

September 18, 2018

Derek Normanton

Municipality of East Hants
Lloyd E Matheson Centre
15 Commerce Court
Elmsdale, NS B2S 3K5

Re: Mount Uniacke Business Park: Wetland and Watercourse Delineation

The Municipality of East Hants (MEH) retained McCallum Environmental Ltd. to conduct a wetland and watercourse assessment for proposed development within two properties adjacent to Highway 102 in Mount Uniacke, NS.

The proposed development area (the Study Area) exists to the south of an existing industrial development located on Highway 1, approximately 2.8km south of Mount Uniacke. The Study Area which exists within PIDs 45367521 and 45172228, extends southward from James Boyle Drive and eventually abuts Highway 101. The Study Areas size is approximately 23 hectares. Study Area Location details are provided in Figure 1 (Appendix A).

As part of the planning process associated with development within the Study Area, McCallum Environmental Ltd. (MEL) conducted biophysical assessments to determine the locations of potential wetlands and watercourses. In addition, MEL obtained wetland functional assessment data in support of future wetland permitting requirements should they be required. MEL completed an evaluation of desktop resources followed by a field program on August 22nd and 23rd, 2018.

The purpose of this report is to provide wetland and watercourse locations and characterizations to support the design process associated with future development of the Study Area.

1.0 METHODOLOGY

1.1 Desktop Review

A background information review of wetlands and watercourses was completed on August 21th, 2018 using the Nova Scotia Topographic Watercourse (NSTD) and Wet Areas databases, the Nova Scotia Environment (NSE) Wetlands database. In addition, the NSE “Wetlands of Special Significance” (WSS) database was also reviewed.

1.2 Field Assessment

The field assessment was completed on August 22nd and 23rd, 2018 by MEL wetland delineators Amber Stoffer and Louis Charron. Meandering transects were completed within the Study Areas to confirm the potential presence of wetlands and watercourses (Figure 1, attached). This report adopts the terms defined by NSE under Section 105 of the *Environment Act*.

Wetlands are:

Land referred to as a marsh, swamp, fen, or bog that either periodically or permanently has water table at, near, or above the land 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.

Watercourses are:

The bed and shore of every river, stream, lake, creek, pond, spring, lagoon or other natural body of water, and the water therein, within the jurisdiction of the Province, whether it contains water or not, and all groundwater.

Wetland boundaries were determined as described by the US Army Corps of Engineers, adapted for the Northcentral and Northeast Regions of the US (US Army Corp of Engineers, 2012) based on topography, soil and hydrology properties, and vegetation. All watercourses encountered during the assessment were also identified.

Wetland boundaries and watercourse routes were recorded on a Garmin GPSMAP 64s. The delineated wetlands were flagged with pink flagging tape and the identified watercourses were flagged with blue flagging tape.

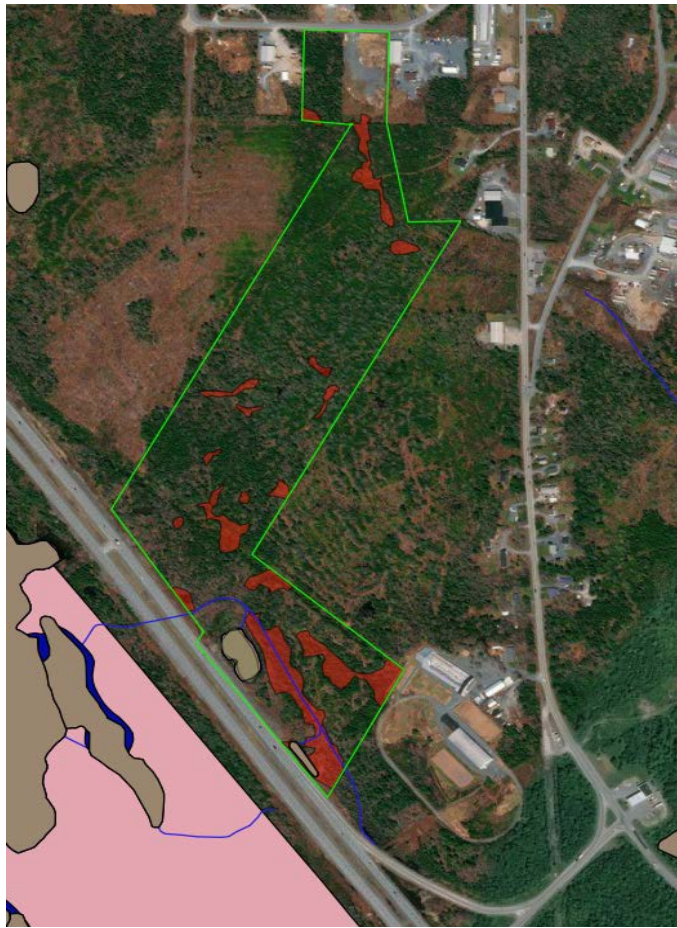
Wetland functional assessments were completed for each wetland using the Wetland Ecosystem Services Protocol - Atlantic Canada (WESP) wetland evaluation technique. The WESP process involves the completion of three forms; a desktop review portion that examines the landscape level aerial conditions to which the wetland is situated, and two field forms. The process serves as a rapid method for assessing individual wetland functions and benefits.

