



**Environmental Impact Study
St. Andrew's Village Development
Plan 51R-3610 Town of Penetanguishene
1145 Fuller Avenue
County of Simcoe**

Prepared For:

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Prepared By:
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Consulting, Inc.

March 28, 2007

AEC 05-226



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Environmental Assessments & Approvals

March 28, 2007

AEC 05-226

Mr. David Wright
45 Robillard Drive
Penetanguishene, ON
L9M 1G9

Re: Environmental Impact Study, St. Andrew's Village Development, Plan 51R-3610 Town of Penetanguishene (1145 Fuller Avenue), County of Simcoe

Dear Mr. Wright:

Azimuth Environmental Consulting (Azimuth) is please to provide you with our Environmental Impact Study (EIS) report related to the development of the above noted property.

The results of our field studies indicate that, the proposed development is aligned completely outside of the St. Andrew's Lake Wetland and hence can be achieved with no site alteration or development within the provincially significant wetland (PSW) and by extension, EP1 lands defined by the Municipality and areas designated Greenlands by the County. The proposed development and its recommended environmental setback limit from the boundary of the PSW maintain a continuous area of "upland fringe" habitat adjacent to the wetland. This preserved upland fringe habitat has features and functions similar to those reported for portions of the Penetang Lake ANSI (regional – life science). By protecting both wetland habitat and upland fringe habitat, the proposed development maintains portions of the property that conform to definitions of the Penetang Lake ANSI.

The proposed environmental setback limit associated with the development was established in recognition of environmentally sensitive features and functions identified on site and in the adjacent wetland. We recognized the wetland lagg as a sensitive feature. Detailed hydrologic studies indicated that the lagg is not maintained by ground water discharge or surface drainage from upland habitat of the property or adjacent land.

Rather, data indicate that the lagg has formed at the interface of mineral and organic soils with water contributions to the lagg coming originating within the wetland. The relatively large environmental setback proposed for land in proximity to the lagg was established in recognition of wildlife habitat functions of the lagg (i.e. waterfowl and amphibian breeding) and to ensure water quality protection. Habitat of the environmental setback established in proximity to the lagg represents mature forest habitat as well as areas undergoing succession toward an upland forest condition (i.e. upland fringe habitat). This fringe habitat provides a buffer to the wetland of composition, structure and size that will maintain current wildlife habitat use of the lagg and associated wetland.

The proposed development will not have a direct or indirect impact on: 1) the habitat of vulnerable, threatened, endangered or provincially significant plants or animals; 2) significant wildlife habitat; or fish habitat.

Site specific information (water balance, ground water monitoring) indicates that the proposed development will not affect wetland hydrology and hence can be achieved with no impact on the St. Andrew's Lake PSW or St. Andrew's Lake (a.k.a Penetang Lake).

The proposed stormwater management system will not result in the discharge of water to the wetland that would be harmful to the PSW nor will it increase the flood potential on or off site. The proposed location of stormwater discharged under events up to the 100 year storm takes advantage of an area of the wetland already disturbed by past land use (i.e. fill placement).

Our studies have indicated that the proposed development is consistent with the PPS and conforms to municipal planning policies.

If you require additional information please do not hesitate to contact us.

Yours truly,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Jim Broadfoot, Hon. B.Sc.
Senior Biologist



Tecia White, M. Sc.
Senior Hydrogeologist



1.0 INTRODUCTION

Azimuth Environmental Consulting (Azimuth) was retained to undertake an Environmental Impact Study (EIS) associated with a proposal to develop a 180 unit, adult lifestyle/retirement residential community. The condominium style development would occur adjacent to land designated Environmental Protection One (EPI) by the Municipality (i.e. the provincially significant St. Andrew's Lake wetland also referred to as the St. Andrew's Lake PSW) in proximity to Fuller Road (Figure 1). Other environmental features identified on site include the County of Simcoe Greenlands and the Penetang Lake Regional Life Science ANSI. All of these features "trigger" an EIS based on planning policies at the Provincial, County and Municipal level.

Our EIS was designed to evaluate the natural features and ecological functions of the area potentially affected directly or indirectly by the proposed condominium development. Since the potential impacts included those affecting the hydrology of a provincially significant wetland, we undertook a detailed assessment of the hydrogeological/hydrological function of the St. Andrew's Lake wetland in addition to detailed assessments of natural heritage features and functions of the property and adjacent lands. The results of our hydrogeology and natural heritage investigations were integrated in our impact assessment.

2.0 STUDY APPROACH

Azimuth undertook the following activities to fulfill the objectives of this study:

2.1 Natural Heritage

- Obtained background information related to the property and surrounding area from the Town of Penetanguishene, the County of Simcoe, and the Ontario Ministry of Natural Resources (OMNR);
- Proposed a scope of work for this EIS to the Town of Penetanguishene's environmental consultant (Appendix 1);
- Defined and assessed environmental features and functions of the St. Andrew's Lake wetland and portions of the property that fall within 120 m based on background information and field observations;
- Classified vegetation communities of the property based on air photo interpretation (using photo mosaic of the property constructed using 2002 ortho photos) and reconnaissance plant surveys of the property conducted on December 4, 2001, April 28th, June 20th, July 6th, August 8th and September 25th, 2006 using the methods of the Ecological Land Classification System (ELC) for southern Ontario (Lee *et al.* 1998). Plant survey data collected by Azimuth environmental on December 4th, 2001 was also incorporated to the plant species list compiled for the property;
- Delineated the boundary of the St. Andrew's Lake Wetland on the property with OMNR field staff (Brad Allan, Management Biologist Midhurst District,



Suzanne Robinson A/District Ecologist) on June 23rd, 2006. Staff from the Severn Sound Environmental Association (SSEA) (Michelle Hudolin) and the Town of Penetanguishenes' environmental consultant (Don Fraser, Beacon Environmental) were also involved in the wetland boundary delineation;

- Conducted evening amphibian call surveys on April 11th and May 31st, 2006 from three sampling locations (Figure 2). Sampling locations were selected to provide coverage of the property and to assess amphibian breeding use of wetland habitat on adjacent land;
- Conducted bird surveys of the property during the breeding season on June 2nd and June 20th, 2006;
- Compiled lists of wildlife (i.e. birds, mammals, reptiles and amphibians) encountered while conducting field studies;
- Scrutinized list of flora and fauna compiled for the property and surrounding area for species of conservation concern nationally or provincially based on conservation rank information provided by OMNR's Natural Heritage Information Centre (NHIC) (i.e. Endangered, Threatened or provincially significant species {i.e. S Rank = 1, 2 or 3} and the list of flora for species considered regionally rare in Simcoe county by Riley (1989);
- Mapped the distribution of vegetation communities and identified natural heritage features (i.e. Provincially Significant Wetland, ANSI, Simcoe County Greenlands) of the property on 2002 aerial photography to show the relationship between these features; and
- Assessed the impact of the proposed conceptual development on the hydrogeology and natural heritage features and functions of the property and adjacent land.

2.2 Hydrogeology

2.2.1 Review of Existing Data

The background review included an evaluation of gaps in the availability of spatial and temporal coverage of hydrogeologic information as well as an assessment of deficiencies in the quality of the data. A field program was developed to address data gaps.

Background data reviewed included:

- Ontario Base Mapping (scale 1:10,000);
- Soil Map of Simcoe Country: Soil Survey Report No. 29;
- St. Andrews Lake Wetland Evaluation (SSEA, January 2004);
- St. Andrew's Lake Wetland - Wetland Data and Scoring Record (Revised December 2003)
- Town of Penetanguishene Hydrogeological Study: St. Andrews Lake (Trow, 1987);
- Geotechnical Investigations (Geospec Engineering 1998); and



- North Simcoe Groundwater Study (Golder *et al.*, 2004)

2.2.2 Drilling and Monitoring Well Installation

Geospec Engineering Ltd (Geospec) completed the drilling and installation of five monitoring wells on December 5, 2005 (Geospec, 2006). The bore hole locations were spaced to provide coverage of the property to allow for an evaluation of shallow overburden deposits (Figure 2). In order to determine the hydrogeological interaction between the shallow ground water system and the St. Andrews Lake Wetland, a monitor pipe was installed in each borehole. Details of the ground water monitoring wells are provided in Table 1.

Table 1: Ground Water Monitoring Well Details

Monitoring Well	Depth (m)	Elevation (masl)	Location (NAD 83)	
			Easting	Northing
OW1	11.1	226.33	585440	4960227
OW2	7.5	226.44	585533	4960169
OW3	7.5	225.41	585626	4960088
OW4	7.5	229.30	585561	4960020
OW5	6.5	225.58	585532	4960337

2.2.3 Ground and Surface Water Elevation Monitoring

The monitoring wells were constructed to allow for the determination of ground water elevations across the site. Water levels from the monitoring wells were collected monthly. In addition, continuous water levels from St. Andrews Lake were collected using a pressure transducer. Continuous lake water level data was collected between April and October 2006. The similarities and contrasts in the hydraulic head between the monitoring wells and the lake provide evidence on the interconnectivity of the ground water and surface water regimes through the comparison of season trend data.

2.2.4 Ground and Surface Water Quality Characterization

Hydrochemistry was used to identify aquifer flow process, and the degree of interaction between neighbouring aquifers and surface water features. This involved the collected and subsequent analysis of water samples from the surface and ground water monitoring locations within the study area.

2.2.5 Hydraulic Testing

Two ground water monitoring wells were slug tested to allow for an evaluation of the hydrogeological characteristics of the screened units (BH2-05 and BH4-05). Recovery data were monitored using pressure transducers (measuring water levels every 3 seconds). These data were then analyzed to determine the hydraulic properties (i.e., hydraulic conductivity) of the hydrostratigraphic unit using the Hvorslev method (1951). This method is based on an empirical relationship describing the water-level response in an unconfined aquifer due to the instantaneous injection of water from a well.



In addition, percolation tests were performed in the approximate locations of the proposed storm water attenuation areas (Figure 2).

2.2.6 Water Balance Analysis

Water balance calculations were performed on the St. Andrews Lake Wetland to provide an indication of the potential impact as a result of changes in the water balance components. Specifically, a water balance evaluation was completed to determine the changes in the ground water infiltration and surface water runoff to the lake from the proposed development area. The water balance was completed on a development and watershed scale.

Water balance analysis was conducted using data from the following sources: recharge estimated based on the hydraulic testing program (see Section 2.2.5 above); monthly climate data were obtained from the Environment Canada for its Midland station; and St. Andrews Lake water level elevations collected in 2006 (see Section 2.2.3 above).

3.0 PLANNING CONTEXT

3.1 Town of Penetanguishene

The property contains Restricted Rural and EP1 land use designations (Schedule A1, Town of Penetanguishene Official Plan Consolidation 2000) (Appendix 2).

According to Section 3.10.2 of the OP development and site alteration is not permitted in Class 1, 2 or 3 wetlands (i.e. significant wetlands), the habitat of threatened or endangered species and in hazardous lands (i.e. EP1 lands). Section 3.10.4 indicates that adjacent lands are those located within 120m of significant wetlands, the habitat of vulnerable, threatened or endangered species or hazardous areas. No development shall be permitted on these adjacent lands unless it has been determined that there will be no negative impact.

3.2 St. Andrew's Lake Provincially Significant Wetland

The western boundary of wetland unit 1 of the provincially significant St. Andrew's Lake Wetland (Appendix 3) occurs on the property. The wetland was re-evaluated in 2002 by the SSEA (SSEA 2004) though the exact boundary on the property was not established. Therefore, the boundary of the wetland on the property was delineated by Azimuth Environmental (Jim Broadfoot, certified wetland evaluator); field reviewed and adjusted by OMNR with the assistance of SSEA and the Town of Penetanguishene's peer review consultant (June 23, 2006 site visit) and surveyed (Don Mita Surveying). The surveyed boundary was accepted as accurate by OMNR (Appendix 4).



According to Section 2.1.3 of the Provincial Policy Statement (PPS, OMAH 2005) “development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E or 7E”. The St. Andrew’s Lake wetland occurs in Ecoregion 6E so this policy applies. Section 2.1.6 of the PPS indicates that site alteration and development shall not be permitted on land adjacent to significant wildlife habitat unless it has been demonstrated that it will result in no negative impact.

3.3 Simcoe County Greenlands

Portions of the property are located within the Tiny Tay Peninsula - Awenda (TTP6) natural heritage unit of the County of Simcoe Greenlands system (Appendix 5). The boundaries of this Greenlands unit on the property correspond generally to the boundaries of the St. Andrew’s Lake wetland.

According to Section 3.7.5 of the County of Simcoe OP (2000) development and site alteration shall be “generally directed away from the following portions of the Greenlands: significant woodlands, significant wildlife habitat, significant valley lands, fish habitat, ANSI’s, environmentally sensitive areas, major lake, river and creek systems, and Niagara escarpment areas”. New uses posed within or adjacent to these features may only be permitted if there is no negative impact on their features and/or associated ecological functions.

3.4 Penetang Lake ANSI (Regional Life Science)

Portions of the property have been mapped as being included in the Penetang Lake Regional Life Science ANSI (Appendix 6).

As indicated above (see Section 3.3) the County of Simcoe’s OP indicates that development and site alteration shall be directed away from ANSI’s and that development within or adjacent to them may only be permitted if there is no negative impact on the features and/or associated ecological functions of the ANSI.

3.5 Rare Species Locations

There are no records of plant or animal species of conservation concern for the property or adjacent land reported in OMNR’s Natural Heritage Information Centre (NHIC) database (Appendix 7). Inventory data collected during the recent re-evaluation of the St. Andrew’s Lake PSW by SSEA indicated the presence of three animal [(Red-shouldered Hawk *Buteo lineatus* – S4B,SZN, Ontario General Status – Sensitive; Caspian Tern *Sterna caspia* S3B,SZN, Ontario General Status – Sensitive; Amber-winged Spreadwing *Lestes eurimus*{Damsel fly} – S3)] and four plant [(White-fringed Orchid *Platanthera blephariglottis* S3S4, Ontario General Status – Sensitive; Carolina Yellow-eyed-Grass *Xyris difformis* S3?, Ontario General Status – Sensitive; Pod Grass *Scheuchzeria palustris* S4S5, Ontario General Status – Secure, Regionally Rare R2 {Riley 1989}; Swamp-pink *Arethusa bulbosa* S4, Ontario General Status –



Secure, Regionally Rare R5 {Riley 1989}} species of conservation concern provincially and/or regionally.

According to Section 2.1.3 of the Provincial Policy Statement (PPS, OMAH 2005) “development and site alteration shall not be permitted in significant habitat of endangered species and threatened species”. The significant wildlife habitat technical guide (OMNR 2000) indicates that habitats of species of conservation concern can be considered significant wildlife habitat. The PPS indicates that development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impact on the natural features or their ecological functions. Section 2.1.6 of the PPS indicates that site alteration and development shall not be permitted on land adjacent to significant wildlife habitat unless it has been demonstrated that it will result in no negative impact.

4.0 EXISTING CONDITIONS

4.1 Land Use

4.1.1 On-Site

The property was once farmed as evidenced by an old barn on site and extensive old-field habitat that is undergoing succession to woodland and forest cover. Land east of the barn has been filled in the past with broken asphalt and concrete pavement as well as soil.

There is an occupied single-family dwelling on the southern half of the property with access from Fuller Road. Discarded automobiles and other refuse occur in proximity to the dwelling. Small amounts of yard waste (grass clippings, brush, etc.), has been deposited in the northern portion of the property in various locations.

The south end of the property, adjacent to Fuller Road was the site of a past sand and gravel extraction operation (Figure 2).

4.1.2 Adjacent Land

Land east and north of the property has been developed as residential subdivision.

Land south of the property contains single –family dwellings built on relatively large lots. An area of industry occurs south of the property on the west side of Fuller Road. An in-active gravel pit occurs approximately 1.5 km south of the property.

The property is bounded on east side by the St. Andrew’s Lake PSW.

4.2 Vegetation

Application of the methods of the Ecological Land Classification for Southern Ontario (ELC) (Lee *et al.* 1998) lead to the identification of 12 plant communities on



the property as shown on Figure 2. Table 2 provides a description of each community. Table 3 reports plant species observed in each community.

None of the plant communities on the property are considered rare provincially. The wetland lagg and Tamarack-Black Spruce Organic Coniferous Swamp vegetation community are uncommon locally.

None of the plant species observed are threatened or endangered and none are ranked as provincially significant (Table 3). Three of the plant species observed (Yellow Pimpernell, Tall Goldenrod and White Heath Aster) are considered regionally rare in Simcoe County by Riley (1989).

