

Penn Energy – S. Glengarry_St. Lawrence-1 SOLAR ENERGY FACILITY

in the
TOWNSHIP OF SOUTH GLENGARRY

FIT Contract No. F-000627-SPV-130-505

FIT Application No. FIT-F3AP3XM

COD: April 2012

Water Assessment

DRAFT

Prepared for:

Penn Energy Renewables Ltd.
620 Righters Ferry Road, Bala Cynwyd, PA 19004

Prepared by:

Bowfin Environmental Consulting
168 Montreal Road, Cornwall, ON K6H 1B3

April 2011

Printed on 100% Recycled Paper



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1.0 INTRODUCTION

Penn Energy Renewables, Ltd. (Penn) has executed a FIT contract with the Ontario Power Authority (OPA) for the construction of a 10 MW solar energy facility north of Cornwall, near the village of Martintown, Ontario. The subject lands are located in part of Lots 1-3 Concession 5IL (or part of Lots 40, 41 & 41a of Plan 107), in the Township of South Glengarry, geographic Township of Charlottenburgh (Figure 1). The proposed Renewable Energy Generation Facility (REGF) would consist of a collection of solar photovoltaic (PV) modules (each approximately 1.00 m x 1.67 m in dimension) that are grouped into arrays tilted and facing south. These stationary arrays are strung together forming a series of rows oriented east to west. The Environmental Protection Act (EPA) administered by the Ministry of the Environment (MOE) regulates Renewable Energy Approvals (REA) under Part V.0.1 of the act, per Ontario Regulation 359/09. As part of this act, a Water Assessment (WA) is required in order to identify water bodies in and within up to 300 m of the proposed project location. Bowfin Environmental Consulting Inc. (Bowfin) has been retained by Penn to conduct the WA.

A water assessment study includes two activities: a review of records (background information), and a site investigation. The records review includes the identification of the presence of a water feature that is within 120 m (or 300 m of a lake trout lake) from the REGF project location.

These water features include:

- a water body;
 - lake;
 - permanent or intermittent stream; or
- seepage area.

Should any water feature be found within the REGF project location or the appropriate adjacent lands, then a report that identifies and assesses any negative environmental effects of the project on the water body/ies is required (Water Body Report).

The following report provides a summary of the records review and site investigations and identifies if a Water Body Report is required.



Figure 1 Location of the Subject Lands

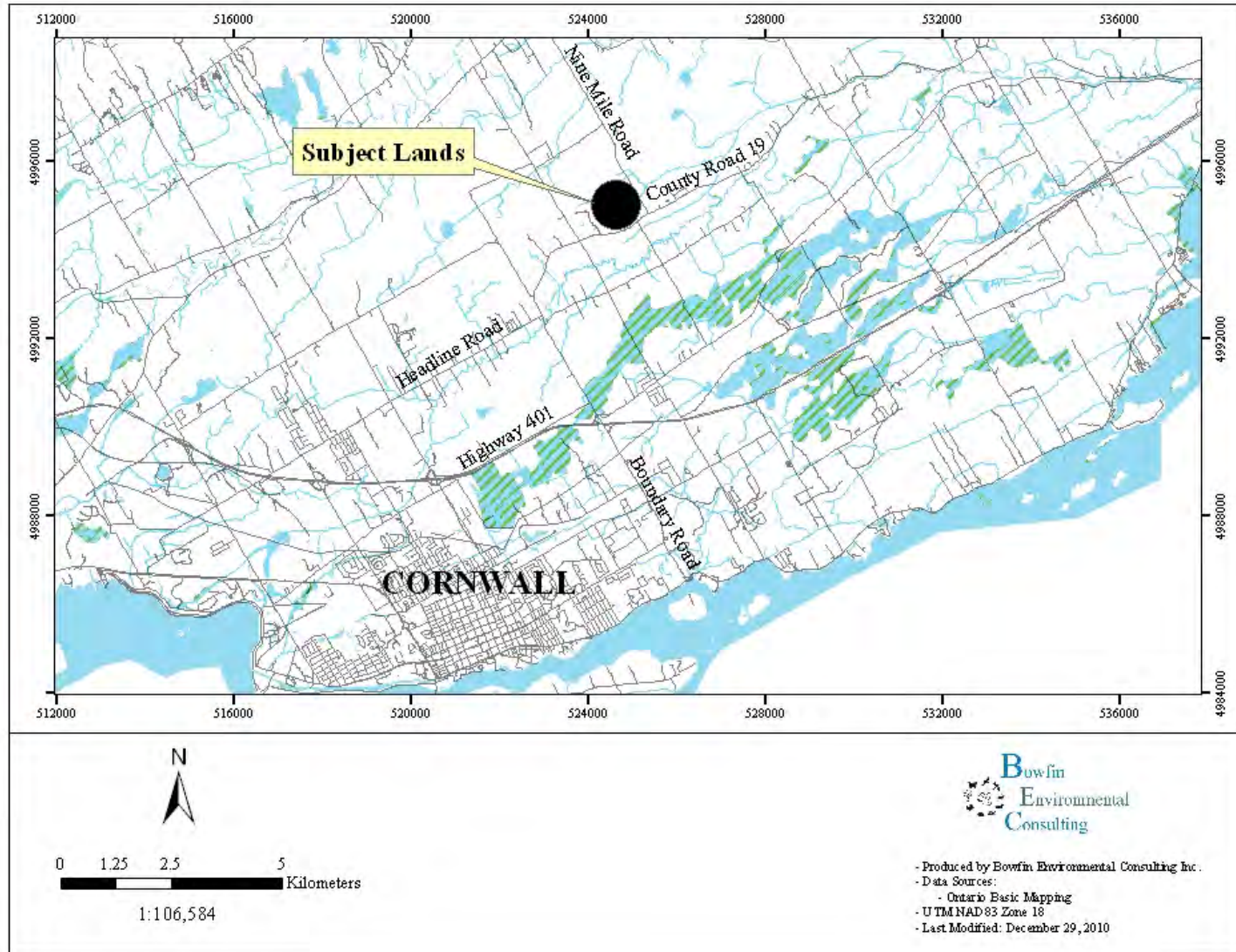
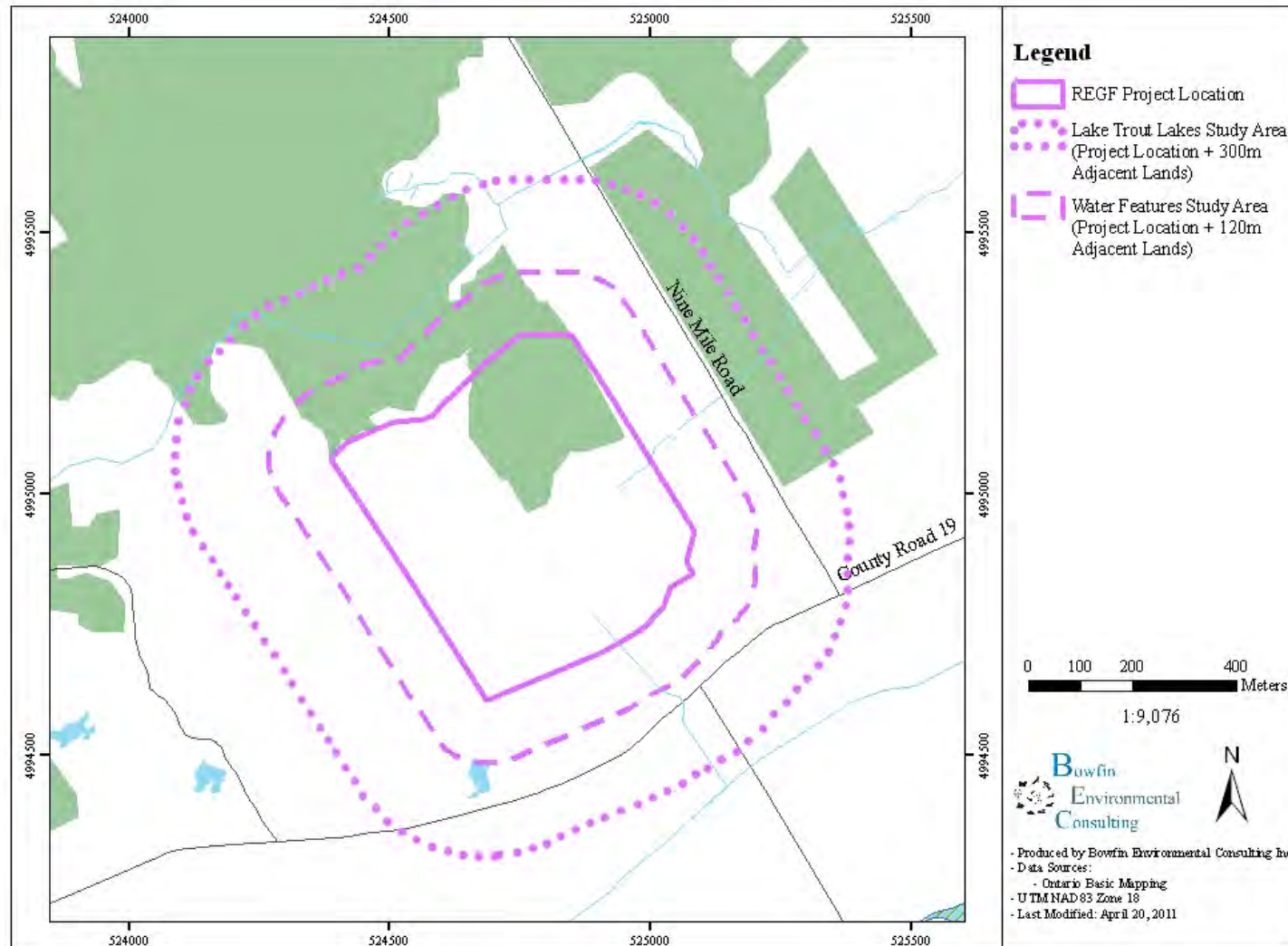


Figure 2 Study Area Boundaries



2.0 METHODOLOGY

2.1 Records Review

The records review was conducted in order to identify potential environmental concerns and included identifying water features within the study area. The water features examined were: water bodies, lakes (including lake trout lakes), permanent and intermittent streams, and seepage areas. Background information was requested from the Kemptville District of the Ontario Ministry of Natural Resources (OMNR) and Raisin Region Conservation Authority (RRCA) and provided to Bowfin by Penn (Appendix A). Coordination meetings were also held with RRCA and OMNR on July 26th, and September 8th 2010, respectively. Numerous records related to water bodies were searched and analyzed, including those maintained by OMNR, the Crown in right of Canada and the local conservation authority such as: Natural Heritage Information Centre (NHIC), Land Information Ontario (LIO), Ontario Renewable Energy Atlas, Conservation Ontario, and the United Counties of Stormont, Dundas and Glengarry (SG&G) Official Plan (OP). This study area is not located within the jurisdiction of any planning boards, municipal planning authority, local roads boards, local services board or the Niagara Escarpment Plan.

