Environmental Assessment
Home Hardware Stores Limited Warehouse & Distribution Centre Expansion

Debert Air Industrial Park

Nova Scotia Environment

exp. Services Inc.
formerly ADI Limited
89 Queen Street
Truro, NS B2N 2B2

Home Hardware Stores Limited Warehouse & Distribution Centre Expansion

Debert Air Industrial Park

Debert, Nova Scotia

prepared for:

Nova Scotia Environment

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DISCLOSURE STATEMENT:

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1.0 Introduction

Home Hardware Stores Limited (HHSL), *the Proponent*, currently owns and operates a warehouse and distribution centre in Debert, Nova Scotia and is proposing a facility expansion. Due to the presence of an existing 3.21-hectare wetland, approval to execute the proposed site changes and construct the facility expansion is understood to be required under the Nova Scotia Environmental Assessment Regulations. The registration of this Environmental Assessment is in response to Schedule A of the Environmental Assessment Regulations, Undertaking F2 (*An undertaking that disrupts a total of 2-hectares or more of any wetland*).

Information pertaining to the Environmental Assessment completed is outlined and discussed herein.

1.1 Name of Undertaking

HHSL proposes to construct a warehouse facility expansion and continue to operate this expanded warehouse facility. The proposed undertaking will be referred to herein as *the Project*.

1.2 Location of Undertaking

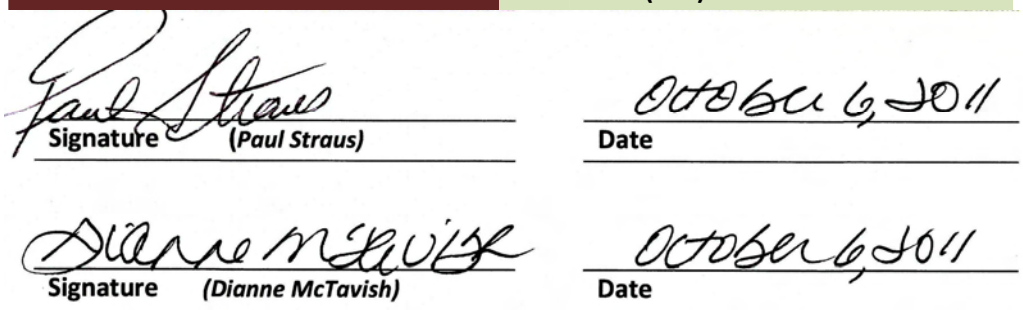
The site of the Project is located within the Debert Air Industrial Park in Colchester County, Nova Scotia, approximately 15-km northwest of the Town of Truro and approximately 2-km southeast of the Village of Debert. The site is bounded on the east and west by two (2) publically owned roads; Lancaster Crescent, on the south by Plains Road and on the north by an industrial property. The property is at about 45^{o} – 25.32'N and 63^{o} – 25.82'W located on the *Truro, Nova Scotia 11E/06, 1:50,000 Topographic Map*. A Project Location Plan is provided in Figure 1 within Appendix 1 of this report.

1.3 Proponent Identification

Table 1.3 below outlines information of the Proponent.

Table 1.3: Proponent Identification

Name of Proponent:	**Home Hardware Stores Limited (HHSL)**
Contact Information:	**Head Office:** **34 Henry Street West** **St. Jacobs, ON** **N0B 2N0** **Tel: (519) 664-2252** **Fax: (519) 664-3943** **Debert Facility:** **336 Lancaster Crescent** **Debert, NS** **B0M 1G0** **Harvey Gullon** **Tel: (902) 662-2800** **Fax: (902) 662-2051**
Chief Signing Officers:	**Paul Straus** **Dianne McTavish** **34 Henry Street West** **St. Jacobs, ON** **N0B 2N0** **Tel: (519) 664-4986** **Fax: (519) 664-3943**



1.4 EA Responsibility

The methodology for the preparation of this document was developed to satisfy regulatory requirements for an Environmental Assessment (EA) for a Class 1 Undertaking under Nova Scotia Environment (NSE) Regulations.

The Environmental Assessment Registration and Biophysical Overview were prepared by:

Exp (formerly ADI Limited) 89 Queen Street Truro, NS B2N 2B2 Contact: Douglas Bach, P.Eng. Telephone: (902) 895-1507 ext. 5223 Fax: (902) 893-2152 Email: douglas.bach@exp.com	**Enviroshpere Consultants Limited** Unit 5 – 120 Morrison Drive PO Box 2906 Windsor, NS B0N 2T0 Contacts: Patrick Stewart, B.Sc. (Hons) Zoology; M.Sc. Oceanography Heather Levy, B.Sc. (Hons) Environmental Science Telephone: (902) 798-4022 Fax: (902) 798-2614 Email: enviroco@ns.sympatico.ca

2.0 Project Information

The following sections provide information that describes the Project.

2.1 Description of Undertaking

2.1.1 Existing Facilities & Operation

HSSL owns and operates a warehouse and distribution centre located in the Debert Air Industrial Park in Colchester County, Nova Scotia. The first building constructed by HSSL is approximately 250,000-square-feet and was completed in 1980. A building addition measuring approximately 110,000-square-feet was constructed in 2003. There are two (2) other existing detached buildings on site currently occupied by HSSL that were originally owned and occupied by the Canadian Military prior to HSSL assuming ownership of the property. One (1) of these existing buildings measures approximately 70,000-square-feet and is currently used for material storage. The second existing building measures approximately 4,000-square-feet and is currently used as a vehicle repair garage. The existing site layout of these existing buildings is illustrated in Figure 2 within Appendix 2 of this report.

2.1.2 Land Ownership

The Proponent currently owns the land it now occupies located on Lancaster Crescent within the Debert Air Industrial Park. The existing property is identified as two (2) property lots with property identification numbers (PID) 20117990 and 20153748 respectively. It is the intention of the Proponent to purchase additional property for the Project. This additional property specifically will include the existing railway right-of-way, currently owned by Canadian National Railway (CNR), between Plains Road and the existing north property boundary (PID 20179066) as well as four (4) property lots between the CNR right-of-way and Lancaster Crescent (PID 20153540, 20153557, PID 20153565 and PID 20153573). The existing layout of these property lots is illustrated in Figure 2 within Appendix 2 of this report. Refer to Appendix 6 for additional information regarding land ownership.

2.1.3 Purpose & Need of Undertaking

This warehouse and distribution centre in Debert provides timely deliveries to Home Hardware Stores, Home Building Centres, Home Hardware Building Centres, and Home Furniture Stores throughout the Atlantic Provinces and the eastern portion of the province of Quebec. The Proponent has determined there is an immediate requirement for increased warehouse space at this distribution centre in order to satisfy increasing shipping and receiving volumes and demands, and to improve the efficiencies within the facility.

2.2 Investigation of Project Alternatives

Several proposed layouts to accommodate the required expansion of warehouse space were investigated. Inventory is handled and transported from within the main warehouse building using a state-of-the-art conveyor system and the facility expansion must enable the efficient expansion of this conveyor system. Options investigated for configuring the proposed facility expansion within the existing property boundaries were inadequate and unsuitable for overall site layout and function and would have involved inefficient and impractical conveyor modifications. It is also projected that within the coming few years, there will be a requirement for additional capacity at this distribution centre beyond what is planned for this Project.

2.3 Project Components

The proposed work will involve approximately three (3) phases to complete. Phase 1 will include a major portion of the site-work as well as the construction of approximately 140,000-square-feet of new warehouse space. During this phase, the existing transfer truck entrance is planned to be relocated

from the east side of the facility to the west side. The employee entrance is planned to remain at its current location on the east side of the facility. A relatively small portion of the existing detached warehouse building is planned to be demolished to allow the construction of the new building addition.

Phase 2 of the proposed work will include the construction of 90,000-square-feet of new warehouse space. It is expected that this phase will be undertaken immediately following Phase 1. The overall 230,000-square-foot facility expansion encompassed within Phase 1 and Phase 2 will be executed so as to accommodate existing shipping and receiving logistics of the operation.

Phase 3 will involve the construction of a new 40,000-square-foot repair garage and include the demolition of the existing repair garage building. This portion of the project is expected to be complete within approximately five (5) years following of the completion of Phase 1 and Phase 2. A proposed site layout is illustrated in Figure 3 within Appendix 3 of this report.

2.3.1 Site Preparation

The existing site has been occupied by the proponent and used as a warehouse facility since 1980. The adjacent property to the west of the CNR right-of-way has been unoccupied to date and is currently partially tree covered. Some of the treed area has recently been cleared by the current owner. As illustrated in Figure 2 in Appendix 2, much of the existing property (3.21-hectares) has been classified as a treed swamp (wetland).

Site-work is planned to involve some tree and brush removal, with areas to be maintained as "buffer zones" where possible, adjacent to the existing public roads. Removal of a major portion of the wetland is also necessary to achieve the planned facility expansion.

2.3.2 Construction Activities

The project will consist of several components, including excavation and backfilling for the construction of the warehouse expansion; detention ponds for management of surface water runoff from warehouse buildings and asphalt areas and parking / trailer marshaling areas; and construction of the warehouse facilities themselves.

Construction activities will begin at the site with a comprehensive geotechnical investigation to determine existing subsurface soil conditions and to establish building foundation design parameters. It is expected this portion of the work at the site will be conducted with typical mobile drilling equipment. Earthworks will be conducted in a manner that will satisfy the requirements of the archaeology report.

The detention ponds will be constructed using existing material from the site as available and appropriate for the use. Additional suitable sub-grade material will be imported from the local

area as required. It is expected that the side slopes on the detention ponds will be constructed to an approximate slope of 1-to-3 and will be stabilized with vegetation. Required inlet and discharge piping will also be installed.

Excavation will be executed for the removal of unsuitable material from the areas where buildings, roadways, and parking areas are to be constructed. These areas will be brought to final sub-grade elevations using appropriate imported material.

A system of catch basins and underground piping will be installed to collect water from the building roof(s) and adjacent loading areas, unloading areas, and parking areas. This storm-water will be discharged through an oil / water separator planned to be located adjacent to the detention ponds. The storm-water will be released to the remaining portion of the wetland at appropriate flow rates and discharge velocities.

The concrete building foundation will be constructed using typical spread footings similar to the existing construction. Final building floor elevation will match the existing to facilitate the movement of inventory within the warehouse building. The building superstructure is intended to be a pre-engineered steel building with a sloping metal roof and metal siding to match the existing building.

Surface works will include asphalt paving and the installation of finish gravel layers. This will also include the installation of topsoil and sod (or seeding) as well as overall landscaping activities.

2.3.3 Proposed Construction Schedule

The following is a general proposed construction schedule for Phase 1 work:

April 2012	Clearing and Grubbing
June/July 2012	Earthworks and Underground Utilities
July 2012	Partial Building Demolition
August 2012	Building Substructure
September/October 2012	Building Superstructure
November 2012	Surface Finishes

2.3.4 Controls During Construction

Potential water, air and noise impacts resulting from the construction activities will be mitigated as described herein.

Standard mitigation measures will be incorporated into plans and construction documents to prevent the release of sediment-laden water to the remaining portion of the existing wetland.

- Sedimentation and erosion control measures will be implemented prior to beginning the work and maintained during the course of the work to prevent entry of sediment into the water.
- All materials and equipment used for the purpose of the site preparation and project completion will be operated and stored in a manner that prevents any deleterious substance (petroleum products, etc.) from entering the downstream watercourse.
- Any in-water work will be isolated as much as possible and completed between June 1 and September 30, 2012.
- All disturbed areas of the work area will be stabilized as soon as possible after project completion.
- All materials imported to the site, including rock, will be clean, non-ore bearing and from a non-watercourse source.
- The operation of all machinery will take place from a stable location.

Dust generated during the course of the work will be minimized by speed control and, if necessary, with the application of a water spray to travelled areas. Combustion emissions will be reduced through proper equipment maintenance to ensure efficient operation and idling will be minimized as much as feasible.

There will be no burning or burial of any construction waste permitted at the site. Construction waste will be recycled and reused wherever possible or will be disposed of at an appropriate waste disposal facility. Proper control of garbage and construction debris will be maintained at the site to prevent attracting wildlife and/or eliminate anything that can harm or injure wildlife.

Organic peat (if any) removed from the wetland will be suitably disposed of, and if temporarily left on site, will be managed to ensure contained water or runoff does not reach the wetland without treatment, since it potentially has a high oxygen demand which could alter conditions in the wetland, and in downstream areas.

Any monitoring procedures required by NSE (noise, dust, surface water, etc.) will be developed to accommodate.

2.3.5 Accidents and Malfunctions

Hazardous materials (fuels, lubricants, hydraulic oil, etc.) and wastes such as waste oil will be managed so as to minimize the risk of chronic and/or accidental release. Refueling and maintenance activities will be undertaken on level terrain, at a suitable distance from environmentally sensitive areas and on a prepared impermeable surface.

Contractors will be required to have suitable emergency spill kits on site at all times. All spills or leaks will be promptly contained and cleaned up and reported to the 24-hour environmental emergencies reporting system (1-800-565-1633).

2.4 Project Funding

The Project will be 100% privately funded by the Proponent. Total budget for the three (3) phases of the project is expected to be in excess of $20-million.

2.5 Neighbouring Businesses

The property is bordered on the northeast by a Sobeys' Stores Distribution Center (a warehouse facility with refrigeration capabilities), and on the north by Nystone Chemicals which is currently not in operation. Previously the facility produced medical grade barium and former settling ponds for washwater remain on the site. Immediately to the south is the Richie Bros. Auctioneers painting facility as well as the Thermocell blown-in cellulose insulation plant. To the east across Lancaster Crescent are Onyx and Marble (a manufacturer of cultured marble countertops) and D'Moya Consulting (a management consultant). All the remaining lots on the eastern side of Lancaster Crescent are part of the Palaeo Indian interpretive development area. There are no other businesses to the south of the site along Plains Road or to the west along Lancaster Crescent.

2.6 Operation & Maintenance

Operation of the overall facility consists of receiving merchandise from vendors and suppliers as well as shipments from within the Home Hardware Stores Limited distribution system. This merchandise is stored at the facility and is then shipped to local Home Hardware Stores, Home Building Centres, Home Hardware Building Centres, and Home Furniture Stores throughout Atlantic Canada and eastern Quebec. All distribution traffic into and out of the site is primarily by transport truck.

The facility operates 24 hours per day for 5 days per week. The security gate for truck traffic is routinely open for 5 days per week (Monday to Friday) from 6:00 am to 8:00 pm. Most truck traffic (arrivals and departures) occur during this timeframe. A small amount of truck traffic occurs during the week outside this timeframe as well as on weekends but it is less than about 5% of the total volume of truck traffic. This operation schedule is expected to be maintained after the completion of the Project.

Maintenance activities at the facility generally consist of regular building and grounds upkeep as well as routine maintenance to the asphalt and gravel surfaces within the site. In addition, there is an existing vehicle repair garage on site, which is scheduled for replacement as previously discussed, where routine maintenance is conducted on the vehicle fleet.

2.7 Environmental Contaminants

Activities in the construction phase and during operation of industrial sites have potential to release contaminants, typically at low levels, to local aquatic and terrestrial environments. Runoff from building surfaces would contain low levels of particulates (e.g. dust). Runoff from parking areas may contain low levels of hydrocarbons including PAHs and aliphatic hydrocarbons from vehicle exhaust and normal operating losses from vehicles, as well as dust and dirt which would be released from paved areas into surface runoff. If ice control is required in parking areas, there is the potential for ice-control agents such as road salt entering the runoff from the site. Potential for spills of product at the site are remote. The distribution facility has a hazardous materials containment area for storage of hazardous products.

Soils at the site are reported to be sandy, derived from near-surface sandstone bedrock, with a low potential for loss of fines to the surrounding environment if eroded during the construction phase of the project.

2.8 Scope of Environmental Assessment

The Environmental Assessment reviews environmental features and human activities within approximately 10-km of the project site, to determine potential effects of the project. Environmental information for the assessment was obtained from consultants' personal knowledge, from reviews of available information, and knowledge of the purpose and proposed design of the project. The approach to environmental assessment under the Canadian Environmental Assessment Act (CEAA) has been followed. In addition, the EA methodology was developed to satisfy regulatory requirements for an EA for a Class 1 Undertaking under the NSE Regulations. In general, lists of valued environmental components (VECs)[1], and project activities and outcomes for the expansion and operation of the Home Hardware Warehouse and Distribution Centre were developed, and the potential for interactions with VECs identified. Where interactions were identified and significant impacts were likely to occur, mitigative actions were determined which would remove the impact, and would be included in the project. The process ensures that all potentially significant impacts on VECs are identified and all potential impacts on them have been considered and sufficient mitigation planned

1 Valued Environmental Components (VECs) are features or things in the environment, which are important either ecologically, socially, economically or culturally. The environmental assessment addresses potential impacts of the project on each VEC identified. To do so involves identifying all the activities or outcomes of the Project which interact with each VEC, and then determining and rating the magnitude of the impact in a standard way, in this case in a manner guided by standard approaches which have been developed for assessments under CEAA.

3 Public Involvement

The following sections discuss the involvement of the local public and First Nations Groups in the Project to date.

3.1 Methods of Involvement

The focus of public involvement is to share information with, and gather input from, members of the public and First Nations groups who may have an interest in a proposed project. The intention of public involvement is to ensure that those who make decisions during and after the Environmental Assessment process are well informed.

A Public Information Session was advertised in two (2) major newspapers (Truro Daily News and the Chronicle Herald) and was conducted at an appropriate venue within the immediate community (Debert Hospitality Centre, 156 Ventura Drive, Debert, Nova Scotia). The session provided information to members of the public in attendance on the proposed Home Hardware Distribution Centre Expansion project as it relates to a local on-site wetland. Representatives from HHSL as well as the Colchester Regional Development Agency (CoRDA) and **exp** (formerly ADI Limited) were available and answered questions presented by those in attendance.

There were about a half dozen (5 who signed the guestbook) interested individuals in attendance at the Public Information Session held on February 3, 2011 at the Debert Hospitality Centre in Debert. The attendees included the MLA for Colchester North, a municipal councillor as well as a representative from the Maritime Aboriginal Peoples Council. No other First Nations groups were in attendance. There appeared to be general agreement that the proposed Undertaking would be a net benefit to the local area.

Contacts were made to engage and advise the Mi'kmaq (CMM and KMKNO) of the proposed project details. Draft copies of the existing site plan and proposed finished site plan were forwarded to CMM, KMKNO as well as the Maritime Aboriginal Peoples Council in January 2011. A meeting was held in July 2011 with representatives from CMM at their office in Truro. An open and informative discussion was held concerning the proponent's plans for the Project especially relating to the ongoing archaeological testing on the four lots. Home Hardware Stores Limited would like to thank CMM for the opportunity to discuss the Project in such an open and relaxed forum.

Considerable contact was also maintained between CoRDA and First Nations groups, especially relating to the archaeological testing of the four lots intended to be purchased and developed by HHSL. Home Hardware Stores Limited would like to thank CoRDA for their excellent coordination and communication efforts with the various First Nations groups. A copy of a letter from Twila Gaudet (Consultation Liason Officer with KMK) and Jody Mattie (Director of Business Development with CoRDA) is attached under Appendix 7.

3.2 Stakeholder Comments & Measures to Address Issues

Two specific questions were asked by interested individuals during the Public Information Session.

The first was regarding the results of the archaeological impact assessment conducted on the four lots scheduled to be purchased by HHSL. The response was that the final report was not yet available but preliminary information suggested that no archaeological artefacts were found during the course of the investigation. It was reported that it was the intention of the proponent to make the results of the final archaeological report available with the Registration Document, if it were available at that time.

The second question was regarding the proposed compensation method for the disturbed existing wetland. The response was that the wetland compensation portion of the project had not yet been completed although it was realized that compensation of some type would no doubt be required.

One of the concerns of the First Nations groups has been the adequate protection or compensation methods for the wetland on the four lots to be purchased by HHSL. It is the intention of the proponent to protect a small portion of the existing wetland immediately north of Plains Road and to provide an acceptable compensation plan for the remainder prior to proceeding with the project.

The other primary concern of First Nations groups is the protection of any archaeological resources that may be affected by the Project. The proponent will not take ownership of the property in question until all archaeological testing has been completed and approved by the Nova Scotia Museum Heritage Division. The Project will proceed only if all archaeological concerns are addressed to the satisfaction of the Nova Scotia Museum Heritage Division.

4 Existing Environment

The following sections identify the various components of the existing environment within the site of the Project.

4.1 Biophysical Environment

A description of the Existing Environment is provided in the report *Biophysical Assessment Home Hardware Expansion—336 Lancaster Crescent, Debert Air Industrial Park, Debert, N.S.* (Envirosphere 2010) found in Appendix 4.

As previously discussed, the project site is located within the Debert Air Industrial Park in Colchester County, Nova Scotia and is bordered on the east and west by Lancaster Crescent and on the south by Plains Road. Existing warehouse/distribution facilities border the area on the east and northeast, and an industrial building occupies the north. A former rail-bed runs through the east side of the site.

The site is approximately 2 km southeast of the community of Debert on a portion of the Minas Lowlands occupied by gently undulating glacial till plains that separate the Cobequid Uplands to the north, from Cobequid Bay of Minas Basin, to the south (Davis and Browne 1997). The area is underlain by red sandstone and conglomerate of the Wolfville Formation, and overlain by sandy/gravely till. Soils at the site belong to the Truro formation, and range from non-stoney, well-drained to imperfectly-drained podzols over sandstone bedrock to imperfectly-drained soils to the east and west, and soil composition closely reflects that of the underlying bedrock.

Topography is generally level to undulating with a gradual slope northward towards the Cobequid Uplands. The site of the proposed expansion includes a broad, low-relief swale extending to the south across Plains Road and bordered by areas of higher elevation to the east and west. The Minas Lowland, in which the project is located, is drained by several rivers including the Debert and the Chiganois which originate in the Cobequid Uplands to the north, flowing through the area to discharge in Cobequid Bay of Minas Basin.

The project site is at the head of the watershed of the Chiganois River, draining through an intermittent stream into Galloping Brook, which flows into MacElmons Pond and thence into the Chiganois River. Peak runoff occurs in the March-to-May period with secondary peaks in the October-to-January period.

4.2 Groundwater Flow Patterns

The Project site serves as a local groundwater recharge area. The regional groundwater flow is inferred to be generally south to southwest and should follow the topography generally southwards toward local wetlands and streams. Regionally, the surface area affected (~9.5 ha) is a small part of the overall aquifer recharge for the area, although locally the project will occupy most of the remaining watershed area available for recharge in the industrial park, estimated to be 13 ha.

4.3 Terrestrial Environment

The study area is located in a mature to semi-mature mixed forest, dominated by white spruce, white pine, trembling aspen, red maple, and balsam fir, which has been variously opened up by forestry activities and industrial development, although the adjacent areas are mainly undeveloped. From Envirosphere 2010 (Appendix 4) and functional assessment carried out in July 2010 (Marbicon 2010, Appendix 5) a wetland area (treed swamp) in the middle of the site is dominated by cat-tails, wire birch, poplar and maple and associated understory communities. South of Plains Road a patchwork of low, level swampy areas dominated by red maple, speckled alder, larch, and black spruce, alternating with the typical forest on the more elevated portions occurs. The site is used by local wildlife and avifauna

and could be considered suitable habitat for a wide range of species; however the fragmentation introduced by roads on the west and south reduces the value of habitat at the site. No plant species at risk were found during botanical surveys (2010) and literature searches did not identify other potential species of significance in the vicinity of the site.

4.4 Freshwater Aquatic Environments & Wetlands

Wetland characteristics and plant species composition was determined in Marbicon 2010, Appendix 5. No significant wetland habitats listed in the Nova Scotia Department of Natural Resources (NSDNR) Significant Habitats Database (www.gov.ns.ca/natr/wildlife/habitats/hab-data/default.asp) occur in the study area. The site includes a wooded swamp (3.2-hectares), which drains through an intermittent stream and exits the property through a culvert under Plains Road (Figure 2). South of Plains Road is a complex of wetlands and ponds in the Galloping Brook watershed. The extent and characteristics of the wetland at the site were determined by Marbicon 2010, Appendix 5). Most of the forest surrounding the wetland had been cut prior to the site survey. The wetland functions hydrologically as a recharge area. Overall the absolute flows into the watershed will not change significantly and potentially will not impact the Chiganois River downstream, which is separated from the watershed at the site by MacElmons Pond, which is a retention area.

The intermittent stream originates at a culvert under the existing rail bed at the discharge point for the storm-water collection system at the site. The stream is not suitable fish habitat based on the field survey and there is no access to the site for fish due to a blocked culvert under Plains Road. The stream is mostly 0.3m to 1m wide and 0.15m to 0.2m deep, sometimes disappearing beneath grass hummocks. The outlet for the stream under Plains Road is blocked, but some flow percolates from the ground on the south side. Below Plains Road the stream continues with similar width and depth into an alder swamp.

4.5 Fish and Fish Habitat

No fish habitat occurs on site, however, the site is a recharge area in the upper watershed of Galloping Brook, a first order stream which flows into MacElmons Pond. Galloping Brook, MacElmons Pond, and the Chiganois River, into which they drain, support various fish species, most commonly brook trout, American eel and white sucker, with gaspereau and Atlantic Salmon occurring in the Chiganois River. Absolute volume of flows will likely be similar after completion of the project, and, with mitigation in place to regulate peak flows, the project is expected to have negligible impact on flows in the Chiganois River. Atlantic salmon, as part of the Inner Bay of Fundy population, are at reduced numbers and are considered at-risk both provincially and under federal species at-risk legislation. The Chiganois River is important for Atlantic salmon stocked to maintain genetic diversity for hatchery rearing and has been stocked annually in most years since 2002. Atlantic herring, shad, gaspereau, flounder, striped bass and

Atlantic sturgeon can all be found at the mouth of the Chiganois River in Cobequid Bay. Fish populations and species diversity in the watershed of Chiganois River are reduced by the presence of tidal gates at the mouth of the river which limit fish passage.

4.6 Birds and Other Wildlife

The site provides habitat for various bird species, in particular in the remaining uncut mixed forest along Lancaster Crescent and Plains Road and along the axis of the wetland. It is not critical habitat for any species, because of the adjacent industrial facilities on the north and east sides, and the removal of forest on the remaining areas of the site carried out in 2010. Habitat at the site is not suitable for several of the uncommon or at-risk species known to nest in the general area (bobolink, barn swallow and common loon) although Canada warbler and boreal chickadee may have nested in the area before it was cut over. The general area of the site is productive for birds (111 species are suspected or have been confirmed to breed in the general vicinity). Large raptors, including bald eagle and osprey, occur east and west of the site adjacent to the Chiganois and Debert Rivers. Bald eagles also nest in the vicinity of MacElmons Pond, in the Debert Wildlife Management Area, located approximately 7-km south of the project site. MacElmons Pond is an important nesting and staging area for migrating waterfowl and supports a small population of American widgeon.

No significant or unique concentrations of mammals are known from the site. Moose and pygmy shrew, species which have conservation status, have been reported in the region, but are rare, and unlikely to be encountered. White-tailed deer tracks were evident during the site visit November 16, 2010.

