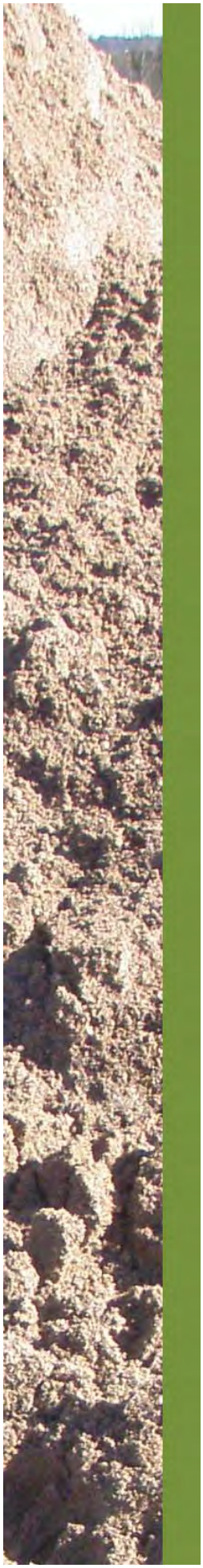
Appendix B

Natural Environment Technical Report: Level 1 and 2

Stantec Consulting Limited



Spencer Pit
Natural Environmental Level 1 & 2
Technical Report

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February 25, 2014

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1.0 Introduction

1.1 BACKGROUND AND OBJECTIVES

Stantec Consulting Ltd. (Stantec) was retained by Tri City Lands Ltd. (Tri City Lands) to prepare a Natural Environment Level 1 & 2 Technical Report for a proposed pit near Guelph, Ontario (the Spencer Pit). Tri City Lands intends to include the report as part of their application for a Category 3 - Class "A" Pit (Above Water) license, under the Aggregate Resources Act (ARA). The pit operation will be restricted to extracting aggregate material no closer than 1.5 metres above the established groundwater table.

As part of the ARA license application process, a Natural Environment Level 2 impact assessment is required when natural heritage features have been identified on, or within, 120 metres of a proposed license area during preliminary investigations (i.e., a Level 1 assessment). During Stantec's preliminary review of available data sources and initial site reconnaissance, it was determined that natural heritage features occur within 120 of the proposed license. As such, this report has been prepared to fulfill the ARA requirements for a Level 1 and a Level 2 Natural Environment Technical Report, which have been combined into this comprehensive document. It is also intended to address the requirements for an Environmental Impact Assessment under the Wellington County Official Plan and the Township of Guelph/Eramosa Zoning By-law, in support of the relevant planning applications. As support for a Planning Act approval the document also is intended to demonstrate that the application is consistent with the Provincial Policy Statement.

1.2 SITE DESCRIPTION AND SURROUNDING LAND USES

The Spencer Pit is proposed to be developed on Part Lots 14, through 18, Concession B in the Township of Guelph/Eramosa in the Wellington County as shown on **Figure 1, Appendix A**. The proposed license area covers 51.16 ha, of which 42.45 ha are proposed for extraction. The proposed license area includes a combination of agricultural, forest and residential land uses. Included in the proposed license area are several hydro towers in the south portion of the site, and a residence with a barn and several outbuildings at the northern end of the site. However, these structures (i.e., hydro towers, residence, barn and outbuildings) are outside of the proposed extraction limit and will not be affected by the proposed pit.

The proposed license area is bounded by existing and former extraction sites to the south, Highway 24 to the west, a railway line to the east and residential lands to the north. Surrounding land uses are generally agriculture to the west and north of the proposed license area, with licensed quarries and open water features from former extraction sites to the south and east.

2.0 Approach

2.1 LITERATURE REVIEW

As part of this Level 1 & 2 report, the following documents were reviewed to identify any natural heritage features within 120 m of the proposed license area:

- Wellington County Official Plan (1999);
- Township of Guelph/Eramosa Zoning By-law (2009);
- Natural Heritage Information Centre ("NHIC") database. 2010. Natural Areas and Species records search. Biodiversity explorer, MNR, Peterborough, http://nhic.mnr.gov.on.ca/;
- MNR Land Information Ontario ("LIO") digital mapping of natural heritage features (2011);
- GRCA's Grand River Information Network (GRIN) online interactive mapping tool, available at: http://www.grandriver.ca/index/document.cfm?Sec=63&Sub1=0&sub2=0)
- Speed River Wetland evaluation record (MNR, 1986);
- Ellis Creek Swamp evaluation record (MNR, 1988);
- Glenchristie Wetland Complex evaluation record (MNR, 1995);
- Ontbirds Archives;
- Ontario Nature's online Reptile and Amphibian Atlas; and,
- Wildlife atlases, including: 'Atlas of the Mammals of Ontario' (Dobbyn, 1994); the 'Ontario Herpetofaunal Summary' (Oldham and Weller, 2000); and, the 'Ontario Breeding Bird Atlas' (Cadman et al., 2007).
- Hydrogeological Assessment, Groundwater Science Corp, November 2013.

Natural heritage information gathered during the literature review was used to identify potentially significant natural heritage features on, and within 120 m of, the proposed license area, as per the requirements of the ARA. Features identified within 120 m of the proposed license area during the literature review included the Speed River Provincially Significant Wetland (PSW) complex. The locations of features identified through literature review are shown on **Figure 2, Appendix A**.

2.2 AGENCY CONSULTATION

A pre-submission consultation meeting with the Ministry of Natural Resources (MNR) was conducted on June 17, 2013, at the MNR office in Guelph. Representatives from Stantec met with MNR planner, Lorraine Norminton, to assess natural heritage features associated with the proposed license area.

Prior to the meeting, Stantec prepared a Terms of Reference (ToR) for the Natural Environment Level 1 & 2 Technical Report, which was submitted to the MNR on June 13, 2013. A copy of the ToR is provided in **Appendix B** of this report. Although MNR staff biologists were unable to attend the meeting, they were able to review the ToR prior to the meeting, and provided input to Ms. Norminton that was forwarded to the Stantec study team. In addition to information from MNR biologists, Ms. Norminton suggested that Stantec submit a formal request to MNR for information on the proposed license area, which Stantec submitted on June 17, 2013. MNR fulfilled this request, also on June 17, 2013.

As a result of the information provided by MNR, it was determined that the proposed license area was within the historic range of Rusty-patched Bumble Bee (Bombus affinis), and that the species had the potential to occur on the site. As a result, the ToR was supplemented by a species-specific field methodology to survey for Rusty-patched Bumble Bee. A copy of this methodology is included in **Appendix C**.

2.3 FIELD STUDY METHODOLOGY

A preliminary site visit was conducted on May 14, 2013, to confirm conditions identified in the literature review, as well as to confirm the presence of natural heritage features on or within 120 metres of the proposed license area. The potential natural heritage functions of these features were used to develop the field study program.

General wildlife surveys (i.e., observations of individuals, tracks or scats) for reptiles and mammals were conducted concurrent with the breeding bird and vegetation surveys.

2.3.1 Vegetation

Prior to the initiation of fieldwork, aerial photographs were reviewed and used to identify vegetation community boundaries. Vegetation communities were delineated on the photographs and checked in the field. Community characterizations were then based on Ecological Land Classification (ELC) according to Lee et al. (1998, revised 2008). Vegetation surveys were conducted on June 12 and August 7, 2013 and were timed in order to capture the greatest number of species during their respective flowering period (i.e., late spring/early summer and mid/late summer). An additional survey was completed on September 14, 2013, and focused specifically on hawthorn trees. A comprehensive vegetation inventory was prepared for the proposed license area and is presented in **Appendix D**. ELC was also conducted on August 7, 2013. ELC mapping is shown on **Figure 3, Appendix A**. Dominant vegetation species within each polygon were recorded on ELC data cards (see **Appendix D**). Provincial significance of vegetation communities, plants and wildlife species was based on the rankings assigned by the NHIC.

2.3.2 Breeding Birds

Breeding bird surveys were conducted by Stantec ecologists on June 3 and June 23, 2013 between 7:30 and 9:30 am. Breeding bird surveys utilized a combination of point counts and area searches across the proposed license area, an approach consistent with methods used by the Canadian Wildlife Service (CWS). Point-counts were 10 minutes in duration and consisted of an unlimited radius, except where adjacent count circles overlapped. All birds heard or seen during the ten-minute "count" were recorded. The highest level of breeding evidence observed, as defined in the Ontario Breeding Bird Atlas, was recorded at each point-count station for each species encountered. The total number of individuals of each species was recorded, in order to develop an understanding of population dynamics in the proposed license area. A list of breeding birds recorded from the proposed license area is included in **Appendix E**.

2.3.3 Amphibians

The Ontario Marsh Monitoring Program (MMP) survey protocol (Bird Studies Canada, 2003) is the recognized field methodology for the audio-surveying of breeding frogs and toads. Two observers record the level of calling of all frog and toad species heard in a three minute period.

The amphibian call counts record four levels of calling:

0 – None heard.

1 – Individuals can be counted, and calls are not overlapping.

2 – Numbers of some individuals can generally be estimated or counted, others overlapping.

3 – Full chorus, calls continuous and overlapping, and individuals not distinguishable.

In accordance with the MMP protocol, surveys begin at least one-half hour after sunset and are completed before midnight. Appropriate survey conditions consist of winds less than 19km/hr and minimum night-time air temperatures of at least 8^{o}C for the first survey, 13^{o}C for the second survey and 21oC for the third. However, surveys can be conducted at lower temperatures if there is strong calling activity.

Stantec ecologists conducted amphibian call count surveys on May 22 and June 21, 2013. Although the MMP protocol recommends three survey periods, it also indicates that early callers, including Spring Peeper, Chorus Frog and Wood Frog, typically call into mid to late May. Due to the late spring in 2013, early callers (e.g., Spring Peeper) were still calling during the May call surveys. As such, it was determined that the May survey period was sufficient to capture any early callers that may have been present.

As there was no potential breeding habitat in the proposed license area (e.g., open water features, wetlands, vernal pools or watercourses), the survey included three stations in potential habitat off-site, but within 120 m of the proposed license area **(see Figure 3, Appendix A).**

The stream corridor to the north-east of the proposed license area was not suitable habitat as it contained no standing water during the breeding season, and when water was present it was flowing, and was limited to spring freshet and heavy precipitation events - neither of which would support amphibian breeding. Station 1 was established to include a small pond adjacent to wetland communities east of the proposed license area. Station 2 was established beside a large open aquatic feature to the east of the FOD5-1 community, and Station 3 was established beside the open aquatic feature along the southern boundary of the proposed license area. The open aquatic features sampled by Stations 2 and 3 were formed by former extraction sites that have filled with water. Both of these features were deep and had some (albeit minimal) shoreline vegetation along portions of the shoreline.

2.3.4 Fish

Fish and fish habitat surveys were not undertaken as fish habitat was not present in the proposed license area. An unnamed tributary to the Speed River was located within 30 m of the northeast license area and generally flowed southeast to the confluence with the Speed River some 460 m east of the proposed license area. The tributary had intermittent flow near the proposed license area and may support fish habitat during periods of high flow and/or contribute to fish habitat in the Speed River. The open aquatic features to the south and east of the proposed license area were not considered fish habitat as they were formed by quarry activity.

2.3.5 Bat Maternity Roosts

The forested portions of the proposed license area were examined for potential bat maternity roosts. Surveys focused on areas of suitable habitat in the FOD3-1 and FOD 5-1 communities, using procedures adapted from MNR's Bats and Bat Habitats: Guidelines for Wind Power Projects (MNR, 2011) to calculate cavity tree density. Surveys were conducted by a qualified Stantec ecologist on May 14, 2003. Fourteen plots were surveyed, including ten plots in the FOD5-1 community and four plots in the FOD3-1 community.

2.3.6 Species-specific Surveys for Rusty-Patch Bumble Bee

Information provided by MNR indicated that the proposed license area was in the historic range of the Rusty-patched Bumble Bee (*Bombus affinis*). In order to determine the presence/absence of the species in the proposed license area, species-specific surveys were undertaken according to MNR protocols. As Rusty-patched Bumble Bee is listed as Endangered in Ontario, the surveys were registered with MNR in accordance with O. Reg. 242/08 under the Endangered Species Act, 2007 (ESA, 2007). A copy of the registration is provided in **Appendix C** of this report. Stantec ecologists conducted surveys for Rusty-patched Bumble Bee on July 25 and August 15, 2013.

Observations of other bumble bee species encountered during the surveys were also recorded. A list of bumble bees recorded from the proposed license area is included in **Appendix E**.

3.0 Environmental Policy Context

3.1 ONTARIO AGGREGATE RESOURCES ACT

Tri City Lands Ltd. is applying to the MNR for a Category 3, Class 'A' license for a pit operation above the groundwater table. According to Section 2.2.1 of the ARA, a Natural Environment Level 1 Technical Report is required to determine whether any of the following features exist on, or within 120 metres of, a proposed extraction site:

- significant wetlands
- significant portions of the habitat of endangered or threatened species
- fish habitat
- significant woodlands
- significant valley lands
- significant wildlife habitat
- significant areas of natural and scientific interest

Section 2.2.2 of the ARA requires that a Natural Environment Level 2 Technical Report be prepared when any of these features have been identified on, or within 120 metres of, the proposed license area. The Natural Environment Level 2 Technical Report must *"determine any negative impacts on the natural features or ecological functions for which the area is identified, and any proposed preventative, mitigative or remedial measures"* as per the Natural Environment Report Standards in ARA Standards 2.01.07.

Stantec's preliminary review of available data sources, and May 14, 2013 site reconnaissance determined that natural heritage features occurred on, and within 120 m of, the proposed license area. This included a wooded area on the east edge of the proposed license area and the Speed River PSW complex within 120 m of the proposed license area to the east. As such, this report has been prepared to fulfill the ARA requirements for both a Level 1 and a Level 2 Natural Environment Technical Report.

3.2 WELLINGTON COUNTY OFFICIAL PLAN

The Wellington County Official Plan was adopted on May 6, 1999 with the most recent revisions being made on April 22, 2013. The County of Wellington Official Plan is the principal document used to guide long range planning for the Township of Guelph/Eramosa.

The proposed license area is located within a Mineral Aggregate Area, as identified on Schedule A3 of the Wellington County Official Plan. Appendix 2 of the Wellington County Official Plan identifies licensed aggregate operations to the south of the proposed license area. As per Section 6.6.5 of the Wellington County Official Plan, *"new aggregate operations may be established within the Aggregate Mineral Area subject to the appropriate rezoning and licensing"*.

The proposed license area does not contain any features identified as Greenlands or Core Greenlands in the Wellington County Official Plan (Schedule A3). However, the proposed license area is within 120 m of the Speed River Provincially Significant Wetland (PSW) Complex, which is identified as Core Greenlands in the Wellington County Official Plan. As per Section 5.6.3 of the Wellington County Official Plan, the proposed license area is considered to be "adjacent lands" to Core Greenlands and the Speed River PSW, and an environmental impact assessment is required to demonstrate that there will be no negative impacts on the natural heritage feature or on its ecological function. The policies regarding environmental impact assessment requirements are provided in Section 4.6.3 of the Wellington County Official Plan, and are generally consistent with the requirements for a Natural Environment Level 2 Technical Report under the ARA.

3.3 TOWNSHIP OF GUELPH/ERAMOSA ZONING BY-LAW

According to the Township of Guelph/Eramosa Zoning By-law (consolidated to December 31, 2009), the proposed license area is designated Agricultural (A). In order to allow the development of the proposed Spencer Pit, a Zoning By-law Amendment will be required to zone the proposed license area Extractive Industrial (M3).

3.4 GRAND RIVER CONSERVATION AUTHORITY

The Grand River Conservation Authority (GRCA) has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, slopes and the Lake Huron shoreline) through the Development, Interference with Wetlands and Alterations to Shorelines and Watercourse Regulation (O. Reg. 150/06, also known as the "Generic Regulation"). Although a permit from the GRCA will not be required for the proposed Spencer Pit under this regulation, it is anticipated that the GRCA will work with local municipalities to review the Spencer Pit application to ensure it meets local and provincial environmental standards. As such, the ToR discussed in Section 2.2 was prepared to take into account the GRCA's "*Environmental Impact Study Guidelines and Submission Standards for Wetlands*" (GRCA, 2005).

4.0 Environmental Site Description

4.1 GEOLOGY, PHYSIOGRAPHY AND SOILS

The proposed license area is located in a spillway in the Dundalk Till Plain physiographic region of Ontario (Chapman & Putman, 1984). This region comprises an area of 2,395.7 square kilometres (925 square miles) of gently undulating till plain. The topography of the area is characterized as being level to slightly undulating. According to the Wellington County Soils report (Hoffman et al., 1963), three soil types may be expected to occur in the proposed license area: Burford loam, Fox sandy loam and Guelph loam. Burford loam is mapped adjacent to the west side of the Speed River. Burford loam is developed on gravelly materials derived largely from dolomitic limestone. Fox sandy loam is mapped as occurring over most of the area used for agriculture in the proposed license area. The parent material for Fox sandy loam is calcareous sand, deposited as glacial outwash. In Wellington County Fox sandy loam is most often found beside present-day streams. Guelph loam is mapped as occurring in the westernmost corner of the proposed license area, near the intersection of Hwy 24 and Kossuth Road. The soil parent material of Guelph loam consists of glacial till derived from the grey and brown limestones of the underlying rock strata.

4.2 HYDROLOGY

The proposed license area is located on high ground to the west of the Speed River. There is no surface water body located in the proposed license area. The soil profile of the proposed license area contributes to high infiltration rates and relatively little surface water runoff, although there is a minor swale, typical of agricultural lands, as described below.

Overland flow within the southwestern half of the proposed license area moves along a topographic depression toward the adjacent quarry. The single on-site defined drainage swale occurs within this topographic depression. The swale begins west of the site and directs intermittent flow eastward, crossing Hespler Road onto the proposed license area and then to the south-central portion of the property, where the swale ends (elevation approximately 310 mAMSL). The area between the swale terminus and the south site edge (at quarry) is cropped (i.e. no defined channel occurs).

An unnamed tributary to the Speed River begins within wetland areas over 3 km north of the proposed license area and flows generally south to the confluence with the Speed River some 460 m east of the proposed license area. The tributary channel is within 30 m of the northeast license boundary (associated with the residential property, as shown on **Figure 3, Appendix A**), and had intermittent flow near the proposed license area. The tributary channel is relatively deeply incised (up to 6 m below surrounding topography). Site inspections conducted by Groundwater Science Corp. confirm that bedrock outcrops occur along the channel near the proposed license area.

No other drainage channels or streams are mapped on or within 120 m of the proposed license area.

4.3 HYDROGEOLOGY

Based on information provided in the Hydrogeologic Assessment prepared by Groundwater Science Corp (2013), the ground surface in the vicinity of the proposed Spencer Pit slopes generally northwest to southeast, generally toward the Speed River valley. Within the proposed license area the ground surface slopes generally from Hespler Road/County Road 124 to either the existing quarry south of the site (west portion of the site), or, to the Speed River Valley (east portion of the site). On-site maximum ground surface elevations, of approximately 321 mAMSL, occur at the western corner of the site near the Kossuth Road intersection. The lowest ground surface elevation, of approximately 306 mAMSL, occurs along the east boundary of the site (at the railway line). On-site drainage follows topography, generally west-northwest from Hesper Road / County Road 124 to south-southeast toward the existing quarry and Speed River valley.

The water table occurs within the bedrock (unconfined) aquifer, and slopes relatively steeply west to east. The water table along the southeast and east edges of the proposed license area is controlled by surface water features (and assumed discharge to these features) adjacent to the site. The surface water features include the Speed River and associated valley wetlands and ponds within the adjacent quarry. The water table is approximately 3 to 4 m below the bedrock surface near County Road 124 and 4 to 6 m below the bedrock surface along the southeast and east edges of the proposed license area.

4.4 VEGETATION COMMUNITIES

Vegetation communities located on, and adjacent to, the proposed license area were delineated into ELC units (see **Figure 3, Appendix A**). Four naturally-occurring community types were identified in the proposed license area. Six naturally-occurring vegetation community types occurred on adjacent lands to the south and east of the proposed license area. Descriptions of these communities follow. Additional land uses and non-naturally occurring vegetation communities outside the 120 m adjacent lands were determined by air photo interpretation and roadside reconnaissance and are not described below.

CUM1 Mineral Cultural Meadow: This open meadow community contained a higher abundance of forbs over graminoids; and generally consisted of tall goldenrod, brown knapweed, bird's foot trefoil, red clover, common ragweed, daisy fleabane, red-top grass, and awnless brome. CUM1 communities were located in the proposed license area as well as the adjacent lands. Tree and shrub cover were sparse, with infrequent observation of black cherry, American basswood, and common buckthorn. Soil texture was coarse sand with a moisture regime of 0.

CUW1 Mineral Cultural Woodland: This community was open canopy woodland composed of black walnut, ash, poplar, and Manitoba maple. Shrub species were generally abundant in the understory, while ground cover was a mix of forb and graminoid species.

CUW1-3 Hawthorn Cultural Woodland[1]: The canopy of this community largely consisted of large-fruited hawthorn, with occasional occurrences of common buckthorn, common crabapple, and less commonly, trembling aspen, black walnut, and black cherry. It was located in the proposed license area. The understory was generally open, consisting primarily of wild red raspberry with infrequent associations of red-osier dogwood, and chokecherry. Ground cover contained a higher abundance of forbs over graminoids; and consisted largely of tall goldenrod, wild carrot, woodland strawberry, wild basil, bird's foot trefoil, yarrow, red-top grass, Kentucky bluegrass, and awnless brome. Soil texture was silty very-fine sand with a moisture regime of 1.

FOC2-2 Dry-Fresh White Cedar Coniferous Forest: This community was dominated by eastern white cedar and occurred to the east of the proposed licence area.

FOD3-1 Dry-Fresh Poplar Deciduous Forest: This was a mid-age community with an abundance of trembling aspen in the canopy, infrequently intermixed with American elm, and green ash. It was located in the proposed license area. The sub-canopy included occasional occurrences of green ash, common buckthorn, and common crabapple. The understory consisted largely of common buckthorn, with infrequent occurrences of prickly gooseberry, hawthorn, and red-osier dogwood. The ground cover often included white avens intermixed with riverbank grape, woodland strawberry, white panicled aster, yellowish enchanters nightshade, and violets, among others. Canopy cover was approximately 60% but with an equally dense sub-canopy. The soil texture was silty very-fine sand with a moisture regime of 1.

FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest: This mature canopy was dominated by sugar maple with infrequent occurrences of black cherry, green ash, and American basswood – a composition similar to that of the sub-canopy. It was located in the proposed license area. The understory contained an abundance of wild red raspberry, which at times was the dominant shrub; associate species in this stratum were common buckthorn, red-berried elderberry, Alleghany blackberry, and alternate-leaved dogwood, among others. Ground cover most frequently consisted of yellowish enchanter's nightshade, but also commonly included dame's rocket, herb-robert, red baneberry, wild ginger, early meadow-rue, blue cohosh, jack-in-the-pulpit, and false-solomon's seal, among others. The canopy of this community was tall (~25m) but generally not dense, providing adequate light for the establishment of shrub and herbaceous species more typically associated with edge or open habitat (e.g. raspberry and blackberry species). Soil texture was silty very-fine sand with a moisture regime ranging from 1 to 2.

MAM2 Mineral Meadow Marsh: The canopy of this community consisted of rare occurrences of willow species and glossy buckthorn. The ground layer consisted of American wild mint and grass species and fewer occurrences of purple-stemmed aster.

[1] ELC code not included in the First Approximation of ELC for Southern Ontario

MAS2-1 Cattail Mineral Shallow Marsh: The canopy of this community consisted of rare occurrences of willow species and fewer occurrences of eastern white cedar. The ground layer was dominated by narrow-leaved cattail. Surface water was present within this community.