2.2 Site Investigation

The site investigation was conducted by visiting the site. The purpose of the site investigation was to confirm the presence, location and boundary of any candidate water body feature identified during the records review. The site investigation also determined if any other water body features were present within the study area. The study area includes the portion of subject lands where any construction activities, including support facilities and staging areas, would take place (the “REGF Project Location”) as well as all adjacent lands within 120 m for all features with the exception of lake trout lakes where the study area was enlarged to include 300 m from the REGF project location (Figure 2). During the site investigation visit the records review mapping was corrected through ground truthing. Ground truthing consisted of systematically cruising the study area during spring and summer to identify and describe all water features.

Resumes of the key personnel are provided in Appendix B.



2.3 Habitat Description

The definition of water body under the REA legislation is:

“a water body includes a lake, permanent stream, an intermittent stream and a seepage area but does not include: grassed waterways, temporary channels for surface drainage, rock chutes and spillways, roadside ditches that do not contain a permanent or intermittent stream, temporarily ponded areas that are normally farmed, dugout ponds or artificial bodies of water intended for the storage, treatment or recirculation of runoff...”

The definition of a permanent stream is:

“...those that continually flow during an average year.”

and the definition for an intermittent stream is:

“... natural or artificial channels, other than dams, that carry water intermittently and are free from vegetation dominated by plant communities that require or prefer the presence of water or continuously saturated soil to survive.”

No definition of lakes is provided in the REA document; as such, the *Ontario Wetland Evaluation System* definition was used:

“Areas of open water that are greater than 8 ha in size and at some location are greater than 2 m in depth from the normal low water mark”

These definitions were utilized to identify the presence of water bodies. Habitat descriptions were based on the appropriate methodologies such as: *Ontario Wetland Evaluation System, Southern Manual (OWES)* for wetland habitats and *Environmental Guide for Fish and Fish Habitat* (MTO 2006) for watercourses. Data collected included information on morphology, substrate, structure and in-water cover and aquatic flora and fauna.

Field notes are included in Appendix C.



3.0 RECORDS REVIEW

The proposed REGF site is located in the township of South Glengarry to the northeast of the City of Cornwall and to the southwest of the village of Martintown. It is located outside of the Oak Ridges Moraine, the Greenbelt Protected Countryside and the Niagara Escarpment. There are no planning boards, municipal planning authority, local roads boards or local services boards within this study area. The project location is not in (nor within 120 m of) a provincial park or conservation reserve. The site is bordered to the north by natural features; to the south by County Road #19, agricultural lands and rural residences; to the east by rural residences, agricultural uses and natural areas; and to the west by natural areas and agricultural uses. The habitat within the study area consisted primarily of crop land, existing and old grazing pastureland, plantations, wetlands and wooded areas. There are ATV trails located throughout the study area and evidence of logging. The land use designation of the subject lands is Rural District (OP Schedule A6). The constraints mapping from the OP indicates the presences of woodlands. Water features listed on the OP include a tributary to Wood Municipal Drain and the dug-out pond used for cattle watering. A summary of the records review results pertaining to the presence of potential water bodies in the study area is provided in Table 1 and illustrated in Figure 3 as applicable.

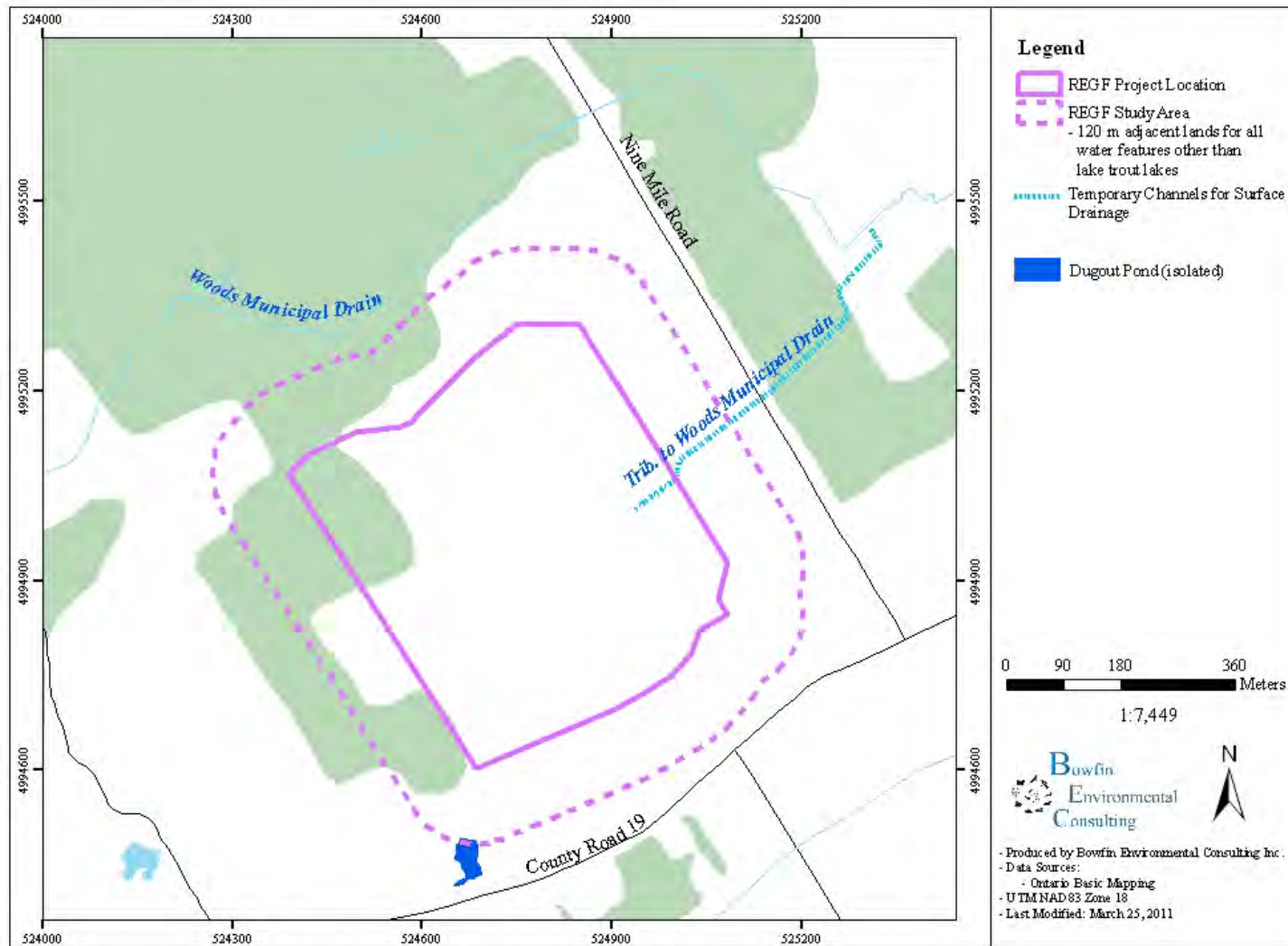
Table 1 Summary of Water Bodies Located within the REGF Project Location or the Adjacent Lands (based on the records review)

Water Feature	On or Adjacent to REGF Project Location?	Records Review Findings
Lakes	No	<ul style="list-style-type: none"> ◆ No lakes within 120 m of the REGF project location. ◆ No lake trout lakes are within 300 m of the REGF project location. ◆ The OP identified the cattle dug-out pond as a waterway located immediately north of County Road 19, outside of the REGF project location.
<u>Permanent Streams</u>		
Intermittent Stream	Unknown	<ul style="list-style-type: none"> ◆ OP identified a small tributary to the Woods Municipal Drain located in the middle of the study area, to the west of Nine Mile Road and outside of the REGF project location. ◆ County Road 19 is expected to have associated ditches. ◆ Requires site investigation.
Seepage area	Unknown	<ul style="list-style-type: none"> ◆ Requires site investigation.

OP = official plan of SD&G, August 4, 2006



Figure 3 Location of Candidate Water Bodies (based on records review)



4.0 SITE INVESTIGATION RESULTS

Site investigations were completed on July 2nd and 23rd and on October 12 and 22nd, 2010. A total of 28.5 man hours were spent on site collecting water features data (Table 2). Site investigations were completed by Michelle Lavictoire and Shaun St. Pierre.

Resumes are found in Appendix B.

Field notes are located in Appendix C.

