



Mr. Scott MacCallum
Clayton Developments Limited
255 Lacewood Drive
Halifax, NS, B3M 4G2
Sent Via Email: [REDACTED]

Project Nos. 11263/13623

Dear Mr. MacCallum:

**Re: Washmill Lake Court Extension Area Wetlands
Bayers Lake/Fairview, Halifax, Nova Scotia**

Further to our discussion, Maritime Testing has compiled information from various wetland reports completed for the above-noted area that are relevant to the private lands that will be developed along the Washmill Lake Extension by your clients. The purpose of this report is to provide information relevant to the Halifax Watershed Advisory Group that is currently reviewing the application for the development of Block C. Also provided is information relevant to Block B and D.

As you are aware, we previously delineated wetlands for HRM, which received Approval from Nova Scotia Environment to alter select wetlands that could not be avoided during the extension of Washmill Lake Court. During the course of that work that began in June 2009, we identified some wetlands that later became relevant to your firm, as you began your phase of roadway development, and to your clients, who propose development of the adjacent private lands. We referred to these as #4, #7, #8 and #9 in our reports for HRM. In September 2010, on your behalf, we delineated additional wetlands on private lands farther east of HRM's phase. We referred to these as #10 and #11.

Overview of Wetland Determination Procedure

For an area to be considered wetland, it must satisfy certain wetland criteria including soil, hydrology and vegetation properties that are wetland indicators. When making a determination that a wetland is present, there are specific 'rules' that are followed in considering the indicators present and the strength of the evidence. Generally we follow the US Army Corps of Engineers methodology, and Nova Scotia Environment (NSE) accepts this practice. A general overview of wetland characteristics that we consider follows: Wetland (hydric) soils typically have either organic deposits (i.e., when organic matter piles up faster than it decomposes, this is a sign of anaerobic decomposition (lack of oxygen due to water saturation) which is slower than aerobic decomposition) or hydric mineral soil properties such as a depleted matrix (color indicators that iron has been depleted from the upper soils in a wet environment).

Wetland hydrology is primarily indicated by inundation or saturated conditions within 30cm (12in) of the ground surface for a sustained period during the growing season, or evidence of flooding such as drift lines, sediment deposits, water-stained leaves, etc.

Wetland (hydrophytic) vegetation is either tolerant of or thrives in wet conditions. To assess for hydrophytic vegetation, we survey the vegetation to determine the indicator status (upland, facultative or obligate) of the dominant plants in all three layers of growth (i.e., tree layer, shrub layer and herbaceous layer). Generally, upland plants require dry conditions, facultative plants can live in wet or dry conditions, and wetland obligates require wet conditions. There are different methods for surveying vegetation and evaluating dominants, but basically, when the majority of the dominant species are facultative or 'wetter', the hydrophytic vegetation requirement is satisfied.

Investigation Results

Wetland #4 (.11 ha) is an irregular-shaped outflow treed bog located on what is currently identified as Block B, north of the Washmill Lake Extension.

The dominant trees are Black Spruce, Red Maple and Grey Birch. The dominants in the shrub layer include Black Spruce saplings, Huckleberry, False Holly, Wild Raisin and Sheep Laurel. The herbaceous layer contains Cinnamon Fern, Pitcher Plant, Bunchberry and sphagnum.



The subsurface contains 30 to 45cm peat deposits overlying bedrock.

Intermittent drainage seeps from its southern extent toward the roadway. At the time of the assessment in June 2009, groundwater was at or near the ground surface and water was seeping out of Wetland #4 and into Wetland #3. HRM later received Approval to alter #3. During a subsequent visit on September 21, 2010, no surface water was present and there did not appear to be an inflow or out flow for this wetland. It was noted that the recent road construction would have interrupted its natural outlet flow, had the conditions been wetter.

Wetlands 7, 8 and 9:

Wetlands 7, 8 and 9 are located north of, across and south of the Washmill Lake Extension, respectively, and drain southward from one to the other.