SWC1-1 White Cedar Mineral Coniferous Swamp: The canopy and sub-canopy of this mature community were dominated by eastern white cedar. Occasional occurrences of eastern white pine were present throughout the understory. Yellow birch and red ash were observed in rare occurrences throughout the canopy, sub-canopy and understory. The ground layer largely contained grass species and fowl meadow grass, and less commonly sensitive fern and Canada goldenrod. Soil was noted as being typically moist to saturated.

4.4.1 Vascular Plant Species

A total of 206 species of vascular plants was recorded from the proposed license area and adjacent lands, of which 61% (125 species) were native and 39% (81 species) were exotic. As 22 of these species were only recorded from the adjacent lands, and were absent from the proposed license area, it has been determined that 184 plant species were present in the proposed license area. Nearly all of the native plants (95%) have a rank of S5, indicating they are common and secure within Ontario. Five species (4%) have a rank of S4 (or some variation), indicating they are apparently secure in Ontario; these species were broad-leaved water-leaf (S4), black walnut (S4), black maple (S4?) and fowl meadow grass (S4S5) in the proposed license area, and Pringle's aster (S4) on adjacent lands. One species, butternut, which was only observed on the adjacent lands, had a rank of S3 (vulnerable).

None of the species observed in the proposed license area had a Co-efficient of Conservatism (CC) value of 9 or 10. One provincially endangered species, butternut, was recorded on adjacent lands in the FOC2-2 community to the east of the proposed license area.

A complete list of plant species recorded from the proposed license area and adjacent lands is provided in **Appendix D**.

4.5 WILDLIFE

A complete list of wildlife species recorded from the proposed license area is provided in **Appendix D**.

4.5.1 Breeding Birds

Thirty-three species of birds were recorded in the proposed license area. Thirty of these bird species are considered to be breeding on, or adjacent to, the proposed license area. All of the species are ranked S5 (common and secure in the province) or S4 (apparently secure in the province; uncommon but not rare), with the exception of European Starling (*Sturnus vulgaris*), which is an introduced species and ranked SNA. One provincially significant species, Barn Swallow (*Hirundo rustica*) was observed foraging for insects over the rail line.

Barn Swallow is listed as Threatened in Ontario. Surveys of the barn and outbuildings in the northern limits of the proposed license area recorded 35 Barn Swallow nests, although these nests were inactive at the time of the survey.

4.5.2 Amphibians

No amphibian breeding habitat was encountered in the proposed license area. Spring Peeper (*Pseudacris crucifer*), Gray Treefrog (*Hyla versicolor*) and Green Frog (*Lithobates clamitans*) were recorded from Station 1 to the east of the proposed license area. No amphibians were recorded from Station 2 or 3 in the open aquatic features. All of these species are ranked S5 (common and secure in the province). No provincially rare, endangered, threatened, or special concern species were found.

4.5.3 Mammals

Observations during the breeding bird and vegetation surveys included five mammal species: Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Gray Squirrel (*Sciurus carolinensis*), Eastern Chipmunk (*Tamias striatus*), Woodchuck (*Marmota monax*) and White-tailed Deer (*Odocoileus virginianus*). All of these species are ranked S5 (common and secure in the province). It is likely that other small mammal species common in rural areas (e.g., Raccoon, White-striped Skunk, Porcupine and assorted rodents), are also found in the general area.

No provincially rare, endangered, threatened, or special concern species were found. The cavity tree density survey did not identify a sufficient snag density to qualify as potential bat maternity roosting habitat, and no bats were observed during the course of field investigations.

4.5.4 Fish

As described in Section 2.3.4, fish habitat was not present in the proposed license area. The nearest confirmed fish habitat, the Speed River, is located in excess of 120 m from the proposed license area. The open aquatic features to the south and east of the proposed license area were not considered fish habitat as they were formed by former quarrying activity and had no connection to fish-bearing habitat. The stream to the north of the proposed license area was intermittent, although it may provide fish habitat at times when it is flowing or contribute to fish habitat in the Speed River.

4.5.5 Bumble Bees

A total of 246 individual bumble bees were collected during targeted surveys. Preferred habitats for bumble bees in the proposed license area included the small cultural meadow (CUM) communities and the edges of the cultural woodland (CUW) communities where they bordered agricultural lands.

Seven bumble bee species were recorded, including: Yellow Bumble Bee (*Bombus fervidus*); Common Eastern Bumble Bee (*Bombus impatiens*); Brown-belted Bumble Bee (*Bombus griseocollis*); Confusing Bumble Bee (*Bombus perplexus*); Two-spotted Bumble Bee (*Bombus bimaculatus*); Red-belted Bumble Bee (*Bombus rufocinctus*); and, Half-black Bumble Bee (*Bombus vagans*). Rusty-patched Bumble Bee was not observed during the surveys. All of the species observed are ranked S5 (common and secure in the province) or S4 (apparently secure in the province; uncommon but not rare). No nationally or provincially rare, endangered, threatened, or special concern species were found.

5.0 Natural Heritage Features

5.1 HABITATS OF ENDANGERED OR THREATENED SPECIES

Information from the literature review identified the potential for ten Threatened or Endangered species to be found in the vicinity of the proposed license area. These species included:

- Barn Swallow (*Hirundo rustika*): Threatened
- Bobolink (*Dolichonyx oryzivorus*): Threatened
- Chimney Swift (*Chaetura pelagica*): Threatened
- Eastern Meadowlark (*Sturnella magna*): Threatened
- Eastern Whip-poor-will (*Caprimlugus vociferous*): Threatened
- Rusty-patched Bumble Bee (*Bombus affinis*): Endangered
- Gray Fox (*Urocyon cineroargenteus*): Threatened
- Rainbow Mussel (*Villosa iris*): Threatened
- Butternut (*Juglans cinerea*): Endangered
- Blanding's Turtle (*Emydonidea blandingii*): Threatened

Under the PPS, development and site alteration are prohibited in significant habitat[2] of Threatened and Endangered species. Based on a review of the habitat requirements for these species, as prescribed in the Significant Wildlife Habitat Technical Guide, or "SWHTG" (MNR, 2000), and the available habitats in the proposed license area, it was determined that potential habitat was not present for:

- Bobolink or Eastern Meadowlark (due to the absence of grasslands or meadows);
- Chimney Swift (due to the absence of nesting structures);
- Eastern Whip-poor-will (due to the absence of deciduous forest in excess of 100 ha);
- Gray Fox (due to the lack of large, diverse forest blocks and denning opportunities);
- Rainbow Mussel (due to the absence of aquatic features); and,
- Blanding's Turtle (due to the absence of aquatic habitat).

[2] Under the PPS (2005), significant habitat for endangered and threatened species means the habitat, as approved by MNR, that is necessary for the maintenance, survival and/or the recovery of naturally occurring or reintroduced populations of endangered or threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle.

One Barn Swallow was recorded foraging for insects over the railroad track to the east of the proposed license area. A survey of the barn and outbuildings on the residential lands in the northern limits of the proposed license area recorded 35 Barn Swallow nests in the large wooden barn at the north end of the property. Although these nests were inactive at the time of the survey, it is assumed that Barn Swallows use them during breeding season. As discussed in Section 1.2, the barn is located within the proposed license area, but is outside of the proposed extraction limits.

As described in Section 4.4.1, botanical inventories were conducted in all vegetation communities in the proposed license area. Two butternut trees were recorded in the FOC2-2 community to the east of the rail line, but the species was not encountered in the proposed license area.

As described in Section 4.5.5, bumble bee surveys were conducted in suitable habitats on, and adjacent to, the proposed license area. Rusty-patched Bumble Bee was not recorded during the bumble bee surveys.

Based on these results it is concluded that habitat for Barn Swallow was present in the proposed license area, and Butternut were present on adjacent lands. However, these habitats were located outside of the extraction limits and will not be affected by the proposed pit.

5.2 SIGNIFICANT WETLANDS

There are no wetlands in the proposed license area. A review of the LIO digital mapping indicated that the Speed River Provincially Significant Wetland (PSW) complex is located within 120 m of the eastern proposed license area, and includes the SWC1-1, MAM2 and MAS2-1 communities shown on **Figure 3, Appendix A**. According to the wetland data record for the Speed River Wetland (MNR, 1986), the Speed River PSW complex covers an area of 546.1 ha along the Speed River, and consists of swamps (71%) and marsh (29%) communities. As described in Section 5.4.1, LIO mapping indicated that a Deer Wintering Area was contained within the forested sections of the Speed River PSW complex.

LIO mapping also indicated that the Glenchristie PSW complex is located to the west of the proposed license area. At its closest point, the complex is in excess of 120 m from the proposed license area and is separated from the proposed license area by Hespeler Road/Hwy 24. The Glenchristie wetland consists of eleven individual wetland units, including swamps (86%) and marshes (14%) and covers an area of 47.14 ha.

A third wetland complex, the Ellis Creek PSW complex, is located to the northwest of the proposed license area. The Ellis Creek PSW complex covers an area of 311.7 ha, and consists of swamps (74%) and marsh (26%) communities. The Ellis Creek PSW is located in excess of 120 m from the proposed license area.

5.3 FISH HABITAT

There is no fish habitat in the proposed license area. The intermittent stream to the north of the proposed license area may contribute to indirect fish habitat, or may provide fish habitat during periods of high flows in spring or immediately after heavy precipitation events, but it will not be affected by the proposed pit.

5.4 SIGNIFICANT WILDLIFE HABITAT

In order to ensure a comprehensive approach to identifying and evaluating significant wildlife habitat (SWH), significance has been determined based on guidance provided in the Natural Heritage Reference Manual (MNR, 2010) and criteria from the draft Significant Wildlife Habitat EcoRegion 6E Criterion Schedule (MNR, 2012) with support from the SWHTG (MNR, 2000) as appropriate. The evaluation below addresses the forms and functions of natural heritage features.

The Natural Heritage Reference Manual divides wildlife habitat into four broad categories:

- Habitats of seasonal concentrations of animals;
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of species of conservation concern (excluding endangered and threatened species); and,
- Animal movement corridors.

This section discusses these categories of significant wildlife habitat relative to the proposed license area. A full description of the evaluation of specific types of wildlife habitat is provided in **Tables 1-4**, **Appendix E**.

5.4.1 Seasonal Concentrations Areas

LIO mapping indicated a Deer Wintering Area associated with the forested portions (i.e., the SWC1-1 community) of the Speed River PSW complex that was within 120 m of the proposed license area (see **Figure 2, Appendix A**). Deer Wintering Areas are identified and assessed by the MNR. As a result, no additional field surveys were required.

5.4.2 Rare Vegetation Communities or Specialized Habitats for Wildlife

There is no rare vegetation community on, or within 120 metres, of the proposed license area.

Spring Peeper and Gray Treefrog were recorded from Amphibian Station 1. These species are identified as target species in the draft SWH Ecoregion 6E Criterion Schedule (MNR, 2012).

As such, the pond and associated wetland communities (i.e., MAM2, MAS2-1 and SWC1-1) to the east of the proposed license area are considered SWH for amphibian breeding habitat (woodland).

5.4.3 Habitats of Species of Conservation Concern (excluding endangered and threatened species)

Plants

A review of the NHIC database identified records of ten plant species ranked S1-S3 within 1 km of the proposed license area, including: Burning Bush (S3); Carey's Sedge (S2); Harbinger-of-spring (S3?); Long-styled Canadian Sanicle (S2); Moss Phlox (S1?); Ram's-head Lady's-slipper (S3); Scarlet Beebalm (S3); Sharp-fruited Rush (S3); Smith's Bulrush (S3); and, Woodland Flax (S2). However, with the exception of Ram's-head Lady's Slipper (1986) and Woodland flax (date unknown) these records are in excess of one hundred years old and are likely outdated. None of these species was recorded from the proposed license area during botanical inventories.

Birds

Information provided by MNR identified records of two bird species of Special Concern within 1 km of the proposed license area, including: Bald Eagle and Common Nighthawk. No suitable habitat was present in the proposed license area for either species, and they were not recorded during breeding bird surveys. No provincially significant bird species were observed in the proposed license area during breeding bird surveys.

Reptiles

Information provided by MNR identified records of three reptile species of Special Concern within 1 km of the proposed license area, including: Eastern Ribbonsnake, Milksnake and Snapping Turtle. Both Eastern Ribbonsnake and Snapping Turtle have specific aquatic habitat requirements. There are no water features in the proposed license area, and the Open Aquatic features within 120 m are not suitable, so no potential habitat is present for these two species. Although Milksnake is a generalist in terms of habitat requirements, key habitat features (i.e., hibernacula) were not identified within the proposed license area. None of these species was recorded during field investigations.

Insects

Information provided by MNR identified records of two insect species of Special Concern within 1 km of the proposed license area, including: Monarch and West Virginia White. Potential habitat for West Virginia White in the FOD forest communities was contaminated by garlic mustard, which is a deterrent to egg laying by West Virginia White.

CUM communities in the proposed license area containing common milkweed were small, and provided limited foraging opportunities. Larger CUM communities were abundant in the general area. Neither species was observed during field investigations.

Given the absence of species observations and the lack of any high quality specific habitat types, it is concluded that there is no habitat for species of conservation concern in, or within 120 m of, the proposed license area.

5.4.4 Animal Movement Corridors

The NHRM defines animal movement corridors as habitats that link two or more habitats that are critical to the maintenance of a population of a particular species or group of species. As such, the emphasis is on the linkage function between habitats, as opposed to the habitats themselves. By applying this definition, there are no animal movement corridors in the proposed license area as it does not link two (or more) critical habitats.

With regards to amphibian movement corridors associated with the amphibian breeding habitat (woodland) identified in Section 5.4.2, the upland summer habitat (i.e., the FOC2-2 community) is immediately adjacent to woodland amphibian breeding habitat (i.e., the pond) with no requirement for elongated, vegetated areas to move from one habitat to another.

While animals may move across the proposed license area, based on the field data and the SWH criteria it, is concluded that no significant Animal Movement corridors are present in the proposed license area. Forested areas along the Speed River may provide some movement corridor function, but these areas are beyond 120 m of the proposed license area and separated from the proposed license area by the rail corridor.

5.4.5 Determination of Significance

Based on this evaluation, the following features should be considered as significant wildlife habitat:

1. The pond and associated MAM2-1, MAM2 and SWC1-1 communities, to the east of the proposed license area, for the provision of amphibian breeding habitat (woodland).

5.5 SIGNIFICANT WOODLANDS

The NHRM provides guidance with respect to the following woodland characteristics that indicate provincial significance:

- Woodland size;
- Ecological functions including: interior habitat, proximity, linkages, water protection and diversity;
- Woodlands that provide uncommon features; and,

- Woodland economic and social values.

The following sections provide a framework for the evaluation of significant woodlands as it relates to the proposed license area.

5.5.1 Woodland Size

Section 5.5.4 of the Wellington County Official Plan states that woodlands over 10 ha in area are considered to be significant by the County and included in the Greenlands system. The wooded area in the proposed license area (as delineated by the FOD5-1, FOD3-1 and CUW1-3*complex) is approximately 6.03 ha in area. This area is below the size required for significance in the Wellington County Official Plan. As such, it has not been included in the Greenlands system as shown on Schedule A3 of the Wellington County Official Plan.

5.5.2 Ecological Functions

Woodland Interior

Woodlands of a size and shape that create habitat more than 100 metres from the perimeter often provide habitat for species whose productivity depends on larger sizes and reduced disturbance. Calculations of the forested areas in the proposed license area indicate that there is no interior habitat in the proposed license area. As forest in Wellington County covers between 15 and 30% of the landscape, application of the NHRM guidelines suggests that 2 ha or more of interior habitat would be required for a woodlot to be considered significant. As such, the on-site woodlot does not meet the criteria for woodland interior.

Proximity to Other Woodlands or Other Habitats

The NHRM indicates that woodlands should be considered significant if a portion of it is located within a specified distance of a significant natural feature likely receiving ecological benefit from the woodland, and the entire woodland meets the minimum area threshold.

The Speed River PSW complex is included in the Greenlands system on Schedule A3 of the Wellington County Official Plan. However, the on-site woodland is separated from the PSW by an active railway line, including a gravel rail bed and cleared corridor, which effectively separates the two features and restricts the transfer of “ecological benefit” from the on-site woodland to the PSW.

Linkages

The NHRM indicates that woodlands should be considered significant if they are located within a defined natural heritage system or provide a connecting link between two other significant features, and meets the minimum area thresholds.

The on-site woodland is not included in the Greenlands system, and does not connect two other significant features. It is separated from the Speed River PSW to the east by an active railway line. As such, there is no linkage function provided by the woodland.

Water Protection

The NHRM indicates that woodlands should be considered significant if they are located within a sensitive or threatened watershed or a specified distance of a sensitive groundwater discharge, sensitive recharge, sensitive headwater area, watercourse or fish habitat and meet minimum area thresholds.

The onsite woodland is not located in, or in proximity to, sensitive water features. The Open Aquatic feature to the east of the woodland is a former quarry operation, and is not considered a sensitive feature. It is separated from the woodland by the railway line. As such, there is no water protection function provided by the woodland.

Woodland Diversity

The NHRM indicates that woodlands should be considered significant if they have a naturally occurring composition of native forest species that have declined significantly south and east of the Canadian Shield, or have a high native diversity through a combination of composition and terrain, and meets the minimum area thresholds.

The on-site woodland does not contain a naturally-occurring composition of native forest species in decline. Approximately 41% of the plants recorded from the proposed license area were exotics. As such, there is no woodland diversity function provided by the woodland.

5.5.3 Uncommon Characteristics

The NHRM indicates that woodlands should be considered significant if they have: a unique species composition; a vegetation community with a provincial ranking of S1, S2 or S3; habitat of a rare, uncommon or restricted woodland plant species; or, characteristics of older woodlands.

Each vegetation community and plant species has been ranked by the NHIC to set protection priorities for rare species and natural communities. There is no rare vegetation community or characteristics of older woodlands in the proposed license area. Of the 184 plant species recorded from the proposed license area, none is ranked as S1-S3. Four species are identified as S4 (uncommon), including: broad-leaved water-leaf, black walnut, black maple and fowl meadow grass, although these species are not restricted to the woodland.

These uncommon species are likely of local importance but do not meet the criteria to be considered of provincial importance. As such, the woodland contains no uncommon characteristics.

5.5.4 Economic and Social Functional Values

Economic use of the woodland and its social values are unknown. As the woodlot in the proposed license area is wholly owned by Tri City Lands, and therefore private property, it is unlikely to provide significant economic or social values beyond those intended by the landowners.

5.5.5 Determination of Significance

Based on this evaluation, the onsite woodlot (consisting of ELC communities FOD3-1, FOD 5-1 and CUW1-3*) does not meet the criteria to be considered a significant woodland. This is consistent with the Greenlands system mapping presented in Schedule A3 of the Wellington County Official Plan.

5.6 SIGNIFICANT VALLEY LANDS

There are no significant valleylands on, or within 120 m of, the proposed license area. The Speed River is located to the east of the proposed license area, and the top-of-bank for the river is in excess of 120 m from the license area. The Speed River is separated from the proposed license area by the railway line and active and former aggregate operations.

5.7 AREAS OF NATURAL & SCIENTIFIC INTEREST

There is no Area of Natural and Scientific Interest (ANSI) on, or within 120 m of, the proposed license area.

5.8 SUMMARY OF NATURAL HERITAGE FEATURES

Table 5.1 provides a summary of the natural heritage features in and within 120 metres of the proposed license area.

Table 5.1: Natural Heritage Features Associated with the Proposed License Area

Natural Heritage Feature	Present in Proposed License Area	Present on Adjacent Lands
Habitat of endangered and threatened species	Y	Y
Significant Wetlands	N	Y
Fish habitat	N	Y
Significant Wildlife Habitat		
• seasonal concentration areas	N	Y
• rare vegetation communities or specialized habitats	N	Y
• habitats of species of conservation concern	N	N
• animal movement corridors	N	N
Significant Woodlands		

Table 5.1: Natural Heritage Features Associated with the Proposed License Area

Natural Heritage Feature	Present in Proposed License Area	Present on Adjacent Lands
• woodland size	N	N
• ecological functions	N	N
• uncommon characteristics	N	N
• economic and social functional values	N	N
Significant Valleylands	N	N
Areas of Natural & Scientific Interest	N	N

One natural heritage feature is located in the proposed license area:

- Habitat for Barn Swallow in the wooden barn at the northern limits of the proposed license area. The barn is, however, located outside of the extraction limits.

Natural features on adjacent lands (i.e., within 120 m of the proposed license area) include:

- Habitat for butternut in the FOC2-2 community to the east of the rail line;
- Fish habitat in the intermittent stream to the north of the proposed license area;
- Speed River Provincially Significant Wetland complex;
- Deer Wintering Area; and,
- Significant Wildlife Habitat for amphibian breeding habitat (woodland).

6.0 Description of the Proposed Development

Tri City Lands is applying for a Category 3 - Class "A" Pit (Above Water) license, under the Aggregate Resources Act (ARA). The total area to be licensed is 51.16 ha, of which 42.45 ha are proposed for extraction. **Figure 4, Appendix A** illustrates the Proposed License area and extraction limits. This section should be read in conjunction with the Site Plans prepared by Harrington McAvan Ltd. as part of the ARA license application. The Site Plans provide specific details regarding the existing conditions, operational plan, rehabilitation plan and cross sections (e.g., pre- and post-licensing contours, drainage, etc.).

The application for the Spencer Pit will permit a maximum annual tonnage limit of 650,000 tonnes/year produced in a permanent plant site in the middle of the property. Shipping will be from the plant site to Hwy24/Kossuth Rd. Extraction will occur sequentially in 4 areas in the direction shown in the Site plans. Stripping of topsoil and overburden will occur prior to extraction in areas large enough for a year's production (approximately 5 ha). Topsoil and overburden will be used to build acoustical berms which will be seeded immediately to prevent erosion and control dust. Following extraction each area will be progressively rehabilitated with a minimum of 1.5 m of soil above the established groundwater table and will be returned to agriculture.

Extraction will be by loaders and trucks at the face and transported to the plant site for processing and shipping. Processing may include crushing, screening, washing, stacking and recycling of asphalt and concrete imported to the plant site area. Wash water will be cleansed in wash ponds and reused. There will be no offsite discharge of water. Fuel storage and scrap storage areas will be maintained in the plant site area. Final Rehabilitation of the disturbed area will be to agriculture with maximum 3:1 side slopes. Dust will be mitigated on site for the duration of the operation.

7.0 Potential Environmental Effects and Mitigation Measures

This section provides a discussion on the potential impacts, and recommended mitigations, on natural heritage features associated with the proposed license area. This section should be read in conjunction with the Site Plans prepared by Harrington McAvan Ltd. as part of the ARA license application. The Site Plans provide specific details regarding the existing conditions, operational plan, rehabilitation plan and cross sections (e.g., pre- and post-licensing contours, drainage, etc.).

7.1 HABITATS OF ENDANGERED OR THREATENED SPECIES

A survey of the barn and outbuildings on the residential lands in the northern limits of the proposed license area recorded 35 Barn Swallow nests in the large wooden barn at the north end of the property. These nests were inactive at the time of the survey, but it is assumed that Barn Swallows use them during breeding season. Although the barn is located within the proposed license area, it is excluded from the extraction limits and will not be affected by the proposed pit.

Two butternut were recorded, both in the FOC2-2 community to the east of the proposed license area. One dead individual was observed 8 m east of the railroad tracks. The second individual was observed in the southern portion of the FOC2-2 community. This tree was young to mid-age, with a DBH of 9 cm, and was considered “retainable” but was located in excess of 25 m from the proposed license area and separated from it by the rail line corridor.

7.2 SPEED RIVER PROVINCIALLY SIGNIFICANT WETLAND

The MAM2, MAS2-1 and SWC1-1 communities to the east of the proposed license area are identified as part of the Speed River PSW complex, which is included as Core Greenlands on Schedule A3 of the Wellington County Official Plan.

