat
Butternut	*Juglans cinerea*	G4	Endangered	S3?	Endangered	deciduous forest	No suitable habitat
Clinton's Clubrush	*Trichophorum clintonii*	G4	-	S2S3	-	dry hillsides and banks; open sandy meadows and openings in oak and pine forest	No suitable habitat
Downy Yellow False Foxglove	*Aureolaria virginica*	G5	-	S1	-	woodlands	No suitable habitat
Eastern Flowering Dogwood	*Cornus florida*	G5	Endangered	S2?	Endangered	deciduous and mixed forests	No suitable habitat
Fern-leaved Yellow False Foxglove	*Aureolaria pedicularia*	G5	-	S2?	-	sandy upland forests, sandy upland savannas, sandy thickets, and stabilized sand dunes	No suitable habitat
Few-flowered Club-rush	*Trichophorum planifolium*	G4G5	Endangered	S1	Endangered	only found on RBG property	No suitable habitat
Forked Panic Grass	*Dichanthelium dichotomum*	G5	-	S2	-	open wooded areas where there is some direct sunlight reaching the ground vegetation	No suitable habitat
Green Dragon	*Arisaema dracontium*	G5	Special Concern	S3	Special Concern	damp deciduous forests	No suitable habitat
Hoary Mountain Mint	*Pycnanthemum incanum*	G5	Endangered	S1	Endangered	oak savannas and prairies	No suitable habitat
Large Yellow Pond-lily	*Nuphar advena*	G5T5	-	S3	-	swamps, ponds, protected coves along lakes, and shallow areas along slow-moving rivers	No suitable habitat
Narrow-leaved Puccoon	*Lithospermum incisum*	G5	-	S1	-	fields and open areas	No suitable habitat
Northern Hawthorne	*Crataegus pruinosa var. disso*	G4G5	-	S3	-	old fields, clearings, roadbanks, and dry, often rocky, forests	Low - hawthorn is only located in a younger area of Site

TABLE 3.5

POTENTIAL TERRESTRIAL SPECIES AT RISK IN THE SITE VICINITY
NATURAL ENVIRONMENT ASSESSMENT REPORT
PORT FUELS MATERIAL SERVICES, INC
Hamilton, Ontario

Species		*Global Rank*	*SARA*	*Provincial Rank*	*SARO*	*Habitat*	*Potential to Occur on Site*
Panicled Hawkweed	*Hieracium paniculatum*	G5	-	S2?	-	dry woods	No suitable habitat
Perfoliate Bellwort	*Uvularia perfoliata*	G5	-	S1	-	moist woodland and scrub	No suitable habitat
Puttyroot	*Aplectrum hyemale*	G5	-	S2	-	deciduous forests	No suitable habitat
Red Mulberry	*Morus rubra*	G5	Endangered	S2	Endangered	moist forest habitats	No suitable habitat
Scarlet Beebalm	*Monarda didyma*	G5	-	S3	-	stream banks and other wet places	No suitable habitat
Shiny Wedge Grass	*Sphenopholis nitida*	G5	-	S1	-	dry forests	No suitable habitat
Soft-hairy False Gromwell	*Lithospermum parviflorum*	G4G5T4	-	S2	-	moderately dry habitats; prairies, open woods	No suitable habitat
Spotted Wintergreen	*Chimaphila maculata*	G5	Endangered	S1	Endangered	sandy habitats in dry-mesic oak-pine woods	No suitable habitat
White Wood Aster	*Eurybia divaricata*	G5	Threatened	S2	Threatened	open, dry, deciduous forests	No suitable habitat
White-tinged Sedge	*Carex albicans var. albicans*	G5T4T5	-	S3	-	mesic to dry upland forests	No suitable habitat
Yellow Stargrass	*Hypoxis hirsuta*	G5	-	S3	-	dry prairies and open woods	No suitable habitat

Notes:

