



Waste Management of Canada Corporation

Environmental Assessment for a New Landfill Footprint at the West Carleton Environmental Centre

BIOLOGY (AQUATIC & TERRESTRIAL) DETAILED IMPACT ASSESSMENT

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Table of Contents

	Page
1. Introduction.....	1
1.1 Description of the Preferred Alternative Landfill Footprint.....	3
1.2 Facility Characteristics Report.....	3
1.3 Other WCEC Facilities	4
1.4 Biology Study Team.....	4
2. Study Area.....	5
3. Methodology	5
4. Description of the Environment Potentially Affected.....	7
4.1 On-Site	7
4.1.1 Aquatic.....	7
4.1.2 Vegetation.....	7
4.1.3 Wildlife	9
4.2 Site-Vicinity	12
4.2.1 Aquatic.....	12
4.2.2 Vegetation.....	12
4.2.3 Wildlife	14
4.3 Regional	16
4.3.1 Landscape Connectivity	16
5. Significance of the Environment Potentially Affected	18
5.1 Significant Habitat of Endangered and Threatened Species	18
5.1.1 Butternut.....	18
5.1.2 Eastern Meadowlark and Barn Swallow	19
5.2 Significant Wetlands	20
5.3 Significant Woodlands	21
5.4 Significant Valleylands	21
5.5 Significant Wildlife Habitat.....	22
5.5.1 Seasonal Concentrations of Animals.....	22
5.5.2 Animal Movement Corridors	23
5.5.3 Rare Vegetation Communities or Specialized Habitats.....	24
5.5.4 Habitats of Species of Conservation Concern	24
5.6 Significant Areas of Natural and Scientific Interest.....	25
5.7 Fish Habitat.....	25
5.8 Significant Features Summary	25
6. Impacts on the Terrestrial Environment.....	25
6.1 Significant Habitat of Endangered and Threatened Species	26
6.1.1 Eastern Meadowlark and Barn Swallow	26
6.2 Significant Wetlands	26
6.3 Significant Woodlands	27



6.4	Significant Wildlife Habitat.....	27
6.4.1	Seasonal Concentrations of Animals	27
6.4.2	Rare Vegetation Communities or Specialized Habitats.....	27
7.	Effects and Mitigation	28
7.1	Potential Effects on Natural Environment.....	28
7.1.1	Construction Effects	28
7.1.2	Operation and Maintenance Effects.....	31
7.2	Standard Mitigation to Minimize Impacts.....	31
7.2.1	Mitigation During Planning and Design.....	31
7.2.2	Construction Mitigation	32
7.2.3	Site Specific Mitigation and Enhancement.....	35
7.2.4	Operation and Maintenance Mitigation	37
7.2.5	Compensation Measures.....	37
7.3	Net Effects	41
7.3.1	Vegetation.....	41
7.3.2	Wildlife	42
7.3.3	Summary of Net Effects.....	43
8.	Monitoring and Commitments for the Undertaking.....	45
8.1	Monitoring Strategy and Schedule	45
8.1.1	Environmental Effects Monitoring	45
8.1.2	Development of an Environmental Management Plan	46
8.2	Commitments.....	46
9.	Biology (Aquatic & Terrestrial) Approvals Required for the Undertaking.....	48
10.	References	49

List of Figures

Figure 1.	Preferred Alternative Landfill Footprint and Facility Layout	2
Figure 2.	Biology Study Area	6
Figure 3.	Watercourses within the Study Area	8
Figure 4.	Vegetation Communities.....	10
Figure 5.	Wildlife and Aquatic Features	11
Figure 6.	Fisheries Habitat Classification	13
Figure 7.	Landscape Context.....	17
Figure 8.	Net Environmental Effects	44





List of Tables

Table 1.	Area-Sensitive Bird Species Recorded at Ottawa Landfill	14
Table 2.	Summary of Significant Wildlife Habitat in Study Area	22
Table 3.	Conceptual Compensation and Restoration Options.....	40
Table 4.	Summary of Vegetation Removals.....	41
Table 5.	Interior Forest Habitat Removed	42
Table 6.	Potential Effects, Proposed Mitigation and Compensation Measures, and Resulting Net Effects	43
Table 7.	Proposed Monitoring Requirements.....	46
Table 8.	Summary of EA Commitments.....	47



1. Introduction

This report documents the Biology impact assessment of the Preferred Alternative Landfill Footprint for the Environmental Assessment (EA) for a new landfill footprint at the West Carleton Environmental Centre (WCEC). In the preceding Alternative Methods phase of the EA, a net effects analysis as well as a comparative evaluation of the four alternative landfill footprint options were carried out in order to identify a Preferred Alternative Landfill Footprint. The Preferred Alternative Landfill Footprint was determined to be Option #2. The potential environmental effects, mitigation or compensation measures to address the potential adverse environmental effects, and the remaining net effects following the application of the mitigation or compensation measures were identified for the Preferred Alternative Landfill Footprint.