The Speed River PSW complex covers an area of 546.1 ha along the Speed River, and consists of swamps (71%) and marsh (29%) communities. Given the prevalence of conifer swamp and marsh communities in general vicinity of the proposed license area, it is assumed that the MAM2, MAS2-1 and SWC1-1 communities to the east of the proposed license area are typical of the communities in the PSW.

The Speed River PSW complex is separated from the proposed license area by an existing railway line, and no areas of the wetland will be cleared by the proposed development. As a result, there will be no direct impact to the wetland as a result of the proposed Spencer Pit.

There are no connecting surface water features between the proposed license area and the Speed River PSW, and current surface runoff between the proposed license area and the wetland is intercepted and redirected by the rail bed. As such, there will be no reduction in

surface flow to the wetland. Additionally, as the proposed Spencer Pit is an above-water operation, groundwater flow to the wetland will not be affected and wetland functions will be maintained.

As per provincial standards, no fugitive dust emissions resulting from extraction and vehicle traffic will leave the pit.

A regulatory extraction setback will be maintained along the eastern limits of the pit where it is located across the railway line from the PSW and upland FOC2-2 community. This setback will be at minimum 15 m in width, and will be located between the extraction limits and the license area boundary. In addition to the extraction setback, the wetland communities will be further separated from the proposed pit by the existing railway line, associated corridor and upland FOC2-2 community. When the extraction setback is combined with the existing rail corridor and upland FOC2-2 community, the wetland communities will be afforded in excess of 30 m of separation from the pit.

Upon final rehabilitation, the vegetated buffer will remain intact, and side slopes prepared to a 3:1 ratio. Final rehabilitation will restore the lands to an agricultural land use. This after use will restore the historic activities that have occurred at this location for many years and it is an appropriate land use in the context of the surrounding landscape. There will be no impact on the wetland from the post extraction land use.

7.3 FISH HABITAT

Potential fish habitat may be present in the intermittent stream on the residential property to the north of the proposed license area. This stream may also contribute to fish habitat in the Speed River, which it joins approximately 460 m downstream of the proposed license area. Although the stream is located within 30 m of the northern limits of the proposed license area, it is located approximately 80 m from the proposed extraction limits and will not be directly affected by the proposed pit. Furthermore, as the proposed pit will be extracting above the water table, contributions to the stream from groundwater sources will not be affected.

7.4 DEER WINTERING AREA

The SWC1-1 community to the east of the proposed license area was identified by MNR as a Deer Wintering Area. As there is no clearing proposed in the community, there will be no direct impacts to the deer wintering area as a result of the proposed pit. Mitigations identified to address potential impacts to the Speed River PSW (as described in Section 7.2) will also be sufficient to address potential indirect impacts associated with the deer wintering area. It should be noted that existing and former aggregate operations are present to the east and south of the wetland communities, and the presence of deer in proximity to these operations is an indication of the animals' ability to adapt to aggregate developments.

7.5 AMPHIBIAN BREEDING HABITAT (WOODLAND)

The MAM2, MAS2-1 and SWC1-1 communities to the east of the proposed license area provides woodland amphibian breeding habitat. Species recorded during the amphibian breeding surveys included Spring Peeper, Gray Treefrog and Green Frog. These species were restricted to the pond and adjacent forest lands located in the wetland communities and were not recorded from the proposed license area. Amphibian movement between the wetland communities and the forested portions of the proposed license area is restricted by the railway line and steep rail bed. Additionally, as there are no water features in the proposed license area, the potential habitat for the proposed license area to attract and support amphibians is negligible.

As there is no clearing proposed in the wetland communities, there will be no direct impacts to woodland amphibian breeding habitat as a result of the proposed pit. Mitigations identified to address potential impacts to the Speed River PSW (as described in Section 7.2) will also be sufficient to address potential indirect impacts associated with woodland amphibian breeding habitat. It should be noted that existing and former aggregate operations are present to the east and south of the wetland communities, and the presence of breeding amphibians in proximity to these operations is an indication of the animals' ability to adapt to aggregate developments.

8.0 Conclusions and Recommendations

Based on the information provided in this Natural Environment Level 1 & 2 Technical Report, and the Site Plans, Stantec has concluded the following:

- Habitat for Barn Swallow (Threatened) is present in the old barn in the north end of the proposed license area. This feature is outside of the extraction limits.
- Significant features within 120 m of the proposed license area include:
  - Habitat for Butternut (Endangered);
  - Fish habitat;
  - The Speed River PSW;
  - Deer Wintering Area; and,
  - Amphibian breeding habitat (woodland).
- There will be no direct impacts to significant features in or within 120 m of the proposed license area.
- Potential indirect impacts to significant features within 120 m will be mitigated through appropriate measures specified in the Site Plans.

The phased approach and progressive restoration strategy being proposed by Tri City Lands will ensure that potential impacts to natural heritage features within 120 m of the proposed Spencer Pit will be mitigated. The features and ecological functions of the Speed River PSW (including woodland amphibian breeding habitat) will be maintained over the long-term.

These conclusions are dependent on implementation of the following recommendations:

1. Clearing of the onsite woodlands shall be avoided during the breeding bird season from May 1 through July 31 to protect nests under the federal Migratory Birds Convention Act and the provincial Fish and Wildlife Conservation Act. If cutting is necessary during this window, a nest survey, as required by the Canadian Wildlife Service (CWS), shall be conducted. This survey must occur no more than 72 hours before any cutting activity. If the proposed cutting is not completed within 72 hours of the nest search, the search must be repeated. If a nest is found, a no-touch buffer surrounding the nest (the width of which is determined by the species nesting) must be enforced until the young have naturally fledged.

Conclusions and Recommendations
February 25, 2014

This document entitled Spencer Pit; Natural Environmental Level 1 & 2 Technical Report was prepared by Stantec Consulting Ltd. for the account of Tri City Lands Ltd. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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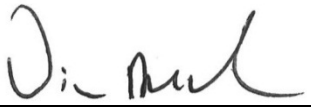
Prepared by 
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Township of Guelph/Eramosa Zoning By-law. 2009

Wellington County Official Plan. 1999.

Appendix A:

Figures

555500 556000 556500 557000 557500 558000

4814500 4814000 4813500 4813000

Township 1 Road

Highway 24

Laird Road West

Kossuth Road

Hespeler Road

Speed River

Forestell Road

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Revised: 2014-02-25 By: stroszkali

February 2014
160960833

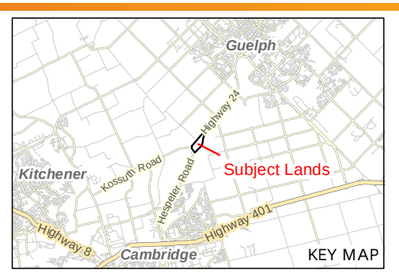
Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Orthographic imagery provided by © First Base Solutions Inc., 2013. Imagery date: 2010.

Legend

- Proposed License Area
- Adjacent Lands
- Railway
- Watercourse
- Waterbody



Client/Project

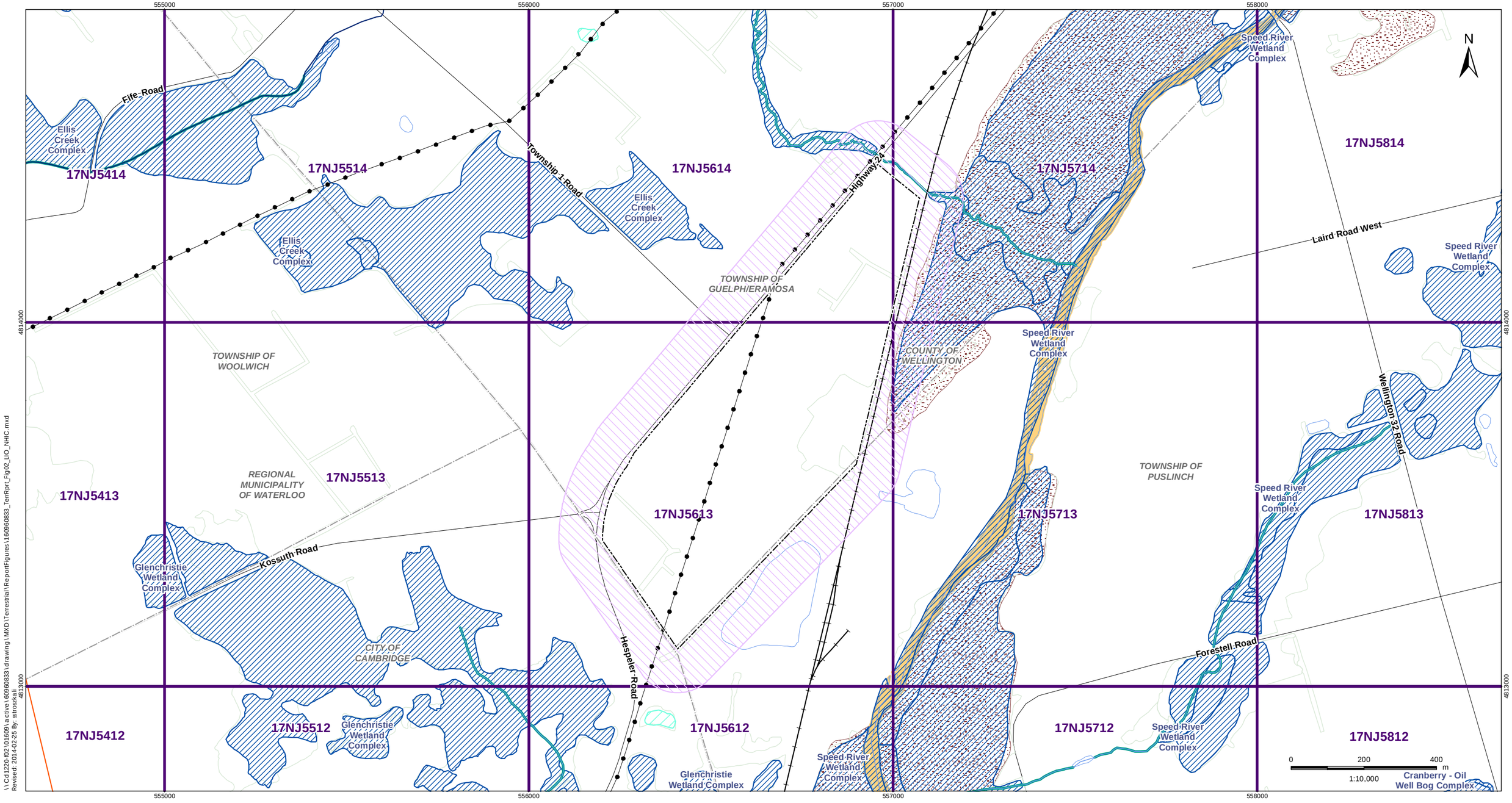
Spencer Pit
Township of Guelph-Eramosa

Figure No.

1

Title

Project Location



\\Cd1220-f02.\01609\active\160960833\drawing\MXD\Terrestrial\ReportFigures\160960833_TerrRprt_Fig02_LIO_NHIC.mxd
Revised: 2014-02-25 By: sstroszkall

February 2014
160960833

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Orthographic imagery provided by © First Base Solutions Inc., 2013. Imagery date: 2010.

Legend

- Proposed License Area
- Adjacent Lands
- Aquatic Resource Area
- Constructed Drain
- Railway
- Utility Line
- Gas Pipeline
- Municipal Boundary - Upper Tier
- Municipal Boundary - Lower Tier
- NHIC grid
- Watercourse
- Waterbody
- Wooded Area

Wetland

- Provincially Significant
- Unevaluated

Wintering Area

- Waterfowl Winter Concentration Area
- Deer Wintering Area (Stratum 2)

Client/Project

Spencer Pit
Township of Guelph-Eramosa

Figure No.

2

Title

LIO Records Review
NHIC Search

555500 556000 556500 557000 557500 558000

4814500 4814000 4813500 4813000

N

Township 1 Road
Highway 24
Laird Road West
Kossuth Road
Hespeler Road
Forestell Road

AG-grain
RES
CUM1
SWC1-1
FOC2-2
MAM2
MAS2-1
OA
FOD5-1
RR
CUW1
FOD3-1
CUW1-3*
CUM1/DIST
AG-soy
AG-corn
RES/CUM1
AG-hay
SWD

1 2 3

0 100 200 m
1:7,500

\\Cd1220-f02\01609\active\160960833\drawing\MXD\Terrestrial\ReportFigures\160960833_TerrRprt_Fig03_ELC.mxd
Revised: 2014-02-25 By: stroszkali

February 2014
160960833

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Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
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Legend
- Proposed License Area
- Adjacent Lands
- Butternut Tree
- Amphibian Survey Locations
- Railway
- Watercourse
- Waterbody
- Vegetation Community

Forest (FO)
Deciduous Forest (FOD)
FOC2-2 Dry-Fresh White Cedar Coniferous Forest
FOD3-1 Dry-Fresh Poplar Deciduous Forest
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest

Cultural (CU)
Cultural Meadow (CUM)
CUM1 Mineral Cultural Meadow
Cultural Woodland (CUW)
CUW1 Mineral Cultural Woodland
CUW1-3* Hawthorn Cultural Woodland

Marsh (MA)
MAM2 Mineral Meadow Marsh
MAS2-1 Cattail Mineral Shallow Marsh

Swamp (SW)
SWC1-1 White Cedar Mineral Coniferous Swamp
Deciduous Swamp (SWD)
SWD Deciduous Swamp

Other
RR Railroad
RES Residential
AG Agricultural
OA Open Aquatic

Client/Project
Spencer Pit
Township of Guelph-Eramosa

Figure No.
3

Title
Ecological Land Classification and Amphibian Monitoring Stations

555500 556000 556500 557000 557500 558000

4814500 4814000 4813500 4813000

Township 1 Road

Highway 24

Laird Road West

Kossuth Road

Hespeler Road

Forestell Road

N

0 100 200 m

1:7,500

\\Cd1220-f02\01609\active\160960833\drawing\MXD\Terrestrial\ReportFigures\160960833_TerrRprt_Fig04_ProplicenseExtraction.mxd
Revised: 2014-02-25 By: sstroskali

February 2014
160960833

Stantec

Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Orthographic imagery provided by © First Base Solutions Inc., 2013. Imagery date: 2010.

Legend

- Proposed License Area
- Adjacent Lands
- Limit of Extraction
- Railway
- Watercourse
- Waterbody

Client/Project

Spencer Pit
Township of Guelph-Eramosa

Figure No.

4

Title

Proposed License Area and Limit of Extraction

Appendix B:

Terms of Reference

Stantec Consulting Ltd.
70 Southgate Drive Suite 1
Guelph ON N1G 4P5
Tel: (519) 836-6050
Fax: (519) 836-2493

June 11, 2013
File: 160960833

Attention: Ms Lorraine Norminton, District Planner
Ministry of Natural Resources – Guelph District
Ontario Government Bldg
1 Stone Rd W
Guelph ON N1G 4Y2

Dear Lorraine,

Reference: Proposed Spencer Pit – Terms of Reference for a Natural Environment Level 1 & 2 Technical Report

Background

This letter outlines Terms of Reference for a Natural Environment Level 1 & 2 Technical Report in accordance with the *Aggregate Resources Act* of Ontario Provincial Standards for a Category 3 - Class "A" License (above water table) for the proposed Spencer Pit. The proposed pit is located on Part Lots 14, 15 and 16 and Lots 17 and 18, Concession B in the Township of Guelph/Eramosa in the County of Wellington (the "subject lands"). The subject lands are located south of Wellington Rd 124 at the intersection of Township Rd 1.

Approach

During our preliminary review of available literature and data sources, it was determined that there was potential for significant natural heritage features to be associated with the subject lands. As such, the report will be prepared to fulfill the ARA requirements for an integrated Natural Environment Level 1 & 2 Technical Report, and will conform to the County of Wellington Official Plan requirements for an Environmental Impact Study (EIS) and the Township of Guelph/Eramosa Zoning By-law. Where appropriate, preparation of the Natural Environment Level 1 & 2 Technical Report will give due consideration to the GRCA EIS Guidelines.

Proposed Report Contents

The Natural Environment Level 1 & 2 Technical Report will accompany the ARA application being prepared by Harrington McAvan Ltd. and will provide information on the following:

1. A review of literature to identify potentially significant natural heritage features associated with the property, which includes (at minimum) the following documents and online databases:

    - Natural Heritage Information Centre ("NHIC") database. 2010. Natural Areas and Species records search. Biodiversity explorer, MNR, Peterborough, http://nhic.mnr.gov.on.ca/;

    - MNR Land Information Ontario ("LIO") digital mapping of natural heritage features (2011);

- GRCA's Grand River Information Network (GRIN) online interactive mapping tool, available at: http://www.grandriver.ca/index/document.cfm?Sec=63&Sub1=0&sub2=0)
- Ontbirds Archives;
- Ontario Nature's online Reptile and Amphibian Atlas; and,
- Wildlife atlases, including: 'Atlas of the Mammals of Ontario' (Dobbyn, 1994); the 'Ontario Herpetofaunal Summary' (Oldham and Weller, 2000); and, the 'Ontario Breeding Bird Atlas' (Cadman et al., 2007).

2. Pre-consultation with the appropriate agencies, including the MNR, Township of Guelph/Eramosa, County of Wellington and the GRCA, as appropriate.

3. A description of the environmental policy context, specifically the relevant municipal and/or agency policy requirements that apply to the subject lands and the proposed development including the *Aggregate Resources Act*, the Provincial Policy Statement (including the Natural Heritage Reference Manual and supporting technical guides) the County of Wellington Official Plan and Township of Guelph/Eramosa Zoning By-law.

4. Field investigations, including:

   - Ecological Land Classification of vegetation communities on, and adjacent to, the property;
   - Vegetation surveys, timed in order to capture the greatest number of species during their respective flowering period (i.e., late spring/early summer and mid/late summer);
   - Bat maternity roost surveys, to determine the potential for roosting habitat for bat species in the forested sections of the subject lands;
   - Amphibian breeding surveys, using call count surveys according to the Marsh Monitoring Program protocol (BSC, 2003), in the latter halves of May and June.
   - Breeding bird surveys, utilizing a combination of transects and point counts in representative habitats across the property, an approach consistent with methods used by the Canadian Wildlife Service (CWS); and,
   - General wildlife surveys (i.e., observations of individuals, tracks or scats) for reptiles and mammals, which can be conducted concurrent with the breeding bird and vegetation surveys.
   - The historic range for Rusty-patched Bumblebee covers an area that includes the subject lands. As Rusty-patched Bumblebee is listed as Endangered under Ontario's *Endangered Species Act*, the need and appropriate protocols to conduct field investigations for Rusty-patched Bumblebee will be determined in consultation with the MNR.

- Details on the protocols used for conducting field investigations will be provided in the Report.

5. A description of the proposed Spencer Pit development;

6. To fulfill requirements of the Provincial Policy Statement and the *Aggregate Resources Act*, the report will identify and assess significance of the following features on and within 120 metres of the site:

   - significant wetlands;
   - significant portions of the habitat of endangered or threatened species;
   - fish habitat;
   - significant woodlands;
   - significant valley lands;
   - significant wildlife habitat; and,
   - significant areas of natural and scientific interest.
   - Significance will be determined based on the criteria provided in the Natural Heritage Resource Manual (MNR, 2010) and the draft Significant Wildlife Habitat EcoRegion 6E Criterion Schedule (MNR, 2012) with support from the Significant Wildlife Technical Guide (MNR, 2000) as appropriate, and will address the form and functions of natural heritage features and their contribution at the sub-watershed level.

7. The potential environmental effects of the proposed development and assessment of negative impacts in combination with related Site Plans and Hydrogeological reports;

8. Recommended mitigation measures and progressive rehabilitation and restoration strategy to minimize and/or avoid impacts to natural heritage features. This will include the identification of compensation planting opportunities in on-site areas not currently forested; and,

9. Recommended monitoring activities to support the progressive rehabilitation and restoration strategy.

We look forward to receiving your written response to this proposed Terms of Reference, and working with you towards the completion of the Natural Environment Level 1 & 2 Technical Report. Please do not hesitate to contact me should you require further information.

Regards,

STANTEC CONSULTING LTD.

Reference: Proposed Spencer Pit – Terms of Reference for a Natural Environment Level 1 & 2 Technical Report

Vince Deschamps, M.Sc, MCIP, RPP
Senior Environmental Planner
Tel: (519) 836-6050 Ext. 305
Fax: (519) 836-2493
vince.deschamps@stantec.com

Attachment: Attachment

c. Mr. Glenn Harrington, Harrington McAvan Ltd.
Mr. Daniel Eusebi, Stantec Consulting Ltd.

vjd w:\active\60960833\correspondence\mnr\160960833_mnr terms of reference_20130611.docx

Appendix C:

Rusty-patched Bumble Bee Field Methodology

Form Name: Notice of Activity Form and Other Notices under the Endangered Species Act, 2007

Form Number:	0429E (2013/07)
Date Registration Received:	July 16, 2013
Date Registration Filed:	July 16, 2013
Confirmation ID:	X-103-0000000009-v001
Version Number:	
Update Date:	
Client ID:	36

Part 1. Registrant Information

Registrant Type: Business

Personal Information for Individuals

Name:
Primary Phone Number:
Alternative Phone Number:
Fax Number:
Email Address:
Preferred Language:

Business Information

Business Number:	887251288
Legal Name of Business:	Stantec Consulting Inc.
Operating Name of Business:	
Business Type:	Professional, Scientific and Technical Services
Business Location:	Guelph (City)

Business Accountable Person Information

Name:	Mr. Vince Deschamps
Job Title:	Terrestrial Ecologist
Primary Phone Number:	519 836-6050
Alternative Phone Number:	
Fax Number:	
Email Address:	vince.deschamps@stantec.com
Preferred Language:	English

Contact Person Information for Business

Is the contact person for this business the same as the accountable person?:	Yes
Name:	Mr. Vince Deschamps
Job Title:	Terrestrial Ecologist
Primary Phone Number:	519 836-6050
Alternative Phone Number:	
Fax Number:	
Email Address:	vince.deschamps@stantec.com
Preferred Language:	English

Address Information

Physical Address

Address Type:	Civic
Address:	70 Southgate Drive, Suite 1 Guelph, Ontario, Canada N1G 4P5
Additional Location Information:	

Mailing Address

Address:	70 Southgate Drive, Suite 1 Guelph, Ontario, Canada N1G 4P5
Additional Location Information:	

Part 2: Activity Information

Activity under O.Reg 242/08 of the Endangered Species Act, 2007:

Activity:	Species Protection or Recovery Activities
Subactivity (if applicable):	

AdditionalActivity Information:	The project will assist in the protection and recovery of Rusty-patched Bumblebee by confirming presence or absence of this species and increasing knowledge of population distributions of this species. Surveys for bumblebees can provide information about what species are present, and can also be used to identify habitat features such as areas for foraging, nesting and over wintering. This project implements the following action in the government response statement for Rusty-patched Bumblebee: Inventory and Monitoring: 6. Engage volunteers (e.g., field naturalist groups) to undertake surveys, using digital photographs to determine the presence or absence of the species. The proposed activity is related to the development of the Spencer Pit. Rusty-patched Bumblebee was identified by the MNR Guelph District as potentially occurring in the study area. This project will be used to determine possible impacts to this species or their habitat could be present in the study area. Bumblebees captured will be identified and then released in situ. No adverse effects are anticipated to this species. This survey protocol includes the handling, trapping or capture of bumblebees, although no sampling or collection will occur.
Species Group X:	Insects
Species Name X:	Rusty-patched Bumble Bee (Bombus affinis)
Start Date	July 15, 2013
End Date	October 4, 2013

Part 3: Site Information

1 NAICS Code:	541
1 NAICS Description:	Professional, scientific and technical services
2 NAICS Code:	
2 NAICS Description:	
3 NAICS Code:	

3 NAICS Description:

Site Contact Information

Is the Site Contact person the same as the Accountable Person?:	Yes
Is the Site Contact person the same as the Business Contact Person?:	Yes
Primary Contact:	Yes
Name:	Mr. Vince Deschamps
Job Title:	Terrestrial Ecologist
Primary Phone Number:	519 836-6050
Alternative Phone Number:	
Fax Number:	
Email Address:	vince.deschamps@stantec.com
Preferred Language:	English

Site Location Information

Site Location:	1
Primary Location:	Yes
Address Type:	Surveyed Address – Lot & Concession
Address:	Lot 14-18, Concession B Guelph, Ontario
Additional Location Information:	This pit is a proposed aggregate pit located in the Township of Guelph/Eramosa in the County of Wellington. It is located south of Wellington Rd 124 at the intersection of Township Rd 1.