No amphibian species of concern have been reported in the study area and significant occurrences are unlikely. The Wood Turtle, *Glyptemys insculpta*, a federally listed species at risk, has been reported near the Chiganois River, east of the project site. The species normally nests near slow flowing streams in the intervale areas but can move into upper parts of tributaries in the home watersheds in summer. The project site is some distance from possible nesting and overwintering sites, as the Galloping Brook watershed only joins the Chiganois River below MacElmons Pond Provincial Park. Access is also blocked by local roads and industrial development between the site and the Chiganois River, so the occurrence of the species at the site is unlikely.

4.7 Species at Risk

Species at-risk are those plants or animals whose existence is threatened or which are in danger of being threatened, by human activities or natural events. Species which are considered to be at-risk are selected by provincial, national and international conservation and biological organizations. The Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC) presently recommends species to be listed under the federal *Species at Risk Act*, and species are also listed at the provincial level. No plant species of concern were recorded during the botanical survey conducted during the

wetland assessment. Animal species at risk in the Debert area (see Section 4.6 above) are not likely to be found at the project site.

4.8 Socioeconomic Environment

4.8.1 First Nations

The site is not used for hunting or fishing by Mi'kmaq, but an area to the east is significant as a pre-contact archaeological site, and will be a focus for the Mi'kmawey Debert Cultural Centre, to be built east of Lancaster Crescent and operated by the Confederacy of Mainland Mi'kmaq (CMM). A wooded area south of the Home Hardware Warehouse and Distribution Centre site encompassing the watersheds of Galloping and Alder Brooks is occupied by the Mi'kmawey Debert Interpretative Trail operated by CMM.

4.8.2 Water Supply/ Groundwater

The Debert area has a large groundwater resource potential deriving from the aquifers in Wolfville Formation sandstone and extensive outwash sand and gravel deposits, and the project area (9.5 ha) makes up a small proportion of the overall groundwater recharge area.
No surface water supplies, and only two groundwater wells occur within one kilometer of the project, the latter along Lancaster Crescent in the industrial park and likely not used as the area is provided with municipal water (NSNDR 2011). Colchester County supplies water to the industrial park and adjacent areas by service mains that run parallel to Plains Road and Lancaster Crescent; a water tower is located near the junction of Plains and McElmon Roads. The municipal water supply is drawn from two active water wells located 2 and 3 km north and south respectively from the project (Project Location Plan, Appendix 1). The well located along McElmon Road 2 km south of the project area supplies about 95% of the volume.

4.8.3 Recreational Fishing

There are no streams supporting recreational fishing at the site, although recreational fishing (brook trout) takes place in downstream areas, including Galloping Brook, MacElmons Pond and Chiganois River.

4.8.4 Archaeological Resources

The Debert Paleo-Indian Site to the immediate east of the existing Home Hardware Warehouse and Distribution Centre is currently the site of ongoing surveys for artifacts and other indications of past occupation. The site is protected under the provincial Special Places Protection Act, and

is a designated a National Historic Site. Proximity to the Palaeo-Indian site suggests that the current project site would have high potential for archaeological resources. No archaeological resources were found in an archaeological survey of the proposed project site to date. The archaeological work is continuing in the wetland area and the report is expected to be available by late autumn 2011. At this time no approval has been given by the Nova Scotia Museum, Heritage Division.

4.8.5 Parks and Protected Areas/ Recreational Areas

Significant parks and protected areas include the Debert Paleo-Indian Site to the east, and the Debert Wildlife Management Area located about 7 km south encompassing MacElmons Pond and the MacElmons Pond Provincial Park, as well as a freshwater marsh operated by Ducks Unlimited Canada. The Isgonish Marsh Burying Ground, a National Historic Site and a Registered Nova Scotia Heritage Site, is located on the Chiganois River west of Lower Onslow, and a designated International Bird Area (IBA) is located in Cobequid Bay south of the project site. Other notable features of the area used for recreation or conservation include the Debert Airport for recreational flying; the Debert Rifle Range located near Debert; and the Mi'kmawey Debert Interpretive Trail to the south.

4.8.6 Transportation

Plains Road is the main road between Debert and the Trans Canada Highway (Highway 104) and supports local, private and commercial traffic. The expanded distribution centre, as well as other possible expansions in the area (e.g., the Sobey's Distribution Centre), may result in an increase in truck traffic volumes. Truck traffic is not projected to increase appreciably due to this project since the proposed building expansion will improve efficiency but not significantly affect total volume of goods transported, which is only expected to increase by 5 to 10 percent. Various factors associated with the project, including expansion of the industrial base in the area as well as increased use of the Debert area for residential development, and use of Plains Road to access restaurant facilities (e.g. Tim Horton's) is likely to increase traffic levels in the vicinity of the Home Hardware Warehouse and Distribution Centre site, leading to increase the potential for vehicle accidents. Accidents can result in property damage and loss of life, as well as environmental damage, in particular, to the wetland habitats southwest of Plains Road within the Lancaster Crescent area. Presently, there is no traffic control or signage warning of truck activity in the area.

4.8.7 Residential/Commercial Development

The site is part of the Debert Air Industrial Park operated by Colchester Regional Development Authority. The industrial park has been designed to be environmentally friendly and sustainable, including a balance of natural and industrial areas. Land to the west of Lancaster

Crescent has not yet been developed, but several industrial facilities, including the existing Home Hardware Warehouse and Distribution Centre, occupy lands to the east, north and southeast. Industries include a Sobeys' Distribution Centre (northeast of the project site) and Nystone (a former processor of pharmaceutical barium) located immediately to the north. Other local commercial enterprises include an Onyx & Marble and D'Maya Consulting on the east side of Lancaster Crescent, and the manufacturing facilities and distribution centres of Richie Bros. & Thermocell are located across Plains Road, southeast of the project site.

4.8.8 Viewscape

The view of the project site is largely blocked by a buffer of mixed mature forest along Plains Road and Lancaster Crescent.

5 Valued Environmental Components & Mitigation of Impacts

Valued Environmental Components (VECs) are features or things in the environment, which are important either ecologically, socially, economically or culturally. The environmental assessment addresses potential impacts of the project on each VEC identified. To do so involves identifying all the activities or outcomes of the project which interact with each VEC, and then determining and rating the magnitude of the impact in a standard way. Determination and rating of magnitude of impact was completed in a manner guided by standard approaches which have been developed for assessments under the *Canadian Environmental Assessment Act* (CEAA). Where interactions are identified and significant impacts are likely to occur, mitigations for the impacts must be implemented before the project can proceed. The assessment process ensures that all potentially significant impacts on VECs are identified and all potential impacts on them have been considered and sufficient mitigation planned. The following sections as well as Tables 5.3.1 & 5.3.2 identify the VECs and planned mitigation of environmental impacts of the existing environment within the site of the Project.

5.1 Socioeconomic Valued Environmental Components

5.1.1 First Nations

The project has the potential to impact the stream-flow regime in the watershed of Galloping Brook and through the Mi'kmawey Nature Area, by sudden release of runoff from precipitation and snow melt from parking areas and buildings during construction and operational phases of the project, consequently increasing peak flows and reducing low or maintenance flows. During

construction, there is the potential for accidental release of contaminants and suspended sediments, which also may impact the waters in the nature interpretation area. The distance the sediment may be transported may be limited because of the small watershed of the site (approx 23 ha including the proposed development of ~ 9.5 ha) and intervening wetland areas, leading to only moderate potential for sediment reaching the trail system area. During operation of the project, contaminated runoff and dust from parking areas has the potential to enter the watershed. These impacts would be relatively small due to the small area of the watershed affected by the project in relation to the watershed as a whole (9.5 ha versus 1,621 ha or 0.59%), and in any case, will be mitigated by a storm-water management system, including water detention/settling ponds to stabilize offsite flow, and oil separation ponds to treat contaminated runoff, if necessary.

5.1.2 Tourism

The character of the area along Plains Road, which is presently a mix of industrial lots and forested areas, will not be changed significantly by the project, as existing forested buffers will largely be maintained. Forested buffers will likely hide the facility from the main road, and the buildings will be a significant distance away, with mainly parking or level storage areas, and ponds visible. Traffic loading of Plains Road will not increase to the extent that it will interfere with tourist traffic. The distribution centres in the area, including Home Hardware, could be highlighted and used by the Municipality as tourist draws. Additional workforce at the site will help to maintain amenities such as Tim Horton's which also serve the tourists in the area. Negative impacts on tourism could arise if the Mi'Kmawey Nature Trail area is disturbed through failure to control sedimentation and to manage changes in flow regime in the watershed resulting from the construction and operation of the project. The increased development in proximity to the archaeological site and proposed interpretive facility, and generally increased activity, could also have a slight negative impact on tourist experience in the area.

5.1.3 Archeological Resources

The project is unlikely to disturb artifacts and other archaeological resources; the site has a small footprint in an already partially disturbed area, and an archaeological survey of the site indicated that the probability of finding artifacts is low. No archaeological resources were found in an archaeological survey of the proposed project site conducted in the summer of 2010. The archaeological work is continuing in the wetland area and the report is expected to be available by late autumn 2011. At this time no approval has been given by the Nova Scotia Museum, Heritage Division. The project would not impact the adjacent Palaeo-Indian site to the east of Lancaster Crescent.

5.1.4 *Transportation & Vehicular Traffic*

Operations of the expanded facility would place additional strain on the secondary roads and the highway in the area, which may not have been designed for the additional industrial activities created by the industrial park. In addition, increased incidence of trucks turning into the Home Hardware Warehouse and Distribution Centre, and leaving Lancaster Crescent, could lead to increased incidence of collisions with private vehicles, which use Plains Road as the main access from Debert to the Trans Canada Highway and amenities such as the local Tim Horton's. The Lancaster Crescent industrial area surrounds a former wetland recharge area on the project site, and wetlands extending to the south from it are important local habitats, which could be damaged by accidental spills of hydrocarbons from motor vehicle accidents. Traffic patterns are out of the control of HHSL, however, some traffic control measures such as signage to alert drivers to turning vehicles, etc. should probably be examined to avoid future motor vehicle accidents near the site.

5.1.5 Industrial Activity

Additional truck traffic may cause minor conflicts with the operation of other businesses in the area, particularly the strip along McElmon Road, along which the traffic will have to pass, although the effect is likely to be minor. The road in the area is probably not near its capacity; hence this would be a negligible impact.

5.1.6 Regional Economy

Expansion of the Home Hardware Warehouse and Distribution Centre will benefit the local and regional economy, through the infusion of jobs and the streamlining of infrastructure expenditures and maintenance activities associated with development of the industrial park facilities. Minimizing the footprint and visual impact of the project site will minimize negative impacts on tourism.

5.1.7 Recreational Fishing

The project is unlikely to contaminate watercourses in the area such as Galloping Brook, MacElmons Pond and Chiganois River, or interfere significantly with flows in the Galloping Brook system. The portion of the watershed affected by the project is relatively small, hence any downstream impacts on flow and suspended sediment levels would be relatively small.

5.1.8 Parks and Protected Areas

The project will not interfere with the proposed site of the Mi'kmawey Cultural Centre, and will have negligible impacts on the interpretive trail system of Galloping Brook. The project would have a negligible footprint and not interfere significantly with future uses of adjacent lands for parks.

5.1.9 Use of Area by Locals/ Health and Safety

The village of Debert is located approximately 2 km west of the Project location along Plains Road. The nearest residences to the Project are located in a subdivision, which was formerly housing for the Debert Military Base, which is about 1 km west of the Project along Plains Road. There is currently no residential development between Lancaster Crescent and the exit to the Trans Canada Highway off McElmon Road.

Debert residents routinely use McElmon Road and Plains Road for commuting. These local roads are also used by truck traffic serving the industrial facilities within the park, including the Home Hardware Distribution Center. Truck traffic is not projected to increase appreciably due to this project since the building expansion will improve efficiency but not significantly affect total volume of goods transported, which is only expected to increase by about 5 to 10%. Truck traffic will increase during the construction phase as a result of earthmoving operations. Appropriate traffic control measures during construction of the facility will be exercised to control traffic and reduce congestion and the potential for vehicle accidents.

5.1.10 Aesthetics/ Viewscape

Natural appearance and/or well-maintained facilities, in general, are important for appreciation by the area, by frequent users; both those working at the industrial facilities in the area, and tourists passing through. The project will maintain forested buffers, which will help to hide industrial activities and maintain the natural appearance, and result in negligible changes to the viewscape at the site.

5.2 Biophysical Valued Environmental Components

5.2.1 Wetlands

The project will remove most of the existing treed swamp at the site by converting the area to a pad for future buildings and parking areas for transport trucks. However, a portion of the swamp will be preserved north of Plains Road and detention ponds will be designed to moderate storm flows and regulate release in order to maintain flows into the remaining swamp

as close as possible to current levels and patterns. The loss of wetland on the site will be compensated through a wetland compensation project in the Debert area and through the wetland creation potential of some of the measures employed on site to manage water flow.

To minimize damage to remaining wetland areas during construction, appropriate management practices will be employed to control site runoff and sedimentation, and procedures will be in place to avoid accidental discharges of hydrocarbons and other contaminants. The constructed facilities at the site will include measures to reduce erosion and sedimentation, as previously discussed, including use of semi-porous materials for the pad and landscaping, which includes providing soil and vegetated cover for exposed areas not immediately needed for the expansion. Organic peat removed from the wetland will be suitably disposed of, and if temporarily left on site, will be managed to ensure contained water or runoff does not reach the wetland without treatment, since it potentially has a high oxygen demand which could alter conditions in the wetland, and in downstream areas. Routine operation of the facility will not affect the remaining portion of wetland habitat. As previously discussed, detention ponds will capture storm and runoff flow and release them slowly to the remaining watershed, as well as serving as settling basins to remove suspended sediment.

5.2.2 Surface Waters

The project can impact surface waters by sudden release of runoff from rainfall and snow melt from parking areas and buildings during construction and operational phases of the project, increasing peak flows and reducing low or maintenance flows. During construction there is the potential for accidental release of contaminants and suspended sediments. To minimize damage to surface waters downstream during construction, appropriate management practices will be employed to control site runoff and sedimentation as previously discussed, and procedures will be in place to avoid accidental discharges of hydrocarbons and other contaminants. During operation of the project, contaminated runoff and dust from parking areas has the potential to enter the watershed. These impacts will be mitigated by a storm-water management system including water detention ponds to stabilize offsite flow, and an oil separation system to handle contaminated runoff as necessary. Overall, potential impacts will be relatively small, as the project area occupies a small percentage of the Galloping Brook watershed as a whole (~9.5 ha of 1,621 ha, 0.59%).

5.2.3 Fish Habitat

There is no fish habitat on the site to be directly impacted by construction or operation of the Home Hardware Warehouse and Distribution Centre. Practices implemented during construction and operation to reduce or eliminate contamination of water leaving the site, to maintain a normal flow regime at the site, to control oxygen demand, and to eliminate

accidental spills of hydrocarbons and other contaminants, will minimize any downstream impacts on fish habitat (e.g., in Galloping Brook).

5.2.4 Wildlife

Waterfowl in downstream areas, particularly in the wetlands in the lower reaches of Galloping Brook and in MacElmons Pond, can be impacted by accidental spills of contaminants, particularly hydrocarbons during construction and operation of the facility. Birds are highly susceptible to hydrocarbon impacts through loss of the insulating capacity of the feathers, but also through eating contaminated food. During construction, best management practices will be employed for eliminating accidental spills of fuel and lubricants from on-site vehicles and other heavy equipment. Transport truck use during operation of the facility can potentially cause impacts through accidental releases of fuel and lubricants, small quantities of which may be lost during normal operations. The site drainage system will include a system for oil separation in addition to storm-water detention to reduce the amount of hydrocarbons reaching downstream areas of the watershed.

Most of the forest cover in the footprint of the proposed site has been removed, with the exception of a buffer around the treed wetland and along Lancaster Crescent and Plains Road. Terrestrial birds will return to nest sites occupied in previous years, likely occupying the wetland areas, and incidentally nesting in the cut-over areas. To avoid harming nesting birds, site activities involving removal of vegetation are planned to be completed by May 1, 2012. Noise from the operation of equipment, construction, and movement of materials etc., as well as lights used in night operations, could also disturb breeding birds in adjacent areas. If possible, activities should be planned to take place outside the normal nesting seasons, which occur between mid-May and late August. Operation of the facilities is not expected to interfere with bird populations. However, some birds (e.g. pigeons, gulls) may be attracted to the site and harmed by garbage and construction debris. Proper control of garbage and construction debris should be undertaken for the site to prevent attracting wildlife and/or eliminate anything that can harm or injure wildlife.

5.2.5 Species at Risk

Based on the botanical survey and a review of conservation databases and Nova Scotia Museum records, only moose, pygmy shrew, and wood turtle are species at risk known or likely to occur at the project site or in the immediate watershed. These species are rare and are unlikely to be encountered and therefore there will be no impacts from construction or operation of the project. Good environmental practice in designing a project to minimize impacts on the local ecosystem, including species at risk if present, includes minimizing the footprint of the project in the natural landscape as much as possible, and maintaining areas of natural landscape inside.

These are contiguous with areas outside the project site in the form of landscape corridors allow local populations to spread and be maintained. The present project maintains a portion of the existing treed wetland and a wooded buffer along Plains Road. Protecting the wetland areas southwest of Plains Road and between the site and the Mi'kmawey Interpretive Trail would ensure a continuous forest is maintained.

5.2.6 Terrestrial Ecosystem

The existing terrestrial forest ecosystem (plants and animals) will be mostly removed by construction of the facilities. Remaining forested areas form an important element of the local landscape and may provide an important visual buffer for the site. Efforts should be made at the design and construction stage to minimize damage to the terrestrial ecosystem and, if possible, to restore unused adjacent areas of the site. Activities during operation of the facility, particularly changes in layout involving vegetation communities, have been carefully evaluated to ensure that damage such as equipment storage are minimized. Areas within the property currently underutilized for storage and other purposes will be designated for use to the furthest extent possible so as to minimize the utilization of natural areas for the expansion.

5.3 Cumulative Impacts

No significant cumulative impacts (impacts arising from the project in combination with ongoing or foreseen activities) are envisioned for the project. The project itself occupies a small footprint in an already disturbed area and the main potential impact is biological habitat removal and change in runoff regime. The industrial park, in which the project is located, occupies a small area in relation to the available undeveloped lands in the vicinity of Debert and consequently, as a whole, even when it is developed, will have a small overall impact on the local environment. The project will not likely result in a large incremental increase in traffic levels in the area, however, at present levels and with increasing development including residential use in Debert, there may be an increased risk of traffic problems and accidents in the future which should be investigated and mitigated in advance.

Table 5.3.1: Potential Interaction Between Project Activities / Operations & VEC's

General Category of VEC		CONSTRUCTION								OPERATIONS		
Project Component (✓ … denotes potential interaction)		Site Preparation	Detention Ponds	Excavation	Site Storm Sewer System	Building Construction	Finished Site Work	Accidents (Oil / Fuel Spills)		Routine Loading / Offloading	Truck Transport	Accidents (Oil / Fuel Spills)
BIOPHYSICAL	Wetlands	✓	✓	✓	✓			✓				✓
	Surface Water	✓	✓	✓	✓			✓				✓
	Fish Habitat							✓				✓
	Wildlife – Waterfowl							✓				✓
	Terrestrial Birds	✓	✓	✓		✓	✓	✓				✓
	Species at Risk							✓				✓
	Groundwater Resources							✓				✓
	Terrestrial Vegetation	✓	✓	✓			✓	✓				✓
	Terrestrial Ecosystem	✓	✓	✓			✓	✓				✓
SOCIOECONOMIC	First Nations							✓				
	Tourism							✓			✓	✓
	Cultural / Historical – Archeological			✓								
	Infrastructure										✓	
	Industrial Activities									✓	✓	
	Regional Economy									✓	✓	✓
	Recreational Fishing							✓				✓
	Parks & Protected Areas	✓	✓	✓				✓				✓
	Residential Use / Health & Safety									✓	✓	
	Aesthetics - Viewscape	✓	✓	✓	✓					✓	✓	

Table 5.3.2: Summary of impacts and mitigation on Valued Ecosystem Components

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
BIOPHYSICAL COMPONENTS						
Wetlands	Construction	Alteration/ Removal of Wetland	Significant	Negative	Wetland compensation will be provided.	Not Significant.
Surface Water	Construction	Alteration of flow regime	Significant	Minor, Negative	Use of catch basins/ detention ponds to manage surface water flows.	Not Significant.
		Accidental Hydrocarbon Spills	Significant	Negative	Best management practices; spill protection equipment available.	Not Significant.
	Operation	Alteration of flow regime	Significant	Minor, Negative	Use of catch basins/ detention ponds to manage surface water flows.	Not Significant.
		Contaminated runoff; accidental Hydrocarbon Spills	Significant	Negative	Use of catch basins/ detention ponds, oil separator system.	Not significant.
Fish Habitat	Construction and Operation	Accidental Hydrocarbon Spills & contamination	Significant	Negative	Provide pollution prevention and emergency measures. Use of catch basins/ detention ponds, oil separator system.	Not significant.
Wildlife-Waterfowl (MacElmons Pond)	Construction & Operation	Accidental Hydrocarbon Spills cause mortality.	Significant	Negative	Provide pollution prevention training, spill emergency numbers on site.	Not significant.
Terrestrial Birds	Construction	Removal of habitat; noise and activity from construction	Significant	Negative	Avoid breeding season; conduct work during daylight where possible.	Not significant
	Operation	Loss of habitat	Significant	Negative	If possible restore damaged and unused parts of the site. Create landscaped/ treed areas etc.	Not significant
Species at Risk – Atlantic Salmon in Chiganois River	Construction & Operation	Accidental Hydrocarbon and Chemical Spills	Significant	Negative	Control spills and accidental discharges.	Not significant
Species at Risk-Wood Turtle	Construction & Operation	Accidental hydrocarbon and chemical spills	Significant	Negative	Control spills and accidental discharges.	Not significant

Table 5.3.2: Summary of impacts and mitigation on Valued Ecosystem Components

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
Species at Risk – Red Knot	Construction & Operation	Shorebird more likely in offsite coastal areas.	Significant	Negative	Control spills and accidental discharges.	Not significant
Species at Risk – Bobolink	Construction	Species does not occur at project site and not likely to be impacted.	NA	NA	Not applicable	Not applicable
Groundwater	Construction	Contamination from accidental hydrocarbon spills	Significant	Negative	Provide pollution prevention and oil spill emergency measures.	Not significant
	Operation	Accidental hydrocarbon spills	Significant	Negative	Efficient runoff management system for facilities and parking areas.	Not significant.
Terrestrial Vegetation	Construction	Removal of existing forest cover; damage remaining forest	Significant	Negative	If possible restore damaged and unused parts of the site. Avoid working in remaining forested buffer areas.	Not significant.
	Construction	Accidental hydrocarbon spills contaminate soil, cause die-offs.	Significant	Negative	Provide pollution prevention and emergency measures & response capability.	Not significant.
Terrestrial Ecosystem	Construction	Damage to terrestrial ecosystem adjacent to Project Site	Significant	Negative	Avoid damage to adjacent areas.	Not Significant
	Operation	Reduced habitat, interference with water flow patterns	Significant	Negative	If possible restore damaged and unused parts of the site to pre-existing ecological function.	Not Significant
SOCIOECONOMIC COMPONENTS						
First Nations Interpretive Trail System	Construction & Operation	Interference with flows in streams along Interpretive Trail.	Significant	Negative	Storm-water management and detention ponds to normalize flow.	Not significant
First Nations Palaeo-Indian Site	Construction & Operation	No effect	No Effect	No Effect	Not applicable	Not applicable
Tourism	Operation	Project affects natural appearance of site.	Not Significant	Minor Negative	Maintain treed buffers and landscape the property	Not significant

Table 5.3.2: Summary of impacts and mitigation on Valued Ecosystem Components

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
Sedimentation and Flow Changes	Construction	Mi'Kwawey Trail Area	Not Significant	Minor Negative	High level of sedimentation and flow control	Not significant
Cultural, Historical & Archaeological Features	Construction & Operation	Damage to existing archaeological features	Significant	Negative	Stop work, notify authorities if any artifacts are discovered.	Not significant
Infrastructure-Transportation & Vehicular Traffic	Construction	Increased local vehicle traffic; increased potential for collisions with transport trucks.	Significant	Minor Negative	Temporary traffic control on Plains Road. Assist/advise municipal/provincial governments for improved long term traffic management	Not significant
	Operation	Increased wear on highway; increased local traffic and potential for vehicle accidents	Significant	Minor Negative	Assist/advise municipal/provincial governments for improved traffic management on Plains Road. Appropriate safety signage.	Not significant
Local Industrial Activity	Operation	Increased industrial development	Significant	Positive	Cooperate in local planning.	Not applicable
Regional Economy	Operation	Improvements to the regional economy	Significant	Positive	Cooperate in local planning.	Not applicable
Recreational Fishing	Construction & Operation	Accidental hydrocarbon spills contaminate surface waters.	Significant	Negative	Provide pollution prevention and emergency measures & response capability.	Not significant
Parks and Protected areas	Construction & Operation	Accidental hydrocarbon spills affect downstream areas.	Significant	Negative	Efficient surface water runoff management system for facilities and parking areas.	Not significant.
Residential Use Health and Safety	Construction & Operation	May increase risk of vehicle accidents by Debert commuter and industrial traffic.	Significant	Negative	Contribute to traffic control assessment & planning. Scheduling operations to avoid peak traffic periods.	Not significant
Aesthetics—Viewscape	Construction & Operation	Appearance of excavation & construction activities & detention ponds from Plains Road.	Significant	Negative	Forest buffer zone along roadway for a "natural" view & landscaping after construction activities.	Not significant

6 Effects of the Environment on the Project

The site could be exposed to extremes in temperature, wind and precipitation, which will be taken into consideration in design of facilities. Allowances will be made for build-up of snow and snow management, as well as rainwater management, in particular in light of climate change when extreme storm occurrences including extreme rainfall events, could become more common.

7 Monitoring

A monitoring program will be undertaken to examine water quality (TSS, pH, Dissolved Oxygen and Temperature) leaving the site during construction and through the early operational stage of the project to ensure the stormwater management system is functioning as planned. The program will include sampling in a reference stream and in Galloping Brook at a point upstream and downstream of the junction with the tributary originating at the project site. NSE will be consulted concerning appropriate frequency and length of the monitoring program.

8 Approvals and Permits

The following approvals are required for this Undertaking;

- The Proponent is required to register this Project as a Class 1 Undertaking in accordance with the Nova Scotia Environment Act and Environmental Assessment Regulations.
- The Proponent is required to obtain a Nova Scotia Environment Wetland Alteration Approval.
- A Breaking Soil Permit will be required from the NSTIR Area Manager prior to conducting any work within the highway right-of-way.
- A Building Permit will be required from the Municipality for the building and foundation work.
- It has been determined that the Proponent will not require formal approval from DFO in order to proceed with the work.
- There are no known requirements for an environmental assessment under the Canadian Environmental Assessment Act (CEAA) associated with this project.