The Preferred Alternative Landfill Footprint was refined based on stakeholder comments received and in order to further avoid or mitigate potential adverse environmental effects, and is illustrated in **Figure 1**.

A Facilities Characteristics Report (FCR) as well as a description of the ancillary facilities associated with the WCEC have been prepared so that potential environmental effects and mitigation or compensation measures identified for the Preferred Alternative Landfill Footprint during the Alternative Methods phase of the EA can be more accurately defined, along with enhancement opportunities and approval requirements.

The discipline-specific work plans developed during the ToR outlined how impacts associated with the Preferred Alternative Landfill Footprint would be assessed. The results of these assessments have been documented in the following 10 standalone Detailed Impact Assessment Reports:

- Atmospheric (Air Quality, Noise, Odour, and Landfill Gas)
- Geology and Hydrogeology
- Surface Water
- Biology
- Archaeology
- Cultural Heritage
- Transportation¹
- Land Use
- Agriculture
- Socio-Economic (including Visual)

Despite being standalone documents, there are; however, interrelationships between some of the reports, where the information discussed overlaps between similar disciplines. Examples of this include the following:

- Geology and Hydrogeology, Surface Water and Biology (Aquatic Environment); and
- Land Use, Agricultural, and Socio-Economic (including Visual).

1. *In previous reports effects on airport operations with respect to bird strikes was included in the Transportation component. For the purposes of the Detailed Impact Assessment, this criteria is being address in a separate stand-alone Gull Management report.*



