1158 Second Line Road, Ottawa, Ontario

Environmental Impact Assessment and Tree Conservation Report

Presented to:

Mr. Adel Houssari

September 2013

CJB Environnement inc.

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1. PROPERTY INFORMATION

The property under study, owned by Adel Houssari, is found at 1158 Second Line Road, Ottawa, Ontario, Canada, K2K 1X7. The lot, Concession and Township of the property are con 3 pt lot 11 RP 5R-1715; parts 1&2 (PIN: 045260207 Roll#061430081612601) and con 3 pt lot 11 RP 5R-2564 parts 1&2 (PIN: 045261418 Roll# 061430081912605). The name of the councillor for the property is Marianna Wilkinson and the WARD name is Kanata North (number 4). According to Schedule B of the City of Ottawa Official Plan, the land use designation is a General Urban Area. The Zoning By-Law is "Development Reserve Zone", Consolidation, June 25th 2008. The current land use is residential. The property is in the study area of the Kanata North Environmental/Stormwater Management plan (CH2Mhill Canada, 2001).

2. DESCRIPTION OF THE SITE AND THE NATURAL ENVIRONMENT

The study site is found at 1158 Second Line Road (45.349181°N, -75.948673°W). The 1.13 hectare site is forested and located on the northeast side of Second Line Road, between Goward Drive (northwest) and Whernside Terrace (southeast). A steel hydro tower is located along the northeast side of the property (Figure 1).

The site is bordered by two residential developments to the northwest and southeast. To the northeast, the site borders a hydro corridor where a wildflowers and grasses community grow underneath it. Finally, the southwest limit of the property is bordered by the South March Highlands Natural Area.

Covering an area of 1,478 ha, the South March Highlands Natural Area, designated as Natural Environment Area in the City of Ottawa's Official Plan, is a site of Natural and Scientific Interest (Brunton, 2002; Brunton, 2005). A significant wildlife corridor connects the South March Highlands with the Carp Hills to the northwest along the Carp Ridge. Portions of the South March Highlands include provincially significant wetlands.

This Environmental Impact Statement (EIS) is required due to the presence of the South March Highlands Natural Area along the southwest edges of the study site.

2.1 General Map of the Natural Environment

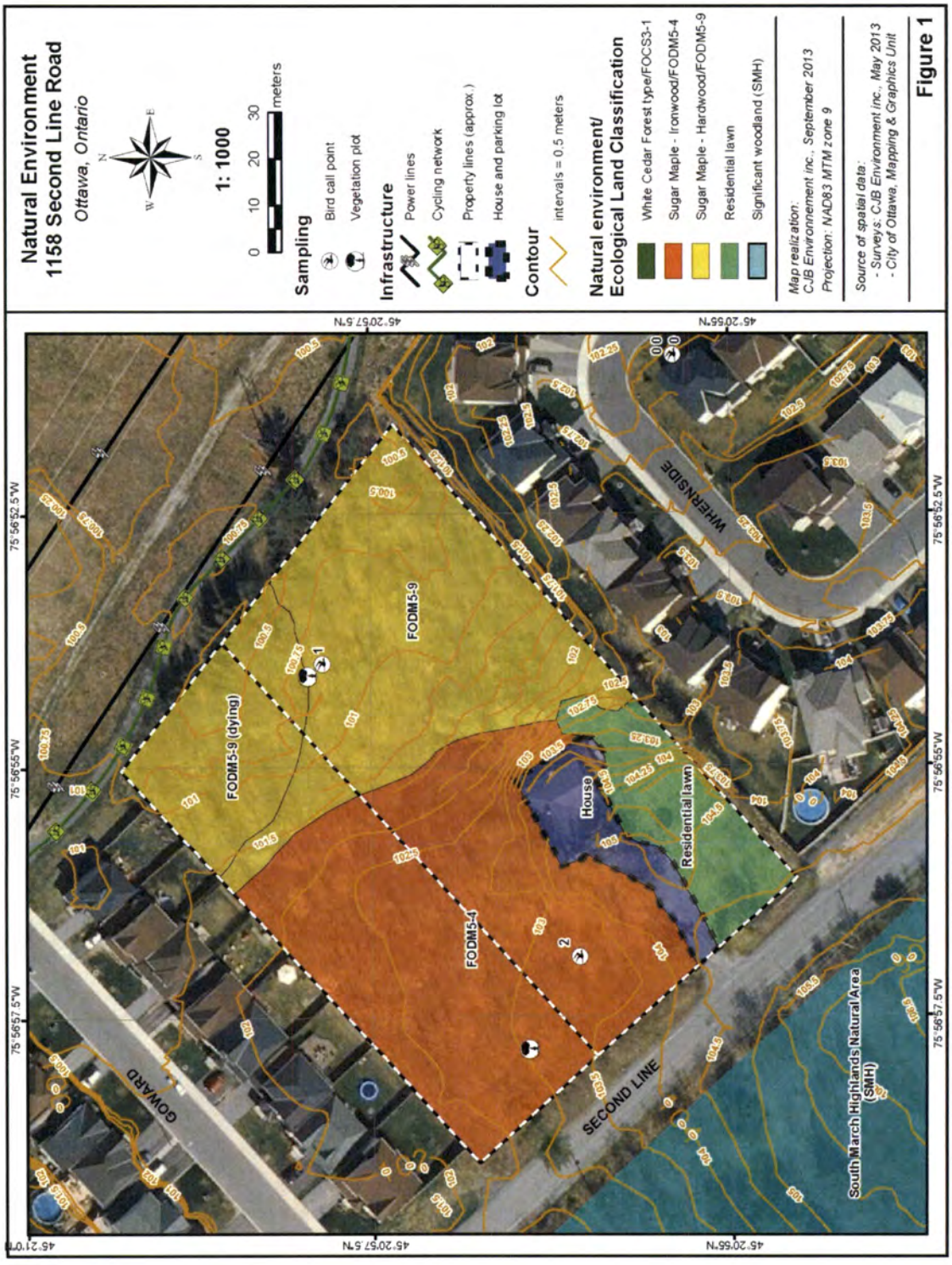

Figure 1. Natural and Man-made elements surrounding the property of 1158 Second Line Road in Ottawa.

2.2 Landforms, Soils and Geology

The surficial geology of the region is composed of clay and silt underlying erosion terraces. These fine materials come from the disappearance of the Champlain Sea which was created from the melting of the glaciers more than 10,000 years ago. Consequently, the upper part of this material contains marine deposits. The bedrock of the site is composed of sandstone with dolomites interbeds (City of Ottawa, 2013a).

Using a soil auger, we executed one soil sampling on the vegetation plot #1 (SMH side, Figure 1). We observed a thin organic soil layer (< 1 cm) overlying a thicker sandy soil horizon (> 17 cm). This soil composition combined with the absence of mottle (i.e. spots of various colors or shades, often rusty brown) suggests that the site has relatively good drainage (Photo 1).

Soil sample (vegetation plot #1, Figure 1)

Photo 1

The finding of a colony of white morels (*Morchella esculenta*) on the site suggests that the soil is slightly alkaline (Photo 2).

White morel (*Morchella esculenta*)

Photo 2

2.3 Surface Water, Groundwater and Fish Habitat

The property of 1158 Second Line Road is in the Ottawa West Watershed (City of Ottawa 2011). No water body (e.g. lakes, ponds, aquifer, springs, streams, etc.) were observed on the property. The nearest water body is the South March Highlands Wetlands complex located 100 meters upland. According to the topology of the property, rain water flows towards the northeast limit of the property (Figure 1). At the regional scale, only 10% of precipitation that falls in the Ottawa area infiltrates into the ground, the rest being lost to evapotranspiration or runoff to rivers and lakes (Natural Resource Canada as cited in City of Ottawa 2011).

2.4 Vegetation Cover

The natural environment of the property at 1158 Second Line Road is described in order to identify vegetation communities and potential environmentally significant urban woodlots and to assess the potential for the occurrence of species at risk at the provincial and federal levels. All vegetation communities identified are classed in accordance with the MNR's Ecological Land Classification (ELC) for Southern Ontario (Lee 2008).