General wetland and watercourse characteristics were recorded for the features identified during the field assessment and are presented in the sections which follow.

2.0 RESULTS

2.1 Desktop Results

According to the database searches, and as indicated in Figure 1 (below), the NSTD identified two wetlands within the Study Area; both adjacent to Highway 101 at the southern extent of the Study Area. The database search also identified one mapped watercourse initiating from Highway infrastructure to the east of the Study Area, extending across the southern portion of the Study Area and exiting beyond the southern Study Area boundary beneath Highway 101.



Legend:

- Red polygons – Delineated wetlands**
- Brown polygons – Desktop mapped wetlands**
- Blue line – Desktop mapped watercourses**
- Blue polygons – Wetland of Special Significance**
- Pink polygon – Protected Water Supply Area**

The desktop review process also confirmed that the Study Area does not exist within or contain the following:

- Ramsar site, Provincial Wildlife Management Area (Crown and Provincial lands only), Provincial Park, Nature Reserve, Wilderness Area or lands owned or legally protected by non-government charitable conservation land trusts
- Wetlands in designated protected water areas as described within Section 106 of the Environment Act
- A designated wetland of special significance (WSS)

Figure 1: Mapped Wetlands and Watercourses

2.2 Field Results

2.2.1 Wetlands

Sixteen (16) wetlands were identified during the field assessment.

Locations of watercourses and wetlands are provided on Figure 1 (Appendix A). Representative photos are attached.

Table 1 (attached) provides a summary of characteristics associated with wetlands identified within the Study Area.

The majority of the wetlands identified exist as isolated mixed-wood treed swamps (n= 11). These wetlands play a role in intercepting and storing surface water run-off, but do not possess surface water connectivity to additional wetlands and/or watercourses. None of the wetlands identified across the Study Area provide any access to fish.

Only one wetland complex exists (WL10 which comprises swamp and marsh habitat), and one isolated bog (WL7) which is located in southern portions of PID 45367521. One shallow open water wetland was identified in the same place as one of the desktop mapped wetlands in southern portions of the Study Area.

Hydrological conditions with wetlands are very consistent throughout. Nine of the wetlands exhibit saturated surfaces, and four wetlands comprise groundwater within 30cm of the surface. Standing water was only observed within four wetlands; Wetland 10 comprises 15cm of water across 30% of the wetland surface, whereas Wetlands 13 and 15 only comprise standing water across 5% and 2% of the wetland surface respectively. The lack of evidence suggesting water is retained at surface within wetlands across the Study Area indicates that they are not high functioning water storage wetlands.

Wetland 16 is entirely comprised of open water (<2m deep). Wetland 16 was observed to be surrounded by rock impoundments and exists at a much lower elevation than the adjacent Highway 101. There was no evidence to suggest that WL10 sources water to WL16, and there is no fish access present. Visual observations suggest that the wetland may have been created, or a natural system was altered as part of Highway construction in the past, resulting in the creation of the lower lying basin feature from which a shallow open water wetland has formed.