4.3 Fisheries/Watercourses

There are no watercourses on the property. Common Shiner (*Luxilus cornutus* S5) and other unidentified minnow species were reported to occur in open water areas of the wetland in 2002 (SSEA 2004). The presence of a breeding pair of Common Loons (*Gavia immer*) with young observed on St. Andrew's Lake in 2002 confirms that the lake has a resident fish population. Given the nature of the lake we suspect, as did SSEA, that the lake provides habitat for minnow (i.e. Family Cyprinidae) species primarily but we suspect that Pumpkinseed (*Lepomis gibbosus*) and Brook Stickleback (*Culaea inconstans*) may also occupy the lake.

The wetland lagg itself may contain fish though none were observed during frequent site visits. We expect that the habitat of the lagg may be suitable for Stickleback and/or minnow species known to inhabit the lake. However, acid conditions (i.e. pH 5.3 – Section 4.9) and the fact that the lagg is known to dry down (i.e. completely dry when observed in October 2005) at times, suggest that fish habitat potential of the lagg is limited.

4.4 Wetland Habitat

The most recent evaluation of the St. Andrew's Lake wetland by SSAC (November 4, 2002) and its subsequent minor revisions (December 2003 and July 2005) resulted in an overall score of 653 points indicating that it is a provincially significant wetland (PSW) (i.e. score exceeds 600 overall points).

The wetland is made up of four individual wetland units that together cover approximately 60 ha (Appendix 3). Wetland habitat of the property makes up part of the largest of the four wetland units (i.e. Wetland Unit 1). Component scores for biology, social, hydrological and special features were 129, 81, 193 and 250 respectively. The high score for special features related to both rarity of wetland type (i.e. fen) and species of conservation concern (see Section 3.5 above). Shoreline fen habitat is restricted to Wetland Unit 1 but does not occur on the property (Figure 2).



Fen habitat within Wetland Unit 1 varies from “poor fen” habitat containing Sphagnum mosses, ericaceous shrubs and Black Spruce to “rich fen” habitat dominated by sedges and brown mosses. These habitat differences are apparent on aerial photographs (Figure 2) and were recognized in SSEA’s wetland evaluation report (SSEA 2004) as “tall shrub fen” and “emergent sedge fen”, respectively. According to Warner and Rubec (1997) poor fen habitat conditions indicate areas of wetland raised above the water table with relatively low dissolved mineral content. In contrast, water in richer fen habitat has higher concentrations of minerals.

A portion of the St. Andrew’s Lake PSW occurs on the property (i.e. 3.7 ha, 6.7% of Wetland Unit 1). The boundary of the wetland on the property was delineated by Azimuth Environmental in June 2006. This boundary was field reviewed and adjusted by OMNR on June 23, 2006 and subsequently surveyed (Figure 2).

Wetland habitat on the property includes organic deciduous and coniferous swamp, a small area of mineral meadow marsh habitat (Figure 2, Table 2), and lagg habitat.

November 4, 2002 wetland evaluation mapping indicates that the property contains portions of wetland communities S5 and possibly S6 (Appendix 3). The fen habitat of the shoreline of St. Andrew’s Lake (wetland communities F1 and F2) does not occur on the property (Appendix 3). Portions of the deciduous swamp habitat we identified on site (i.e. Vegetation Community 10, SWD6-1, Figure 2) adjacent to the wetland boundary are developed on mineral soils though most of SWD6-1 occurs on organic soils (i.e. peat > 40 cm deep). The understory of community SWD6-1 is densely populated with Buckthorn (*Rhamnus* spp.).

November 4, 2002 wetland mapping indicates the presence of a lagg or moat near the interface of the wetland and upland along the northern boundary of the property. This lagg is visible on aerial photography and occurs inside the boundary of the wetland established on the property in June 2006 (Figure 2). The lagg averages roughly 5m in width and follows the transition between mineral and organic soils within the north end of community SWD6-1 (Figure 2). We observed no ground water discharge sites in proximity to the lagg. The topography and soils next to the lagg (i.e. level ground, sand) are such that surface runoff and ground water flow toward the lagg is of extremely low volume. Thompson and Sorenson (2005) define a lagg in the context of bog habitat as: “a narrow, wet, tall shrub-dominated zone surrounding a bog. Water accumulates in the lagg as the result of drainage from surrounding uplands and the slightly raised surface of the bog. The water in the lagg may be stagnant or slowly moving, but it is enriched with dissolved minerals compared to the open bog”. Warner and Rubec (1997) indicate that “lagg swamp” occurs “in the zone between upland mineral terrain and a peatland (swamp, fen or bog)”; that the lagg is directly enriched by runoff from the upland; and that surface water movement is parallel to the upland. According to the Peart (2006) “a lagg receives water from the bog and assists with its distribution to surrounding lands; the lagg is the outside perimeter of active



peat formation; and the lagg is where the water regime changes as a chemical switch is made from acid dominated waters, to increasing calcium and basic waters; the lagg is where water moves out from the bog and where water is filtered and trapped so that incoming nutrients such as calcium, magnesium and potassium don't enter the lagg; and the transition from organic to mineral soils is critical".

The lagg on the property was completely dry when observed on October 21, 2005. The lagg contained water during all site visits conducted in 2006 up to November 9th. Based on air photo interpretation it appears that a pond may have been excavated on adjacent land at the north end of the lagg (Figure 2). As indicated in Section 4.9 below, water chemistry of the lagg is consistent with the definition provided by Peart (2006). That is, the lagg is acidic and has low concentrations of calcium, magnesium and potassium. The acidic nature of the lagg is attributable to the presence of peat and the acidic compounds that are produced during decomposition. The low pH of the lagg indicates that water movement in this upland/wetland transition zone is outward from the raised peat of the adjacent organic swamp (i.e. from the wetland toward the upland). If the lagg was receiving water primarily from surface water runoff or as ground water discharge, the lagg would have a geochemical signature typical of surface water features, such as St. Andrew's Lake (i.e. neutral pH with a slightly higher alkalinity – see Section 4.9).

4.5 Areas of Natural and Scientific Interest (ANSI)

Portions of the property have been mapped as part of the Penetang Lake regionally significant life science ANSI (Appendix 6). According to OMNR's natural areas report (Appendix 6) this ANSI includes the lake, wetland and "upland fringe" composed of "balsam poplar-sugar maple-red maple-ash-black cherry-red oak". None of the plant communities on site have compositions matching the above description related to "upland fringe" (Table 1).

4.6 Wildlife Habitat

Thirty-six bird species were identified on the property during spring migration and the breeding season for neotropical migrant bird species (Table 4). Breeding on the property was deemed possible, probable or confirmed for 30 species (Table 4). An active Ruffed Grouse nest was found on April 28, 2006 in plant community polygon 3. Six of the bird species observed are considered "area sensitive" by OMNR (OMNR 2000). The Cooper's Hawk observed on April 28, 2006 was eating a freshly killed Rock Pigeon (*Columba livia*). Signs of Pigeon predation (discarded feathers) were common along the north end of the property in proximity to a residence where pigeons were being raised. A Red-shouldered Hawk (S4B,SZN, Ontario General Status – Sensitive) was observed calling, circling and soaring above St. Andrew's lake and land to the south in July 2002 (SSEA 2004). No Red-shouldered Hawks were seen or heard while we conducted field studies and we found no stick nests on the property to indicate breeding use by hawks, owls, crows or ravens. Waterfowl use of



the property was limited to the lagg (pair of Wood Ducks observed April 28, 2006). The open water of the lagg and the availability of natural cavities in nearby trees of the wetland and vegetation community polygon 3 provide suitable nesting and brood rearing habitat for Wood Duck.

Amphibian (i.e. frog and toad) call surveys conducted April 11, 2006 (surveys conducted between 8:40 p.m. and 9:00 p.m., weather conditions: air temperature 12°C, wind southeast Beaufort wind scale 2, cloud cover 40%, precipitation - nil, observer Jim Broadfoot) revealed breeding activity in areas shown on Figure 2 by large numbers of Spring Peeper (*Pseudacris crucifer* S5) and small numbers of Western Chorus Frogs (*Pseudacris triseriata* S4). Call surveys conducted May 31, 2006 (surveys conducted between 8:40 p.m. and 9:00 p.m., weather conditions: air temperature 24°C, wind southeast Beaufort wind scale 1, cloud cover 100%, precipitation - rain, observer Jim Broadfoot) revealed breeding activity in areas shown on Figure 2 by a few Spring Peepers, large numbers of Gray Treefrogs (*Hyla versicolor* S5) and small numbers of Green Frogs (*Rana clamitans* S5). Frog call surveys indicated that there is no amphibian breeding habitat on the property located outside of the delineated wetland. No other amphibian species, including salamanders, were observed during site visits. Other amphibian species reported to inhabit the St. Andrew's Lake PSW include Red-spotted Newt (*Notothalmus viridescens viridescens* S5) and Northern Leopard Frog (*Rana pipiens* S5) (SSEA 2004). The recent wetland evaluation scoring record indicates that American Bullfrog (*Rana catesbeiana* S4) do not inhabit the wetland. None of the amphibian species observed are endangered, threatened or ranked as provincially significant.

No reptiles were observed during the course of field work on the property. Reptiles reported to inhabit the St. Andrew's Lake PSW include Snapping Turtle (*Chelydra serpentina* S5), Midland Painted Turtle (*Chrysemes picta marginata* S5) and Eastern Garter Snake (*Thamnophis sirtalis sirtalis* S5) (SSEA 2004). None of these species is ranked as a species of conservation concern nationally or provincially. We found no evidence of turtle nesting on the property, including upland habitat adjacent to the wetland.

Mammals observed on site included: White-tailed Deer (*Odocoileus virginianus* S5); Beaver (*Castor canadensis* S5); Coyote (*Canis latrans* S5); Fisher (*Martes pennanti* S5); Striped Skunk (*Mephitis mephitis* S5); Snowshoe Hare (*Lepus americanus* S5); Eastern Cottontail (*Sylvilagus floridanus* S5); Red Squirrel (*Tamias striatus* S5). Raccoon (*Procyon lotor* S5). Mink (*Mustela vison* S5) and Muskrat (*Ondatra zibethicus* S5) were reported to inhabit the St. Andrew's Lake PSW (SSEA 2004, OMNR 2005) but were not observed on the property during 2006 field work. None of the mammal species observed on the property or in the PSW are ranked as species of conservation concern nationally or provincially. Fisher is considered an area sensitive species by OMNR (OMNR 2000 - Appendix G). The property and surrounding land, including the PSW is not mapped as deer yard (Allan *et al.* 2005) and there is no



physical evidence (i.e. signs of past, intense deer browsing, established browse lines, etc.) that deer inhabit the area in any numbers during the winter.

4.7 Physiography

The property is located in the central portion of the Penetang Peninsula that is classified as part of the Simcoe Uplands by Chapman and Putnam (1984). On the Penetang Peninsula, the uplands were submerged in glacial Lake Algonquin with the result that boulder pavement, sand, and silt appear on the surface. The property has surficial deposits of glaciolacustrine material comprised of outwash sands.

Topographic mapping (Scale 1:50,000 Figure 1) reveals that the property is elevated with respect to Georgian Bay. St. Andrews Lake occurs east of the property. The lake is isolated in that it has no apparent watercourse outflow (Appendix 3). The southern, northwestern and western portions of the property are elevated with respect to St. Andrews Lake and exhibit dry, sandy soils with good infiltration capacity. An area of in-active sand and gravel aggregate extraction occurs to the south of St. Andrews Lake, indicating that infiltration is occurring in proximity to the Lake. Well records for properties north of Pine Grove Road show that sand and gravel deposits extend up to 200 feet below surface. The lands within the proposed building envelope are relatively flat.

4.8 Geology

The Quaternary geological mapping in the study area is a compilation of the mapping completed by Bajc and Paterson 1992, and Burwasser and Boyd 1974. This mapping illustrates the uppermost layer of overburden materials. On the subject lands, glaciofluvial and ice contact stratified deposits are identified to the east and south of St. Andrews Lake. The western corner of the site is mapped as an area of silt and sand till. Minor marsh and muck deposits are associated with St. Andrews Lake.

The results of the site drilling program indicate that at all of the drilling locations, with the exception of BH3-05, the surficial material consists of a sand and silt till (Geospec, 1998 and 2006). The till has been described as loose to very dense. According to particle size distribution curves (which do not include the cobbles and boulders), the till consists predominantly of sand (71%), silt (17-23%), and gravel (4-6%). Due to the proximity of BH3-05 to the wetland, the subsurface material included fill, which has been placed on top of a peat layer. The peat at this location is 0.7 m in thickness and overlays 2.5 m of silt and sand before the till unit was encountered.

The till beneath the property is in excess of 11 m thick (Note: the entire thickness of the till unit was not penetrated). This is equivalent to an elevation of approximately less than 215 masl. Based on the regional interpretation presented in the Wellhead



Protection Area Report for the Town of Penetanguishene (Golder *et al.*, 2004), the base of the till is mapped at approximately 220 masl.

4.9 Hydrology

As discussed in Section 4.3, there are no water courses on-site. The only surface water feature is the St. Andrews Lake Wetland. The area of St. Andrews Lake Wetland on the property covers approximately 4 ha and bounds the property to the east. Located at the height of land at an elevation of approximately 226 masl, the lake is “perched” approximately 40 m above the local water table. With a lake depth of approximately 2 m, the lakebed occurs at 224 masl. In addition, St. Andrews Lake is considered a “closed” system (i.e. isolated wetland – Appendix 3), as there is no surface outflow from the lake.

Water level monitoring data (pressure transducer/datalogger) indicated that the high water level in the lake peaked during the spring freshet (Figure 3). Water level data for the month of June was not obtained as the water level dropped below the transducer. Manual measurements indicated that the water level dropped approximately 25 cm of the 40 cm decrease during this period. The water level in the lake reached a low at 224.9 masl.

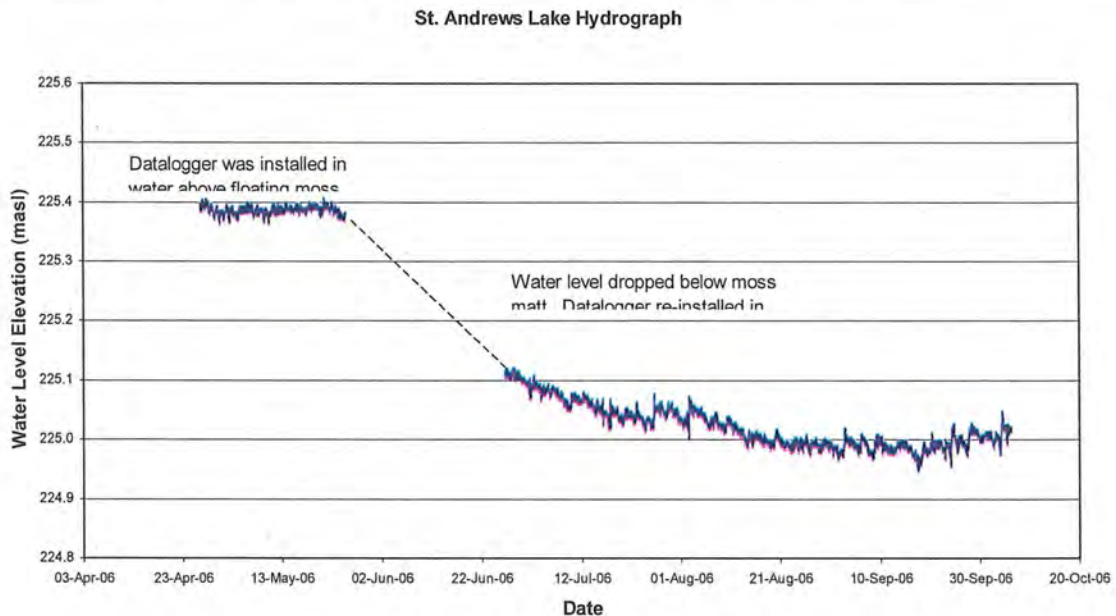


Figure 3. St. Andrew’s Lake hydrograph.

Major ion chemistry was useful to identify some of the more important sources of water to the wetland. Piper Diagrams (Figure 4) were used to show the effects of various factors, including major ion composition of possible water sources. Two surface water samples were collected and are determined to represent the current



conditions of the lake. These samples were taken from the open water portion of the lake as well as from within the lagg (Figure 2). Water quality results are provided in Table 4.

The water quality of the open water portion of St. Andrews Lake has the typical surface water signature. Specifically, the surface water exhibits a low alkalinity (40 mg/L), low concentrations of metal ions, and a neutral pH (between 6.5-8.5). The elevated chloride (14.5 mg/L) is evident on the Piper Diagram (Figure 4) and may be indicative of road salt contamination.

The water from the lagg has a considerably different water quality signature. Specifically, the alkalinity concentration is below detection limits (<10 mg/L) and a low pH (5.3). Alkalinity is a measure of the capacity of the water to resist a change in pH that would tend to make the water more acidic. In general, water with a low pH (< 6.5) could be acidic, and could contain elevated concentrations of metal ions such as iron, manganese, copper, lead, and zinc.