To classify these communities, we sampled two forest plots of 400 m^3 each (Figure 1). For every tree, we measured the diameter at breast height (DBH), which is at approximately 1.20 m from the ground, and the general health condition for each tree. We also measured the height of the forest stand. Finally, we identified and estimated the percentage of cover of shrub and herbaceous understory species. In order identify potential high quality tree specimens or species at risk such as the butternut (*Juglans cinerea*), we walked the entire study site.

According to our results, the field study site has three types of vegetation community. These three vegetation communities are all terrestrial and named as follows: a *Dry Fresh Sugar Maple Ironwood Deciduous Forest type* (FODM5-4), a *Dry Fresh Sugar Maple Hardwood Deciduous Forest type* (FODM5-9), and a residential lawn (Figure 1).

2.4.1 Residential lawn

The first vegetation community is a typical residential lawn (grasses and forbs) of 0.11 ha containing a few isolated trees and shrubs. We observed a few common lilacs (*Syringa vulgaris*) and sugar maples (*Acer saccharum*) (Photo 3).

The edge of the residential lawn (Second Line Road behind)

Photo 3

2.4.2 Dry Fresh Sugar Maple Ironwood Deciduous Forest type (FODM5-4)

As its name suggests, the second vegetation community is a forest stand of 0.485 hectare largely dominated by native species such as the eastern hop-hornbeam (*Ostrya virginiana*) commonly known as Ironwood, and sugar maple (*A. saccharum*). American beech (*Fagus grandifollia*) and northern red oak (*Quercus rubra*) were also observed in this forest plot (Photo 4, 5, 6 and 7). Exploring this forest community, we also observed few individuals of bitternut hickory (*Carya cordiformis*) and white ash (*Fraxinus americana*). The complete statistical details (density and number of stem per hectare) of the forest plot #1 are in Table 1. According to Lee (2008), the abundance of ironwood suggests the presence of a highly managed forest or historically grazed site. Photo 6 suggests a certain level of forest management as brushwood, fallen dead branches and twigs are windrowed. In the North Kanata Environmental Management Plan (CH2Mhill Canada 2001), this forest underwent extensive logging. Consequently, trees are not over the range of 50 to 65 years old. The health condition of this forest stratum is generally good. A few individuals had dead branches or had ecological injuries probably caused by fungi, insect or woodpeckers looking for food (Photo 8 and 9). Some trees reach approximately 20 meters high. Table 1 and Photo 4 to 7 show, however, that the stand has many small trees.

Forest plot #1, southwest view

Photo 4

Forest plot #1, northwest view

Photo 5

Forest plot #1, northeast view

Photo 6

Forest plot #1, southeast view

Photo 7

Sugar maple, injured

Photo 8

Sugar maple, woodpecker injury

Photo 9

The shrub stratum is also largely dominated by a younger stage of the Eastern hop-hornbeam (*O. virginiana*) (55%), and sugar maple (*A. saccharum*) (40%). To a lesser

extent, white spruce (*Picea glauca*) (<5%), white ash (*F. americana*) (<5%), currant (*Ribes spp.*) (<5%), (*Rhamnus cathartica*) (<5%), basswood (*Tilia americana*) (<5%), and the alternate-leaved dogwood (*Cornus alternifolia*) (<5%) are also present in the shrub layer of this forest community. The European buckthorn (*R. cathartica*) is an invasive species in Canada (Environment Canada 2002). Though this species is tolerant of a wide range of moisture and light conditions, at the time of our observations, the population was limited to the edge of the forest (Photo 5).

The forest herbaceous understory stratum is largely dominated by the yellow trout lily (*Erythronium americanum*) (>80%). The remaining 20% of forest herbs observed are the baneberry (*Actaea* spp.), Carex (*Carex* spp.), white trillium (*Trillium grandiflorum*), rattlesnakeroot (*Prenanthes* spp.), large false Solomon's seal (*Maianthemum racemosum*), and Carolina spring beauty (*Claytonia caroliniana*). In addition to the herbaceous species observed in this forest plot, we also identified a few colonies of Canada wild ginger (*Asarum canadense*).

Trees have several ecological functions such as providing shelters and food for wildlife. They also generate oxygen, provide air pollution control, prevent soil from excessive erosion, recycle nutrients, regulate the water table, absorb toxins and control local climate (Beckham 1991). They act, also, as a visual and noise barrier from the traffic on Second Line road and neighbors.

Table 1. Statistic of tree species identified in the forest plot #1.

Species of forest plot #1	Number of stem	%	Density (stem/ha)	Basal area (m^2)	Basal area (%)	Density (m^2/ha)
Eastern hop-hornbeam	30	44.8%	750.0	0.6286	53%	15.72
Sugar maple	25	37.3%	625.0	0.3997	34%	9.99
American beech	11	16.4%	275.0	0.0669	6%	1.67
Northern red oak	1	1.5%	25.0	0.0674	6%	1.68
Total, excluding dead trees	65	97.0%	1625.0	**1.1626**	98%	29.06
Total, dead trees	2	3.0%	50.0	**0.0220**	2%	0.55
Total	**67**	**100**	1675.0	**1.1846**	100%	29.61

According to Muncaster and Brunton (2006), this stand was not evaluated. If we define a continuous forested site as one with a canopy that appears unbroken on an aerial photograph (see Appendix 8: Characteristics of Significant Woodlands in Environmental Impact Statement Guidelines, (City of Ottawa 2013b)), the study area is not continuous since the Second Line Road cuts the study site from the South March Highlands Natural Area. There is no rare vegetation community, or species at risk resent in the study site. While exploring this forest community, a large specimen of sugar maple was identified adjacent to the house (Figure 1).

This forest stand is considered to have moderate ecological value due to many factors including its overall health condition, its species composition (number of species, presence of exotic shrub species), its fragmentation from any natural corridor (road,

house development, power line), and the absence of species at risk and hydrological connection.

2.4.3 *Dry Fresh Sugar Maple Hardwood Deciduous Forest type (FODM5-9)*

The third vegetation community is a forest stand of 0.467 hectares largely dominated by native sugar maple (*A. saccharum*) followed by secondary species such as the eastern hop-hornbeam (*O. virginiana*), basswood (*T. americana*), burr oak (*Quercus macrocarpa*), white ash, (*F. americana*), bitternut hickory (*Carya cordiformis*) and the northern red oak (*Q. rubra*). American beech (*Fagus grandifollia*), eastern white cedar (*Thuya occidentalis*), and eastern hop-hornbeam (*O. virginiana*) were also found (Photo 10, 11, 12 and 13). Exploring this forest community, we also observed a few white elms (*Ulmus americana*). The complete statistical details (density and number of stem per hectare) of forest plot #2 are given in Table 2. Photo 14 suggests a certain level of forest management in this forest segment as brushwood, fallen dead branches and twigs are windrowed. As mentioned earlier, CH2Mhill Canada (2001) suggests that this forest section underwent extensive logging. Consequently, trees are not over the range of 50 to 65 years old. The health condition of this forest stratum is not as good as the FODM5-9. Half of the individuals in the plot were not in good condition. These individuals were dead or had dead branches or had injuries probably caused by fungi, insects or birds such as woodpeckers (Photo 15). The tallest trees are approximately 18 meters high. Table 2 and Photo 10 to 13 show, however, that the stand has many small trees.

Forest plot #2, northwest view

Photo 10

Forest plot #2, southeast view

Photo 11

Forest plot #2, southwest view

Photo 12

Forest plot #2, northwest view

Photo 13

Windrow

Photo 14

Snag of eastern white cedar

Photo 15

Forest dieback

Photo 16

The shrub stratum is also dominated largely at the young stage of the Eastern hop-hornbeam (*O. virginiana*) (60%), and sugar maple (*A. saccharum*) (30%). To a lesser

extent, white ash (*F. americana*) (<5%), European buckthorn (*R. cathartica*) (<5%), basswood (*Tilia americana*) (<1%), basswood (*T. americana*) (<1%), bitternut hickory (*Carya cordiformis*) (<1%), Northern red oak (*Q. rubra*) (<1%), currant (*Ribes spp.*) (<1%), black cherry (*Prunus* serotina), chokecherry (*P. virginiana*), and eastern poison ivy (*Toxicodendron radicans*) are also found in the shrub layer of this forest community.