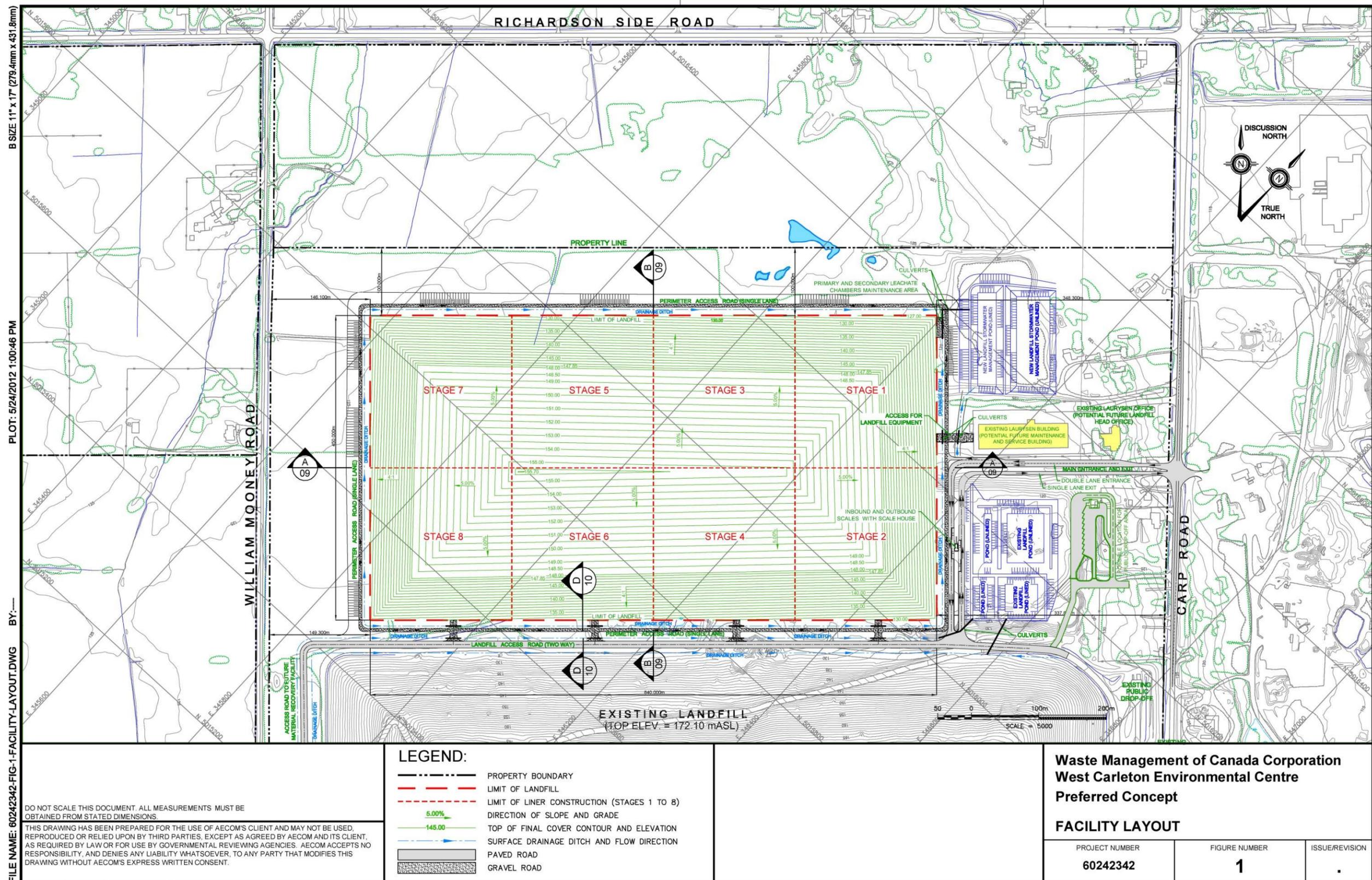


Figure 1. Preferred Alternative Landfill Footprint and Facility Layout

1.1 Description of the Preferred Alternative Landfill Footprint

The southern half of the Preferred Alternative Landfill Footprint is on WM-owned lands and the northern half is on lands that WM has options to purchase. A 100 m buffer is maintained between the north limit of the Preferred Landfill Footprint and the private lands to the north (e.g., lands which front onto Richardson Side Road) in accordance with Ontario Regulation 232/98, and an approximate 350 m buffer is maintained between the east limit of the footprint and Carp Road. A light industrial building (e.g., the Laurysen building) is situated in the eastern portion of the WM optioned lands, which WM anticipates using for equipment storage/maintenance or waste diversion activities in the future. An approximate 45 to 50 m buffer is maintained between the toe of slope of the existing and new landfill footprint, thus allowing sufficient area for a new waste haul road to the new footprint, and for maintenance and monitoring access. The location of the west limit of the Preferred Alternative Landfill Footprint was determined by maintaining the noted buffers and providing the required 6,500,000 m³ of disposal capacity, while maintaining landfill elevation below 158 mASL (as reported in the CDR) and maintaining side slopes required by Ontario Regulation 232/98 (e.g., varying from 4H to 1V to 5%). This results in an approximate 146 m buffer between the west limit of the Preferred Footprint and William Mooney Road. This buffer preserves a portion of the existing woodlot within the west part of the WM-owned lands.

The final contours of the landfill are shown in **Figure 1** and reflect a rectangular landform with a maximum elevation (top of final cover) of 155.7 mASL. This elevation is approximately 30.7 m above the surrounding existing grade. By comparison, the maximum elevation of the existing Ottawa WMF landfill is approximately 172 mASL or approximately 47 m above the surrounding existing grade. The contours reflect maximum side slopes of 4H to 1V, and a minimum slope of 5%. The total footprint area of the new landfill is 37.8 ha.

1.2 Facility Characteristics Report

The FCR presents preliminary design and operations information for the Preferred Alternative Landfill Footprint (Option #2) and provides information on all main aspects of the landfill design and operations including:

- site layout design;
- surface water management
- leachate management;
- gas management; and,
- landfill development sequence and daily operations.



The FCR also provides estimates of parameters relevant to the detailed impact assessment including estimates of leachate generation, contaminant flux through the liner system, landfill gas generation, and traffic levels associated with waste and construction materials haulage.

1.3 Other WCEC Facilities

In addition to the new landfill footprint, the WCEC will also include other facilities not subject to EA approval. These include:

- A material recycling facility
- A construction and demolition material recycling facility
- An organics processing facility
- Residential diversion facility
- Community lands for parks and recreation
- A landfill-gas-to-energy facility
- Greenhouses

Although these facilities do not require EA approval, it is important to consider environmental impacts from all potential activities at the WCEC, not just the new landfill footprint. As such, the synergistic impacts of these facilities in relation to the Preferred Alternative Landfill Footprint will also be assessed in the EA.