4.10 Hydrogeology

The Wellhead Protection Area Report for the Town of Penetanguishene (Golder *et al.*, 2004) identifies two main aquifers in the area: the Upper and Lower Aquifer. The aquifer of interest is the Upper Aquifer, which is present across almost the entire study area, although it is combined with the Lower Aquifer beneath the St. Andrews Lake area. This aquifer is semi-confined and is approximately 40 metres thick. The static water level is approximately 190 masl (Golder *et al.*, 2004).

Golder *et al.* (2004) also noted that perched and smaller localized aquifers are occasionally present. In this regard, 5 monitoring wells were installed to determine if there perched water table conditions exist in the area. The water level elevation data is presented on Figure 5. All water levels are expressed as masl.

Table 6: Ground Water Elevations

Monitoring Well	6-Jan-06	31-Jan-06	15-Mar-06	17-Apr-06	1-Jun-06	26-Jun-06	2-Aug-06	5-Sep-06	6-Oct-06	9-Nov-06	13-Dec-06	11-Jan-07
OW1-05	Dry	Dry	Dry	215.5	215.5	215.5	215.4	215.5	215.5	215.5	215.4	215.4
OW2-05	Dry	Dry	Dry	220.4	220.5	220.3	220.3	219.9	219.5	219.4	220.6	220.4
OW3-05	Dry	Dry	Dry	221.3	219.8	218.8	218.4	217.7	217.1	216.7	217.9	218.7
OW4-05	Dry	Dry	Dry	221.1	220.8	220.8	220.8	220.8	220.7	220.8	220.8	220.8
OW5-05	217.3	217.3	217.3	217.3	217.3	217.3	217.3	217.3	217.3	217.3	217.3	217.3

Note: Water levels measured in OW1-05, OW4 and OW5-05 represent water collected in the base of the monitoring well as water levels are a few centimeters above the bottom of the well and do not fluctuate over time. OW2 and OW3 monitor a local perched water table.

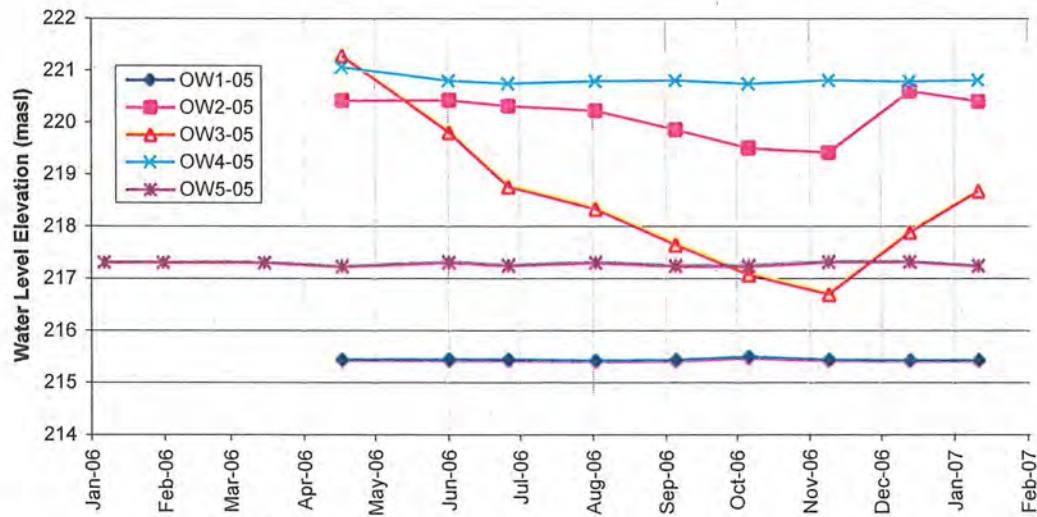


Figure 5. Ground water level elevations (masl) measured on site in 2006.

The water level monitoring data indicates that there are perched conditions at OW2-05 and OW3-05. The greatest response to meteoric conditions is monitored in OW3-05. This monitoring well is constructed in the till unit, however it is anticipated that the response is attributed to the overlying, saturated silt and sand. Although located adjacent to the St. Andrews Lake Wetland, the high water level is reported to be approximately 3 m below lake level.

Based on the water level data collected for the monitoring wells, there is minor perched conditions within the till unit (identified at OW2-05 and OW3-05). Furthermore, it is anticipated that the perched units are not laterally extensive and are independent due to the large gradient difference (greater than 3 m during the fall of 2006). Therefore, there are no perched water table conditions that would impact the proposed development.

4.11 Ground and Surface Water Interaction

Although the South Ontario Wetland Evaluation report (OMNR, Revised December 2003) reports that the potential for ground water discharge to the wetland is low (scored a 6 of a possible 30), a hydrogeological evaluation completed by Trow (1987) reports that St. Andrews Lake appears to be a local and shallow discharge zone. Documentation for the Life Science ANSI (NHIC database, November 2001) also indicates that the lake may be “spring-fed”. It has also been suggested that additional water may be entering the lake from shallow perched aquifers.

However, results of our detailed hydrogeological assessment indicate that there is negligible hydraulic interconnection between St. Andrews Lake and associated



wetland habitat and the ground water regime. This interpretation is supported by recent water quality data that indicates the lake has a surface water chemical signature. St. Andrews Lake is maintained primarily by direct precipitation over the lake and overland runoff from the surrounding catchment area. The dry condition of the lagg observed during very dry autumn conditions in 2005 also supports the conclusion that the lake and associated wetland are maintained primarily by surface water.

4.12 Ground Water Recharge

Estimates of ground water recharge were calculated based on percolation and “slug” tests. Two percolation tests were completed in the vicinity of the proposed storm water attenuation areas. The results indicated that the infiltration rates at both sites were similar. The overburden sediments recharged at a rate of 0.7 L/min or an equivalent depth of 7 mm/min (Figure 6).

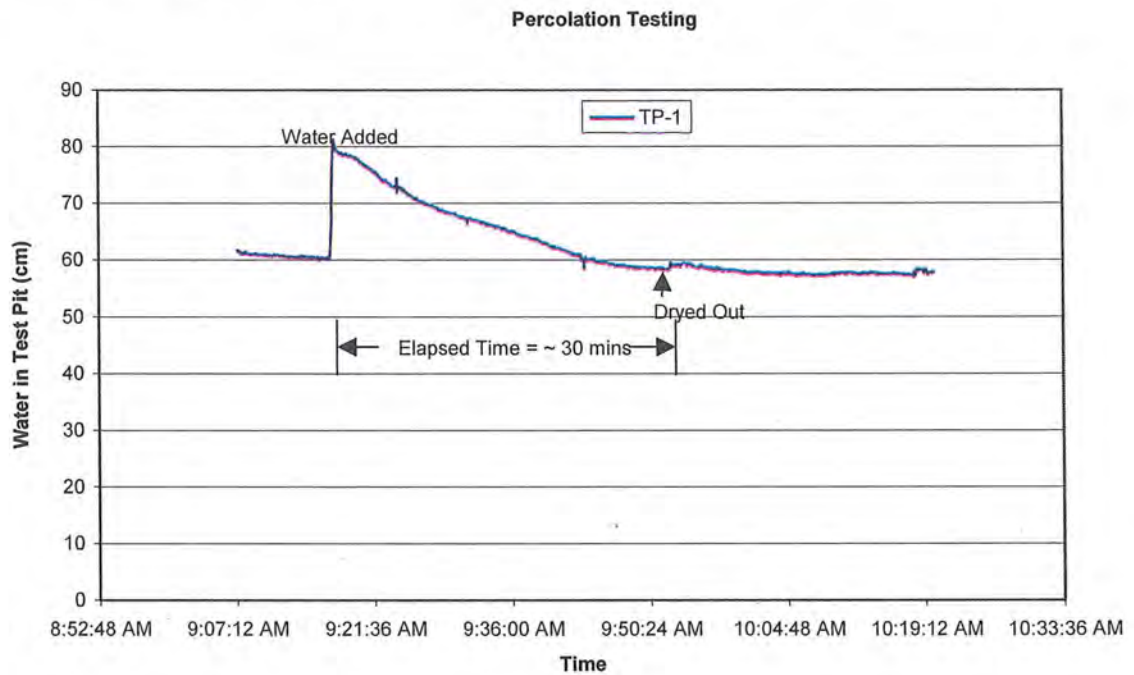


Figure 6. Percolation test results, 2006.

The results of the slug test (OW2-05 and OW4-05) indicate that the till unit has a bulk hydraulic conductivity of approximately 1×10^{-7} m/s. This indicates that the permeability of the till unit is considerable less than the unconsolidated sand found at surface. The low permeability of the till has resulted in the perched surface water condition of St. Andrews Lake Wetland.



5.0 PROPOSED DEVELOPMENT

The concept plan developed for the property is for an adult lifestyle/retirement residential condominium development comprised of 180 townhouse or linked units as shown on the attached plan (Appendix 8).

The condominium would have full municipal servicing (i.e. water and sanitary sewer) as described in the St. Andrew's Village Development, Functional Servicing Report (Walter Fedy Partnership 2007).

Stormwater Management for all flows up to the 100year storm event, is to be achieved by site filling and grading to establish six attenuation areas as shown on Fig. 4 of the functional servicing report (Walter Fedy Partnership 2007). This will require that the entire east roadway (Street 'B') be filled to approximately 2.5 metres above the existing. Under high flow events (i.e. in excess of 100 year storm), storm water will be discharged from the attenuation areas through emergency overflow weirs or pipes, or combination thereof, as shown on Fig. 4 of the functional servicing report (Walter Fedy Partnership 2007). Weirs shall consist of a reinforced earth or rip-rap material extending from the high-water level in the attenuation areas to the asphalt roadway/concrete sidewalk and/or pipe invert. Similar material will be used to provide erosion protection on the "downstream" side of emergency overflow weirs or pipe outlets to the level of the existing environmental setback elevation. Emergency overflow outlets will only be utilized for storms in excess of the 100 year event (i.e. Regional Storm) or in the event of restrictions/obstructions in the storm sewer system. The emergency overflow outlet weirs will be constructed outside of the wetland and environmental setbacks established on the property as part of this EIS. Flows up to 100 year storm events will be piped to an outlet flow control structure that directs water to a vortex solids separator that provides quality control for water discharged to the wetland under all storm events. The vortex solids separator will provide an enhanced level of treatment according to MOE guidelines meeting Level 1 protection criteria.

6.0 IMPACT ASSESSMENT AND MITIGATION

6.1 Land Use

The proposed development would convert a disturbed area of abandoned farmland and sand/gravel extraction to residential development. The proposed development would not alter habitat of the St. Andrew's Lake PSW or habitat of the property that matches the description the regional life science ANSI identified locally (see Section 6.5). Also, since the Simcoe County Greenlands overlay appears to be aligned with wetland habitat in this area, the proposed development would not affect this natural heritage feature either. Therefore, the proposed development would not affect areas of the property identified as EP1 by the municipality.



The surrounding land to the west and north contains a mix of residential and industrial land uses. The proposed development would therefore not introduce a foreign land use to the area. Since site topography and treed habitat of the St. Andrew's Lake wetland do not provide views of the St. Andrew's Lake (a.k.a Penetang Lake) from the property or Fuller Road adjacent to the property, the proposed development does not affect the scenic qualities of the area.

6.2 Vegetation

As indicated above, the proposed development does not have a direct impact on wetland habitat nor habitat of the property that matches the description the regional life science ANSI identified locally (see Section 6.5). Vegetation units to be directly affected by the proposed development are successional upland communities that are growing in on land disturbed by previous agricultural and sand/gravel extraction activities. None of the successional communities are considered rare nationally or provincially and all are common in the area. The proposed environmental setback established adjacent to the PSW and ANSI offers protection of the vegetation communities from development. A hoarding fence should be established along the entire setback limit prior to construction in order that construction impacts can be avoided or minimized. Under no circumstances should construction activity occur on the "non-development side" of the hoarding fence.

None of the plant species in the development area are ranked as endangered, threatened or provincially significant. Therefore the development will not affect the habitat of species of conservation concern in this regard.

6.3 Fisheries/Watercourse

There are no watercourses on the property and so the proposed development does not involve watercourse crossings, diversions or other construction activities requiring approvals under the *Fisheries Act*.

A 30m setback from the wetland boundary in proximity to the lagg is proposed as an environmental setback. This setback is adequate to provide water quality protection for surface water in the lagg and hence any potential fish habitat function it may have.

6.4 Wetland Habitat

The proposed development is situated entirely outside of the boundary of the St. Andrew's Lake Wetland established on the property with agency approval in 2006 (Figure 6). Therefore, the development can be achieved with no site alteration or development within the wetland.

An environmental setback limit was established for the St. Andrew's Lake Wetland based on the results of our EIS. The proposed setback limits were established in



recognition of environmentally sensitive features and functions associated with the wetland and those features that contribute to its functions.

The lagg was recognized as a unique feature providing potential fish habitat, waterfowl breeding habitat and amphibian breeding habitat. A 30m setback from the lagg was established. The habitat of the “lagg setback” includes mixed and upland forest types (FOM5-2, FOD3-1: Table 2, Figure 2). The deciduous forest habitat (Plant Community Polygon 2) represents early successional forest growth outward into abandoned farmland. In time this section of the lagg setback is expected to have a composition and structure similar to the more mature community FOM5-2 (Plant Community Polygon 3) forming a naturally vegetated forest buffer to the wetland lagg. As the trees in community FOD3-1 mature and the canopy closes, cooler and moister ground level conditions than exist presently are expected to develop. In time, these conditions will provide suitable upland habitat for amphibians breeding in the lagg.

Since water chemistry data indicate that the primary contribution of water to the lagg is from the “wetland side” (i.e. from the peat underlying the adjacent swamp), site grading and berming needed to achieve the proposed stormwater management design will not affect the integrity of the lagg/wetland. Emergency overflow discharged in proximity to the lagg and wetland under storms exceeding the 100 year event are not considered problematic to the wetland or an unusual condition attributed by development of the site, as high volumes of overland flow would reach the wetland in proximity to the lagg, even if the property remains undeveloped.

The proposed location of the stormwater discharge takes advantage of existing site topography and occurs in an area adjacent to the wetland that has been disturbed by past use of the property (i.e. filling). The proposed discharge point does not occur in proximity to the lagg, fen habitat or other area of robust *Sphagnum* growth. Since water discharged to this location will be treated to Level 1 quality standards it will not significantly impact water quality in this part of the wetland. None of the vegetation adjacent to the proposed discharge location is rare or sensitive to disturbance in part because the vegetation in this area has been established on and adjacent to previously disturbed land. Discharge of stormwater in the proposed location is not expected to affect the integrity of wetland habitat on the property.

Any dewatering required to install elements of the stormwater management system (i.e. vortex solids separator and/of connecting pipes) should be evaluated in terms of the requirements for a permit to take water. If dewatering is required, water should be discharged 30m upslope of the wetland into a temporary sediment containment system (i.e. pit, filter bag, etc.).

A 10m environmental setback was established along most of the remainder of the wetland boundary, south of the lagg (Figure 6). No site development or site alteration



is to occur within the environmental setback area. Therefore, the existing vegetation of 10m wide setback will remain intact and continue to undergo plant succession toward forest conditions. Since the proposed development is “condominium style”, site maintenance will be preformed by a single body (i.e. a property management firm) as opposed by individuals. This means that there is a much higher level of control over the types of incursions into environmental setback areas that sometimes occur in single-family style subdivision developments where individual lots backing onto protected areas are individually owned. Therefore, refuse dumping and other “over the back fence” types of environmental impacts are not expected as part of the proposed developments. So, a 10m setback adjacent to areas of the wetland with low environmental sensitivity are adequate.

6.5 Area of Natural and Scientific Interest (ANSI)

OMNR has indicated that the boundary of the Penetang Lake ANSI was only very generally delineated and that for this site the ANSI boundary should include all of the wetland and the immediately adjacent uplands that “buffer” the wetlands (Appendix 6). The ANSI is considered to contain the lake, associated wetland and surrounding upland fringe.

The property contains two of the three habitat elements included in the Penetang Lake ANSI (i.e. wetland and “upland fringe”). The proposed development retains all of the wetland habitat on the property as well as upland habitat adjacent to the wetland that represents “fringe” habitat. All of the mature upland forest habitat of the property that occurs adjacent to the wetland boundary (i.e. Plant Community Polygons 3 and 8, Figure 2) is preserved. Portions of successional forest habitat (i.e. Plant Community Polygon 2, Figure 2) that have grown out into the abandoned farm field are maintained within a 30m wetland protection setback. All of upland Plant Community Polygon 7 is maintained. The upland fringe habitat retained by the development concept represents a diversity of habitat types and provides a continuous “band” of habitat adjacent to the wetland that extends through the property linking to similar upland fringe habitat on adjacent land. The width of the retained fringe varies from 12 m to 60 m. The areas of mature forest cover (i.e. Plant Community Polygons 3 and 8, Figure 2) are likely functionally connected in that they appear to represent upland habitat suitable for some woodland amphibians that breed in the wetland (i.e. function as terrestrial habitat outside the breeding season).