The forest herb stratum is largely dominated by the yellow trout lily (*Erythronium americanum*) (>50%) and Carex (*Carex* spp.) (20%). The remaining 30% cover of forest herbs observed are the white trillium (*Trillium grandiflorum*), sharp-lobed hepatica (*Anemone acutiloba*), violet (Viola spp.), partridgeberry (*Mitchella repens*), grasses (*Poa* spp.), aster (*Aster* spp.), and common dandelion (*Taraxacum officinale*).

This community has several ecological functions such as providing shelter and food for wildlife. Forest communities also generate oxygen, provide air pollution control, prevent soil from excessive erosion, recycle nutrients, regulate the water table, absorb toxins and control local climate (Beckham 1991). They act as a visual and noise barrier from the traffic on Second Line road and neighbors.

Table 2. Statistic of tree species identified in the forest plot #2.

Stem number (all conditions):	Number of stem	%	Density (nb stem/ha)	Basal area (m^2)	Basal area (%)	Density (m^2/ha)
Eastern hop-hornbeam	13	28.9%	325	0.0547	4.93%	1.37
Sugar maple	17	37.8%	425	0.3592	32.39%	8.98
American beech	0	0.0%	0	0.0000	0.00%	0.00
Northern red oak	1	2.2%	25	0.0630	5.68%	1.58
Eastern white cedar	2	4.4%	50	0.0379	3.42%	0.95
Glossy buckthorn	4	8.9%	100	0.0034	0.31%	0.08
Burr oak	2	4.4%	50	0.1178	10.62%	2.94
Bitternut hickory	1	2.2%	25	0.0602	5.43%	1.51
Basswood	3	6.7%	75	0.2722	24.54%	6.80
White ash	2	4.4%	50	0.1408	12.69%	3.52
Total, excluding dead trees	**45**	93.8%	1125	**1.1092**		27.73
Total, dead trees	**3**	6.3%	75	**0.0459**		3.52
Total	**48**	100.0%	1200	**1.1551**		31.25

According to Muncaster and Brunton (2006), this stand was not evaluated. If we define a continuous forested site as one with a canopy that appears unbroken on an aerial photograph (see Appendix 8: Characteristics of Significant Woodlands in Environmental Impact Statement Guidelines, (City of Ottawa 2013b)), however, the study area is not continuous since the Second Line Road separates the study site from the South March Highlands Natural Area.

This forest stand is considered to have moderate ecological value due to many factors including its overall health condition, its species composition (number of species, presence of exotic shrub species), its fragmentation from any natural corridor (road,

house development, power line), and the absence of high quality specimen or species at risk and hydrological connection.

A small portion of this vegetation community (0.14 ha) was in very bad condition. This stand is located at the northern section of the study site (Figure 1). Indeed, this forest section has several snags (i.e. standing leafless trees) probably caused by a significant natural stress agent (e.g.: lack of water, insects, fungi, etc.) (Photo 18). We were not able to identify the cause of this forest dieback. We observed, however, dying sugar maple, white ash, and some aspen (*Populus* spp.). The forest regeneration of this section was well established with the Eastern hop-hornbeam (*O. virginiana*) dominating the vegetation cover (60%) followed by the white ash (25%), the European buckthorn (*Rhamnus cathartica*) (5%), and minor species such as the bitternut hickory (*Carya cordiformis*) and the black cherry (*Prunus serotina*).

We also observed isolated non vigorous and snags of white ash on the property. Some of these snags were cut (Photo 17) while others were still standing (Photo 18). The cause of their death is unconfirmed.

Snag of white ash cedar cut down

Photo 17

Snag of white ash standing

Photo 18

2.5 Wildlife

2.5.1 Birds

Two bird call points were done on the property. To conduct the bird call survey, we used the Ontario Breeding bird Atlas protocol (Ontario Breeding Bird Atlas 2001). Weather conditions of this inventory are described below (Table 3).

Table 3. Information on the condition of the bird calls point.

Song bird point count	Date	Starting time	Duration	Cloud condition	Wind condition	Temperature
Station #1	May 18 2013	5:02 AM	15 minutes	Clear	None (0 km/h	8 °C
Station #2	May 18 2013	5:23 AM	15 minutes	Clear	None (0 km/h	8 °C

A total of seventeen birds species were identified by call. Nine species were heard inside the property limits whereas eight species were heard outside the property limits. The complete list of birds species heard from the survey is given in Table 4. Bird calls heard on the go were also noted.

Table 4. Bird species heard at the bird call point 1 and 2 on May 16, 2013.

Species	Point #1 (Power line side)	Point #2 (SMH side)	Heard on the go	Inside the property	Outside the property
American crow	X		X		X
American goldfinch		X		X	
American robin	X	X	X	X	
Black-capped chickadee	X	X			X
Blue jay		X			X
Brown thrasher			X	X	
Canada Goose	X	X			X
Chipping sparrow	X			X	
Eastern phoebe	X	X	X	X	
Great crested flycatcher			X	X	
Killdeer			X		X
Mourning dove		X			X
Northern cardinal			X	X	
Northern flicker		X		X	
Red-winged blackbird	X	X			X
Song sparrow	X				X
White-breasted nuthatch			X	X	

2.5.2 Amphibians

For the amphibian survey, we used the protocol defined in the Marsh Monitoring Program (Konze *et al.* 1997). We modified some aspects of the program. For example, we performed the amphibian call survey even if open water was mandatory to undertake the survey. We used, therefore, the exact same location as for the bird call survey in order to hear potential amphibians inside the property or outside the property limits (e.g.: Power line side #1 or the South March Highlands Natural Area side #2). According to the Konze

et al. (1997) guidelines, we did Survey 2 that, depending of the spring conditions, should be performed between May 15th and May 30th. We performed the survey half an hour after sunset. The weather conditions were excellent for the survey (e.g.: no wind, temperature 15°C, etc.).

The only amphibians noted were Spring peepers heard at the point located on the side of the South March Highlands Natural Area. The location of these calls is estimated to be in the South March Highlands Natural Area. Accord to the Konze *et al.* (1997), the level of calling was 2 meaning that the number of some individuals can be estimated or counted, others overlapping. At the second survey point (the side of the power lines), no amphibian was heard outside or inside the property limit.

2.5.3 Mammals and reptiles

Active searching was performed for mammals and reptiles. No individuals were observed during the field visits. We did observe the entrances of a few groundhog burrows within the property limits. According to the landowners, white-tailed deer visit the study site occasionally.

2.6 Habitat for Species at Risk

The timing of our surveys concorded with the presence of spring ephemerals (early to mid-May) and woodland sedges (mid-May to early June). Consequently, we were in a good position to observe plant species at risk growing in the forested study site. No species at risk were observed.

According to Erin Thompson, a biologist at the Ministry of Natural Resources Kemptville District, a few species are documented in proximity of the site. These species are butternut (endangered), Blanding's turtle (threatened), whip-poor-will (threatened), milksnake (special concern), and the snapping turtle (special concern) (Appendix 1). None of these species was observed.

The study site can still have potential for some species at risk. The potential, however, is greatly reduced due to the regular use of the site by the landowner and his family. As discussed earlier, we observed a few windrows of dead branches, many trails and one small cabin in the trees.

As mentioned in the Environmental Data Collection Checklist given by the City of Ottawa for this project, special attention was given to the Whip-poor-will and the Blanding's turtle.

2.6.1 Whip-poor-will

Using the whip-poor-will pilot project participant's guide (Ontario Whip-poor-will Project 2012), we set up a whip-poor-will survey in order to detect the presence of this species at risk (threatened in Ontario and in Canada). The call of the whip-poor-will was played after the sunset at the birds call station 1 and 2 for 2 x 3 minutes. Bird call station 1 is in the

FODM5-9 type of forest whereas bird station 2 is in the FODM5-4 type of vegetation (Figure 1). After played the call, we listened for approximately ten minutes. Every individual heard was noted in the field book. The distance (m) and direction (bearing, °) of the call heard were estimated.

