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# Appendix B: Fish Habitat Compensation Plan





Lachance Drain Relocation and  
Railway Spur Line Construction  
C. P. Rail to C. S. Wind Property

## **FISH HABITAT COMPENSATION PLAN LACHANCE DRAIN RELOCATION**

Prepared for:  
Corporation of the City of Windsor



March 2012



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Dwg. No. L2: Notes

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(All drawings are included in Appendix C as part of the **Lachance Drain Relocation and Railway Spur Line Construction – TERRESTRIAL DESIGN BRIEF** submitted on March 23, 2012)

## **Fish Habitat Compensation Plan Lachance Drain Relocation**

### **1.0 Introduction**

MMM Group Limited (MMM) has been retained by The Corporation of the City of Windsor as part of the Design/Build Team to undertake the construction of a Railway Spur Line north from the existing Canadian Pacific Railway (CPR). This Spur Line will service a local business, C.S. Wind (Figure 1). As part of the Railway Spur Line construction, a section of Lachance Drain will require relocation as well as the installation of two permanent drain crossings associated with the East and West Spur Lines. Due to timing constraints, a temporary drain crossing of the drain will also be required.

In order to accommodate the proposed project schedule of having the Spur Line in operation by August 2012 while working within the in-water construction timing constraint, the proposed two-step construction sequencing plan was developed:

1. Construct the Spur Line; and
2. Relocate the Lachance Drain.

As the Spur Line will be constructed in advance of the drain relocation, a temporary drain crossing will be required. This temporary crossing will be decommissioned after the drain is relocated. The two permanent Spur Line crossings along the relocated section of the drain will be constructed in the dry during the construction of the relocated channel. Once the Spur Line is constructed, work will begin on creating the relocated channel. It is anticipated that the relocated channel including all restoration works (i.e. plantings, seeding, sod mat salvage) will be completed by the fall with the Lachance Drain being redirected through the relocated channel in late October 2012. The existing section of the Lachance Drain will be immediately filled in once flow has been diverted into the new relocated channel.

The proposed Spur Line construction and subsequent relocation of the Lachance Drain and crossings will result in the Harmful Alteration Disruption or Destruction (HADD) of fish habitat. The federal Fisheries Act (FA) prohibits activities that will result in a HADD unless authorized by the reviewing agencies. The Essex Region Conservation Authority (ERCA) will review the proposed drain works under the FA on behalf of Fisheries and Oceans Canada (DFO) due to their Level 3 status. Where proposed activities cannot be relocated, redesigned or mitigated to avoid impacts to fish habitat, compensation is required to ensure that there is “no net loss of productive capacity” of fish habitat.

In order to have this project reviewed under the Fisheries Act, a Fish Habitat Compensation Plan (FHCP) has been prepared on the behalf of the Corporation of the City of Windsor to compensate for the loss of fish habitat. It is anticipated that this document will also satisfy the Aquatic Habitat component of the project to be reviewed under the Ontario Regulation for the Development, Interference with Wetlands and Alteration to Shoreline and Watercourses also administered by ERCA. This FHCP addresses the impacts to fish habitat associated with the proposed drain relocation and crossings and demonstrates that the proposed compensation and mitigation measures will result in a net gain to the productive capacity of fish habitat. This report documents the existing habitat and fish community in the affected reaches of the drain, the alterations to fish habitat, proposed compensation, construction impacts and mitigation and post-

M:\Ecology\_Group\Jobs\2011\321128-000-460 - Windsor Spurline Mapping\MXD\Proposed Railway Spur and LaChance Drain Realignment.mxd



- Legend**
- Proposed Temporary Drain Crossing
  - Proposed Permanent Drain Crossing
  - Existing Farm Drain Crossing (to be used for site access)
  - Proposed Lachance Drain Relocation
  - Watercourses



Client:	<b>THE CORPORATION OF THE CITY OF WINDSOR</b>	
Title:	<b>Proposed Railway Spur Line and Lachance Drain Relocation</b>	
Prepared by:	<b>MMM GROUP</b>	
32-11128-000-460	Scale as Shown	Review: AS
Date: March 22, 2012	<b>Figure: 1</b>	
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construction monitoring. Implementation of this FHCP will achieve DFO's guiding principle of "no net loss of productive capacity" of fish habitat.