In our opinion the proposed environmental protection setback from the wetland and retention of all of Plant Community Polygon #8 on site, satisfies OMNR requirements regarding the delineation of ANSI habitat on the property (i.e. all wetland habitat is preserved and wetland buffer areas as well as lands functionally connected to the wetland {terrestrial habitat for woodland amphibians} is retained.



6.6 Wildlife Habitat

None of the wildlife species observed are threatened, endangered or ranked as provincially significant. There was no evidence that raptors breed on the property. Waterfowl use of the property was limited to wetland habitat (i.e. no evidence of nesting in adjacent upland habitat). No nests of colonial nesting birds were identified on or adjacent to the property. Amphibian breeding habitat was present in the wetland on the property but not within the proposed development area. The proposed development preserves areas of mature forest cover that currently exist next to wetland habitat as potential upland habitat for the woodland amphibians that breed within the wetland (i.e. Spring Peeper, Western Chorus Frog, Tree Frog). Habitat retained as part of the environmental setback may also function for amphibians that breed in the wetland. The development is sufficiently separated from areas with concentrated numbers of breeding amphibians to prevent indirect impacts on the breeding function of these areas of the wetland. Deer do not winter on the property or in the area. Based on these observations it is apparent that the proposed development will not affect significant wildlife habitat in any of these regards.

Several wildlife species observed on site are considered “area sensitive” by OMNR (i.e. six bird species, one mammal – see Section 4.6). All of these species require forest area as opposed to open land. Given that most of the property is actually open land without continuous forest cover, it would appear that the area sensitive species detected on site occur there primarily due to the extensive swamp habitat and upland fringe associated with the overall St. Andrew’s Lake Wetland and Penetang Lake ANSI. Since these features will not be affected by the proposed development we anticipate continued use by these species of the wetland habitat and associated upland fringe habitat maintained on site. Also, since extensive areas of urban development already exist in proximity to the property, the proposed development does not introduce a new land use to the area that area sensitive species of the wetland and ANSI have not previously been exposed to. Therefore, we do not anticipate significant negative impacts of the development on local area sensitive species.

6.7 Soils and Topography

The proposed development does not require the removal or organic soil from the property. Site grading required to establish the proposed stormwater management design will not involve significant impacts to existing topography as it is relatively flat at present. It is anticipated that slope stabilization will be required in the southern section of the property in the location of the previous gravel/sand extraction.

6.8 Ground and Surface Water Interaction

St. Andrew’s Lake and its associated wetland is “perched” on a till unit of low permeability approximately 40 m above the regional water table. The shallow monitoring wells indicate that local perched ground water conditions do occur within the till unit. The water level data suggests that these perched water tables are isolated



and independent of one another (i.e., the hydraulic heads would be similar if laterally extensive and hydraulically connected). Furthermore, the perched water tables are lower than the base of the lake indicating that there is no ground water contribution to the lake. Therefore, the water level in the lake is maintained primarily by surface water runoff and precipitation.

Although there are isolated perched conditions within the till unit, this will not impact the proposed development plan. Specifically, site grading and/or installation of buried servicing (i.e. water, storm water drainage, sanitary sewer, etc.) will be completed/constructed above the perched water tables.

Due to the lack of hydraulic connection between St. Andrews Lake Wetland and perched and static water table condition, the proposed development can be achieved with no impact on wetland hydrology. The only changes to the wetland hydrology are the difference in pre and post water balance conditions. The implications of development on St. Andrews Lake Wetland is described in the following section

6.9 Water Balance

6.9.1 Pre-Development

The property is located within the 225 ha catchment area of St. Andrews Lake Wetland. Site drainage from the entire property is generally from the elevated areas to the low-lying wetland area.

Monthly water budgets were prepared using the Thornthwaite and Mather (1955) method, which is based on the monthly temperature and precipitation data from the Midland Environment Canada station for the years 1987 to 2002. The water budget calculates the effect of evapotranspiration and provides an estimated net monthly surplus or deficit. The surplus reflects the water available to runoff or infiltrate to the ground water regime. The average annual water is 467 mm (based on 100mm soil moisture), within the range of 196 to 738 mm/year (95% confidence limits). Average precipitation is 962 mm within the range of 688 mm to 1236 mm (95% confidence limits).

In general, flat lands promote infiltration, as do higher permeability soils. The majority of the site area is composed of sandy till soils, which have a high infiltration rate (approximately 80% of surplus). Infiltration rates were estimated using the method from the MTO Stormwater Management Planning and Design Manual (March 2003).

The amount of water infiltrating the ground water regime is approximately 80% of the water surplus value. Based on the normal water surplus value of 467 mm, approximately 374 mm (10^{-2} m/s) is available for infiltration, while the remaining water surplus runs off into St. Andrews Lake.



The maximum surplus is approximately 61,644 m³/year for the 13ha property (based on average annual surplus). Of this amount, a portion runs off as snowmelt (estimated at 80% of the winter surplus). The remainder is available to infiltrate or runoff. Based on a runoff coefficient of 0.8, the existing infiltration is approximately 12,329 m³/year (93 mm/year).

6.9.2 Post-Development

Based on the most recent version of the Walter Fedy Partnership's Functional Servicing Report (Walter Fedy Partnership 2007), the development area encompasses approximately 13.2 ha (5.2 % of the total watershed). The developable land is composed of medium density residential, park / woodlot, and Provincially Significant Wetlands. The land use breakdown is presented on Table 7. The estimated area of impervious area for each designation is also provided.

Table 7: Hard Surface Area

Designations	Area (ha)	Hard Surface factor
Watershed Area	255	
Property Area	13.2	
Proposed Development Area	9.5	
Medium Density Residential	1.9	75%
Commercial	0.0	80%
Wetland	3.7	0%
Park/Woodlot	6.0	0%
Roads	1.7	100%

Table 8: Pre and Post Water Balance Conditions

Pre-Development (ha)						
Watershed	Watershed Area	Discharge areas in Watershed	Infiltration Area in Watershed	Property Area	Discharge areas on Property	Infiltration Area on Property
St. Andrews Lake	255	0.0	255.0	13.2	0.0	13.2

Post-Development					
	Hard Surface Area/SWMP	Unmitigated Effective Infiltration in Watershed	Infiltration Loss in Watershed (%)	Effective Infiltration Area on Property	Unmitigated Infiltration Loss on Property (%)
St. Andrews Lake	3.52 ha	251.9 ha	1%	9.7 ha	27%



Table 8 shows the relative proportion of lands in each watershed that potentially are removed from the infiltration area due to hard surface creation. The maximum potential impact to infiltration losses is directly proportional to the area of the lands within the watershed. Based on these estimates, the maximum loss (before mitigation) to infiltration within the watershed is approximately 4,633 m³ (1% of the maximum infiltration).

On the property, the maximum loss equates to 27% of infiltration. This will be offset by an increase in surface runoff by the same amount plus a small amount due to a decrease in evapotranspiration. The total reduction in ground water infiltration for the watershed will result in no measurable impact to the wetland.

7.0 CONCLUSIONS

The proposed development is aligned completely outside of the St. Andrew's Lake Wetland and hence can be achieved with no site alteration or development within the provincially significant wetland (PSW) and by extension, EP1 lands defined by the Municipality and areas designated Greenlands by the County. The proposed development and its recommended environmental setback limit from the boundary of the PSW maintains a continuous area of "upland fringe" habitat adjacent to the wetland. This preserved upland fringe habitat has features and functions similar to those reported for portions of the Penetang Lake ANSI (regional – life science). By protecting both wetland habitat and upland fringe habitat, the proposed development maintains portions of the property that conform to definitions of the Penetang Lake ANSI.

The proposed environmental setback limit associated with the development was established in recognition of environmentally sensitive features and functions identified on site and in the adjacent wetland. The wetland lagg was recognized in this EIS as a sensitive feature. Detailed hydrologic studies indicated that the lagg is not maintained by ground water discharge or surface drainage from upland habitat of the property or adjacent land. Rather, data indicate that the lagg has formed at the interface of mineral and organic soils with water contributions to the lagg coming from the area of raised peat formation in the wetland. The relatively large environmental setback proposed for land in proximity to the lagg was established in recognition of wildlife habitat functions of the lagg (i.e. waterfowl and amphibian breeding) and to ensure water quality protection. Habitat of the environmental setback established in proximity to the lagg represents mature forest habitat as well as areas undergoing succession toward an upland forest condition (i.e. upland fringe habitat). This fringe habitat provides a buffer to the wetland of composition, structure and size that will maintain current wildlife habitat use of the lagg and associated wetland.



The proposed development will not have a direct or indirect impact on: 1) the habitat of vulnerable, threatened, endangered or provincially significant plants or animals; 2) significant wildlife habitat; or fish habitat.

Site specific information (water balance, ground water monitoring) indicates that the proposed development will not affect wetland hydrology and hence can be achieved with no impact on the St. Andrew's Lake PSW or St. Andrew's (a.k.a Penetang Lake).

The proposed stormwater management system will not result in the discharge of water to the wetland that would be harmful to the PSW nor will it increase the flood potential on or off site. The proposed location of stormwater discharged under events up to the 100 year storm takes advantage of an area of the wetland already disturbed by past land use (i.e. fill placement).

Our studies have indicated that the proposed development is consistent with the PPS and conforms to municipal planning policies.



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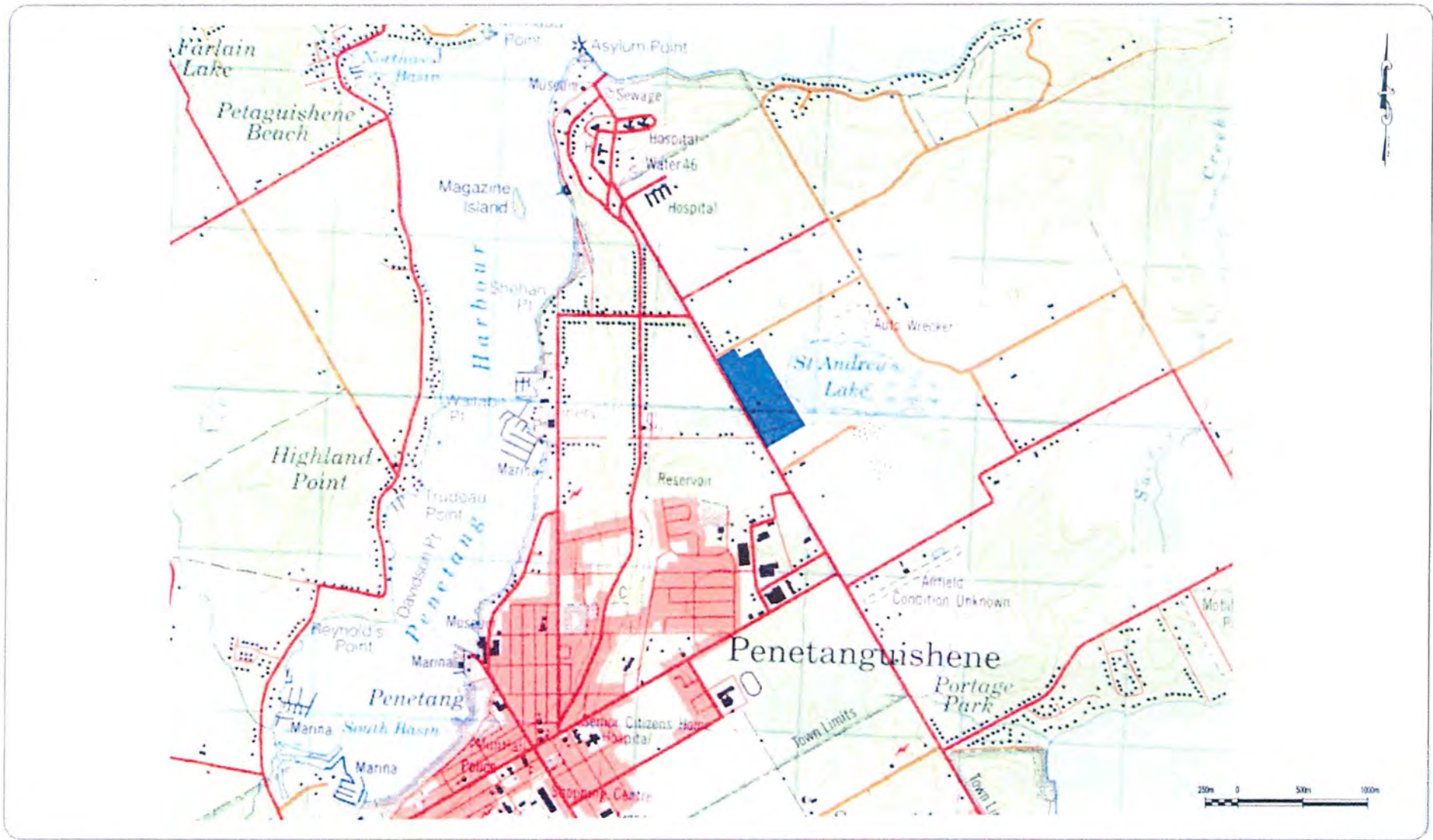
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Legend:

 Site Location

 AZIMUTH ENVIRONMENTAL CONSULTING, INC.

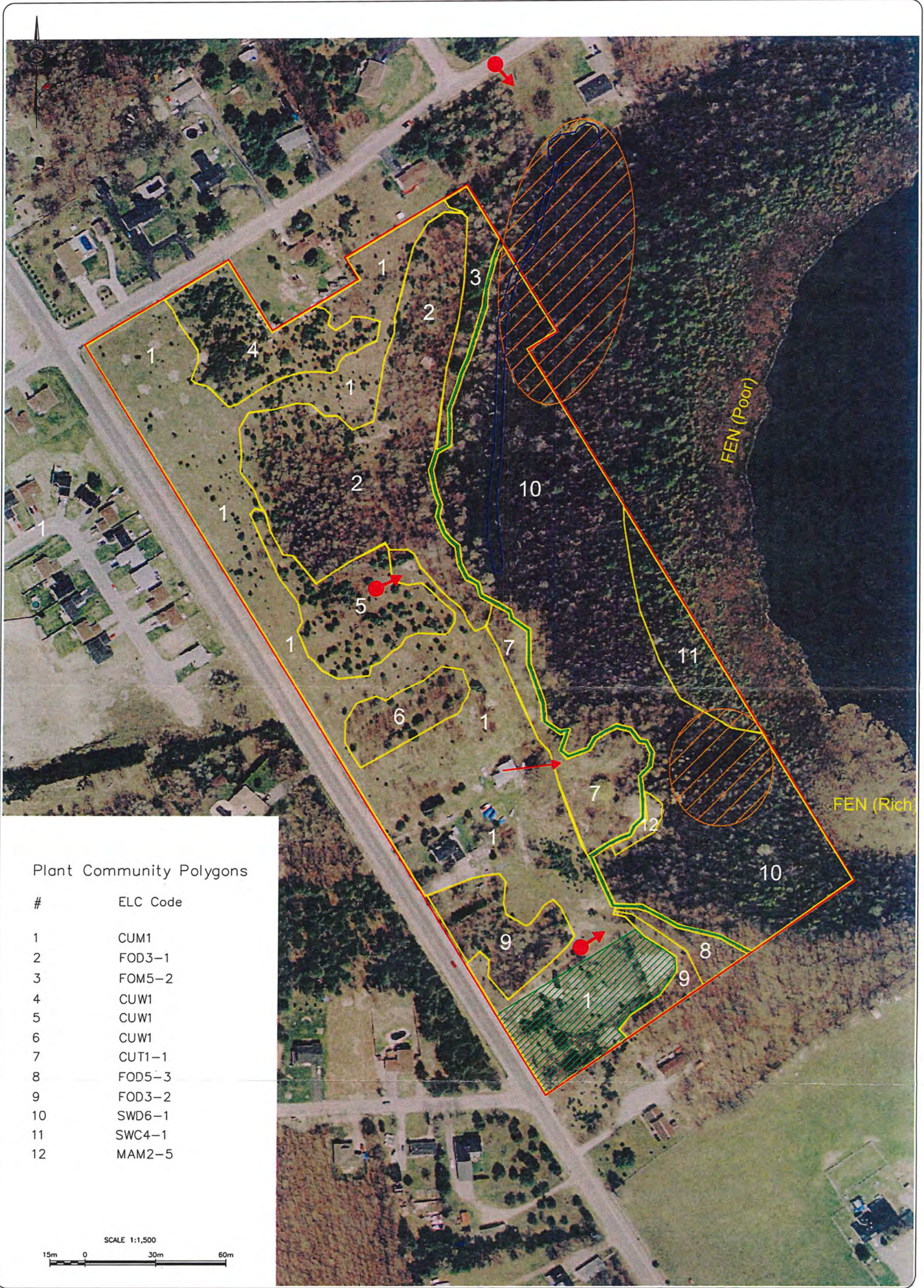
SITE LOCATION MAP

Date Issued: February 2007
 Created By: PHD
 Project No.: 05-226
 File Name: Figure 1

**St. Andrews Wetland
 EIS**

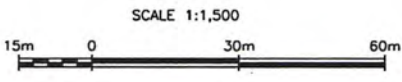
Figure No.