Table 2 Summary of Dates, Times of Site Investigations

Date	Start time	End time	Staff	Total No. of Staff Hours	Air Temperature (min-max) °C	
July 2, 2010	0900	1200	S. St. Pierre M. Lavictoire	6	19.0 (13.0-25.0)	Sunny, light wind
July 23, 2010	0730	1130	S. St. Pierre	4	21.5 (18.0-25.0)	Overcast, light rain, no wind
October 12, 2010	0930	1500	S. St. Pierre M. Lavictoire	11	5.7 (-0.2-11.6)	Sunny with scattered clouds, light wind
October 22, 2010	0900	1245		7.5	2.7 (-0.1-5.5)	Overcast, light wind

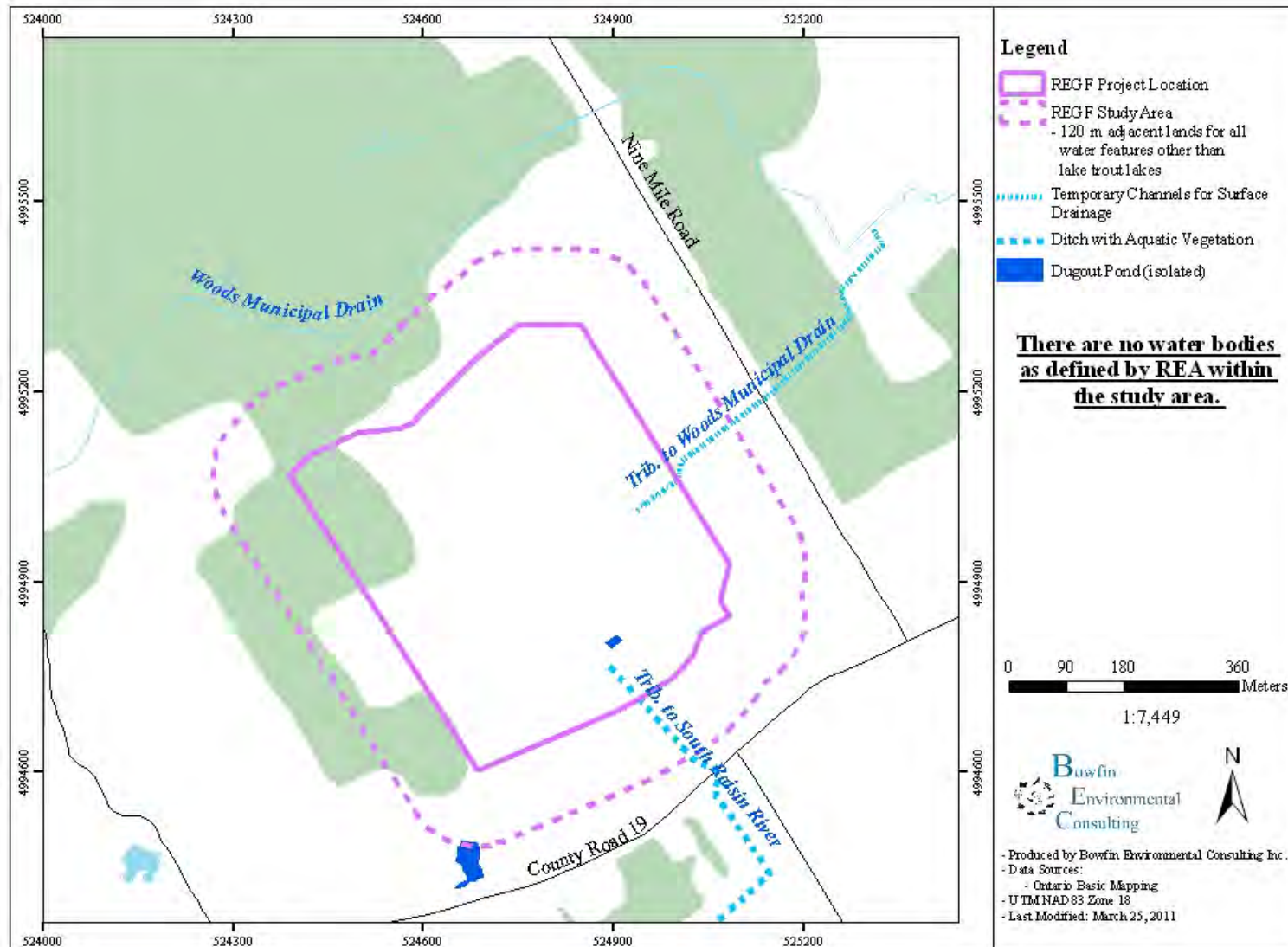
S. St. Pierre – B. Sc and Fisheries and Wildlife Technologist

M. Lavictoire – Michelle (Nunas) Lavictoire – biologist, M. Sc. (Natural Resources)

Min-Max Temp taken from: Environment Canada. 2010. National Climate Data and Information Archive - [Online] Available: <http://www.climate.weatheroffice.gc.ca> [November 23, 2010].



Figure 4 Location of Candidate Water Bodies (based on site investigations)



4.1. Tributary to Wood Municipal Drain

This ditch originated within the REGF project location (Photo 1) and continued towards the east into an agricultural field and the vegetation within the swale was mowed (Photo 2). The habitat assessment occurred on July 23, 2010. At the time of the visit the swale was dry. The average channel width was 60 cm. The substrate was composed of fines. There was insufficient water to provide in-stream cover. No erosion was observed. The riparian area consisted of agricultural crops. There was no woody vegetation and as such no canopy cover. The swale was mowed and the vegetation consisted of common strawberry, purple loosestrife, thistle sp., and grass sp.



Photo 1 Grassed swale within project location.



Photo 2 Swale outside of project location, looking west.

Conclusion: This feature is not a water body.

4.2. Tributary to South Branch of the Raisin River

This tributary was a dug-ditch located on the southern portion of the study area. The upstream end was located near the small dug-out pond, but was not connected to it, and the downstream end of the ditch was located at County Road 19 (outside of the study area) (Photo3). The site was dry during the summer and the channel was fully vegetated with cattails, reed canary grass and purple loosestrife. The average channel width was 256 cm. The average bankfull depth was approximately 20 cm. The substrate was composed of fines. There was no in-stream cover due to the lack of water. No erosion was observed. The riparian area was fully vegetated primarily by herbaceous species. Herbaceous vegetation was dominated by reed canary grass followed by goldenrod sp., and grass sp. The little woody vegetation consisted of willow sp., red-osier dogwood, white ash and American elm. There was very little canopy cover.



Photo 3 Looking northwest along the ditch.

Conclusion: This feature is not a water body.

4.3 Dug-Out Pond (Cattle Watering Hole)

This watering hole is a dug-out pond that provides a source of drinking water to cattle (Photo 4). The pond's length was approximately 60 m and the width was approximately 15 m. This pond was isolated. The substrate was composed of fines. The aquatic vegetation was dominated by algae sp., and duckweed sp. There were no signs of erosion. The riparian area was fully vegetated by herbaceous species with some trees on the west side. Herbaceous vegetation was dominated by thistle sp. followed by reed canary grass, bladder campion, and grass sp. Other species included white ash. This area is heavily impacted by cattle access (trampling, grazing and feces). Painted turtles were observed. No turtle nesting habitat is located at the dug-out pond.



Photo 4 Looking west at the dug-out pond.

Conclusion: This feature is not a water body.

4.4 Dug-Out Pond (Small Pond)

A second dug-out pond was located within the REGF project location. This pond was clearly dug by machinery (based on the square size and steep and even banks) (Photo 5). The pond's length was approximately 20 m, and the width was approximately 15 m. The pond was isolated. The substrate was composed of fines. No aquatic vegetation was observed. No reptiles or amphibians were observed. The riparian area was fully vegetated. Herbaceous vegetation was dominated by goldenrod sp. followed by grass sp., purple loosestrife, and common dandelion. There was no canopy cover.



Photo 5 Looking west at the dug-out pond.

Conclusion: This feature is not a water body.

4.5 Summary of Site Investigations Including Confirmation of, Corrections/additions to Records Review Findings

The records review indicated that there were no lakes or lake trout lakes in or within 300 m of the REGF Project Location. The records review identified several areas that required site investigations to determine if water bodies, as defined by O.Reg. 359/09, were present in or within 120m of REGF Project Location. The site investigations confirmed the presence of the candidate water bodies identified during the records review as well as two additional candidate water bodies (small dug-out pond and tributary to South Branch of the Raisin River). Both tributaries were seasonal. The tributary to Wood Municipal Drain was mowed through the channel and the tributary to the South Branch Raisin River contained “*vegetation dominated by plant communities that require or prefer the presence of water or continuously saturated soil to survive*”. The two ponds did not meet the definition of a lake, were isolated and were dug-out. Using the REA definitions and the data collected during the site investigations it was confirmed that there were no water bodies located within the study area (Table 3). A telephone conversation between MOE and Bowfin held on March 22nd, 2011, determined that no scoping meeting was warranted.



Table 3 Summary of Water Bodies Located within the REGF Project Location or the Adjacent Lands (based on the Site Investigations)

Water Feature	Findings		Changes (corrections to records review and/or addition of new water body features)	On or Adjacent to Project Location?
	Records Review	Site Investigations		
Lakes	<ul style="list-style-type: none"> No lakes within 120 m of the REGF project location. No lake trout lakes are within 300 m of the REGF project location. The OP identified the cattle dug-out pond as a waterway located immediately north of County Road 19, outside of the REGF project location. 	<ul style="list-style-type: none"> No lakes within 120 m of the REGF project location. No lake trout lakes are within 300 m of the REGF project location. 	None	None
Permanent Streams	<ul style="list-style-type: none"> OP identified a small tributary to the Woods Municipal Drain located in the middle of the study area, to the west of Nine Mile Road and outside of the REGF project location. 	<ul style="list-style-type: none"> Confirmed the presence of the tributary to Woods Municipal Drain which was a vegetated swale and did not meet the water body definition Observed another candidate water body feature, tributary to South Branch of the Raisin River, which was a seasonal, fully vegetated ditch and did not meet the water body definition 	Removal of candidate water bodies and confirmation that no additional water bodies were present.	None
Intermittent Stream	<ul style="list-style-type: none"> County Road 19 is expected to have associated ditches. Requires site investigation. 			
Seepage Area	<ul style="list-style-type: none"> Requires site investigation. 	<ul style="list-style-type: none"> No seepage areas found. 	None	None



5.0 CONCLUSION

The records review indicated that there were no lakes or lake trout lakes in or within 300m of the REGF Project Location. The records review identified several areas (one vegetated ditch and two dug-out ponds) that required site investigations to determine if water bodies, as defined by O. Reg. 359/09, were present in or within 120 m of the REGF project location. Multiple site investigation visits were made. During these visits a second seasonal vegetated ditch was observed. None of the candidate water body features met the definition of water bodies. Site visits confirmed that there were no water bodies (lakes, permanent streams, intermittent streams or seepage areas) in or within 120 m of the REGF project location. **As such there is no need to complete a Water Body Report for this proposed solar facility.** A telephone conversation between MOE (district office) and Bowfin held on March 22nd, 2011, determined that no scoping meeting was warranted.

6.0 REFERENCES

Bowfin 2011. Penn Energy Solar Energy Facility in the Township of Edwardsburgh/Cardinal Natural Heritage Assessment. Draft November 2010. Prepared for Penn Energy Renewable. 105 pp.