## 2.0 Existing Conditions

### 2.1 Data Collection Methodology

The existing fish habitat present in the reach of the Lachance Drain located within the subject lands were investigated, documented and assessed. The habitat features documented included bank stability, channel morphology, cover habitat and substrate.

Fish community investigations were based on background information provided in the Sandwich South Employment Lands Trunk Sanitary Sewer Habitat Evaluation and Species at Risk Survey (Waldron, 2009) and field sampling using a single minnow trap. A Licence to Collect Fish for Scientific Purposes was not obtained from the MNR as a minnow trap was set using a personal fishing licence issued to Alexander Stettler, MMM Aquatic Biologist.

### 2.2 Aquatic Habitat

According to the DFO Draft Drain Classification Mapping obtained from ERCA (February 2011), the Lachance Drain has been classified as F Class – Channelized. F Class drains are typically considered intermittent or ephemeral as they are general dry for more than two consecutive months.

The Lachance Drain originates approximately 570 m east of the Banwell Road and generally flows in an east to west direction for approximately 2.2 km before discharging into the Little River Drain (Figure 1). The drain enters the subject lands from the east by flowing through a defined channel between two agricultural fields and exits the lands approximately 500 m downstream at the edge of the existing industrial park before discharging into the Little River Drain approximately 525 m further downstream. The relocation of the Lachance Drain will affect approximately 480 m of existing channel length and will result in the drain being relocated to the south to accommodate the Railway Spur Line. The aquatic habitat present will be described in terms of the habitat located within the section to be relocated as well as the habitat located upstream and downstream to document the fish habitat present within the entire assessed area.

#### Upstream of the Proposed Relocated Section

The drain morphology upstream of the proposed section to be relocated consists of a straight excavated channel with a uniform U shape consisting of all flat habitat (100%) over a substrate consisting of clay, silt and sand. The defined channel had a wetted width of approximately 2.2 m with a bankfull width approximately 3 m and a water depth of approximately 0.2 m with minimal flow. In-water cover was sparse and limited to small clusters of emergent and floating vegetation consisting mainly of sedges (*Carex sp.*) and duckweed (*Lemna sp.*). The riparian zone is dominated with herbaceous vegetation consisting of meadow species and *phragmites sp.* which provide overhanging cover along the drain margins. Trees and woody shrubs were present but were sparse and consisted of black ash (*Fraxinus nigra*) and maple (*Acer sp.*) trees along with red-osier dogwood (*Cornus stolonifera*).

### The Proposed Section to be Relocated

The section of drain to be relocated consists of two reaches; a reach that flows east/west and a reach that flows north/south (Figure 1).

The east/west reach flows between two fallow agricultural fields for approximately 280 m from its entrance onto the subject lands to where the drain changes direction and continues south. Within this reach, the drain morphology is dominated by a uniform straight U-shaped channel with all flat habitat (100%) over a clay, silt and sand substrate. The drain had an average wetted width of 2 m, an approximate bankfull width of 2.3 m and an average water depth of 0.2 m with minimal flow. There is a single field access crossing of the drain that consists of a corrugated steel pipe culvert backfilled with rip-rap and soil. The culvert appears to be impeding flow as more water was present in the drain channel upstream of the crossing than downstream. This crossing will be removed as part of the drain relocation works. Moderate in-water cover was present and was provided primarily by emergent vegetation consisting of sedges, rushes (*Juncus sp.*), cattails (*Typha sp.*) and *phragmites sp.* along with woody debris. The banks appear to be stable and are well vegetated with small trees, shrubs and herbaceous species consisting of maples, ashes, poplars (*populous sp.*), red-osier dogwood, staghorn sumac (*Rhus typhina*) and meadow species which provided moderate overhanging cover.