Part 4: Registrant Attestation

Name:	Vince Deschamps
Name of Corporation:	Stantec Consulting Inc.
Title:	Terrestrial Ecologist
Date:	2013/07/16

Appendix D:

ELC and Botanical Inventory

Memo

Stantec

To:	Vince Deschamps	From:	James Leslie
File:	160960833	Date:	November 18, 2013

Reference: Botanical and ELC Surveys: Spencer Pit

This memo has been prepared to provide a summary of the field investigations conducted on June 12 and August 7, 2013 on the property of the proposed Spencer Pit, located between Guelph and Cambridge, ON, south of Highway 24. One additional hawthorn survey was completed on September 14, 2013 and focused specifically on the hawthorn woodland; incidental observations of goldenrods and asters were also recorded at that time. A survey was also conducted on October 30, 2013 to identify vegetation species within the adjacent lands to the proposed licensed area. All surveys were completed by James Leslie.

The purpose of these surveys was to identify and confirm natural and anthropogenic features and provide a general assessment of their ecological significance. The work included Ecological Land Classification (ELC) of vegetation communities and two floristic surveys of the Study Area and adjacent habitat. The spring botanical survey was completed on June 12, while the ELC and summer botanical inventory were completed on August 7; woodland and wildlife features were recorded on both days.

ELC mapping was developed using the ELC field guide for Southern Ontario (Lee et al., 1998) and was completed to the finest level of resolution (Vegetation Type) where feasible. Vegetation communities were first identified on aerial imagery and then checked in the field. Provincial significance of vegetation communities was based on the rankings assigned by the Natural Heritage Information Centre (NHIC, 2010).

Flora nomenclature was based on the Ontario Plant List (Newmaster et al. 1998). However, many updates to genera, specific epithets and family names have been made to reflect recent taxonomic revisions. The primary source of these updates is Michigan Flora Online (2011). For Ontario species not present in the Michigan Flora, the NHIC (2010) was consulted to obtain an updated name if applicable.

The provincial status of all plant species is based on Newmaster et. al (1998), with updates from NHIC (2010). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). This CC value, ranging from 0 (low) to 10 (high), is based on a species' tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value

of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

VEGETATION COMMUNITIES

ELC mapping of the Study Area was completed at a scale of 1:7,500 and is shown on Figure 3.

The vast majority of the Study Area consisted of active agricultural land composed of row crops (soy and grain). Natural habitat was south centrally located and consisted of upland forest, while small anthropogenic communities were observed east of this, consisting of open meadow and thicket habitat. No wetland habitat was present within the Study Area.

The vegetation community types are succinctly described in **Table 1** below.

Table 1 Ecological Land Classification (ELC) Vegetation Types

ELC TYPE	Community Description
Forest (FO)	
Deciduous Forest (FOD)	
FOD3-1 Dry-Fresh Poplar Deciduous Forest	This was a mid-age community with an abundance of trembling aspen in the canopy, infrequently intermixed with American elm, and green ash. The sub-canopy included occasional occurrences of green ash, common buckthorn, and common crabapple. The understory consisted largely of common buckthorn, with infrequent occurrences of prickly gooseberry, hawthorn, and red-osier dogwood. The ground cover often included white avens intermixed with riverbank grape, woodland strawberry, white panicled aster, yellowish enchanters nightshade, and violets, among others. Canopy cover was approximately 60% but with an equally dense sub-canopy. The soil texture was silty, very-fine sand with a moisture regime of 1.
FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest	This mature canopy was dominated by sugar maple with infrequent occurrences of black cherry, green ash, and American basswood – a composition similar to that of the sub-canopy. The understory contained an abundance of wild red raspberry, which at times was the dominant shrub; associate species in this stratum were common buckthorn, red-berried elderberry, Alleghany blackberry, and alternate-leaved dogwood, among others. Ground cover most frequently consisted of yellowish enchanter's nightshade, but also commonly included dame's rocket, herb-robert, red baneberry, wild ginger, early meadow-rue, blue cohosh, jack-in-the-pulpit, and false-solomon's seal, among others. The canopy of this community was tall (~25m) but generally not dense, providing adequate light for the establishment of shrub and herbaceous species more typically associated with edge or open habitat (e.g. raspberry and blackberry species). Soil texture was often silty, very-fine sand with a moisture regime ranging from 1 to 2.
Coniferous Forest (FOC)	

FOC2-2 Dry-Fresh White Cedar Coniferous Forest	This community was assessed remotely; its canopy was dominated by eastern white cedar.
Cultural (CU)	
Cultural Meadow (CUM)	
CUM1 Mineral Cultural Meadow	This open meadow community contained a higher abundance of forbs over graminoids, generally consisting of tall goldenrod, brown knapweed, bird's foot trefoil, red clover, common ragweed, daisy fleabane, red-top grass, and awnless brome. Tree and shrub cover were sparse, with infrequent observation of black cherry, American basswood, and common buckthorn. Soil texture was coarse sand with a moisture regime of 0.
Cultural Woodland (CUW)	
CUW1 Mineral Cultural Woodland	This community was assessed remotely but was generally an open canopy woodland composed of black walnut, ash, poplar, and Manitoba maple. Shrub species were generally abundant in the understory, while ground cover was a mix of forb and graminoid species.
CUW1-3* Hawthorn Cultural Woodland	The canopy of this community largely consisted of large-fruited hawthorn, with occasional occurrences of common buckthorn, common crabapple, and less commonly, trembling aspen, black walnut, and black cherry. The understory was generally open, consisting primarily of wild red raspberry with infrequent associations of red-osier dogwood, and chokecherry. Ground cover contained a higher abundance of forbs over graminoids, consisting largely of tall goldenrod, wild carrot, woodland strawberry, wild basil, bird's foot trefoil, yarrow, red-top grass, Kentucky bluegrass, and awnless brome. Soil texture was silty, very-fine sand with a moisture regime of 1.
Swamp	
Coniferous Swamp (SWC)	
SWC1-1 White Cedar Mineral Coniferous Swamp	The canopy and sub-canopy of this mature community were abundant in eastern white cedar. Occasional occurrences of eastern white pine were present throughout the understory. Yellow birch and red ash were observed in rare occurrences throughout the canopy, sub-canopy and understory. The ground layer largely contained grass species and fowl meadow grass, and less commonly sensitive fern and Canada goldenrod. Soil was noted as being typically moist to saturated.
Marsh (MA)	
Meadow Marsh (MAM)	
MAM2 Mineral Meadow Marsh	The canopy of this community consisted of rare occurrences of willow species and glossy buckthorn. The ground layer consisted of occasional occurrences of American wild mint and grass species and fewer occurrences of purple-stemmed aster.
Shallow Marsh (MAS)	
MAS2-1 Cattail Mineral Shallow Marsh	The canopy of this community consisted of rare occurrences of willow species and fewer occurrences of eastern white cedar. The ground layer was dominated by narrow-leaved cattail. Surface water was present within this community.

None of the vegetation communities listed above are considered rare in the province.

VASCULAR PLANT SPECIES

A total of 206 species of vascular plants were recorded from the Study Area and adjacent lands, of which -61% were native. 95% of these native plants have a rank of S5, indicating they are common and secure within Ontario. 5 species (4%) have a rank of S4 (or some variation), indicating they are apparently secure in Ontario; these species were broad-leaved water-leaf (S4), black walnut (S4), black maple (S4?), fowl meadow grass (S4S5) and pringle's aster (S4).

Pringle's aster was observed on adjacent lands and has a CC value of 9. None of the species observed had a CC value of 10.

Two butternut (*Juglans cinerea)* were recorded, both east of the proposed license area. One dead individual was observed 8m east of the railroad tracks. The second individual was observed in the southern portion of the dry-fresh white cedar coniferous forest community, also east of the railroad tracks.

Butternut is provincially ranked S3? (possibly-vulnerable); and is considered endangered provincially and federally. Butternut is afforded habitat protection under the ESA (2007).

This medium-sized tree is commonly found in a variety of habitats throughout Southern Ontario, including woodlands and hedgerowsideal habitat includes rich, moist, and well-drained soils often found along streams, but may also be found on well-drained gravel sites, particularly those made of limestone (COSEWIC, 2003). Butternut is intolerant of shade and occurs singly or in small groups with a variety of associates (Farrar, 1995).

Incidental wildlife (or evidence of) noted during the survey consisted of: deer (deer beds), Red-tailed Hawk, Black-capped Chickadee, Ruffed Grouse, and American Robin.

STANTEC CONSULTING LTD.

James Leslie, BES
Terrestrial Ecologist
james.leslie@stantec.com

Reference: Botanical and ELC Surveys:

Attachments: ELC Map and Field Notes

REFERENCES

COSEWIC 2003. COSEWIC assessment and status report on the butternut Juglans cinerea in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 32 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

Farrar, J.L. 1995. Trees in Canada. Fitzhenry & Whiteside Limited and the Canadian Forest Service. Canada. 198 pp.

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Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario plant list. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON, Forest Research Information Paper No. 123. 550 pp. + appendices.

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: SPENCER PIT		POLYGON: ADS. PROPERTY	
SURVEYOR(S): JTL	DATE: OCT 30-13		UTME:
START:	END:	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☒ NATURAL	☐ PLANKTON	☐ LAKE
☒ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☐ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☒ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☒ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☒ FORB	☒ MARSH
SITE	☐ CARB. BEDRK.	☐ TABLELAND	COVER	☐ LICHEN	☐ SWAMP
☐ OPEN WATER		☐ ROLL. UPLAND	☒ OPEN	☐ BRYOPHYTE	☐ FEN
☐ SHALLOW WATER		☐ CLIFF	☐ SHRUB	☐ DECIDUOUS	☐ BOG
☐ SURFICIAL DEP.		☐ TALUS	☐ TREED	☐ CONIFEROUS	☐ BARREN
☐ BEDROCK		☐ CREVICE / CAVE		☐ MIXED	☐ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	3	1	SALIX SP. > RHAFRAN
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER	0.2	4	MENARVE = POA SP. > SYM PUN

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:		BA:

		<10	10 – 24	25 – 50	>50
SIZE CLASS ANALYSIS:	R/O		✓	✓	✓
STANDING SNAGS:	✓		✓	✓	✓
DEADFALL/LOGS:	R		✓	✓	✓

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE: MINERAL MEADOW MARSH		CODE: MAM2
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes:

- SURFACE H2O < 20%, < 10cm DEEP; DEER - SCAT ; BEAVER - CUT - TK
- LOOKS WELL GRAZED - ALMOST LIKE PASTURE - MOST LIKELY BY DEER

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
SALIX SP.	R				
TRIOCC	R				
RHAFRAN	R				

SPECIES CODE	LAYER 1	2	3	4	COLL.
RHAFRAN				R	
MENARVE				O-A	
ALISMA SP.				O	
SPIRAEA LOOSE				R-O	
RANUNCULUS SP.				R-O	
SYM LAEVE				R	
PLA RUGE				R	
SYM LAEVIS				O	
FORGET ME NOT				R	
SYM PUNIC				O	
CIR CANA				R	
JUNCUS SP.				R	
JUN EFFU				R-O	
POA SP.				O-A	
SC. ATRO				R-O	
ANG CANA				R	
TYP ANGU				R	
SCH TABERNAE				R	
CAREX SP.				R-O	

Page ___ of ___

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: _____ (Project Manager)

ELC

COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Spencer Pit		POLYGON: ADJ PROPERTY	
SURVEYOR(S): STL	DATE: Oct 30-13		UTME:
START:	END:	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL ☒ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☒ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☒ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☒ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	THUOCCI > BETALLE > FRAPENN
2	SUB-CANOPY	3	4	THUOCCI > FRAPENN > BETALLE
3	UNDERSTOREY	4	3	THUOCCI > RHACATH > FRAPENN
4	GRD. LAYER	5-7	4	POA SP. > GLY SP. STRI > ONOSENS = SOLCANA

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	O	<10	A	10 – 24	R-O	25 – 50	N	>50
STANDING SNAGS:	R	<10	R	10 – 24	R	25 – 50	N	>50
DEADFALL/LOGS:	R	<10	O	10 – 24	R	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:	CODE:
COMMUNITY SERIES:	CODE:
ECOSITE:	CODE:
VEGETATION TYPE: WHT CEDAR MINERAL CONIFER SWAMP	CODE: SWC 1-1
INCLUSION	CODE:
COMPLEX	CODE:

Evidence of Disturbance / Notes:

- SOIL TYPICALLY MOIST TO SATURATED
- NO SURFACE H2O OBS (ASIDE FROM CREEK)

ELC

COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
THUOCCI	A	A	O		
BET ALLE	R-O	R	R		
FRAPENN	R	O	R-O		
SAM CANA			R		
CRATAEGUS		R	R		
RHACATH		R	O		

SPECIES CODE	LAYER 1	2	3	4	COLL.
SOL RUGO				O	
SOL DULC				O	
SCH TAB-MON				R	
VERBENA SP				R	
TYP ANGU				R	
GLYCERIA	SP			O-A	
SYM NOVA				R-O	
POA SP				O-A	
ON SENS				O	
VRT DIOC				R-O	
RANUNCULUS	SP.			R	
DRY CART				R-O	
EUP PERF				R	
ELY RIPE				R	
SYM PUNI				R	
CAREX SPP				R-O	
TAR OFFI				R	
SOL CANA				O	
LOBELIA SP				R	
HESP MATR				R	
GEU ROBE				R-O	
LADY FERN				R	
WOOD ANEMONE				R	
EQU ARVE				R	
ALL PETI				R	
TUS FARF				R	

Page ___ of ___

Signature: [signature] (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: ______ (Project Manager)

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: SPENCER PIT		POLYGON: ADJ PROPERTY	
SURVEYOR(S): JTL	DATE: OCT 30-13	UTME:	
START:	END:	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☒ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☐ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
	☐ CARB. BEDRK.	☐ TABLELAND		☐ LICHEN	☐ SWAMP
SITE		☒ ROLL. UPLAND	COVER	☐ BRYOPHYTE	☐ FEN
☐ OPEN WATER		☐ CLIFF	☐ OPEN	☐ DECIDUOUS	☐ BOG
☐ SHALLOW WATER		☐ TALUS	☐ SHRUB	☒ CONIFEROUS	☐ BARREN
☒ SURFICIAL DEP.		☐ CREVICE / CAVE	☒ TREED	☐ MIXED	☐ MEADOW
☐ BEDROCK		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☒ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	THUOCC >> ULAMER = ACESAS
2	SUB-CANOPY	3	3	THUOCC >> ACESAS = RHACATH
3	UNDERSTOREY	4-5	2	THUOCC = RHACATH > SAMRACE
4	GRD. LAYER	6-7	3	GAUROS = SOLFLEX > CHELMAJ

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION: BA:

SIZE CLASS ANALYSIS:	O	<10	A	10 – 24	R	25 – 50	R	>50
STANDING SNAGS:	R	<10	R	10 – 24	M	25 – 50	M	>50
DEADFALL/LOGS:	O	<10	R-O	10 – 24	M	25 – 50	M	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	PIONEER	YOUNG	MID-AGE	X MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE: DF-WHT CONAC CONIFER FOREST		CODE: FOC2-2
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes:

- ON SLOPE OFTEN SPARSE HERB COVER
- SOME AREAS W/ EXPOSED LIMESTONE DROP-OFFS (≤1m)

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
THUOCC	A	O-A	R-O		
ULAMER	R	R	–		
ACESASA	R	R	–		
RHACATH		R	R-O		
SAMRACE			R		
SAPBARBARA			R		
RUBIDA			R		

SPECIES CODE	LAYER 1	2	3	4	COLL.
HESMATR				R	
CHELMAJ				O	
GAUROS				O	
SOLFLEX				O	
VIOLA SP.				R-O	
CAREX SP				R	
SOLPULC				R-O	
THALICTRUM	SP			R	
ALLPET1				R-O	

Page ___ of ___

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: _____ (Project Manager)

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: SPENCER PIT		POLYGON: ADJ. PROPERTY		
SURVEYOR(S): JTL	DATE: OCT 31 - 13		UTME:	
START:	END:		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☒ NATURAL	☐ PLANKTON	☐ LAKE
☒ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☐ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☒ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☒ FORB	☒ MARSH
SITE		☐ TABLELAND		☐ LICHEN	☐ SWAMP
☐ OPEN WATER	☐ CARB. BEDRK.	☐ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
☐ SHALLOW WATER		☐ CLIFF		☐ DECIDUOUS	☐ BOG
☒ SURFICIAL DEP.		☐ TALUS	COVER	☐ CONIFEROUS	☐ BARREN
☐ BEDROCK		☐ CREVICE / CAVE	☐ OPEN	☐ MIXED	☐ MEADOW
		☐ ALVAR	☐ SHRUB		☐ PRAIRIE
		☐ ROCKLAND	☐ TREED		☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2-3	1	SALIX SP > THUOCC1
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER	4-7	4	TYP ANG

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:		BA:

SIZE CLASS ANALYSIS:	O	<10	R	10 – 24	N	25 – 50	N	>50
STANDING SNAGS:	R	<10	R	10 – 24	N	25 – 50	N	>50
DEADFALL/LOGS:	N	<10	N	10 – 24	N	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE: CATTAIL MINERAL SHALLOW MARSH		CODE: MAS2-1
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes:

- SURFACE H2O PRESENT

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.	SPECIES CODE	LAYER 1	2	3	4	COLL.
THUOCC1	R					TYPH ANG				D	
SALIX	R-O										

Page ___ of ___

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: _____ (Project Manager)

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: SPENCER PIT		POLYGON: ADJ. PROPERTY	
	SURVEYOR(S): JTL	DATE: OCT 30, 13		UTME:
	START:	END:	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☒ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☒ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☒ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	FRAPENN = POPTREM > ACESASA
2	SUB-CANOPY	3	3	FRAPENN = POPTREM = ACESASA
3	UNDERSTOREY	4	3	RHACATH > FRAPENN = ROSA SP.
4	GRD. LAYER	5-7	4	SOLALTI > SYMNOVA > FRAVIRG

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:								BA:
SIZE CLASS ANALYSIS:	O	<10	O	10 – 24	R	25 – 50	N	>50
STANDING SNAGS:	N	<10	R	10 – 24	N	25 – 50	N	>50
DEADFALL/LOGS:	R	<10	R	10 – 24	N	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	PIONEER	YOUNG	☒ MID-AGE	MATURE	OLD GROWTH

SOIL ANALYSIS:

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE: MINERAL CULTURAL WOODLAND		CODE: CUW1
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes: CANOPY COVER ~35%

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER
ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
FAGGRAN	R	R-O	O		
ULMAMER	R	R	/		
THUOCCI	/	R-O	R		
ACENIGR	R	/	/		
POPTREM	O	O	R		
FRAPENN	O	O	O		
ACESASA	R-O	O	O		
TILAMER	/	R	/		
BLK LOCUST	R	R	/		
RUBIDAE				R	
ROSA SP.			O		
SHEP. CANA			R		
RHUTYPH			R		
CRATAEGUS SP.			O		
VIB OPUL				O	
RHACATH			O		

SHEPERDIA CANADENSIS

SPECIES CODE	LAYER 1	2	3	4	COLL.
SOL RUGO				O	
SYM LATE				R	
SOL ALTIS				A	
FRAVIRG				O	
RED CLOVER				O	
DAUCARO				O	
VIOLA SP.				R	
[illegible]				O	
ARC MINU				R	
HESMATR				R	
PLALANC				O	
SYM NOVA				O	
SYM PILO				R	
SOL NEMO				R	
SYM LANCE				R-O	
COMMON MULLEIN				R	
SYM ERIC				R	
V. BUGLOSS				R	

Page ___ of ___

Signature: (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: (Project Manager)

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: SPENCER PIT		POLYGON: 4	
	SURVEYOR(S): JTL	DATE: AUG 7-13		UTME:
	START: 4:25	END: 4:50	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☐ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☒ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☒ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☒ FORB	☐ MARSH
SITE	☐ CARB. BEDRK.	☒ TABLELAND	COVER	☐ LICHEN	☐ SWAMP
☐ OPEN WATER		☐ ROLL. UPLAND	☒ OPEN	☐ BRYOPHYTE	☐ FEN
☐ SHALLOW WATER		☐ CLIFF	☐ SHRUB	☐ DECIDUOUS	☐ BOG
☒ SURFICIAL DEP.		☐ TALUS	☐ TREED	☐ CONIFEROUS	☐ BARREN
☐ BEDROCK		☐ CREVICE / CAVE		☐ MIXED	☒ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☐ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2-3	1	PRU SERO = TIL AMER
2	SUB-CANOPY			
3	UNDERSTOREY			
4	GRD. LAYER	4-7	4	SOL ALTI > NED LUPU = KNAPWEED

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:							BA:
SIZE CLASS ANALYSIS:	R	<10	R	10 – 24	✓	25 – 50	✓	>50
STANDING SNAGS:	N	<10	N	10 – 24	N	25 – 50	N	>50
DEADFALL/LOGS:	N	<10	N	10 – 24	N	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: CS	DEPTH TO MOTTLES/GLEY	g= 0	G= 0
MOISTURE: D	DEPTH OF ORGANICS:	0	(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:	>58	(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:	CODE:
COMMUNITY SERIES:	CODE:
ECOSITE:	CODE:
VEGETATION TYPE: MINERAL CULTURAL MEADOW	CODE: CUMI
INCLUSION	CODE:
COMPLEX	CODE:

Evidence of Disturbance / Notes:

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE:
	POLYGON:
	DATE:
	SURVEYOR(S):

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
PRU SERO	R				
TIL AMER	R				
PIN STRO	R				
RHA CATH				R	

SPECIES CODE	LAYER 1	2	3	4	COLL.
VIP. BUGLOSS				O	
COMMON RAGW.				O	
RED CLOVER				O	
DAU CARO				O	
LOT CORN				O	
SOL ALTI				D-A	
BROM INVR				O	
BRO INVR				O	
PLA LANCE				O	
DAISY FLEA.				O	
NED LUPU				O	
BEAD CAMP.				O	
ACR STOL				O	
PHL PRAT				R	
COMMON MULL.				R	
ASTER SP				O	
CATNIP				R-O	
ELM REPER				R-O	
POA PRAT				R-O	
POT RECT				O	
VIC CRAC				R	

Page ___ of ___

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☑ & legible ☑

Signature: _____ (Project Manager)

ELC

COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Spencer Pit		POLYGON: 2	
SURVEYOR(S): JTR	DATE: Aug 7-13		UTME:
START: 9:00	END: 3:50	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☒ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☒ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☒ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☒ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☒ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☒ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☒ TREED		

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2-3	3	CRATAEGUS C. > RHA CATH
2	SUB-CANOPY			
3	UNDERSTOREY	4	3	RUBIDAE > COR STOL > PRU VIRG
4	GRD. LAYER	5-7	4	SOL ALTI > BAR PRAT = VIC CRAC

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:							BA:	
SIZE CLASS ANALYSIS:	O	<10	R	10 – 24	N	25 – 50	N	>50
STANDING SNAGS:	R	<10	N	10 – 24	N	25 – 50	N	>50
DEADFALL/LOGS:	R	<10	R	10 – 24	N	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD GROWTH

SOIL ANALYSIS:

TEXTURE: Si vfS	DEPTH TO MOTTLES/GLEY	g= ø		G= ø	
MOISTURE: 1	DEPTH OF ORGANICS:	ø			(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:	45			(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:	CODE:
COMMUNITY SERIES:	CODE:
ECOSITE:	CODE:
VEGETATION TYPE: Hawthorn Cultural Woodland	CODE: CUW 1-3*
INCLUSION	CODE:
COMPLEX	CODE:

Evidence of Disturbance / Notes: - Deerbeds (2)

ELC

COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:
POLYGON:
DATE:
SURVEYOR(S):

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
POP TREM	R				
JUG NIGR	R				
PRU SERO	R				
RUB ALLE			R		
RUB IDAE			O		
MALUS PUM	R-O				
JAP. BARBERRY	R				
COR STOL			R-O		
PRU VIRG			R		
RHA CATH	O				
CRATAEGUS	O-A				

SPECIES CODE	LAYER 1	2	3	4	COLL.
SOL ALTI				A	
DAU CARO				O	
FRA VIRG				O	
WILD BASIL				O	
PHL PRAT				O	
POA PRAT				O	
EUT GRAM				O	
LOT CORN				O	
VIC CRAC				R-O	
AGR GIGA				O	
DAC GLOM				R-O	
ASC SYRI				R	
YARROW				O	
OX-EYE				O	
CAR SPIC				R-O	
BRO INER				O	
ASTER SP.				O	

Page ___ of ___ RMC.