All work is to be done in accordance with the Erosion and Sedimentation Control Handbook for Construction Sites (NSE).

All work during the construction phase will be done in accordance with the Temporary Workplace Traffic Control Manual.

All work is to conform to the requirements of the Fisheries Act, Species at Risk Act as well as the Migratory Birds Convention Act and all other applicable Federal legislation.

9 Archaeological Testing

Archaeological testing of the four lots has been undertaken by Laird Niven and two separate reports have been produced. The first report filed was for Lots 211 (PID 20153573), 213 (PID 20153557) and 214 (PID 20153540). The second report filed was for Lot 212 (PID 20153565). The Introduction and Summary and Conclusions sections of both reports have been reproduced for information below.

Testing was not completed in the wetland portion of each of the lots due to standing water. In the areas that were tested with completed shovel tests, there was no cultural material recovered.

Further testing of the wetland area is underway using methods agreed to by the Nova Scotia Museum, Heritage Division. Copies of the report are expected to be available during the fall of 2011.

9.1 Excerpts from Report Titled "Lots 211, 213, 214, Lancaster Drive, Debert (Heritage Research Permit A2010NS61)"

Introduction

Home Hardware is proposing an expansion to their current operations on Lancaster Drive in the Debert Air Industrial Park and an archaeological impact assessment was required before this work could begin. To this end, an archaeological shovel testing program was designed for Lots 211, 213, and 214, of which Lot 211 will be affected by the expansion (Figures 1 and 2). The objective of this testing program was primarily to determine the presence or absence of First Nation's archaeological resources on these lots but also to document any other archaeological resources of significance that may be present in the study area. The central section of the lots was untestable by conventional means as they were in a designated wetland that was covered in standing water or had water immediately below the surface (Plate 1). No cultural material was recovered from any of the shovel tests in the study area. Recommendations for mitigation are presented at the end of the report.

Summary and Conclusions

A total of 42, 20 by 20m squares were tested in 2010 over Lots 211, 213, and 214. In Lot 211, seven of the squares had more than 95% of the shovel tests reach a target basal level, which was weathered bedrock in the majority of cases. These squares should be considered cleared for development without the need for further archaeology. Nine of the 20 by 20m squares in Lot 211 had less than 95% of the shovel tests reach a target basal level, mainly due to water infiltration. These squares would not be

considered cleared for development and mitigation options are presented below. As noted above, the proposed development will impact all of Lot 211. Approximately one third of the lot was untestable due to the presence of the wetland.

In Lot 213, nine of the 20 by 20m squares had more than 95% of the shovel tests reach a target basal level, which was weathered bedrock in the majority of cases. These squares should be considered cleared for development. One square in Lot 213 had less than 95% of the tests reach a target basal level and would not be considered cleared for development. Approximately one third, or a little more, of this lot was not testable due to the presence of the wetland. While on paper the proposed development will affect only the northeast corner of square Z, the understanding from CoRDA is that at least part of the lot will be grubbed of tree stumps and filled, but the forested strip on the west side of Lancaster Drive will remain unaltered.

A total of 16, 20 by 20m squares were tested in Lot 214 and, of these, 14 had more than 95% of the tests reach a target basal level, the majority of which were weathered bedrock. These squares should be considered cleared for development without the need for further archaeology. Two of the tests had less than 95% of the tests reach a target basal level, mainly due to water infiltration, and should not be considered cleared for development. Approximately one third of Lot 214 was not testable due to the presence of the wetland.

The problem of testing in wetlands was brought to the fore with this project and it is a question that has no easy answers. The archaeological work provided no data that would have helped determine how recently the wetland was formed, although it was obviously never a major watercourse and the lack of deep cutting suggests it is relatively recent. While the wetland could not be tested effectively using conventional means, all of the testable land around it was tested and all of the tests that reached target basal levels were negative. The fact that the wetland is surrounded on three sides by negative squares would suggest that there is a low potential for the wetland to contain archaeological resources, particularly those dating to the Palaeo-Indian period. If this scenario is accepted, there would be no requirement for further archaeological testing within the project area.

If the wetland is considered significant, then alternate methods of testing within it will have to be devised. CoRDA has met with CMM, Heritage Division, and the Nova Scotia Museum on this matter and no suitable testing method has been agreed upon. An appeal to the Nova Scotia archaeology community in general resulted only in suggestions that some manner of coring program be used. Indeed, the use of a portable coring system, such as a Vibracore, would be the only workable solution for testing for the presence or absence of archaeological resources within a wetland. The problem with using coring for finding archaeological sites is that their small bore size (3 to 4 Inches), while very good for retrieving stratigraphic information, is much less useful for the recovery of artifacts. The small bore size would mean that the frequency of the tests would have to increase dramatically for reliable presence/absence data to be gathered. This would also dramatically increase the cost of the testing. The use of larger

coring apparatus is precluded by the presence of the wetland and any attempts to use it would result in a great deal of disturbance, particularly in the critical first 30 to 60 cm.

In the end, there is no clear mitigation / testing strategy that would allow for the economical testing of the wetland to determine the presence or absence of archaeological resources within it. It would be more economical to have a geologist examine and test the wetland to determine both how old it is and how significant it may be in an attempt to determine archaeological potential as it relates to the Palaeo-Indian period. If the wetland is determined to be relatively recent and the archaeological potential to be low, the project could proceed as planned. If the wetland is dated to the Palaeo-Indian period and the archaeological potential is determined to be high, alternative testing strategies will have to the revisited with the relative cost of the testing balanced against the proposed development cost.

9.2 Excerpts from Report Titled "Lot 212, Lancaster Drive, Debert (Heritage Research Permit A2009NS110)"

Introduction

Home Hardware is proposing an expansion to their current operations on Lancaster Drive in the Debert Air Industrial Park and an archaeological impact assessment was required before this work could begin. To this end, an archaeological shovel testing program was designed for Lot 212, one of the lots that will be affected by the expansion. The objective of this testing program was to determine the presence or absence of First Nation's archaeological resources on the lot, particularly on the east side, which is scheduled to the impacted by the proposed expansion of the Home Hardware operation (Figures 1 and 2). On inspection, however, the majority of the study area, specifically the central and east sections, were wetland and, given the likelihood of not reaching the required basal levels before having to stop at water, they were considered untestable by conventional means. Since more than 5% of the tests for Lot 212 were either not tested or did not reach the required basal levels because of water, archaeological monitoring will be required for any subsurface disturbance within the lot. All of the completed shovel tests (those that reached the required basal targets) were negative.

Summary and Conclusions

The testing of Lot 212 showed it to be relatively undisturbed by wartime development and no evidence of major grading or infilling was observed. In general, the soils were relatively uniform, with a thick forest duff over a leached sand layer of varying thickness, over the massive, or covering, sands. All of the tests that reached the accepted basal level, in this case weathered bedrock, were negative. The average depth of the 155 tests was 81.23 cm, but, while 91 (58.71%) reached the accepted level of weathered bedrock, 64 (41.29%) did not because of water infiltration collapsing the walls of the tests. The eastern and central sections of the study area were completely covered by a wetland and could not be tested. This is problematic as the proposed development will impact approximately one third of Lot 212.

The problem of testing in wetlands was brought to the fore with this project and it is a question that has no easy answers. The archaeological work provided no data that would have helped determine how recently the wetland was formed, although it was obviously never a major watercourse and the lack of deep cutting suggests it is relatively recent. While the wetland could not be tested effectively using conventional means, all of the testable land around it was tested and all of the tests that reached target basal levels were negative. The fact that the wetland is surrounded on three sides by negative squares would suggest that there is a low potential for the wetland to contain archaeological resources, particularly those dating to the Palaeo-Indian period. If this scenario is accepted, there would be no requirement for further archaeological testing within the project area.

If the wetland is considered significant, then alternate methods of testing within it will have to be devised. CoRDA has met with CMM, Heritage Division, and the Nova Scotia Museum on this matter and no suitable testing method has been agreed upon. An appeal to the Nova Scotia archaeology community in general resulted only in suggestions that some manner of coring program be used. Indeed, the use of a portable coring system, such as a Vibracore, would be the only workable solution for testing for the presence or absence of archaeological resources within a wetland. The problem with using coring for finding archaeological sites is that their small bore size (3 to 4 Inches), while very good for retrieving stratigraphic information, is much less useful for the recovery of artifacts. The small bore size would mean that the frequency of the tests would have to increase dramatically for reliable presence/absence data to be gathered. This would also dramatically increase the cost of the testing. The use of larger coring apparatus is precluded by the presence of the wetland and any attempts to use it would result in a great deal of disturbance, particularly in the critical first 30 to 60 cm.

In the end, there is no clear mitigation / testing strategy that would allow for the economical testing of the wetland to determine the presence or absence of archaeological resources within it. It would be more economical to have a geologist examine and test the wetland to determine both how old it is and how significant it may be in an attempt to determine archaeological potential as it relates to the Palaeo-Indian period. If the wetland is determined to be relatively recent and the archaeological potential to be low, the project could proceed as planned. If the wetland is dated to the Palaeo-Indian period and the archaeological potential is determined to be high, alternative testing strategies will have to the revisited with the relative cost of the testing balanced against the proposed development cost.

10 References

Davis, D. S. and S. Browne, 1997. The Natural History of Nova Scotia, Nimbus Publishing.

Envirosphere, 2010. Biophysical Assessment Home Hardware Expansion—336 Lancaster Crescent, Debert Air Industrial Park, Debert, N.S. Report to ADI Limited, Truro, N.S. December 2010.

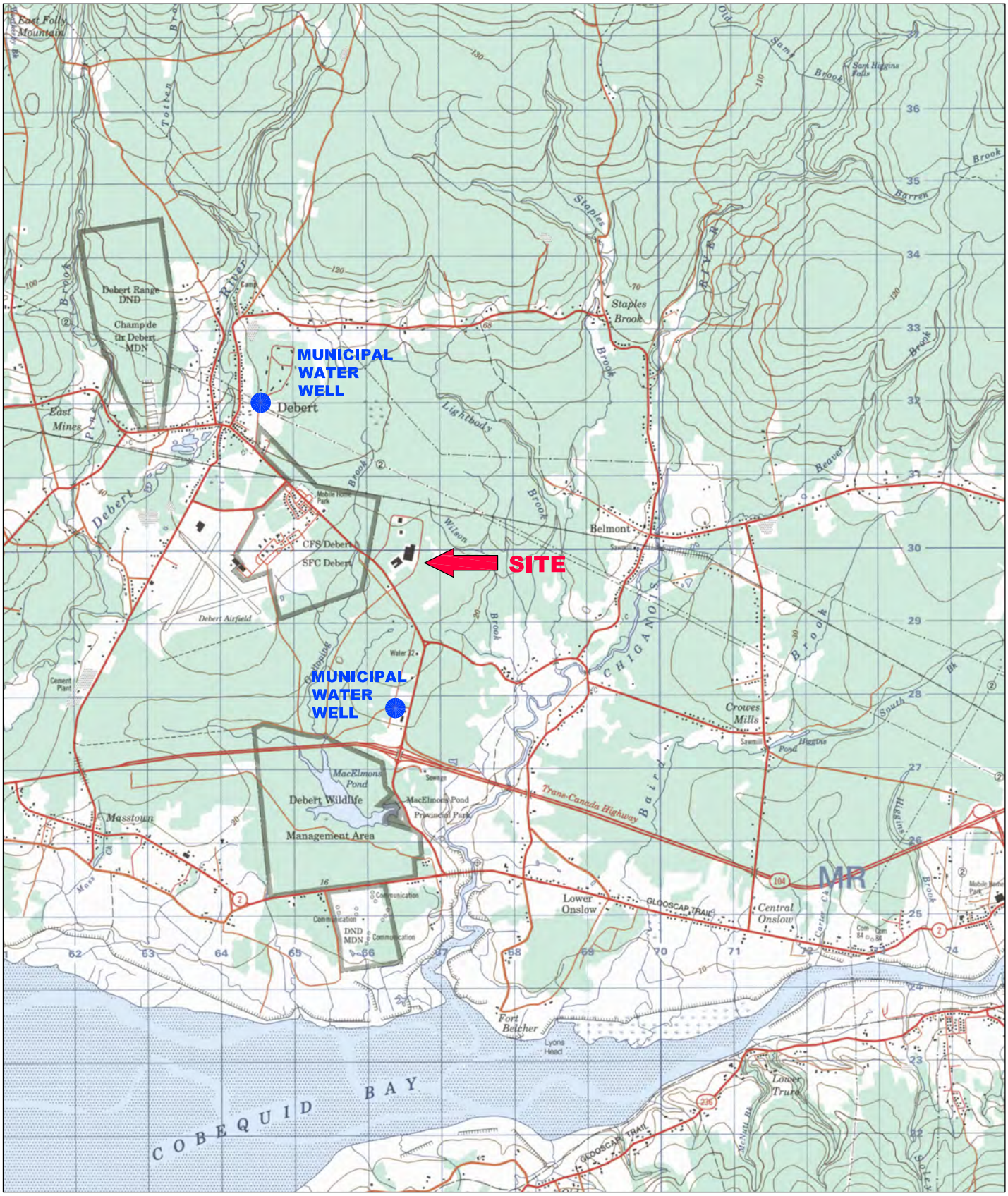
Marbicon, 2010. Wetland Functional Assessment for Home Hardware, Debert, Nova Scotia. September 17, 2010.

NSDNR 2011. Interactive Groundwater Map. (Gis4.natr.gov.ns.ca/website/nsgroundwater

Note: Additional references and personal communication are found in Appendix IV, Biophysical Assessment.

APPENDIX 1

Figure 1: Project Location



March 2011

ADI Limited
A Trow Global Company

Truro, NS, Canada
Engineering, Consulting, Procurement and Project Management

HOME HARDWARE STORES LTD.

PROJECT LOCATION

WAREHOUSE & DISTRIBUTION CENTRE EXPANSION

FIGURE No. **1**

SCALE: NTS

APPENDIX 2

Figure 2: Existing Site Plan

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Home Hardware Stores Ltd.

Warehouse & Distribution Centre Expansion

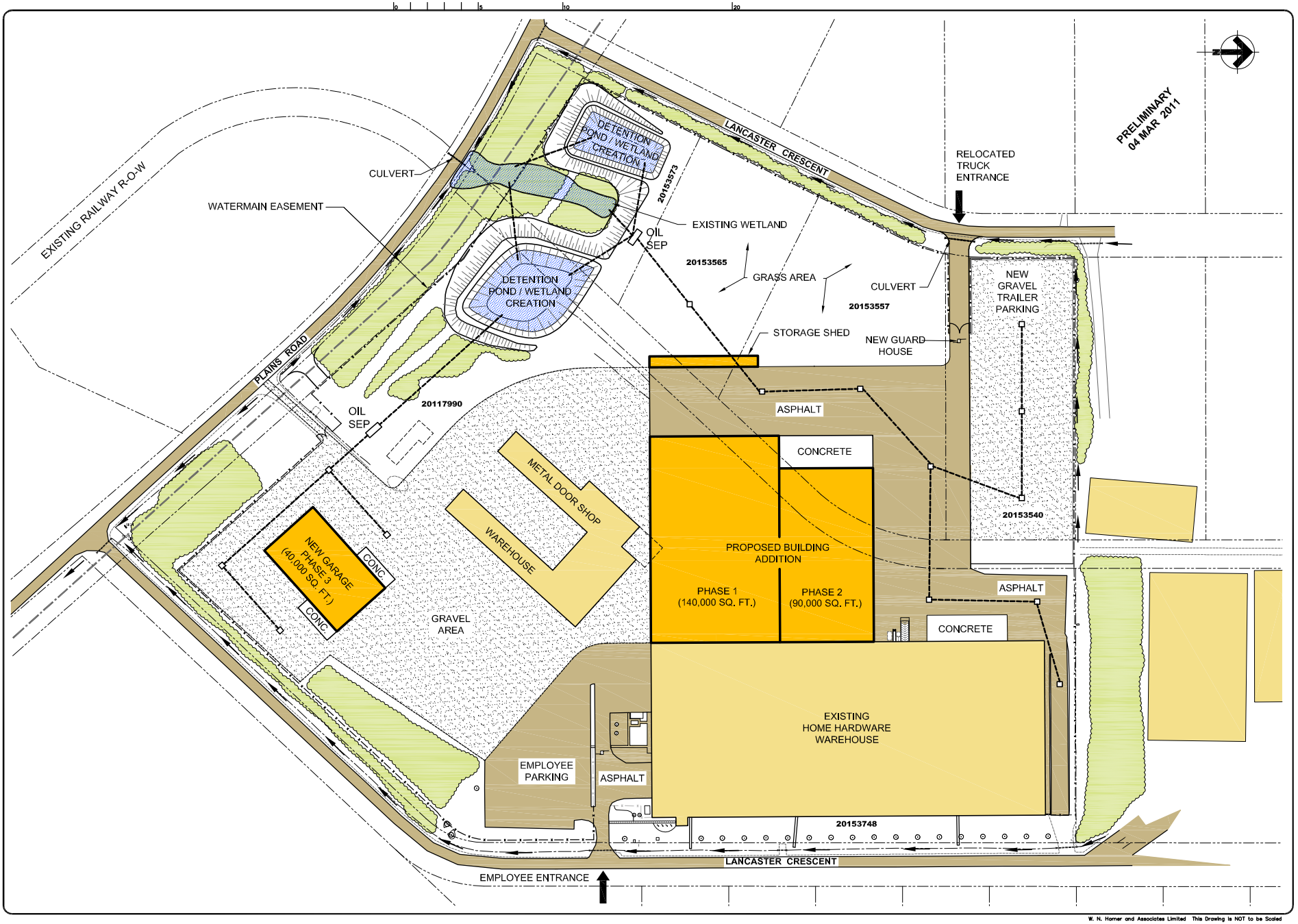
Existing Site Plan

FIGURE No. **2**

SCALE: 1" = 200'

APPENDIX 3

Figure 3: Proposed Finished Site Plan



W. N. Horner and Associates Limited This Drawing is NOT to be Scaled

FIGURE No. 3

SCALE: 1" = 200'

Warehouse & Distribution Centre Expansion

Proposed Finished Site Plan

Home Hardware Stores Ltd.

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APPENDIX 4

Report - Biophysical Assessment Home Hardware Expansion - 336 Lancaster Crescent, Debert Air Industrial Park, Debert, N.S., Envirosphere, December 2010 Revised March 25, 2011

Biophysical Assessment
Home Hardware Expansion—
336 Lancaster Crescent,
Debert Air Industrial Park, Debert, N.S.

Submitted to:

ADI Limited
Truro, Nova Scotia

December 31, 2010

Envirosphere CONSULTANTS LIMITED

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1 INTRODUCTION

Home Hardware Stores Limited is proposing to expand a warehouse and distribution facility at 336 Lancaster Crescent, Debert Air Industrial Park, Nova Scotia. An approval to construct the facility is required under the Activities Designation Regulations of the *Nova Scotia Environment Act* because the project will affect a wetland; the project is designated a Class I undertaking requiring an environmental assessment under the Environmental Assessment Regulations because the wetland affected is greater than 2 ha. ADI Limited, Truro, Nova Scotia, acting on behalf of the proponent, contracted Envirosphere Consultants Limited of Windsor, Nova Scotia, to prepare a biophysical overview and assessment in support of the application. This report contains the results of the overview and assessment. It presents a description of the methodology and scope, existing environment, environmental effects, cumulative effects, discussions, and conclusions. The level of detail of the assessment is sufficient to ensure that all information necessary to allow adequate review of the project is provided; and to demonstrate how the assessment was conducted, and the information on which the conclusions were based.

2 INFORMATION SOURCES

Information for the biophysical overview and assessment was collected from various sources, including published literature, interviews with representatives of the Department of Natural Resources, and Fisheries and Oceans Canada, other anecdotal sources, review of existing information including soil surveys, geology, natural history (e.g. *Natural History of Nova Scotia*), relevant websites (DNR Significant Habitat and Wetland Databases, Atlantic Canada Conservation Data Centre, and Nova Scotia Museum of Natural History), including the results of a wetland survey and functional assessment carried out on July 16 & 31, 2010, and observations made on site visits and walkover on July 11 and November 16, 2010 by project personnel. Technical documentation such as aerial photos and 1:50,000 topographic maps were also used in interpretations.

3 SITE LOCATION AND STUDY AREA

The site is located southeast of Debert, Nova Scotia, mid-way between Debert and Belmont, and approximately east of the former DND airport, 1:50000 NTS 11E-6, 45º 25.35’N and 63º 25.82’ W, Air Photo 129, L-23 04-06-29 (Figures 1 & 2).

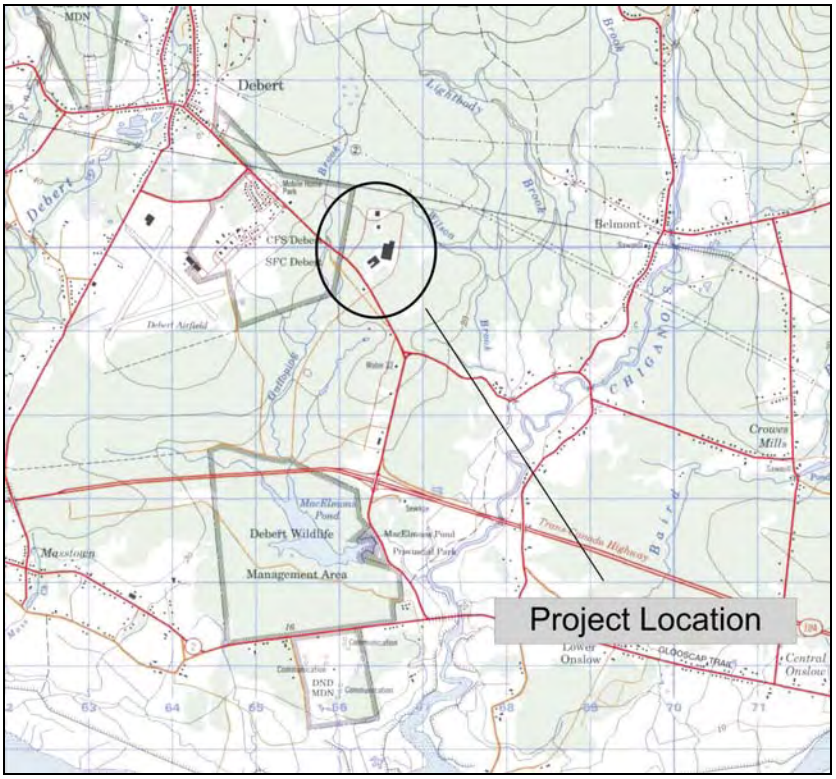

Figure 1. Project location.

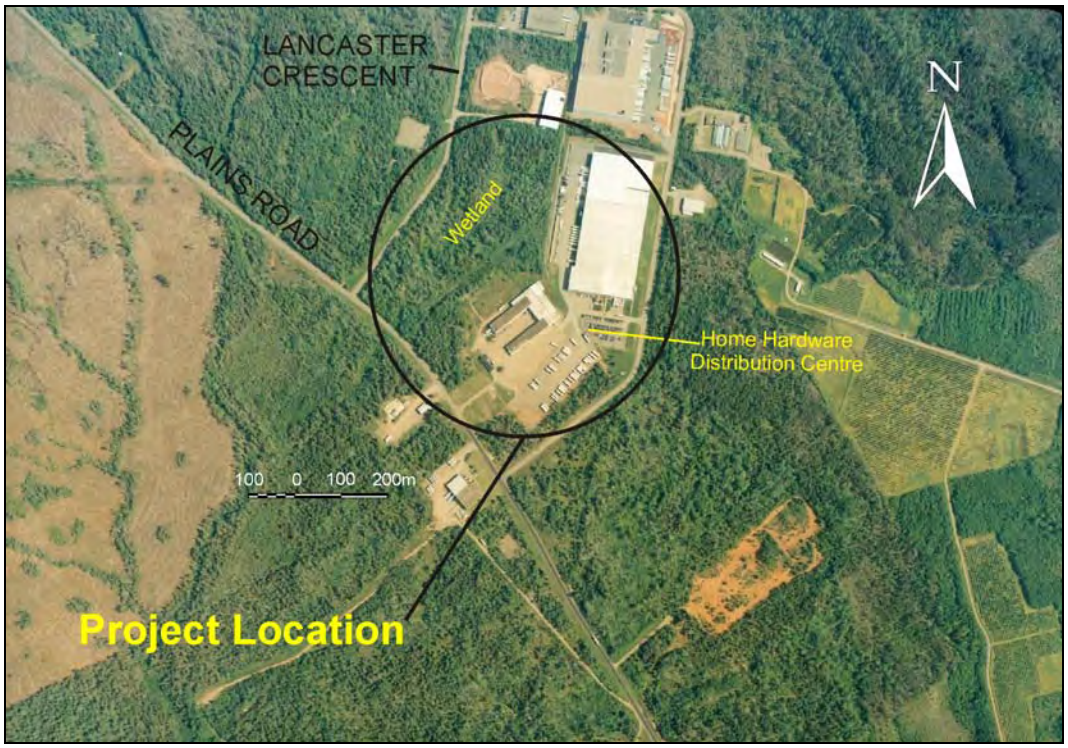

Figure 2. Project location and adjacent area.

4 EXISTING ENVIRONMENT

4.1 PHYSICAL ENVIRONMENT

4.1.1 TOPOGRAPHY AND GEOLOGY

The project site is located within the Debert Air Industrial Park in Colchester County, Nova Scotia and is bordered on the east and west by Lancaster Crescent and on the south by Plains Road. The site is ~2 km southeast of the community of Debert on a portion of the Minas Lowlands occupied by gently undulating glacial till plains that separate the Cobequid Uplands to the north, from Cobequid Bay, Minas Basin, to the south. The area is underlain by red sandstone and conglomerate of the Wolfville Formation, and overlain by sandy/gravely till. Soils at the site belong to the Truro formation, and range from non-stoney, well-drained to imperfectly-drained, podzols over sandstone bedrock to imperfectly drained soils to the east and west (Webb et al 1991) and soil composition closely reflects that of the underlying bedrock. Topography is generally level to undulating with a gradual slope northward towards the Cobequid Uplands. The site of the proposed expansion includes a broad, low-relief swale extending to the south across Plains Road and bordered by areas of higher elevation to the east and west.

4.1.2 CLIMATE

The study area is in the Atlantic Maritime Ecozone, which is strongly influenced by the Atlantic Ocean, Bay of Fundy, and Gulf of St. Lawrence, characterized by long frost-free growing periods, cool summer temperatures (average temperature of 14º C), low evaporation rates, and exposure to wind. Inland areas receive precipitation ~900 mm and over 1500 mm near the coast, only about 15% of which falls as snow (Figure 3). Winters are mild with conditions near the coast foggy; mean daily low winter temperatures are typically from -5ºC to 0º C.