1



Plant Community Polygons

#	ELC Code
1	CUM1
2	FOD3-1
3	FOM5-2
4	CUW1
5	CUW1
6	CUW1
7	CUT1-1
8	FOD5-3
9	FOD3-2
10	SWD6-1
11	SWC4-1
12	MAM2-5



- Legend:
- Property Boundary
 - Wetland Boundary, 2006
 - Lagg
 - Watercourse
 - Vegetation Communities
 - Active Amphibian Breeding, 2006
 - Amphibian Call Survey Sampling Locations
 - Area of old sand/gravel extraction
 - Water Sampling Location
 - TP Percolation Test Pits
 - Borehole / Monitoring Wells

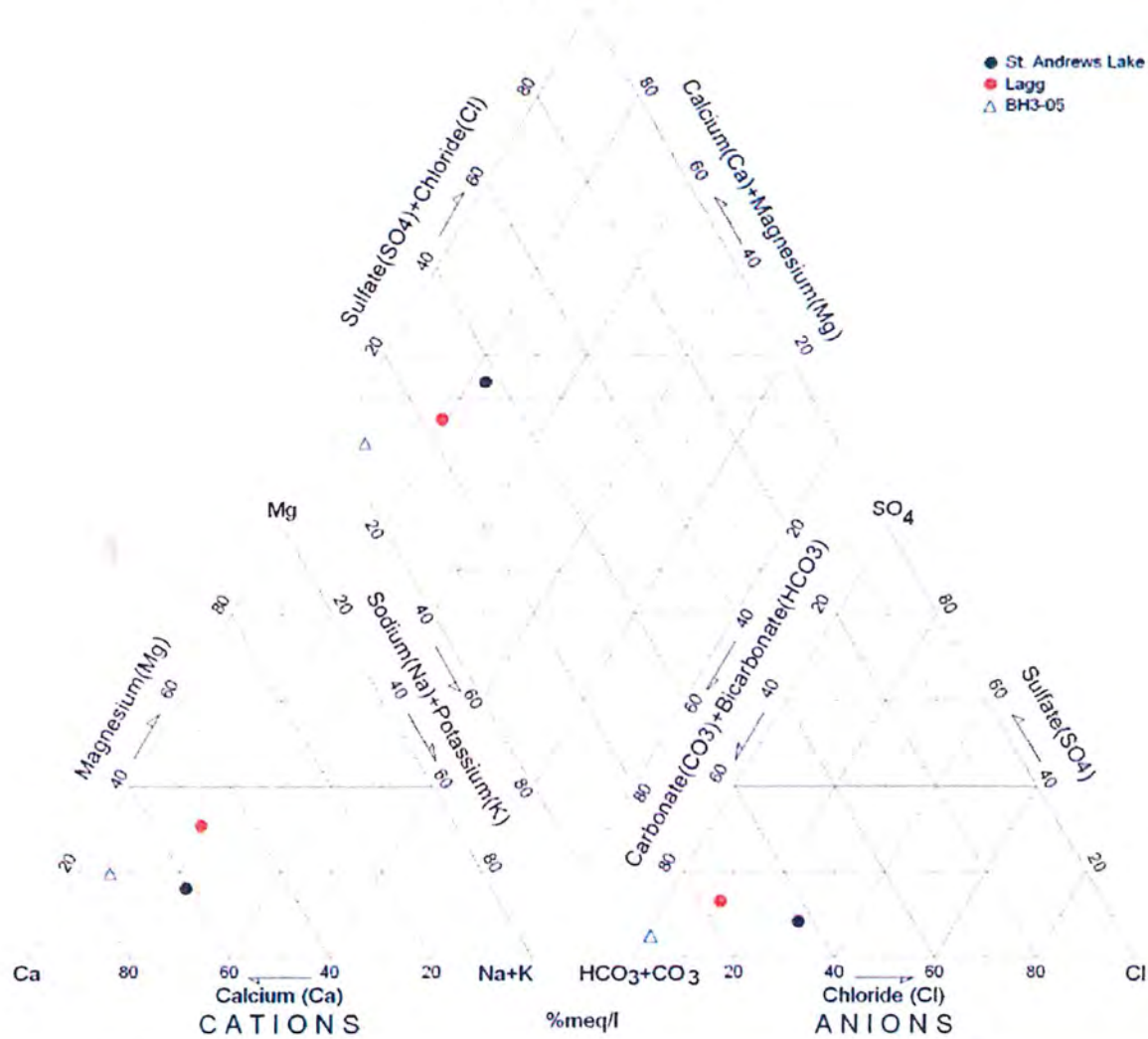
AZIMUTH ENVIRONMENTAL CONSULTING, INC.

ENVIRONMENTAL FEATURES

Date Issued: February 2007	St. Andrews Wetland EIS	Figure No.
Created By: PHD		2
Project No. 05-226		
File Name: Figure 2		

Hydrochemical Evaluation

St. Andrews Lake



Legend:

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

HYDROCHEMICAL EVALUATION

Date Issued February 2007
 Created By PHD
 Project No 05-226
 File Name FIGURE 4

St. Andrews Wetland
 EIS

Figure No.
 4



Legend:

- Wetland Boundary Established 2006
- Proposed Stormwater Control Outlet

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

PROPOSED DEVELOPMENT

Date Issued: February 2007	Figure No.
Created By: PHD	St. Andrews Wetland EIS
Project No. 05-226	7
File Name: Figure 7	

Table 2. Plant Community Description, 1145 Fuller Avenue, Town of Penetanguishene, 2006.

Polygon # ¹	ELC Code ²	ECL Name	Community Description						
			Species Composition			Tree Size Class ³			
			Canopy/Subcanopy	Understory	Ground Layer	<10cm	10-24cm	25-50cm	>50cm
1	CUM1	Mineral Cultural Meadow Ecosite	NA	White Pine (scattered) and Scotch Pine (scattered and in patches), Choke Cherry, Trembling Aspen	Grasses, Bracken Fern, Raspberry, Goldenrod, Aster	NA	NA	NA	NA
2	FOD3-1	Dry-Fresh Poplar Deciduous Forest Type	Trembling Aspen, Paper Birch, White Pine, Scotch Pine	Buckthorn, Meadowsweet, White Pine, Trembling Aspen, Choke Cherry, Raspberry	Bracken Fern, Poison Ivy, Moss	A	O	N	N
3	FOM5-2	Dry-Fresh Poplar Mixed Forest Type	Trembling Aspen, White Pine, Paper Birch, Red Oak, Red Maple, Large-tooth Aspen	Red Maple, Buckthorn, Trembling Aspen,	Bracken Fern, Poison Ivy, Moss	O	O	A	O
4	CUW1	Mineral Cultural Woodland Ecosite	White Pine, Scotch Pine, Choke Cherry, Paper Birch, Trembling Aspen, Red Maple	Choke Cherry, Green Ash, Hawthorn, Red Raspberry, Staghorn Sumac	Grasses, Bracken Fern, Poison Ivy	A	A	R	N
5	CUW1	Mineral Cultural Woodland Ecosite	Scotch Pine, White Pine, White Spruce, Red Maple, Trembling Aspen	Raspberry, Staghorn Sumac, Red Maple, Trembling Aspen	Grasses, Bracken Fern, Poison Ivy	D	O	N	N
6	CUW1	Mineral Cultural Woodland Ecosite	Paper Birch, White Pine, White Spruce, Trembling Aspen	Staghorn Sumac, Meadowsweet, Raspberry, Trembling Aspen, Red-osier Dogwood	Grasses	D	O	N	N
7	CUT1-1	Sumac Cultural Thicket Type	Staghorn Sumac, Box Elder, Willow, American elm	Raspberry, Staghorn Sumac, Red Maple, Trembling Aspen	Grasses, Daylily, Tansy	NA	NA	NA	NA
8	FOD5-3	Dry-Fresh Sugar Maple-Oak Deciduous Forest Type	Sugar Maple, Red Oak, White Ash, Hop-hornbeam, Yellow Birch, American Basswood	Sugar Maple, Hop-hornbeam, Red Oak	Trillium, Trout Lily	O	A	A	N
9	FOD3-2	Dry-Fresh White Birch Deciduous Forest Type	Paper Birch, Trembling Aspen, Red Maple, White Ash, Red Oak, Large-tooth Aspen	Buckthorn, Trembling Aspen, Sugar Maple, Red Maple, Paper Birch	Grasses, Moss	A	A	R	N
10	SWD6-1	Red Maple Organic Deciduous Swamp Type	Red Maple, American Elm, Green Ash	Buckthorn	Fern	O	A	A	N
11	SWC4-1	Tamarack-Black Spruce Organic Coniferous Swamp Type	Tamarack, Black Spruce	Tamarack, Black Spruce, Red Maple	Moss	O	A	O	N
12	MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh Type	NA	NA	Tussock Sedge, Red-osier Dogwood	NA	NA	NA	NA

¹ Polygon Number - see Figure 2

² ELC Code - see Table 2 for plant species list

³ Size Class: D - Dominant; A - Abundant; O - Occasional; R - Rare; NA - Not Applicable

Table 3. Plant List, 1145 Fuller Avenue, Town of Penetanquishene

FAMILY ¹	Scientific Name	Common Name	Plant Community												Conservation Ranking ⁴					
			Upland									Wetland			GRANK	SRANK	COSEWIC	MNR	TRACK	Regional
			1 ²	2	3	4	5	6	7	8	9	10	11	12						
CUM ³	FOD3-1	FOM5-2	CUW1	CUW1	CUW1	CUT1-1	FOD5-3	FOD3-2	SWD6-1	SWC4-1	MAM2-5									
ACERACEAE	<i>Acer negundo</i>	Box Elder	X	X	X				X						G5	S5			N	
ACERACEAE	<i>Acer rubrum</i>	Red Maple			X	X	X				X	X	X		G5	S5			N	
ACERACEAE	<i>Acer x freemanii</i>	Swamp Maple (Hybrid Maple)									X				HYB	S?			N	
ACERACEAE	<i>Acer saccharum</i>	Sugar Maple		X		X				X	X				G5	S5			N	
ANACARDIACEAE	<i>Rhus radicans</i>	Poison Ivy	X	X		X	X		X		X				G5	S5			N	
ANACARDIACEAE	<i>Rhus typhina</i>	Staghorn Sumac				X	X	X	X						G5	S5			N	
APIACEAE	<i>Cicuta maculata</i>	Spotted Water-hemlock									X				G5	S5			N	
APIACEAE	<i>Daucus carota</i>	Wild Carrot	X			X		X	X		X				G?	SE5			N	
APIACEAE	<i>Taenidia integerrima</i>	Yellow Pimpernell						X							G5	S4			N	R6
APOCYNACEAE	<i>Apocynum androsaemifolium</i>	Spreading Dogbane	X	X		X	X		X						G5	S5			N	
ASCLEPIADACEAE	<i>Asclepias syriaca</i>	Kansas Milkweed	X												G5	S5			N	
ASTERACEAE	<i>Achillea millefolium</i>	Common Yarrow	X			X									G5	S5			N	
ASTERACEAE	<i>Ambrosia artemisiifolia</i>	Annual Ragweed	X												G5	S5			N	
ASTERACEAE	<i>Centaurea maculosa</i>	Spotted Starthistle		X		X	X								G?	SE5			N	
ASTERACEAE	<i>Centaurea nigra</i>	Black Starthistle	X				X		X						G?	SE?			N	
ASTERACEAE	<i>Chrysanthemum leucanthemum</i>	Oxeye Daisy	X												G?	SE5			N	
ASTERACEAE	<i>Conyza canadensis</i>	Fleabane	X		X										G5	S5			N	
ASTERACEAE	<i>Erigeron annuus</i>	White-top Fleabane	X	X				X							G5	S5			N	
ASTERACEAE	<i>Eupatorium maculatum</i>	Spotted Joe-pye Weed							X			X	X		G5	S5			N	
ASTERACEAE	<i>Eurybia macrophylla</i>	Large-leaf Wood-aster								X	X				G5	S5			N	
ASTERACEAE	<i>Euthamia graminifolia</i>	Flat-top Fragrant-golden-rod				X	X		X		X				G5	S5			N	
ASTERACEAE	<i>Hieracium aurantiacum</i>	Orange Hawkweed	X	X											G?	SE5			N	
ASTERACEAE	<i>Hieracium caespitosum</i>	Yellow Hawkweed	X												G?	SE5			N	
ASTERACEAE	<i>Matricaria matricarioides</i>	Pineapple-weed Chamomile						X							G5	SE5			N	
ASTERACEAE	<i>Rudbeckia hirta</i>	Black-eyed Susan	X			X	X	X							G5	S5			N	
ASTERACEAE	<i>Solidago altissima</i>	Tall Goldenrod	X				X	X							G5	S5			Y	R4
ASTERACEAE	<i>Solidago caesia</i>	Bluestem Goldenrod								X					G5	S5			N	
ASTERACEAE	<i>Solidago canadensis</i>	Canada Goldenrod	X	X		X	X	X	X		X		X		G5	S5			N	
ASTERACEAE	<i>Solidago nemoralis</i>	Gray-stemmed Goldenrod	X	X		X	X	X	X						G5	S5			N	
ASTERACEAE	<i>Solidago rugosa</i>	Rough-leaf Goldenrod			X						X				G5	S5			N	
ASTERACEAE	<i>Symphyotrichum cordifolium</i>	Heart-leaf Aster				X									G5	S5			N	
ASTERACEAE	<i>Symphyotrichum lanceolatum</i>	Panicked Aster				X									G5	S5			N	
ASTERACEAE	<i>Symphyotrichum lateriflorum</i>	Starved Aster								X					G5	S5			N	
ASTERACEAE	<i>Symphyotrichum novae-angliae</i>	New England Aster	X			X	X			X					G5	S5			N	
ASTERACEAE	<i>Symphyotrichum ontarionis</i>	Ontario Aster								X					G5	S4			N	
ASTERACEAE	<i>Symphyotrichum pilosum</i>	White Heath Aster				X									G5	S5			N	R5
ASTERACEAE	<i>Symphyotrichum puniceum</i>	Swamp Aster		X			X								G5	S5			N	
ASTERACEAE	<i>Symphyotrichum urophyllum</i>	Arrow-leaved Aster	X	X			X			X					G4	S4			N	
ASTERACEAE	<i>Tanacetum vulgare</i>	Common Tansy	X				X		X						G?	SE5			N	
ASTERACEAE	<i>Taraxacum officinale</i>	Brown-seed Dandelion	X	X		X	X	X	X	X					G5	SE5			N	
ASTERACEAE	<i>Tragopogon pratensis</i>	Meadow Goat's-beard	X												G?	SE5			N	
AQUIFOLIACEAE	<i>Ilex verticillata</i>	Black Holly									X				G5	S5			N	
BETULACEAE	<i>Alnus incana</i>	Speckled Alder									X	X			G5	S5			N	
BETULACEAE	<i>Betula alleghaniensis</i>	Yellow Birch								X					G5	S5			N	