1.4 Biology Study Team

The Biology study team consisted of AECOM staff. The actual individuals and their specific roles are provided as follows:

- **James Kamstra – Senior Terrestrial Biologist**
- **Nick Hodges – Aquatic & Terrestrial Ecologist**



2. Study Area

The specific On-Site, Site-Vicinity, and Regional study areas for the Preferred Alternative Landfill Footprint at the WCEC are listed below and are shown on **Figure 2**:

On-Site the lands required for the Preferred Alternative Landfill Footprint;

Site-Vicinity..... the lands in the vicinity of the Preferred Alternative Landfill Footprint, extending about 500 m in all directions; and,

Regional..... the lands within approximately 1 to 5 km of the Preferred Alternative Landfill Footprint for those disciplines that require a larger analysis area (i.e., socio-economic, odour, etc.).

3. Methodology

The assessment of impacts associated with the Preferred Alternative Landfill Footprint was undertaken through a series of steps that were based, in part, on a number of previously prepared reports (Biology Existing Conditions Report, Biology Comparative Evaluation Technical Report). The net effects associated with the four Alternative Landfill Footprint Options identified during the Alternative Methods phase of the EA were based on Conceptual Designs. These effects were reviewed within the context of the preliminary design plans developed for the Preferred Alternative Landfill Footprint, as identified in the FCR, to determine the type and extent of any additional investigations required to ensure a comprehensive assessment of net effects. Additional investigations were then carried out, where necessary, in order to augment the previous work undertaken.

With these additional investigations in mind, the potential impact on the Aquatic and Terrestrial environment of the Preferred Alternative Landfill Footprint was documented.

With a more detailed understanding of the Aquatic and Terrestrial environment developed, the previously identified potential effects and recommended mitigation or compensation measures associated with the Preferred Alternative Landfill Footprint (documented in the Biology comparative Evaluation Technical Report, September 2011) were reviewed to ensure their accuracy in the context of the preliminary design for the preferred landfill footprint. Based on this review, the potential effects, mitigation or compensation measures, and net effects associated with the Preferred Alternative Landfill Footprint were confirmed and documented. In addition to identifying mitigation or compensation measures, potential enhancement opportunities associated with the preliminary design for the Preferred Alternative Landfill Footprint were also identified, where possible.





Figure 2. Biology Study Area

Following this confirmatory exercise, the requirement for monitoring in relation to net effects was identified, where appropriate. Finally, any Aquatic or Terrestrial approvals required as part of the implementation of the Preferred Alternative Landfill Footprint were identified.

4. Description of the Environment Potentially Affected

The following sections provide a description of the environment potentially affected on-site, in the site-vicinity and regionally. Refer to Figures 3, 4, 5, 6 and 7. Additional information pertaining to the entire study area (i.e., that which could not be differentiated on the basis of on-site, site-vicinity and regional study areas) follows as well.

4.1 On-Site

4.1.1 Aquatic

There are no permanent or intermittent streams within the preferred landfill footprint. Refer to **Figure 3** for the location of Study Area watercourses.

4.1.2 Vegetation

The existing landfill along the southern edge of the study area consists of buried refuse material covered by soil that has been allowed to become colonized with grasses that have been seeded. Most of the area immediately north of the existing landfill mound consists of highly disturbed exposed fill, which is bare or with sporadic cover of grasses and weedy forbs. Excavated depressions on the north side of the existing landfill have become man-made wetlands consisting of cattail marsh (MAS2-1) as shown on **Figure 4**, or permanent pond with submerged aquatic plants (especially stoneworts *Chara* sp.) (SAS). A willow thicket swamp (SWT2-2) surrounds the largest pond. Man-made ponds and marsh are fed by surface water that flows from the surrounding operations, including the existing landfill.

A mixed woodlot consists of three vegetation types as shown on **Figure 4**: fresh-moist White Cedar coniferous forest (FOC4-1) dominated by White Cedar (*Thuja occidentalis*) with occasional other species in the canopy such as Paper Birch (*Betula papyrifera*) and Trembling Aspen (*Populus tremuloides*); fresh-moist Cedar – Birch mixed forest (FOM7-2) co-dominated by White Cedar and Paper Birch with other trees represented including Balsam Fir, Trembling Aspen, Green Ash (*Fraxinus pennsylvanica*) and Red Maple (*Acer rubrum*); and younger fresh-moist Poplar Deciduous Forest (FOD8-1) dominated by Trembling Aspen with some Balsam Poplar (*Populus balsamifera*), Green Ash and Paper Birch.