The project site receives an average of 1170 cm of precipitation annually, the majority (87%) as rain (Canadian Climate Normals 1971-2000, for Debert http://www.climate.weatheroffice.gc.ca/climate_normals/). Total precipitation is highest in May and October-December and peak daily precipitation is typically less than 50 mm, but more than 80 mm has been recorded in July, August and October (record rainfall of 89.4 mm in August 1999) (Figure 3). Most runoff occurs in the October-May period, peaking in March-April (Figure 3).

4.1.3 HYDROLOGY

The Minas Lowland in which the project is located is drained by several rivers including the Debert and the Chiganois which originate in the Cobequid Uplands to the north, flowing through the area to discharge in Cobequid Bay of Minas Basin. The project site is at the head of the watershed of the Chiganois River, draining through an intermittent stream into Galloping Brook which flows into MacElmon's Pond and thence into the Chiganois River. Peak runoff occurs in the March-May period with secondary peaks in the winter (October-January) period (Figure 3).

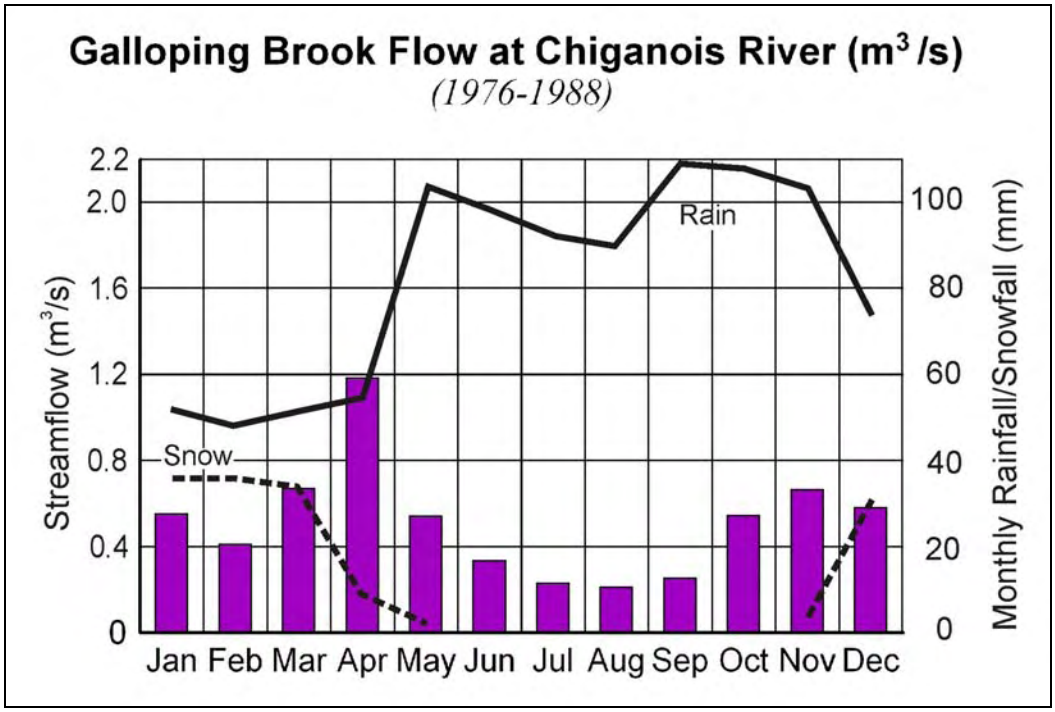

Figure 3. Estimated average monthly flow (m^3/s) of Galloping Brook, at Chiganois River, 1976-1988 and monthly precipitation. Based on watershed area of 16.2 km^2 and flows in North River, Colchester County (Environment Canada 1989 & Water Survey of Canada, www.ec.gc.ca/rhc-wsc). Precipitation from www.climate.weatheroffice.gc.ca/climate_normals/.

4.2 BIOLOGICAL RESOURCES AND HABITAT

4.2.1 TERRESTRIAL HABITAT

The study area is located in a mature to semi-mature mixed forest, dominated by white spruce, white pine, trembling aspen, red maple, and balsam fir, which has been variously opened up by forestry activities and industrial development, although the adjacent areas are mainly undeveloped. Wetland areas on the site are dominated by cat-tails, wire birch, poplar and maple and associated understorey communities (Marbicon 2010, Appendix C). South of Plains Road a patchwork of low, level swampy areas dominated by red maple, speckled alder, larch, and black spruce, alternating with typical mixed forest on the more elevated portions, occurs. Land developed for warehouses and industrial facilities occupy the north, northwest and northeast surrounding Lancaster Crescent and an unused rail bed runs along the eastern side of the proposed expansion area; however the typical upland forest extends west, southwest and in a patchwork to the east. The project site straddles a swale occupied by a wooded swamp, with runoff from the adjacent warehouse and parking facilities directed into the swale and contributing to overall flow through the wetland. The site has been recently logged in preparation for development except for a buffer along the swamp and bordering Plains Road and Lancaster Crescent.

The site is used by local wildlife and avifauna and would be considered suitable habitat for a wide range of species; however the proximity to developed areas reduces the value of habitat at the site. No plant

species at risk were found during botanical surveys (2010) and literature searches did not identify other potential species of significance in the vicinity of the site.

4.2.2 FRESHWATER AQUATIC ENVIRONMENTS/ WETLANDS

No significant wetland habitats listed in the NSDNR significant habitats database occur in the study area. The site includes a wooded swamp (3.2 hectares), which drains through an intermittent stream and exits the property through a culvert under Plains Road (Figure 2). South of Plains Road is a complex of wetlands and ponds in the Galloping Brook watershed. The extent and characteristics of the wetland at the site were determined by a wetland delineation and functional assessment in July 2010 (Marbicon 2010, Appendix C). Most of the forest surrounding the wetland had been cut over prior to the site survey. The wetland occupies a linear low area in the topography, occupying about half the site, and is supported by groundwater flow and precipitation, as well as drainage from the existing Home Hardware facilities and land situated to the west, through culverts under the existing rail bed and Lancaster Crescent respectively (Figure 4). The northern part of the wetland is dominated by cattails (*Typha latifolia*) and wire birch (Figure 5). The southern part is a shrub swamp dominated by speckled alder and occasional red maple (Figure 6). The wetland functions as a hydrological recharge area.

The intermittent stream originates at a culvert under the existing railbed at the discharge point for the stormwater collection system at the site (Figure 2). The stream is not suitable fish habitat based on the field survey and there is no access to the site for fish due to a blocked culvert under Plains Road. The stream meanders through the lower portion of the swamp and occasionally disappears subsurface [1]. It is mostly from 0.3 to 1 m wide and 15 – 20 cm deep, sometimes disappearing beneath grass hummocks (Figure 7). Bottom substrate is mixed mud to sand and gravel with considerable woody debris. Flow was low during both site visits, which were during periods of high precipitation, and the stream is expected to dry out in summer. The outlet for the stream under Plains Road is blocked, but some flow percolates from the ground on the south side. Below Plains Road the stream continues with similar width and depth into an alder swamp (Figure 8).

At the time of the survey, flow in the stream was low, suspended sediment levels low, water was slightly basic and acceptable for freshwater organisms according to Freshwater Aquatic Life guidelines (CCME 1999) and dissolved oxygen levels were high and near saturation (Table 1).

1 A walkover of the intermittent stream was conducted in July and November 2010 by biologists from Envirosphere Consultants Limited to determine characteristics and potential of the site for fish habitat.

Table 1. Water quality measurements of intermittent stream upstream and downstream of Plains Road at study site, November 16, 2010.		
Site Location	**Upstream**	**Downstream**
Temperature ºC	6.7	6.6
Saturation %	82.2	80.2
Dissolved Oxygen (mg/L)	9.9	9.9
Conductivity (µs)	227.2	218.6
Specific Conductivity (25º C) (µs)	348.6	336.8
TSS (mg/L)	11.0	3.0
pH	7.9	7.3

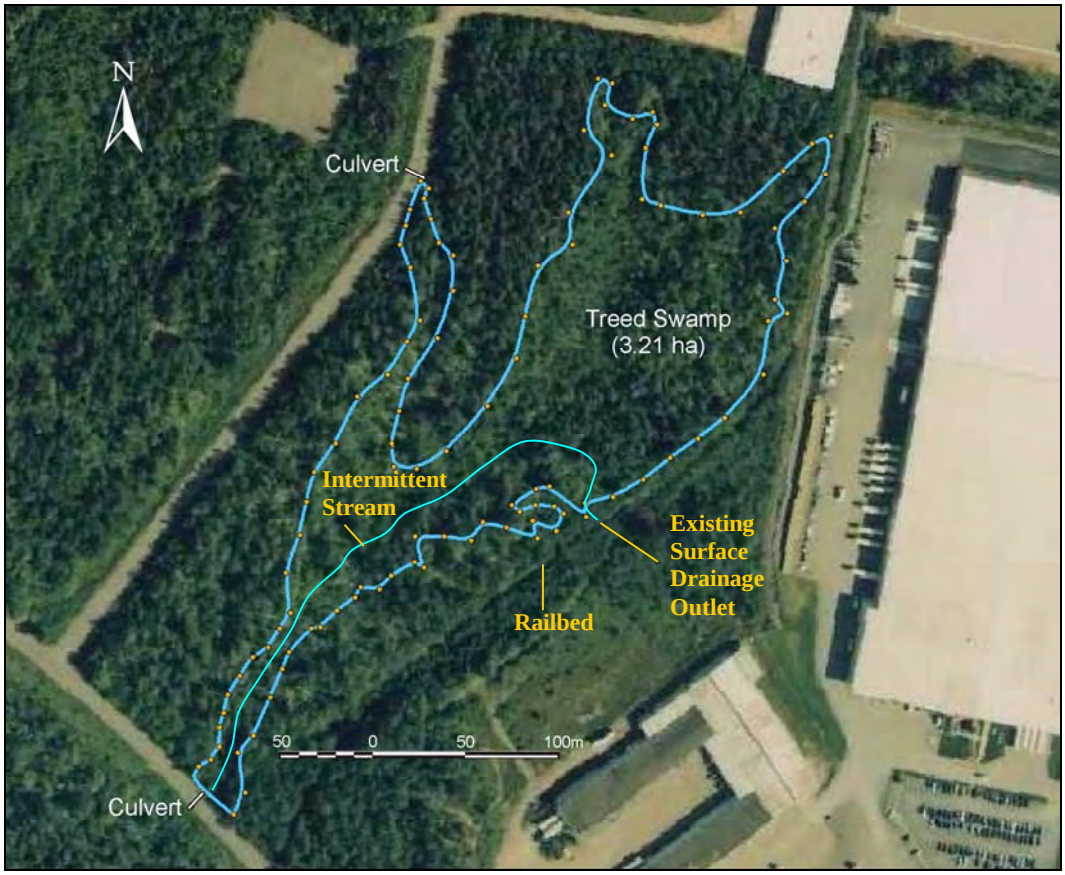

Figure 4. Wetland and surface water features on project site.

Figure 5. Cattail marsh on northern part of the property, July 2010.

Figure 6. Wooded swamp on the southern extremity of the site, July 2010.

Figure 7. Intermittent stream at Plains Road, November 16, 2010.

Figure 8. Intermittent stream and alder swamp below Plains Road, looking south, November 16, 2010.

4.2.3 BIRDS

The site provides habitat for various bird species, in particular in the remaining uncut mixed forest along Lancaster Crescent and Plains Road and along the axis of the wetland. It is not critical habitat for any species, in particular because of the adjacent industrial facilities on the north and east sides, and removal

of forest on the remaining areas of the site carried out in 2010. Habitat at the site is not suitable for several of the uncommon or at-risk species known to nest in the general area (Bobolink, Barn Swallow and Common Loon)(Appendix A) although Canada Warbler and Boreal Chickadee may have nested in the area before it was cut over. The general area of the site is productive for birds—one hundred eleven (111) species are suspected or have been confirmed to breed in the general vicinity (*Maritime Breeding Birds Atlas*, website; Erskine 1992)) (Table 2). Large raptors including Bald Eagle and Osprey occur east and west of the site adjacent to Chiganois and Debert Rivers, respectively and bald eagle nest in the vicinity of MacElmon's Pond, in the Debert Wildlife Management Area, located approximately 7 km south of the project site (K. George, Wildlife Biologist, DNR, personal communication 2010). MacElmons Pond supports nesting and is an important staging area for migrating waterfowl including a small population of American widgeon (K. George, Wildlife Biologist, DNR, personal communication 2010; NS DNR website, *www.gov.ns.ca*).

4.2.4 MAMMALS AND OTHER WILDLIFE

No significant or unique concentrations of mammals are known from the site (K. George, Wildlife Biologist, DNR, personal communication 2010). White-tailed deer tracks were evident during the site visit November 16, 2010, and Moose and Pygmy Shrew have been reported in the region but are rare (L. Bennett, Coordinator, Special Places, personal communication, 2010).

4.2.5 FISH

No fish habitat occurs on site; however the site is a recharge area in the upper watershed of Galloping Brook, a first order stream which flows into MacElmon's Pond and thence into the Chiganois River. The watershed supports various fish species, most commonly brook trout, American eel and white sucker (A. Heggelin, NS Dept. of Fisheries and Aquaculture, personal communication 2010) with gaspereau and Atlantic Salmon occurring in the Chiganois River (V. Smith, DFO, personal communication 2010; Gibson *et al* 2003). Atlantic Salmon are at reduced numbers and are considered at risk both provincially and under federal species at risk legislation, as part of the Inner Bay of Fundy population. The Chiganois River has been a recipient river for a DFO Live Gene Bank Program for Atlantic salmon (J. Gibson, DFO, personal communication, 2010), and salmon have been released into the Chiganois River annually since 2002 (with the exception of 2007) (S. O'Neil, DFO, personal communication, 2010). Atlantic herring, shad, gaspereau, flounder, striped bass and Atlantic Sturgeon can all be found at the mouth of the Chiganois River in Cobequid Bay. Fish populations and species diversity in the watershed of Chiganois River are reduced by the presence of tidal gates at the mouth of the river which limit fish passage.

Table 2. Bird species with potential to breed in the vicinity of the project site, based on presence of suitable habitat. Regionally rare species are shown in bold. Source: Maritime Breeding Bird Atlas.

Alder Flycatcher	Common Yellowthroat	Palm Warbler
American Bittern	Dark-eyed Junco	Pileated Woodpecker
American Crow	Downy Woodpecker	Pine Grosbeak
American Goldfinch	Eastern Bluebird	Pine Siskin
American Kestrel	Eastern Kingbird	Purple Finch
American Redstart	Eastern Wood-Pewee	Red Crossbill
American Robin	European Starling	Red-breasted Nuthatch
American Woodcock	Evening Grosbeak	Red-eyed Vireo
Baltimore Oriole	Golden-crowned Kinglet	Red-tailed Hawk
Barred Owl	Gray Catbird	Red-winged Blackbird
Bay-breasted Warbler	Gray Jay	Rose-breasted Grosbeak
Black-and-white Warbler	Great Horned Owl	Ruby-crowned Kinglet
Black-backed Woodpecker	Hairy Woodpecker	Ruby-throated Hummingbird
Black-billed Cuckoo	Hermit Thrush	Ruffed Grouse
Blackburnian Warbler	**Indigo Bunting**	Sharp-shinned Hawk
Black-capped Chickadee	Least Flycatcher	Song Sparrow
Blackpoll Warbler	Lincoln's Sparrow	Spruce Grouse
Black-throated Green Warbler	Magnolia Warbler	Swainson's Thrush
Blue Jay	Merlin	Swamp Sparrow
Blue-headed Vireo	Mourning Dove	Tennessee Warbler
Brown-headed Cowbird	Mourning Warbler	Tree Swallow
Canada Warbler	Nashville Warbler	Veery
Cape May Warbler	**Northern Cardinal**	White-throated Sparrow
Cedar Waxwing	Northern Flicker	White-winged Crossbill
Chestnut-sided Warbler	Northern Parula	Wilson's Warbler
Chipping Sparrow	Northern Waterthrush	Yellow Warbler
Common Grackle	Ovenbird	Yellow-bellied Flycatcher
Common Nighthawk	Osprey	Yellow-rumped Warbler
Common Raven		

4.2.6 REPTILES AND AMPHIBIANS

No potential for significant occurrences of reptiles and amphibians were identified for the site. However, the Wood Turtle, *Glyptemys insculpta*, a federally-listed species at risk has been reported near the Chiganois River, east of the site (K. George, Wildlife Biologist, DNR, personal communication, 2010).

4.2.7 SPECIES AT RISK

Species at Risk are those plants or animals whose existence is threatened or which are in danger of being threatened, by human activities or natural events. Species which are considered to be at risk are selected

by provincial, national and international conservation and biological organizations. The Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC) presently recommends species to be listed under the federal *Species at Risk Act*, and species are also listed at the provincial level.

No plant species of concern were recorded during the botanical survey conducted as part of the wetland assessment (Marbicon 2010, Appendix C); and animal species at risk are not likely to be found at the project site (see below). Other information on species of concern in the vicinity of the study area includes 1621 records of 288 vascular plant species of concern and 50 records (17 species) of non-vascular plants, within a 100 km radius of the study site (ACCDC, 2010)(Table 4); and for animal species 1432 records of 75 vertebrate species, and 427 records (81 species) of invertebrate taxa (ACCDC 2010)(Table 4). Three provincial red status species including plants (Blue Cohosh and Northern Maidenhair), and a damselfly (Taiga Bluet) have been recorded within 10 km of the study site, as well as four federally-listed vertebrate species at risk—two birds, the Bobolink and Red Knot—as well as the Wood Turtle and Atlantic Salmon (NS Museum, 2010)(Table 3). None of the habitat types required by these species are likely to occur on the project site. COSEWIC listed marine-estuarine species, Atlantic Mud-Piddock & Striped Bass; COSEWIC Candidate species Gaspereau (*Alosa pseudharengus*) & Shad *Alosa sapidissima* and provincially red-listed species Atlantic Sturgeon, occur in Cobequid Bay at the mouth of the Chiganois River and would not be influenced by the project. Federally listed species at risk include:

- Bobolink is federally listed as a *threatened* species that is known to arrive in May and nest in terrestrial and coastal meadowlands; the species would be associated with agriculture hayfields adjacent to Chiganois and Debert Rivers.
- Red Knot is a shorebird which is federally-listed as an *endangered* species. The species feeds along sand beaches with adjacent mudflats in Nova Scotia during migration, typically seen in spring (mid-April to May) and more commonly during their fall migration from July to September. Red Knot would be most common in coastal areas outside the immediate project site.
- Wood Turtle is federally listed as a *threatened* species that has been observed within a 10 km radius of the study site (ACCDC 2010) associated with the Chiganois River. Wood Turtles are generally active between April to October and nest in the late-June to July period, with hatchlings emerging in September to October.
- Atlantic Salmon in Inner Bay of Fundy populations of (including the Debert & Chiganois Rivers) are federally-listed as endangered (the species is at low numbers world-wide but moderate populations occur in other parts of Nova Scotia such as the Northumberland Strait shore). The watershed at the site does not provide suitable nursery habitat for the species; however the Chiganois River is one of several rivers in the area stocked with salmon to provided genetic diversity for hatchery breeding programs.

Table 3. Provincially listed species of concern with potential to occur in the vicinity of the project site. Nova Scotia Museum records (L. Bennett, NS Museum, personnel communication, 2010).

Scientific Name	Common Name	Provincial Status	ACCDC [1]
PLANTS			
Adiantum pedatum	Northern Maidenhair Fern	red	S1
Anenome virginiana var alba	Virginia Anemone	yellow	S1S2
Carex comosa	Bearded Sedge	yellow	S2
Carex hirtifolia	Pubescent Sedge	yellow	
Desmodium canadense	Showy Tick-Trefoil	red	
Dryopteris fragrans	Fragrant Wood Fern	yellow	S2
Equisetum pratense	Meadow Horsetail	yellow	
Laqportea Canadensis	Wood Nettle	yellow	
Lilium canadense	Canada Lily	yellow	S2S3
Polygonum scandens	Climbing False Buckwheat	yellow	S3
Stellaria longifolia	Longleaf Stichwort	yellow	
Tiarella cordifolia	Heart-leaved Foamflower	yellow	S2
BIRDS			
Dolichonyx oryzivorus	Bobolink	yellow	S3S4B
Gavia immer	Common Loon	yellow	
Hirundo rustica	Barn Swallow	yellow	
Parus hudsonicus	Boreal Chickadee	yellow	
Wilsonia canadensis	Canada Warbler	yellow	
INVERTEBRATES			
Coenagrion resolutum	Taiga bluet (Damselfly)	red	S1
Barnea truncata	Atlantic Mud-Piddock	--	
Alasmidonta undulata	Triangle Floater (mussel)	yellow	S2S3
FISH			
Acipenser oxyrhynchus	Atlantic Sturgeon	red	
Alosa aestivalis	Blueback Herring	green	
Alosa pseudoharengus	Gaspereau	yellow	
Alosa sapidissima	Shad	green	
Morone saxatilis	Striped Bass	yellow	S1
Salmo salar	Atlantic Salmon	red	S2
REPTILES & AMPHIBIANS			
Glyptemys insculpta	Wood turtle	yellow	S3
MAMMALS			
Alces alces	Moose	red	
Sorex hoyi	Pygmy Shrew	green	
1.Atlantic Canada Conservation Data Centre Status			

Table 4. Records of species of concern within a 10 km radius of Home Hardware Proposed Site. Atlantic Canada Conservation Data Centre (ACCDC) Database, November 2010. E=endangered; T=threatened; SC=Species of Concern; NAR=not at risk.

Family/Scientific Name		Common Name	Rank		
			National	Provincial	Sub-National
Plants					
Asteraceae	*Senecio pseudoarnica*	Seabeach Ragwort		Yellow	S2
	Symphyotrichum boreale	Boreal Aster		"	S2?
Berberidaceae	*Caulophyllum thalictroides*	Blue Cohosh		Red	S2
Campanulaceae	*Lobelia spicata*	Pale-spiked Lobelia		"	S1
Caprifoliaceae	*Triosteum aurantiacum*	Orange-fruited Tinker's Weed		Yellow	S2
Cyperaceae	*Carex adjusta*	Lesser Brown Sedge		"	S2S3
	Carex comosa	Bearded Sedge		"	S2
	Carex foenea	Hay Sedge		Green	S3?
	Eriophorum gracile	Slender Cottongrass		Yellow	S2
Dryopteridaceae	*Dryopteris fragrans var. remotiuscula*	Fragrant Wood Fern		"	S2
	Woodsia glabella	Smooth Cliff Fern		"	S2
Juncaceae	*Juncus subcaudatus*	Woodland Rush		Undetermined	S3
Liliaceae	*Allium schoenoprasum var, sibiricum*	Wild Chives		"	S2
	Lilium canadense	Canada Lily		Yellow	S2S3
Lycopodiaceae	*Huperzia selago*	Northern Fir moss		Undetermined	S1S3
	Lycopodium sabinifolium	Ground-Fir		Green	S3?
Onagraceae	*Oenothera fruticosa ssp. glauca*	Narrow-leaved Evening Primrose		Undetermined	S2
Orchidaceae	*Platanthera orbiculata*	Small Round-leaved Orchid		Green	S3
Plantaginaceae	*Plantago rugelii*	Rugel's Plantain		Undetermined	S2
Poaceae	*Piptatherum canadense*	Canada Rice Grass		Yellow	S2
Polygalaceae	*Polygala sanguinea*	Blood Milkwort		"	S2S3
Polygonaceae	*Polygonum buxiforme*	Small's Knotweed		Undetermined	S2S3
	Polygonum pensylvanicum	Pennsylvania Smartweed		Green	S3
	Polygonum scandens	Climbing False Buckwheat		Yellow	S3

Table 4. Records of species of concern within a 10 km radius of Home Hardware Proposed Site. Atlantic Canada Conservation Data Centre (ACCDC) Database, November 2010. E=endangered; T=threatened; SC=Species of Concern; NAR=not at risk.

Potamogetonaceae	*Potamogeton friesii*	Fries' Pondweed		Undetermined	S2
Primulaceae	*Primula mistassinica*	Mistassini Primrose		Yellow	S2
Pteridaceae	*Adiantum pedatum*	Northern Maidenhair Fern		Red	S1
Pyrolaceae	*Pyrola asarifolia*	Pink Pyrola		Green	S3
Ranunculaceae	*Anemone virginiana var. alba*	Virginia Anemone		Yellow	S1S2
	Ranunculus flammula var. flammula	Lesser Spearwort		Green	S2
Saxifragaceae	*Tiarella cordifolia*	Heart-leaved Foamflower		Yellow	S2
Scrophurlariaceae	*Gratiola neglecta*	Clammy Hedge-Hyssop		"	S1S2
Sparganiaceae	*Sparganium natans*	Small Burreed		Green	S3
Verbenaceae	*Verbena hastata*	Blue Vervain		"	S3
Violaceae	*Viola canadensis*	Canada Violet		Extirpated	S2
	Viola nephrophylla	Northern Bog Violet		Yellow	S2
Animals-Birds					
Accipitridae	*Accipiter gentilis*	Northern Goshawk	NAR	Yellow	S3S4
Anatidae	*Anas acuta*	Northern Pintail		Green	S2B
Cardinalidae	*Cardinlais cardinalis*	Northern Cardinal			S3S4
	Passerina cyanea	Indigo Bunting		"	S1S2B
Cuculidae	*Coccyzus erythropthalmus*	Black-billed Cuckoo		Green	S3?B
Icteridae	*Dolichonyx oryzivorus*	Bobolink	T	Yellow	S3S4B
	Icterus galula	Baltimore Oriole		Green	S2S3B
Rallidae	*Rallus limicola*	Virginia Rail		Green	S2B
Scolopacidae	*Calidris canutus rufa*	Red Knot rufa ssp	E	Yellow	S2S3M
	Limosa haemastica	Hudsonian Godwit		Undetermined	S3M
	Phalaropus lobatus	Red-necked Phalarope		Green	S2S3M
Strigidae	*Aegolius funereus*	Boreal Owl	NAR	"	S1B
Turdidae	*Hylocichla mustelina*	Wood Thrush		"	S1B
	Sialia sialis	Eastern Bluebird	NAR	Yellow	S3B
Animals-Dragonflies & Damselflies					
Coenagrionidae	*Coenagrion resolutum*	Taiga Bluet		Red	S1
Animals-Butterflies					

Table 4. Records of species of concern within a 10 km radius of Home Hardware Proposed Site. Atlantic Canada Conservation Data Centre (ACCDC) Database, November 2010. E=endangered; T=threatened; SC=Species of Concern; NAR=not at risk.

Hesperiidae	*Boloria chariclea*	Arctic Fritillary		Yellow	S2
	Erynnis juvenalis	Juvenal's Duskywing		Green	S2S3
Lycaenidae	*Satyrium calaus*	Banded Hairstreak		Undetermined	S2
Nymphalidae	*Nymphalis milbert*	*Milbert's Tortoiseshell*		Green	S2
	Polygonia faunus	Green Comma		"	S3
	Polygonia interrogationis	Question Mark		"	S3B
	Polygonia progne	Gray Comma		"	S3S4
Other					
Emydidae	*Glyptemys insculpta*	Wood Turtle	T	Yellow	S3
Salmonidae	*Salmo salar*	Atlantic Salmon	E	Red	S2

S1 Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.