The north/south reach flows between the edge of an existing industrial park and a fallow agricultural field for approximately 200 m. This reach has been previously altered and relocated and as a result consists of a wide uniform straighten channel, which is much larger than the channel in the east/west reach. The section of the drain at the 90-degree bend where the drain transitions from flowing east/west to north/south has been armored with rip-rap encased in gabion baskets to provide erosion protection. As the channel continues downstream through the north/south reach, it changes direction to flow to the west at a 90-degree bend. At this transition point, the channel bed and banks have also been lined with rip-rap for erosion protection.

The drain morphology in the north/south section is dominated by diffuse flow through dense in-channel vegetation consisting of *phragmites sp.* and cattails over a substrate consisting of clay, silt, sand and detritus. The drain had an average wetted width of 3.1 m, an approximate bankfull width of 4.2 m and an average water depth of 0.1 m with minimal flow. Dense in-water cover habitat was present and was provided primarily by emergent vegetation located throughout the channel. The banks along the drain were moderately to sparsely vegetated and provided minimal overhanging and overhead cover. Evidence of erosion along the west channel bank was observed as a result of surface run-off being conveyed to the drain.

### Downstream of the Proposed Relocated Section

The downstream section of the Lachance Drain flows east/west between the existing industrial park and the CPR tracks for approximately 525 m to the outlet at the Little River. The channel morphology documented in the north/south reach to be relocated continues throughout the remaining downstream length of the Lachance Drain to the Little River as this entire section appears to have been altered and relocated at the same time. As the drain continues flowing west, the channel generally consists of a wide uniform straighten channel with all flat habitat and a silty/clay substrate. Dense in-channel vegetation is present (cattails and *phragmites sp.*) with the banks vegetated with herbaceous meadow species.



### 2.3 Fish Community

The review of background fish community data in the Sandwich South Employment Lands Trunk Sanitary Sewer Habitat Evaluation and Species at Risk Survey (Waldron, 2009) combined with field sampling indicated three fish species present in the Lachance Drain (Table 1).

The fish community in Lachance Drain within the assessed area consists of warmwater baitfish and panfish species that are generalist feeders and have an intermediate tolerance to a range of environmental conditions (i.e. low oxygen levels) (Eakins, 2008).

**Table 1: Lachance Drain Fish Community**

COMMON NAME	SCIENTIFIC NAME
Central Mudminnow	<i>Umbra limi</i>
Pumpkinseed*	<i>Lepomis gibbosus</i>
Sunfish Species	<i>Centrarchidae sp.</i>

(\* Waldron, 2009)

No provincial or federal aquatic Species At Risk were identified within the Lachance Drain (A. McCloskey, pers. comm., December 30, 2011 and D. Balint, pers. comm., January 05, 2012). The thermal classification of Lachance Drain within subject lands and surrounding area has been classified as warmwater by the MNR (A. McCloskey, pers. comm. December 30, 2011).

### 3.0 Assessment of Alterations to Fish Habitat

Impacts to fish habitat are associated with a temporary crossing within the existing drain, the relocation of a section of the Lachance Drain, the installation of two permanent culvert drain crossings within the relocated drain and the alteration of the riparian vegetation border to accommodate the Spur Line.

Within the existing drain channel, a temporary railway crossing will be constructed during the permissible in-water timing window. This crossing is required to maintain the project schedule by allowing the Railway Spur Line to be constructed at the same time as the relocated channel. Once the Lachance Drain flow is diverted into the new channel, the temporary crossing will be decommissioned. The relocation of approximately 480 m of the Lachance Drain channel includes an existing farm crossing which is approximately 15 m wide. As a result, the relocation of the drain will result in the loss of approximately 465 m of open channel habitat. In addition, the removal of this existing farm crossing will benefit fish habitat downstream of the crossing, as this crossing appears to be constricting flow (i.e. blockage in culvert or poor culvert installation).