Table 5. Information on the condition of the whip-poor-will survey.

Song bird point count	Date	Starting time	Duration	Cloud condition	Wind condition	Temperature
Station #1	May 17 2013	20:45 PM	16 minutes	Clear	None (0 km/h	13-15 °C
Station #2	May 17 2013	21:11 PM	16 minutes	Clear	None (0 km/h	13-15 °C

No whip-poor-wills were heard during the survey. For short periods of time, noisy cars driving on Second Line Road disturbed the survey.

2.6.2 Blanding's turtle

As it was mentioned in the Environmental Data Collection Checklist for this project, special attention was given to the Blanding's turtle. During the field visit, no Blanding's turtles were observed during the active searching for reptiles. Moreover, the study site does not correspond to the habitat requirements of this species.

3. DESCRIPTION OF THE PROPOSED PROJECT

CJB Environmental was contracted to conduct an Environmental Impact Statement (EIS) for a residential development to be located on 1158 Second Line Road, con 3 pt lot 11 RP 5R-1715; parts 1&2 (PIN: 045260207 Roll#061430081612601) and con 3 pt lot 11 RP 5R-2564 parts 1&2 (PIN: 045261418 Roll# 061430081912605), Geographic Township of March, Ottawa, Ontario, Canada. The proposed project is a residential development of single houses/semi detached or town units. No development plans are currently available. Property lines in Figure 1 demonstrate the potential extent of the project. The proponent of the project is seeking both a rezoning and site approval from the City of Ottawa. The EIS was undertaken in advance of the rezoning application and is required as part of the application process.

3.1 Constraints

3.1.1 South March Highlands Natural Area

As described previously, located a few hundred meters south of the 1158 Second Line Road, the South March Highlands Natural Area is designated as a Natural Environmental Area in the Schedule A of the Official Plan. The forest is located immediately adjacent to and within the urban and developing area in Kanata. According to the City of Ottawa's website, the Forest is an ecologically significant and diverse area in the City of Ottawa, and is also an important environment for outdoor recreation such as biking, hiking, birding, etc.

3.1.2 Others

The North Kanata Environmental Management Plan (CH2Mhill Canada 2001) identified two environmental features in and around the property. First, the property would have a Sugar Maple Forest and Small Red Ash Swamp of "medium" quality. After characterising the site, our data suggest that the forest is composed essentially of a Dry Fresh Sugar Maple Ironwood Deciduous Forest type (FODM5-4) and a Dry Fresh Sugar Maple Hardwood Deciduous Forest type. No wetland/swamp was observed on the site. Second, the report mentioned that a wetland and an osprey nest are located east of the study site. At the time of our visit, no wetland and osprey nest were observed. Moreover, during the amphibian surveys, no amphibian was heard on the property. The land is now dominated by wildflowers and grasses that grow underneath a power line.

An old landfill of 2.1 ha is located at 0.5 km south southeast of the study site. The landfill operated from 1963 to 1974. According to the Memo of the City of Ottawa (2002), "there continues to be no evidence of a related public health risk" regarding the old landfill. Moreover, a letter from AMEC (2013) confirms that the area of influence is not impacting the property and satisfies Section 3.8 of the Official Plan (Appendix 2). Therefore, no additional investigation (Risk Assessment) is required.

3.2 Plans and Drawings

The EIS was undertaken in advance of rezoning application and is required as part of the application process. No Plans and Drawings were available at the time the EIS was undertaken.

4. IMPACT ASSESSMENT

4.1 General

The South March Highlands Natural Area is the major natural heritage feature in the immediate area and is a significant attribute of the regional landscape. However, the study site does not contribute to the features and functions of the adjacent South March Highlands Natural Area. There are no environmental features of note present on the forested study site. There is no hydrological connection (water course) between the site and the natural area as the contouring of the land would cause rain water to exclusively flow from South March Highlands onto the site and from the site to the east (power lines), away from South March Highlands. Furthermore, the Second Line Road separates the South March Highlands from the study site. Two road ditches are located at each side of the street which capture this rain water from the South March Highlands Natural Area and drain this water away from the study site due to a slope in elevation. Therefore, the site does not contribute to the hydrology regime of South March Highlands. Any increases in impervious rain water will not impact the moisture regime of the South March Highlands.

4.2 Impact assessment matrix

The environmental assessment of the project primarily aims to identify, describe and assess the negative effects and propose mitigation measures on the receiving environment. For the purposes of the analysis, the project is designed in four phases: site preparation, construction, operation, and decommissioning. To facilitate the descriptions of negative effects and mitigation measures, the project components are grouped by themes, as presented in Table 6. The components of the project are facing the elements of the environment in a double-entry table, which identifies all interrelationships between the project and the elements of the receiving environment (Table 6). In this table, an interrelationship is indicated (X) whenever a part of the project is likely to have an effect on one of the elements of the environment.

Table 6. Matrix to identify environmental effects

DIMENSIONS	PHYSICAL							BIOLOGICAL						
	AIR		SOL			Water		Habitat		Fauna		Veg.		
						Ground	Surface							
	Quality	Sound env.	Quality	Drainage	Erosion	Quality	Quality	Terrestrial	Aquatic	Terrestrial	Aquatic	Terrestrial	Aquatic	Landscape
SITE PREPARATION														
1. Delineating protective zones			X											
2. Vegetation clearing										X		X		
3. Demolition of the existing house		X	X											
CONSTRUCTION														
4. Soil excavation	X	X	X			X	X							
5. Street and buildings construction	X	X	X				X							
6. Waste management and residual material			X				X							
7. Machinery	X	X	X				X							
OPERATION														
8. Traffic	X	X												
9. Residential development								X		X				X

Table 7. Impacts and Mitigations Summary Table

Activity	Natural Feature/Function	Potential Effect (may be positive or negative)	Proposed Mitigation	Residual Effect (may be positive or negative)
Site preparation				
1. Delineating protective zones	Soil quality	Delineating protective zones (South March Highlands Natural Area and residual trees on the site) will prevent the passage of machinery in the Natural Area and will circumscribe the passage of the machinery on study site. This action will prevent soil erosion as well as the compaction of soil around trees.	- Mark the excavation site using visible markers (ribbon, rope, paint, etc.) and inform workers of the precautions to be taken.	The negative residual impact is deemed negligible.
2. Vegetation clearing	Vegetation	Loss of trees on the site	- Immediately cut all ash species found on the site. - Only remove trees that cannot be conserved. - Special attention must be given to residual trees in order to avoid injuries to trunks, branches or roots.	Removal of invasive, trees severely infected by pathogens. If necessary, replace cut tree by native species as recommended in the EMP. Positive effect to neighbours is expected as dangerous tree will be eliminated. See Tree Conservation Report section 5.1
	Breeding birds	Destruction of the nests of breeding birds.	- No tree removal will take place between April 15th and July 31th to minimize the impact on breeding birds. - A pre-clearing survey for active stick nests and cavity nests must also be conducted between April 1st and April 15th, in order to identify early-nesting owls and raptors.	Residual effect should be minimized as birds may breed on trees in surrounding area (e.g. SMH).
3. Demolition of the existing house	Soil quality	Waste material resulting from demolition activities may cause contaminants to disperse in the soil and surrounding environment. Impact from this work is possible with respects to potential contamination.	- The work must be performed by a qualified contractor. - Once the house is demolished, appropriate waste management procedures will be taken so that the materials do not contaminate the environment. The material will be placed in containers.	Taking into account the mitigation measures, the residual impact is deemed negligible.