S2 Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.

S3 Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations. (21 to 100 occurrences).

S4 Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).

S5 Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.

S#S# Numeric range rank: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the Element (e.g., S1S2).

SH Historical: Element occurred historically throughout its range in the province (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 - 70 years (depending on the species), and suspected to be still extant.

SU Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information.

SX Extinct/Extirpated: Element is believed to be extirpated within the province.

S? Unranked: Element is not yet ranked.

SA Accidental: Accidental or casual in the province (i.e., infrequent and far outside usual range). Includes species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded.

SE Exotic: An exotic established in the province (e.g., Purple Loosestrife or Coltsfoot); may be native in nearby regions.

SE# Exotic numeric: An exotic established in the province that has been assigned a numeric rank.

SP Potential: Potential that Element occurs in the province, but no occurrences reported.

SR Reported: Element reported in the province but without persuasive documentation, which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report.

SRF Reported falsely: Element erroneously reported in the province and the error has persisted in the literature.

SZ Zero occurrences: Not of practical conservation concern in the province, because there are no definable occurrences, although the species is native and appears regularly. An NZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations) or transitory. In other words, the migrant regularly passes through the province, but enduring, mappable Element Occurrences cannot be defined.

4.3 HUMAN USES OF THE ENVIRONMENT

4.3.1 FIRST NATIONS

The site is not used for hunting or fishing by Mi'kmaq but an area to the east (Figure 9) is significant as a pre-contact archaeological site, and will be a focus for the Mi'kmawey Debert Cultural Centre, to be built east of Lancaster Crescent and operated by the Confederacy of Mainland Mi'kmaq (CMM)(Figure 9). A wooded area south of the Home Hardware site encompassing the watersheds of Galloping and Alder Brooks is occupied by the Mi'kmawey Debert Interpretative Trail operated by CMM (Figures 9 & 10).

4.3.2 GROUNDWATER RESOURCES

No surface water supplies are in the vicinity of the project. Colchester County supplies water to the industrial park and adjacent areas by service mains that run parallel to Plains Road and Lancaster Crescent; a water tower is located near the junction of Plains & MacElmon Roads. The project site serves as a groundwater recharge area.

4.3.3 RECREATIONAL FISHING

There are no streams supporting recreational fishing at the site, although recreational fishing (brook trout) takes place in downstream areas including Galloping Brook, McElmons Pond and Chiganois River (V. Smith, DFO, personal communication 2010).

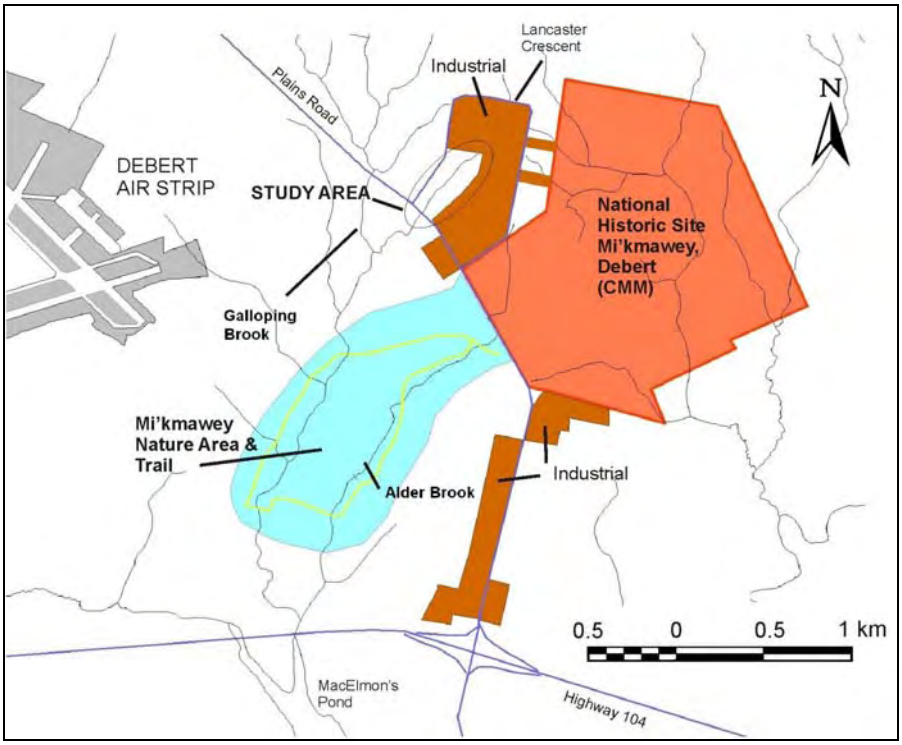

Figure 9. Industrial & First Nations developments near project site.

Figure 10. Entrance to Mi'kmawey Nature Trail southeast of project site, November 16, 2010.

4.3.4 ARCHAEOLOGICAL RESOURCES

The Debert Paleo-Indian Site to the immediate east of the existing Home Hardware warehouse facility is currently the site of ongoing surveys for artifacts and other indications of past occupation. The site is protected under the provincial Special Places Protection Act (ACCDC, 2010) and is encompassed by a National Historic Site (J. Mattie, Colchester Regional Development Authority (CORDA), personal communication, 2010). Proximity to the Palaeo-Indian site suggests that the current project site would have high potential for archaeological resources (L. Bennett, Coordinator, Special Places, personal communication 2010). However no archaeological resources were found in an archaeological survey of the proposed project site conducted in the summer of 2010 (J. Mattie, CORDA, personal communication 2010).

4.3.5 PARKS AND PROTECTED AREAS/ RECREATIONAL AREAS

Significant parks and protected areas include the Debert Paleo-Indian Site to the east, and the Debert Wildlife Management Area located about 7 km south encompassing MacElmon's Pond & the MacElmon's Pond Provincial Park, as well as a freshwater marsh operated by Ducks Unlimited Canada (ACCDC, 2010). The Isgonish Marsh Burying Ground, a National Historic Site and a Registered Nova Scotia Heritage Site, is located on the Chiganois River west of Lower Onslow, and a designated International Bird Area (IBA) is located in Cobequid Bay south of the project site (ACCDC, 2010). Other notable features of the area used for recreation or conservation include Debert Airport for recreational flying; the Debert Rifle Range located near Debert; and the Mi'kmawey Debert Interpretive Trail (CMM) to the south (Figure 9).

4.3.6 RECREATIONAL ACTIVITIES

The proposed project site is not used by the public presently except possibly for hunting. There are no residences in the vicinity of the project and adjacent areas are unlikely to be used for recreational activities by locals. Plains Road which passes the site may be used for cycling and road tours. Recreational facilities in adjacent areas include: MacElmon's Pond Provincial Park, Mi'kmawey Debert Interpretative Trail and Camp Debert facilities.

4.3.7 TRANSPORTATION

Plains Road is the main road between Debert and the Trans Canada Highway (Highway 104) and supports local private as well as commercial traffic. The expanded distribution centre, as well as other possible expansions in the area (e.g. the Sobey's distribution centre) will result in an increase in truck traffic volumes, although the increase will probably not be excessive. Various factors associated with the project, including expansion of the industrial base in the area as well as increased use of the Debert area for residential development, and use of Plains Road to access to restaurant facilities such as Tim Horton's, is likely to increase traffic levels in the vicinity of the Home Hardware site, leading to increase the potential for vehicle accidents. Accidents can result in property damage and loss of life, as well as environmental damage, in particular to the wetland habitats southwest of Plains Road in the Lancaster Crescent area. Presently there is no traffic control or signage warning of truck activity in the area.

4.3.8 RESIDENTIAL/COMMERCIAL DEVELOPMENT

The site is part of the Debert Air Industrial Park operated by Colchester Regional Development Authority. The industrial park has been designed to be environmentally friendly and sustainable, including a balance of natural and industrial areas (J. Mattie, CORDA, personal communication 2010; SRES 2005). Land to the west of Lancaster Crescent has not yet been developed, but several industrial facilities, including the existing Home Hardware distribution centre, occupy lands to the east, north and southeast. Industries include: a Sobey's distribution centre (northeast of the project site); and Nystone, a former processor of pharmaceutical barium located immediately to the north. Other local commercial enterprises include as Onyx & Marble and D'Maya Consulting on the east side of Lancaster Crescent, and the manufacturing facilities and distribution centres of Richie Bros. & Thermocell are located across Plains Road southeast of the project site.

4.3.9 VIEWSCAPE

The view of the project site is largely blocked by a buffer of mixed mature forest along Plains Road and Lancaster Crescent. Plains Road is one of the main routes for road traffic from the Trans Canada Highway to Debert, and would include local and industrial, as well as tourist traffic.

5 ASSESSMENT APPROACH AND METHODS

Information for the assessment was obtained from consultants' personal knowledge, from reviews of available information, and knowledge of the purpose and proposed design of the project. The approach to environmental assessment under the Canadian Environmental Assessment Act (CEAA) has been

followed. In general, lists of valued environmental components (VECs)[2], and project activities and outcomes for the expansion and operation of Home Hardware Warehouse & Distribution Centre were developed, and the potential for interactions with VECs identified. Where interactions were identified and significant impacts were likely to occur, mitigative actions were determined which would remove the impact, and would be included in the project. The process ensures that all potentially significant impacts on VECs are identified and all potential impacts on them have been considered and sufficient mitigation planned.

6 PREDICTING ENVIRONMENTAL EFFECTS—SIGNIFICANCE AND MITIGATION OF IMPACTS ON VALUED ENVIRONMENTAL COMPONENTS

The list of Valued Environmental Components (VECs) considered for the assessment, and interactions with project components, are presented in Tables 5 & 6. The environmental effects and potential impacts of the project along with their significance and suggested mitigations are outlined in the following and are summarized in Table 7.

Table 5. Valued Environmental Components (VECs) for Home Hardware expansion.

Biophysical	Socioeconomic
Wetlands	First Nations
Surface Water	Tourism
Fish Habitat	Cultural, Historical and Archaeological Resources
Terrestrial Birds	Infrastructure–Transportation & Vehicular Traffic
Waterfowl	Industrial Activity
Species at Risk	Regional Economy
Groundwater Resources	Recreational Fishing
Terrestrial Vegetation	Parks & Protected Areas
Terrestrial Ecosystem	Residential Use /Health & Safety
	Aesthetics - Viewscape

6.1 SOCIOECONOMIC IMPACTS

6.1.1 FIRST NATIONS

The project has the potential to impact the streamflow regime in the watershed of Galloping Brook and through the Mi'kmawey Nature Area, by sudden release of storm runoff and snow melt from parking areas and buildings during construction and operational phases of the project, consequently increasing

2 Valued Environmental Components (VECs) are features or things in the environment, which are important either ecologically, socially, economically or culturally. The environmental assessment addresses potential impacts of the project on each VEC identified. To do so involves identifying all the activities or outcomes of the project which interact with each VEC, and then determining and rating the magnitude of the impact in a standard way, in this case in a manner guided by standard approaches which have been developed for assessments under CEAA.

peak flows and reducing low or maintenance flows. During construction there is the potential for accidental release of contaminants and suspended sediments, which may also impact the watercourses in the Mi'kmawey nature interpretation area. During operation of the project, contaminated runoff and dust from parking areas has the potential to enter the watershed. These impacts would be relatively small due to the small area of the watershed affected by the project in relation to the watershed as a whole, and in any case will be mitigated by a stormwater management system including water detention/settling ponds to stabilize offsite flow, and oil separation ponds to treat contaminated runoff if necessary.

6.1.2 TOURISM

The character of the area along Plains Road, which is presently a mix of industrial lots and forested areas, will not be changed significantly by the project, as existing forested buffers will largely be maintained. Traffic loading of Plains Road will not increase to the extent that it will interfere with tourist traffic. The distribution centres in the area, including Home Hardware, could be highlighted and used by the Municipality as tourist draws. Additional workforce at the site will help to maintain amenities such as Tim Horton's which also serve tourists in the area.

6.1.3 CULTURAL, HISTORICAL AND ARCHAEOLOGICAL RESOURCES

The project is unlikely to disturb artifacts and other archaeological resources—the site has a small footprint in an already partially disturbed area, and an archaeological survey of the site indicated that the probability of finding artifacts is low. The project would not impact the adjacent Palaeo-Indian site to the east of Lancaster Crescent.

6.1.4 INFRASTRUCTURE, TRANSPORTATION & VEHICULAR TRAFFIC

Operations of the expanded facility would place would cause a moderate increase in traffic on the secondary roads and the highway in the area, which may not have been designed for the additional industrial activities created by the industrial park. In addition, increased incidence of trucks turning into the Home Hardware facility and leaving from Lancaster Crescent could lead to increased incidence of collisions with private vehicles which use Plains Road as the main access from Debert to the Trans Canada Highway and amenities such as the local Tim Horton's. The Lancaster Crescent area is centred on a wetland recharge area, and wetlands extending to the south are important local ecological habitats which could be damaged by accidental spills of hydrocarbons from motor vehicle accidents. Implementation of some traffic control measures such as signage to alert drivers to turning vehicles etc. should probably be examined to avoid future motor vehicle accidents at the site.

6.1.5 INDUSTRIAL ACTIVITY

Additional truck traffic may cause minor conflicts with the operation of other businesses in the area, particularly the strip along MacElmon's Road, along which the traffic will have to pass. The road in the area is probably not near its capacity so this would be a negligible impact.

6.1.6 REGIONAL ECONOMY

Expansion of the Home Hardware Debert facilities will benefit the local and regional economy through the infusion of jobs, and the streamlining of infrastructure expenditures and maintenance activities associated with development of the industrial park facilities. Minimizing the footprint and visual impact of the project site will minimize negative impacts on tourism.

6.1.7 RECREATIONAL FISHING

The project is unlikely to contaminate watercourses in the area such as Galloping Brook, MacElmon's Pond and Chiganois River, or interfere significantly with flows in the Galloping Brook system. The portion of the watershed affected by the project is relatively small, and any downstream impacts on flow and suspended sediment levels would be relatively small.

6.1.8 PARKS AND PROTECTED AREAS

The project will not interfere with the proposed site of the Mi'kmawey Cultural Centre, and will have negligible impacts on the interpretive trail system on Galloping Brook and Alder Brook. The project would have a negligible footprint and not interfere significantly with future uses of adjacent lands for parks.

6.1.9 RESIDENTIAL USE/HEALTH & SAFETY

Construction and operation of the project will lead to increased truck traffic along Plains and MacElmon's roads as well as along the Trans Canada Highway in the area. Local and commuter traffic from residential neighbourhoods surrounding Debert to the west, would potentially be exposed to higher volumes of truck traffic, increasing potential for accidents and delays. Consideration should be given to some form of traffic management during construction and operation of the facility to reduce congestion and potential for collisions.

6.1.10 AESTHETICS - VIEWSCAPE

Natural appearance and/or well-maintained facilities in the area in general are important for appreciation of the area by frequent users, both those working at the industrial facilities in the area as well as tourists passing through. The project will maintain forested buffers, which will help to hide industrial activities and maintain the natural appearance, and result in negligible changes to the viewscape at the site.

6.2 BIOPHYSICAL IMPACTS

6.2.1 WETLANDS

The project will remove most of the existing treed swamp at the site in converting the area to a pad for future buildings and parking areas for transport trucks. A portion of the swamp will be preserved, however, north of Plains Road and detention ponds will be designed to moderate storm flows and regulate release in order to maintain flows into the remaining swamp as close as possible to current levels and patterns. The loss of wetland on the site will be compensated through a wetland compensation project in the Debert area and through wetland creation potential of some of the measures employed on site to manage flow.

To minimize damage to remaining wetland areas during construction, appropriate management practices will be employed to control site runoff and sedimentation, and procedures will be in place to avoid accidental discharges of hydrocarbons and other contaminants. The constructed facilities at the site will include measures to reduce erosion and sedimentation including use of semi-porous materials for the pad and landscaping which includes providing soil and vegetated cover for exposed areas not immediately needed for the expansion. Organic peat removed from the wetland will be suitably disposed of, and if temporarily left on site, will be managed to ensure the water contained in it, or leaving the site as runoff, do not reach the wetland without treatment, since it potentially has a high oxygen demand which could alter conditions in the wetland, and in downstream areas. Routine operation of the facility will not affect the remaining portion of wetland habitat. Detention ponds will capture storm and runoff flow and release them slowly to the remaining watershed, as well as serving as settling basins to remove suspended sediment.

6.2.2 SURFACE WATER

The project can impact surface waters by sudden release of storm runoff and snow melt from parking areas and buildings during construction and operational phases of the project, increasing peak flows and reducing low or maintenance flows. During construction there is the potential for accidental release of contaminants and suspended sediments. To minimize damage to surface waters downstream during construction, appropriate management practices will be employed to control site runoff and sedimentation, and procedures will be in place to avoid accidental discharges of hydrocarbons and other contaminants. During operation of the project, contaminated runoff and dust from parking areas has the potential to enter the watershed. These impacts will be mitigated by a stormwater management system including water detention/settling ponds to stabilize offsite flow, and oil separation ponds to treat contaminated runoff if necessary.

6.2.3 FISH HABITAT

There is no fish habitat on the site to be directly impacted by construction or operation of the Home Hardware Debert distribution facility. Practices implemented during construction and operation to reduce or eliminate contamination of water leaving the site, to maintain a normal flow regime at the site, to control oxygen demand, and to eliminate accidental spills of hydrocarbons and other contaminants, will minimize any downstream impacts on fish habitat (e.g. in Galloping Brook).

6.2.4 WATERFOWL

Waterfowl in downstream areas, particularly in the wetlands in the lower reaches of Galloping Brook and in MacElmon's Pond, can be impacted by accidental spills of contaminants particularly hydrocarbons during construction and operation of the facility. Birds are highly susceptible to hydrocarbon impacts through loss of the insulating capacity of the feathers, but also through eating contaminated food. During construction, best management practices will be employed for eliminating accidental spills of fuel and lubricants from on-site vehicles and other heavy equipment. Transport truck use during operation of the facility can potentially cause impacts through accidental releases of fuel and lubricants, small quantities

of which may be lost during normal operations. The site drainage system will include ponds for oil separation in addition to stormwater detention to reduce the amount of hydrocarbons reaching downstream areas of the watershed.

6.2.5 TERRESTRIAL BIRDS

Most of the forest cover in the footprint of the proposed site has been removed, with the exception of a buffer around the treed wetland and along Lancaster Crescent and Plains Road. Terrestrial birds will return to nest sites occupied in previous years, likely occupying the wetland areas, and incidently nesting in the cut-over areas. To avoid harming nesting birds, site activities involving removal of vegetation are planned to be completed by mid-May 2011. Noise from the operation of equipment, construction, and movement of materials etc., as well as lights used in night operations, could also disturb breeding birds in adjacent areas. If possible, activities should be planned to take place outside the normal nesting seasons, between mid-May and late August. Operation of the facilities is not expected to interfere with bird populations. However, some birds (e.g. pigeons, gulls) may be attracted to the site and proper sanitation practices to control garbage should be undertaken for the site.

6.2.6 SPECIES AT RISK

No plant or animal species at risk are known or likely to occur at the project site or in the immediate watershed and therefore there will be no impacts from construction or operation of the project. Good environmental practise in designing a project to minimize impacts on the local ecosystem, including species at risk if present, includes minimizing the footprint of the project in the natural landscape as much as possible, and maintaining areas of natural landscape inside which are contiguous with areas outside the project site in the form of landscape corridors allow local populations to spread and be maintained. The present project maintains a portion of the existing treed wetland and a wooded buffer along Plains Road. Protecting the wetland areas southwest of Plains Road and between the site and the Mi'kmawey Interpretive Trail would ensure a continuous forest is maintained.

6.2.7 GROUNDWATER RESOURCES

The site is a groundwater recharge area for local aquifers. The runoff from the site will be channelled into a detention pond system and into the remaining wetland on the site, and a portion will re-enter the groundwater aquifer at the site. Water management at the site will focus on maintaining flows out of the site at current levels, with the same balance between surface and groundwater flows.

6.2.8 TERRESTRIAL VEGETATION

Vegetation communities in the footprint of the project will be removed during the construction phase and those remaining have the potential to be damaged by construction activities and changes in drainage patterns. Plant communities at the site are not unique or significant; however it is important to minimize damage to the site through proper design and construction practices, including revegetation as an option to maximize vegetation cover. In general, no effects on the remaining terrestrial vegetation caused by the routine operation of the facilities are foreseen. Vegetation control using herbicides potentially could lead

to elevated concentrations of herbicide in the soil, which would affect adjacent plant communities, and should be avoided.

6.2.9 TERRESTRIAL ECOSYSTEM

The existing terrestrial ecosystem (plants and animals) will be removed by construction of the facilities. While its loss is not likely to be significant in terms of unique habitat or species, the remaining terrestrial ecosystem is an important element of the local landscape and may provide an important visual buffer for the site. Efforts should be made at the design and construction stage to minimize damage to the terrestrial ecosystem and if possible to restore unused adjacent areas of the site. Activities during operation of the facility, particularly changes in layout involving vegetation communities, should be carefully evaluated to ensure that damage such as equipment storage are minimized. For example, with good planning, areas within the property currently underutilized for storage and other purposes could be designated for use, rather than using existing natural areas for expansion.

7 CUMULATIVE IMPACTS

No significant cumulative impacts (impacts arising from the project in combination with ongoing or foreseen activities) are envisioned for the project. The project itself occupies a small footprint in an already disturbed area and the main potential impact is biological habitat removal and change in runoff regime. The industrial park in which the project is located occupies a small area in relation to the available undeveloped lands in the vicinity of Debert and consequently, as a whole, even when it is developed, will have a small overall impact on the local environment. The project will not likely result in a large incremental increase in traffic levels in the area; however at present levels and with increasing development including residential use in Debert, there may be an increased risk of traffic problems and accidents in future which should be investigated and mitigated in advance.

8 IMPACTS OF THE ENVIRONMENT ON THE PROJECT

The site could be exposed to extremes in temperature, wind and precipitation, which should be taken into consideration in design of facilities. Allowances should be made for build-up of snow and snow management, as well as rainwater management, in particular in light of global warming when extreme storm occurrences including extreme rainfall events, could become more common.

9 MONITORING

A monitoring program will be undertaken to examine water quality leaving the site during construction and through the early operational stage of the project to ensure the stormwater management system is functioning as planned.

Table 6. Potential interactions between project activities and operations and Valued Environmental Components (VECs) for Home Hardware Stores Limited Warehouse & Distribution Centre Expansion.

General Category of VEC	Biophysical									Socioeconomic									
Project Component (potential interactions shown by ✓)	Wetlands	Surface Water	Fish Habitat	Wildlife-waterfowl	Terrestrial Birds	Species at Risk	Groundwater Resources	Terrestrial Vegetation	Terrestrial Ecosystem	First Nations	Tourism	Cultural/, Historical & Archaeological Resources	Infrastructure–Transportation & Vehicular Traffic	Industrial Activity	Regional Economy	Recreational Fishing	Parks & Protected Areas	Residential Use /Health & Safety –	Aesthetics - Viewscape
Construction																			
- Site Preparation	✓	✓			✓			✓	✓										✓
- Construct Detention Ponds	✓	✓			✓			✓	✓										✓
- Excavation	✓	✓			✓			✓	✓			✓							✓
- Install catch basins & piping system	✓	✓																	✓
- Construct building					✓														
- Surface work (paving & landscaping)					✓			✓	✓										
- Accidents (Oil/ Fuel Spills)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓		
Operation																			
- Routine Offloading/Loading Operations														✓	✓			✓	✓
- Truck Transport													✓	✓	✓			✓	✓
- Accidents (Oil/ Fuel Spills)	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓					✓	✓		

Table 7. Summary of impacts and mitigation on Valued Ecosystem Components, Home Hardware Stores Limited Warehouse & Distribution Centre Expansion, 2010.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
BIOPHYSICAL COMPONENTS						
Wetlands	Construction	Alteration/ Removal of Wetland.	Significant	Negative	Wetland compensation will be provided.	Not significant.
Surface Water	Construction	Alteration of flow regime.	Significant	Minor, Negative	Use of catch basins/ detention ponds to manage surface water flows.	Not significant.
		Accidental hydrocarbon spills.	Significant	Negative	Best management practices; spill protection equipment available.	Not significant.
	Operation	Alteration of flow regime.	Significant	Minor, Negative	Use of catch basins/ detention ponds to manage surface water flows.	Not significant.
		Contaminated runoff; accidental hydrocarbon spills.	Significant	Negative	Use of catch basins/ detention ponds, oil separator ponds.	Not significant.
Fish Habitat	Construction and Operation	Accidental hydrocarbon spills & contamination.	Significant	Negative	Provide pollution prevention and emergency measures. Use of catch basins/ detention ponds, oil separator ponds.	Not significant.
Wildlife-Waterfowl (MacElmons Pond)	Construction & Operation	Accidental hydrocarbon spills cause mortality.	Significant	Negative	Provide pollution prevention training, spill emergency numbers on site.	Not significant.
Terrestrial Birds	Construction	Removal of habitat; noise and activity from construction.	Significant	Negative	Avoid breeding season; conduct work during daylight where possible.	Not significant
	Operation	Loss of habitat	Significant	Negative	If possible restore damaged and unused parts of the site. Create landscaped/ treed areas etc.	Not significant
Species at Risk – Atlantic Salmon in Chiganois River	Construction & Operation	Accidental Hydrocarbon and Chemical Spills.	Significant	Negative	Control spills and accidental discharges.	Not significant
Species at Risk-Wood Turtle	Construction & Operation	Accidental Hydrocarbon and Chemical Spills.	Significant	Negative	Control spills and accidental discharges.	Not significant

Table 7. Summary of impacts and mitigation on Valued Ecosystem Components, Home Hardware Stores Limited Warehouse & Distribution Centre Expansion, 2010.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
Species at Risk – Red Knot	Construction & Operation	Shorebird more likely off site in coastal areas.	Significant	Negative	Control spills and accidental discharges.	Not significant
Species at Risk – Bobolink	Construction	Species does not occur at project site and not likely to be impacted.	NA	NA	Not applicable	Not applicable
Groundwater Resources	Construction	Contamination from accidental hydrocarbon spills.	Significant	Negative	Provide pollution prevention and oil spill emergency measures.	Not significant
	Operation	Accidental hydrocarbon spills.	Significant	Negative	Efficient runoff management system for facilities and parking areas.	Not significant.
Terrestrial Vegetation	Construction	Removal of existing forest cover; damage remaining forest.	Significant	Negative	If possible restore damaged and unused parts of the site. Avoid working in remaining forested buffer areas.	Not significant.
	Construction & Operation	Accidental hydrocarbon spills con-taminate soil, cause die-offs.	Significant	Negative	Provide pollution prevention and emergency measures & response capability.	Not significant.
Terrestrial Ecosystem	Construction	Damage to terrestrial ecosystem adjacent to Project Site.	Significant	Negative	Avoid damage to adjacent areas.	Not Significant
	Operation	Reduced habitat, interference with water flow patterns.	Significant	Negative	If possible restore damaged and unused parts of the site to pre-existing ecological function.	Not Significant
SOCIOECONOMIC COMPONENTS						
First Nations Interpretive Trail System	Construction & Operation	Interference with flows in streams along Interpretive Trail.	Significant	Negative	Stormflow management and detention ponds to normalize flow.	Not significant
First Nations Palaeo-Indian Site	Construction & Operation	No Effect	No Effect	No Effect	Not applicable	Not applicable
Tourism	Operation	Project affects natural appearance of site.	Not Significant	Minor Negative	Maintain treed buffers and landscape the property	Not significant

Table 7. Summary of impacts and mitigation on Valued Ecosystem Components, Home Hardware Stores Limited Warehouse & Distribution Centre Expansion, 2010.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
Cultural, Historical & Archaeological Features	Construction & Operation	Damage to existing archaeological features.	Significant	Negative	Stop work, notify authorities if any artifacts are discovered.	Not significant
Infrastructure-Transportation & Vehicular Traffic	Construction	Increased local vehicle traffic; increased potential for collisions with transport trucks.	Significant	Minor Negative	Temporary traffic management on Plains Road. Assist/advise municipal governments for improved long-term traffic management.	Not significant
	Operation	Increased wear on highway; increased local traffic and potential for vehicle accidents.	Significant	Minor Negative	Assist/advise municipal governments for improved traffic management on Plains Road. Appropriate safety signage.	Not significant
Local Industrial Activity	Operation	Increased industrial development.	Significant	Positive	Cooperate in local planning.	Not applicable
Regional Economy	Operation	Improvements to Regional Economy.	Significant	Positive	Cooperate in local planning.	Not applicable
Recreational Fishing	Construction & Operation	Accidental hydrocarbon spills contaminate surface waters.	Significant	Negative	Provide pollution prevention and emergency measures & response capability.	Not significant
Parks and Protected areas	Construction & Operation	Accidental hydrocarbon spills affect downstream areas.	Significant	Negative	Efficient runoff management system for facilities and parking areas.	Not significant.
Residential Use/ Health and Safety	Construction & Operation	May increase risk of vehicle accidents by Debert commuter and industrial traffic.	Significant	Negative	Contribute to traffic control assessment & planning. Scheduling operations to avoid peak traffic periods.	Not significant
Aesthetics—Viewscape	Construction & Operation	Appearance of excavation & construction activities & detention ponds from Plains Road.	Significant	Negative	Forest buffer zone along roadway for a "natural" view & landscaping after construction activities.	Not significant

10 PUBLIC CONSULTATION

No public meetings were held prior to the completion of the environmental assessment as they are not required for a screening-level assessment under provincial or federal legislation and the project is simple and unlikely to cause public concern.