		Plant Community												Conservation Ranking ⁴				
		Upland						Wetland										
		1 ²	2	3	4	5	6	7	8	9	10	11	12					
BETULACEAE	<i>Betula papyrifera</i>		X	X	X		X			X	X			G5	S5			N
BETULACEAE	<i>Ostrya virginiana</i>								X					G5	S5			N
BORAGINACEAE	<i>Echium vulgare</i>	X	X					X						G?	SE5			N
BRASSICACEAE	<i>Arabis lyrata</i>	X												G5	S4			N
BRASSICACEAE	<i>Barbarea vulgaris</i>	X												G?	SE5			N
BRASSICACEAE	<i>Thlaspi arvense</i>					X								G?	SE5			N
CAPRIFOLIACEAE	<i>Diervilla lonicera</i>				X									G5	S5			N
CAPRIFOLIACEAE	<i>Lonicera tatarica</i>		X				X							G?	SE5			N
CARYOPHYLLACEAE	<i>Dianthus armeria</i>		X		X									G?	SE5			N
CARYOPHYLLACEAE	<i>Silene vulgaris</i>	X		X	X		X			X				G?	SE5			N
CLUSIACEAE	<i>Hypericum perforatum</i>	X			X									G?	SE5			N
CLUSIACEAE	<i>Triadenum fraseri</i>										X			G4G5	S5			N
CONVOLVULACEAE	<i>Convolvulus arvensis</i>	X												G?	SE5			N
CORNACEAE	<i>Cornus stolonifera</i>						X						X	G5	S5			N
CUPRESSACEAE	<i>Juniperus communis</i>	X												G5	S5			N
CYPERACEAE	<i>Carex bebbii</i>	X												G5	S5			N
CYPERACEAE	<i>Carex crawei</i>	X												G5	S4			N
CYPERACEAE	<i>Carex flava</i>	X												G5	S5			N
CYPERACEAE	<i>Carex stricta</i>							X					X	G5	S5			N
CYPERACEAE	<i>Eriophorum virginicum</i>										X			G5	S5			N
DENNSTAEDTIACEAE	<i>Pteridium aquilinum</i>	X	X	X	X	X								G5	S5			N
DRYOPTERIDACEAE	<i>Dryopteris marginalis</i>										X			G5	S5			N
DRYOPTERIDACEAE	<i>Matteuccia struthiopteris</i>										X			G5	S5			N
DRYOPTERIDACEAE	<i>Onoclea sensibilis</i>			X							X			G5	S5			N
EQUISETACEAE	<i>Equisetum palustre</i>	X												G5	S5			N
EQUISETACEAE	<i>Equisetum hyemale</i>							X						G5	S5			N
ERICACEAE	<i>Vaccinium myrtilloides</i>		X											G5	S5			N
FABACEAE	<i>Coronilla varia</i>	X						X						G?	SE5			N
FABACEAE	<i>Lotus corniculatus</i>	X												G?	SE5			N
FABACEAE	<i>Melilotus alba</i>	X												G5	SE5			N
FABACEAE	<i>Trifolium pratense</i>	X												G?	SE5			N
FABACEAE	<i>Vicia cracca</i>	X												G?	SE5			N
FAGACEAE	<i>Quercus macrocarpa</i>									X				G5	S5			N
FAGACEAE	<i>Quercus rubra</i>		X	X					X	X				G5	S5			N
IRIDACEAE	<i>Sisyrinchium montanum</i>	X												G5	S5			N
JUNCACEAE	<i>Juncus articulatus</i>	X												G5	S5			N
JUNCACEAE	<i>Juncus effusus</i>			X										G5	S5			N
LAMIACEAE	<i>Monarda fistulosa</i>	X			X	X								G5	S5			N
LILIACEAE	<i>Asparagus officinalis</i>	X												G5?	SE5			N
LILIACEAE	<i>Erythronium americanum</i>								X					G5	S5			N
LILIACEAE	<i>Hemerocallis fulva</i>							X						G?	SE5			N
LILIACEAE	<i>Maianthemum canadense</i>			X					X					G5	S5			N
LILIACEAE	<i>Maianthemum stellatum</i>								X					G5	S5			N
LILIACEAE	<i>Trillium grandiflorum</i>								X					G5	S5			N
MONOTROPACEAE	<i>Monotropa uniflora</i>			X		X								G5	S5			N
OLEACEAE	<i>Fraxinus americana</i>		X						X					G5	S5			N
OLEACEAE	<i>Fraxinus pennsylvanica</i>				X			X			X			G5	S5			N
ONAGRACEAE	<i>Oenothera biennis</i>					X								G5	S5			N

		Plant Community											Conservation Ranking ⁴				
		Upland						Wetland									
		1 ²	2	3	4	5	6	7	8	9	10	11	12				
OROBANCHACEAE	<i>Conopholis americana</i>			X										G5	S4?		N
OROBANCHACEAE	<i>Epifagus virginiana</i>								X					G5	S5		N
OSMUNDACEAE	<i>Osmunda cinnamomea</i>										X			G5	S5		N
OSMUNDACEAE	<i>Osmunda regalis</i>									X	X			G5	S5		N
PINACEAE	<i>Larix laricina</i>											X		G5	S5		N
PINACEAE	<i>Picea glauca</i>					X	X			X	X			G5	S5		N
PINACEAE	<i>Picea mariana</i>											X		G5	S5		N
PINACEAE	<i>Pinus strobus</i>		X	X	X	X	X				X	X		G5	S5		N
PINACEAE	<i>Pinus sylvestris</i>		X		X	X								G?	SE5		N
PLANTAGINACEAE	<i>Plantago lanceolata</i>	X												G5	SE5		N
PLANTAGINACEAE	<i>Plantago major</i>	X												G5	SE5		N
POACEAE	<i>Bromus inermis</i>	X												G5	S5		N
POACEAE	<i>Dactylis glomerata</i>	X					X							G?	SE5		N
POACEAE	<i>Danthonia spicata</i>		X		X	X			X					G5	S5		N
POACEAE	<i>Elymus repens</i>	X												G5	SE5		N
POACEAE	<i>Eragrostis cilianensis</i>		X											G?	SE5		N
POACEAE	<i>Lolium perenne</i>	X					X							G?	SE4		N
POACEAE	<i>Oryzopsis asperifolia</i>								X					G5	S5		N
POACEAE	<i>Phleum pratense</i>	X			X	X	X	X						G?	SE5		N
POACEAE	<i>Poa pratensis</i>	X	X		X				X					G5	S5		N
POACEAE	<i>Schizachne purpurascens</i>		X		X									G5	S5		N
POLYGONACEAE	<i>Polygonum persicaria</i>	X												G3G5	SE5		N
POLYGONACEAE	<i>Rumex acetosella</i>		X				X							G?	SE5		N
PRIMULACEAE	<i>Trientalis borealis</i>			X										G5	S5		N
RHAMNACEAE	<i>Rhamnus alnifolia</i>		X							X	X			G5	S5		N
RHAMNACEAE	<i>Rhamnus frangula</i>		X	X			X			X	X	X		G?	SE5		N
ROSACEAE	<i>Amelanchier laevis</i>			X										G4G5Q	S5		N
ROSACEAE	<i>Fragaria virginiana</i>	X								X				G5	S5		N
ROSACEAE	<i>Potentilla simplex</i>	X												G5	S5		N
ROSACEAE	<i>Prunus pensylvanica</i>				X									G5	S5		N
ROSACEAE	<i>Prunus serotina</i>			X					X					G5	S5		N
ROSACEAE	<i>Prunus virginiana</i>		X		X									G5	S5		N
ROSACEAE	<i>Rosa multiflora</i>				X									G?	SE4		N
ROSACEAE	<i>Rubus allegheniensis</i>	X	X			X		X		X				G5	S5		N
ROSACEAE	<i>Rubus idaeus</i>				X	X		X						G5	S5		N
ROSACEAE	<i>Rubus occidentalis</i>						X	X						G5	S5		N
ROSACEAE	<i>Spiraea alba</i>	X	X		X		X							G5	S5		N
RUBIACEAE	<i>Cephalanthus occidentalis</i>										X			G5	S5		N
SALICACEAE	<i>Populus grandidentata</i>		X	X						X				G5	S5		N
SALICACEAE	<i>Populus tremuloides</i>		X	X	X	X	X			X	X			G5	S5		N
SALICACEAE	<i>Salix alba</i>							X						G5	SE4		N
SALICACEAE	<i>Salix eriocephala</i>					X								G5	S5		N
SCROPHULARIACEAE	<i>Verbascum thapsus</i>	X												G?	SE5		N
SMILACACEAE	<i>Smilax herbacea</i>								X					G5	S4		N
SOLANACEAE	<i>Physalis heterophylla</i>				X									G5	S4		N
TYPHACEAE	<i>Typha latifolia</i>										X	X		G5	S5		N
TILIACEAE	<i>Tilia americana</i>								X					G5	S5		N
ULMACEAE	<i>Ulmus americana</i>							X	X		X			G5?	S5		N

		Plant Community																	
		Upland						Wetland						Conservation Ranking ⁴					
		1 ²	2	3	4	5	6	7	8	9	10	11	12					N	
VITACEAE	<i>Parthenocissus quinquefolia</i>	Virginia Creeper						X		X				G5	S4?			N	
VITACEAE	<i>Vitis riparia</i>	Riverbank Grape					X				X			G5	S5			N	

¹ Nomenclature based on Ontario Ministry of Natural Resources (OMNR), Natural Heritage Information Centre (NHIC) database - <http://nhic.mnr.gov.on.ca/MNR/nhic/species.cfm>

² Polygon Number - see Figure 2

³ ELC Code - see Table 1 for community description

⁴ GRANK, SRANK, COSEWIC, MNR and TRACK from OMNR, NHIC database; Regional - from Riley 1989. Distribution and status of the vascular plants of central region. OMNR, Central Region, Richmond Hill.

Observers: Martha Scott; Tracey Etwell; Lisa Moran; Jim Broadfoot

Observation Dates: 2001 - December 4; 2006 - April 28; June 20; July 6; August 8; and September 25

Table 4. Bird List, 1145 Fuller Avenue, Town of Penetanquishene, 2006.

FAMILY	Scientific Name	Common Name	Date				Conservation Rank ²				
			28-Apr-06	2-Jun-06	20-Jun-06	23-Jun-06	GRANK	SRANK	COSEWIC	MNR	TRACK
ACCIPITRIDAE	<i>Accipiter cooperii</i>	Cooper's Hawk	X ¹				G5	S4B,SZN	NAR	NAR	N
ANATIDAE	<i>Aix sponsa</i>	Wood Duck	X				G5	S5B,SZN			N
BOMBYCILLIDAE	<i>Bombycilla cedrorum</i>	Cedar Waxwing			H		G5	S5B,SZN			N
CARDINALIDAE	<i>Passerina cyanea</i>	Indigo Bunting		S		S	G5	S5B,SZN			N
COLUMBIDAE	<i>Zenaida macroura</i>	Mourning Dove	Obs	S	S	S	G5	S5B,SZN			N
CORVIDAE	<i>Corvus brachyrhynchos</i>	American Crow	Obs	H	H		G5	S5B,SZN			N
CORVIDAE	<i>Cyanocitta cristata</i>	Blue Jay	Obs	H	H		G5	S5			N
EMBERIZIDAE	<i>Melospiza melodia</i>	Song Sparrow	Obs	S			G5	S5B,SZN			N
EMBERIZIDAE	<i>Spizella passerina</i>	Chipping Sparrow	Obs	P		S	G5	S5B,SZN			N
FRINGILLIDAE	<i>Carduelis tristis</i>	American Goldfinch	Obs	H	H	H	G5	S5B,SZN			N
HIRUNDINIDAE	<i>Tachycineta bicolor</i>	Tree Swallow	Obs				G5	S5B,SZN			N
ICTERIDAE	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	X	S	H	H	G5	S5B,SZN			N
ICTERIDAE	<i>Icterus galbula</i>	Baltimore Oriole		S			G5	S5B,SZN			N
ICTERIDAE	<i>Molothrus ater</i>	Brown-headed Cowbird		H	S		G5	S5B,SZN			N
ICTERIDAE	<i>Quiscalus quiscula</i>	Common Grackle		H	H		G5	S5B,SZN			N
PARIDAE	<i>Poecile atricapillus</i>	Black-capped Chickadee	Obs	H			G5	S5			N
PARULIDAE	<i>Geothlypis trichas</i>	Common Yellowthroat		S			G5	S5B,SZN			N
PARULIDAE	<i>Mniotilta varia</i>	Black-and-white Warbler		S			G5	S5B,SZN			N
PARULIDAE	<i>Seiurus noveboracensis</i>	Northern Waterthrush		S	S		G5	S5B,SZN			N
PARULIDAE	<i>Setophaga ruticilla</i>	American Redstart		S	S		G5	S5B,SZN			N
PARULIDAE	<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler		S			G5	S5B,SZN			N
PARULIDAE	<i>Dendroica petechia</i>	Yellow Warbler		S	S		G5	S5B,SZN			N
PARULIDAE	<i>Dendroica pinus</i>	Pine Warbler	Obs				G5	S5B,SZN			N
PHASIANIDAE	<i>Bonasa umbellus</i>	Ruffed Grouse	NE				G5	S5			N
PHASIANIDAE	<i>Meleagris gallopavo</i>	Wild Turkey	H				G5	S4			N
PICIDAE	<i>Colaptes auratus</i>	Northern Flicker	Obs	H			G5	S5B,SZN			N
PICIDAE	<i>Dryocopus pileatus</i>	Pileated Woodpecker	Obs				G5	S4S5			N
REGULIDAE	<i>Regulus calendula</i>	Ruby-crowned Kinglet	Obs				G5	S5B,SZN			N
SCOLOPACIDAE	<i>Scolopax minor</i>	American Woodcock			H		G5	S5B,SZN			N
STURNIDAE	<i>Sturnus vulgaris</i>	European Starling		AE			G5	SE			N
TROGLODYTIDAE	<i>Troglodytes aedon</i>	House Wren		S			G5	S5B,SZN			N
TURDIDAE	<i>Catharus fuscescens</i>	Veery		S	S	S	G5	S4B,SZN			N
TURDIDAE	<i>Turdus migratorius</i>	American Robin	Obs	S	S		G5	S5B,SZN			N
TYRANNIDAE	<i>Myiarchus crinitus</i>	Great Crested Flycatcher		S	S		G5	S5B,SZN			N
TYRANNIDAE	<i>Tyrannus tyrannus</i>	Eastern Kingbird		H	H		G5	S5B,SZN			N

FAMILY	Scientific Name	Common Name	Date				Conservation Rank ²				
			28-Apr-06	2-Jun-06	20-Jun-06	23-Jun-06	GRANK	SRANK	COSEWIC	MNR	TRACK
VIREONIDAE	<i>Vireo olivaceus</i>	Red-eyed Vireo		S			G5	S5B,SZN			N

¹ Breeding Evidence Code: Obs - species observed outside of its breeding season; X - observed during breeding season; H - observed during breeding season in suitable breeding habitat; S - singing male; P - pair observed in suitable nesting habitat during nesting season; AE - adult entering or leaving nest site; NE - nest with eggs

² Conservation Rank (GRANK, SRANK, COSEWIC, MNR and TRACK) from Ontario Ministry of Natural Resources, Natural Heritage Information Centre database

Observer: Jim Broadfoot

Weather Conditions/Observation Times:

April 8, 2006: Temperature +12°C; Wind West, Beaufort Wind Scale 1; Cloud Cover Nil; Precipitation Nil / 0900hr to 1230hr.

June 2, 2006: Temperature +15°C; Wind Nil; Cloud Cover <10%; Precipitation Nil / 0615hr to 0740hr.

June 20, 2006: Temperature +24°C; Wind West, Beaufort Wind Scale 2; Cloud Cover 70%; Precipitation Nil / 0930 to 1140.

June 23, 2006: Temperature +25°C; Wind North, Beaufort Wind Scale 3; Cloud Cover 20%; Precipitation Nil / 1300hr to 1530hr.