The new channel will be approximately 550 m long and will require the installation of two culvert crossings associated with the Railway Spur Line, which will each be approximately 27 m long. As a result, the new Lachance Drain channel will consist of approximately 496 m of open channel habitat. The loss of fish habitat associated with the relocation has been calculated and is presented in Table 2.

**Table 2: Assessment of Fish Habitat Gained Due to Channel Relocation**

FISH HABITAT PRESENT	LOSS OF FISH HABITAT (OPEN CHANNEL LENGTH)	FISH HABITAT COMPENSATION (OPEN CHANNEL LENGTH)	NET CHANGE
Existing Channel	465 m	496 m	+31 m

Even with the two new drain crossings, the net change in total fish habitat available has been increased by 31 m of new open channel habitat as a result of the longer channel length associated with the relocation. The habitat in the existing channel that will be lost is not considered sensitive or critical habitat for the species present with similar habitat present upstream and downstream of the relocated section. In addition to the increased channel length, the relocated channel has been designed with additional fish habitat enhancement features including a low flow channel, addition of riparian woody vegetation, the removal of an existing farm culvert crossing and the removal of channel hardening materials (rip-rap and gabion) that will offer an improvement to the habitat present in the existing channel.

#### 4.0 Fish Habitat Compensation Plan (FHCP)

This FHCP has been developed to compensate for the loss of fish habitat as a result of the drain relocation, the two permanent crossings and the single temporary crossing. The FHCP has been designed to maintain DFO’s guiding principle of “no net loss of productive capacity” in conformance with the Practitioners Guide To Habitat Compensation for DFO Habitat Management Staff Version 1.1. The proposed compensation and enhancement features have been developed to provide a net gain of aquatic habitat through the removal of channel hardening materials, improved fish passage features and the introduction of overhanging cover through the planting of the riparian zones along the relocated channel for the Lachance Drain. Construction of the proposed Lachance Drain relocation is anticipated to commence in the summer of 2012.

##### 4.1 In-Water Habitat

Previous channel modifications (straightening) within the existing drain on the subject lands has created a channel that contains limited habitat diversity with dense amounts of in-water vegetation that has potential to impeded fish passage during periods of low flow. As a result, we are proposing to increase the amount and quality of fish habitat in the relocated channel through the addition of the following habitat enhancement features:

- **Low Flow Channel:** The relocated channel of the Lachance Drain will contain a 1 m wide low flow channel to provide a more defined flow path and deeper water habitat (Dwg. L3). The low flow channel will also function to improve fish passage during periods of low flow by constricting flow.
- **Increased Channel Length:** The proposed relocated channel will be approximately 31 m longer than the original channel to create additional fish habitat. The increased channel length with the proposed fish habitat enhancement features will provide overall benefits to the existing fish community (Dwg. L1).
- **Removal of Channel Hardening Material:** Within the existing channel at the two 90-degree bend locations, the channel has been hardened through the installation of erosion protection measures. The protection measures include rip-rap and gabion baskets within the channel bed and along the banks that will be removed. The anticipated flow rates and

velocities in the relocated channel have been assessed for erosion protection. Although the assessment indicated that the potential for erosion is low, we are proposing to install erosion protection at the two new 90-degree bends in the relocated channel to minimize the potential for erosion at these areas where erosion is typically an issue. The erosion protection will consist of smooth riverstone, an improvement over the existing angular rip-rap. The riverstone erosion protection also has the potential to provide in-water cover as the interstitial spaces may provide refuge for fish (Dwg. L3).