S1: Extremely rare in Ontario; usually 5 or fewer occurrences in the province or very few remaining individuals; often especially vulnerable to extirpation.
S2: Very rare in Ontario; usually between 5 and 20 occurrences in the province or with many individuals in fewer occurrences; often susceptible to extirpation.
S3: Vulnerable; due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4: Common in Ontario; apparently secure with over 80 occurences in the province
S5: Demonstrably secure; species is widespread in Ontario
S5?: Rank uncertain
G3: Vulnerable; At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
G4: Apparently Secure; Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5: Secure; Common; widespread and abundant.
H: Possibly Extirpated (Historical) — Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years.
T: combined with the G-rank; reserved for ranking the subspecies or varieties of a global population. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.
Rank qualifiers (e.g. S1B,S2N) are used for some migratory or transitory species to indicate different conservation statuses at specific times of the year, such as during the breeding (B) and non-breeding (N) seasons.
- : Indicates no status

Appendix A

Agency Correspondence

Ministry of Natural Resources

Box 5000
4890 Victoria Ave. N.
Vineland Station, Ontario
L0R 2E0

Tel: (905) 562-4147
Fax: (905) 562-1154

Ministère des Richesses naturelles

C.P. 5000
4890 avenue Victoria Nord
Vineland Station, Ontario
LOR 2EO

Tél : 905-562-4147
Téléc.: 905-562-1154

Ontario

Guelph District

July 7, 2014

Lisa Horn
Conestoga-Rovers & Associates
651 Colby Drive
Waterloo, Ontario N2V 1C2
lhorn@craworld.com

Dear Lisa,

Thank you for your inquiry regarding the presence of species at risk (SAR) on the property located on Pier 15 in the Port of Hamilton, as identified in the map you provided in your e-mail on June 27, 2014.

Digital mapping for some natural heritage features is available from Land Information Ontario (LIO). MNR recommends contacting LIO to obtain relevant feature mapping. Datasets of potential interest (and the corresponding LIO dataset) include – wetlands ('Wetland Unit' dataset), ANSI ('ANSI dataset), wooded areas ('Wooded Areas'), wintering areas ('Wintering Areas'), and fish spawning areas ('Spawning Areas').

Notwithstanding the recommendation to obtain mapping from LIO, MNR Guelph District does not have any records for wetlands or ANSI on or adjacent to the study area of interest to you.

If you are interested in fisheries information for the Hamilton Harbor or watercourses in the greater surrounding area to your study site, please contact Anne Yagi, Management Biologist at (905) 562-1196 to determine what information may be required.

I can inform you that we have no confirmed observations of Species at Risk in the vicinity of the above property. SAR suspected to occur based on local information includes Bald Eagle, Barn Swallow, Chimney Swift, Peregrine Falcon, and Snapping Turtle.

Please note that because the province has not been surveyed comprehensively for the presence of species at risk (SAR), the absence in the NHIC database of an EO in a particular geographic area does not indicate the absence of the species in that area. Consequently, the presence of an EO is useful to flag the presence of the species in the area, but is not an appropriate tool to determine whether a species is absent, or whether it should be surveyed for or not in a particular area.

Consequently, we provide the following advice with respect to determining the presence of species at risk on a property for which a land-use change or on-the-ground activity is being proposed (note that some of the following may not apply to a given type of proposed activity, or for a given study area):

I. Habitat Inventory

The District 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 and aquatic habitats in the study area 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 SAR on the property

A list of species at risk 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 species at risk known to occur in the county or regional municipality within which the area is located. The list of species at risk known to occur in the Municipality of Hamilton is attached. The species-specific COSEWIC status reports (www.cosewic.gc.ca) are a good source of information on species at risk habitat needs and will be helpful in determining the suitability of the property's 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 http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/MNR_SAR_CSSR_SARO_LST_EN.html

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 by going to http://www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/244543.html and clicking on the link Priority List of Species to be Assessed and Classified by COSSARO.