Table 5. Water Quality Results, 1145 Fuller Avenue, Town of Penetanguishene, 2006

Parameter	Unit	M.D.L	G / S	Sampling Location		
				St. Andrews Lake	Wetland Lagg	BH3-05
					634843	634844
pH	N/A	N/A	6.5-8.5	7.11	5.31	8.2
Alkalinity (as CaCO3)	mg/L	10		40	<10	136
Carbonate (as CaCO3)	mg/L	10		<5	<10	<10
Electrical Conductivity	uS/cm	2		148	29	280
Nitrate as N	mg/L	0.05		0.1	<0.05	0.08
Nitrite as N	mg/L	0.05		<0.05	<0.05	<0.05
Ammonia as N	mg/L	0.05		0.94	<0.05	<0.05
Fluoride	mg/L	0.05		<0.05	<0.05	0.06
Chloride	mg/L	0.10		13.2	1.26	0.8
Bromide	mg/L	0.05		<0.05	<0.05	<0.05
Sulphate	mg/L	0.10		5.3	2.05	6.23
Calcium	mg/L	0.05		14.5	2.93	44.1
Magnesium	mg/L	0.05		2.35	1.08	7.13
Sodium	mg/L	0.05		5.48	0.92	3.01
Potassium	mg/L	0.05		1.49	0.57	2.21
Phosphate as P	mg/L	0.10		n/a	<0.10	<0.10
Total Phosphorus	mg/L	0.05	0.01	<0.05	0.08	<0.05
Aluminum	mg/L	0.004	0.075	0.026	0.423	0.012
Arsenic	mg/L	0.003	0.005	<0.003	<0.003	<0.003
Barium	mg/L	0.002		0.016	0.009	0.021
Boron	mg/L	0.010	0.20	0.015	0.133	0.054
Cadmium	mg/L	0.002	0.0002	<0.002	<0.002	<0.002
Chromium	mg/L	0.003	0.0089	<0.003	<0.003	<0.003
Copper	mg/L	0.003	0.005	<0.002	0.004	0.004
Iron	mg/L	0.005	0.3	0.059	0.299	0.094
Lead	mg/L	0.002	0.001	<0.002	0.003	<0.002
Manganese	mg/L	0.002		0.003	0.116	0.006
Mercury	mg/L	0.0001	0.0002	<0.002	<0.0001	<0.0001
Molybdenum	mg/L	0.002	0.04	<0.002	<0.002	<0.002
Nickel	mg/L	0.003	0.025	<0.003	<0.003	<0.003
Selenium	mg/L	0.004	0.1	<0.004	<0.004	<0.004
Silver	mg/L	0.002	0.0001	<0.002	<0.002	<0.002
Strontium	mg/L	0.005		0.033	0.01	0.055
Thallium	mg/L	0.006	0.0003	<0.006	<0.006	<0.006
Tin	mg/L	0.002		<0.002	<0.002	<0.002
Titanium	mg/L	0.002		<0.002	0.007	<0.002
Uranium	mg/L	0.002	0.005	<0.002	<0.002	<0.002
Vanadium	mg/L	0.002	0.006	<0.001	0.002	0.002
Zinc	mg/L	0.004	0.03	0.007	0.124	0.053
Total Dissolved Solids	mg/L	20		n/a	74	148
Total Hardness (as CaCO3)	mg/L	10		46	12	139
Total Organic Carbon	mg/L	0.5		8	9.8	1.4
Colour	Colour Unit	5		<5	225	<5
Turbidity	NTU	0.5		<0.5	1.3	1.3



Appendix 1

EIS Scope Letter to Beacon Environmental, February 7, 2006



Environmental Assessments & Approvals

February 7, 2006

AEC 05-226

Beacon Environmental
8 Main Street North
Markham, ON
L3P 1X2

Attention: Donald M. Fraser, Principal

Re: Proposed Scope of Work – EIS, Plan 51R-23610 Town of Penetanguishene (1145 Fuller Avenue), County of Simcoe (1145 Fuller Avenue)

Dear Mr. Fraser:

The following outlines the scope of work we propose for an EIS that we have been retained to conduct on lands located between the Fuller Road and the western boundary of the St. Andrew's Lake wetland. This property is the location of a previous EIS study that we completed in February 2002 (Project AEC 01-135). The property has changed hands since our original involvement. The development concept being brought forward now is to build 175 condominium units and associated infrastructure (recreation facilities, parking, internal roadways, storm water management facilities, links to municipal sanitary sewer and water, etc.). In contrast to the development concept associated with our original EIS, no intrusion into the PSW or Penetang Lake ANSI is proposed.

The information you provided by way of peer review or our earlier EIS (Gartner Lee Ltd. March 20, 2002) was used to define the scope of work for our new study. We also factored in the new information provided by the recent re-evaluation of the St. Andrew's Lake Wetland into our proposed scope of work.

Hydrologic Study

The re-evaluation of the St. Andrew's Lake Wetland conducted by the Severn Sound Environmental Association (Bob Bowles, Michelle Hudolin, revised December 2003) resulted in provincial significant status (Wetland Total 653). The bog communities identified during the previous wetland evaluation have been reassessed as fen communities. Since the wetland contains fen habitat we have proposed a detailed investigation of the dynamics of surface and ground water contributions to the wetland (copy of Background and Proposed Work Program Attached) in recognition of the sensitivities of these wetland types to alterations of existing conditions. The scope of



work related to hydrologic studies was designed to render a detailed water budget for the wetland. Field work on this aspect of the study began in autumn 2005.

Natural Heritage Study

Field work conducted as part of the St. Andrew's Wetland re-evaluation spanned the growing season (i.e. 21 May, 31 May, 3 June, 23 July, 4 September, 8 October, 2002) and hence the plant list compiled by Bowles and Hudolin (copy Attached) included three seasons. The list of wildlife compiled for the wetland (see Attached) was derived from field observations spread out over a sufficient span of time and in seasons appropriate to detecting breeding birds, amphibians, reptiles, etc. This field work discovered no threatened or endangered flora or fauna but did reveal three provincially significant animal species (Red-shouldered Hawk, Caspian Tern, Amber-winged Spreadwing {Damsselfly}), two provincially significant plant species (White-fingered Orchid, Yellow-eyed Grass) and two regionally significant plants (Dragon's Mouth {Orchid}, Pod – grass). Since these observations were made during numerous site visits, at appropriate times, by skilled observers, and discovered a range of provincially and regionally rare species, we don't feel it necessary to conduct extensive inventories in the wetland itself in order to define sensitive natural heritage features of the wetland which must be considered in our impact assessment, as this has already been recently done. Instead, we propose focusing our efforts on lands outside of the wetland where development is proposed and inside the wetland to a distance of 50m from the wetland boundary.

Plant Surveys

Vegetation communities of the upland habitat of the project will be mapped and described following the criteria of Lee *et al.* (1998. Ecological land classification for southern Ontario: first approximation and its applications. SCSS FG-02). The vegetation communities of the wetland shown on November 2004 mapping done by the Severn Sound Environmental Association will be assumed to accurately reflect existing conditions.

The flowering dates of plant species of conservation concern observed by Bowles and Hudolin in the wetland include the time spans – May/June, June/July and July/August. Therefore, we propose plant surveys of the property on three occasions: late May, late June and late July. Plant inventories would include all upland habitat of the property and a 50m wide strip of wetland habitat adjacent to the wetland boundary.

Wildlife Surveys

We propose to conduct dawn bird surveys in late May and late June to define the range of breeding birds utilizing the property and habitat adjacent to the wetland/upland boundary.

Though waterfowl staging and breeding is known to occur in the wetland it is not considered to be even regionally significant waterfowl habitat (December 2003 wetland evaluation data scoring record). Waterfowl staging would occur in the open water section of the wetland that is separated from the proposed development by 100m width of



treed swamp habitat (November 4, 2002 mapping). Therefore we see no need to conduct specific waterfowl surveys.

Habitat outside of the wetland will be assessed for its potential function for those animal species of conservation concern known to occur in the wetland (i.e. Red-shouldered Hawk, Caspian Tern, rare Damselfly) based on their habitat requirements. Areas outside of the wetland that could provide critical functions for wetland dependent species (i.e. semi-permanent amphibian breeding ponds, foraging habitat, turtle egg laying sites, waterfowl nesting habitat, etc.) will be identified. The EIS will consider the need to incorporate protective buffers/setbacks in order to protect important wetland habitat features and/or functions discovered during field studies.

Summary of Proposed Scope of Work Re: Natural Heritage

- Plants – Late Spring (i.e. late May) and summer (late June/late July) plants surveys of all upland areas of property and within 50m strip of wetland habitat adjacent to wetland boundary. Vegetation communities of the upland habitat of the property defined according to criteria of ELC. Vegetation communities of wetland defined based on November 2004 mapping of the wetland by Severn Sound Environmental Association;
- Bird Survey – Two dawn surveys (Late May, Late June); and
- Assessment of any critical habitat functions provided by upland habitat on the property to the adjacent wetland.

Summary of Proposed Scope of Work Re: Hydrology (from Azimuth Proposal Attached)

- Vertical gradients from shoreline mini-piezometers and observation wells (n = 5 boreholes on property);
- Continuous water level elevations over several months (specifically spring and summer); and
- Water sample collection for chemical analysis.

We look forward to your recommendations regarding the scope of work Town would like to see implemented to protect this important wetland feature.

Thank you,

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Electronic Signature

Jim Broadfoot, H. B.Sc.
Senior Biologist



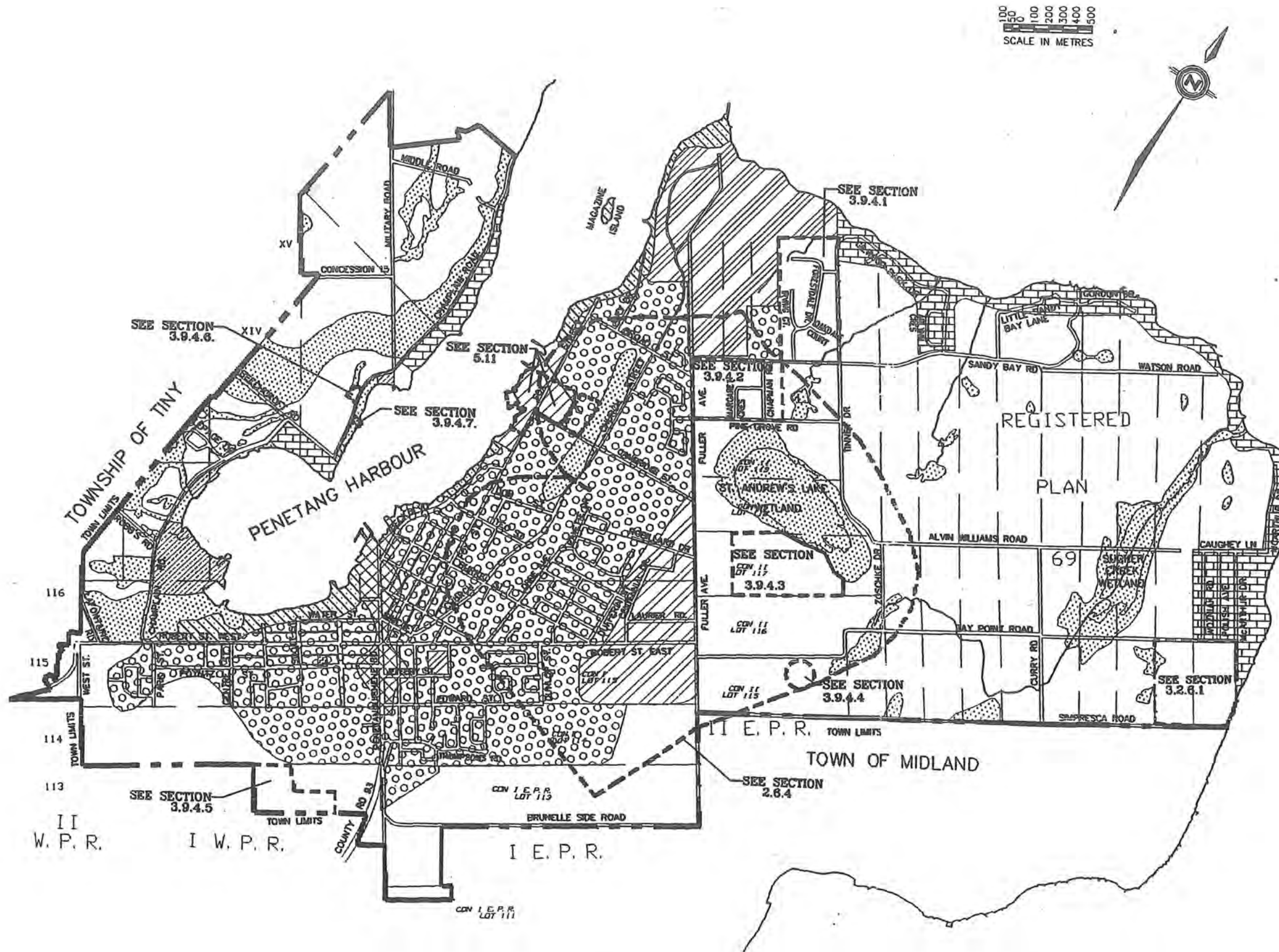
Appendix 2

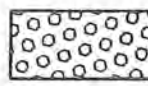
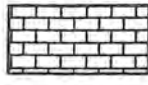
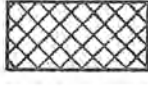


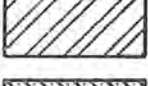






Schedules A1 (October 1999)

Town of Penetanguishene Official Plan Consolidation

The Official Plan of the Town of Penetanguishene

Schedule A1 LAND USE PLAN



-  Neighbourhood Residential
-  Shoreline Residential
-  Central Commercial
-  Marine Commercial One
-  Marine Commercial Two
-  Industrial
-  Open Space
-  Restricted Rural
-  Environmental Protection One
-  Major Institutional
-  Minor Institutional
-  Exceptions Refer to Section in Text

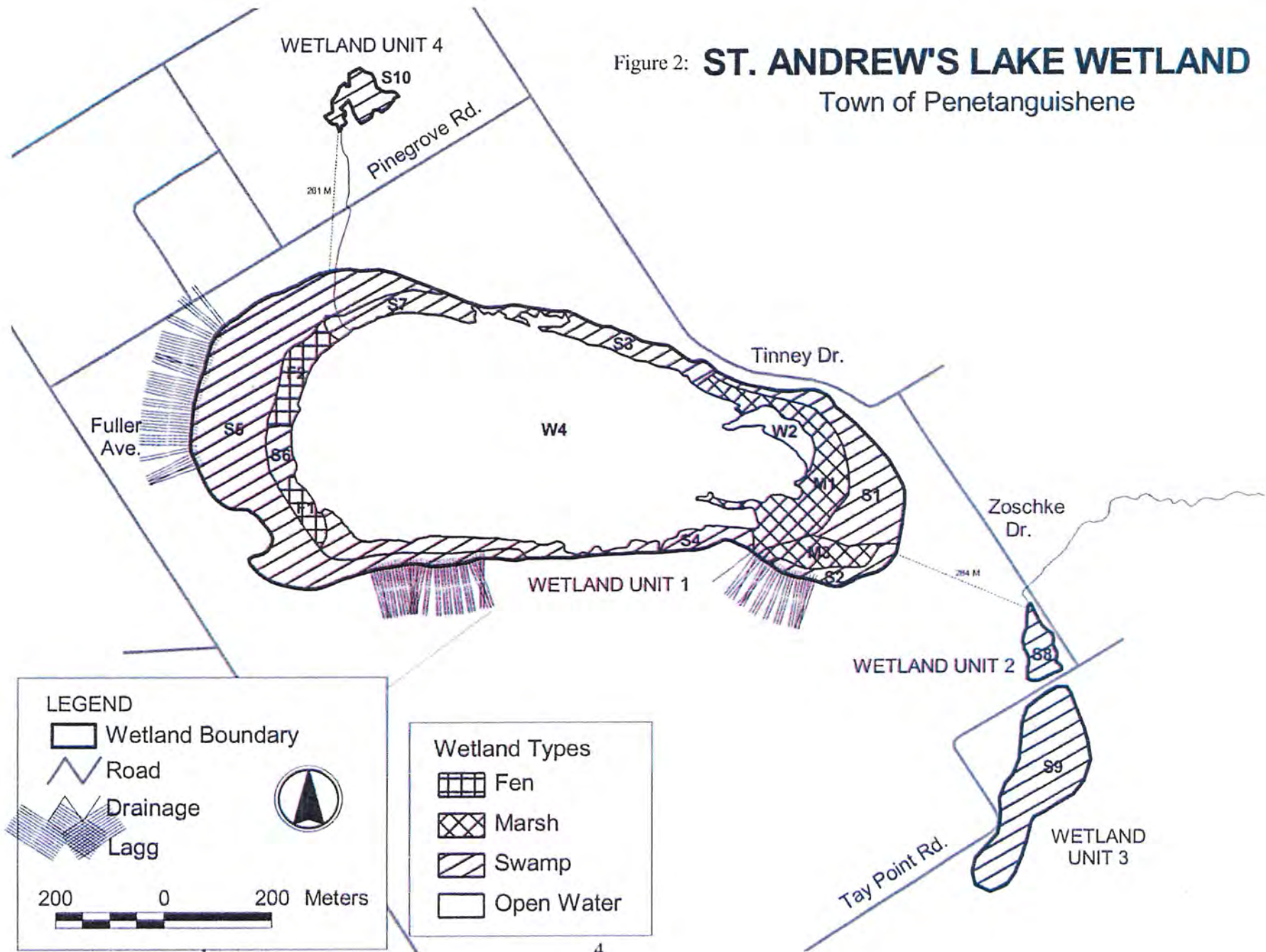
McNAIR & MARSHALL
 Planning and Development Consultants
 Barrie, Ontario October, 1999



Appendix 3

St. Andrew's Lake Wetland Map
Figure 2 from Severn Sound Environmental Association,
St. Andrew's Lake Wetland evaluation, January 2004.