- **Fish Passage Culverts:** The two new permanent culvert crossings required for the installation of the East and West Spur Lines will be designed to facilitate fish passage. The new crossings will be constructed with an 1800 mm concrete pipe that will be counter sunk a minimum of 10% below the drain bottom and will be lined with graded riverstone. These culvert crossings will be constructed in the dry during the construction of the new channel and are an improvement over the existing drain crossings.

## 4.2 Riparian Habitat Planting

The riparian zone of the drain currently consists of a combination of herbaceous species with a minimal number of small trees and shrubs that provide moderate overhanging cover along the drain margins. The lack of woody vegetation and canopy cover in the riparian zone along the drain may be limiting the productive capacity of the drain.

Roth et. al. (1996) suggests that the removal of riparian vegetation has the potential to reduce species diversity and adversely affect fish community composition by changing the food sources available to fish and other stream organisms, altering the aquatic habitat through loss of woody vegetation and changing the flow regime. As a result of the benefits associated with a vegetated riparian zone, specifically with woody vegetation, it is common practice to re-vegetate the riparian zones of warm and coldwater watercourses as a method of enhancement. A vegetated riparian zone has the potential to reduce thermal impacts, filter nutrient and sediment from surface water, contribute allochthonous (terrestrial) energy inputs, improve bank stability and moderate flows.

The proposed planting plan along the relocated channel has been designed to naturalize the riparian border and is anticipated to improve the aquatic habitat conditions. A vegetated riparian area will also stabilize the slopes and reduce the potential for erosion into the drain. The riparian area will be vegetated through riparian plantings as well as the transplanting of vegetation through sod mats salvaged from the existing drain location. The salvaging of sod mats will preserve the existing seed bank and allow the channel to naturalize at a faster rate. All riparian plantings will consist of native trees, shrubs and seed mixture approved by Essex Region Conservation Authority (ERCA).

Details of the riparian restoration plan have been prepared indicating the locations of plantings/seeding and sod mats to stabilize the drain banks and floodplain following construction (Dwg. L1 and L3). After planting and seeding, erosion resistant material such as a bio-degradable blanket will be placed along the drain banks and bed to provide stability and erosion protection until the vegetation has become established.

## 5.0 Impacts and Mitigation Measures

The following is an assessment of potential impacts and description of mitigation measures proposed to minimize effects to fish and fish habitat during the relocation of a section of the

Lachance Drain and the installation of the railroad crossings. The following mitigation measures will be applied where appropriate, as stipulated conditions of the contract documents:

#### Deleterious Substances (Construction Machinery)

The use of construction machinery during the construction period has the potential to result in the addition of deleterious materials (fuel, oil, lubricant, etc.) into the drain that could alter fish habitat and/or physically injure fish.

- The use of machinery during construction increases the risk of deleterious substances (i.e. fuel, oils, lubricants, etc.) from potentially entering the drain. This will be mitigated by ensuring that all machinery entering the construction site will be clean, degreased, in good working order and free of leaks.
- All machinery will be refueled in a designated refueling area minimum of 30 m from the drain. Refueling shall be conducted with the use of spill control devices as well as following operation and storage precautions and emergency spill control procedures. Furthermore, all oils, lubricants, fuels and chemical products will be stored in secure areas to prevent their accidental release into the environment.
- In the event that there is an accidental release of these substances, the contractor shall endeavour to capture, contain and clean up any spills and leaks immediately and report spills, as required, to the Ministry of the Environment's 24-hour Spills Action Centre. Furthermore, the contractor will ensure that there is an adequate supply of clean-up materials on site as well as ensure that crews are fully trained on their use.
- Construction equipment must not be cleaned in the drain.

#### Deleterious Substances (Sediment and Fines)

Reduced water quality and clarity may potentially occur due the transportation of fine debris into the drain during construction activities.