Wetland #7 (.040 ha) is located on what is currently identified as Block C. It appeared to be a pond at the time of our initial assessment on June 26, 2009. Water was observed seeping in three locations out of the pond and into Wetland #8; one location was overland flow and two locations appeared to be 'sidewall leaks' through fractures in the exposed slate bedrock sidewalls. On July 14, 2006, the 'pond' was no longer inundated and appeared more like a cranberry bog, though seeps were still ongoing toward Wetland #8. Peat accumulations are very shallow and in some places only moist soil exists containing pioneering plant species such as cranberry, suggesting that this wetland is in the early stages of bog development.

Wetland #7 is ringed by slate embankments vegetated with Black Spruce, Larch, Grey Birch, Highbush Blueberry (*Vaccinium corymbosum*; FACW-), Rhodora (*Rhododendron canadense*; FACW), Sheep Laurel, Lowbush Blueberry and Wintergreen / Teaberry (*Gaultheria procumbens*; FACU, although Tiner (1999) reported this to be an example of a common FACU species found in wetlands in the Northeast). The bog/pond itself contains sedges, Small Cranberry (*Vaccinium oxycoccus*; OBL), Pitcher Plant, Roundleaf Sundew (*Drosera rotundifolia*; OBL) and sphagnum.



Wetland # 8 was a small, irregular-shaped throughflow treed swamp wetland located across the road alignment near the junction of the HRM and Clayton Developments phases of the Washmill Lake Extension project. The wetland was altered (destroyed) with Approval from NSE since avoidance was not possible, given the roadway alignment.

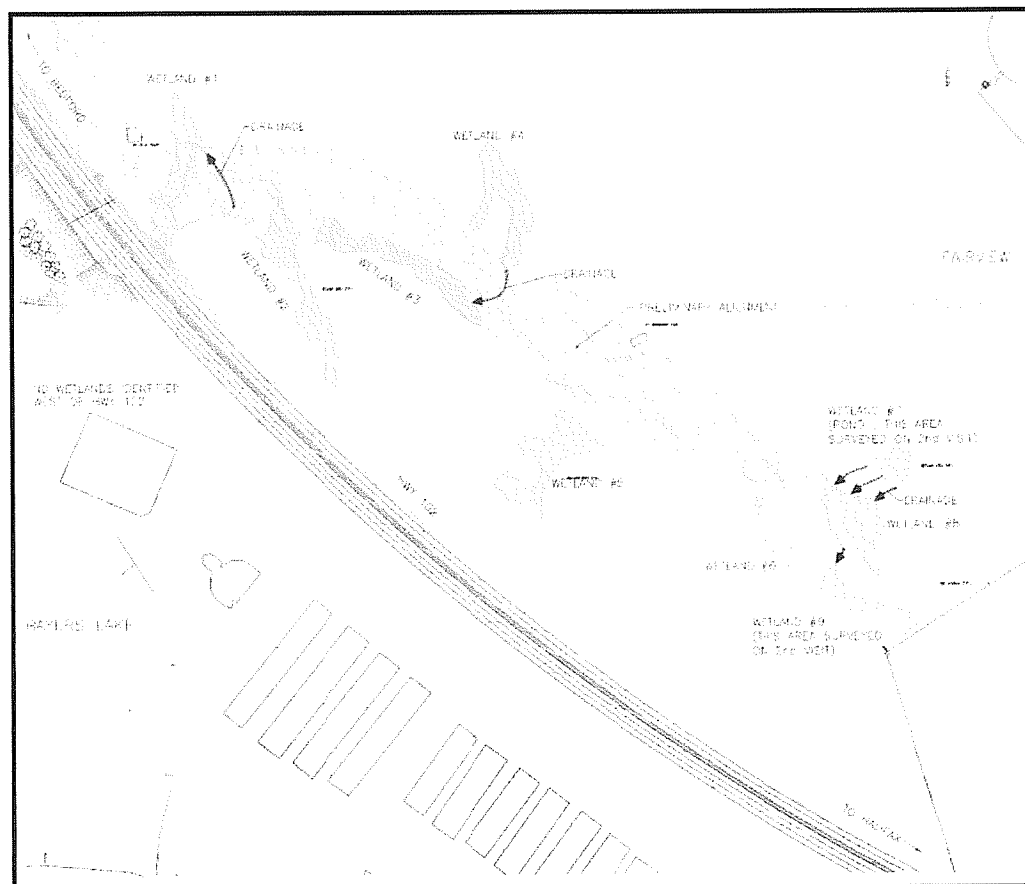
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Wetland #9 is situated on what is now identified as Block D. It is a through-flow wetland with a peaty to mucky subsurface. During both of our site visits in June 2009 and September 2010 it contained standing water at its eastern extent where it discharges via a culvert through a slate fill embankment. We would characterize it as a treed swamp.