Ministry of Natural Resources. Ontario Wetland Evaluation System. Southern Manual. NEST Technical Manual TM-002. March 1993 (updated December 2002).

MTO 2006. Ministry of Transportation Environmental Guide for Fish and Fish Habitat.

Official Plan for the United Counties of Stormont, Dundas and Glengarry adopted July 18, 2005. 188p + schedules.



Appendix A – Correspondence from OMNR and RRCA



Ministry of Natural Resources

Kemptville District
P.O. Box 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tel.: (613) 258-8470
Fax.: (613) 258-3920

Ministère des Richesses naturelles

District de Kemptville
CP 2002
10 Campus Drive
Kemptville, ON K0G 1J0

Tél.: (613) 258-8470
Télééc.: (613) 258-3920

May 27, 2010

Penn Energy Trust
620 Righters Ferry Road
Bala Cynwyd, PA 19004
United States

Attention: Bob Gray

**RE: Information Request – Solar Project – Charlottenburgh, South Glengarry
Our File No.: 2010_CHA-874**

Dear Mr. Gray,

The Ministry of Natural Resources (MNR) Kemptville District has carried out a review of the area in order to identify any potential natural resource and natural heritage values in the area of the identified sites – Lot 1-3, Concession 5, Charlottenburgh geographic township.

The MNR must clearly indicate that this is an initial records review and does not form part of the MNR review and confirmation process.

Our records review indicates that there are portions of the lots which are wooded. As such, there is the potential for these woodlands to be Significant Woodlands. Under the Provincial Policy Statement (PPS) and the Planning Act, the identification and delineation of significant woodlands is a responsibility of the Municipality. The MNR recommends that you contact the municipality and review their Official plan to determine if they have identified this area as such. The identification of Significant Woodlands by a municipality must conform to MNR standards prior to its use for the Natural Heritage Assessment. If Significant Woodlands are not identified in the Official Plan, the proponent is required to evaluate the significance of the feature in accordance with MNR guidance if works are proposed within the feature or the setback distance (120 meters). Furthermore, it is important to note in this particular area that the Cornwall Remedial Action Plan covers the area identified by these sites. This plan has a focus on woodland protection in this particular area and should be canvassed for further information as this may further support information gathering and future Natural Heritage Assessments.

There is unevaluated wetland identified on the property. If development is proposed within 120 meters of this wetland, a wetland evaluation as per the Ontario Wetland Evaluation System must be carried out to establish significance. Furthermore, this wetland and the watercourse located on site may also serve as fish and/or wildlife habitat and thus a determination of significance in this regard would also be required. With respect to fisheries and fish habitat information, the local Conservation Authority and the Department of Fisheries and Oceans may have additional data and information that pertains to this site, which should be referenced.

Our review of various other values and features shows no known MNR records for the following:

- Areas of Natural and Scientific Interest



- Nesting Sites
- Fish spawning areas
- Fish nursery areas
- Wintering areas – wildlife
- Staging areas - wildlife

The MNR would like to note that based on a review of air photos, it appears that there is agricultural land located on part of the site. The MNR recommends that it be determined what agricultural land classification this area is deemed to be so as to avoid development on Class 1 and Class 2, prime agricultural lands. For further information regarding agriculture, please contact the Ontario Ministry of Agriculture, Food and Rural Affairs.

Lastly, the MNR oversees the provincial Endangered Species Act (2007) and thus following a review of the information obtained from Natural Heritage Information Centre (NHIC) and a search of SAR records which exist at the MNR Kemptville District office, the MNR can advise that there is a high potential for **Butternut (Endangered)**, and **Loggerhead Shrike (Endangered)** and provincially tracked rare species Halbered-leaved Tearthumb, Brainerd's Hawthorn and Caughuawaga Hawthorn. While provincially tracked rare species are not protected by the Endangered Species Act, under the PPS, the identification of Significant Wildlife Habitat is (like Significant Woodlands) a delegated responsibility of the municipality. As such, if Significant Wildlife Habitat is not identified by the Municipality, the proponent is required to evaluate the significance of the feature.

Although this data represents the MNR's best current available information, it is important to note that a lack of occurrence at a site does not mean that there are no Natural Heritage Values and/or Species at Risk (SAR) at the location. MNR must note further, that there may not be any records currently held for newly listed Endangered and Threatened species and therefore for both above mentioned reasons, the MNR continues to encourage ecological site assessments to determine the potential for other SAR occurrences, while requiring the assessment of the site, to determine the presence of previously unknown Natural Heritage features and values. When a SAR does occur on a proposed site, it is recommended that the proponent contact the MNR for technical advice and to discuss what activities can occur without contravention of the Act. If an activity is proposed that will contravene the Act (such as Section 9 or 10), the proponent must contact the MNR to discuss the potential for application of certain permits (Section 17) or agreement (Regulation 242/08). For specific questions regarding the Endangered Species Act (2007) or species at risk, please contact Species at Risk Biologist, Paula Norlock at paula.norlock@ontario.ca. Not only is the ecological site assessment vital for assessing those Species at Risk on and adjacent to the site, however, it can also serve as the foundation for evaluating Significant Habitat of Endangered and Threatened species within the identified study area.

For the purposes of the required Natural Heritage Assessment report, the MNR recommends the following sources of direction and information as areas by which to begin the desktop portion of your review:

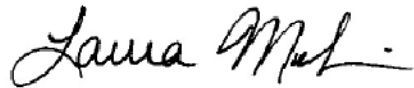
- Natural Heritage Reference Manual (2010) – the newly published NHRM is a key document for understanding the importance of and the criteria for evaluating the various Natural Heritage Values on the landscape (including Significant Woodlands). This document can be accessed via: <http://www.mnr.gov.on.ca/en/Business/LUEPS/Publication/249081.html>
- Significant Wildlife Habitat Technical Guide (1999) – this document provides further technical direction and information as it relates to Significant Wildlife Habitat: http://www.mnr.gov.on.ca/en/Business/FW/Publication/MNR_E001285P.html



- Ontario Wetland Evaluation System:
http://www.mnr.gov.on.ca/en/Business/Biodiversity/2ColumnSubPage/STEL02_176756.html

If you have any questions, please do not hesitate to contact me.

Sincerely,



Laura Melvin
A/ District Planner
Resource Management Planner
laura.melvin@ontario.ca



Max Frable

From: Kim MacDonald [kim.macdonald@rrca.on.ca]
Sent: Friday, 19 February, 2010 4:37 PM
To: 'Joanne Haley'; 'Dwane Crawford'; Bob Gray
Subject: 18461 CNTY RD 19 (Jeff Cashion property)
Attachments: SKMBT_C35110021916340.pdf

Here is the data I have on record pertaining to the above noted property. Dwane and Joanne, I believe you have a meeting with Bob Gray this upcoming week.

According to our information, Significant Woodlands and the watercourse (Woods Drain - Class C fish habitat, meaning warm water & baitfish species) are the only natural heritage features located on the subject property. No floodplain data, organic soils or wetlands were observed.

I also took the liberty of examining the woodland data and the results are listed in my previous e-mail to Bob (attached below).

According to our staff forester, hard maple, spruce and black ash species are relatively significant. In addition, once you get into 90 year old species, the age is relatively significant. According to the information, the Conservation Authority would prefer to see the north portion of the subject property remain, as well as the riparian vegetation along Woods Drain.

Any work in or around the drain would require a fishery review under S. 35 of the Federal Fisheries Act. Our office has a level 2 Agreement with the Department of Fisheries and Oceans to conduct the fishery reviews on their behalf. I don't believe the Green Energy Act supersedes the Federal Fisheries Act. I'm also in the process of verifying our O. Reg. 175/06 implications in relation to Green Energy projects to ensure I'm not missing anything. Regardless, please note that O. Reg. 175/06 does not deal with vegetation removal.

If all the work is to take place south of Woods Drain, the RRCA would have no adverse comments or concerns other than maintaining a vegetated buffer adjacent the drain. A 15 to 30 m setback from the drain for any site alterations and development would be preferable.

As a final note, please note that butternut species are protected under the Species at Risk legislation and butternut species should not be cut or removed from the subject property. In that instance, the Ministry of Natural Resources should be contacted for more information. Butternut species tend to be present in the vicinity of hardwood, and hardwood species are located on the north portion of the subject property.

Should you have any questions, please feel free to give me a call.

Regards,

Kimberley MacDonald
Watershed Planner & Regulations Officer
The Raisin Region Conservation Authority
P.O. Box 429
18045 County Road 2
Cornwall, Ontario
K6H 5T2
Tel: (613) 938-3611
Fax: (613) 938-3221
email: kim.macdonald@rrca.on.ca





**Drain Classification
Field Data Sheet**

WMSD-070420-RR
Date of Sample: 11/19/07
Time of Sample: 2:50pm

DGPS Coordinates: 0524895 E / 4997000 N

Drain Name <u>Woods Drain</u>	Sampling Location/Road Crossing <u>9 mile (</u>	Township <u>Charlottenburgh</u>	Grow <u>Chrys for K&T</u>
----------------------------------	--	------------------------------------	--

Sample Method: Electrofisher Intensity(seconds): 1-20 Length of Station: 20 metres
 Seine Net 5 metres

In-stream cover: Deciduous Oakbrush Birch/rod Grasses Arrowhead Water lily Pondweed
other: lily leaf

Bank cover: None Grasses Shrubs Forest trees Other: _____

Over-head cover: Shrubs

Exotic Species: Purple loosestrife European frogbit Flowering rush Eurasian watermilfoil
 Curly pondweed Zebra mussels Three-spine stickleback
other: _____

Northern Pike Habitat: Yes No Northern Pike Spawning Habitat: Yes No

Bank erosion: Yes No Erosion: Minimal Medium Extensive

Protective Measures: Cattle fencing Rip rap Other: _____

Flow Rate: Slow Moderate Strong Riffle/pool sequence: Yes No Depth (nearest pool): _____

Sediments/Turbidity: Clear Moderate Severe

Substrate: Detritus Sand Silt/muck Clay Gravel Cobble Boulder Bedrock

Impoundments: Beaver Other: _____

Culvert (size, placement, perched): 12 in diameter (open flatland)