- Silt-fencing shall be installed parallel to the drain along the top of bank to minimize the accidental introduction of deleterious substances (i.e. sediments and fines) associated with construction into the drain. This measure shall be implemented prior to construction and maintained during the construction phase. The contractor will monitor the silt-fencing and repair/replace (if necessary) to ensure that it is functioning as intended. The silt-fencing will remain in place until such time as the site restoration measures are functioning as intended.
- Ensure all materials placed within the relocated channel are clean and free of silt and clay sized particles.
- The stabilization of all disturbed areas shall be undertaken as soon as practical to avoid the sediment transport into the drain.
- Once the new channel is constructed, the bottom of the drain will be lined immediately with an erosion resistant material such as a bio-degradable blanket. The lining should be at least 3 m wide so that it extends entirely across the 2 m wide bottom of the drain and 0.5 m along the side slopes. This measure will reduce the potential for erosion in the channel until the vegetation has become established.
- Once the relocated channel has been constructed, the downstream connection to the existing channel should be established first to allow water to slowly backup into the newly created channel and equalize before establishing the upstream connection. The

reconnections to the existing channel will be done in this order to minimize erosion from occurring in the new channel associated with the influx of rushing water into an empty channel from the upstream connection.

### Displacement of the Fish Community

Potential impacts to the fish community associated with the relocation of the Lachance Drain may include injury and/or death to fish. It is anticipated that fish will likely leave the existing channel to be filled in once the water flow has been directed into the relocated channel however, in the event that fish become isolated within the existing channel, they may sustain injury and/or death.

- All in-water works for the relocation of Lachance Drain works will occur only during the permissible warmwater construction timing window of July 1<sup>st</sup> to March 14<sup>th</sup> as stipulated by MNR (A. McCloskey, pers. comm., December 30, 2011). Adhering to the in-water timing window will minimize the impacts of construction activities on the fish community during sensitive periods (i.e. spawning, incubation, etc.)
- Prior to the initiation of in-water work, a Licence to Collect Fish for Scientific Purposes shall be obtained from the MNR in order to perform a fish removal. Following the redirection of water flow into the new relocated channel, a qualified fisheries biologist will undertake a fish removal to relocate any fish trapped within the existing channel. Every effort will be made to relocate all fish trapped within the existing channel during the fish removal. Fish that are removed from the existing channel will be carefully placed into buckets and returned to the drain downstream of the work zone with the results being reported to the MNR. The fisheries biologist will remain on site until such time that the existing channel has been isolated and a fish removal has been completed.
- If de-watering is required to remove the remaining water from the existing channel, a fine metal screen will be placed around the pump intake to ensure that any trapped fish are not entrained in the pump system. The de-watering discharge will require the use of a sediment filtering device (i.e. sediment filter bag, sediment fencing enclosure, settling basin) located a minimum of 30 m from the drain into an area of undisturbed vegetation.
- The materials to be used for the channel relocation, stabilization of the disturbed areas and for the fish habitat enhancements (i.e. riverstone, top soil, plantings etc.) should be present on the site prior to initiation of the relevant construction to minimize the duration of in-water works and disturbance.

### Riparian Vegetation Removal and Planting

The riparian vegetation along the existing drain section to be relocated will be removed as the channel will be filled in to accommodate the work area and storage yard associated with the new Spur Line. A new riparian vegetated border will be created along the newly relocated channel as riparian vegetation has the potential to decrease bank erosion, provide overhead and overhanging cover and increase nutrient inputs into the drain. The new riparian vegetated border will be created through a combination of plantings, seeding and sod mat salvage from the existing drain.

- The newly created banks along the relocated channel and all disturbed areas will be re-vegetated post-construction with approved ERCA species and salvaged sod mats. The channel banks will be planted with trees, shrubs and seeded with herbaceous species. Dwg. L1-L3 details the specific planting and sod mat salvage plan including locations and species to be utilized.

- All effort will be made to minimizing the size of the disturbed area by limiting the amount of vegetation to be removed during the creation of the relocated channel.