		Given the relatively small size of the structures, the impact is considered negligible.	- All waste will be disposed of in accordance with regulations and cannot be incinerated or buried on site. - Following excavation, clean soil will be used to backfill and rehabilitate the area.	
	Soil quality	The movements of trucks and heavy equipment present a risk of accidental spills and therefore a risk of soil contamination. Given the relatively small size of the site, the impact is considered negligible.	- Provide the necessary equipment to prevent dispersion of wastes into the environment. - See section 8. Machinery	Taking into account the mitigation measures, the residual impact is deemed negligible.
	Sound environment	The demolition activities will be a source of noise.	- The usual working hours (7AM-7PM) will be respected.	Taking into account the mitigation measures, the residual impact is deemed negligible.
Construction				
4. **Soil excavation**	Air quality	Excavation could give rise to airborne dust that may affect air quality, especially in dry weather. However, these will be negligible.	- Limit the time periods in which fine materials that may be a source of dust are exposed. - Adopt working methods that minimize the emission of fine particles. The use of water as a dust suppressant should be done with great care, including the recovery and proper management any runoff. - Minimize the duration of these operations.	Taking into account the mitigation measures, the residual impact is deemed negligible.
	Sound environment	The excavation work will be a source of noise.	- The usual working hours (7AM-7PM) will be respected.	Taking into account the mitigation measures, the residual impact is deemed negligible.
	Soil quality, surface water and groundwater	The project will require soil excavation for the implementation of a street and various infrastructure such foundations, drainage, separator, pipes, piles, concrete slab, and installation of public and private utilities (sewage and aqueduct).	- The work must be performed by a qualified contractor. - If soil contamination is detected, once excavated, appropriate soil management is essential to avoid contamination of the environment. Place in airtight containers or shelter from the elements by covering with traps. Complete characterization of the	Considering the application of mitigation, the residual impact is negligible.

		Impact from this work is possible with respects to potential contamination.	excavated soil at the bottom and sides of trenches to determine their appropriate destination. Redirect to an authorized site, in accordance with the standards. Following excavation, clean soil will be used to backfill and rehabilitate the area.	
	Surface water quality	Water can accumulate in excavations during construction. The impact is negligible.	- Water in the excavations will be pumped and directed to a water treatment system or to an authorized site.	Considering the application of mitigation, the residual impact is negligible.
5. Street and building construction	Air quality	Construction of the street and the wood and metal structures for the buildings involves activities that may affect air quality through the emission of fine particles. Painting can also temporarily affect air quality in the immediate vicinity of the site. Given the relatively small size of the buildings, the impact is considered negligible.	- Adopt good working practices to minimize emissions and volatilization of solvents and paints.	Considering the application of mitigation, the residual impact is negligible.
	Sound environment	A variety of activities such as assembly work and welding may cause noise. Two small residential areas adjacent to the study site may be affected by these noisy activities.	- The usual working hours (7AM-7PM) will be respected.	Considering the application of mitigation, the residual impact is negligible.
	Soil quality and surface water	Impacts on soil quality and surface water from spills are possible. Contaminants that may be discharged include welding debris, paint and solvents. Accidental spills of dirty water during cleaning activities could also cause contamination of soil and surface water. The magnitude of the impact depends on the number of incidences and the amount of material discharged. Taking into account the measures proposed by the proponent, the risk is very low.	The following measures must be taken to minimize the risk of spills: - Set up the working areas to reduce the risk of soil contamination. - Minimize the amount of solvents used. - Handle paint and solvents containers in places where it is possible to recover spills. - Keep containers that are not in use closed. - Prohibit the disposal of paints, solvents and wastewater on the ground or in ditches. - Quickly recover any spilled hazardous material, even small quantities, and dispose of them in compliance with applicable regulations. - Continuous care is essential to avoid accidents that can cause a spill.	Considering the strict application of mitigation, the residual impact is negligible.

6. **Waste management and residual material**	Soil quality and surface water	Waste management, including management of hazardous waste, can affect soil and surface water quality. In this case, the waste produced on site will include construction and demolition debris from the existing house and parking lot. Considering the nature and magnitude of the work, the impact is considered minor. Inadequate soil and debris management could result in impacts to soil and surface water. The magnitude of this impact varies according to the volumes involved, the nature of the soils and their dryness, as well as weather conditions.	- Comply with the applicable rules and regulations for waste management. Manage in accordance with the principle of 4Rs: reduction, reuse, recycling and recovery. - Manage soils in accordance with the results of the characterization. If contaminated soil is detected, it must be managed in accordance with the appropriate regulations and disposed of at an authorized site. - Pay attention to waste likely to be carried by the wind (paper, plastic bags, etc.). At the end of the work, collect all waste, including empty containers and packaging. - Waste must be transported by a qualified contractor holding the licenses and permits required, particularly for the transport of hazardous waste. - Care should be taken to prevent accidental spills during handling, packaging and transport of debris and contaminated soils. - The contractor must provide an emergency plan to recover the contaminated soil or toxic and dangerous debris that could accidentally fall from the trucks. - Fallen debris will be collected and managed according to current environmental regulations.	Considering that contaminated soils, if any, will be disposed of in an authorized site and considering the rigorous application of the mitigation measures, the residual impact is considered negligible.
	Fauna	Disturbance, displacement, injury or death of wildlife as a result of vegetation clearing and other activities associated with site alteration or development.	- Contractors and other on-site workers should be briefed on appropriate measures to reduce human-wildlife conflict during the work *(e.g.* waste management, no feeding of wildlife, no deliberate harm to wildlife). If necessary, provide contact numbers for large animal removal, rehabilitation of injured wildlife, and species at risk reporting.	Considering the application of the mitigation measured, the residual impact is negligible.

7. Machinery	Air quality	The use of machinery is likely to affect air quality. The movements of the machinery and the repeated passage of trucks may cause degradation of air quality through the emission of fine particles. Given the amount of work, the impact is considered minor. In addition, considering the small number of trucks involved and the easy access via the Second Line Road, this impact is considered negligible.	- Use of equipment in good operating condition and in compliance with emission regulations. - Turn off the engines when machinery is not on operation. - As needed, clean circulation areas to minimize dust lift. - When transporting soils or materials that can be carried by the wind, make sure to cover the loads with tarps to prevent any loss, as required by the road safety code.	Considering the application of mitigation, the residual impact is negligible.
	Sound environment	The machinery and trucks have a negative impact on the sound environment. Transportation activities will affect the noise environment along the routes used by trucks. Two small residential areas may be affected by these noisy activities. Given the amount of work and the machinery used, the impact is considered minor.	- Use equipment in good operating condition and equipped with an adequate muffler. - Turn off the engines when machinery is not on operation. - The usual working hours (7AM-7PM) will be respected.	Considering the application of mitigation, the residual impact is negligible.
	Soil quality and surface water	The presence of machinery on the site could be the source of leakage of oil or grease, which may cause soil and surface water contamination.	Take measures to reduce the risk of leaks and spills: - Use clean equipment in good operating condition to minimize leakage and potential breakage and spills. - Do not perform maintenance of equipment on the site. - ,If possible place the machinery on paved or nonporous surfaces When the machinery is put away for the night or for short periods of time. A possible spill would then be easy to recover. - Remove from the site any vehicle that is no longer required. - If they are required on site, handle and store petroleum products carefully (at least 30 m from any ditch).	Considering the application of the mitigation measures, the residual impact is negligible.

			- Provide permanent presence on site of equipment to deal with a spill (absorbent, waterproof containers, etc.). - Collect any spill, even of small amounts. - If a spill occurs, apply emergency measures to control the spill and fix the problem that caused the spill (breakage, mishandling, etc.). Contain the contaminated area clean and remove contaminated material and send it to an authorized site. Report the accident by contacting the appropriate authorities. - Use watertight dump trucks for the transportation of soils. - The drivers of all trucks and other vehicles will take the necessary precautions to minimize the risk of leaks or spills during transport such as defensive driving, following speed limits, etc. - At the end of the work, clean the site of any material that falls off the trucks.	
Operation				
8. **Traffic**	Air quality	Traffic is likely to affect air quality. The movements of vehicles may cause degradation of air quality by the emission of fine particles.	- Turn off truck engines when they are not in operation. - As needed, clean traffic areas to minimize dust lift.	Considering the application of mitigation, the residual impact is negligible.
	Sound environment	Machinery and trucks have a negative impact on the sound environment. Considering that the work involves small machinery, the impact is negligible. Two small residential areas, however, may be affected by these noisy activities.	- Use equipment in good operating condition and equipped with an adequate muffler. - Turn off the engines with machinery is not on operation.	Considering the application of the mitigation, the residual impact is negligible.