11 LIMITING CONDITIONS

The American Society for Testing and Materials Standards of Practice and the Canadian Standards Association state that no environmental assessment can wholly eliminate uncertainty regarding the recognition of potential environmental liabilities. The intent of the assessment is to reduce, but not eliminate, uncertainty regarding projects, giving reasonable limits of time and costs.

The conclusions of this report are based in part on the information provided by others, which is assumed to be correct. The potential exists that unexpected environmental conditions may be encountered at the site and with the project, not specifically investigated. Should this occur, the proponent and regulatory authorities must be notified so that we may decide if modifications to our conclusions are necessary.

The findings of this investigation are based on research and investigations carried out in October-December 2010 and the generally accepted assessment practices of our industry. No other warranty is made.

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13 PERSONAL COMMUNICATIONS

Ms. Laura Bennett, Corrdinator, Special Places, Nova Scotia Museum of Natural History.
Mr. Tim Bernard, Director of Culture & History, Confederacy of Mainland Mi'kmaq.
Ms. Kim George, Regional Biologist, NSDNR, Truro, NS.
Dr. Jamie Gibson, Ph.D., Research Scientist, DFO, Dartmouth, NS.
Mr. Anthony Heggelin, Nova Scotia Inland Fisheries, Pictou, NS.
Mr Jody Mattie, Colchester Regional Development Authority (CORDA), Truro, NS.
Mr. Shane O'Neil, DFO, Dartmouth, NS.
Mr. Roode, Nystone, Debert, NS.
Mr. Vince Smith, Fisheries Officer, DFO, Dartmouth, NS.

APPENDIX A
NOVA SCOTIA MUSEUM SEARCH
HERITAGE AND BIOLOGICAL RESOURCES

Nov 15, 2010

Heather Levy
Envirosphere Consultants Ltd.
Box 2906, Unit 5-20 Morison Dr.
Windsor, NS B0N 2T0

Dear Ms. Levy:

RE: Environment Screening 10-10-27
Debert
Envirosphere Consultants Limited

Further to your request of October 27, 2010, staff of the Heritage Division have reviewed their files for reference to the presence of heritage resources in the study area. Please be aware that our
information is not comprehensive, in that it is incomplete and of varying degrees of accuracy with respect to the precise location and condition of heritage resources.

It should be noted that the amount and degree of disturbance from previous developments could have a significant role in establishing the presence, absence or condition of heritage resources in this area.

Archaeological and Historical Sites and Remains
The project area is considered to have high potential for archaeological resources given the Palaeo Indian evidence recorded in the area and the Special Places designated zone and archaeology site that overlaps. It is therefore recommended that an assessment for archaeological resources takes place.

Natural Heritage
The staff of the Nova Scotia Museum Collections Unit (Natural History) have reviewed their records and make the following observations:

Zoology
Staff have reviewed the museum records for the area provided and have found no records of species with potential conservation concern for the area, although the receiving drainages have the potential for impacting on some intertidal molluscs and migratory fish all with COSEWIC designation. These include:

Heather Levy
Nov 15, 2010
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The Atlantic Mud-piddock *Barnea truncata* (COSEWIC - Threatened - currently under S.A.R.A. review)
Atlantic Salmon - Inner Bay of Fundy population, *Salmo salar* (COSEWIC - Endangered - S.A.R.A.- Endangered) The receiving streams would have to be evaluated for spawning habitat potential for Atlantic Salmon).
Striped Bass - Bay of Fundy population, *Morone saxatils* (COSEWIC - Threatened - currently under S.A.R.A review)
Atlantic Sturgeon - *Acipenser oxyrhynchus* (provincially red-listed)
Blueback Herring - *Alosa aestivalis*
Gaspereau - *Alosa pseudoharengus* - COSEWIC Candidate Species (provincially red-listed)
Shad - *Alosa sapidissima* - COSEWIC Candidate Species

The following bird species of concern have been recorded to nest in the area:
Bobolink - *Dolichonyx oryzivorus* - provincially Yellow-listed
Canada Warbler - *Wilsonia canadensis* - provincially Yellow-listed
Boreal Chickadee - *Parus hudsonicus* - provincially Yellow-listed
Barn Swallow *Hirundo rustica* - provincially Yellow-listed
Common Loon *Gavia immer* - provincially Yellow-listed

Uncommon Mammal species in the area include:
Mainland Moose - Alces alces - provincially Endangered
Pygmy Shrew (Sorex hoyi)

If the area under consideration includes wetland habitats, we note that there are several species of
Dragonflies and Damselflies which use such habitats that have a conservation status in Nova Scotia. We refer the proponent to the NSDNR site regarding general Status of Wildlife for specific details. http://www.gov.ns.ca/natr/wildlife/genstatus/ranks.asp

Botany
Staff have reviewed the museum records for the area provided and offer the following list of species-at-risk that could be impacted by development at this site; those in adjacent squares are marked with an *. Plants should be assessed during the growing season and those at risk to loss be so identified in any report generated.

Adiantum pedatum*
Anenome virginiana var alba*
Carex comosa
Carex hirtifolia *
Desmodium canadense *
Dryopteris fragrans*
Equisetum pratense *
Laqportea canadensis*

Heather Levy
Nov 15, 2010
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Lilium canadense *
Polygonum scandens*
Stellaria longifolia *
Tiarella cordifolia*

Other VEC's
Our vastly incomplete cemeteries database does not contain any records for this area, nor does our cave inventory.

I have attached an invoice for the staff time spent reviewing our records and compiling this response. If you have any questions, please contact me at 424-6468.

Sincerely,
Laura Bennett,
Coordinator, Special Places
Enclosure

APPENDIX B
pH and TSS RESULTS

Envirosphere Consultants Limited
Unit 5—120 Morison Drive, Box 2906, Windsor, Nova Scotia, B0N 2T0
ph: (902) 798-4022, fax: (902) 798-2614, e-mail: enviroco@ns.sympatico.ca, website: www.envirosphere.ca

Envirosphere Consultants Limited
Unit 5-120 Morison Drive
Windsor, Nova Scotia
B0N 2T0

Environmental Sample Analysis Report
Report Date: 18-Nov-10 Report Number: A0257

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	pH	Type of Sample	Detection Limit	Sample Comments
L2010-62	CRM	Brook draining from wetland	CRM	11/16/2010	11/18/2010	7.0	STD	0.1	CRM=7.01
L2010-62	downstream	Brook draining from wetland	Surface Water	11/16/2010	11/18/2010	7.3	REG	0.1	
L2010-62	upstream	Brook draining from wetland	Surface Water	11/16/2010	11/18/2010	7.9	REG	0.1	
L2010-62	upstream	Brook draining from wetland	Surface Water	11/16/2010	11/18/2010	8	DUP	0.1	

Name of Analyst: Heather Long Analyses reviewed by: _____ Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

The results in this report relate only to the items tested. ***Validation Range: 3-10 units***

The quality of the results is dependent on the quality of sample provided.

Comment: Samples for pH should be kept cool until delivery to the lab unless the samples are analyzed immediately. Preferably samples should be analyzed within 24 hours. Hach manual recommends filling bottle completely and capping tightly; cooling to 4°C for storage and analyzing within 6 hours. If this can't be done, Hach manual recommends reporting the holding time with results.

Method: Standard Methods for the Examination of Water and Wastewater 21st Edition. 2005 and online version., 4500-HB. Electrometric measurement of pH. ECL Method 8, pH.

Type of Sample: REG = regular; STD = standard; DUP = duplicate

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

Envirosphere Consultants Limited
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Envirosphere Consultants Ltd.
Unit 5-120 Morison Drive
Windsor, NS B0N 2T0

Environmental Sample Analysis Report
Report Date: 18-Nov-10 Report Number: A0258

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	TSS (mg/L)	Type of Sample	Detection Limit	Sample Comments
L2010-62	CRM	Brook draining from wetland	CRM		11/18/2010	194.0	STD	0.5 mg/L	CRM=213mg/L
L2010-62	downstream	Brook draining from wetland	Surface water	11/16/2010	11/18/2010	3.0	REG	0.5 mg/L	
L2010-62	upstream	Brook draining from wetland	Surface water	11/16/2010	11/18/2010	11.0	REG	0.5 mg/L	
L2010-62	upstream	Brook draining from wetland	Surface water	11/16/2010	11/18/2010	11.5	DUP	0.5 mg/L	

Name of Analyst: Heather Levy Analyses reviewed by: B Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

The results in this report relate only to the items tested.
The quality of the results is dependent on the quality of sample provided.

Validation Range: 1-1000 mg/L

Samples for TSS analysis should be kept cool until delivery to the lab unless they are analyzed immediately. A minimum sample volume of 500 ml is preferred. Place sample in a clean plastic container free of cracks or contamination. Fill the bottle to the top and then cap. Samples should reach the lab within 24 hours of sampling, but will be accepted up to 7 days.

Methods: Standard Methods for the Examination of Water and Wastewater 21st Edition. 2005 and online version. 2540D. Total Suspended Solids. ECL method 3, Total Suspended Solids.

Type of Sample: REG = regular; STD = standard; DUP = duplicate

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

APPENDIX C
WETLAND DELINEATION REPORT

Wetland Delineation

FOR

Home Hardware

Debert, Nova Scotia

September 17, 2010

Prepared By:
Jim Jotcham, Marbicon Inc.

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Home Hardware
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INTRODUCTION

Marbicon Inc. has conducted a wetland delineation of the (approximately) 3.21 hectares (8 acres) wetland located on the northeast side of Plains Road and bounded on the other three sides by Lancaster Crescent in Debert, Colchester County, Nova Scotia. A warehouse facility operated by Home Hardware Stores Limited is to the east of the wetland. The subject site is a wooded swamp and includes a small stream running in a roughly north-south orientation and draining through a culvert under Plains Road. The wetland has been partially cleared to the north. Also to the north a wetter area with cat-tails lends a marshy aspect to part of the site, but this area is thinly wooded by gray birch, so it can be considered structurally as a transition site from marsh to swamp. The stream comes from a culvert draining from the east, and there appears to also be seepage from the west, including from a culvert under Lancaster Crescent. The approximate center of the wetland is at about 45^{o} 25.35' N and 63^{o} 25.82' W, located on the "Truro Nova Scotia" 11E/06, 1:50,000 topographic map. The wetland boundaries depicted in this report represent a calculated estimation of the jurisdictional limits within the site, and are subject to modification following a detailed survey by a certified land surveyor. The delineation points in this report were obtained with a hand-held Garmin 76CSx GPS. The field work for this delineation was performed on July 16 and 31, 2010.

Existing Site Conditions

The subject property is a fairly flat depression, draining from the north to the south. The source of the water appears to be mostly seepage from the surrounding slopes but includes a small stream originating from a culvert under the railroad bed on the east side. The outflow is to the south through a culvert under Plains Road, and the stream likely drains into Galloping Brook. Figure 1 shows the site and surrounding area.

Much of the area has already been cutover, but the standing upland forest is mostly a mixed forest with occasional conifer thickets with trembling poplar (*Populus tremuloides*), white spruce (*Picea glauca*) and balsam fir (*Abies balsamea*) with occasional red maple (*Acer rubrum*) throughout.

The wetland to the south is generally a shrub swamp (Figure 2) dominated by woody species such as speckled alder (*Alnus incana*) with occasional red maple (*Acer rubrum*). Drier hummocks and adjacent upland had trees such as white spruce and trembling poplar. The wetland transitions into a cat-tail marsh to the north, with scattered small trembling poplar throughout (Figure 3).

According to the first *Soil Survey of Colchester County Nova Scotia (*Report number 3, Nova Scotia Soil Survey 1948), the soil belongs to the Truro soil association; described as sandy loam soils developed on red sandy loam till, derived from medium grained red sandstones. The drainage of these soils is governed by the topography. The poorly drained soils are found on level or nearly level land and under forest vegetation have resulted in the formation of bog-like soils.

The latest soil survey (Report number 19, 1991) places the soil in the Truro Association, with the specific soil unit on site being Tu1/C. Tu1 map units are composed of well- and rapidly drained Orthic

Humo-Ferric Podzols. These map units contain soils that are very friable, deep, and highly permeable. The wet areas on the subject site were thus not identified in this soil report.

↑
N

Figure 1. Site and Vicinity (see Appendix C for the wetland overlay).

The wetland is surrounded on three sides by Lancaster Crescent and is to the left of the large Home Hardware building shown.

The aerial photograph is taken from number 04304 107 L-24 (2004-06-30).

Figure 2: Site photograph, the wooded swamp on the south part of the site.

Figure 3. Site photograph, the cut over wet area north of the swamp.

Figure 4. Site photograph, the cat-tail marsh on the north part of the property.

Methods

This wetland delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Jurisdictional wetland boundaries were delineated through aerial photograph interpretation and single point wetland analysis. Wetland data were recorded on Sample Wetland Delineation Data Sheets (Appendix A). *Munsell Soil Color Charts* (X-Rite Inc. 2000) were used to aid in identifying hydric soils in the field. The *Flora of Nova Scotia* (Zinck 1998) aided with plant nomenclature and identification.

Field wetland surveys were conducted on July 16 and 31, 2010 by Marbicon Inc. Botanist Jim Jotcham. A summer student, Peter Bull, assisted on July 31. Mr. Jotcham walked throughout the site to determine the location of potentially jurisdictional boundaries within the property. Four single data point locations (2 pairs) were sampled to evaluate whether or not the vegetation, hydrology, and soils data supported a determination of wetland or non-wetland status. The location of these data points was recorded with a hand-held Garmin 76CSx GPS receiver. Points were averaged to achieve the most accurate reading possible. The estimated boundary was flagged with pink "wetland delineation" tape, each visible from the other, and marked with the GPS. These flag and gps locations are listed in Appendix D. Using these GPS points, the total wetland area examined was estimated at 3.21 ha. These measurements are approximate, and do not in any way constitute a legal land survey.

Jurisdictional Wetlands of Nova Scotia

This report describes wetlands of Nova Scotia that may be regulated by the Nova Scotia Department of Environment in the *Environmental Assessment Regulations*, *Activities Designation Regulations*, and *Approvals Procedures Regulations*. Specific information is further described in the *Operational Bulletin Respecting Alteration of Wetlands (March 2006)*

"Wetland means land commonly referred to as a marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions."

This definition for wetlands applies to freshwater environments and salt marshes and is used by the Nova Scotia Department of Environment in delivery of all programs.

At the time of writing this report, provincial wetland alteration permits were required to alter a wetland of any size. In addition, altered sites larger than 2 ha require an environmental assessment.

The Nova Scotia *Environmental Goals and Sustainable Prosperity Act* specifies that "A policy of preventing net loss of wetlands will be established in the year 2009". Net loss of wetlands means "net loss of wetland area and function, including habitat".

Routine Determinations

To be determined a wetland; the following three criteria should be met:

- A majority of dominant vegetation species are wetland associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season; and
- Hydric soils are present.

Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase "sustains aquatic processes as indicated by the presence of hydric soils, hydrophytic vegetation and biological activities adapted to wet conditions". Hydrophytic vegetation should be the dominant plant type and is characterized by the dominant plant species comprising the plant community (Environmental Laboratory 1987). The "50/20 rule" was used to determine the dominant plant species at each data point location. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional species that individually comprise 20 percent or more of the total dominance measure for the stratum (HQUSACE 1992).

Dominant plant species observed at each data point were then classified according to their indicator status (probability of occurrence in wetlands) (Table 1), in accordance with the U.S. Fish and Wildlife Service's (USFWS) National List of Vascular Plant Species That Occur in Wetlands: NE Region (Region 1) (1996). These indicators are used as this area most closely resembles the flora of Nova Scotia and climate regime. Further relevant information was reviewed in the Flora of Nova Scotia (Zinck 1998). If the majority (greater than 50 percent) of the dominant vegetation on a site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC) (excluding FAC-), then the site is considered to by dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species[1]

Plant Species Classification	Abbreviation[2]	Probability of Occurring in Wetland
Obligate	OBL	>99%
Facultative Wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative Upland	FACU	1-33%
Upland	UPL	<1%
No indicator status	NI	Insufficient information to determine status
Plants That Are Not Listed (assumed upland species)	NL	Does not occur in wetlands in any region.

[1] Source: Reed 1988

[2] A '+' or '–' symbol can be added to the classification to indicate greater or lesser probability, respectively, of occurrence in a wetland.

Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA-NRCS 2003). Indicators that a hydric soil is present include soil color (gleyed soils and soils with bright mottles and/or low matrix chroma), aquic or preaquic moisture regime, reducing soil conditions, sulfidic material (odor), soils listed on hydric soils list, iron and manganese concretions, organic soils (Histosols), histic epipedon, high organic content in surface layer in sandy soils, and organic streaking in sandy soils.

A soil pit was excavated to a minimum depth of 500 millimeters or refusal at each data point. The soil was then examined for hydric soil indicators. The matrix color and mottle color (if present) of the soil was determined using the *Munsell Soil Color Charts*.

Hydrology

Wetlands, by definition, either periodically or permanently, have a water table at, near or above the land's surface or that is saturated with water. To be classified as a wetland, a site should have at least one primary indicator or two secondary indicators of wetland hydrology. Primary indicators of wetland hydrology may include, but are not limited to: water marks, drift lines, sediment deposition, drainage patterns, visual observation of saturated soils, and visual observation of inundation. In addition to the primary indicators, there is a variety of secondary wetland hydrology indicators. Secondary indicators include, but are not limited to: oxidized root channels in the upper 12 inches, water-stained leaves, and local soil survey data. When no primary indicators of wetland hydrology are observed at a data point, two or more secondary indicators are required to confirm wetland hydrology.

RESULTS

Approximately 3.21 hectares of potentially jurisdictional wetlands of Nova Scotia has been mapped for this site, using a hand-held GPS device. Copies of the routine wetland determination forms are included in Appendix A. A list of plant species observed at the data points is included in Appendix B. Also attached is a complete list of plants observed on the property. A discussion of the wetlands and other waters is presented below, and a wetland delineation map is presented in Appendix C.

Wetlands

Swamp

"A swamp can be either a mineral wetland or a peatland characterized by an open tree cover of Balsam Fir, Black Spruce, Red Maple and Larch, as well as numerous shrubs, herbs and some mosses. The waters are rich in nutrients, due to seepage slopes or springs supplying water from the surrounding higher ground. There is usually a drainage outlet. If peat is present, it is mainly comprised of well-decomposed wood, underlain at times by sedge peat. In addition, hummocks are often formed from the decomposition of mosses and herbaceous plants. These provide a drier site on which both coniferous and deciduous trees can become established" (NS Museum of Natural History).

The wooded and shrubby wetland areas in the south part of the site comfortably fit the above definition for a swamp, in this case, mostly dominated by speckled alder but with red maple and balsam fir scattered throughout. Part of the cleared area would have been swamp. The cat-tail (*Typha latifolia*) area further to the north is a transition zone, with several poplars growing among them. The site was therefore not differentiated from the swamp in this report. Except for this small area, the vegetation on site was typical of swamp vegetation. A complete list of plant species observed in the wetland and adjacent upland is presented in Appendix B.

CONCLUSION

The dominant wetland type on site is a swamp, typical of those in the area. The area delineated was about 3.21 ha.

It is the proponent's responsibility to ensure that all regulatory requirements are met prior to further development within this area.

Jim Jotcham

Jim Jotcham, September 17, 2010

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LIST OF APPENDICES

APPENDIX A

Routine Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Home Hardware Municipality/County: Debert Sampling Date: July 31/10

Applicant/Owner: Home Hardware Sampling Point: W1

Investigator(s): Jim Torcham / Peter Bell Affiliation: Marbican Inc.

Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none

Slope (%): Ø Lat: 45° 25' 23.3" Long: 63° 25' 51.6" Datum: WGS 86

Soil Map Unit Name/Type: TBA Wetland Type: Swamp (cutover)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓ Cutover

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 M dia.)	Absolute % Cover	Dominant Species?	Indicator Status
1. NONE			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5 M)			
1. Spec. Alder	15	Y	FACW
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: 5 M)			
1. Impatiens cap.	15	Y	FACW
2. Spp. fern	15	Y	FACW
3. Spec. alder	10		FACW
4. Aster umbel.	5		FACW
5. Trem pylar	5		None
6. Glyceria striata	5		OBL
7. Polygonum sag.	2		OBL
8.			
9.			
10.			
	57 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

cutover – photo 9339

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

Sampling Point: W1 – July 31/10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	5YR 3/3	95	5YR 5/8	5			silt clay	Redox
6-18"	5YR 3/2	95	~~7~~ N-Black	5				

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Depleted Dark Surface (F7)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Polyvalue Below Surface (S8)
___ Thin Dark Surface (S9)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Redox Depressions (F8)
___ Red Parent Material (TF2)

Indicators for Problematic Hydric Soils[3]:

___ Sandy Gleyed Matrix (S4)
___ Coast Prairie Redox (A16)
___ 5 cm Mucky Peat or Peat (S3)
___ Iron-Manganese Masses (F12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE

Depth (inches): ____

Hydric Soil Present? Yes ✓ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ____	Depth (inches): ____
Water Table Present?	Yes ____	No ____	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Home Hardware Municipality/County: Debert Sampling Date: July 31/10

Applicant/Owner: Home Hardware Sampling Point: U1

Investigator(s): Jim Torcham / Peter Bull Affiliation: Morbicon Inc.

Landform (hillslope, terrace, etc.): Slight slope Local relief (concave, convex, none): none

Slope (%): 2 Lat: 45°25'23.4" Long: 63°25'52.4" Datum: WGS 84

Soil Map Unit Name/Type: TBA Wetland Type: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓ (current edge)

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ____	
Wetland Hydrology Present?	Yes ____	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Edge of cleared area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 m dia)	Absolute % Cover	Dominant Species?	Indicator Status
1. W. Spruce	60	Y	FACU
2. Trem. Poplar	10		none
3.			
4.			
5.			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 M)			
1. Wild Raisin	5	Y	OBL
2. W. Spruce	2	Y	FACU
3.			
4.			
5.			
	7	= Total Cover	
Herb Stratum (Plot size: 5M)			
1. Bracken Fern	30	Y	FACU
2. Kalmia angus.	30	Y	FAC
3. Maian. can.	10		FAC-
4. Blackberry	1		FACU-
5. Cornus can.	2		FAC-
6.			
7.			
8.			
9.			
10.			
	73	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

photo # 9340

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

Sampling Point: ____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2"	5YR 2.5/2	100					Sandy/Organic	mod. duff layer
2-12"	5YR 5/4	100					Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: none

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Depleted Dark Surface (F7)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (TF2)

Indicators for Problematic Hydric Soils[3]:

- ___ Sandy Gleyed Matrix (S4)
- ___ Coast Prairie Redox (A16)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ____

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: none

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No ✓	Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

Debert, Colchester County, Nova Scotia

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Home Hardware Municipality/County: Pictou Sampling Date: July 31/10

Applicant/Owner: Home Hardware Sampling Point: W2

Investigator(s): Jim Jotcham / Peter Bell Affiliation: Morbican Inc

Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none

Slope (%): 0 Lat: 45°25'17.6" Long: 63°25'54.9" Datum: WGS84

Soil Map Unit Name/Type: Wetland Type: Swamp

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____

Hydric Soil Present? Yes ✓ No ____

Wetland Hydrology Present? Yes ✓ No ____

Is the Sampled Area within a Wetland? Yes ✓ No ____

If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 10 M dia)			
1. NONE			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5 M)			
1. Spec. alder	80	Y	FACW
2. Trem. poplar	10		NONE
3.			
4.			
5.			
	90 = Total Cover		
Herb Stratum (Plot size: 5 M)			
1. Ran. repens	40	Y	FAC
2. Son. fern	20	Y	FACW
3. Glyceria str.	20	Y	OBL
4. Aster umbel	5		FACW
5.			
6.			
7.			
8.			
9.			
10.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Rapid Test for Hydrophytic Vegetation

__ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

photo 9343

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

Sampling Point: W2 - July 31

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14"	5YR 2.5/2	100					silty	
14"-16"	5YR 4/3	90	5YR 5/8	10	C	M		
16"-18"	7.5YR 5/3	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Depleted Dark Surface (F7)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Polyvalue Below Surface (S8)
__ Thin Dark Surface (S9)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
✓ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Redox Depressions (F8)
__ Red Parent Material (TF2)

Indicators for Problematic Hydric Soils[3]:

__ Sandy Gleyed Matrix (S4)
__ Coast Prairie Redox (A16)
__ 5 cm Mucky Peat or Peat (S3)
__ Iron-Manganese Masses (F12)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE

Depth (inches): ____

Hydric Soil Present? Yes ____ No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

__ Surface Water (A1)
__ High Water Table (A2)
✓ Saturation (A3)
__ Water Marks (B1)
__ Sediment Deposits (B2)
__ Drift Deposits (B3)
__ Algal Mat or Crust (B4)
__ Iron Deposits (B5)
__ Inundation Visible on Aerial Imagery (B7)
__ Sparsely Vegetated Concave Surface (B8)
__ Water-Stained Leaves (B9)
__ Aquatic Fauna (B13)
__ Marl Deposits (B15)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres on Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

__ Surface Soil Cracks (B6)
__ Drainage Patterns (B10)
__ Moss Trim Lines (B16)
__ Dry-Season Water Table (C2)
__ Saturation Visible on Aerial Imagery (C9)
__ Stunted or Stressed Plants (D1)
__ Geomorphic Position (D2)
__ Shallow Aquitard (D3)
__ Microtopographic Relief (D4)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

Debert, Colchester County, Nova Scotia

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Home Hardware Municipality/County: Debert Sampling Date: July 31/10

Applicant/Owner: Home Hardware Sampling Point: U2

Investigator(s): Jim Jotcham / Peter Bell Affiliation: Marbicon Inc.