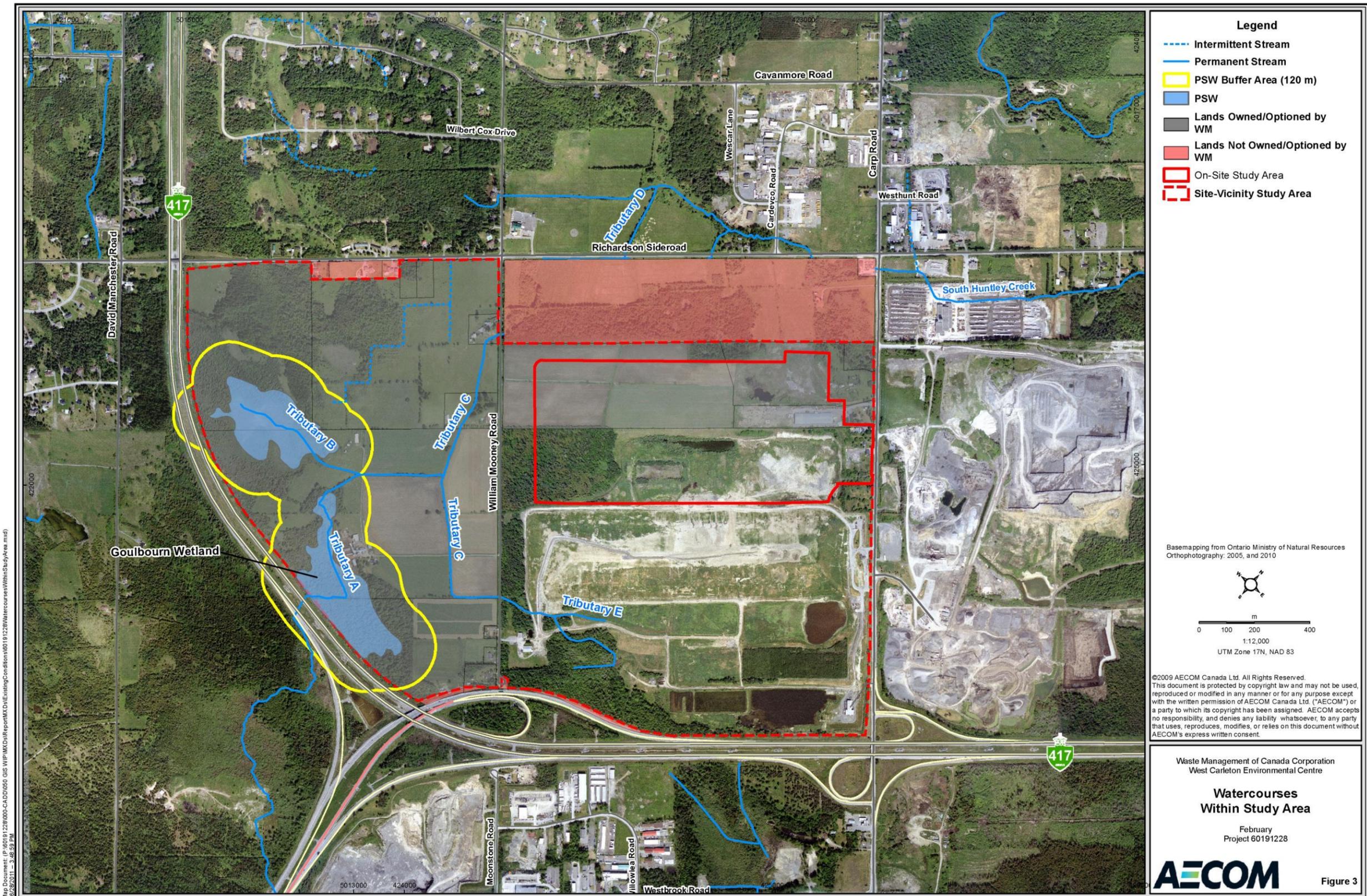


Figure 3. Watercourses within the Study Area

On the northeast side of the preferred landfill footprint and along Carp Road, a former farmstead has recently been removed and is now regenerating to meadow. Immediately to the west, a former gravel pit is also regenerating to a weedy growth. The lower portion of the pit is seasonally flooded meadow marsh. A deeper permanent pond and cattail marsh is present in the south side of the pit. A portion of deciduous swamp extends onto the site.