9. Residential development	Landscape	The new residential development will replace a house. It may affect the visual environment of the neighbourhood; however, given the presence of two other residential developments adjacent to the site, the effect is negligible.	- If necessary, trees and shrubs will be planted all along the site. This will integrate the new residential development into its surroundings.	Considering the application of the mitigation, the residual impact is negligible. Greening the site is a positive effect through which the wildlife corridor of the Shirley's Brook North Branch will be improved.
	Vegetation	Loss of native biodiversity due to increased presence of non-native invasive species after development.	- Use only locally appropriate native species for landscaping adjacent to the South March Highlands. - Re-establish native vegetation along new or disturbed edges of natural features by seeding or transplanting locally appropriate native species (except all ash species).Provide new homeowners with a list of locally appropriate native species for use in landscaping, along with information on the negative impacts of non-native invasive species such as the Norway maple, Amur maple, periwinkle and other commonly cultivated species.	Considering the application of the mitigation, the residual impact is negligible.
	Fauna	Ongoing conflicts between wildlife and humans or domestic pets following development of new homes in or adjacent to the South March Highlands.	- Provide *Owner Awareness Package* to all new residents, including information on avoiding and resolving human-wildlife conflicts, with references for more information. - Include information on potential consequences of allowing pets to roam unattended, including o Impacts of pets on wildlife o Impacts of wildlife on pets o Legal restrictions on uncontrolled pets	Considering the application of mitigation, the residual impact is negligible.

5. MITIGATION

This section highlights recommendations to minimize potential impacts to the natural environment and presents a Tree Conservation Report.

5.1 Tree Conservation Report

The field surveys and this report were completed by Dominic Chambers, who has a Master's of Science in Biology/Forestry and over 8 years of experience as a biologist in completing field surveys and natural environment assessments. Chantale Caux, who has over 8 years of experience as a Biologist, accompanied Mr. Chambers during the field surveys. Bruno Dupré, with over twelve years of experience in environmental assessment, supervises the current project.

The objectives of this section were to determine the measures of protection for retained trees (if applicable), make recommendations for the removal of particular tree species, and finally suggest appropriate tree species for landscaping. Despite the absence of development plans, this Tree Conservation Report was prepared in order to outline the protective measures that must be taken with respect to retained trees. According to the proponent of the development project, a maximum of trees will be protected to provide an added value to the residential development.

A small portion of the site (21.5%) is adjacent to a South March Highlands Natural Area. The majority of the site is bordered by other residential developments (56.6%) or power lines (21.8%) beneath which wildflowers and grasses grow. The Second Line Road separates the study site from the South March Highlands forest (Figure 1). The study site is mainly forested. A complete description of the forest stands is given in section 2.4.2 and 2.4.3 of the EIS.

If there is retained trees, prior to the works, the sections of the property with these trees will be protected by placing a fence at least 1.5 metres high. The fence will be placed outside the root critical zone (RCZ). According to the City of Ottawa's website, the RCZ is established as being 10 centimetres from the trunk of a tree for every centimetre of trunk diameter. The trunk diameter is measured at a height of 1.2 metres for trees of 15 centimetres diameter and greater and at a height of 0.3 metres for trees of less than 15 centimetres diameter.

As discussed in the impact assessment matrix, no grading or activities that may cause soil compaction such as the passage of heavy machinery and stockpiling of construction material are allowed within the RCZ of retained trees (if applicable). The root system, trunk or branches of the trees to be retained must not be damaged. For example, no signs, notices or posters are allowed to be attached to a tree. Avoid directing the exhaust fumes from any equipment towards the canopy of trees to be retained. Any branches of a retained tree that interfere with any stage of the residential development are to be

removed by a qualified arborist. Pruning trees without using proper techniques could create entrances for pathogens.

As mentioned in the matrix, some species of trees are recommended in the residential development landscaping plan. It will be important to priorities *Upland Dry Forest* species such as the sugar maple, basswood, red oak, etc. It is important to avoid any non-native species such as the Norway maple, buckthorn shrubs and the recently popular Japanese knotweed. Some native species must be avoided. All ash species are now vulnerable to the emerald ash borer. This insect is a highly destructive wood-boring beetle that feeds under the bark of all ash trees even individuals having a DBH < 2cm (Natural Resources Canada, 2012). Silver maple and willows must be avoided because of their very intrusive root systems that could damage house foundations, water lines and sewers. Finally, shade intolerant species such as poplars and birches are undesirable next to a house because of the softness of their wood. The branches and trunk of these species are more likely to break during strong winds.

To protect breeding birds, no tree or shrub larger than 1 cm (DBH) should be removed between April 15th and July 31st.

6. MONITORING

As suggested in the Contents of the Environmental Impact Statement Report (City of Ottawa, 2012), a monitoring program in EIS using basic and/or conventional mitigation measures to avoid or minimize potential impacts is not needed. The mitigation measures suggested in the impact matrix (section 4.2) are conventional.

7. SUMMARY AND RECOMMANDATIONS

The site is mostly forested with a small portion of disturbed land occupied by the house and a driveway. The forested portion contains three different terrestrial vegetation communities: a *Dry Fresh Sugar Maple Ironwood Deciduous Forest type* (FODM5-4), a *Dry Fresh Sugar Maple Hardwood Deciduous Forest type* (FODM5-9), and a residential lawn.

The residential development of the site will not have any negative impacts on the natural features and functions of the South March Highlands Natural Area if existing woody vegetation along the boundary of this natural area is preserved and the mitigation measures identified in this section 4.2 are followed. This conclusion is also based on the following points:

- First, there is no hydrological connection (water course) between the site and the natural area. The topography of the land would cause rain water to flow exclusively from the South March Highlands onto the site and from the site to the east (towards the power lines), away from South March Highlands. Furthermore, the Second Line Road separates the South March Highlands from the study site. Two ditches are located on each side of the road. These capture the rain water from the South March Highlands Natural Area and drain it away of the study site.

- Second, no natural features of note on the site itself.

- Third, no species at risk were observed on the site despite the fact that we covered the entire study site during their growing season. Moreover, no Whip-poor-will, Blanding's turtle and butternut were observed despite the fact that they were specifically targeted by different surveys.

This EIS identifies mitigation measures for the woody vegetation to be retained. The EIS concludes that the residential development will not have a significant impact on the adjacent Natural Area if the proposed mitigation measures are fully respected.

Here are some general recommendations regarding the residential development:

1. All ash species found on the site should be cut immediately in order to avoid the study site becoming a possible source of infestation by the emerald ash borer;

2. Woody vegetation inside the study site is to be removed outside of the bird breeding period from April 15th to July 31st;

3. Landscaping must priorities *Upland Dry Forest* species such as the sugar maple, basswood, red oak, etc. Silver maple, willows, and shade intolerant species should be avoided.

8. REFERENCES

Beckham, N., 1991, Trees: finding their true value, Australian Horticulture, August 1991.http://www.uow.edu.au/~sharonb/STS300/valuing/price/pricing.html

CH2Mhill Canada, 2001, Kanata North Environmental/Stormwater Management Plan, Development Services Department, Ref N°: ACS2001-DEV-POL-0008, Ottawa, 71 pages.

City of Ottawa, 2011, Characterization of Ottawa's Watersheds: An Environmental Foundation Document with Supporting Information Base., City of Ottawa, March 2011

City of Ottawa, 2012, Contents of the Environmental Impact Statement (EIS) Report, City of Ottawa, 19 pages.