Tile Outlets: _____

General Land Use: Abandoned farmland

Waterway Uses (baitfish, recreation, hydropower,...): _____

Adjacent Landowners: _____

Sub-Watershed: Raisin Region Drain Super: L. McDonald Last Cleanout Date: clean



Fish Species Present

Species	Adult	YOY	Comments (date seen, numbers, breeding colonies, etc.)
Northern Pike			
Smallmouth Bass			
Largemouth Bass			
Rock Bass			
White Crayfish			
Black Crayfish			
Rock Bass			
Pumpkinseed			
Bluegill			
Common Shiner			
Golden Shiner			
Starry Stinner			
Bluntnose minnow			
Fathead minnow			
Logperch			
Crooked Midgefish			
Piney Darter			
Creek Chub			
Roadside Darter			
Spotted Killifish			
Brook Stickleback			
Brown Bullhead			
White Sucker			
Carp			
Freshwater Pearl Driller			
Marbled Sculpin			

NRVIS (compressed)

	Yes	No	Low	High	Severe	Local	Wide spread
Artificial Structures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cattle Access	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Construction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dredging	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eutrophication	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exotic Species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Forest Loss	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Invasive Species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Use Change	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overgrazing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Point Source Pollution	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shedding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water Level Fluctuations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife Kill	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments (Frags, birds, etc.)
 - Beaver dam to E. side of road



064720-0711200-R2



**Drain Classification
Field Data Sheet**

Date of Sample: July 21/03
 Time of Sample: 1:00pm
 Photo Number: Files 96

updated July 12/03
 DGPS Coordinates: 0425165/494477 Temperature: _____

Drain Name <u>dammed tributary of WOLF CREEK</u>	Sampling Location/Road Crossing <u>CASHION RD.</u>	Township <u>CHARLOTTEBURGH</u>	Crew <u>KAT TAYLOR</u>
---	---	-----------------------------------	-------------------------------

Sample Method: Electrofisher Intensity: _____ Length of Station: 20 metres Width: 1.5m
 Seine Net 5 metres

INTERMITTENT

In-stream cover: cattails bulrush burrhead grasses arrowhead water lily pondweed
 ledges other: pickled weed

Bank cover: none grasses shrubs forest trees other _____

Buffer strip: no yes Width: 1m Over-head cover: 10%

Exotic Species: purple loosestrife European frogbit flowering rush Eurasian watermilfoil
 curly pondweed zebra mussels three-spine stickleback charr
 other: _____

Northern Pike Habitat: yes no Northern Pike Spawning Habitat: yes no

Bank erosion: no yes Extent: minute medium extensive

Bank Slope: gentle moderate steep

Protective Measures: cattle fencing rip rap ditches _____

Flow Rate: slow moderate strong Riffle/pool sequence: yes no Depth (nearest pool): _____
 N/A

Sediments/Turbidity: clear moderate severe N/A

Substrate: detritus sand silt/muck clay gravel cobble boulder bedrock

Impoundments: beaver other _____

Culvert (size, placement, perched): 1.9m Tile Outlet: _____

General Land Use: Agricultural / Excluded

Waterway Uses (baitfish, recreation, hydropower,...): _____

Adjacent Landowners: _____

Sub-Watershed: Wolf River Drain Super: Co. Hamilton Last Cleanout Date: _____

Class F

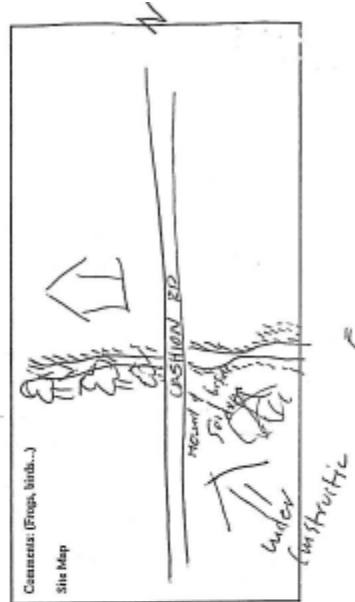


Fish Species Present

Species	Number	Size Range	Comments (disease, tumors, breeding colour...)
Northern Pike			
Smallmouth Bass			
Largemouth Bass			
Muskellunge			
Walleye			
Yellow Perch			
Black Crappie			
Rock Bass			
Pumpkinseed			
Bluegill			
Common Aliner			
Golden Aliner			
Silvery Aliner			
Bluntnose minnow			
Fathead minnow			
Logperch			
Central Mudminnow			
Jolly Darter			
Creek Chub			
Redbelly Dace			
Banded Killifish			
Brook Silverside			
Brown Bullhead			
White Sucker			
Carp			
Peel Dace			
Mottled Sculpin			

NRVIS (compressed)

	Yes	No	Low	Med	Severe	Local	Wide spread
Artificial barriers							
Cattle access							
Contaminants							
Deforestation							
Erosion/sedimentation							
Eutrophication							
Forest fire effects							
Invasive Species							
Non point source pollution							
Oversight/abandonment							
Point source pollution							
Shoreline alteration							
Timber harvesting							
Water Crossings							
Water Level Flows							
Water Level Fluctuations							
Water Taking							
Winter Kill							
Other							



Appendix B – Resumes

MICHELLE L. (NUNAS) LAVICTOIRE, M. Sc.

EDUCATION

M.Sc. Natural Resources, Environmental Assessment of Best Management Practices for Cattle Pasturing near Small Streams, Macdonald Campus, McGill University – Supervisor Dr. Curtis

B.Sc. Wildlife Biology, Macdonald Campus, McGill University, 1997

LANGUAGES

Fluent in English, French, Spanish and novice Indonesian.

PROFESSIONAL AFFILIATIONS

American Fisheries Society (AFS), Ontario Association of Certified Engineering Technicians and Technologists (O.A.C.E.T.T.), Association Québécoise pour l'évaluation d'impacts (AQEI), International Association for Impact Assessment (IAIA), World Sturgeon Conservation Society.

POSITIONS HELD

2002-:	Bowfin Environmental Consulting Inc., Principal/Biologist
2000-2002:	Self-employed, Biologist
1999-2000	Tera Environmental Consultants, Calgary, AB, Environmental Planner
1998-1999:	Enviroconsult Inc. Calgary, AB, Biologist
1998:	Golder Associates Ltd., Calgary, AB, Contract Technician
1997-1998:	Envirowest Consultants Ltd., Prince George, BC, Biologist
1996:	Heritage Laurentien, Montreal, PQ, Naturalist
1996:	Martineau-Walker, Montreal, PQ, Naturalist
1995:	Ottawa-Carleton Wildlife Centre, Ottawa, ON, Wildlife Intern

CERTIFICATIONS/COURSES

OACETT rcjii Graduate Technologist, Class 1 WSC Electroshocking Certification, first aid, CPR, PADI Instructor, marine radio operator, Pleasure Craft Operator Card. Ontario Fishes course offered by the Centre for Biodiversity and Conservation Biology at the Royal Ontario Museum. Ontario Freshwater Mussel Identification Workshop, Ontario Wetland Evaluation Training, Ecological Land Classification, Bitternut Health Assessor. MTO R.A.Q.S. Fisheries Assessment, Environmental Inspection during Construction and Fisheries Compliance during Contracts

EXPERIENCE

Experience in environmental assessments, peer reviews, terrestrial habitat assessment, freshwater and marine habitat assessment, route selection, watershed studies and terrestrial and fisheries inventories including habitat mapping, stream classification, underwater surveys, electroshocking, and development of mitigation and compensation measures, including obtaining extensions to OMNR in-water timing constraints and DFO Authorizations and DFO Permits for Killing Fish by Means other than Fishing.



Aquatic and Terrestrial Environmental Impact Assessments

- Completed EIS for proposed WPCP expansion in the Town of Greater Napanee, ON
- Currently working on a terrestrial and aquatic component for the evaluation of proposed small hydroelectric options for a Cree community in northern Quebec.
- Currently responsible for the aquatic component for the Cataraqui Bridge Crossing, Kingston, ON.
- Currently completing the aquatic and terrestrial assessments for the proposed Clear Point small hydroelectric facility in Renfrew, ON.
- Currently completing the aquatic and terrestrial assessments for three proposed solar farms located in Port Hope, Prescott and Martintown.
- Currently working on an aquatic assessment for a proposed quarry near Rockland, ON.
- Completed aquatic environmental impact assessment for proposed sand pit operations in Greely and Bourget.
- Completed an environmental assessment for a proposed development along Heb Gordon Drain, Manotick, ON.
- Evaluated wetland boundaries for Doran Creek Wetland following OWES, Iroquois Ontario.
- Evaluated wetland boundary and significant woodland features for several single lot developments in the United Counties of SD&G and City of Ottawa.
- Completed the Environmental Impact Statement for the route selection and the Environmental Impact Assessment for the preferred option for the Caron Street Expansion in Rockland, ON.
- Completed the aquatic impact assessment and terrestrial species at risk evaluation for a proposed expansion to a small hydroelectric facility in Douglas, ON.
- Completed terrestrial EIS for proposed WTPP expansion in Iroquois, ON.
- Completed a terrestrial and aquatic route selection assessment for the Simcoe WPCP.
- Completed a Level 1 and Level 2 aquatic and terrestrial assessments for a proposed quarry expansion near Cornwall, ON
- Completed Level 2 fisheries report for Gagne Pit expansion near Rockland, Ontario.
- Completed wetland assessment following OWES for the proposed Morrisburg Industrial Park
- Completed aquatic impact assessment for PTTW, Apple Hill Quarry.
- Currently working on Aquatic and Terrestrial Environmental Impact Assessments for First Chute small hydroelectric facility projects on the Bonnechere River, ON.
- Completed the aquatic habitat and community assessment for a permit to take water for the Amberwood Golf Course, Ottawa ON
- Complete fish community and habitat impact assessment for the Morrisburg Waste water tunnel
- Prepared aquatic impact assessment for the construction of the Clarkson WWTP outfall, Lake Ontario.
- Created artificial reef design for the Town of Saugeen Shores WPP.
- Conducted assessment of fish habitat use and determined potential impacts for the Town of Saugeen Shores WPP.
- Developed and conducted a study to assess fish kills within the Town of Saugeen Shores WPP.
- Fish habitat assessment along Stagecoach Road, Ottawa ON.
- Complete aquatic habitat and community impact assessment for a permit to take water for the Summersheights Golf Course.
- Prepared impact assessment and monitoring plan for the Burloak Water Purification Tunnel project (Burlington, ON).
- Completed aquatic habitat and community assessments for the permit to take water for the Riverbend Golf Course, Ottawa ON
- Conducted aquatic field assessments and reports for EA for vermiculite Canada project near



Bobcaygeon.