Landform (hillslope, terrace, etc.): gentle slope Local relief (concave, convex, none): none

Slope (%): 2 % Lat: 45° 25' 17.4" Long: 63° 24' 54.6" Datum: WGS 86

Soil Map Unit Name/Type: TBA Wetland Type: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No ✓

Hydric Soil Present? Yes ____ No ✓

Wetland Hydrology Present? Yes ____ No ✓

Is the Sampled Area within a Wetland? Yes ____ No ✓

If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 m dia.)	Absolute % Cover	Dominant Species?	Indicator Status
1. Trem. poplar	60	Y	none
2. Balsam fir	15		
3. W. spruce	5		
4.			
5.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 m)			
1. Trem. poplar	5	Y	none
2. B. fir	5	Y	FAC
3. W. Raisin	5	Y	OBL
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 5 m)			
1. Soli. rugosa	50	Y	FAC
2. Big-leaved Aster	50	Y	none
3. Soli. canadensis	2		FACU
4. Bracken fern	2		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	104	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species		x 2 =	
FAC species	2	x 3 =	6
FACU species		x 4 =	
UPL species	3	x 5 =	15
Column Totals:	6 (A)		22 (B)

Prevalence Index = B/A = 3.67

Hydrophytic Vegetation Indicators: none

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[3]

___ Morphological Adaptations[3] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[3] (Explain)

[3]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

photo 9342

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

Sampling Point: U2 / July 31/10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4"	7.5 YR 3/3	100					Loam	
4-8	7.5 YR 4/4	100					"	
8-18	7.5 YR 4/6	100					"	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: none

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Depleted Dark Surface (F7)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Polyvalue Below Surface (S8)
___ Thin Dark Surface (S9)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Redox Depressions (F8)
___ Red Parent Material (TF2)

Indicators for Problematic Hydric Soils[3]:

___ Sandy Gleyed Matrix (S4)
___ Coast Prairie Redox (A16)
___ 5 cm Mucky Peat or Peat (S3)
___ Iron-Manganese Masses (F12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: none

Depth (inches): ____

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: none

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____

Water Table Present? Yes ____ No ____ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

Debert, Colchester County, Nova Scotia

APPENDIX B

Vegetation Inventory

Wetland Indicator Categories (USAC 1987):

Indicator Code	Wetland Type	Comment
OBL	Obligate Wetland	Occurs almost always (estimated probability 99%) under natural conditions in wetlands.
FACW	Facultative Wetland	Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
FACU	Facultative Upland	Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).
UPL	Obligate Upland	Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified. If a species does not occur in wetlands in any region, it is not on the National List.
NA	No agreement	The regional panel was not able to reach a unanimous decision on this species.
NI	No indicator	Insufficient information was available to determine an indicator status.
NO	No occurrence	The species does not occur in that region.

(NL = species not listed)

Plant Species Observed at Data Point Locations, July 31 2010 (2 pairs)

Scientific Name	Common Name	Wetland Indicator	% Cover	Layer
HH-U1 (edge of cutover)				
Picea glauca	White spruce	FACU	60	Tree
Populus tremuloides	Trembling poplar	NL	10	Tree
Viburnum nudum	Possum-haw viburnum	OBL	5	Shrub
Picea glauca	White spruce	FACU	2	Shrub
Pteridium aquilinum	Bracken fern	FACU	30	Herb
Kalmia angustifolia	Sheep laurel	FAC	30	Herb
Maianthemum canadense	Wild lily-of-the-valley	FAC-	10	Herb
Cornus canadensis	Dwarf dogwood	FAC-	2	Herb
Rubus allegheniensis	Allegheny blackberry	FACU-	1	Herb
HH-W1 (cutover)				
Alnus incana	Speckled alder	FACW	15	Shrub
Impatiens capensis	Spotted jewel-weed	FACW	15	Herb
Onoclea sensibilis	Sensitive fern	FACW	15	Herb
Alnus incana	Speckled alder	FACW	10	Herb
Aster (*Doellingeria) umbellatus*	Parasol white-top	FACW	5	Herb
Populus tremuloides	Trembling poplar	NL	5	Herb
Glyceria striata	Fowl manna-grass	OBL	5	Herb
Polygonum sagittatum	Arrow-leaved tear-thumb	OBL	2	Herb

HH-U2 (upland mixed woods)

Populus tremuloides	Trembling poplar	NL	60	Tree
Abies balsamea	Balsam fir	FAC	15	Tree
Picea glauca	White spruce	FACU	5	Tree
Populus tremuloides	Trembling poplar	NL	5	Shrub
Abies balsamea	Balsam fir	FAC	5	Shrub
Viburnum nudum	Possum-haw viburnum	OBL	5	Shrub
Solidago rugosa	Rough-leaf goldenrod	FAC	50	Herb
Aster(Eurybia) macrophyllus	Large-leaf wood aster	NL	50	Herb
Solidago canadensis	Canada goldenrod	FACU	2	Herb
Pteridium aquilinum	Bracken fern	FACU	2	Herb

HH-W2 (shrub swamp)

Alnus incana	Speckled alder	FACW	80	Shrub
Populus tremuloides	Trembling poplar	NL	10	Shrub
Ranunculus repens	Creeping buttercup	FAC	40	Herb
Onoclea sensibilis	Sensitive fern	FACW	20	Herb
Glyceria striata	Fowl manna-grass	OBL	20	Herb
Aster (*Doellingeria) umbellatus*	Parasol white-top	FACW	5	Herb

Site vegetation inventory (wetland and immediately adjacent upland) surveyed July 16 and 31, 2010.

Scientific Name	Common Name	S-Rank	DNR Rank	Wetland Indicator
Abies balsamea	Balsam fir	S5	Green	FAC
Acer rubrum	Red maple	S5	Green	FAC
Agrimonia striata	Woodland agrimony	S5	Green	FACU-
Alnus incana	Speckled alder	S5	Green	FACW
Amelanchier bartramiana	Bartram shadbush	S5	Green	FAC
Anthoxanthum odoratum	Sweet vernal grass	SE	--	FACU
Apocynum androsaemifolium	Spreading dogbane	S5	Green	NL
Aralia hispida	Bristly sarsaparilla	S5	Green	NL
Aralia nudicaulis	Wild sarsaparilla	S5	Green	FACU
Aster (Oclemena) acuminatus	Whorled aster	S5	Green	NL
Aster (Symphyotrichum) lateriflorus	Small white aster	S5	Green	FACW-
Aster(Eurybia) macrophyllus	Large-leaf wood aster	S5	Green	NL
Aster (*Doellingeria) umbellatus*	Parasol white-top	S5	Green	FACW
Athyrium felix-femina	Lady-fern	S5	Green	FAC
Betula populifolia	Gray birch	S5	Green	FAC
Calamagrostis canadensis	Blue-joint reed grass	S5	Green	FACW+
Callitriche palustris	Vernal water sandwort	S5	Green	OBL
Carex crinita	Fringed sedge	S4S5	Green	OBL
Carex echinata	Little prickly sedge	S5	Green	OBL
Carex intumescens	Bladder sedge	S5	Green	FACW+
Carex scoparia	Pointed broom sedge	S5	Green	FACW
Centaurea nigra	Black starthistle	SE	--	NL
Chelone glabra	White turtlehead	S5	Green	OBL
Cicuta maculata	Spotted water-hemlock	S5	Green	OBL
Circaea alpina	Small enchanter's nightshade	S5	Green	FACW
Comptonia peregrina	Sweet fern	S5	Green	NL
Cornus canadensis	Dwarf dogwood	S5	Green	FAC-
Cornus sericea	Silky dogwood	S5	Green	FACW+
Deschampsia flexuosa	Crinkled hairgrass	S5	Green	NL
Diervilla lonicera	Northern bush honeysuckle	S5	Green	NL
Dryopteris cristata	Crested shield fern	S5	Green	FACW+
Equisetum sylvaticum	Woodland Horsetail	S5	Green	FACW
Euthamia graminifolia	Narrow-leaved goldenrod	S5	Green	FAC
Festuca filiformis	Hair fescue	SE	--	NL
Fragaria virginiana	Strawberry	S5	Green	FACU

Fraxinus americana	White ash	S5	Green	FACU
Galeopsis tetrahit	Hemp-nettle	SE	--	NL
Galium asprellum	Rough bedstraw	S5	Green	OBL
Galium palustre	Marsh bedstraw	S5	Green	OBL
Gaultheria procumbens	Teaberry	S5	Green	FACU
Glyceria grandis	American manna grass	S4S5	Green	NL
Glyceria striata	Fowl manna-grass	S5	Green	OBL
Hieracium lachenalii	Common hawkweed	SE	--	NL
Hypericum perforatum	Common St. John's-wort	SE	--	NL
Impatiens capensis	Spotted jewel-weed	S5	Green	FACW
Juncus effusus	Soft rush	S5	Green	FACW+
Juncus tenuis	Slender rush	S5	Green	FAC-
Kalmia angustifolia	Sheep laurel	S5	Green	FAC
Larix laricina	American larch	S5	Green	FACW
Luzula acuminata	Hairy woodrush	S5	Green	FAC
Luzula multiflora	Common woodrush	S5	Green	FACU
Lycopus uniflorus	Northern bugleweed	S5	Green	OBL
Lysimachia terrestris	Loosestrife	S5	Green	OBL
Maianthemum canadense	Wild lily-of-the-valley	S5	Green	FAC-
Mentha arvensis	Corn mint	S5	Green	FACW
Monotropa uniflora	Indian pipe	S5	Green	FACU-
Myosotis laxa	Small forget-me-not	S5	Green	OBL
Onoclea sensibilis	Sensitive fern	S5	Green	FACW
Osmunda cinnamomea	Cinnamon Fern	S5	Green	FACW
Osmunda claytoniana	Interrupted fern	S5	Green	FAC
Petasites frigidus	Sweet colts-foot	S4S5	Green	FACW
Picea glauca	White spruce	S5	Green	FACU
Picea rubens	Red Spruce	S5	Green	FACU
Pinus strobus	Eastern white pine	S5	Green	FACU
Populus tremuloides	Trembling poplar	S5	Green	NL
Potentilla simplex	Old-field cinquefoil	S5	Green	FACU-
Polygonum sagittatum	Arrow-leaved tear-thumb	S5	Green	OBL
Prunella vulgaris	Self-heal	S5	Green	FACU+
Prunus virginiana	Choke cherry	S5	Green	FACU
Pteridium aquilinum	Bracken fern	S5	Green	FACU
Ranunculus acris	Tall buttercup	SE	--	FAC+
Ranunculus repens	Creeping buttercup	SE	--	FAC
Ribes hirtellum	Gooseberry	S5	Green	FAC
Rubus allegheniensis	Allegheny blackberry	S5	Green	FACU-
Rubus hispidus	Bristly Dewberry	S5	Green	FACW
Rubus idaeus	Red raspberry	S5	Green	FAC-

Rubus pubescens	Dwarf red raspberry	S5	Green	FACW
Salix bebbiana	Bebb's willow	S5	Green	FACW
Scirpus atrocinctus	Black-girdle bulrush	S5	Green	FACW+
Solidago canadensis	Canada goldenrod	S5	Green	FACU
Solidago rugosa	Rough-leaf goldenrod	S5	Green	FAC
Spiraea alba	Narrow-leaved meadow-sweet	S5	Green	FAC+
Thalictrum pubescens	Meadow-rue	S5	Green	FACW+
Thelypteris palustris	Marsh fern	S5	Green	NL
Trientalis borealis	Northern starflower	S5	Green	FAC
Trillium cernuum	Nodding trillium	S4	Green	FACW
Tussilago farfara	Coltsfoot	SE	--	FACU
Typha latifolia	Cat-tail, broad-leaved	S5	Green	OBL
Vaccinium angustifolium	Late lowbush blueberry	S5	Green	FACU-
Veronica officinalis	Gypsy-weed	S5SE	Green	FACU-
Viburnum nudum	Possum-haw viburnum	S5	Green	OBL
Viola sp.	Violet	--	--	--

Notes:

S5 = Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.

S4 = Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the element is of long-term concern.

SE = Exotic: An exotic established in the province

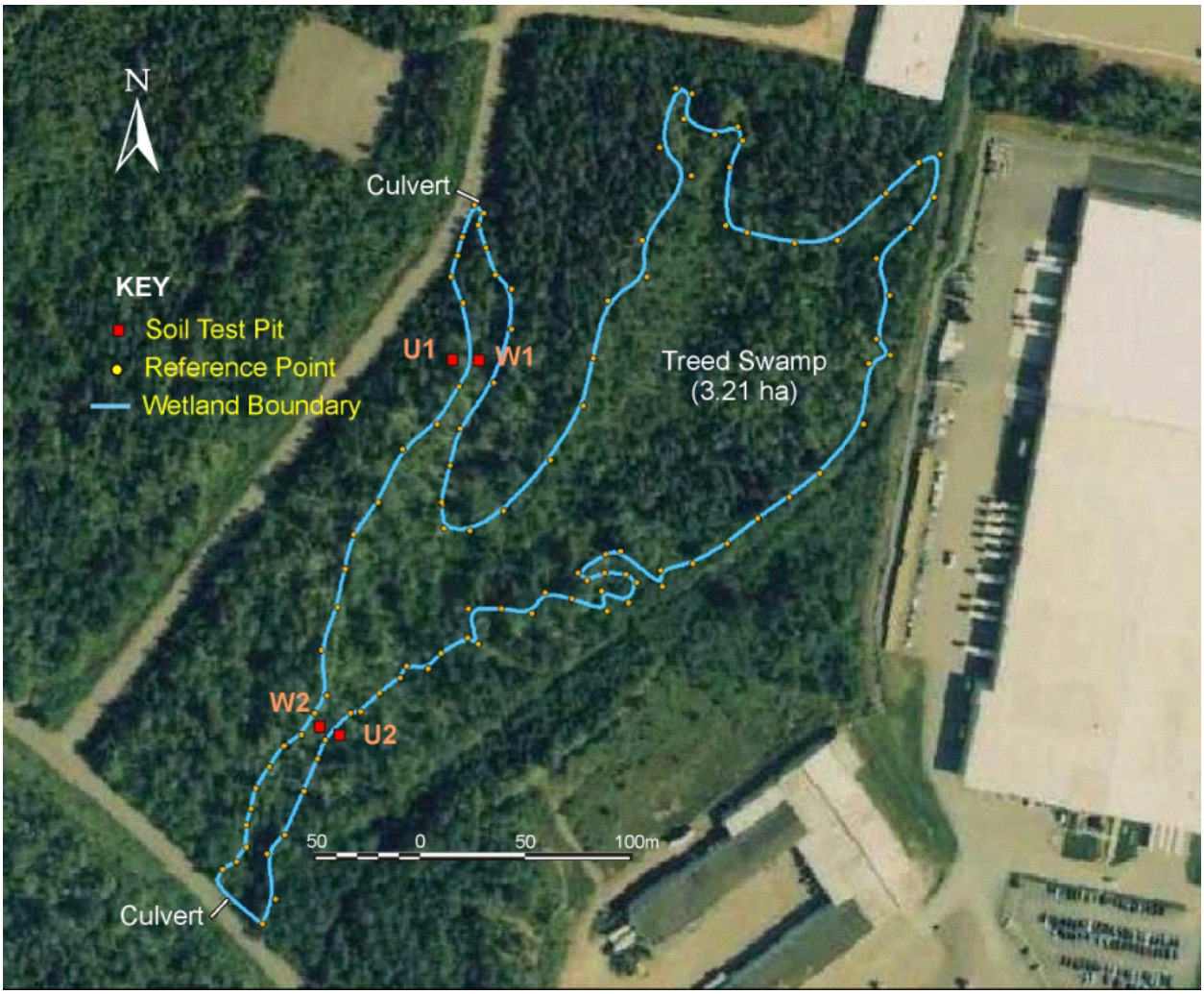
Green = NSDNR ranking, defined as any species known to be, or believed to be, not at risk

APPENDIX C

Wetland Delineation

The wetland covers approximately 3.21 hectares. The approximate wetland/upland boundaries are marked as the superimposed lines. The approximate locations of the two pairs of sample data points (soil test pits) are shown (W1, U1, W2, and U2).

North



APPENDIX D

Data point (8) and boundary point (6) GPS locations

Data Point GPS Locations (soil test pits):

GPS Point	Latitude	Longitude
W1 (Wetland):	N 45° 25.2940’	W 63° 25.9157’
U1 (Upland):	N 45° 25.2902’	W 63° 25.9092’
W3 (Wetland):	N 45° 25.3892’	W 63° 25.8734’
U4 (Upland):	N 45° 25.3879’	W 63° 25.8598’

Boundary point GPS locations (waypoints # 171 to # 283):

GPS Point	Latitude - N	Longitude - W
171	45° 25.2807’	63° 26.0069’
172	45° 25.0867’	63° 25.7931’
173	45° 25.4198’	63° 25.5264’
174	45° 25.2472’	63° 25.9522’
175	45° 25.2448’	63° 25.9349’
176	45° 25.2510’	63° 25.9301’
177	45° 25.2623’	63° 25.9333’
178	45° 25.2673’	63° 25.9270’
179	45° 25.2783’	63° 25.9204’
180	45° 25.2863’	63° 25.9153’
181	45° 25.2911’	63° 25.9126’
182	45° 25.2979’	63° 25.9038’
183	45° 25.2984’	63° 25.9000’
184	45° 25.3031’	63° 25.8932’
185	45° 25.3070’	63° 25.8859’
186	45° 25.3099’	63° 25.8837’
187	45° 25.3093’	63° 25.8761’
188	45° 25.3133’	63° 25.8712’
189	45° 25.3172’	63° 25.8617’
190	45° 25.3157’	63° 25.8578’
191	45° 25.3244’	63° 25.8616’
192	45° 25.3246’	63° 25.8497’
193	45° 25.3235’	63° 25.8387’

194	45° 25.3287’	63° 25.8341’
195	45° 25.3272’	63° 25.8244’
196	45° 25.3242’	63° 25.8117’
197	45° 25.3293’	63° 25.8136’
198	45° 25.3265’	63° 25.8038’
199	45° 25.3314’	63° 25.8010’
200	45° 25.3335’	63° 25.8048’
201	45° 25.3339’	63° 25.8126’
202	45° 25.3319’	63° 25.8189’
203	45° 25.3337’	63° 25.8222’
204	45° 25.3384’	63° 25.8122’
205	45° 25.3392’	63° 25.8068’
206	45° 25.3346’	63° 25.7923’
207	45° 25.3305’	63° 25.7917’
208	45° 25.3363’	63° 25.7809’
209	45° 25.3415’	63° 25.7685’
210	45° 25.3479’	63° 25.7574’
211	45° 25.3534’	63° 25.7462’
212	45° 25.3594’	63° 25.7353’
213	45° 25.3718’	63° 25.7197’
214	45° 25.3892’	63° 25.7102’
215	45° 25.3871’	63° 25.7181’
216	45° 25.3933’	63° 25.7152’
217	45° 25.4042’	63° 25.7106’
218	45° 25.4133’	63° 25.7155’
219	45° 25.4211’	63° 25.7035’
220	45° 25.4290’	63° 25.6950’
221	45° 25.4396’	63° 25.6930’
222	45° 25.4375’	63° 25.7006’
223	45° 25.4298’	63° 25.7124’
224	45° 25.4179’	63° 25.7296’
225	45° 25.4170’	63° 25.7450’
226	45° 25.4195’	63° 25.7623’
227	45° 25.4213’	63° 25.7699’
228	45° 25.4359’	63° 25.7680’
229	45° 25.4427’	63° 25.7642’
230	45° 25.4461’	63° 25.7658’
231	45° 25.4440’	63° 25.7741’
232	45° 25.4479’	63° 25.7855’
233	45° 25.4542’	63° 25.7825’
234	45° 25.4555’	63° 25.7882’

235	45° 25.4407’	63° 25.7939’
236	45° 25.4336’	63° 25.7826’
237	45° 25.4173’	63° 25.8001’
238	45° 25.4082’	63° 25.7981’
239	45° 25.4020’	63° 25.8122’
240	45° 25.3877’	63° 25.8174’
241	45° 25.3756’	63° 25.8207’
242	45° 25.3619’	63° 25.8325’
243	45° 25.3491’	63° 25.8491’
244	45° 25.3440’	63° 25.8612’
245	45° 25.3446’	63° 25.8706’
246	45° 25.3505’	63° 25.8713’
247	45° 25.3510’	63° 25.8714’
248	45° 25.3604’	63° 25.8685’
249	45° 25.3696’	63° 25.8652’
250	45° 25.3812’	63° 25.8530’
251	45° 25.3947’	63° 25.8468’
252	45° 25.4047’	63° 25.8470’
253	45° 25.4083’	63° 25.8529’
254	45° 25.4150’	63° 25.8561’
255	45° 25.4208’	63° 25.8591’
256	45° 25.4237’	63° 25.8571’
257	45° 25.4258’	63° 25.8605’
258	45° 25.4177’	63° 25.8649’
259	45° 25.4130’	63° 25.8664’
260	45° 25.4077’	63° 25.8687’
261	45° 25.4011’	63° 25.8644’
262	45° 25.3861’	63° 25.8604’
263	45° 25.3801’	63° 25.8656’
264	45° 25.3707’	63° 25.8734’
265	45° 25.3643’	63° 25.8856’
266	45° 25.3510’	63° 25.8944’
267	45° 25.3427’	63° 25.9030’
268	45° 25.3341’	63° 25.9060’
269	45° 25.3244’	63° 25.9088’
270	45° 25.3136’	63° 25.9144’
271	45° 25.3023’	63° 25.9123’
272	45° 25.2978’	63° 25.9168’
273	45° 25.2925’	63° 25.9212’
274	45° 25.2897’	63° 25.9271’
275	45° 25.2895’	63° 25.9275’

276	45^{o} 25.2844’	63^{o} 25.9327’
277	45^{o} 25.2789’	63^{o} 25.9378’
278	45^{o} 25.2736’	63^{o} 25.9394’
279	45^{o} 25.2696’	63^{o} 25.9409’
280	45^{o} 25.2640’	63^{o} 25.9409’
281	45^{o} 25.2604’	63^{o} 25.9445’
282	45^{o} 25.2584’	63^{o} 25.9494’
283	45^{o} 25.2502’	63^{o} 25.9552’

APPENDIX 5

Report - Wetland Functional Assessment for Home Hardware, Debert, N.S., Marbicon, September, 2010.

Wetland Functional Assessment

FOR

Home Hardware

Debert, Colchester County, Nova Scotia

September 18, 2010

Prepared By:
Jim Jotcham, Marbicon Inc.

Contents: Wetland assessment

Debert, Colchester County, Nova Scotia

List of figures

INTRODUCTION

Marbicon Inc. has conducted a wetland delineation of the (approximately) 3.21 hectares (8 acres) wetland located on the northeast side of Plains Road and bounded on the other three sides by Lancaster Crescent in Debert, Colchester County, Nova Scotia. A warehouse facility operated by Home Hardware Stores Limited is to the east of the wetland. The subject site is a wooded shrub swamp and includes a small stream running in a roughly north-south orientation and draining through a culvert under Plains Road. The northern part of the wetland has been partially cleared and a wetter area with cat-tails there lends a marshy aspect to part of the site, but this area is thinly wooded by gray birch, so it can be considered structurally as a transition site from marsh to swamp. The stream comes from a culvert (possibly a storm drain) draining from the east, and there appears to also be seepage from the west, including from a culvert under Lancaster Crescent. The approximate center of the wetland is at about 45^{o} 25.35' N and 63^{o} 25.82' W, located on the "Truro Nova Scotia" 11E/06, 1:50,000 topographic map. The wetland boundaries depicted in this report were mapped with a hand-held GPS and provide a realistic rendition of the jurisdictional limits within the site; however the precise location of boundaries should be determined by a survey by a certified land surveyor. The field work for this functional analysis was performed on July 16 and 31, 2010.

The site is generally a swamp, although there is a transitional marshy spot on the northern part of the wetland. The site is mostly a mix of high shrub swamp with occasional treed areas. A significant portion of the wetland had been cleared before the delineation and this functional analysis.

EXISTING SITE CONDITIONS

The subject property is a fairly flat depression, draining from the north to the south. The source of the water appears to be mostly seepage and runoff from the surrounding upland but includes a small stream originating from a culvert under the railroad bed on the east side. The outflow is to the south through a culvert under Plains Road, and the stream likely drains into Galloping Brook. Figure 1 shows the site and surrounding area.

Much of the area has already been cutover, but the standing upland forest is mostly a mixed forest with occasional conifer thickets with trembling poplar (*Populus tremuloides*), white spruce (*Picea glauca*) and balsam fir (*Abies balsamea*) with occasional red maple (*Acer rubrum*) throughout.

The wetland to the south is generally a shrub swamp (Figure 2) dominated by woody species such as speckled alder (*Alnus incana*) with occasional red maple (*Acer rubrum*). Drier hummocks and adjacent upland had trees such as white spruce and trembling poplar. The wetland transitions into a cat-tail marsh-like area to the north, but with scattered small trembling poplar throughout (Figure 3).

The soils in the subject wetland tended to be mineral silty-clay texture. According to the first *Soil Survey of Colchester County Nova Scotia (*Report number 3, Nova Scotia Soil Survey 1948), the soil belongs to the Truro soil association; described as sandy loam soils developed on red sandy loam till, derived from medium grained red sandstones. The drainage of these soils is governed by the topography. The poorly drained soils are found on level or nearly level land and under forest vegetation have resulted in the formation of bog-like soils.

The latest soil survey (Report number 19, 1991) places the soil in the Truro Association, with the specific soil unit on site being Tu1/C. Tu1 map units are composed of well- and rapidly drained Orthic Humo-Ferric Podzols. These map units contain soils that are very friable, deep, and highly permeable. The wet areas on the subject site were thus not identified in this soil report.