Figure 2: **ST. ANDREW'S LAKE WETLAND**
Town of Penetanguishene





Appendix 4

2006 St. Andrew's Lake Wetland boundary acceptance by OMNR.

Jim Broadfoot

Forwarded by: sysop
Forwarded to: jim
Date forwarded: Wed, 01 Nov 2006 16:19:27 -0500
Subject: RE: St. Andrew's Wetland - Boundary Survey
Date sent: Wed, 1 Nov 2006 16:09:57 -0500
From: "Allan, Brad \\\(MNR\\)" <brad.allan@mnr.gov.on.ca>
To: <jim@azimuthenvironmental.com>
Copies to: "Darren Vella" <planningsolutions@rogers.com>, <dwright@maacon.com>,
"Robinson, Suzanne \\\(MNR\\)" <suzanne.robinson@mnr.gov.on.ca>,
"Jurjans, Paul \\\(MNR\\)" <paul.jurjans@mnr.gov.on.ca>,
"Gormaly, Phil \\\(MNR\\)" <phil.gormaly@mnr.gov.on.ca>

Hi Jim,

Both Suzanne Robinson and I had a chance to review the adjusted wetland boundary that you sent me via email on October 27th, 2006 for the section of the St. Andrew's wetland concerning 1145 Fuller Avenue, Town of Penetanguishene, County of Simcoe. We both concur it is an accurate delineation as determined by our field inspection on June 23rd, 2006.

Please send an electronic version to either Paul or Phil so they can incorporate the adjustment into our NRVIS database.

Sincerely,

Brad Allan

Brad Allan
Management Biologist
Huron Area, Midhurst District
(705)-725-7519 (tel)
(705)-725-7584 (fax)
brad.allan@mnr.gov.on.ca

-----Original Message-----

From: Jim Broadfoot [<mailto:jim@azimuthenvironmental.com>]
Sent: Friday, October 27, 2006 11:18 AM
To: Allan, Brad (MNR); Allan, Brad (MNR)
Cc: Darren Vella; dwright@maacon.com
Subject: St. Andrew's Wetland - Boundary Survey

The following section of this message contains a file attachment prepared for transmission using the Internet MIME message format. If you are using Pegasus Mail, or any other MIME-compliant system, you should be able to save it or view it from within your mailer. If you cannot, please ask your system administrator for assistance.

----- File information -----

File: 05-226 St Andrew's Wetland_MNR Boundary Review Letter.pdf
Date: 27 Oct 2006, 11:09
Size: 1319769 bytes.
Type: Unknown



Appendix 5

Simcoe County Greenlands

Source – Discover Simcoe



Appendix 5. Simcoe County Greenlands (Source – Discover Simcoe <http://www.maps.discoversimcoe.com/onpoint/>)



Appendix 6

Penetang Lake ANSI

Mapping, Natural Areas Report and OMNR e-mail correspondence

Penetang Lake Life Science ANSI (Regional)



Legend

----- contour

Township

▭ Township

▭ ANSI_life_current

▭ Evaluated_wetlands_current_version

— Highway

— County Road

— Local Road

1:4,000



Number of natural areas selected: 1

PENETANG LAKE**AREA_ID: 1512**

Significance	Area Type	Size	Centroid UTM	Map #
Regional	Life Science ANSI	70.0 ha	17,586000,4960000	31D/13

Description

Small spring-fed lake with marshy areas of bur-reed-pickerelweed, bog fringe of leatherleaf-cattail-marsh fern-virginia chain fern-tamarack, red maple swamp and balsam poplar-sugar maple-red maple-ash-black cherry-red oak upland fringe. 70 ha site. Several garbage trails lead to the lake's edge. [Hanna 1984]

Vegetation**Representation****Landform****References**

- Hanna, R. 1984. Life Science Areas of Natural and Scientific Interest in Site District 6-6: A Review and Assessment of Significant Natural Areas in Site District 6-6. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, Ontario. SR OFER 8409. viii + 79 pp. + maps.

© Queen's Printer for Ontario, 1998

Jim Broadfoot

Forwarded by: sysop
Forwarded to: jim
Date forwarded: Wed, 12 Jul 2006 13:32:55 -0400
Subject: RE: St. Andrew's Lake Wetland - Boundary Delineation
Date sent: Wed, 12 Jul 2006 12:31:48 -0400
From: "Robinson, Suzanne \ (MNR)" <suzanne.robinson@mnr.gov.on.ca>
To: <jim@azimuthenvironmental.com>
Copies to: "Allan, Brad \ (MNR)" <brad.allan@mnr.gov.on.ca>

Hi Jim

I've discussed the boundary of the Penetang Lake ANSI with staff in Peterborough. As I expected the boundaries for these features were originally very generally and usually require refinements. The process for further refining/delineating the edge of the ANSI is as follows.

For a regional ANSI it is not necessary to go through the entire inventory and confirmation process. For this specific site the ANSI boundary should include the entire wetland and the immediately adjacent uplands that buffer the wetland and are functionally connected. The short ANSI report describes the upland features for which is was identified so any of these community types should be included. You mentioned that you would have ELC data for the lands adjacent to the wetland. This would helpful in further delineating the boundary. I don't think it will be too difficult to fix this one up and it can probably be done from your ELC data, orthophoto interpretation and maybe a quick site visit.

However, I'm not familiar with the policies the Town has in place to deal with regional LS ANSIs. If there are no policies that speak these features in the OP, this process may not be necessary, other than to include in your report. We would be supportive of the boundary refinements and consideration of the feature on the site, if possible.

We can discuss this further at any time, feel free to send me an email or give me a call.

Suzanne

-----Original Message-----

From: Jim Broadfoot [mailto:jim@azimuthenvironmental.com]
Sent: Thursday, June 22, 2006 12:13 PM
To: Robinson, Suzanne (MNR)
Cc: Allan, Brad (MNR)
Subject: RE: St. Andrew's Lake Wetland - Boundary Delineation

Thanks Suzanne:

I'll bring a copy of the figure with me tomorrow so we can have a look at it as a group in the field.

Is there a report to go along with the figure?

Jim Broadfoot

On 22 Jun 2006 at 11:22, Robinson, Suzanne (MNR) wrote:

> Hi Jim
>
> I wanted to send this to you before we meet on the site. The
attached
> map shows the boundary of the Penetang Lake ANSI on the
subject
> property. We can discuss this tomorrow or at another time if you
> wish.
>
> Thanks
> Suzanne
>
>
>
> -----Original Message-----
> From: Jim Broadfoot [mailto:jim@azimuthenvironmental.com]
> Sent: Wednesday, June 21, 2006 7:05 AM
> To: dfraser@beaconenviro.com; Allan, Brad (MNR); Robinson,
Suzanne
> (MNR); mhudolin@town.midland.on.ca Cc:
ksherman@town.midland.on.ca;
> dwright@maacon.com; Darren Vella Subject: St. Andrew's Lake
Wetland -
> Boundary Delineation
>
> Hello All:
>
> Just a reminder that we are meeting in the field this Friday (June
> 23rd, 2006) to delineate the wetland boundary on Mr. Wright's
> property. The wetland boundary has been flagged in advance of
our
> site visit.
>
> Lets meet at the side of Fuller Avenue near the intersection with
Pine
> Grove Road at 1:00 p.m. (See Attached Map).
>
>
>
> Jim Broadfoot, Senior Biologist
> Azimuth Environmental Consulting Inc.
> 229 Mapleview Drive, Unit 1
> Barrie, Ontario
> L4N 0W5
>
> (705) 721-8451 Phone
> (705) 721-8926 Fax
> jim@azimuthenvironmental.com
>
>

Jim Broadfoot, Senior Biologist
Azimuth Environmental Consulting Inc.
229 Mapleview Drive, Unit 1
Barrie, Ontario
L4N 0W5

(705) 721-8451 Phone
(705) 721-8926 Fax

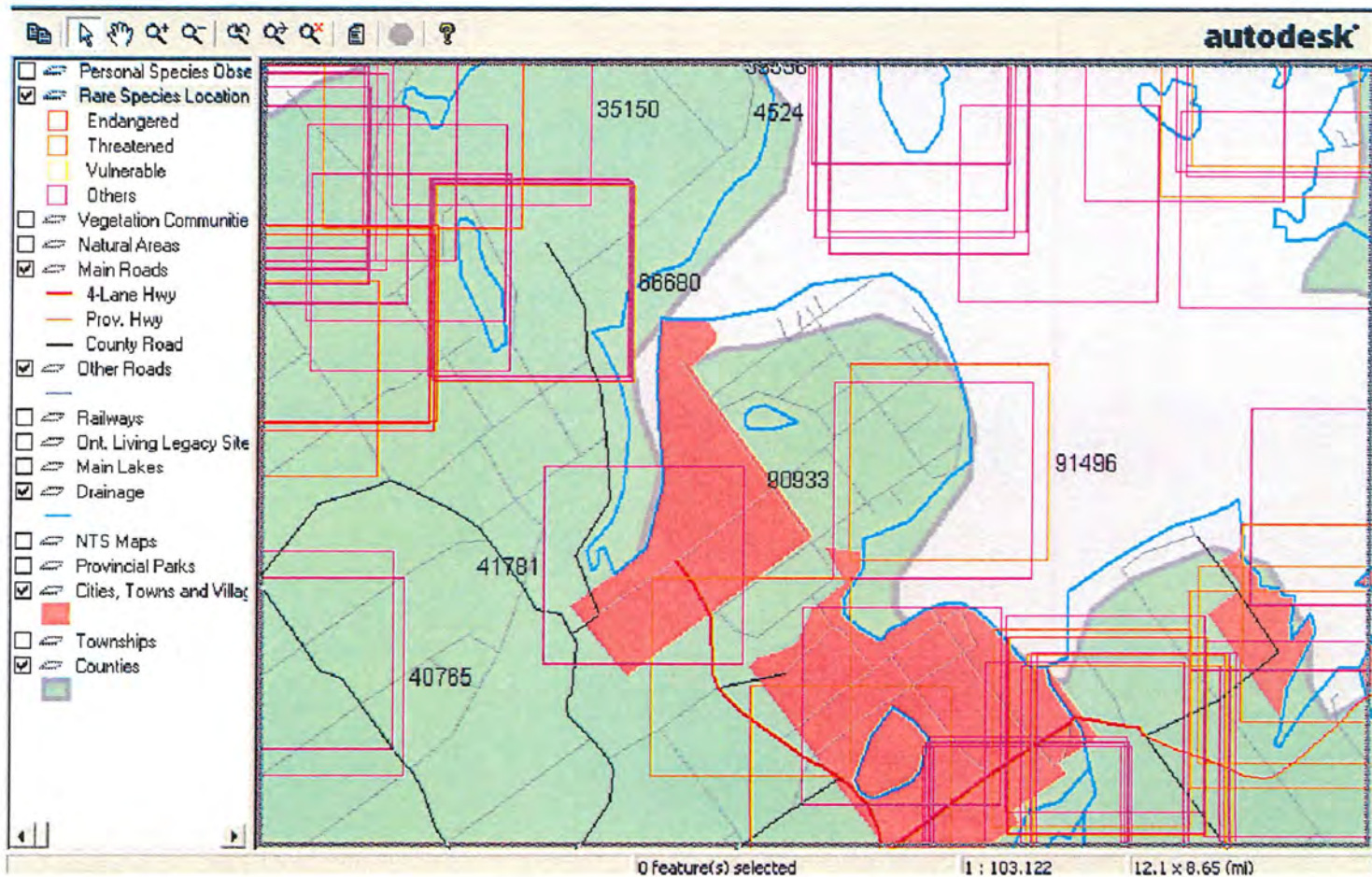
jim@azimuthenvironmental.com



Appendix 7

Rare Species Mapping

Source – OMNR's Natural Heritage Information Centre



Appendix 7. Species of conservation concern locations (Source – Ontario Ministry of Natural Resources, Natural Heritage Information Centre (<http://nhic.mnr.gov.on.ca/MNR/nhic>)).



Appendix 8

St. Andrew's Village Development Plan
Provided by – Innovative Planning solutions

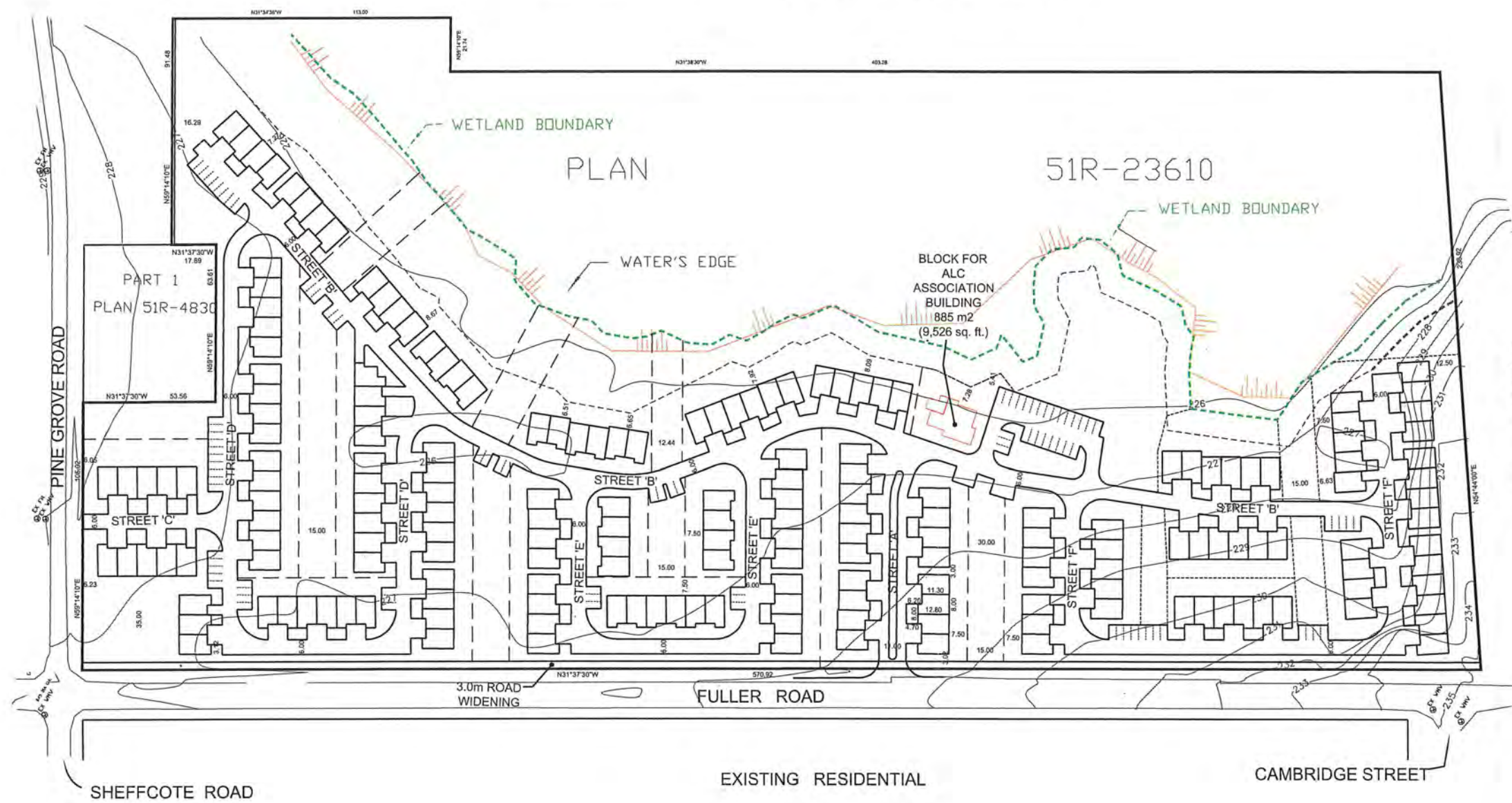
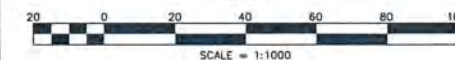


PLAN 51R-7282

ST ANDREW'S LAKE



KEY PLAN
CONCEPTUAL SITE PLAN
 ST. ANDREW'S LAKE
 LOTS 21B, 53B, 63B & PART OF LOT 77B
 REGISTERED PLAN 69
 FORMERLY IN THE
 TOWNSHIP OF TAY
 NOW IN THE
 TOWN OF PENETANGUISHENE
 COUNTY OF SIMCOE
 2007



- 13.21 ha. TOTAL SITE AREA
- 180 units LINKED UNITS
- 2,840 sq. ft. ALC ASSOCIATION BUILDING
- 885m2
9,526ft2 BLOCK FOR ALC ASSOCIATION BLDG
- 73 spaces VISITOR PARKING FOR RESIDENTIAL
- 26 spaces VISITOR PARKING FOR ALC BUILDING

RESIDENTIAL

RESIDENTIAL RESERVE

METRIC
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND
 CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTE
 THIS IS A CONCEPTUAL PLAN FOR PRESENTATION PURPOSES
 ONLY. IS NOT TO BE CONSIDERED A LEGAL DOCUMENT.

CONCEPTUAL SITE PLAN
TOWN OF PENETANGUISHENE

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