### Temporary Spur Line Crossing

A temporary Spur Line crossing of Lachance Drain will be required in order to complete the construction of the Spur Line. The proposed crossing will consist of a 1350 mm culvert (corrugated steel pipe or concrete pipe) that will be decommissioned once the drain has been relocated. The temporary crossing will be constructed in such a manner to minimize impacts to fish and fish habitat.

- Prior to the installation of the temporary crossing, sediment and erosion control measures (i.e. silt-fencing) will be installed along the top of the drain banks and will be tied-in to the edges of the crossing structure once it is in place. These measures must be in accordance with the related Ontario Provincial Standards. The silt-fencing will be inspected daily to ensure that it is functioning as intended and repairs/upgrades are made as necessary.
- Works are not to be undertaken at times when flows are elevated due to local rain events, storms or seasonal floods. All in-water works must comply with the warmwater permissible in-water works timing window (July 1<sup>st</sup> to March 14<sup>th</sup>).
- The work area is to be isolated using coffer dams (i.e. pea gravel bags wrapped in plastic) as the culvert installation is to be undertaken in the dry.
- Water flow in the drain will be maintained to the downstream reach dam by pumping the flow around the isolated work area. A fine metal screen will be placed around the pump intake to ensure that fish are not entrained in the pump system. The water will be discharged over suitable erosion protection to ensure that scouring does not occur within the existing drainage channel.
- A fish removal will be undertaken in the isolated work area by a qualified fisheries biologist with all captured fish being relocated unharmed downstream of the crossing.
- During installation, removal of riparian vegetation will be minimized and no alteration to the existing drain channel or banks (i.e. relocation, dredging, infilling, grading, etc.) will be conducted.
- The temporary culvert will be embedded a minimum of 150 mm below the existing drain bottom and will be lined with riverstone.
- No fording of the drain will be conducted.

## **6.0 Construction Access**

The construction area will be accessed south from Anchor Drive onto the subject lands to the north side of the Lachance Drain. Access to the south side of the Lachance Drain for the Spur Line construction will be gained through the use of existing farm crossings.

## **7.0 Post-Construction Monitoring**

A post-construction monitoring program will be implemented in each of the two years following construction. The post-construction monitoring program will consist of three components including an assessment of the function of the in-water habitat enhancement features, sampling of the fish community and the success of the riparian habitat plantings and sod mats. This

information will be summarized in a Post-Construction Monitoring report that will be submitted to the ERCA and DFO by December 31 in each of the two years following construction.

### **7.1 In-Water Habitat Enhancement Monitoring**

A post-construction survey will be carried out between July 1<sup>st</sup> and March 14<sup>th</sup> to document that the enhancement features (i.e. low flow channel, fish passage culverts) are functioning as intended and will be repeated in each of the two years following the completion of construction. Photographs of these features will also be taken during and following construction to maintain a photographic inventory of the condition and effectiveness of the structures for comparison between years.

### **7.2 Fish Community**

The resident fish community will be sampled during a post-construction survey conducted between July 1<sup>st</sup> and March 14<sup>th</sup>. The survey will determine the use of the relocated channel by the resident fish species and will assess the success of the channel design. The survey shall be repeated once per year for two years following the completion of the channel relocation.

### **7.3 Riparian Habitat Planting**

A qualitative survey of the planted vegetation and sod mat salvaged vegetation will be undertaken to determine the success of the riparian vegetation and will provide recommendations for the replacement of any stock that has not survived. The survey shall be repeated once per year for two years following installation of the plant material.

## **8.0 Conclusion**

Pursuant to an application for authorization for works or undertakings affecting fish habitat, this Fish Habitat Compensation Plan has been prepared on behalf of the Corporation of the City of Windsor and submitted to Essex Region Conservation Authority for review on behalf of Fisheries and Oceans Canada.

Prepared by:

MMM GROUP LIMITED



Mark Cece, B.Sc.  
Ecology Manager/Senior Fisheries Biologist  
Associate Partner

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