- Terrestrial screening level habitat assessment of Ferguson Lake development.
- Designed fish habitat compensation and monitoring plans for Cataraqui River Drilling Project.
- Assessed fish habitat within the Ottawa River near L'Orignal for the Wastewater treatment plant environmental screening report.
- Assessed fish habitat within Lake St. Lawrence (St. Lawrence River) near Morrisburgh for the wastewater treatment plant environmental screening report.
- Conducted level 1 terrestrial impact assessment for Vermiculite Canada project near Bobcaygeon.
- Conducted Environmental Screening Report for South Dundas between Morrisburg and Iroquois.
- Fish habitat assessment Foster Drain, Jock River, Ottawa ON
- Fish habitat assessment on drains on HWY 417 in Casselmen, ON
- Conducted fisheries habitat assessment and designed artificial embayments and fish habitat enhancements for the Chat Falls Boat By-pass.
- Conducted environmental assessment for the proposed South River Hydroelectric Facility including an assessment of impacts on aquatic and terrestrial habitats and communities.
- Wrote Environmental Screening Report and conducted environmental inspections for Cataraqui River Drilling Project.
- Conducted Alexandria Wastewater treatment Plant Expansion Environmental Impact Study.
- Conducted Westley's Point terrestrial and Aquatic Environmental Screening Report for a sewer and watermain.
- Fish habitat assessment on Poole Creek near Stittsville, ON.
- Conducted field work for the environmental screening for the Harbour Front Trunk Sewer Overflow Control – Environmental Assessment.
- Fish habitat assessment Sawmill Creek, Cahill Tributary and Brown's Inlet, Ottawa ON
- Conducted fish habitat assessment and prepared environmental impact statement investigating the potential impacts of a lowering and realignment on the aquatic habitat on Spratt Municipal Drain.
- Conducted terrestrial and aquatic field assessment and wrote Environmental Screening Report for a development project on Loughborough Lake.
- Identified and mitigated potential fish habitat impacts as a result of a proposed increase in water level of the Garry River System, Alexandria, Ontario.
- Fish habitat assessment of Hosaic Creek within the Dupont Nature Reserve, Morrisburg ON.
- Assisted with terrestrial environmental impact assessments, in identification of environmental features to identify constraints and opportunities in support of a proposed Official Plan amendment in Tatlock, Ontario.
- Conducted the marine aquatic impact assessment for the Strait of Georgia Pipeline Crossing, BC.
- Assisted with environmental impact assessments, environmental field reports and fieldwork for various pipeline projects in Alberta.
- Wrote Environmental Overview for Tanglewood Residential Development in Calgary.
- Wrote Environmental Overview for Creekside Mills Residential Development in Calgary.
- Wrote Environmental Overview and Environmental Protection Plan for Beddington Trail, Calgary.
- Wrote Environmental Overview for Elbow Valley Environmental Protection Plan in Calgary.

Aquatic Inventories

- Completed fish community sampling for the Third Crossing on the Cataraqui River (boat electrofishing and seine netting).



- Completed fish community sampling on Lafontaine drain in Rockland for a proposed subdivision.
- Completed backpack electrofishing and minnow trapping on watercourses at proposed sand pit expansions in Greely, and Bourget Ontario.
- Completed backpack electrofishing and minnow trapping on tributaries to Brook Creek in Port Hope, on a tributary to the St. Lawrence River near Prescott and Wood Drain in South Glengarry for proposed solar farms.
- Completed walleye spawning monitoring (night surveys and egg traps) in and around the chute between Lakes Opemisca and Barlow in northern Quebec.
- Completed a fish kill monitoring of the recently upgraded water treatment facility in Southampton, ON.
- Completed fish community sampling on a tributary to Gray's Creek in Cornwall, Ontario for a proposed subdivision.
- Conducted young-of-the-year walleye monitoring on the Raisin River and Lake St. Francis using boat electrofishing, Cornwall ON.
- Conducted boat electrofishing sampling on the Cataraqui River for a proposed dredging program, Kingston ON.
- Completed boat electrofishing and habitat mapping for Port of Prescott proposed expansion.
- Conducted fish community sampling within an unnamed drain in Russell, ON.
- Conducted fish community sampling within Feedmill Creek for a proposed development Ottawa, ON.
- Conducted fish community sampling within a tributary to the St. Lawrence River, Brockville, ON.
- Conducted fish community sampling and pike monitoring on the Eastman Drain, Cornwall ON.
- Conducted fish community monitoring and pike surveys on the Heb Gordon Drain, Manotick, ON.
- Conducted fish community sampling on tributaries to Shirley's Creek Kanata, ON.
- Conducted fish community sampling on Foster Drain, Ottawa ON.
- Designed and conducted walleye larvae survey of Hoople Creek and Raisin River (neuston net).
- Collected and analyzed fish and benthic macroinvertebrates from Pattingale and Hoople Creeks for a comparison study of impacted and non-impacted sites for the Raisin Region Conservation Authority.
- Developed and conducted first year of sampling for a benthic macroinvertebrate monitoring program for PTTW, Riverbend Golf Course, near Ottawa, ON.
- Completed R.I.N. (OMNR) gill netting protocol on Reach 1 of the Bonnechere River, Renfrew ON.
- Collected fish community and benthic macroinvertebrate information within tributaries to Clarence Creek for a proposed subdivision, Rockland, ON.
- Collected fish community and benthic macroinvertebrate information within tributaries to Lafontaine Creek for a proposed subdivision, Rockland, ON.
- Collected fish community information from two tributaries to the Ottawa River, Wendover, ON.
- Sampled fish communities within Adams Pond (Ottawa, ON).
- Completed first year of fish community monitoring for the Poole Creek re-alignment at Huntmar Road, Ottawa (backpack electrofishing multi-season)
- Completed the first year of a three year monitoring project for the Cataraqui Utilities Crossing project within the Cataraqui River (boat shocking, seine netting, habitat assessment)
- Completed a three year monitoring project of the new wetland channel created in the Little Cataraqui River, Kingston ON (seine netting).



- Assessment of benthic macroinvertebrates and fish communities within tributaries of the Bonnechere River (Renfrew ON) (seine netting, gill netting, backpack electrofishing, minnow trapping, multi-season).
- Conducted fish removal on a tributary to Trout Lake for Cruickshank on HWY 60
- Conducted young-of-the-year muskie seining within the Ganonoque area for Muskies Canada and OMNR (seine netting)
- Fish community sampling Mosquito Creek, Carp River and its tributaries. Ottawa, ON (backpack shocking)
- Provided fish removal services for Poole Creek at Huntmar, Kanata Ontario.
- Conducted young-of-the-year muskie and walleye seining within Lake St. Francis (Cornwall, ON).
- Assisted the City of Ottawa in locating and identifying potential walleye spawning grounds in the Rideau River.
- Conducted boat electrofishing on the Cataraqui River (Kingston, ON).
- Collected and analyzed walleye eggs from the spawning grounds at on the Raisin River and Hoople Creek.
- Conducted shoreline boat and beach seining along Lake St. Francis for the Lake St. Francis Fish Habitat Plan.
- Conducted and analyzed data from a stream assessment project of Hoople, Hoasic and Sutherland Creeks (OSAP protocol).
- Conducted boat electrofishing along the shoreline of Lake St. Francis and Raisin River, Cornwall ON with the RRCA.
- Designed, collected and analyzed the results for benthic macroinvertebrate community surveys on several watercourses within Ontario including: South River (Village of South River), tributary to the Beaudette River (Alexandria), Hoasic and Hoople Creeks (Morrisburgh), Sutherland Creek and Raisin River (Cornwall), Jock River (Ottawa) and a tributary to Feedmill Creek (Ottawa).
- Collected information on aquatic habitat, including inventory of fish communities and spawning survey to support proposed water taking from the Tay River (backpack shocking).
- Conducted boat electrofishing along the shoreline of Raisin River, Cornwall ON.
- Lake St. Francis (Cornwall, ON) and on the Cataraqui River (Kingston, ON).
- Developed and conducted fish habitat and community study on the Lower Raisin River (backpack shocking, seine netting, boat electrofishing multi-season).
- Developed, organized and conducted marine field work, gathered environmental information, located contacts and assisted in writing the draft report for the Strait of Georgia Pipeline Crossing.
- Developed and conducted a fish survey on West Nose Creek, Alberta.
- Assisted in a fry monitoring project at the NOVA pump house on Red Deer River, Alberta. Responsibilities included setting and monitoring fry traps, and data collection.
- Conducted FRBC stream inventorying for Lakeland Mills, British-Columbia.
- Project Director: Realized, developed and presented a population study on the host sea anemones and anemonefishes in Sulawesi, Indonesia in cooperation with McGill University, Ecosurveys Ltd (UK) and Newman Biomarine Pte Ltd (Singapore). The study involved coral habitat mapping and fish surveys.

Environmental and Fisheries Inspections

- Completed inspections during construction and fish salvage on Meade Creek at HWY 7, near Peterborough, ON.
- Designed fish salvage operations for a small hydro facility in Ontario.
- Clarkson's wastewater tunnel inspection design and quality control



- Burloak water purification tunnel blasting fish kill monitoring design and implementation
- Burloak water purification tunnel suspended sediments inspection design and implementation
- Provided environmental and fisheries inspections for the construction of the Poole Creek Re-alignment/Huntmar Drive Crossing.
- Conducted fish removal for MTO project on HWY 125.
- Provided fish removal services on the Trans-Northern Pipeline near Cornwall
- Provided fish removal services for a culvert replacement on Green's Creek near Maynooth, ON.
- Provide environmental and fisheries inspections for MTO projects in Napanee and Vankleek Hill, Lancaster and Ottawa Ontario.
- Conducted Environmental inspection of the dewatering process for the Elbow Valley Residential sanitary sewer system, Calgary Alberta.