III. SAR surveys

The District is of the opinion that each species at risk identified under Step II should be surveyed for, regardless of whether or not the species has been previously recorded in the area, or whether previous records are historical in nature. The survey report should describe how each species at risk was surveyed for, and provide a rationale for why, if any, certain species appearing on the county/ regional municipal list were not the subject of the survey. These rationales must be based on evidence demonstrating either that: suitable habitat for the species is not present on the property or; the project will not have any impacts -including indirect impacts- on the species. Some SAR surveys require an authorization under the *Endangered Species Act 2007* and/or a Scientific Collector's Permit; please contact me if you require further direction regarding these.

Guelph District additionally recommends contacting the municipal planning approval authority and the conservation authority to determine if they have any additional information or records of interest for the study area.

Please contact me if your investigations reveal the presence of species at risk on the subject property. I will be happy to provide further advice regarding the provisions of the *Endangered Species Act* at that time.

Sincerely,

Adam Boudens
Asst. Species at Risk Biologist
Ministry of Natural Resources, Guelph District
4890 Victoria Avenue North
Vineland Station, ON L0R 2E0
adam.boudens@ontario.ca

HAMILTON

Jump to: List of Municipalities

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

AMPHIBIANS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Jefferson Salamander (*Ambystoma jeffersonianum*)	**Known to Occur**	*Species Protection and **Habitat Regulation***	inhabit deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	Active: March – October Hibernates: October – March Breeding: Late March - Mid April	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol

BIRDS		ESA Protection	Key Habitats Used By Species	Timing Of Life History Events	How to Conduct a Proper Survey
Acadian Flycatcher (*Empidonax virescens*)	**Known to Occur**	*Species and General Habitat Protection*	generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines	Migrate South before Winter	Follow Breeding Bird Survey Protocol
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 Owl (*Tyto alba*)	**Known to Occur**	*Species Protection and **Habitat Regulation***	generally prefer low-elevation, open country; often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees and cavities in cliffs.	Active Year Round Some leave for the Winter	Follow Breeding Bird Survey Protocol Night surveys may be helpful as they are very vocal
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
Black Tern (*Childonias niger*)	**Known to Occur**	*N/A*	generally prefer freshwater marshes and wetlands; nest either on floating material in a marsh or on the ground very close to water	Migrate South for the 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 (*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	Follow Breeding Bird Survey Protocol
Cerulean Warbler (*Dendoica cerulea*)	**Known to Occur**	*Species and General Habitat Protection*	generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	Migrate South for the Winter	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)	**Known 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
Henslow's Sparrow (*Ammodramus henslowii*)	**Historically Known to Occur**	*Species and General Habitat Protection*	generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material	Migrate South for the Winter	Follow Breeding Bird Survey Protocol
Hooded Warbler (*Wilsonia citrina*)	**Known to Occur**	*N/A*	generally found in the Carolinian Zone, in the interiors of large upland tracts of mature deciduous and mixed forest, and in ravines; can breed in low shrubbery such as raspberry canes	Breed from Late May to Early July	Follow Breeding Bird Survey Protocol
King Rail (*Rallus elegans*)	**Known to Occur**	*Species and General Habitat Protection*	generally this species requires large marshes with open shallow water that merges with shrubby areas	Breed from Late April to mid-May Migrate South for the Winter	Follow March Monitoring Protocol
Least Bittern (*Ixobrychus exilis*)	**Known 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.
Louisiana Waterthrush (*Seiurus motacilla*)	**Known to Occur**	*N/A*	generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps	Migrate South for the Winter	Follow Breeding Bird Survey Protocol

Peregrine Falcon *(Falco peregrinus)*	**Known to Occur**	*N/A*	generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas.	Active Year Round Lay Eggs around Easter Hatching occurs around Mother's Day Young fledge around Father's Day	Visit ideal habitat locations and listen/look for individuals in the vicinity.
Prothonotary Warbler *(Protonotaria citrea)*	**Known to Occur**	*Species and General Habitat Protection*	generally found in the dead trees of flooded woodlands or deciduous swamp forests; Carolinian zone	Migrate South for the Winter Eggs are layed from Late May - Early July	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
Short-eared Owl *(Asio flammeus)*	**Suspected to Occur**	*N/A*	generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields	Active Year Round	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Yellow-breasted Chat *(Icteria virens)*	**Known to Occur**	*Species and General Habitat Protection*	generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Migrate South for the Winter Arrive in Ontario Early May	Follow Breeding Bird Survey Protocol