Signature: [signature] (Field Personnel)

Quality Control: This form is complete ☒ & legible ☒.

Signature: [signature] (Project Manager)

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: SPRUCE PIT		POLYGON: 3	
SURVEYOR(S): JT	DATE: AUG 7-12		UTME:
START: 3:50	END: 4:25	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☒ NATURAL	☐ PLANKTON	☐ LAKE
☐ WETLAND	☒ MINERAL SOIL	☐ RIVERINE	☐ CULTURAL	☐ SUBMERGED	☐ POND
☐ AQUATIC	☐ PARENT MIN.	☐ BOTTOMLAND		☐ FLOATING-LVD.	☐ RIVER
	☐ ACIDIC BEDRK.	☐ TERRACE		☐ GRAMINOID	☐ STREAM
	☐ BASIC BEDRK.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
SITE	☐ CARB. BEDRK.	☒ TABLELAND	COVER	☐ LICHEN	☐ SWAMP
☐ OPEN WATER		☐ ROLL. UPLAND	☐ OPEN	☐ BRYOPHYTE	☐ FEN
☐ SHALLOW WATER		☐ CLIFF	☐ SHRUB	☒ DECIDUOUS	☐ BOG
☒ SURFICIAL DEP.		☐ TALUS	☒ TREED	☐ CONIFEROUS	☐ BARREN
☐ BEDROCK		☐ CREVICE / CAVE		☐ MIXED	☐ MEADOW
		☐ ALVAR			☐ PRAIRIE
		☐ ROCKLAND			☐ THICKET
		☐ BEACH / BAR			☐ SAVANNAH
		☐ SAND DUNE			☐ WOODLAND
		☐ BLUFF			☒ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	4	POPTREM >> ULMAMER
2	SUB-CANOPY	3	4	FRAPENN > RHACATH
3	UNDERSTOREY	4	3	RHACATH >> RIBCYNO > CRATAEGUS
4	GRD. LAYER	5-7	4	V. AVENS > FRAVIRG = INS. V. CROSS

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION: BA:

SIZE CLASS ANALYSIS:	A	<10	A	10 – 24	R	25 – 50	R	>50
STANDING SNAGS:	O	<10	R	10 – 24	M	25 – 50	M	>50
DEADFALL/LOGS:	O	<10	O	10 – 24	M	25 – 50	M	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	PIONEER	YOUNG	MID-AGE	MATURE	OLD GROWTH
			X		

SOIL ANALYSIS:

TEXTURE: SUFS	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:	43	(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE: D-F POPLAR DECID. FOREST		CODE: FOD 3-1
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes: ~60% CANOPY COVER

ELC — COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
ULMAMER	R-O				
FRAPENN	R	O			
ACERUBR	/	/	R		
JUGNIGR	/	R	/		
PRUNSER	/	/	R		
POPTREM	A	R	R		
PICEMAR	/	R	/		
FAGGRAN	R	/	/		
RIBAMER			R		
PRUNVIR			R		
RIBCYNO			R-O		
MAL PUMI		O			
COR RUGE		R	R		
RUBIDAE				R-O	
VIB OPUL				R-O	
ZAN AMER			R		
CAR STRI			R		
CRATAEGUS SPP		R	R-O		
RHACATH		O	A	O-A	

SPECIES CODE	LAYER 1	2	3	4	COLL.
LON CANA				R	
SOL ALTIS				R	
CAL MOLL				R	
SPIR BETULIF				R	
SYMPH OF PUMI				R	
MIL BASIL				R-O	
VIT RIPA				O	
FRA VIR				O	
DAISY FLEA				R-O	
BROWN KNAP				R	
SYMPH ALBUS				O	
W. AVENS				O-A	
VIOLA SP.				O	
DAME'S ROCK.				R-O	
INS. V. CROSS				O	
TAR OFFI				O	
MAIN ARVE				R	
CIR LUNA				O	
ARA MICH				R	
ONO SENS				R	
VIO PUBE				R	
CIR LUTE				R-O	
MOSS SPP				O	
ACHAM ALBA				R	
DRY CARX				R	
EPI HELL				R	

Page ___ of ___

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☑ & legible ☑.

Signature: _____ (Project Manager)

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE: Spencer Pit		POLYGON: 1	
SURVEYOR(S): JTL	DATE: AUG 7-13		UTME:
START: 12:10PM	END: 2:30PM	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☒ TERRESTRIAL	☐ ORGANIC	☐ LACUSTRINE	☒ NATURAL	☐ PLANKTON	☐ LAKE
		☐ RIVERINE		☐ SUBMERGED	☐ POND
☐ WETLAND	☒ MINERAL SOIL	☐ BOTTOMLAND	☐ CULTURAL	☐ FLOATING-LVD.	☐ RIVER
		☐ TERRACE		☐ GRAMINOID	☐ STREAM
☐ AQUATIC	☐ PARENT MIN.	☐ VALLEY SLOPE		☐ FORB	☐ MARSH
		☒ TABLELAND		☐ LICHEN	☐ SWAMP
	☐ ACIDIC BEDRK.	☐ ROLL. UPLAND		☐ BRYOPHYTE	☐ FEN
		☐ CLIFF		☒ DECIDUOUS	☐ BOG
	☐ BASIC BEDRK.	☐ TALUS		☐ CONIFEROUS	☐ BARREN
SITE		☐ CREVICE / CAVE	COVER	☐ MIXED	☐ MEADOW
	☐ CARB. BEDRK.	☐ ALVAR	☐ OPEN		☐ PRAIRIE
☐ OPEN WATER		☐ ROCKLAND	☐ SHRUB		☐ THICKET
☐ SHALLOW WATER		☐ BEACH / BAR	☒ TREED		☐ SAVANNAH
☒ SURFICIAL DEP.		☐ SAND DUNE			☐ WOODLAND
☐ BEDROCK		☐ BLUFF			☒ FOREST
					☐ PLANTATION

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>>MUCH GREATER THAN; >GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	ACESASA >> PRUSER0
2	SUB-CANOPY	2	3	ACESASA >> TILAMER
3	UNDERSTOREY	3-4	4	RUBIDAE >> RHACATH ? CORALTE
4	GRD. LAYER	5-7	4	CIRLUTE > HESMATR = CAUKIRA

HT CODES: 1=>25m 2=10<HT≤25m 3=2<HT≤10m 4=1<HT≤2m 5=0.5<HT≤1m 6=0.2<HT≤0.5m 7=HT<0.2m

CVR CODES: 0=NONE 1=0%<CVR≤10% 2=10<CVR≤25% 3=25<CVR≤60% 4=CVR>60%

STAND COMPOSITION:							BA:
SIZE CLASS ANALYSIS:	A	<10	C	10 – 24	C	25 – 50	N	>50
STANDING SNAGS:	R	<10	R	10 – 24	N	25 – 50	N	>50
DEADFALL/LOGS:	O	<10	O	10 – 24	R	25 – 50	N	>50

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	PIONEER	YOUNG	MID-AGE	X MATURE	OLD GROWTH

SOIL ANALYSIS: – SEE OVER

TEXTURE:	DEPTH TO MOTTLES/GLEY	g=	G=
MOISTURE:	DEPTH OF ORGANICS:		(cm)
HOMOGENEOUS / VARIABLE	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION:

COMMUNITY CLASS:		CODE:
COMMUNITY SERIES:		CODE:
ECOSITE:		CODE:
VEGETATION TYPE: D-F SUGAR MAPLE DECID. FOREST		CODE: FOD5-1
INCLUSION		CODE:
COMPLEX		CODE:

Evidence of Disturbance / Notes:

- INDICATIONS OF PAST MANAGEMENT/DISTURBANCE (STUMPS, DENSITY OF RUBIDAE, OVERALL STRUCTURE)
- TALL CANOPY, COVER ~70%
- WELL USED PATH EXTENDS THROUGH, NW/SE DIRECTION

ELC COMMUNITY DESCRIPTION & CLASSIFICATION

SITE:	
POLYGON:	
DATE:	
SURVEYOR(S):	

LAYERS: 1=CANOPY>10m 2=SUB-CANOPY 3=UNDERSTOREY 4=GROUND (GRD.) LAYER

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT D=DOMINANT

SPECIES CODE	LAYER 1	2	3	4	COLL.
ACESASA	D	A	O		
PRUSER0	R-A	R	/		
FRAPENN	R	R	O		
TILAMER	R	R-A	R-O		
ULMAMER	/	/	R		
JUGNIGR	/	/	R		

SPECIES CODE	LAYER 1	2	3	4	COLL.
CIR LUTE				A	
KMNS FERN				R	
ACTARA ALBA				O	
GAR ROBE				O	
HYDROPH CANA				R	
WILD LEEK				R-O	
HE SP. MATR				O-A	
WILD GINGER				O	
CARX HITCHCOCKIANA				O	
CAUL GIGANT				O	
YEL AVENS				O	
SOL DULC				O	
J. PULPIT				O	
F.S. SOAL				O	
SOL FORB				R-O	
SYMPHY LATER				R	
THAL. DIOICUM				R-O	
SOL RUGOSA				R	
HOUMS TONGUE				R	
ALL PETIO				O	
CAR RADIATA				O	
CAR SPRENGELII				R-O	
SOL CANA				R-O	
FERN SPP.				R	
CHER. MAJUS				R	
FRA VIRG				O	
ELY HYSTR				R	

SPECIES CODE	LAYER 1	2	3	4	COLL.
PRU VIRG			R		
COR STOL			R		
CORALTER			O		
RUB ALLEG.			O		
RIB CYNO			R	R	
VIB OPUL.			R		
SAM RACE			R-O		
RHA CATH			O		
RUB IDAE			A-D		

Page ___ of ___

Signature: _____ (Field Personnel)

Quality Control: This form is complete ☐ & legible ☐.

Signature: _____ (Project Manager)

No. SPENCER PIT – 60960833
Date. JUNE 12, 2013 Page 1 of 4

START 11:30AM
70% OVERCAST
NO RAIN
25°C

BROM INER	
ARC MINU	
TAR OFFI	
LILAC	
POA PRAT	ERI PHIL
CMNIP	LADIES THUMB
ALFALFA	PRU VIRG
DAU CARO	WHITE CAMPION
COMMON RAGWEED	BINDWEED SP.
BLADDER CAMPION	COMMON MULLEIN
CANADA THISTLE	ACER PLAT
MED LUPU	LON TATA
ELY REPENS	M. EAR CHICKWEED
NORWAY SPRUCE	VERONICA SP. (PICS) PURPLE
DAC GLOM	VERONICA SP (PICS) WHT.
INS. V. CREEPER	ACE SASA
YELLOW AVENS	PLAMAJOR
UPRIGHT W. SORREL	PRICKLY CUCUMBER
GOATS BEARD	BRASSICACEAE (PICS) YELLOW
ALL PETI	CHEL. MAJUS
RUB IDAE	SYG NIGR
LEAFY SPURGE	V. WATERLEAF
RHA CATH	RUB OCCI
BROM. TECT.	ACC NEGU

No. RTHA - 8B
BCCH - VO
Date. Page 2 of 4

POPPY (ORNAMENTAL)	THLASPI ARVENSE / GAL MOLL
COR RACE	VIOLA SP. (PICS)
BUT N' EGGS	RAN ACRIS
PHA ARUN	CAREX SPIC
SHEPERDS PURSE	VIT RIPA
SIBERIAN ELM	YARROW
ARABIS GLABRA	~~HEAL-ALL~~ FOD
POTENTILLA RECTA	SOL FLEX
CHEESES (MALVA)	FRA VIRG
JAP. BARBERRY	OST VIRG
RUM CRISP	CAR ROSEA
OX-EYE DAISY	CAR HITCHCOCK.
PLAN. LANC	PLA RUGE
MOTHERWORT	CAUL GIGA
TIL AMER	CIRCAEA CANA
HESP. MATR	UVULARIA GRAN
RED CLOVER	ALLIUM TRIC
BLK MAPLE	MAYAPPLE
GER ROBE	PURPLE TRILLIUM
FRAPENN	VIB OPUL
RIB CYNO	WILD GINGER
F. SOL SEAL	W. AVENS
SAN. CANA	RHA FRANG

No. GROUSE - #B
Date AMRO Page 3 of 4

STAR-FLWR SOL SOL
WHT. TRILLIUM
ACTAEA RUBRA,
EARLY M RUE
ULM AMER
FRAAMER
~~CAREX~~ CAREX SPENGALII (DAPOE, ANTS)
XMAS FERN
SOL DULC
WOOD FERN (PICS)
EUY. OBOVAT.
N.L SPRING BEAUTY
POLYGONATUM PUBE
KIDNEY LV. BUTTERCUP
ANEM ACUTILOB.
WILD COLUMBINE
LIGUSTRUM VULG.
SAM. RACE
"HYDROPHYLLUM CANADENSE ~~SWEET COLTSFOOT~~" (PICS)
J. PULPIT
PRUSERO
ACTAEA (WHITE)
CAREX (J)
CAREX GRACIL.

TROUT LILY
~~CORALTE~~ OVAL
SPREADING DOGBANE
BRACK. FERN
VIC CRAC
ASPARAGUS
TEASEL
ANE CANA
WILD BASIL
HIERACIUM ~~VULG~~ PILO
CUT DAISY FLEABANE
COMMON BARBERRY
MAL PUMIL
[illegible] AMER
COR STOL
POP TREM
ROSA SP.
CRATAEGUS (PICS)
W. SPRUCE
ASC. SYRI
SPI ALBA
EQU ARVE
CAREX (PUBES) ✓
ONOSENS

No.
Date Page 4 of 4

GLYSTRI
DRY CART [illegible] !
~~FAC GRAM~~
VIPERS BUGLOSS
PINEAPPLE WEED
SENECIO. ALUN

No. SPENCER PIT - SUMMER BOTANICAL
Date. AUG 7 - 2013 Page 1 OF 2

- 100% OVERCAST
- ~24°C
- RAIN WITHIN PAST 24 HRS

WHITE CAMPION	
PRICKLY CUCUMBER	
WHITE VERVAIN	
BRAUNUR	
DAC GLOM	
POLY PERSIC	BROWN KNAPWEED
HORSEWEED	MOTHERWORT
PHL PRAT	COMMON MULLEIN
BLACK BINDWEED	URTICA DIOCA SSP. DIOCA
WILD MARJORAM	FRAXINUS AMER.
SOLANUM NIGRUM	SOL ALTIS
LACTUCA SERR.	CIR. ARVENS
ALFALFA	ACC FREE
SILENE NOCTIFL.	PLA LANCEOLATA
SIBERIAN ELM	HYP PERF
DIGITARIA SANGUIN.	DAISY FLEABANE
MALVA NEGLECTA	DAME'S ROCKET
SHEP. PURSE	PRUNUS SEROTINA
NODDING THISTLE	OENOTHERA BIENNIS
ASPARAGUS	YELLOW AVENS
LAMB QUARTERS	CERASTIUM VULGATUM
BIDENS SP.	VERONICA ARVENSIS
AGROST. HYEMALIS	SETARIA VIRIDIS

No.
Date. Page 2 OF 2

SENECIO VULGARIS	ALIS PLA-AQUA
BLUE VERVAIN	MENTHA ARVENSIS
POA COMPRESSA	TYPHA ANGUST.
RUMEX CRISPUS	EPILOB. CILIATUM
PLANTAGO MAJOR	LEER. ORYZOIDES
ACER NIGRUM	PIN STRO.
VIBURNUM OPULUS	JUNCUS ARTICULATUS
HOAL ALC	
OX-EYE DAISY	
TEASEL	
TUS FARFARA	
GRN AMARANTH	
CIR CANA	
RHUS TYPH	
ASTER cf ERICOIDES	
BUTTER N' EGGS	
POP ALBA DRAIN	
PHA ARUN	
CRK WILLOW	
POA PALU.	
JUN TENU	
JUN BUFON.	
SAL PETIO	

Table 1: Botanical List for Spencer Pit 160960833

	LATIN NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS WELL/ DUFF
		LOCAL STATUS SOURCE									RILEY 1989
		LAST UPDATE/ INITIALS									Aug 2002/KH
x	**PTERIDOPHYTES**		**FERNS & ALLIES**								
x	**Dennstaedtiaceae**		**Bracken Fern Family**								
x	*Pteridium*	*aquilinum* var. *latiusculum*	Eastern Bracken-fern	2	3		S5			G5T	X
x	**Dryopteridaceae**		**Wood Fern Family**								
x	*Dryopteris*	*carthusiana*	Spinulose Wood Fern	5	-2		S5			G5	X
x	*Onoclea*	*sensibilis*	Sensitive Fern	4	-3		S5			G5	X
x	*Polystichum*	*acrostichoides*	Christmas Fern	5	5		S5			G5	X
x	**Equisetaceae**		**Horsetail Family**								
x	*Equisetum*	*arvense*	Field Horsetail	0	0		S5			G5	X
x	**GYMNOSPERMS**		**CONIFERS**								
x	**Cupressaceae**		**Cedar Family**								
x	*Thuja*	*occidentalis*	Eastern White Cedar	4	-3		S5			G5	X
x	**Pinaceae**		**Pine Family**								
x	*Picea*	*abies*	Norway Spruce		5	-1	SE3			G?	X
x	*Picea*	*glauca*	White Spruce	6	3		S5			G5	X
x	*Pinus*	*strobus*	Eastern White Pine	4	3		S5			G5	X
x	**DICOTYLEDONS**		**DICOTS**								
x	**Amaranthaceae**		**Amaranth Family**								
x	*Amaranthus*	*retroflexus*	Green Amaranth		2	-1	SE5			G?	X
x	*Chenopodium*	*album* var. *album*	Lamb's Quarters		1	-1	SE5			G5T5	X
x	**Anacardiaceae**		**Sumac or Cashew Family**								
x	*Rhus*	*typhina*	Staghorn Sumac	1	5		S5			G5	X
x	**Apiaceae**		**Carrot or Parsley Family**								
x	*Daucus*	*carota*	Wild Carrot		5	-2	SE5			G?	X

x	**Apocynaceae**		**Dogbane Family**								
x	*Apocynum*	*androsaemifolium*	Spreading Dogbane	3	5		S5			G5T?	X
x	*Asclepias*	*syriaca*	Common Milkweed	0	5		S5			G5	X
x	**Aristolochiaceae**		**Duchman's-pipe Family**								
x	*Asarum*	*canadense*	Wild Ginger	6	5		S5			G5	X
x	**Asteraceae**		**Composite or Aster Family**								
x	*Achillea*	*millefolium*	Common Yarrow	0	3		S5			G5T5	
x	*Ambrosia*	*artemisiifolia*	Common Ragweed	0	3		S5			G5	X
x	*Arctium*	*minus*	Common Burdock		5	-2	SE5			G?T?	X
x	*Bidens*	*cf. frondosa*	Devil's Beggar-ticks	3	-3		S5			G5	X
x	*Centaurea*	*jacea*	Brown Knapweed		5	-1	SE5			G?	X
x	*Cirsium*	*arvense*	Canada Thistle		3	-1	SE5			G?	X
x	*Conyza*	*canadensis*	Horseweed	0	1		S5			G5	X
x	*Erigeron*	*philadelphicus var. philadelphicus*	Philadelphia Fleabane	1	-3		S5			G5T?	X
x	*Erigeron*	*strigosus*	Daisy Fleabane	0	1		S5			G5	
x	*Euthamia*	*graminifolia*	Flat-topped Bushy Goldenrod	2	-2		S5			G5	X
x	*Hieracium*	*piloselloides*	Glaucous King Devil		5	-2	SE5			G?	X
x	*Lactuca*	*serriola*	Prickly Lettuce		0	-1	SE5			G?	X
x	*Leucanthemum*	*vulgare*	Ox-eye Daisy		5	-1	SE5			G?	X
x	*Matricaria*	*discoidea*	Pineapple-weed				SE5			G5	X
x	*Senecio*	*vulgaris*	Common Groundsel		5	-1	SE5			G?	X
x	*Solidago*	*altissima ssp. altissima*	Tall Goldenrod	1	3		S5				X
x	*Solidago*	*canadensis var. canadensis*	Canada Goldenrod	1	3		S5			G5	X
x	*Solidago*	*flexicaulis*	Zig-zag Goldenrod	6	3		S5			G5	X
x	*Solidago*	*rugosa* ssp. *rugosa*	Rough Goldenrod	4	-1		S5			G5T?	X
x	*Symphyotrichum*	*ericoides var. ericoides*	White Heath Aster				S5			G5T5	X
x	*Symphyotrichum*	*laeve var. laeve*	Smooth Aster	7	5		S5			G5	X
x	*Symphyotrichum*	*lanceolatum ssp. lanceolatum*	White Panicled Aster	3	-3		S5			G5T5	X
x	*Symphyotrichum*	*lateriflorum var. lateriflorum*	Calico Aster	3	-2		S5			G5T5	X
x	*Symphyotrichum*	*novae-angliae*	New England Aster	2	-3		S5			G5	X
x	*Symphyotrichum*	*cf. puniceum* var. *puniceum*	Purple-stemmed Aster	6	-5		S5			G5	
x	*Taraxacum*	*officinale*	Common Dandelion		3	-2	SE5			G5	X
x	*Tragopogon*	*dubius*	Doubtful Goat's-beard		5	-1	SE5			G?	
x	*Tussilago*	*farfara*	Coltsfoot		3	-2	SE5			G?	X
x	**Berberidaceae**		**Barberry Family**								
x	*Berberis*	*thunbergii*	Japanese Barberry		4	-3	SE5			G?	
x	*Berberis*	*vulgaris*	Common Barberry		3	-2	SE5			G?	X