The dominant trees in wetland #9 are Red Maple, Grey Birch and Black Spruce. The dominant shrubs are Huckleberry, Rhodora and Sheep Laurel. The dominants in the herbaceous layer are Cinnamon Fern, Bunchberry and sphagnum.

The Figure below taken from our previous wetland reports displays the wetland locations identified in close proximity to the roadway extension project.



Wetland #10 (.38 ha) is situated on what is now identified as Block B. It is an "L" shaped wetland complex situated on uneven ground and containing elements of shrub swamp, bog/fen and meadow / fern wetland types. It receives surface water from adjacent steep uplands (note the slate outcrop in the wetland photo below) and there appears to be a narrow outflow channel on the southern end that likely flows only during spring run-off or after heavy rain events. It was dry on September 21, 2010 in spite of fairly heavy recent rainfall.

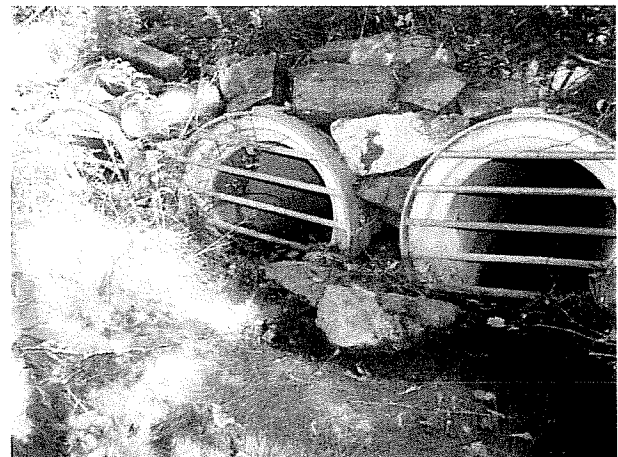


Wetland #10 in background, with slate outcrop in foreground.

Wetland # 11 (.32 ha) contains elements of a forested or shrub swamp as well as bog or fen characteristics. Vegetation includes scattered black spruce, and red maple and larch in the tree layer, huckleberry and sheep laurel in the shrub layer, and cinnamon fern, pitcher plant, sphagnum and sedges in the herbaceous layer. One or two small open water areas exist. It is surrounded by treed uplands. On the day of the site visit in September 2010, water was leaving the wetland through a well defined channel and then through a road culvert, indicating perhaps that this wetland receives surface water from surrounding upland sources regularly.



Inflow area at Wetland #11.



Outflow of Wetland #11 at Washmill Lake
Extension



Wetland #11

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Maritime did not prepare a sketch of wetlands #10 and #11, but they were surveyed and appear on the attached Drainage Plan for the Washmill Lake Court Extension, as well as on engineering drawings for the development of Blocks B and C, respectively.

We trust this meets your present requirements. If you have any questions, do not hesitate to contact the undersigned.


Best Regards,

Maritime Testing (1985) Limited



Doreen Chenard, B.Sc. in Agr.

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