FISH			**Key Habitats Used By Species**	**Timing Of Life History Events**	**How to Conduct a Proper Survey**
American Eel *(Anguilla rostrata)*	**Known to Occur**	*Species and General Habitat Protection*	all fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean; 12-mile creek watershed and Lake Ontario	Active Year Round	• Electrofishing For information please contact your local MNR office, DFO, and Lakes and Rivers
Grass Pickerel *(Esox americanus vermiculatus)*	**Known to Occur**	*N/A*	generally occur in wetlands with warm, shallow water and an abundance of aquatic plants; occur in the St. Lawrence River, Lake Ontario, Lake Erie, and Lake Huron	spawn in Ontario from late March to early May	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**
American Badger *(Taxidea taxus jacksoni)*	**Known to Occur**	*Species Protection and **Habitat Regulation***	generally prefer open habitats, whether natural (grasslands) or man-made (agricultural fields, road right-of-ways, golf courses)	Breed: Late Summer Semi-dormant over Winter	• Determine if soils are suitable (sandy or loamy) • Dens and Woodchuck burrows should be surveyed for use
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
Woodland Vole *(Microtus pinetorum)*	**Known to Occur**	*N/A*	generally associated with deciduous forests in areas of soft, friable, often sandy soil beneath deep humus, where it can burrow easily.	Active Year Round	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**
Eastern Pondmussel *(Ligumia nasuta)*	**Known to Occur**	*Species and General Habitat Protection*	generally inhabit sheltered areas of lakes or slow streams in substrates of fine sand and 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.
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.

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 Chestnut *(Castanea dentata)*	**Known to Occur**	*Species and General Habitat Protection*	found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils.	Flowers occur in Late Spring and Early Summer	• 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 • Perform detailed floristic inventory • Look for distinictive fruits on the ground
American Columbo *(Frasera caroliniensis)*	**Known to Occur**	*Species and General Habitat Protection*	most commonly associated with open deciduous forested slopes, thickets and clearings; grows in a variety of relatively stable habitats as well as on a wide variety of soils	Germination and development of the rosette begin in early spring; Flowers open in May; Fruit production continues until October or November	• 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 • Look for spikes from last years flowers
American Ginseng *(Panax quinquefolius)*	**Known 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
Broad Beech Fern *(Phegopteris hexagonoptera)*	**Known to Occur**	*N/A*	generally inhabits shady areas of beech and maple forests where the soil is moist or wet	The frond of the Broad Beech Fern appears towards the end of May	• 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
Eastern Flowering Dogwood *(Cornus florida)*	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows	flowering occurs in mid-spring, just as the leaves begin to develop. Fruit turns red at the end of summer.	• 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 • Easiest to detect during Spring when in flower • Also look for distinctive bark
Few-flowered Club-rush *(Trichophorum planifolium)*	**Known to Occur**	*Species Protection and* ***Habitat Regulation***	generally found in Dry Fresh Oak deciduous forests and Dry Fresh Oak-Maple-Hickory deciduous forests (only found on RBG property)	Plants flower early before the forest canopy leafs in	• Seaches for this species should only be done in March or April, when the species is most visible • Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters • Distinguishing this species from similar species is difficult and requires collection of plant material, which requires a 17 (2)(b) permit
Green Dragon *(Arisaema dracontium)*	**Known to Occur**	*N/A*	generally grows in damp deciduous forests and along streams.	Flowering occurs in May and June	• 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
Hoary Mountain Mint (*Pycnanthemum incanum*)	**Known to Occur**	*Species and General Habitat Protection*	Oak savannas and prairies	Flowering occurs in July	• 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
Red Mulberry *(Morus rubra)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in moist forest habitats. In Ontario, these include slopes and ravines of the Niagara Escarpment, and sand spits and bottom lands; Can grow in open areas such as hydro corridors	Flowering occurs when leaves emerge in late spring. Fruit emerges in Mid-July.	• Walk slowly and systematically in grid fashion, pausing to scan for plants every 5 meters • Use a plant field guide to distinguish from the similar White Mulberry • Distinguishing Red Mulberry and the hybrid Red and White Mulberry will require the collection of leaves for generic testing, which requires a 17(2)(b) permit
Spotted Wintergreen *(Chimaphila maculata)*	**Historically Known to Occur**	*Species and General Habitat Protection*	generally grow in sandy habitats in dry-mesic oak-pine woods. In Canada, they grow very close to the Great Lakes	Flowering occurs in late July to early August	• Watch for the distinct evergreen leaves in suitable habitat • May be easiest to search in fall and spring
White Wood Aster *(Eurybia divaricata)*	**Known to Occur**	*Species and General Habitat Protection*	generally grows in open, dry, deciduous forests. It has been suggested that it may benefit from some disturbance, as it often grows along trails.	Flowering occurs in early September, and sets fruit later in the month	• 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