↑
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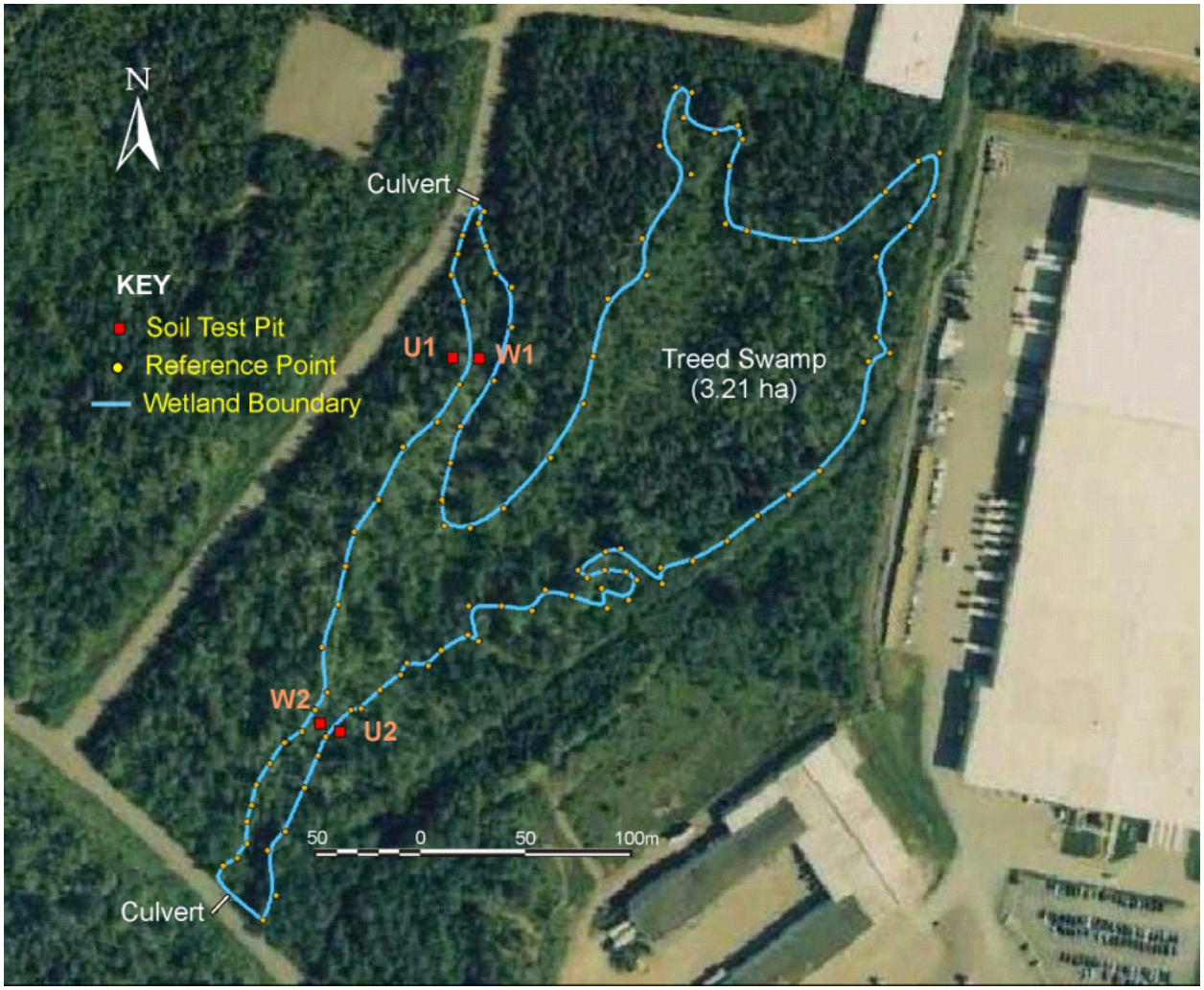

Figure 1. Site and Vicinity, showing the delineated wetland. The photograph was taken in 2004 and therefore does not show the results of the recent logging activity.
The wetland is surrounded on three sides by Lancaster Crescent and is west of the large Home Hardware building shown.
The aerial photograph is taken from number 04304 107 L-24 (2004-06-30).

Figure 2: Site photograph, the shrub swamp on the south part of the site.

Figure 3. Site photograph, the cut over wet area north of the swamp.

Figure 4. Site photograph, the cat-tail marsh on the north part of the property. Note the scattered trembling poplar throughout.

WOODED WETLAND – SHRUB SWAMP
A-1: OFFSITE ENVIRONMENTAL ASSESSMENT

Preliminary assessment based on data from maps and interpretation of aerial imagery.

Project Name: Proposed Home Hardware Expansion
Site Location: Debert, Colchester County, Nova Scotia
Evaluator: Jim Jotcham **Evaluation Date:** September 21, 2010

Watershed Characteristics

Watershed Name: 11E06_92 **Primary watershed area**: Salmon/Debert (1DH)
Size of watershed: Approximately 16.2 km^2 (Primary watershed is approx. 1165 km^2)
Source: Nova Scotia Watershed Series file 1DH, Service Nova Scotia & Municipal Relations. Reviewing the 1:50,000 topo map (11E/06), the swamp appears to drain into a small stream (not on the map) that flows into a culvert under Plains Road and thence south about 300 meters into Galloping Brook, and thence through MacElmons Pond to Chiganois River and finally to the Bay of Fundy. The stream in the swamp is thus a primary or first-order stream.

Wetland Characteristics:

Number of wetlands on the project area: One (1)

Wetland #1:

General type: Swamp – high shrubs with occasional trees
Landscape position: Terrene; located at the uppermost area in a sub-basin
Landform: Flat
Water flow path: Throughflow (from culverts)
Wetland water regime: Seasonally saturated
Wetland origin: Natural
Wetland soils: Mostly saturated fine-textured silt-clay
Human impacts: Partially logged at the north end
Other descriptors: None
Wetland intactness: <90% of original size

Preliminary Wetland Functional Assessment:

Surface water detention:	High (terrene throughflow swamp)
Coastal storm surge detention:	n/a
Stream flow maintenance:	high (headwater wetlands that are not ditched)
Nutrient transformation:	high (swamp)

Carbon sequestration:	moderate (seasonally saturated swamp)
Sediment and other particulate retention:	high (swamp)
Shoreline stabilization:	moderate (Terrene headwater swamp)
Fish and shellfish habitat:	Stream shading along perennial stream
Waterfowl and water bird habitat:	moderate in marshy area
Other wildlife habitat:	moderate (vegetated wetland)

100 m buffer characteristics

Figure 1 shows the wetland and surrounding property before logging (image taken from aerial photography # 04304 107 before logging.

Visual estimate: 80% forest (swamp)
20% swamp / wooded marsh transition

Soils: moderately fine textured till in the wetland; there was not a Histosol except in the marshy area. Upland soils are fairly well-drained sandy loams.

Proximity to other wetlands and waterbodies

Wetlands within 100 m – only along the stream.
Is the wetland bordering a waterbody - no
Are there waterbodies within 100 m of the wetland boundary – no.

Wetlands 100 m – 300 m - none

Wetlands 300 m – 500 m - yes
The subject site likely drains into the Galloping Brook, about 300 m south.
Number of wetlands: one; riparian zone associated with Galloping Brook.
Is the wetland bordering a waterbody – no
Are there waterbodies within 100-300 m of the wetland boundary – no
Galloping Brook drains into MacElmons Pond about 2.5 km south of the subject site.

Date of imagery examined: 1:50,000 Topographic map
1:10,000 air photo 2004

Source of imagery: Topographic map number 11E/06
Air photo number 04304 107 (see Figure 1)

WOODED WETLAND – SHRUB SWAMP
A-2: ONSITE WETLAND CHARACTERIZATION

Rainfall conditions during assessment:
Normal

1. Wetland Characteristics

Wetland type(s): one - shrub swamp, but with marshy area attached
Wetland size: total approximately 3.21 hectares
Wetland immediate drainage area: <10 hectares
Plant community: see the wetland delineation report dated September 17, 2010

2. Delineated wetland-upland edge characteristics

See the wetland delineation report (September 17, 2010). The delineated boundary encompasses the entire wetland enclosed by upland areas north of Plains Road.

3. Wetland buffer zone characteristics (within 100 m)

Also see page 9 (above). The buffer zone, where not logged, is mostly conifer forest, with mostly native herbs. A few invasive plant species are invading the logged area. The buffer area contains upland soils presented in the delineation report.

4. Stressors observed in the wetland and along the wetland edge

The tree clearing to the north is the main stressor, along with the now exposed soil along the wetland edge. This will likely result in direct runoff from the exposed areas. Other stressors include the stormwater discharge via the two culverts draining into the site.

WOODED WETLAND – SHRUB SWAMP
A-3 ONSITE FUNCTIONAL ASSESSMENT

A. Identification of exceptional features:

1. Water body supporting fish or shellfish – no fish or shellfish seen
2. Federally listed plant species – none seen
3. S1, S2, or S3 plant species – none seen
4. Wildlife species of concern – none seen
5. Wetland restored or preserved – no
6. Wetland restored or created for compensatory purposes – no
7. Protected water area – no
8. Floodplain above an area with flooding problems – no
9. Fish/wildlife refuge – no
10. Designated natural area – no
11. Designated beach – no
12. Designated park – no
13. Canadian Heritage River – no
14. Designated RAMSAR wetland – no
15. Designated archaeological or historic site – no
16. Local public park, forest, trail, or recreation area – no

FINDING: The wetland does not have exceptional features

B. Onsite evidence of performance of functions:

1. Surface water retention – yes: occasional puddles of standing water
2. Stream flow maintenance – yes: wetland is along a first-order stream
3. Nutrient transformation – yes: wetland is flooded seasonally or longer
4. Carbon sequestration – yes: plant community is dominated by woody plants
5. Sediment and particulate retention – no indicators found
6. Shoreline stabilization – n/a
7. Coastal storm surge detention – n/a
8. Provision of fish and shellfish habitat – none observed except the flowthrough stream
9. Provision of waterfowl and waterbird habitat – none observed
10. Provision of habitat for other wildlife. The wetland contains a marshy area. Observed wildlife included White-tail deer (*Odocoileus virginianus*); tracks were seen throughout. No rare or endangered animal species were identified.

FINDINGS:

The wetland shows evidence of:

Surface water retention
Stream flow maintenance
Nutrient transformation
Carbon sequestration
Provision of habitat for other wildlife

C. Plant community assessment

1. Number of plant communities associated with this wetland – one – shrub swamp
2. Type of associated wetlands – Shrub swamp
3. Dominant non-native invasive plant species – none
4. Vegetation disturbance – locally severe (logging)
5. Vegetation stressed – only in logged area
6. Vegetative quality – high in undisturbed area: community composed of native species characteristic of the wetland type. Invasive species are absent or cumulatively comprise less than 20 percent cover of any stratum.

FINDING: The wetland contains a diversity of wetland plant communities (shrub swamp and swamp-marsh transitional area) of high quality.

D. Hydrologic conditions and integrity

1. Expected water regime – seasonally saturated
2. Wetland is non-tidal and along a headwater stream (order 1)
3. Wetland surface and subsurface storage capacity and duration – A = wetland capacity and duration not altered; wetland retains its ability to maintain its characteristic hydrologic regime (except possibly in the logged area)
4. Water storage – little ponding; up to 30 cm
5. Dominant land use of immediate upland drainage area – Watershed conditions somewhat modified by logging in the northern section. Area is surrounded by paved road.
6. Condition of wetland soils – undisturbed except by logging in northern section, causing localized rutting.
7. Percent vegetation / open water (excluding stream) – 100% woodland or marsh-like where not logged. Bare soil and small herbs where logged (estimated at least 20% of the wetland)
8. Degree of interspersion – high (dense vegetation cover) except where logged
9. Roughness coefficient – n/a
10. Observable/historical sediment delivery – A= no evidence of sediment delivery to wetlan
11. Predominant upland soils – sandy loams
12. Runoff – Receives small volumes of directed storm runoff in relation to wetland size.
13. Proportion of primary watershed area – A. mapped wetlands make up less than 10% of the minor watershed area.
14. Surface flows – Channel connecting inlet to outlet.
15. Water source – mostly natural
16. Hydrology of tidal wetlands – n/a
17. Signs of surface water detention observed – occasional standing water

FINDINGS:

The wetland's hydrologic condition is natural.

The wetland is along a headwater stream and is therefore important for maintaining stream flow.

The wetland has a moderate ability to detain surface water.

E. Groundwater interactions

1. Soils within the wetland – mineral soils = recharge.
2. Upstream subwatershed characteristics – recharge - upland primarily developed to commercial, industrial, and road land indicating impervious surfaces which result in more runoff to wetlands and lowered water tables creating a gradient for recharge under wetlands.
3. Wetland conditions – recharge = wetland <81 hectares in size; surrounding soils have a high water table.
4. Hydroperiod – recharge = wetlands with the saturated water regime that are on flats.
5. Inlet/outlet configuration – discharge = perennial lotic wetland
6. Topographic relief – slight downslope toward the wetland (a discharge characteristic).

FINDING - The wetland likely serves as a recharge site.

F. Proximity to water bodies and water supplies

1. Proximately to first water resource – A = Galloping Brook.

FINDING – The wetland is in close proximity to Galloping Brook and about 2.5 km upstream from MacElmon's Pond.

G. Signs of nutrient loading

1. Signs of excess nutrient loading – A= no evidence of excess nutrient loading or nutrient sources.

FINDING – The wetland has no evidence of excess nutrient loading

H. Shoreline condition and integrity – n/a; Stream is < 4m

I. Provision of fish and wildlife habitat and habitat integrity

1. Used recently by listed species – none seen
2. Interspersion – n/a
3. Interspersion category – low – shrub swamp with attached cattail marsh-like treed area
4. Wetland condition – A = the presence of litter layer in various stages of decomposition.
5. Relative interspersion of nearby wetlands – B = other wetlands of the same plant community as the assessment wetland are present within 0.8 km .
6. Barriers between wetland and other habitats – C = Large barriers present including paved roads, parking lots, and industrial/commercial development..
7. Amphibian breeding potential – Hydroperiod – adequate; the wetland is inundated long enough in most years to allow amphibians to successfully breed.
8. Amphibian breeding potential – fish presence – B = wetland may occasionally be connected to other waters; predatory fish may be present in some years.
9. Observed amphibian presence – none observed
10. Amphibian and reptile overwintering habitat – C = the wetland is normally less than 1 meter deep and often freezes to the bottom.

11. Additional wildlife species - mammals - white-tailed deer (O*docoileus virginianus*).
12. Spawning or nursery habitat for native fish species – B. Wetland is intermittently connected to a permanent waterbody or watercourse that may support native fish populations as a result of colonization during flood events.
13. Fish species observed or evidenced – none seen
14. Habitat for shellfish species – B. Wetland is along a permanent waterbody or watercourse and seasonally flooded and may support shellfish populations in that waterbody.
15. Shellfish species observed or evidences – none observed
16. Designated wildlife corridor – no
17. Wetland a part of a large block of contiguous upland or wetland – no.

FINDING – Wetland provides habitat for amphibians & reptiles and mammals. Possible habitat for fish and shellfish. Overall habitat quality is high.

J, Visual, recreational, and educational opportunities.

1. Wetland a unique or rare educational, cultural, or recreational opportunity – no.
2. Wetland visible from vantage points such as roads, houses, and businesses – yes
3. Wetland in/near a town so as to generate aesthetic/recreation/educational/cultural use – Yes.
4. Wetland or part in public or conservation ownership – no; privately owned
5. Public access to the wetland from public roads or waterways – No direct access except at culvert under Plains Road..
6. Obvious human disturbances – only the extensive logging at the north end.
7. Human influences on the "viewshed" of the wetland – C = wetland surrounded by intensively developed land uses.
8.. Does the wetland and buffer area provide a spatial buffer between developed areas – Yes; <150 m wide
9. Recreational potential of wetland – C = low probability or potential for recreational use.

FINDING – The wetland provides no significant visual, recreational, or educational opportunities.

K. Use of wetland for commercial purposes

N/A – This wetland is not used for commercial products.

FINDING – The wetland does NOT provide commercial products.

L. Buffer condition and integrity

1. Adjacent buffer width – Water quality = High (>15 m) except for logged area
   - Wildlife habitat = Medium (15-100 m) except for logged area
2. Adjacent area management – 100% full vegetative cover except for logged area
3. Adjacent area diversity and structure – 90% full coverage of native non-invasive plants except for logged area
4. Adjacent upland slope – gentle; 0- 6%

FINDING – Buffer condition and integrity is high; the buffer supports water quality and wildlife habitat. Buffer conditions in the logged area is low.

Conclusion

The shrub swamp is a groundwater recharge site, is inhabited by some wildlife, and has a high functional value. The logged area has been extensively altered, and now has a low functional value.

It is the proponent's responsibility to ensure that all regulatory requirements are met prior to further development within this area.

Jim Jotcham, October 6, 2010

APPENDIX 6

Explanatory Material Regarding Land Ownership

AUTHORIZATION TO ACT

To: Nova Scotia Environment

Re: Properties that contain Wetlands - Lot 211 (PID 20153540), Lot 212 (PID 20153557, Lot 213 (PID 20153565) and Lot 214 (PID 20153573) all located on Lancaster Crescent, Debert, Nova Scotia (collectively "Property")

And Re: Home Hardware Stores Limited expansion of distribution centre located at 336 Lancaster Crescent, Debert, Nova Scotia

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THE UNDERSIGNED hereby irrevocably authorizes and directs Home Hardware Stores Limited to act as its agent in connection with the registration document for the environmental assessment.

AND this shall be your good and sufficient authority for so doing.

Dated at Truro, Nova Scotia, this day of , 2011.

Colchester Regional Development Agency
Per:

_____

_____

I/We have authority to bind the Corporation

Addendum

Explanatory Notes on Land Ownership

1. Home Hardware currently owns the lands municipally known as 336 Lancaster Crescent, Debert, Nova Scotia legally described as PID 20153748 and 20117990 ("Home Hardware Lands") as noted on the attached Debert Industrial Park Palaeo Subdivision dated March 15, 2007 ("Plan").

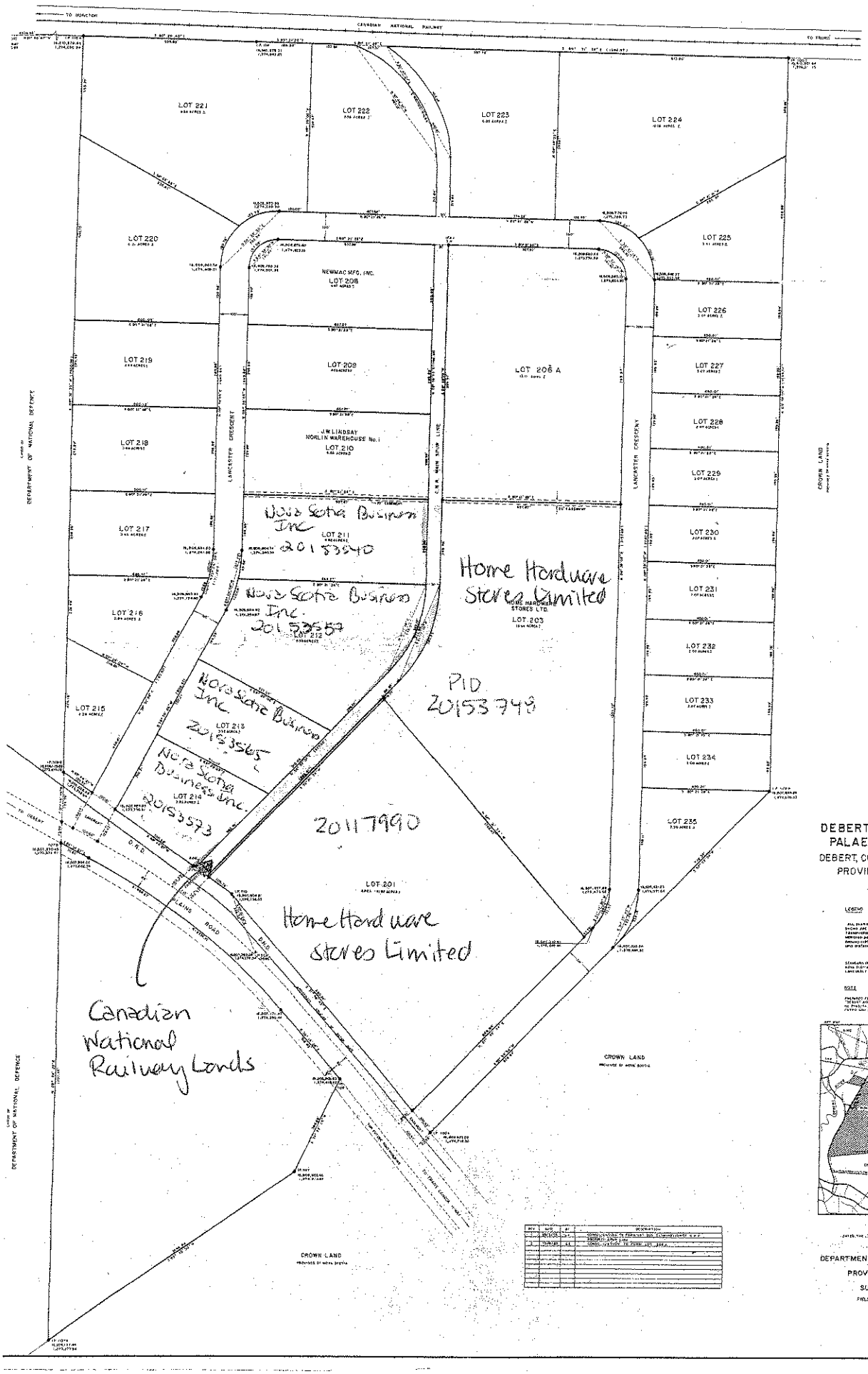
2. Nova Scotia Business Inc. is currently shown on title at the Land Registry/Titles Office for the lands legally described as PID 20153540, 20153557, 20153565 and 20153573 as noted on the attached Plan being the lands that contain the subject wetlands ("Wetland Property").

3. By an unregistered disposition Nova Scotia Business Inc. transferred title to the Wetland Property to the Municipality of the County of Colchester ("Municipality") as of March 31, 2008. It is anticipated that the transfer will be registered on title at the Land Registry/Titles Office in or about February 2011.

4. Pursuant to an agreement between the Municipality and Colchester Regional Development Agency ("CoRDA"), the Municipality intends to transfer the Wetland Property to CoRDA.

5. Canadian National Railway currently owns the lands legally described as PID20179066 ("CNR Property") as noted on the attached Plan. CNR and CoRDA have agreed in principle that CNR will sell the CNR Property to CoRDA.

6. Home Hardware and CoRDA have entered into a Letter of Intent dated March 30, 2010 whereby CoRDA intends to sell the Wetland Property together with the CNR Property to Home Hardware in order that Home Hardware may expand it existing Distribution Centre.


TO MONCTON
CANADIAN NATIONAL RAILWAY
TO TRURO
LOT 221
LOT 222
LOT 223
LOT 224
LOT 220
LOT 225
NEWMAC MFG. INC.
LOT 208
LOT 226
LOT 219
LOT 209
LOT 208 A
LOT 227
LOT 218
J.W. LINDSAY
NORLIN WAREHOUSE No. 1
LOT 210
LOT 228
LOT 229
LOT 217
Nova Scotia Business Inc.
LOT 211
20153540
LOT 230
Home Hardware Stores Limited
LOT 231
LOT 216
Nova Scotia Business Inc.
20153357
LOT 212
HOME HARDWARE STORES LTD.
LOT 203
LOT 232
PID
20155748
LOT 215
Nova Scotia Business Inc.
LOT 213
20153565
LOT 233
Nova Scotia Business Inc.
LOT 214
20153573
LOT 234
20117990
LOT 235
LOT 201
Home Hardware Stores Limited
Canadian National Railway Lands
LANCASTER CRESCENT
C.N.R. MAIN STEM LINE
LAINS ROAD
DEPARTMENT OF NATIONAL DEFENCE
CROWN LAND
PROVINCE OF NOVA SCOTIA
DEBERT INDUSTRIAL PARK
PALAEO SUBDIVISION
DEBERT, COUNTY OF COLCHESTER
PROVINCE OF NOVA SCOTIA
SCALE 1 INCH = 200 FEET
LEGEND
NOTE
DEPARTMENT OF LANDS AND FORESTS
PROVINCE OF NOVA SCOTIA
SURVEYS DIVISION
FIELD PLOT NO. P-83 / 74 A-1
REGISTERED OR RECORDED AT ... O'CLOCK
... A.D. 2007 ... AS NO. ...
... Registrar

APPENDIX 7

Copy of Letter from Twila Gaudet, Consultation Liaison Officer KMKNO to Jody Mattie, Director of Business Development CoRDA

Kwilmu'kw Maw-klusuaqn Negotiation Office
Mi'kmaq Rights Initiative

851 Willow Street
Truro, NS B2N 6N8

Tel (902) 843 3880 **Fax** (902) 843 3882
Toll Free 1 888 803 3880
Email info@mikmaqrights.com
www.mikmaqrights.com

Our Rights. Our Future.

May 9th, 2011

Jody Mattie
Director of Business Development
Colchester Regional Development Agency
35 Commercial Street, Suite 208
P.O. Box 181
Truro, NS B2N 5C1

Via Fax: (902) 897-1157

Mr. Mattie:

Re: Home Hardware Expansion in Debert, Colchester County

In follow up to our telephone call, electronic correspondence and receipt of the additional information you have provided, I write to you with respect to the above noted project.

It is our understanding that the proposed project is expected to impact a wetland area at the Debert location, and any disruption to wetlands is expected to be compensated by the proponent. It is recommended that any wetland compensation include similar vegetation and species as those impacted from this development. The restoration of damaged wetland areas is supported and encouraged, however, it must be noted that they involve complex systems that cannot be easily replicated from a biological perspective.

While our Archaeology Department has concern for impacts to archaeological resources pertaining to Mi'kmaw cultural heritage in the scope of the Home Hardware project at Debert, these concerns will be satisfied if the proponent adheres to the requirements of the Debert Archaeological Resource Impact Assessment Regulations and the necessary testing and assessment meets with the approval of the Mi'kmaq of Nova Scotia as represented in the joint review committee for the regulation and implementation of the Debert Archaeological Resource Impact Assessment Regulations in accordance with the Standards for Archaeological Impact Assessment and Reporting in Debert and Belmont, Nova Scotia.

I trust this will better inform you as proceed with the Environmental Assessment.

Yours in Recognition of Mi'kmaq Rights & Title,

Twila Gaudet BA, L.LB
Consultation Liaison Officer

Kwilmu'kw Maw-klusuaqn Negotiation Office

cc.	Jay Hartling, OAA	Fax: (902) 424-4225
	Mary Jane Abram, CMM	Fax: (902) 893-1520
	Laura Bennett, Heritage Division NSTCH	Fax: (902) 424-0560
	Katie Cottreau-Robin, Heritage Division NSTCH	Fax: (902) 424-0560