4.1.3 Wildlife

4.1.3.1 Amphibians

The man-made ponds and marshes located within the preferred landfill footprint are used by five species of breeding amphibians. Only the Green Frog (*Rana clamitans*) and, to a lesser extent Northern Leopard Frog (*Rana pipiens*), remain in the permanent ponds through the summer. Other species breed in the ponds but spend most of the active season in the adjacent woodlands or old field habitat. Therefore the proximity to ponds and woodlands is important to maintain functional amphibian habitat.

Five species of amphibians were also reported in the swamp along the northern limit of WM owned/optioned property and four species breed in the wetlands of the abandoned gravel pit. Refer to **Figure 5** for wildlife features, including amphibian breeding locations.

4.1.3.2 Breeding Birds

During breeding bird surveys in 2011, 27 species of breeding birds were observed within the proposed expansion envelope. The forest areas support four species of area sensitive breeding birds as recognized by OMNR (2000). One additional area sensitive grassland species, Savannah Sparrow (*Passerculus sandwichensis*), was recorded in some of the fields immediately north of the existing landfill. The approximate locations of the area sensitive species are all shown on **Figure 5**.

It is also noteworthy that approximately 100 Bank Swallow (*Riparia riparia*) nesting holes were observed on a steep exposed earthen bank that lies between the northern edge of the existing landfill and the southern edge of the preferred landfill footprint. Bank Swallow is a colonial nesting species that is sensitive because a large portion of the local population is concentrated in a very small area. The location is important since there are a large number of breeding individuals that will forage over a large distance of several kilometres away from the site.

The ponds in the on-site study area are used for staging by a small number of migratory waterfowl as observations of Ring-necked Duck (*Aythya collaris*) and Lesser Scaup (*Aythya affinis*) on May 3rd, 2011 indicate. Canada Goose (*Branta canadensis*) may also congregate in existing ponds on the on-site area or surrounding fields. A flock of 70 Canada Geese were observed in a field on the north parts of the site on June 1st, 2011.





Figure 4. Vegetation Communities



Figure 5. Wildlife and Aquatic Features

During previous surveys conducted, on June 13, 2007, the non-regulated wetlands to the north of the existing landfill revealed the presence of a breeding pair of Canada Geese, and one breeding pair of Mallard Ducks.

4.1.3.3 Other Fauna

The only mammal species observed during visits to the site were Woodchuck (*Marmota monax*) and Gray Squirrel (*Sciurus carolinensis*) and tracks of White-tailed Deer (*Odocoileus virginianus*) and Raccoon (*Procyon lotor*) were also observed. Undoubtedly other additional mammal species occur within the Study Area. None of the species recorded are rare or Species at Risk. No reptiles were observed but it is likely that Eastern Garter Snake (*Thamnophis sirtalis*) is present in the meadows and Painted Turtle (*Chrysemys picta*) in the ponds.

4.2 Site-Vicinity

4.2.1 Aquatic

The nearest fish habitat to the preferred landfill footprint location is seasonal habitat associated with an intermittent agricultural channel (Tributary C) (Figure 6) located approximately 250 m away from the preferred landfill footprint on the west side of William Mooney Road. This channel flows through an agricultural landscape before entering South Huntley Creek on the north side of Richardson Side Road. South Huntley Creek fish habitat within the Site –Vicinity is also seasonal in nature and of poor quality. Refer to **Figure 6** for fish habitat classification mapping.

4.2.2 Vegetation

Active agriculture covers approximately 45% of the lands within the site vicinity. Most of this is cropland but there are some areas used for livestock pasture. Some former cultivated land or pasture has been abandoned in the last decade or so and is regenerating to cultural meadow and thicket. North of the landfill and along Carp Road, a former farmstead has recently been removed and is now regenerating to meadow. Immediately to the west, a former gravel pit is also regenerating to a weedy growth. The lower portion of the pit is seasonally flooded meadow marsh. A deeper permanent pond and cattail marsh is present in the south side of the pit. A portion of deciduous swamp extends onto the site.

Southwest of William Mooney Road, a fairly extensive contiguous area of natural vegetation abuts Highway 417. It contains a mosaic of coniferous, mixed and deciduous forest, as well as deciduous and mixed swamp. There is also a beaver flooded marsh surrounded by thicket swamp. Overall terrain is level or very slightly undulating with a high water table. Consequently forest is mostly moist. The vegetation of the site vicinity is described in greater detail in the Natural Environment Existing Conditions Report AECOM (2011).