Vegetation across all wetlands is also very consistent and typical for swamp habitats within the province and region generally. The exception is the treed bog (WL7) which comprises nutrient poor ericaceous species typical of bog type habitats in NS and the shallow open water wetland which comprises aquatic vegetation. Dominant species across all swamp wetlands include balsam fir, black spruce, yellow birch, and red maple trees with an understory consisting of speckled alder, yellow birch, red maple and black spruce shrubs and saplings. Three-seeded sedge, cinnamon fern, sensitive fern and cattails are common to the herb layer within swamp habitats. The ericaceous species found in WL7 (bog) include leatherleaf, rhodora, sweet gale and cottongrass herbs, and balsam fir and black spruce shrubs and trees. Wetland 16 comprises aquatic species including lily pads, eastern purple bladderwort and potamogeton species.

No Species At Risk (SAR) (vegetation or wildlife) were identified during the field evaluation.

2.2.2 Watercourses

No watercourses are present within the Study Area.

3.0 SUMMARY

The wetlands within the Study Area present characteristics typical of wetlands in Nova Scotia and the region generally. Although the detailed functional assessment process has not been completed at this time, there are no conditions or wetland characteristics which trigger any of the wetlands to exist as a WSS. Therefore, should wetland alteration permits be sought, a standard 2:1 ratio of wetland compensation would be required by NSE for the wetland area/s lost.

Table 1 below provides wetland areas within the Study Area. It should be noted that some of the wetlands extend beyond the wetland Study Area boundary and are marked with a *.

Table 1: Wetland Area Within the Study Area

Wetland	Area Within Study Area (m ²)
1	615*
2	512
3	3,719
4	570*
5	220
6	440
7	2,444
8	1,469*
9	5,315*
10	10,920*
11	663*
12	830
13	232
14	263
15	316
16	2,834

3.1 Recommendations

Should alteration of on-site wetlands be required, a wetland alteration application should be compiled and submitted to NSE.

If you have any questions, please don't hesitate to contact the undersigned with any questions you might have.

Sincerely,



Andy Walter
Senior Project Manager
McCallum Environmental Ltd.

FIGURE 1

**Mount Uniacke Business
Park
Field Identified Wetlands**

- Study Area
- Field Identified Wetland
- Mapped Wetland (NSE)
- Mapped Waterbody (NSHN)
- Mapped Watercourse (NSHN)
- Drainage



Coordinate System: NAD 1983 CSRS UTM Zone 20N
Projection: Transverse Mercator
Datum: North American 1983 CSRS
Units: Meter



0 62.5 125 250 m

1:5,000 Scale when printed @ 11" x 17"

Drawn By: LC

Date: 2018-09-18



McCallum Environmental Ltd.

Mount Uniacke Business Park
Wetland Characteristics

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Soil Type	Surface Hydrology	Dominant Vegetation	Potential for Fish Presence
WL1	Mixed-wood Swamp	Terrene	Flat	Outflow (inferred, via drainage)	Histosol	Saturated at surface	<i>H: Three-seeded sedge, New York fern, bog aster, cinnamon fern.</i> <i>S: Speckled alder</i> <i>T: Balsam fir, black spruce, paper birch, red maple</i>	None in wetland
WL2	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Three-seeded sedge, cinnamon fern, balsam fir, Canada mayflower</i> <i>S: Balsam fir, yellow birch</i> <i>T: Balsam fir, black spruce, paper birch, red maple</i>	None in wetland
WL3	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Cattail, cinnamon fern, shallow sedge, three-seeded sedge</i> <i>S: Speckled alder, black spruce</i> <i>T: Balsam fir, paper birch, red maple</i>	None in wetland
WL4	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Three-seeded sedge, New York fern, cinnamon fern.</i> <i>S: Balsam fir, yellow birch, red maple</i> <i>T: Balsam fir, black spruce, paper birch, red maple</i>	None in wetland
WL5	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Three-seeded sedge, New York fern, cinnamon fern.</i> <i>S: balsam fir, yellow birch</i>	None in wetland