x	*Caulophyllum*	*giganteum*	Blue Cohosh				S5			G	
x	*Podophyllum*	*peltatum*	May-apple	5	3		S5			G5	X
x	**Betulaceae**		**Birch Family**								
x	*Ostrya*	*virginiana*	Hop Hornbeam	4	4		S5			G5	X
x	**Boraginaceae**		**Borage Family**								
x	*Cynoglossum*	*officinale*	Hound's-tongue		5	-1	SE5			G?	X
x	*Echium*	*vulgare*	Blueweed		5	-2	SE5			G?	X
x	**Brassicaceae**		**Mustard Family**								
x	*Alliaria*	*petiolata*	Garlic Mustard		0	-3	SE5			G5	
x	*Arabis*	*glabra*	Tower Mustard	4	5		S5			G5	X
x	*Capsella*	*bursa-pastoris*	Shepherd's Purse		1	-1	SE5			G?	X
x	*Hesperis*	*matronalis*	Dame's Rocket		5	-3	SE5			G4G5	X
x	*Thlaspi*	*arvense*	Field Penny-cress		5	-1	SE5			G?	X
x	**Caprifoliaceae**		**Honeysuckle Family**								
x	*Lonicera*	*tatarica*	Tartarian Honeysuckle		3	-3	SE5			G?	X
x	*Sambucus*	*racemosa* ssp. *pubens*	Red-berried Elderberry	5	2		S5			G5T4T5	X
x	*Viburnum*	*opulus*	Guelder Rose		0	-1	SE4			G5	
x	**Caryophyllaceae**		**Pink Family**								
x	*Cerastium*	*fontanum*	Larger Mouse-ear Chickweed		3	-1	SE5			G?	X
x	*Silene*	*latifolia*	Bladder Campion				SE5			G?	X
x	*Silene*	*noctiflora*	Night-flowering Catchfly		5	-1	SE5			G?	X
x	*Silene*	*vulgaris*	Catchfly		5	-1	SE5			G?	X
x	**Celastraceae**		**Staff-tree Family**								
x	*Euonymus*	*obovata*	Running Strawberry-bush	6	5		S5			G5	X
x	**Cornaceae**		**Dogwood Family**								
x	*Cornus*	*alternifolia*	Alternate-leaved Dogwood	6	5		S5			G5	X
x	*Cornus*	*foemina* ssp. *racemosa*	Red Panicled Dogwood	2	-2		S5			G5?	X
x	*Cornus*	*stolonifera*	Red-osier Dogwood	2	-3		S5			G5	X
x	**Cucurbitaceae**		**Gourd Family**								
x	*Echinocystis*	*lobata*	Prickly Cucumber	3	-2		S5			G5	X
x	**Dipsacaceae**		**Teasel Family**								

x	*Dipsacus*	*fullonum* ssp. *sylvestris*	Wild Teasel		5	-1	SE5			G?T?	X
x	**Euphorbiaceae**		**Spurge Family**								
x	*Euphorbia*	*esula*	Leafy Spurge		5	-2	SE5			G5	X
x	**Fabaceae**		**Pea Family**								
x	*Lotus*	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5			G?	X
x	*Medicago*	*lupulina*	Black Medick		1	-1	SE5			G?	X
x	*Medicago*	*sativa* ssp. *sativa*	Alfalfa		5	-1	SE5			G?T?	X
x	*Trifolium*	*pratense*	Red Clover		2	-2	SE5			G?	X
x	*Vicia*	*cracca*	Tufted Vetch		5	-1	SE5			G?	X
x	**Fagaceae**		**Beech Family**								
x	*Fagus*	*grandifolia*	American Beech	6	3		S5			G5	X
x	**Geraniaceae**		**Geranium Family**								
x	*Geranium*	*robertianum*	Herb-robert		5	-2	SE5			G5	X
x	**Grossulariaceae**		**Currant Family**								
x	*Ribes*	*americanum*	Wild Black Currant	4	-3		S5			G5	X
x	*Ribes*	*cynosbati*	Prickly Gooseberry	4	5		S5			G5	X
x	**Guttiferae**		**St. John's-wort Family**								
x	*Hypericum*	*perforatum*	Common St. John's-wort		5	-3	SE5			G?	X
x	**Hydrophyllaceae**		**Water-leaf Family**								
x	*Hydrophyllum*	*canadense*	Broad-leaved Water-leaf	8	-2		S4			G5	X
x	*Hydrophyllum*	*virginianum*	Virginia Water-leaf	6	-2		S5			G5	X
x	**Juglandaceae**		**Walnut Family**								
x	*Juglans*	*nigra*	Black Walnut	5	3		S4			G5	X
x	**Lamiaceae**		**Mint Family**								
x	*Clinopodium*	*vulgare*	Wild Basil	4	5		S5			G?	X
x	*Leonurus*	*cardiaca* ssp. *cardiaca*	Common Motherwort		5	-2	SE5			G?T?	X
x	*Mentha*	*arvensis* ssp. *borealis*	American Wild Mint	3	-3		S5				X
x	*Nepeta*	*cataria*	Catnip		1	-2	SE5			G?	X
x	*Origanum*	*vulgare*	Wild Marjarom		5	-2	SE5			G?	X
x	*Prunella*	*vulgaris* ssp. *vulgaris*	Common Heal-all		0	-1	SE3			G5T?	X

x	**Malvaceae**		**Mallow Family**								
x	*Malva*	*neglecta*	Cheeses		5	-1	SE5			G?	
x	**Oleaceae**		**Olive Family**								
x	*Fraxinus*	*americana*	White Ash	4	3		S5			G5	X
x	*Fraxinus*	*pennsylvanica*	Red Ash	3	-3		S5			G5	X
x	*Ligustrum*	*vulgare*	Common Privet		1	-2	SE5			G?	X
x	*Syringa*	*vulgaris*	Common Lilac		5	-2	SE5			G?	X
x	**Onagraceae**		**Evening-primrose Family**								
x	*Circaea*	*lutetiana* ssp. *canadensis*	Yellowish Enchanter's Nightshade	3	3		S5			G5T5	X
x	*Epilobium*	*ciliatum* ssp. *ciliatum*	Ciliate Willow-herb	3	3		S5			G5T?	X
x	*Oenothera*	*biennis*	Common Evening-primrose	0	3		S5			G5	X
x	**Oxalidaceae**		**Wood Sorrel Family**								
x	*Oxalis*	*stricta*	Upright Yellow Wood-sorrel	0	3		S5			G5	X
x	**Papaveraceae**		**Poppy Family**								
x	*Chelidonium*	*majus*	Celandine		5	-3	SE5			G?	X
x	*Sanguinaria*	*canadensis*	Bloodroot	5	4		S5			G5	X
x	**Plantaginaceae**		**Plantain Family**								
x	*Plantago*	*lanceolata*	Ribgrass		0	-1	SE5			G5	X
x	*Plantago*	*major*	Common Plantain		-1	-1	SE5			G5	X
x	*Plantago*	*rugelii*	Rugel's Plantain	1	0		S5			G5	X
x	**Polygonaceae**		**Smartweed Family**								
x	*Fallopia*	*convolvulus*	Black Bindweed		1	-1	SE5			G?	X
x	*Persicaria*	*maculosa*	Lady's-thumb		-3	-1	SE5			G?	X
x	*Rumex*	*crispus*	Curly-leaf Dock		-1	-2	SE5			G?	X
x	**Portulacaceae**		**Purslane Family**								
x	*Claytonia*	*virginica*	Virginia Spring Beauty	5	3		S5			G5	X
x	**Ranunculaceae**		**Buttercup Family**								
x	*Actaea*	*pachypoda*	White Baneberry	6	5		S5			G5	X
x	*Actaea*	*rubra*	Red Baneberry	5	5		S5			G5	X
x	*Anemone*	*canadensis*	Canada Anemone	3	-3		S5			G5	X
x	*Anemone*	*acutiloba*	Sharp-lobed Hepatica	6	5		S5			G5	X
x	*Aquilegia*	*canadensis*	Wild Columbine	5	1		S5			G5	X

x	*Ranunculus*	*abortivus*	Kidney-leaf Buttercup	2	-2		S5			G5	X
x	*Ranunculus*	*acris*	Tall Buttercup			-2	SE5			G5	X
x	*Thalictrum*	*dioicum*	Early Meadow-rue	5	2		S5			G5	X
x	**Rhamnaceae**		**Buckthorn Family**								
x	*Rhamnus*	*cathartica*	Common Buckthorn		3	-3	SE5			G?	X
x	*Rhamnus*	*frangula*	Glossy Buckthorn		-1	-3	SE5			G?	X
x	**Rosaceae**		**Rose Family**								
x	*Crataegus*	*punctata*	Large-fruited Thorn	4	5		S5			G5	X
x	*Fragaria*	*virginiana* ssp. *virginiana*	Scarlet Strawberry	2	1		SU			G5T?	X
x	*Geum*	*aleppicum*	Yellow Avens	2	-1		S5			G5	X
x	*Geum*	*canadense*	White Avens	3	0		S5			G5	X
x	*Malus*	*pumila*	Common Crabapple		5	-1	SE5			G5	X
x	*Potentilla*	*recta*	Rough-fruited Cinquefoil		5	-2	SE5			G?	X
x	*Prunus*	*serotina*	Black Cherry	3	3		S5			G5	X
x	*Prunus*	*virginiana* ssp. *virginiana*	Choke Cherry	2	1		S5			G5T?	X
x	*Rubus*	*allegheniensis*	Alleghany Blackberry	2	2		S5			G5	X
x	*Rubus*	*idaeus* ssp. *strigosus*	Wild Red Raspberry	0	-2		S5			G5T5	X
x	*Rubus*	*occidentalis*	Thimble-berry	2	5		S5			G5	X
x	*Spiraea*	*alba*	Narrow-leaved Meadow-sweet	3	-4		S5			G5	X
x	**Rubiaceae**		**Madder Family**								
x	*Galium*	*mollugo*	White Bedstraw		5	-2	SE5			G?	X
x	**Rutaceae**		**Rue Family**								
x	*Zanthoxylum*	*americanum*	American Prickly-ash	3	5		S5			G5	X
x	**Salicaceae**		**Willow Family**								
x	*Populus*	*alba*	Silver Poplar		5	-3	SE5			G5	X
x	*Populus*	*tremuloides*	Trembling Aspen		0		S5			G5	X
x	*Salix*	*petiolaris*	Slender Willow	3	-4		S5			G4	X
x	*Salix X*	*fragilis*	Hybrid Crack WIllow		-1	-3	SE5			G?	X
x	**Sapindaceae**		**Maple Family**								
x	*Acer*	*negundo*	Manitoba Maple	0	-2		S5			G5	X
x	*Acer*	*nigrum*	Black Maple	7	3		S4?			G5Q	X
x	*Acer*	*platanoides*	Norway Maple		5	-3	SE5			G?	X
x	*Acer*	*saccharum*	Sugar Maple	4	3		S5			G5T?	X
x	*Acer X*	*freemanii*	Freeman's Maple								

x	**Scrophulariaceae**		**Figwort Family**								
x	*Linaria*	*vulgaris*	Butter-and-eggs		5	-1	SE5			G?	X
x	*Verbascum*	*thapsus*	Common Mullein		5	-2	SE5			G?	X
x	*Veronica*	*arvensis*	Corn Speedwell		5	-1	SE5			G?	X
x	**Solanaceae**		**Nightshade Family**								
x	*Solanum*	*dulcamara*	Bitter Nightshade		0	-2	SE5			G?	X
x	*Solanum*	*ptychanthum*	Eastern Black Nightshade	3	5		S5			G5	X
x	**Tiliaceae**		**Linden Family**								
x	*Tilia*	*americana*	American Basswood	4	3		S5			G5	X
x	**Ulmaceae**		**Elm Family**								
x	*Ulmus*	*americana*	White Elm	3	-2		S5			G5?	X
x	*Ulmus*	*pumila*	Siberian Elm		5	-1	SE3			G?	
x	**Urticaceae**		**Nettle Family**								
x	*Urtica*	*dioica* ssp. *gracilis*	American Stinging Nettle	2	-1		S5			G5T?	X
x	**Verbenaceae**		**Vervain Family**								
x	*Verbena*	*hastata*	Blue Vervain	4	-4		S5			G5	X
x	*Verbena*	*urticifolia*	White Vervain	4	-1		S5			G5	X
x	*Verbena*	*species*									
x	**Violaceae**		**Violet Family**								
x	*Viola*	*species*	Violet Species								
x	*Viola*	*pubescens*	Downy Yellow Violet				S5			G5	X
x	**Vitaceae**		**Grape Family**								
x	*Parthenocissus*	*inserta*	Inserted Virginia-creeper	3	3		S5			G5	X
x	*Vitis*	*riparia*	Riverbank Grape	0	-2		S5			G5	X
x	**MONOCOTYLEDONS**		**MONOCOTS**								
x	**Alismataceae**		**Water-plantain Family**								
x	*Alisma*	*plantago-aquatica*	Common Water-plantain	3	-5		S5			G5	X
x	*Alisma*	*species*									
x	**Araceae**		**Arum Family**								
x	*Arisaema*	*triphyllum* ssp. *triphyllum*	Small Jack-in-the-pulpit	5	-2		S5			G5T5	X

x	**Cyperaceae**		**Sedge Family**								
x	*Carex*	*species*	Sedge species								
x	*Carex*	*gracillima*	Graceful Sedge	4	3		S5			G5	X
x	*Carex*	*hitchcockiana*	Hitchcock's Sedge	6	5		S5			G5	X
x	*Carex*	*rosea*	Stellate Sedge	5	5		S5			G5	
x	*Carex*	*spicata*	Spiked Sedge		5	-1	SE5			GNR	
x	*Carex*	*sprengelii*	Long-beaked Sedge	6	0		S5			G5?	X
x	**Juncaceae**		**Rush Family**								
x	*Juncus*	*articulatus*	Jointed Rush	5	-5		S5			G5	X
x	*Juncus*	*bufonius*	Toad Rush	1	-4		S5			G5	X
x	*Juncus*	*tenuis*	Path Rush	0	0		S5			G5	X
x	**Liliaceae**		**Lily Family**								
x	*Allium*	*tricoccum*	Wild Leek	7	2		S5			G5	X
x	*Asparagus*	*officinalis*	Garden Asparagus		3	-1	SE5			G5?	X
x	*Erythronium*	*americanum* ssp. *americanum*	Yellow Dog's-tooth Violet	5	5		S5			G5T5	X
x	*Maianthemum*	*racemosum* ssp. *racemosum*	False Solomon's Seal	4	3		S5			G5T	X
x	*Maianthemum*	*stellatum*	Star-flowered Solomon's Seal	6	1		S5			G5	X
x	*Polygonatum*	*pubescens*	Hairy Solomon's Seal	5	5		S5			G5	X
x	*Trillium*	*erectum*	Purple Trillium	6	1		S5			G5	X
x	*Trillium*	*grandiflorum*	White Trillium	5	5		S5			G5	X
x	*Uvularia*	*grandiflora*	Large-flowered Bellwort	6	5		S5			G5	X
x	*Epipactis*	*helleborine*	Common Helleborine		5	-2	SE5			G?	X
x	**Poaceae**		**Grass Family**								
x	*Agrostis*	*gigantea*	Red-top		0	-2	SE5			G4G5	X
x	*Agrostis*	*scabra*	Fly-away Grass	6	0		S5			G5	X
x	*Agrostis*	*stolonifera*	Redtop		-3		S5			G5	X
x	*Bromus*	*inermis* ssp. *inermis*	Awnless Brome		5	-3	SE5			G4G5T'	X
x	*Bromus*	*tectorum*	Downy Chess		5	-2	SE5			G?	X
x	*Dactylis*	*glomerata*	Orchard Grass		3	-1	SE5			G?	X
x	*Digitaria*	*sanguinalis*	Large Crabgrass		3	-1	SE5			G5	X
x	*Elymus*	*hystrix*	Bottle-brush Grass	5	5		S5			G5	X
x	*Elymus*	*repens*	Quack Grass		3	-3	SE5			GNR	X
x	*Glyceria*	*striata*	Fowl Meadow Grass	3	-5		S4S5			G5T5	X
x	*Leersia*	*oryzoides*	Rice Cut Grass	3	-5		S5			G5	X
x	*Phalaris*	*arundinacea*	Reed Canary Grass	0	-4		S5			G5	X
x	*Phleum*	*pratense ssp. pratense*	Timothy		3	-1	SE5			G?	X

x	*Poa*	*compressa*	Canada Blue Grass		2		SE			GNR	X
x	*Poa*	*palustris*	Fowl Meadow Grass	5	-4		S5			G5	X
x	*Poa*	*pratensis* ssp. *pratensis*	Kentucky Bluegrass	0	1		S5			G5T5	X
x	*Schedonorus*	*arundinaceus*	Tall Fescue		2	-1	SE5			G?	X
x	*Setaria*	*viridis var. viridis*	Green Foxtail			-1	SE5			G?	X
x	**Typhaceae**		**Cattail Family**								
x	*Typha*	*angustifolia*	Narrow-leaved Cattail	3	-5		S5			G5	X
x*	*Athyrium*	*filix-femina* ssp. *angustum*	Northern Lady Fern	4	0		S5			G5T5	X
x*	*Eupatorium*	*perfoliatum*	Perfoliate Thoroughwort	2	-4		S5			G5	X
x*	*Solidago*	*nemoralis var . nemoralis*	Gray Goldenrod	2	5		S5			G5T?	X
x*	*Symphyotrichum*	*pilosum* var. *pringlei*	Pringle's Aster	9	-2		S4			G5T5	R
x*	*Betula*	*alleghaniensis*	Yellow Birch	6	0		S5			G5	X
x*	*Echium*	*plantagineum*	Purple Viper's Bugloss				SE1			G?	
x*	*Myosotis*	*species*									
x*	*Lobelia*	*species*									
x*	*Shepherdia*	*canadensis*	Canada Soapberry	7	5		S5			G5	X
x*	*Robinia*	*pseudo-acacia*	Black Locust		4	-3	SE5			G5	X
x*	*Juglans*	*cinerea*	Butternut	6	2		S3?	END	END	G4	X
x*	*Lysimachia*	*ciliata*	Fringed Loosestrife	4	-3		S5			G5	X
x*	*Crataegus*	*species*	Hawthorn species								
x*	*Rubus*	*idaeus* ssp. *idaeus*	Red Raspberry				SE1			G5T5	
x*	*Rosa sp*										
x*	*Salix*	*species*	Willow species								
x*	*Schoenoplectus*	*tabernaemontani*	Soft-stemmed Bulrush	5	-5		S5			G5	X
x*	*Scirpus*	*atrocinctus*	Black-girdled Bulrush				S5			G5	
x*	*Juncus*	*effusus* ssp. *solutus*	Soft Rush	4	-5		S5			G5T?	X
x*	*Juncus*	*species*									
x*	*Glyceria*	*species*									
x*	*Poa*	*species*									

Note: x indicates that the species was observed within the proposed licensed area.

Note: x* indicates that the species was observed on adjacent properties only and not within the proposed licensed area.

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

Total Species: **206**

Native Species:		**125**	61%
Exotic Species		**81**	39%
Regionally Significant Species		enter manually	
Locally Significant Species		enter manually	
S1-S3 Species		1	1%
S4 Species		5	4%
S5 Species		118	95%

Co-efficient of Conservatism and Floristic Quality Index

Co-efficient of Conservatism (CC) (average)		**3.6**	
CC 0 to 3	*lowest sensitivity*	56	47%
CC 4 to 6	*moderate sensitivity*	57	48%
CC 7 to 8	*high sensitivity*	5	4%
CC 9 to 10	*highest sensitivity*	1	1%
Floristic Quality Index (FQI)		**39**	

Presence of Weedy & Invasive Species

mean weediness		**-1.7**	
weediness = -1	*low potential invasiveness*	37	49%
weediness = -2	*moderate potential invasiveness*	25	33%
weediness = -3	*high potential invasiveness*	14	18%

Presence of Wetland Species

average wetness value		**1.7**	
upland		65	33%
facultative upland		49	25%
facultative		39	20%
facultative wetland		35	18%
obligate wetland		8	4%

EXPLANATION OF TERMINOLOGY *(See the following pages for addition detailed information on terms.)*

Botanical and Common Name: From Newmaster et. al, 1998. Species requiring confirmation noted (cf).

Co-efficient of Conservatism: This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity.

Wetness Index: This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or upland habitats.

Weediness Index: This value, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance.

Provincial Status: Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. S4 and S5 species are generally uncommon to common in the province. Species ranked S1-S3 are considered to be rare in Ontario.

Local Status:

X: native species present (collection-based) and all exotic species

R: native species locally rare (number of sites): Hamilton-Wentworth (<6 sites), Durham (<10 sites), GTA (<40 sites), Site District 6E7 (<20 sites), Oak Ridges Moraine (20 or fewer sites), Halton (<5 sites); Peterborough (suspected of being rare, 5 or fewer occurrences); CVC/Peel Region (<11 sites)

U: native species locally uncommon Hamilton-Wentworth (6-10 sites), Durham (11-20 sites), GTA (41-80 sites), Site District 6E7 (21-40 sites), Halton (5-15 sites).

E: Presumed Extirpated

?: More work required to determine status

H: historic record

O: only old (>20 years) records known (Peterborough)

Record Type

SR - sight record

SRP - sight record with photograph

TRCA Rankings:

L5: able to withstand high levels of disturbance; generally secure throughout the jurisdiction, including the urban matrix. May be of very localized concern in highly degraded areas

L4: able to withstand some disturbance; generally secure in rural matrix; of concern in urban matrix

L3: able to withstand minor disturbance; generally secure in natural matrix; considered to be of regional concern.

L2: unable to withstand disturbance; some criteria are very limiting

factors; generally occur in high-quality natural areas, in natural matrix; probably rare in the TRCA jurisdiction; of concern regionally

L1: unable to withstand disturbance; many criteria are limiting factors; generally occur in high-quality natural areas in natural matrix; almost certainly rare in the TRCA jurisdiction; of concern regionally

LX: extirpated from our region with remote chance of rediscovery. Presumably highly sensitive

LH: hybrid between two native species. Usually not scored unless highly stable and behaves like a species (e.g. *Equisetum x nelsonii*)

L+: exotic. Not native to TRCA jurisdiction. Includes hybrids between a native species and an exotic

L+?: origin uncertain or disputed, i.e. may or may not be native

pL : found in natural cover, but only as planted, not regenerating

The sensitivity of natural areas can be assessed through application of the Weediness Index. The Weediness Index quantifies the potential invasiveness of non-native plants, and, in combination with the percentage of non-native plants can be used as an indicator of disturbance. Values (ranging from 1- to -3) have been assigned to most non-native species based on the potential impact each species can have in natural areas:

-1: little or no impact on natural areas (most non-native plants are in this category)

-2: occasional impacts on natural areas, generally infrequent or localized

-3: major potential impacts on natural areas

Wetness Index

All plants in southern Ontario have been assigned a wetland category, based on the designations developed for use by the United States Fish & Wildlife Service. Plants are designated into the following categories:

OBL (Obligate Wetland): occurs almost always in wetlands under natural conditions (estimated >99% probability)

FACW (Facultative Wetland): usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability)

FAC (Facultative): equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)

FACU (Facultative Upland): occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)

UPL (Upland): occurs almost never in wetlands under natural conditions (estimated <1% probability)

Further refinement of the Facultative categories are denoted by a "+" or "-" to express exaggerated tendencies for those species. The "+" denotes a greater estimated probability occurring in wetlands than species in the general indicator category, but a lesser probability than species occurring in the next higher category. The "-" denotes a lesser estimated probability of occurring in wetlands than species in the general indicator category, but a greater probability than species occurring in the next lower general category.

Each wetland category has been assigned a numerical value to facilitate the quantification of the wetness index. The wetland categories and their corresponding values are as follows:

OBL : -5
FACW+: -4
FACW: -3
FACW-: -2
FAC+: -1
FAC: 0
FAC-: 1
FACU+: 2
FACU: 3
FACU-: 4
UPL: 5

Provincial Status

Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These rankings are based on the total number of extant Ontario populations and the degree to which they are potentially or actively threatened with destruction. The ranks are:

S1: Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2: Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3: Vulnerable - Vulnerable in the nation or state/province 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: Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5: Secure - Common, widespread, and abundant in the nation or state/province.

SH: 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. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences.

SR: Reported in Ontario, but without persuasive documentation.