Species at Risk Inventories

- Completed SAR assessment for the Colborne Effluent forcemain.
- Completed Protection of SAR assessment for MTO Contract 2010-4028 near Perth, ON.
- Completed butternut assessments in Port Hope, Prescott, and Martintown for proposed solar farms.
- Completed butternut assessments for a proposed sand pit expansion near Bourget, ON.
- Completed butternut assessment for proposed quarry near Moose Creek, ON.
- Completed SAR habitat assessment and search for butternut and American ginseng inventories along Thorps-Ellis Drain, S, D & G
- Completed SAR habitat assessment for proposed WPCP expansion in Greater Napanee, ON.
- Completed butternut assessment on butternuts located on a proposed property to be subdivided in Stittsville.
- Completed butternut inventory for the proposed Clear Point Hydroelectric facility, Renfrew, ON.
- Completed visual surveys for turtle species at risk along the Bonnechere River, Renfrew, ON.
- Completed visual survey for Eastern musk turtle near Kemptville, ON

Other

- Currently co-authoring the Walleye Management Plan for Lake St. Francis with the Raisin Region Conservation Authority and OMNR.
- Assisted in the peer review of the Talston Hydroelectric project, NWT Canada.
- Presented a talk on monitoring walleye larvae and BMPs at the IAGLR Conference, May 2006.
- Presented *How to Develop a Monitoring Program for BMPs* at the Great Lakes Sustainability Non Point Source Symposium, March 2006
- Co-authored Lake St. Francis Fish Habitat Plan for Raisin Region Conservation Authority.
- Coordinated the 2003 Strategic Habitat Restoration Working Group workshop for the Raisin Region Conservation Authority.
- Co-authored a paper on the Effects of Marine Pipelines on the Benthic Environment, presented at the 7th International Symposium on Environmental Concerns in Right-of-Way Management.
- Created and conducted environmental education programs in French for children and the general public.



SHAUN M. ST.PIERRE, B.Sc.**EDUCATION**

B.Sc. Biology, Trent University 2007

Fisheries and Wildlife Technology, Frost Campus, Sir Sandford Fleming College, 2005

Fisheries and Wildlife Technician, Frost Campus, Sir Sandford Fleming College, 2004

LANGUAGES

Fluent in French and English

POSITIONS HELD

2006-: Bowfin Environmental Consulting Inc., Field Assistant/Environmental Site Inspector

2005: St. Lawrence River Institute of Environmental Sciences, Field Research Assistant

2004: MNR Kawartha Lakes, Field Research Assistant

2003: DFO- Experimental Lake Area, Field Research Assistant

2001: Resource Stewardship S, D &G, Stewardship Ranger

CERTIFICATIONS

Ontario Benthos Biomonitoring Network, Ontario Stream Assessment Protocol, Butternut Health Assessor, Class 2 Electroshocking, first aid, CPR, Pleasure Craft Operator Card, Marine Radio Operator, WHMIS, All Terrain Vehicle Riders Course (issued by the Manitoba Safety Council), Water Safety Training (Bronze Cross), Ontario Trapping Course and Snowmobile Licenses.

EXPERIENCE

Experience assisting in environmental monitoring, environmental assessments, terrestrial habitat assessment, freshwater habitat assessment, fish behavioral studies, winter bat hibernaculum inventories and fisheries inventories including habitat mapping, electroshocking, FWIN and RIN. Other experience include GIS.

Aquatic Inventories

- Assisted with boat electrofishing along the shoreline of the Cataraqui River (Kingston, ON), South Nation River (Casselman, ON), Raisin River (Lancaster, ON), and Lake St. Francis (South Lancaster, ON).
- Assisted in collecting and data entry for benthic macroinvertebrate community surveys on several watercourses within Ontario including: Bonnechere River (Renfrew, ON), tributaries of the Bonnechere River (Renfrew, ON), the Jock River (Ottawa, ON) and tributary to the Beaudette River (Alexandria, ON).
- Assisted in collecting and data entry for several fish community surveys using backpack electrofisher including: Bonnechere River (Renfrew and Douglas, ON), tributaries of the Bonnechere River (Renfrew, ON), tributary to the Beaudette River (Alexandria, ON),



tributaries to the South Nation River (Jessup Falls, ON), Butler's Creek (Brockville, ON), Black Creek (Westminster, ON) and Lac Opemisca (Ouje-Bougoumou, QC).

- Mapped fish habitat in many watercourses including: tributaries to the South Nation River (Jessup Falls, ON), Butler's Creek (Brockville, ON), Black Creek (Westminster, ON).
- Assisted in YOY sampling on the Raisin River (Lancaster, ON).
- Assisted in conducting riverine index netting on the Bonnechere River (Renfrew, ON).
- Assisted in conducting larvae surveys on Hoople Creek, Raisin River and the Bonnechere River.
- Assisted in collecting walleye eggs from the spawning grounds on the Raisin River and Hoople Creek.
- Assisted in the monitoring of a new wetland channel created in the Little Cataraqui River.
- Marsh monitoring program breeding amphibian survey at Hoople Creek and the Bonnechere River.
- Assisted in conducting fall walleye index netting for the MNR in Kawartha Lakes

Species at Risk Inventories

- Butternut survey and assessment for proposed development (Brockville, ON).
- Butternut survey and assessment for proposed development (South Lancaster, ON).
- Butternut survey and assessment for quarry expansion (Moosecreek, ON).
- Butternut survey and assessment for quarry expansion (Westminster, ON).
- Butternut survey along the Bonnechere River near Renfrew Ontario.
- American Eel survey on the South Nation River (Casselman, ON)
- American Ginseng survey for proposed development (South Lancaster, ON).
- American Ginseng survey along the Bonnechere River near Renfrew Ontario.

Terrestrial Inventories

- Plant community inventories for proposed development (Ouje-Bougoumou, QC)
- Plant community inventories for proposed development (Brockville, ON)
- Plant community inventories for proposed development (Hamilton, ON)
- Plant community inventories for proposed development (Simcoe, ON)
- Plant community inventories for proposed development (South Lancaster, ON).
- Plant community inventories for quarry expansion (Moosecreek, ON).
- Plant community inventories for quarry expansion (Westminster, ON).
- Plant community inventories along the Bonnechere River (Renfrew)
- Plant community inventories for the Caron street extension (Rockland)

Environmental and Fisheries Inspections

- Conducted environmental inspections for the construction of the Clarkson WWTP outfall, Lake Ontario.
- Assisted in providing environmental and fisheries inspections for the blasting and drilling operation for the Burloak Water Purification Tunnel project (Burlington, ON).
- Assisted in providing environmental and fisheries inspections for the construction of the Poole Creek Re-alignment/Huntmar Drive Crossing.

Aquatic Habitat Mapping for Municipal, City Roads and Provincial Highways



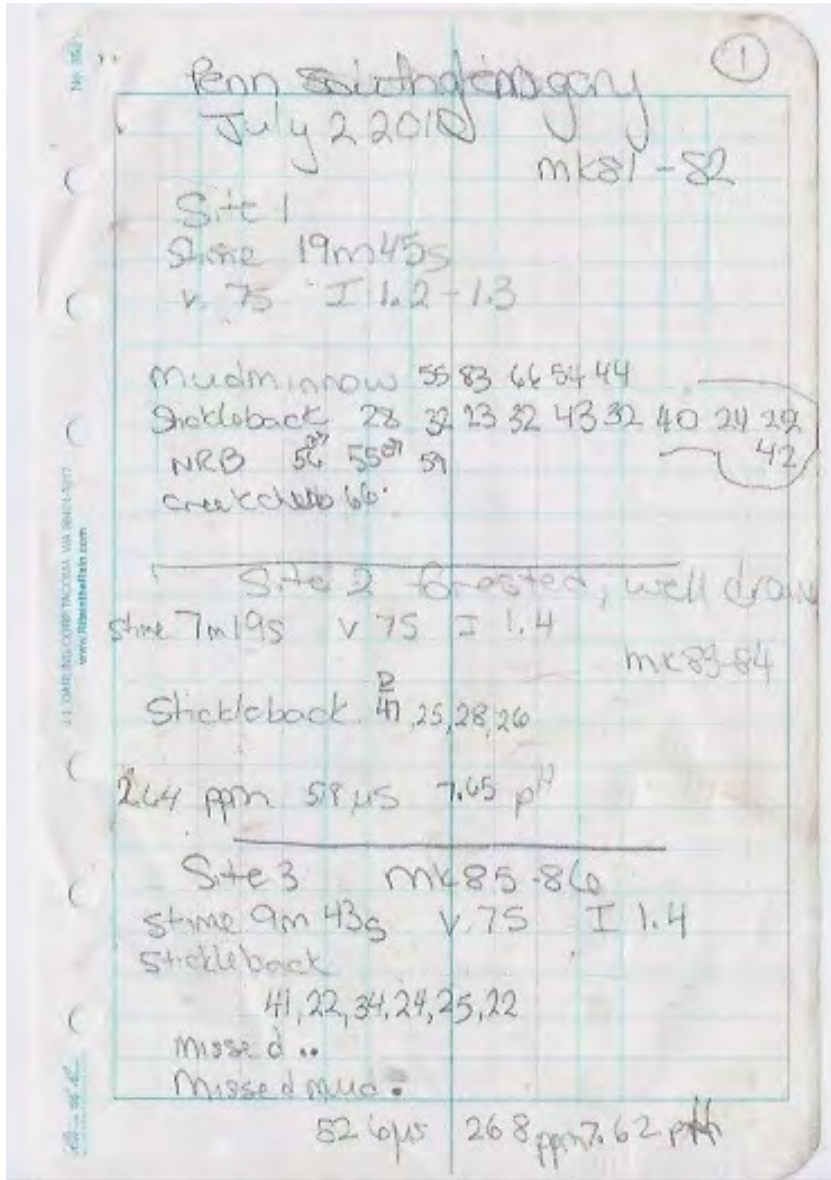
- Conducted MTO habitat assessments at Prince of Wales, Fernbank road, Fallowfield road, HWY 115, Arbuckle drain, the Carp river, tributaries to the Carp river and tributaries to Mud creek.