City of Ottawa, 2013a, Geological spatial databases, Mapping & Graphics Unit, Planning & Growth Management Department, City of Ottawa, 2013

City of Ottawa, 2013b, Environmental Impact Statement Guidelines, Development application review, City of Ottawa, available at http://ottawa.ca/en/development-application-review-process-0/appendix-8-characteristics-significant-woodlands

Konze, Karl and McLaren, Margaret, 1997, *Wildlife Monitoring Programs and Inventory Techniques for Ontario*. Ontario Ministry of Natural Resources. Northeast Science and Technology. Technical Manual TM-009. 139 pp.

Lee, H., 2008, Southern Ontario Ecological Land Classification Vegetation Type List. Ontario Ministry of Natural Resources, London, 35 pages.

Muncaster and Brunton, 2006. Urban Natural Areas Environmental Evaluation Study, City of Ottawa, Ottawa.

Natural Resources Canada, 2012, Emerald ash borer, Natural Resources Canada, Government of Canada, Ottawa, http://cfs.nrcan.gc.ca/pages/318.

Ontario Breeding Bird Atlas, 2001, Guide for participant, Ontario Breeding Bird Atlas, University of Guelph, Guelph, 45 pages.

Ontario Whip-poor-will project, 2012, Where in the square? Whip-poor-will pilot project participant's guide, Bird Studies Canada, Port Rowan, 14 pages.

Appendix 1

MINISTRY of NATURAL RESOURCES COORESPONDENCE

Good morning Mr. Chambers,

I took a look at the property you outlined in your email and screened it for species at risk (SAR). The following species are documented in proximity to the site:

Butternut (endangered –END)
Blanding's turtle (threatened- THR)
Whip-poor-will (THR)
Milksnake (special concern- SC)
Snapping turtle (SC)

Endangered and threatened species have species protection and Whip-poor-will has general habitat protection and species protection.

Little brown bat has been recently listed as endangered and has both species and habitat protection. Though not documented here, there is the potential for the species to occur. Chimney Swift (THR) is also afforded the same type of protection and may occur on the site should any old cavity trees or chimneys be present.

Please note that general habitat protection for all endangered and threatened species comes into effect June 30th of this year. Also, information regarding species at risk is based on documented occurrences only and does not include an interpretation of potential habitat within or in proximity to the site in question. Although this data represents the MNR's best current available information, it is important to note that a lack of information for a site does not mean that additional features and values are not present. i.e.: Species at Risk (SAR) or their habitat could still be present at the location or in the immediate area. It is the responsibility of the proponent to ensure that species at risk are not killed, harmed, or harassed; or their habitat is not damaged or destroyed through the activities carried out on the site. The MNR continues to strongly encourage ecological site assessments to determine the potential for SAR habitat and occurrences. When a SAR or potential habitat for a SAR does occur on a site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for a permit (Section 17). For specific questions regarding the Endangered Species Act (2007) or SAR, please contact a district Species at Risk Biologist at sar.kemptville@ontario.ca.

Please note: The advice in this letter may become invalid if:

- The Committee on the Status of Species at Risk in Ontario (COSSARO) re-assesses the status of the above-named species OR adds a species to the SARO List such that the section 9 and/or 10 protection provisions apply to those species.
- Additional occurrences of species are discovered.
- Habitat protection comes into force for one of the above-mentioned species through the creation of a habitat regulation.

For future information requests, please review and fill out the attached application and send to Kemptville.inforequest@ontario.ca.

Regards,

Erin Thompson

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Appendix 2

Letter from AMEC, April 15 2013

April 15, 2013

VIA EMAIL

TZ13009

Adel Houssari and Nada Harb
1158 Second Line Road
Kanata, Ontario
K2K 1X7

Dear Mr. Houssari and Ms. Harb:

**RE: Former Township of March Closed Landfill
Development Property 1158 Second Line Road**

AMEC Environment & Infrastructure, a Division of AMEC Americas Limited ("AMEC") was retained by Adel Houssari and Nada Hard to provide an assessment of the potential environmental concerns that the Former Township of March Closed Landfill ("March Landfill") may present with respect to a proposed development property located at 1158 Second Line Road in Ottawa (Kanata), Ontario (the "Development Property"). The proposed Development Property is located within 500 metres of the March Landfill. The location of the Development Property and the March Landfill are shown on Figure 1 attached. This letter addresses the potential environmental concerns and is intended to provide the necessary clearance for the Development Property with respect to March Landfill to satisfy the City of Ottawa's Planning and Approval requirements with respect to old closed landfills.

Development Property

The proposed development property consists of two contiguous parcels of located on the east side of Second Line Road between Goward Drive and Klondike Road in the suburban area of Morgan's Grant. The parcels have a combined area of 1.23 hectares and are located just inside the City of Ottawa rural-urban boundary. The Development Property has a frontage of approximately 96 metres along Second Line Road and an average lot depth of 127.7 metres. The Development Property is bound to the north and south by private residential properties and by a Hydro high tension power line right-of-way to the east. Lands opposite the Development Property on the west side of Second Line Road consist of undeveloped rural lands designated as a Natural Environment Area (NEA). The topography across the Development Property is moderately sloped to the northeast with overall relief in the order of 4 metres.

The southern two-thirds of the Development Property is currently improved with one (1) single family home while the northern third is currently vacant. The residence is currently supplied with on-site servicing including domestic water by an on-site water well while sanitary wastes management by way of an on-site septic system. The owners are proposing to redevelop the property to residential use. The proposed development will include typical municipal servicing including water, sewer, Hydro, telephone cable and natural gas.

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The March Landfill is located approximately 370 metres south of the Development Property and approximately 210 metres southwest of the intersection of Klondike Road and Second Line Road. The March Landfill was operated by the former Township of March as a municipal waste disposal site between 1963 and 1974 under Provisional Certificate of Approval (C of A) number A461101 issued by the Ontario Ministry of the Environment (MOE). The March Landfill was officially closed in 1974.

The March Landfill is located in an open water marsh and comprises approximately 2 hectares (4.94 acres) with dimensions measuring approximately 175 metres (east-west) by 160 metres (north-south). The Site is characterized by two distinct areas; 1) an upper road allowance, which serves as the western extension of un-opened Klondike Road right-of-way; and 2) the lower waste disposal area to the south of and flanking the road allowance. The surface of the lower waste disposal area lies approximately 2 to 3 metres below the road allowance and is currently surrounded by open water to the east, south, and west.

The March Landfill and surrounding lands lie within a physiographic region known as the March Highlands, an area characterized by a gently rolling bedrock terrain. The highlands are flanked to the east and northeast by lowlands of the Ottawa Area Clay Flats, an area typified by flat-lying lands and abundant marshes. The geology of the March Landfill and surrounding area is characterized by thin overburden deposits and abundant bedrock outcrops. The bedrock geology is comprised of a relatively flat-lying Palaeozoic sedimentary sequence that unconformably overlies Precambrian crystalline basement rocks (Williams, 1991). The March Landfill and host wetland lie within a linear depression or graben-like structure. This structure appears to have formed due to faulting on either side of the wetland, as inferred by vertical offsets observed in the bedrock stratigraphy beneath the landfill, subsequently modified by glaciation.

In October 2000 the City of Ottawa (then as the Region of Ottawa-Carleton) initiated environmental investigations at the property located at the 78.5 hectare parcel located at the southwest corner of the intersection of Klondike Road and Second Line Road in support of its acquisition for preservation as a NEA. The March Landfill was identified as an area of potential environmental concern with respect to the acquisition of the property. Subsequent investigations carried out at and in the immediate vicinity of the March Landfill identified soil and/or groundwater impacts by several contaminants including volatile organic compounds (VOC), petroleum hydrocarbons (PHC), polynuclear aromatic hydrocarbons (PAH) and metals.

Extensive hydrogeological investigations carried out at the March Landfill and surrounding lands by AMEC on behalf of the City of Ottawa between January 2001 and July 2002 delineated a groundwater contaminant plume migrating in the bedrock beneath the March Landfill and downgradient lands beneath the Morgan's Grant subdivision to the east-northeast. The groundwater contaminant plume is characterized by elevated concentrations of trichloroethylene (TCE) and its degradation products including isomers of dichloroethylene (DCE) and vinyl chloride (VC). These compounds together have been collectively referred to as the "TCE plume". TCE, cis-1,2-DCE, and VC continue to persist in the bedrock groundwater at concentrations exceeding drinking water and/or potable groundwater use standards as provided in the Ontario Drinking Water Standards, Objectives and Guidelines (MOE, revised 2006) and Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental

Protection Act (MOE, 2004, amended 2011). An outline of the TCE plume showing its migration relative to the March Landfill and the Development Property is provided on Figure 1.