SX: Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SE: Exotic; not believed to be a native component of Ontario's flora. Numerical rankings after SE follow designations described above for native species.

SU: Unranked — Nation or state/province conservation status not yet assessed.

Rank ranges, e.g. S2S3, indicate that the rank is either S2 or S3, but that current information is insufficient to differentiate.

"?" following a rank indicates uncertainty about the assigned rank.

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Appendix E:

Wildlife Species

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	Local Status Hamilton	Local Status TRCA	Waterloo Regionally Significant	Source	Local Status PIF Priority Species (BCR 13)	COMMENTS	Area Sensitive Reference
BUMBLE BEES													
Two-spotted Bumble Bee	*Bombus bimaculatus*	GNR	S4										
Yellow Bumble Bee	*Bombus fervidus*	GNR	S4										
Brown-belted Bumble Bee	*Bombus griseocollis*	GNR	S4										
Common Eastern Bumble Bee	*Bombus impatiens*	G5	S4S5										
Confusing Bumble Bee	*Bombus perplexus*	GNR	S4S5										
Red-belted Bumble Bee	*Bombus rufocinctus*	GNR	S4										
Half-black Bumble Bee	*Bombus vagans*	GNR	S5										
AMPHIBIANS													
Tetraploid Gray Treefrog	*Hyla versicolor*	S5	G5					L2					
Spring Peeper	*Pseudacris crucifer*	S5	G5					L2					
Northern Green Frog	*Lithobates clamitans*	S5	G5										
BIRDS													
Great Blue Heron	*Ardea herodias*	S5	G5				m	L3	X			Flyover	
Turkey Vulture	*Cathartes aura*	S5B	G5				m		X			Flyover	
Red-tailed Hawk	*Buteo jamaicensis*	S5	G5	NAR	NAR								
Killdeer	*Charadrius vociferus*	S5B, S5N	G5										
Mourning Dove	*Zenaida macroura*	S5	G5										
Ruby-throated Hummingbird	*Archilochus colubris*	S5B	G5				m		X				
Hairy Woodpecker	*Picoides villosus*	S5	G5			10	m		X				
Eastern Wood-Pewee	*Contopus virens*	S4B	G5		SC-NS						X		
Eastern Phoebe	*Sayornis phoebe*	S5B	G5				m						
Great Crested Flycatcher	*Myiarchus crinitus*	S4B	G5										
Eastern Kingbird	*Tyrannus tyrannus*	S4B	G5								X		
Red-eyed Vireo	*Vireo olivaceus*	S5B	G5										
Blue Jay	*Cyanocitta cristata*	S5	G5										
Tree Swallow	*Tachycineta bicolor*	S4B	G5										
Barn Swallow	*Hirundo rustica*	S4B	G5	THR	THR-NS								
Black-capped Chickadee	*Poecile atricapillus*	S5	G5										
House Wren	*Troglodytes aedon*	S5B	G5										
American Robin	*Turdus migratorius*	S5B	G5										
Gray Catbird	*Dumetella carolinensis*	S4B	G5										
European Starling	*Sturnus vulgaris*	SNA	G5										
Cedar Waxwing	*Bombycilla cedrorum*	S5B	G5										
Common Yellowthroat	*Geothlypis trichas*	S5B	G5										
Chipping Sparrow	*Spizella passerina*	S5B	G5										
Song Sparrow	*Melospiza melodia*	S5B	G5										
Swamp Sparrow	*Melospiza georgiana*	S5B	G5						X				
Northern Cardinal	*Cardinalis cardinalis*	S5	G5										
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S4B	G5								X		
Indigo Bunting	*Passerina cyanea*	S4B	G5										
Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5										
Common Grackle	*Quiscalus quiscula*	S5B	G5										
Brown-headed Cowbird	*Molothrus ater*	S4B	G5										
Baltimore Oriole	*Icterus galbula*	S4B	G5								X		
American Goldfinch	*Carduelis tristis*	S5B	G5										

COMMON NAME	SCIENTIFIC NAME	ONTARIO STATUS	GLOBAL STATUS	COSSARO	COSEWIC	AREA SENSITIVITY (ha)	Local Status Hamilton	Local Status TRCA	Waterloo Regionally Significant	Source	Local Status PIF Priority Species (BCR 13)	COMMENTS	Area Sensitive Reference
MAMMALS													
Eastern Chipmunk	*Tamias striatus*	S5	G5										
Woodchuck	*Marmota monax*	S5	G5										
Grey Squirrel	*Sciurus carolinensis*	S5	G5										
Red Squirrel	*Tamiasciurus hudsonicus*	S5	G5										
White-tailed Deer	*Odocoileus virginianus*	S5	G5										
SUMMARY													
Total Odonata:	*0*												
Total Butterflies:	*0*												
Total Other Arthropods	*7*												
Total Amphibians:	*3*												
Total Reptiles:	*0*												
Total Birds:	*33*												
Total Breeding Birds:	*31*												
Total Mammals:	*5*												
SIGNIFICANT SPECIES													
Global:	*0*												
National: (COSEWIC)	*2*												
Provincial: (COSSARO)	*1*												
Regional:	*5*												
Local: (Halton)	*0*												
Local: (Hamilton)	*5*												
Local: (TRCA)	*3*												

Explanation of Status and Acronymns

COSSARO: Committee on the Status of Species at Risk in Ontario
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
REGION: Rare in a Site Region
S1: Critically Imperiled—Critically imperiled in the province (often 5 or fewer occurrences)
S2: Imperiled—Imperiled in the province, very few populations (often 20 or fewer),
S3: Vulnerable—Vulnerable in the province, relatively few populations (often 80 or fewer)
S4: Apparently Secure—Uncommon but not rare
S5: Secure—Common, widespread, and abundant in the province
SX: Presumed extirpated
SH: Possibly Extirpated (Historical)
SNR: Unranked
SU: Unrankable—Currently unrankable due to lack of information
SNA: Not applicable—A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S#: Range Rank—A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species
S#B- Breeding status rank
S#N- Non Breeding status rank
?: Indicates uncertainty in the assigned rank
G1: Extremely rare globally; usually fewer than 5 occurrences in the overall range
G1G2: Extremely rare to very rare globally
G2: Very rare globally; usually between 5-10 occurrences in the overall range

G2G3: Very rare to uncommon globally
G3: Rare to uncommon globally; usually between 20-100 occurrences
G3G4: Rare to common globally
G4: Common globally; usually more than 100 occurrences in the overall range
G4G5: Common to very common globally
G5: Very common globally; demonstrably secure
GU: Status uncertain, often because of low search effort or cryptic nature of the species; more data needed.
GNR: Unranked—Global rank not yet assessed.
T: Denotes that the rank applies to a subspecies or variety
Q: Denotes that the taxonomic status of the species, subspecies, or variety is **questionable**.
END: Endangered
THR: Threatened
SC: Special Concern
2, 3 or NS after a COSEWIC ranking indicates the species is either on Schedule 2, Schedule 3 or No Schedule of the Species At Risk Act (SARA)
NAR: Not At Risk
IND: Indeterminant, insufficient information to assign status
DD: Data Deficient
6: Rare in Site Region 6
7: Rare in Site Region 7
Area: Minimum patch size for area-sensitive species (ha)
H- highly significant in Hamilton Region (i.e. rare)
m- moderately significant in Hamilton Region (i.e. uncommon)
L1- extremely rare locally (Toronto Region)
L2- very rare locally (Toronto Region)
L3- rare to uncommon locally (Toronto Region)
HR- rare in Halton Region, highly significant
HU- uncommon in Halton Region, moderately significant
* The Pileated Woodpecker will incorporate smaller woodlots into its homerange, therefore it may not be a true area-sensitive species (Naylor et al. 1996)

LATEST STATUS UPDATE

Odonata: January 2012
Butterflies: December 2011
Bumble Bees: September 2013
Other Arthropods: January 2012
Amphibans: December 2011
Reptiles: December 2011
Birds: August 2013
Mammals: February 2012
S and G ranks and explanations: December 2011

NOTE

All rankings for birds refer to breeding birds unless the ranking is followed by N

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Appendix F:

Significant Wildlife Habitat Assessment

Table F-1: Significant Wildlife Habitat Assessment - Assessment of Seasonal Concentration Areas; Proposed Spencer Pit

Assessment of Seasonal Concentration Areas		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
Waterfowl Stopover and Staging Area (Terrestrial)	Vegetation community classifications were utilized to assess features within Subject lands that would support waterfowl terrestrial stopover and staging areas. ELC surveys, GIS analysis of the landscape and aerial photo analysis were used to identify large wetlands or marshes with a diversity of vegetation communities interspersed with cultural meadows that flood each spring (terrestrial staging areas).	CUM1 and CUT1 communities. Plus evidence of annual spring flooding from melt water or run-off within these Ecosites. Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH.	There is no open field habitat on or within 120 m of the subject lands. No cSWH	N/A	None
Waterfowl Stopover and Staging Area (Aquatic)	Vegetation community classifications were utilized to assess features within subject lands that would support waterfowl aquatic stopover and staging areas. ELC/FEC surveys, GIS analysis of the landscape and aerial photo analysis were used to identify large wetlands or marshes with a diversity of vegetation communities interspersed with open water (aquatic staging areas).	MAM, MAS, SAS, SAM, SAF and SWD communities. Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify.	There are no large wetlands or marshes with characteristics on or within 120 m the subject lands that would support a significant staging or stopover area. MNR mapping indicates a Waterfowl Winter Concentration Area along the Speed River east of the subject lands, but this is in excess of 120 m from the proposed license area. No cSWH	N/A	None
Shorebird Migratory Stopover Area	Vegetation community classifications were utilized to assess features within subject lands that would support shorebird migratory stopover areas. ELC surveys, GIS analysis of the landscape and aerial photo analysis were used to identify shorelines and beach areas which would support shorebird migratory stopover areas.	BBO, BBS, BBT, SDO, SDS, SDT and MAM communities. Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of amour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH.	There are no muddy flats or shorelines having characteristics conducive to concentrations of shorebirds. No cSWH.	N/A	None
Raptor Wintering Area	Vegetation community classifications were utilized to assess features within 120 m of the Project Location that would support raptor wintering areas. ELC/FEC surveys, GIS analysis of the landscape and aerial surveys conducted prior to leaf-out were used to identify communities which would support wintering raptors.	Habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha with a combination of forest and upland. Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands.	Subject lands lacks suitable forest and open field habitat to provide significant habitat to wintering raptors. No cSWH	N/A	None

Table F-1: Significant Wildlife Habitat Assessment - Assessment of Seasonal Concentration Areas; Proposed Spencer Pit

Assessment of Seasonal Concentration Areas		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
		One of Forest: FOD, FOM or FOC; and one of Upland CUM, CUT, CUS or CUW communities.			
Bat Hibernacula	Wildlife habitat assessments included searches with the subject lands and known nearby potential hibernacula including caves and abandoned mine workings.	CCR and CCA communities. Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. Buildings are not considered to be SWH.	No cliffs or rock talus, caves documented on site. No cSWH	N/A	None
Bat Maternity Colonies	Forested woodlands were surveyed for the presence and density of snags/cavity trees as described in Section 2.3.3.	FOD and FOM communities. Maternity colonies considered SWH are found in forested ecosites. Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario. Female bats prefer wildlife trees (snags) in early stages of decay, class 1-3.	The density of snags did not meet the criteria for maternity roosts. No cSWH	N/A	None
Bat Migratory Stopover Area	Vegetation community classifications were utilized to assess features within 120 m of the subject lands that would support bat migratory stopover areas.	No specific ELC communities. Areas adjacent to a Great Lakes shoreline or other landform features that concentrate bats (i.e., ridges or peninsulas). Criteria not currently defined in the draft Ecoregion 6E Criterion Schedule or the SWHTG.	Subject lands are not located near the Great Lakes and there are no landforms present that would concentrate bats. No cSWH.	N/A	None
Turtle Wintering Areas	Vegetation community classifications were utilized to assess features within the subject lands. Targeted turtle surveys were conducted in suitable habitat in May and June 2012.	SW, MA, OA, SA, FEO and BOO communities. For most turtles, wintering areas are in the same general area as their core habitat. Water must be deep enough not to freeze to the bottom and have soft mud substrate. Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate dissolved oxygen.	Subject lands do not contain aquatic features. OA communities to the east/south of subject lands are former quarries, and have steep walls that restrict access and hard substrates that prevent burrowing. No cSWH.	N/A	None
Reptile Hibernaculum	Vegetation community classifications were utilized to assess features within the subject lands that would support snake hibernacula.	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations.	No talus, rock barren, crevice or cave habitat found. No distinct candidate hibernacula were observed during the surveys	N/A	None

Table F-1: Significant Wildlife Habitat Assessment - Assessment of Seasonal Concentration Areas; Proposed Spencer Pit

Assessment of Seasonal Concentration Areas		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
	Habitat features that would provide an underground route, act as a potential hibernacula including exposed rock crevices or inactive animal borrows were recorded.	Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line The subject lands are well outside the known range of the Five-lined Skink.	conducted on site. No cSWH		
Colonially-Nesting Bird Breeding Habitat (Bank and Cliff)	Vegetation community classifications were utilized to assess features within subject lands that would support colonially-nesting bank and cliff bird breeding habitat. Breeding bird surveys were conducted as described in Section 2.3.2.	Eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos, or barns found in any of the following: CUM1, CUT1, CUS1, BLO1, BMS1, BLT1, CLO1, CLS1 OR CLT1 communities. Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, and soil or aggregate stockpiles. Does not include a licensed/permitted mineral aggregate operation.	Potential ELC community types limited to small patches of CUM1. No nesting features present in CUM1. No cSWH	N/A	None
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)	Vegetation community classifications were utilized to assess features within subject lands that would support colonially-nesting tree and shrub bird breeding habitat. Breeding bird surveys were conducted as described in Section 2.3.2.	SWM, SWD and FET communities.	Target ELC communities not present on subject lands. No stick nests observed. No cSWH	N/A	None
Colonially-Nesting Bird Breeding Habitat (Ground)	Vegetation community classifications were utilized to assess features within subject lands that would support colonially-nesting ground bird breeding habitat. Breeding bird surveys were conducted as described in Section 2.3.2.	MAM, MAS, CUM, CUT or CUS communities. Any rocky island or peninsula within a lake or large river. Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird).	No suitable habitat for ground nesting colony birds. Subject lands are not located within the known range of Brewer's Blackbird. No cSWH.	N/A	None
Migratory Butterfly Stopover Areas.	Vegetation community classifications were utilized to assess features within subject lands that would support migratory butterfly stopover areas.	Fields and other open areas with varied habitat types that are found within 5 km of the Lake Erie or Lake Ontario shoreline are considered candidate significant wildlife habitat for migratory butterfly stopover areas.	Subject lands are not located near the Great Lakes and there are no landforms present that would concentrate butterflies.	N/A	None
Landbird Migratory Stopover Areas	Vegetation community classifications were utilized to assess features within subject lands that would support landbird migratory stopover areas.	FOC, FOM, FOD, SWC, SWM and SWD communities. Woodlots need to be >10 ha in size and within 5 km of Lake Ontario.	Subject lands are not located near Lake Ontario and there are no landforms present that would concentrate landbirds.	N/A	None
Deer Yarding Areas	OMNR determines deer yards following methods outlined in	FOM, FOC, SWM, SWC, CUP2, CUP3, FOC3 or CUT communities.	None identified by OMNR. No cSWH	N/A	None

Table F-1: Significant Wildlife Habitat Assessment - Assessment of Seasonal Concentration Areas; Proposed Spencer Pit

Assessment of Seasonal Concentration Areas		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
	"Selected Wildlife and habitat Features: Inventory Manual". No studies are required.	Note: MNR to determine this habitat.			
Deer Winter Congregation Areas	OMNR is responsible for determining and mapping deer winter congregation areas.	FOC, FOM, FOD, SWC, SWM and SWD communities. Woodlots will typically be >100 ha, although conifer plantations <50 ha may also be used.	MNR mapping indicates Deer Wintering Area in the forested portions of the Speed River Wetland Complex to the east of the proposed license boundary.	Deer Wintering Areas are identified by MNR.	None

Table F-2: Significant Wildlife Habitat Assessment – Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat; Proposed Spencer Pit

Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
Cliffs and Talus Slopes	ELC and botanical inventories were used to assess the presence of cliffs and talus slopes.	TAO, TAS, TAT, CLO, CLS or CLT communities. A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris. Most cliff and talus slopes occur along the Niagara Escarpment.	No cliff or talus slope communities were identified on the subject lands. No cSWH	N/A	None
Sand Barren	ELC and botanical inventories were used to assess the presence of sand barrens.	SBO1, SBS1 or SBT1 communities. Sand barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires or erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	No sand barren communities were identified on the subject lands. No cSWH	N/A	None
Alvar	ELC and botanical inventories were used to assess the presence of alvars.	ALO1, ALS1, ALT1, FOC1, FOC2, CUM2, CUS2, CUT2-1 or CUW2 communities. An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex,	No alvar communities were identified on the subject lands. No cSWH	N/A	None

Table F-2: Significant Wildlife Habitat Assessment – Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat; Proposed Spencer Pit

Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
		with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plants. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or relict plant and animal species. Vegetation cover varies from patchy to barren with a less than 60% tree cover.			
Old Growth Forest	ELC and botanical inventories were used to assess the presence of old growth forests.	FOD, FOC or FOM communities. Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris. Stands 30 ha in size or with at least 10 ha interior habitat (assuming 100 m buffer to edge of forest).	No old growth communities were identified on the subject lands. No cSWH	N/A	None
Savannah	ELC and botanical inventories were used to assess the presence of savannahs.	TPS, TPW and CUS2 communities. A savannah is a tall-grass prairie habitat that has tree cover between 25 – 60%. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	No savannah communities were identified on the subject lands. No cSWH	N/A	None
Tall-grass Prairie	ELC and botanical inventories were used to assess the presence of tall-grass prairies.	TPO communities. A tall-grass prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH.	No tall-grass prairie communities were identified on the subject lands. No cSWH	N/A	None
Other Rare Vegetation Communities	ELC and botanical inventories were used to assess the presence of other rare vegetation communities.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG. Any ELC Ecosite that has a possible ELC Vegetation Type that is Provincially Rare is cSWH.	No rare vegetation communities were identified on the subject lands. No cSWH	N/A	None
Waterfowl Nesting Area	The results of ELC surveys and GIS	MAS, SAS1, SAM1, SAF1, MAM, SWT or	Target ELC communities not present	N/A	None

Table F-2: Significant Wildlife Habitat Assessment – Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat; Proposed Spencer Pit

Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
	analysis of the landscape were used to identify large upland areas of forest habitat that occurred adjacent to a large marsh, pond, swamp or swamp thicket communities or clusters of these vegetation communities within 120 m of the subject lands. Breeding bird surveys were conducted as described in Section 2.3.2.	SWD communities. All upland habitats located adjacent to these wetland ELC Ecosites are cSWH Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.	on subject lands. No waterfowl observed during breeding bird surveys. No cSWH		
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	Searches for stick nests (active or not) were conducted in conjunction with ELC and habitat assessments. Breeding bird surveys were conducted as described in Section 2.3.2.	FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).	No stick nests observed. Neither Osprey nor Bald Eagle observed during breeding bird surveys. No cSWH.	N/A	None
Woodland Raptor Nesting Habitat	Searches for stick nests (active or not) were conducted in conjunction with ELC and habitat assessments. Breeding bird surveys were conducted as described in Section 2.3.2.	All forested ELC communities, as well as SWC, SWM, SWD and CUP3. All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat.	One Red-tailed Hawk stick nest observed during breeding bird surveys.	Presence of 1 or more active nests from the following species list is considered significant: Northern Goshawk, Cooper's Hawk, Sharp-shinned Hawk, Red-shouldered Hawk, Barred Owl Broad-winged Hawk.	Red-tailed Hawk is not one of the target species, and no other raptors were recorded breeding on the subject lands. No SWH.
Turtle Nesting Areas	Searches for potential nest areas were conducted in conjunction with ELC and habitat assessments.	Exposed sand or gravel areas in or within 100 m of MAM, SAS, SAM, SAF, BOO or FEO communities. Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	Target ELC communities not present on subject lands. No cSWH.	N/A	None
Seeps and Springs	Searches for seeps and springs were conducted in conjunction with the ELC and habitat assessments.	Seeps/Springs are areas of emergence of groundwater where the water table is present at the ground surface. Often they are found within	No seeps or springs were identified within the subject lands. No cSWH	N/A	None

Table F-2: Significant Wildlife Habitat Assessment – Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat; Proposed Spencer Pit

Assessment of Rare Vegetation Communities and Candidate Specialized Wildlife Habitat		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
		headwater areas within forested habitats. Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system could have seeps or springs.			
Amphibian Breeding Habitat (Woodland)	Searches for potential woodland pools that could support amphibian breeding habitat were conducted during site reconnaissance and in conjunction with ELC and habitat assessments. Amphibian call count surveys were conducted as described in Section 2.3.3.	FOC, FOM, FOD, SWC, SWM and SWD communities. Presence of a wetland, lake or pond within or adjacent (within 120 m) to a woodland (no minimum size). The wetland, lake or pond and surrounding woodland ecosite, is the candidate SWH. Breeding ponds within the woodland or the shortest distance from forest habitat are more significant because of reduced risk to migrating amphibians and more likely to be used. Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat.	One pond was observed adjacent to the FOC2-2 community to the east of the subject lands. The pond and FOC2-2 community is cSWH.	Presence of breeding population of 1 or more of: Eastern Newt, Blue-spotted Salamander, Spotted Salamander, Gray Treefrog, Spring Peeper, Western Chorus Frog or Wood Frog, with at least 20 individuals (adults, juveniles, eggs/larval masses).	Spring Peeper and Gray Treefrog were recorded from Station 1. The pond and associated FOC2-2 are considered SWH for amphibian breeding habitat (woodland).
Amphibian Breeding Habitat (Wetland)	Searches for potential woodland pools that could support amphibian breeding habitat were conducted during site reconnaissance and in conjunction with ELC and habitat assessments. Amphibian call count surveys were conducted as described in Section 2.3.3.	SW, MA, FE, BO, OA and SA communities. Wetlands and pools (including vernal pools) >500m^2 (about 25 m diameter) isolated from woodland/forest habitat (>120 m) Sites supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats. Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. Bullfrogs require permanent water bodies with abundant emergent vegetation. The ELC ecosite wetland area and the shoreline are cSWH.	Two OA features were located to the east and south of the subject lands.	Presence of 1 or more of: Eastern Newt, Spotted Salamander, Four-toed Salamander, Blue-spotted Salamander or Bullfrog; or three or more of American Toad, Gray Treefrog, Western Chorus Frog, Northern Leopard Frog, Pickerel Frog, Green Frog or Mink Frog with at least 20 breeding individuals (adults, juveniles, eggs/larval masses).	No amphibians recorded from Stations 2 or 3. No SWH.