Mount Uniacke Business Park
Wetland Characteristics

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Soil Type	Surface Hydrology	Dominant Vegetation	Potential for Fish Presence
							<i>T: Balsam fir, yellow birch, red maple</i>	
WL6	Mixed-wood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	<i>H: Wool grass, sensitive fern, Walters sedge</i> <i>S: Balsam fir, red maple</i> <i>T: Balsam fir, red maple</i>	None in wetland
WL7	Treed Bog	Terrene	Basin	Isolated	Histosol	Saturated at surface Groundwater within 30cm	<i>H: Leatherleaf, rhodora, sweet gale, cottongrass</i> <i>S: Black spruce, balsam fir, white pine</i> <i>T: Balsam fir, black spruce</i>	None in wetland
WL8	Mixed-wood Swamp	Terrene	Basin	Outflow (inferred)	Histosol	Saturated at surface	<i>H: Canada rush, wild sarsaparilla, cattail.</i> <i>S: Balsam fir, black spruce</i> <i>T: Balsam fir, red maple</i>	None in wetland
WL9	Mixed-wood Swamp	Terrene	Basin/sloped	Isolated	Histosol	Saturated at surface Groundwater within 30cm	<i>H: Wool grass, cinnamon fern, bristly blackberry</i> <i>S: Black spruce, red maple</i> <i>T: Balsam fir, red maple</i>	None in wetland
WL10	Treed swamp/ Graminoid marsh complex	Terrene	Basin	Throughflow (via drainage)	Histic Epipedon	15cm standing water across 30% of wetland. Saturated at surface Groundwater within 30cm	<i>H: Canada rush, cinnamon fern, cattail, sensitive fern</i> <i>S: Speckled alder</i> <i>T: Balsam fir, red maple, yellow birch</i>	None in wetland

Mount Uniacke Business Park
Wetland Characteristics

Wetland ID	Wetland Type	Landscape Position	Landform	Water Flow	Soil Type	Surface Hydrology	Dominant Vegetation	Potential for Fish Presence
WL11	Hardwood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface	H: Cattail, Canada mayflower, wool grass S: Red spruce, yellow birch T: Red spruce, yellow birch	None in wetland
WL12	Mixed-wood Swamp	Terrene	Basin Sloped	Outflow (via drainage)	Histosol	Saturated at surface Groundwater within 30cm	H: New York fern S: Balsam fir T: Balsam fir, white ash, striped maple	None in wetland
WL13	Hardwood Swamp	Terrene	Basin	Isolated	Histosol	Saturated at surface 2cm standing water across 5% of wetland.	H: Three-seeded sedge, cinnamon fern, sensitive fern, fowl manna grass. S: Balsam fir, yellow birch T: Yellow birch	None in wetland
WL14	Mixed-wood Swamp	Terrene	Basin	Isolated	Histic Epipedon	Saturated at surface	H: Northern beech fern, crested shield fern cinnamon fern, three-seeded sedge S: Balsam fir, yellow birch T: Balsam fir, red maple, yellow birch	None in wetland
WL15	Mixed-wood Swamp	Terrene	Sloped Basin	Isolated	Histosol	Saturated at surface. 20cm standing water across 2% of wetland.	H: Crested shield fern cinnamon fern, three-seeded sedge, wild sarsparilla S: Balsam fir, yellow birch, black spruce T: White ash, red maple, yellow birch	None in wetland
WL16	Shallow Open Water	Terrene	Basin	Isolated	Histosol on rock	Shallow open water	H: Lily pad (Nymphaea odorata), eastern purple bladderwort, potamogeton species.	None in wetland



Photo 1: Typical Treed Swamp Habitat (WL2)



Photo 2: Wetland 4.



Photo 3: Wetland 5



Photo 4: Wetland 7 (bog)



Photo 5: Wetland 10



Photo 6: Wetland 1



Photo 7: Wetland 8



Photo 8: Wetland 16 (Shallow Open Water Wetland)