A Human Health Risk Assessment (HHRA) was completed by AMEC on behalf of the City (AMEC 2003) to identify potential exposure pathways and human receptor groups in order to assess the potential risk to the residential community downgradient of the landfill associated with the presence of TCE plume in groundwater. A Risk Management Plan (RMP), including the implementation of a multi-component annual monitoring program, was developed for the March Landfill to provide an overall long-term environmental management strategy to prevent unacceptable risks to human health associated with the TCE plume. The HHRA and RMP were acknowledged by the Ontario Ministry of the Environment (MOE) in July 2007. The RMP, including groundwater, surface water and private water well monitoring programs currently remains in effect. The data acquired since 2000 has resulted in a comprehensive understanding of the migration of the March Landfill TCE plume and associated environmental concerns.

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Groundwater Contamination

Groundwater in the vicinity of March Landfill has been impacted by PHC, PAH and VOC, the latter consisting primarily of TCE and related degradation products. Impacts by PHC and PAH are confined to the immediate area of the landfill. TCE groundwater impacts extend beyond the landfill and have been delineated over a distance of 1.5 kilometres and a maximum with of approximately 350 metres migrating in the sandstone bedrock. The TCE plume has been the subject of continuous monitoring since 2000. The migration of the TCE plume has been well documented in annual reports prepared by AMEC on behalf of the City of Ottawa. These data indicate the TCE plume to be migrating to the east-northeast.

One of the primary human exposure concerns associated with the March Landfill TCE plume is the intrusion of TCE vapours into homes and/or buildings constructed on top of the TCE Plume. The migration of subsurface vapour typically occurs through cracks and seams in the building foundation and/or floor due to differential pressure between the interior and exterior of the structure. Given the TCE plume migration away from the Development Property and the intention to service the Property with municipal water, the TCE plume is not considered to pose any environmental concern with respect to the Development Property.

Surface Water Contamination

Surface water in the vicinity of March Landfill has been monitored periodically by AMEC on behalf of the City to assess potential impacts resulting from the March Landfill. The monitoring data indicates that the surface water in water body hosting the March Landfill is impacted by metals and PAH. Other waster bodies in the area exhibit similar impacts thus it remains uncertain if these impacts are directly attributable to the March Landfill or other anthropogenic activities in the general area.

Surface runoff in the vicinity of the March Landfill is directed to the open water marsh in which the landfill in located. This marsh is drained to the north by a series of un-named tributaries of Shirley's Brook. Surface water at March Landfill is thus not considered to pose any environmental concern with respect to the Development Property.

Landfill Generated Gases

Landfill gases have not been assessed at March Landfill. Wastes at the landfill were placed in a open water marsh underlain by relatively impermeable native clay silt / silty clay deposits. These impermeable deposits extend across the base of the landfill to the edge of the marsh. The landfill was closed by capping the wastes with permeability silty sands. These features serve to promote direct venting of any landfill gases, if present, with little to no potential of lateral migration beyond the landfill footprint. As such, the March Landfill is not considered to pose any concerns with respect to the Development Property.

Landfill Odours

The March Landfill was closed in 1974. The landfill is covered with 0.6 to 1.2 metres of silty sand and is well vegetated blending in with the surrounding terrain. No noxious or other odours originating at or attributable to the landfill have been identified.

Landfill Litter

The March Landfill has been closed in 1974. Landfilled waste disposed at the site has been covered with a suitable material that is continuous across the waste disposal area with no obvious gaps, breaches or large areas of exposed waste. Penetration of the cover by waste material is relatively minor and is generally limited to re-bar and wire. The cover fill is well vegetated with actively growing grasses, shrubs and trees rendering the Site relatively inconspicuous and aesthetically benign.

Visual Impact;

The March Landfill is separated from the Property by a distance of 370 metres. The landfill lies in an open water marsh reaching a peak elevation of approximately 108 metres. Intervening lands between the Development Property and March Landfill reach a peak elevation of 110.5 m. Although this elevation change is minimal, the intervening lands are well vegetated with grasses, shrubs and mature trees thus obscuring the sight lines from the Property.

As noted above the landfill is well vegetated with actively growing grasses, shrubs and trees rendering the Site relatively inconspicuous and aesthetically benign allowing it to blend naturally with its surroundings. The March Landfill is thus not considered to pose any concerns with respect to visual impact.

Dust and Noise

The March Landfill has been closed in 1974. As such, no issues concerning noise or dust emissions typically associated with an operating landfill exist at the March Landfill.

Fires;

The March Landfill has been closed in 1974. These are no fire-related concerns regarding the March Landfill beyond those commonly associated with vacant forested lands (i.e., grass and/or forest fires).

Vectors and Vermin

The closed March Landfill is located in rural marsh setting surrounded by vacant forested lands which serve as home to a variety of fauna, including the landfill itself.

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The March Landfill was operated by the former Township of March as a municipal waste disposal site between 1963 and 1974. The March Landfill was officially closed in 1974. The City of Ottawa has been engaged in monitoring and management of potential environmental concerns associated with the March Landfill since October 2000. The data acquired from these studies has shown that the former Township of March Landfill poses no potential environmental concern with respect to the Development Property.

We trust the above information is satisfactory. If you have any questions, please do not hesitate to contact the undersigned.

Yours truly,

AMEC E□□□r□□□ □□□□ I□□r□□□r□□□□r□
□ D□□□□□□□ □□AMEC A□ □r□□□□ L□□ □□□d

Kevin D. Hicks, M.Sc., P.Geo., QP_{ESA}
Senior Associate Hydrogeologist

KDH/kdh

Attachment (1)
Figure 1 – Site Plan

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BASE MAPPING AND AERIAL IMAGERY PROVIDED BY THE CITY OF OTTAWA SURVEYS AND MAPPING UNIT

LEGEND

- MW-14D — SHALLOW BEDROCK MULTI-LEVEL MONITORING WELL (2000)
- MW-12D — SHALLOW OVERBURDEN / BEDROCK MULTI-LEVEL MONITORING WELL (2000)
- MW-101 — DEEP BEDROCK MULTI-LEVEL MONITORING WELL (2001)
- MW-210 — DEEP BEDROCK MULTI-LEVEL MONITORING WELL (2002)
- MW-201 — SHALLOW BEDROCK MULTI-LEVEL MONITORING WELL (2002)
- MW-301 — BEDROCK COREHOLE WITH SINGLE OR MULTI-LEVEL MONITORING WELL (2002)
- MW3-02 — SHALLOW BEDROCK MONITOR (J.D. PATERSON 2002)
- MW4 — MULTI-LEVEL BEDROCK MONITOR (J.D. PATERSON 2004)
- MW-401 — DEEP BEDROCK MULTI-LEVEL MONITORING WELL (2006 - 2008)
- PROPOSED DEVELOPMENT PROPERTY
- MARCH LANDFILL TCE PLUME
- RURAL - URBAN BOUNDARY
- MARCH LANDFILL PROPERTY LINE

30 0 30 60 90
METRES

DECOMMISSIONED MONITORING WELLS SHOWN IN WHITE

amec

TITLE:	SITE PLAN
PROJECT:	1158 SECOND LINE ROAD
CLIENT:	ADEL HOUSSARI AND NADA HARB
DESIGNED BY:	KDH
DRAWN BY:	JFT
CHECKED BY:	KDH
DATE:	APRIL 2013
SCALE:	1 : 3,000
PROJECT No.:	TZ13009
FIGURE No:	1

P:\PROJECTS IN PROGRESS\1 ENVIRONMENTAL\2013\TZ13009 - HOUSSARI MARCH\FIGURE 1.DWG