Table F-3: Significant Wildlife Habitat Assessment – Assessment of Habitat for Species of Conservation Concern; Proposed Simpson Spencer Pit

Assessment of Habitat for Species of Conservation Concern		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
Marsh Breeding Bird Habitat	Searches for marsh breeding bird habitat were conducted in conjunction with ELC and habitat assessments. Breeding bird surveys were conducted as described in Section 2.3.2.	MAM, SAS, SAM, SAF, FEO and BOO communities. All wetland habitats are to be considered as long as there is shallow water with emergent aquatic vegetation present. For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently it may be found in upland shrubs or forest at a considerable distance from water.	No marsh habitats were identified within the subject lands. No cSWH	N/A	None
Woodland Area-Sensitive Bird Breeding Habitat	Searches for woodland area-sensitive bird breeding habitat were conducted in conjunction with ELC and habitat assessments. Breeding bird surveys were conducted as described in Section 2.3.2.	FOC, FOM, FOD, SWC, SWM and SWD communities. Habitats where interior forest breeding birds are breeding, typically large mature (>60 years old) forest stands or woodlots >30 ha. Interior forest habitat is at least 200 m from forest edge habitat.	Forested communities on the subject lands were too small and narrow to provide interior habitats. No cSWH.	N/A	None
Open Country Bird Breeding Habitat	Searches for open country bird breeding habitat were conducted in conjunction with ELC and habitat assessments. Breeding bird surveys were conducted as described in Section 2.3.2.	CUM communities Large grassland areas (includes natural and cultural fields and meadows) >30 ha. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e., no row cropping or intensive hay/livestock pasturing in the last 5 years). Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older.	CUM communities on the subject lands were too small to provide grassland habitat. No cSWH.	N/A	None.
Shrub/Early Successional Bird Breeding Habitat	Searches for shrub/early successional bird breeding habitat were conducted in conjunction with ELC and habitat assessments. Breeding bird surveys were conducted as described in Section 2.3.2.	CUT, CUS and CUW communities. Large field areas succeeding to shrub and thicket habitats >10 ha in size. Not Class 1 or Class 2 agricultural lands, with no row-cropping or intensive hay or livestock pasturing in the last 5 years. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or lightly grazed pasturelands.	No successional shrub or thicket habitat >10 ha on the subject lands. No cSWH.	N/A	None
Terrestrial Crayfish	Searches for terrestrial crayfish chimneys were conducted in conjunction with ELC and habitat assessments.	MAM and MAS communities. Meadows and edges of shallow marsh communities (no minimum size).	No MAM or MAS communities were located on the subject lands. No cSWH	N/A	None

Table F-3: Significant Wildlife Habitat Assessment – Assessment of Habitat for Species of Conservation Concern; Proposed Simpson Spencer Pit

Assessment of Habitat for Species of Conservation Concern		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
S1-S3, SH, Species of Conservation Concern	Species of conservation concern that may occur within the subject lands were identified through the NHIC database and wildlife atlases. All species of conservation concern or provincially rare plant and animal species element occurrences within a 1 or 10 km grid. Site investigations were conducted to assess and delineate the potential for habitat to support these species. Field surveys to determine presence of species of conservation concern were carried out through the botanical, breeding bird inventories and wildlife habitat assessments.	Species of conservation concerns that are known to occur in proximity to the subject lands include: Bald Eagle (S4,SC) Common Nighthawk (S4B, SC) Monarch (S4B, S2N, SC) West Virginia White (S3, SC) Eastern Ribbonsnake (S3, SC) Eastern Milksnake (S3,SC) Snapping Turtle (S3,SC) Criteria for cSWH based on SWHTG, Appendix G (MNR, 2000).	Suitable habitat for Bald Eagle, Common Nighthawk, Eastern Ribbonsnake and Snapping Turtle not present on the subject lands. No cSWH for Bald Eagle, Common Nighthawk, Eastern Ribbonsnake or Snapping Turtle Suitable habitat for Monarch, West Virginia White and Eastern Milksnake present on the subject lands. cSWH present for Monarch, West Virginia White and Eastern Milksnake.	Habitat form and function to be assessed to determine area of significant habitat that protects the rare or special concern species identified.	Eastern Milksnake was not observed during field investigations. Key habitat features (i.e., hibernacula) were not identified within the subject lands. As the subject lands does not provide any key habitat for this species it is not considered to provide SWH. West Virginia White was not observed during field investigations. Potential habitat in the FOD forest communities was contaminated by garlic mustard, which is a deterrent to egg laying by West Virginia White. As the subject lands does not provide any key habitat for this species it is not considered to provide SWH. Monarch butterfly was not observed during field investigations. CUM communities on the subject lands containing common milkweed were small, and provided limited foraging opportunities. Larger CUM communities were abundant in the general area. As discussed in Table E-1, the subject lands are not a butterfly stopover area. As the subject lands does not provide any key habitat for this species it is not considered to provide SWH.

Table E-4: Significant Wildlife Habitat Assessment – Assessment of Animal Movement Corridors; Proposed Spencer Pit

Assessment of Animal Movement Corridors		Candidate Significant Wildlife Habitat		Evaluation of Significance	
Wildlife Habitat	**Methods**	**Criteria**	**Assessment of Candidacy**	**Criteria**	**Evaluation**
Amphibian Movement Corridor	ELC surveys adjacent to potential amphibian breeding habitat (woodland). Identified once Amphibian Breeding Habitat is confirmed.	Movement corridors between breeding habitat and summer habitat Corridors may be found in all ecosites associated with water Determined based on identifying significant amphibian breeding habitat (woodland).	Upland summer habitat is immediately adjacent to woodland amphibian breeding habitat with no requirements to have elongated, vegetated areas to move from one habitat to another. As no defined corridors between upland and breeding habitat are present, no cSWH was identified.	N/A	None
Deer movement corridor	Identified in proximity to deer wintering habitat, moose aquatic feeding area and mineral licks.	Corridors may be found in all forested ecosites. Typically follow riparian areas, woodlots, and areas of physical geography (ravines or ridges). Corridors will be multi-functional i.e. these will function for any smaller mammal species as well. Movement corridor must be determined when Moose Aquatic Feeding Area and Mineral Lick Habitat has been identified as significant.	No significant deer wintering habitat, moose aquatic feeding area and mineral licks. No cSWH.	N/A	None

Appendix G:

Qualifications

Vince Deschamps BES (Hons.), M.Sc.

Senior Environmental Planner

Vince Deschamps is a senior environmental planner with over 20 years of experience in Canada and abroad, conducting environmental assessments, resource economics, conservation planning and biological inventories. Vince has focused on assessing ecological components of urban and aggregate development proposals for conformity with municipal OPs, the PPS and the Aggregate Resources Act, as well as Natural Heritage Assessments for renewable energy projects under the Renewable Energy Approval (REA) process. Projects have included development and coordination of complex ecological field investigations, including management of staff and subconsultants, data analysis, including assessment of impacts to ecological receptors, and reporting. Vince's familiarity with applicable legislation and the regulatory authorities serves our clients well; his experiences with private, public and NGO sectors lend him a creative and thoughtful approach to project development, delivery and evaluation. Vince lived and worked in Indonesia for five years, where he specialized in assessing impacts of development activities on biodiversity, specifically regarding the IFC's Performance Standard 6–Biodiversity Conservation and Sustainable Natural Resource Management. As a result, he has a keen sense of cultural and political sensitivities that influence the processes bearing on a project's outcome. This translates well into Vince's frequent consultation with stakeholders from all levels, including government and NGOs. His strong interpersonal skills, analytical, writing and presentation abilities are supported by a high level of organization, aiding in the timely and accurate completion of projects.

EDUCATION

M.Sc., University of Guelph / Rural Planning and Development, Guelph, Ontario, 2000

B.E.S. (Hons.), University of Waterloo / Environment and Resource Studies, Waterloo, Ontario, 1988

Certificate, Ontario Ministry of Natural Resources / Ecological Land Classification System for Southern Ontario, Kingston, Ontario, 2006

MEMBERSHIPS

Full Member, Canadian Institute of Planners

Full Member, Ontario Professional Planners Institute

PROJECT EXPERIENCE

Cement / Aggregates

Dunnville Quarry Expansion Level 1 and 2 Natural Environment Technical Report, Waterford Sand and Gravel Ltd.*, Haldimand County, Ontario (Environmental Planner)

Prepared a Level 1 & 2 Natural Environmenta Technical Report for a proposed expansion of an aggregate quarry near Dunnville, Ontario. The report was required to meet the natural environment reporting requirements of the Aggregate Resources Act for a Category 2 – Class A Quarry (Below Water Table) and the EIS requirements of the Haldimand County Official Plan and Town of Dunnville Zoning By-Law. Natural heritage evaluations included Ecological Land Classification, vegetation inventories, breeding bird and amphibian surveys and input to the Rehabilitation Plan. The Level 1 & 2 Report was prepared in accordance with the 2010 Natural Heritage Reference Manual (MNR).

Vince Deschamps BES (Hons.), M.Sc.

Senior Environmental Planner

Upper's Lane Quarry, Walker Industries, Niagara Falls, Ontario (Project Manager / Environmental Planner)

Preparation of a Natural Environment Level 1 & 2 Report for the development of the Upper's Lane Quarry near Niagara Falls, Ontario. The report was required to meet the natural environment reporting requirements of the Aggregate Resources Act for a Category 2 – Class A Quarry (Below Water Table). A comprehensive suite of field investigations was undertaken, including Ecological Land Classification, winter wildlife surveys, breeding bird and amphibian surveys, snake surveys, insect surveys and habitat assessments for potential rare species and wildlife species at risk.

Township of East Garafraxa Gravel Pit Expansion*, Ontario (Project Manager / Ecologist)

Prepared a Natural Environment Level 1 & 2 Report for the expansion of the Township of East Garafraxa's existing licensed gravel pit operation near Orangeville, Ontario. The report was required to meet the natural environment reporting requirements of the Aggregate Resources Act for a Category 3 – Class A Pit (Above Water Table), and included Ecological Land Classification and a breeding bird survey.

Clinton Pit Level 1 & 2 Natural Environment Technical Report, Jennison Construction Limited*, Huron County, Ontario (Project Manager / Environmental Planner)

Prepared a Natural Environment Level 1 & 2 Report for a proposed gravel pit operation near Clinton, Ontario. The report was required to meet the natural environment reporting requirements of the Aggregate Resources Act for a Category 3 – Class A Pit (Above Water Table) and the EIS requirements of the Huron County and Ashfield-Colborne-Wawanosh Township Official Plans. Natural heritage evaluations included Ecological Land Classification, vegetation inventories, breeding bird surveys and the preparation of a Woodlot Restoration and Rehabilitation Plan. The Level 1 & 2 Report was prepared in accordance with the 2010 Natural Heritage Reference Manual (MNR), and was successfully defended at an Ontario Muncipal Board (OMB) hearing.

Environmental Impact Assessments

Biodiversity Management Rosia Montana Project, Rosia Montana Gold Corporation S.A., Romania (2003-2004) (Biodiversity Specialist)

Vince was a member of the Stantec consulting team that conducted an Environmental Impact Assessment of the Rosia Montana Gold Corporation S.A. proposed Rosia Montana Project in Romania. Among other project-related tasks, he was responsible for producing the Biodiversity Conservation Plan, drafting several sections of the EIA report, coordinating biological field surveys in Romania, and acquiring and analyzing data from other project consultants.

Martabe Project Biodiversity Management and Impact Assessment, Newmont Mining, Indonesia (2004-2005)* (Biodiversity Specialist)

Vince was part of the MWH Global team conducting preliminary feasibility studies for Newmont Mining Corporation for development of the Martabe gold mine project in North Sumatra, Indonesia. Vince was responsible for reviewing ecological baseline studies conducted in the Martabe Project Area (MPA) on behalf of Newmont, identifying key ecological issues, potential impacts and developing management options for the proposed project. Key to the development of the biodiversity component of the feasibility study was the presence of globally threatened species in and adjacent to the MPA, and accelerating forest cover loss as a result of unsustainable land conversion by local communities.

** denotes projects completed with other firms*

Vince Deschamps BES (Hons.), M.Sc.

Senior Environmental Planner

External Environmental Audit, PT Freeport, Indonesia (2005)* (Biodiversity Specialist)

As a sub-consultant to MWH Global, Vince participated in the 2005 External Environmental Audit of the PT Freeport Indonesia (PTFI) mining operation in Papua, Indonesia. The audit is required on a periodic basis by the current Contract of Work established between the Government of Indonesia and PTFI, and is focused on evaluation of: compliance with specific COW requirements and applicable regulations; the effectiveness of PTFI's environmental management system, practices, and procedures in actual practice; and, the level to which PTFI's operations employs internationally recognized best management practices for the management and mitigation of its environmental impacts. In his role as an Audit Team member, Vince was responsible for the evaluation of biodiversity and ecological impacts, particularly in relation to the restoration, rehabilitation and monitoring of the Ajkwa Deposition Area and excavated/waste rock stockpile areas in the highlands. Given his fluency in Bahasa Indonesia, Vince was also called upon to assist in the evaluation of regulatory compliance issues and provide translation assistance to other audit team members as circumstances required.

Biodiversity Evaluation, PT Holcim Indonesia, Tuban, East Java (2008)* (Biodiversity Specialist)

Served as the Lead Consultant for a biodiversity evaluation of Holcim's proposed PT. Semen Dwima Agung Cement Operation near Tuban, East Java. The International Finance Corporation (IFC) requested Holcim to conduct an independent expert evaluation of the biodiversity analysis conducted for the Project ESIA (ANDAL) within the context of the IFC Performance Standard 6 – Conservation of Biodiversity and Sustainable Resource Management (PS6). In addition to the evaluation of the content of the ANDAL, the evaluation also provided a series of recommendations to further understand conditions at the project site and bolster PT Holcim Indonesia's effort to minimize impacts on terrestrial flora and fauna in the project area.

Eramet/Weda Bay Nickel BFS ESHIA, Halmahera, Indonesia (2009-2011)* (Terrestrial Biodiversity Team Leader)

Engaged as the Team Leader for Technical Memorandum 01 (TM01, Terrestrial Biodiversity) for Weda Bay Nickel's "Bankable Feasibility Study-Environmental, Social and Health Impact Assessment" (BFS ESHIA). Worked with the BFS ESHIA Project Manager and Technical Director to ensure timely delivery of all outputs related to Terrestrial Biodiversity. This included providing oversight and guidance to experts from the Indonesian Institute of Sciences Research Centre for Biology (LIPI) to design and conduct field investigations, analyzing the results of these investigations, assessing potential impacts to terrestrial biodiversity as a result of mine development, and recommending mitigations to minimize these impacts. Responsible for the preparation of the Terrestrial Biodiversity Baseline Report, Terrestrial Biodiversity Action Plan and integrating these documents into the overall BFS ESHIA Report. Fieldwork and reporting was in compliance with the Equator Principles, IFC Performance Standards, and other guidelines designated by Weda Bay Nickel.

Peer Reviews of Other Consultants' Ecological Reports for Various Land Development Proposals and Projects on Behalf of Various Municipalities*, Ontario (Lead Reviewer)

Conducted ecological peer reviews on behalf of various municipalities. Projects included:
- Island Lake Golf and Country Club Community Environmental Impact Study and Proposed French Drive Road Extension, Town of Mono, ON
- Environmental Impact Assessment, Part of North Half of Lot 16 and Part Lot 17, Concession 4, Township of Adjala-Tosorontio, ON
- Hamount and Valleygrove Lands - Dufferin County Road #16 Township of Amaranth Environmental Impact Statement, Township of Amaranth, ON
- Country Meadows Estates Subdivision Environmental Impact Assessment (Part Lot 30, Concession 1) Township of Amaranth, Dufferin County, ON
- Melancthon II Wind Project Environmental Screening Report / Environmental Impact Statement, Township of Amaranth, ON

** denotes projects completed with other firms*

Vince Deschamps BES (Hons.), M.Sc.

Senior Environmental Planner

Environmental Impact Assessments for Various Land Development Proposals and Projects*, Ontario (Ecologist / Environmental Planner)

Projects involved assessment of development impact on the natural environment and recommending monitoring strategies in conformity with legislative requirements, including municipal Official Plans, the Provincial Policy Statement, the Aggregate Resources Act, the Oak Ridges Moraine Conservation Plan and conducting Municipal Class Environmental Assessments under the Ontario Environmental Assessment Act. Projects include:

- Rehabilitation of The Gore Road from King Street to Patterson Sideroad Municipal Class EA (Schedule B), Region of Peel, ON
- Kincardine Avenue Municipal Service Extension Municipal Class EA (Schedule B), Township of Kincardine, ON
- Municipal Class EA (Schedule C) for the East Luther Grand Valley Water Pollution Control Plant, Grand Valley, ON
- ORMCP Conformity Report for the Colgan Water Supply Municipal Class EA (Schedule B), Township of Adjala-Tosorontio, ON
- Bonaire Highlands Scoped EIS, Fergus, ON
- Veterans Way Lands EIS, Orangeville, ON
- Aberfoyle Creek Estates Phase III EIS, Aberfoyle, ON
- Giant's Tomb Subdivision EIS Review, Tiny Township, ON
- Pickering-Kingston Road Environmental Report, Pickering, ON
- Gamble Road Lot 5 EIS, Richmond Hill, ON
- Hilltop Community EIS, Ayr, ON
- Churchville Planning & Heritage Study, Natural Heritage Component, Brampton, ON
- Humber College Institute of Technology and Advanced Learning, Orangeville Campus, Environmental Management Plan Part B: Terrestrial and Aquatic Resources, Orangeville, ON

Goreway Direct Access Natural Gas Pipeline Environmental and Social Impact Assessment, Sithe Canadian Pipelines, Ontario (Project Manager)

Managed and prepared a Draft ESIA to construct and operate a 610 mm (NPS 24) natural gas pipeline to provide fuel for the 800 MW Goreway Station combined cycle gas fuelled power station proposed to be located on Goreway Drive in the City of Brampton, Ontario. The Draft ESIA was based on the Ontario Energy Board's "Environmental Guidelines for Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario", and documented the information analysis and decision-making that resulted in the recommendation of a Preferred Pipeline Route, and the impact assessment, mitigation and monitoring measures associated with construction and operation of the pipeline.

Compatibility Assessment, Iron Ore Company of Canada*, Labrador (Project Manager)

Conducted an environmental, socioeconomic, and land use compatibility assessment for a proposed hospital and community college in the Town of Labrador City on IOCC's long-range mine plan. The assignment consisted of a quick assessment of the Town's proposed facilities, a technical assessment of the potential impacts of IOCC's mine plan on them, and input to the provincial and municipal EA processes required to develop these facilities.

Technical EA Reviews of the Detour Gold Project, Coral Rapids Power Limited Partnership & Taykwa Tagamou Nation*, Ontario (Project Manager / Lead Reviewer)

Served as project manager overseeing multi-disciplinary technical reviews, on behalf of Coral Rapids Power Limited Partnership and the Taykwa Tagamou Nation (TTN), of Environmental Assessment reports prepared for the Detour Lake gold mine project in northern Ontario. The reviews focused on the interests of the TTN, in particular how the proposed mine facilities, electrical transmission corridor and roads may affect them and how potential effects might be accommodated.

Renewable Energy

Natural Heritage Assessments for Various Renewable Energy Projects Under the Renewable Energy Approvals Process, Ontario (Environmental Planner)

Projects involved assessment of development impact on the natural environment and recommending monitoring strategies in conformity with the REA process include:

** denotes projects completed with other firms*

Vince Deschamps BES (Hons.), M.Sc.

Senior Environmental Planner

- Sydenham Wind Energy Centre, Townships of Brooke-Alvinston and Dawn-Euphemia, ON
- Suncor Energy Adelaide Wind Power Project, Municipality of Adelaide-Metcalfe, ON
- Suncor Energy Cedar Point Wind Power Project, Town of Plympton-Wyoming and the Municipality of Lambton Shores, ON
- Bow Lake Wind Farm, Townships of Smilsky and Peever, ON

Environmental Permitting for Bluewater, Goshen and Jericho Wind Energy Centres, NextEra Energy Canada*, Huron and Lambton Counties, Ontario (Project Manager)

Served as project manager for the environmental permitting for the Bluewater, Goshen and Jericho Wind Farms proposed by NextEra Energy Canada in Huron and Lambton Counties in Ontario. These wind centres have a maximum generating capacity of 480 MW. Environmental permitting for the wind energy centres was undertaken in accordance with the recent Renewable Energy Approval (REA) process, as required under the 2009 Green Energy Act. Provided overall management responsibilities for the assignment, including project administration and the timely provision of deliverables, as well as serving as the primary point of contact for NextEra Energy Canada for the assignment.

Economic Analysis & Feasibility Studies

Value of Water Resources in Lore Lindu National Park, Indonesia, The Nature Conservancy (2001) (Project Manager)

This study investigated the economic contributions of waters arising from Lore Lindu National Park in Central Sulawesi. As part of this study, the framework for water and other resource valuations was developed using a combination of literature review, key informant interviews, field visits and data analysis. One of the key components was the development and application of the Agricultural Producer and Water User Survey that gathered primary data at the household level from a statistically-representative sample of rural households in the Study Area. In concert with other research techniques, the survey was used to estimate the value of agricultural production, livestock inventories and other sources of protein, and household and industrial water consumption. The study also estimated the total number of people who are dependent on water from LLNP for drinking, washing, bathing, and other day-to-day activities, as well as the total area of land irrigated by waters arising from the Park.

Value of Water Resources in Berau Regency, East Kalimantan, Indonesia, The Nature Conservancy (2002) (Project Manager)

This study estimated the economic contributions of water from the Kelay and Segah rivers in Berau Regency. The results present a conservative, but reliable estimate of the value of these contributions to the local economy using the framework developed in the LLNP Water Value Study. The study estimated the value of agricultural production, livestock inventories and other sources of protein, and household consumption of waters from these two rivers, the total number of people who are dependent on them for drinking, washing, bathing, and the total area of land irrigated by the two rivers. This study may also serve as a model to guide future conservation initiatives in Berau, and on the larger Mahakam River in East Kalimantan.

Carbon/Mangrove Rehabilitation Feasibility Study, East Kalimantan, The Nature Conservancy (2004)* (Project Manager / Lead Researcher)

Vince carried out a feasibility study for restoring mangrove forest using carbon-funding mechanisms. The feasibility study covered the technical and financing sustainability aspects, including a thorough literature review of previous efforts. Technical feasibility focused on South East Asia with emphasis on Indonesia and the financial aspects worldwide. The outcome documented how the Clean Development Mechanism (CDM) might be used to set aside forest concessions in ecologically sensitive areas in Indonesia.

Comprehensive Review & Overhaul of Barbados Groundwater Protection Zoning Policy & System, Barbados Water Authority (2008)* (Planning Specialist)

Vince served as a Planning Specialist to assess the social, financial and economic impact of land use restrictions in Groundwater Protection Zones 1 through 5. Assessment involved engaging a representative cross section of stakeholders and consisted of reviewing current and historic Government of Barbados' population and economic statistics, conducting two Public Information Centres and Key Informant Interviews to identify common land use practices affecting groundwater resources, conducting community mapping to assess the impacts of land use practices on groundwater resources and conducting water-user and land use surveys to determine social, financial and economic conditions in the five Zones.

** denotes projects completed with other firms*

Vince Deschamps BES (Hons.), M.Sc.

Senior Environmental Planner

Economic Impacts of Agriculture Studies*, Ontario (Researcher)

Vince played a significant role in the development and execution of a series of studies to assess the economic impacts of agriculture in various counties across Ontario. The focus of the research was to determine the economic value of sales and jobs related to agriculture, either directly or indirectly. The studies involved a combination of 'economic base' and 'input-output like' methods and incorporated secondary data from Statistics Canada, the Ontario Ministry of Agriculture, Food & Rural Affairs (OMAFRA), supplemented by primary data generated through the development, delivery and analysis of surveys of agriculture-related businesses, and focus groups with primary producers and mapping components. The studies were conducted in cooperation with the local (i.e., County-level) Federations of Agriculture, with the support of OMAFRA and Human Resources Development Canada. Vince organized and undertook studies in the following municipalities:

- United Counties of Prescott & Russell
- United Counties of Stormont, Dundas & Glengarry
- Lambton County
- Perth County
- Frontenac County
- Lennox & Addington County
- Elgin County
- Oxford County
- Middlesex County
- Lanark County
- Renfrew County
- City of Ottawa

Northwest Brampton Urban Boundary Review, Shale Resources Review, City of Brampton, Ontario (Researcher)

Conducted an economic assessment of the Greater Toronto Area market area for shale production an brick manufacturing, as well as determining the long-term demand trends and quantities for heavy clay products, most notably clay bricks.

** denotes projects completed with other firms*