REPTILES		ESA Protection	**Key Habitats Used By Species**	**Timing Of Life History Events**	**How to Conduct a Proper Survey**
Blanding's Turtle *(Emydonidea blandingii)*	**Known to Occur**	*Species and General Habitat Protection*	generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	Eggs are laid in June, with hatchlings emerging in late September and early October.	Contact MNR Guelph District SAR Bio to obtain a copy of the protocol
Eastern Hog-nosed Snake *(Heterodon platirhinos)*	**Historically Known to Occur**	*Species and General Habitat Protection*	generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water.	Mating occurs in spring and in August and early September. Hatching occurs in late August or early September	• In early spring, look for individuals near ideal hibernation sites • During egg-laying period (June), look for nesting females in sandy areas in early morning and late evening. • Rest of the season, survey intensively and systematically by flipping rocks and examining small shrubs in forest openings while listening carefully for hissing or retreat of the animal • More active at Dusk
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Known 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)*	**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)*	**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**

From: Jennings, Lisa
To: Horn, Lisa
Cc: McDonell, Lesley
Subject: RE: aquatic and terrestrial environment information for Pier 15, Hamilton Harbour
Date: Monday, July 07, 2014 10:24:58 AM
Attachments: Pier 15 HH Fisheries Data.pdf

Hi Lisa,

I have completed the fisheries review for Pier 15 proposed development site. I have one fish station within the Pier 15 area, it is older data (DFO fish monitoring station). There will be no charge for the data as there is little available. Please see data attached. I have also attached a map illustrating the fisheries station location.

Lesley (Terrestrial Ecologist) completed a natural heritage features review, and there are no features of interest (sign. woodlands, ESA, wetlands, ANSI) near the proposed development site. She did however mention the possibility of Chimney swifts, as the area is comprised of older abandoned building (chimneys). It may be beneficial to conduct a survey to ensure there no suitable chimney's within the development area (roosting/nesting sites). If you have any questions or require additional information, please contact Lesley at (905) 525-2181 ext. 231 lesley.mcdonell@conservationhamilton.ca

I also mentioned to Laura on Friday, the proposed development site is regulated by HCA, and you will need to contact Darren Kenny (Watershed office) for further review (I provided Laura with Darren's contact information).

If you have any questions or require additional information, please do not hesitate to contact me

Regards,
Lisa

Lisa Jennings, B.Sc.
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From: Horn, Lisa [mailto:lhorn@craworld.com]
Sent: Thursday, July 03, 2014 1:38 PM

To: Jennings, Lisa
Subject: aquatic and terrestrial environment information for Pier 15, Hamilton Harbour

Hi Lisa,

I had called this morning regarding collecting information about the aquatic and terrestrial environment around Pier 15 in Hamilton Harbour. I was wondering if my supervisor (Laura Lawlor) and I might be able to call you first thing tomorrow morning to discuss what kind of information would be obtained through this search, as in the past we have not dealt with there being an associated fee attached to this information? Please let me know if there is a time that works for you.

Thanks in advance,

Lisa Horn

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