Other

- Assisted in conducting a winter bat hibernaculum inventory (Plantagenet)
- Field research assistant for the Metalicus study and EDC study (Experimental Lakes Area)
- Captured, pit tagged and tracked Northern Pike (Experimental Lakes Area)
- Construction and maintenance of nature trail (the Cornwall Outdoor Recreational Area)
- Conducted frog deformities surveys (Glengarry)



Appendix C – Field Notes



PENN S. GLENGARRY

July 2/10 08

SITE 1
 LENGTH 60m
 @1017h A.T. 18°C
 W.T. 12°C
 493 u/s
 262 p/s
 7.61 p/s

m081 D/S P.00/S.020/S
 m082 u/s P.31 u/s 300/S
 NW 345 DEPTHS 25, 45, 52, 38, 15
 336 17, 52, 56, 40, 18
 700 18, 50, 51, 39, 13

P.033 - 035 DRAGONFLY

GREEN POND
 VERY
 SWAMP SPHAGNUM
 DARE EGG JUNCUS
 BLUE JAY

SITE 2 LENGTH 40
 @1047h A.T. 18°C
 N.T. 12°C

m083 D/S P.38 u/s 370/S
 m084 u/s P.36 u/s 370/S

NW 150 DEPTHS 12, 17, 17, 12, 9
 70 2, 4, 11, 7, 5
 103 2, 6, 9, 5, 2

SITE 3
 LENGTH 50m
 A.T. 18°C
 N.T. 13°C @1119h

m085 D/S P.42 u/s 480/S
 m086 u/s P.40 u/s 480/S

NW 130 DEPTHS 3, 1, 14, 17, 8
 87 3, 7, 8, 10, 5
 250 4, 5, 7, 5, 3

m087 SIDE DITCH P.44 u/s
 m088 AT 9 mile u/s P.50 LOOKING THROUGH CURVE
 COLLECT FLEECE OF BLOCKAGE
 P.51 LOOKING U/S
 m089 AT 9 mile D/S P.52 LOOKING D/S

P.045 - 049 DRAGONFLY
 DRAGONFLY WHITE FACE
 EASTERN KING BIRD



Date: July 28/10		Location: S. GLEN HAVEN		Site Length (m): 75		AirTemp: 21°C		TDS		Page 1 of 1						
Time: 07:50		Stream Name: WOOD DRAIN		GPS Mark D/S: 12046 12116		WaterTemp: 17°C		Cond: 480µS/cm								
Crew Members: 55		Site #: 1		GPS Mark U/S: 10222 10305 12404		pH: 7.67		Time: 08:04								
Transect #	Distance (m)	CW (cm)	WW (cm)	Bank Height (cm)		Depths (cm)/Cover/Substrate (mm)/Habitat						% Canopy Cover	% Bank Veg	Comments (pictures, temp...)		
				Left	Right											
1	0	100 372	372	12	11	23 61 57 39 3							0	100	NSE	
2	15	86 421	421	15	14	16 37 60 28 14							0	100	NSE	
3	30	14 334	334	18	19	26 51 49 39 17							0	100	NSE	
4	45	100 423	423	20	22	21 57 50 24 8							0	100	NSE	
5	60	650 630	630	25	15	14 37 72 21 15							0	100	NSE	

COMMENTS: (surrounding land-use, %tree, shrub, herb + 3 dom. sp. for each category, veg list, barriers...)

AV: CHAMA B.V. ① C. GRASS ~~TRUSS~~-200 APPEARS TO BE BACKED UP BY ALGAE MAT
 ② SP. BARKED ② S. BARKED ② P. BARKED ② S. BARKED ② S. BARKED
 ③ L.P. BARKED ③ P. BARKED ③ S. BARKED ③ S. BARKED ③ S. BARKED
 ④ R. G. C. ④ P. BARKED ④ S. BARKED ④ S. BARKED ④ S. BARKED

HAVE BEEN ORDERED IN THE AREA



Date: <u>Jan 4 2010</u>		Location: <u>S. Glengarry Penn</u>		Site Length (m): <u>40</u>		Air Temp: <u>20°C</u>		TDS		Page <u>1</u> of <u>1</u>						
Time: <u>08:27</u>		Stream Name: <u>WOOD DRAIN</u>		GPS Mark D/S: <u>11071 P12416 120</u>		Water Temp: <u>15°C</u>		Cond. <u>524 us 289</u>								
Crew Members: <u>SS</u>		Site #: <u>2</u>		GPS Mark U/S: <u>11074 P12416 120</u>		<u>7.68m</u>		Time: <u>08:28</u>								
Transect #	Distance (m)	CW (cm)	WW (cm)	Bank Height (cm)		Depths (cm)/Cover/Substrate (mm)/Habitat					% Canopy Cover	% Bank Veg	Comments (pictures, temp...)			
				Left	Right	10	12	9	8	5						
1	0	171	160	27	25	10	12	9	8	5				Exp. Soil		
2	10	282	180	20	25	8	6	3	3	3						
						FI										
3	20	278	128	20	20	4	4	4	2	3						
						FI										
4	30	200	103	16	17	7	4	4	3	2						
						FI										
5	40	219	135	16	14	4	4	4	3	2						
						FI										

COMMENTS: (surrounding land-use, %tree, shrub, herb + 3 dom. sp. for each category, veg list, barriers...)

VISIBLE FLOW

SHRUBS OF TREE D.P. ASH @ HYBRID MAPLE

B.V. (P) NERLE (S) S. REDWOOD (L) S. PEAR

RECENTLY DREDGED NO LINDEN SHED



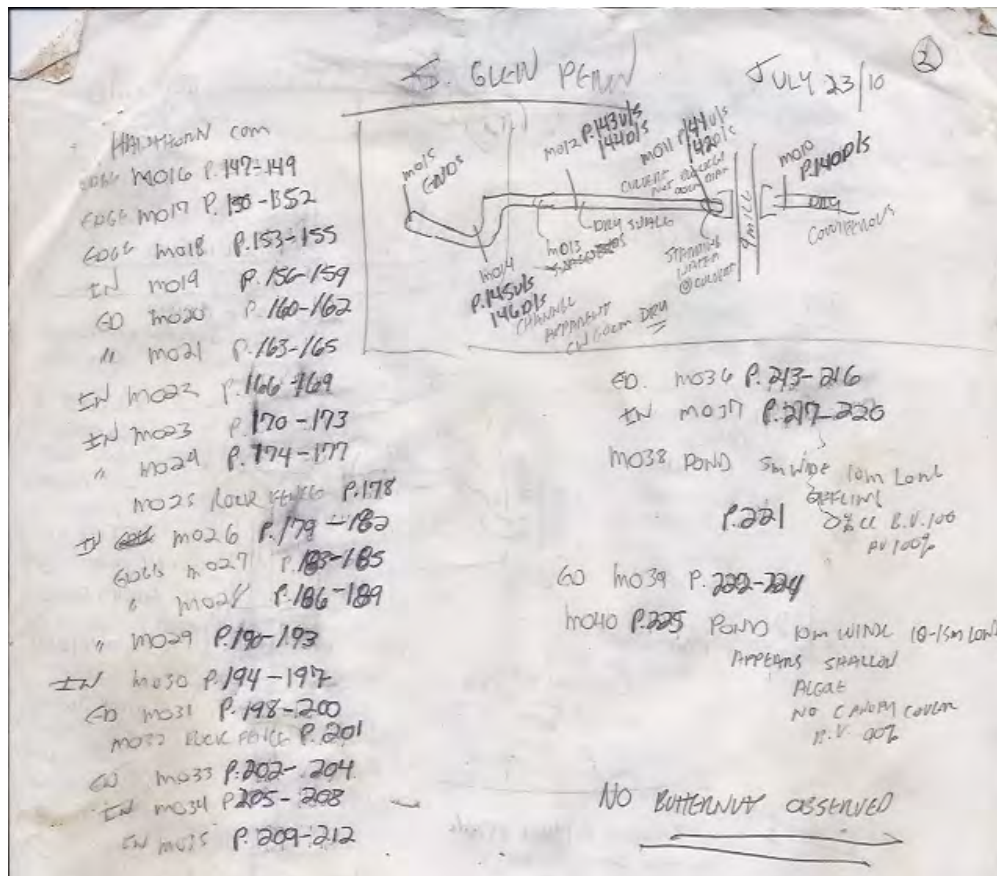
Date: 05/28/10		Location: S. GLEN PENN		Site Length (m): 50	AirTemp: 20°C	TDS	Page 1 of 1									
Time: 0845		Stream Name: WOOD DRAIN		GPS Mark D/S: MASS PL 304613	WaterTemp: 15°C	Cond: 276 µS/cm										
Crew Members: 3		Site #: 3		GPS Mark U/S: MASS 0152461506	9.68	Time: 0847										
Transect #	Distance (m)	CW (cm)	WW (cm)	Bank Height (cm)		Depths (cm)/Cover/Substrate (mm)/Habitat						% Canopy Cover	% Bank Veg	Comments (pictures, temp...)		
				Left	Right											
1	0	400	167	15	12	3	6	5	5	4				100	50	exp. soil
						Fl										
						GL										
2	12.5	349	152	14	11		2	2	3	2				100	50	/
						Fl										
						GL										
3	25	245	157	19	20	3	4	5	6	2				100	60	moor silt
						Fl										//
						GL										
4	37.5	171	108	21	15	3	7	10	6	2				100	50	moor silt - 100%
						Fl										7, 60
						GL										
5	50	257	154	18	20	5	7	6	5	4				100	60	//
						Fl										
						GL										

COMMENTS: (surrounding land-use, %tree, shrub, herb + 3 dom. sp. for each category, veg list, barriers...)

UGG SAME AS SITE 2







Oct 12, 2010
 S. GLENGARRY PENN
 MK184 Marsh edge
 P. 315
 Se edge
 AT DIRT CROSSING ON 9 mile
 WEST OF ROAD P. 316-318

S. GLENGARRY OCT 20/10
 MK 260 To Gnc
 261 P. 338 looking E MK 266
 P. 339 looking NE up
 White pine
 P. 340 looking toward
 NW MK 221
 So. 1 beaver
 dam on
 over
 clay
 262 P. 341 NW P. 24E
 ditch
 P. 342, 343, 344 straddled
 Shallow w/w used flooded
 by beavers
 substrate much - 55cm
 iron sep over
 clay
 P. 345 R
 346 SE 347 NW MK 263
 MK 264 edge of comm 261
 MK 265 P. 348 W
 P. 349 N 4 to G5
 MK 266 P. 350, 351
 P. 352-354
 AT 9 mile



Appendix D – Site Concept Plans

