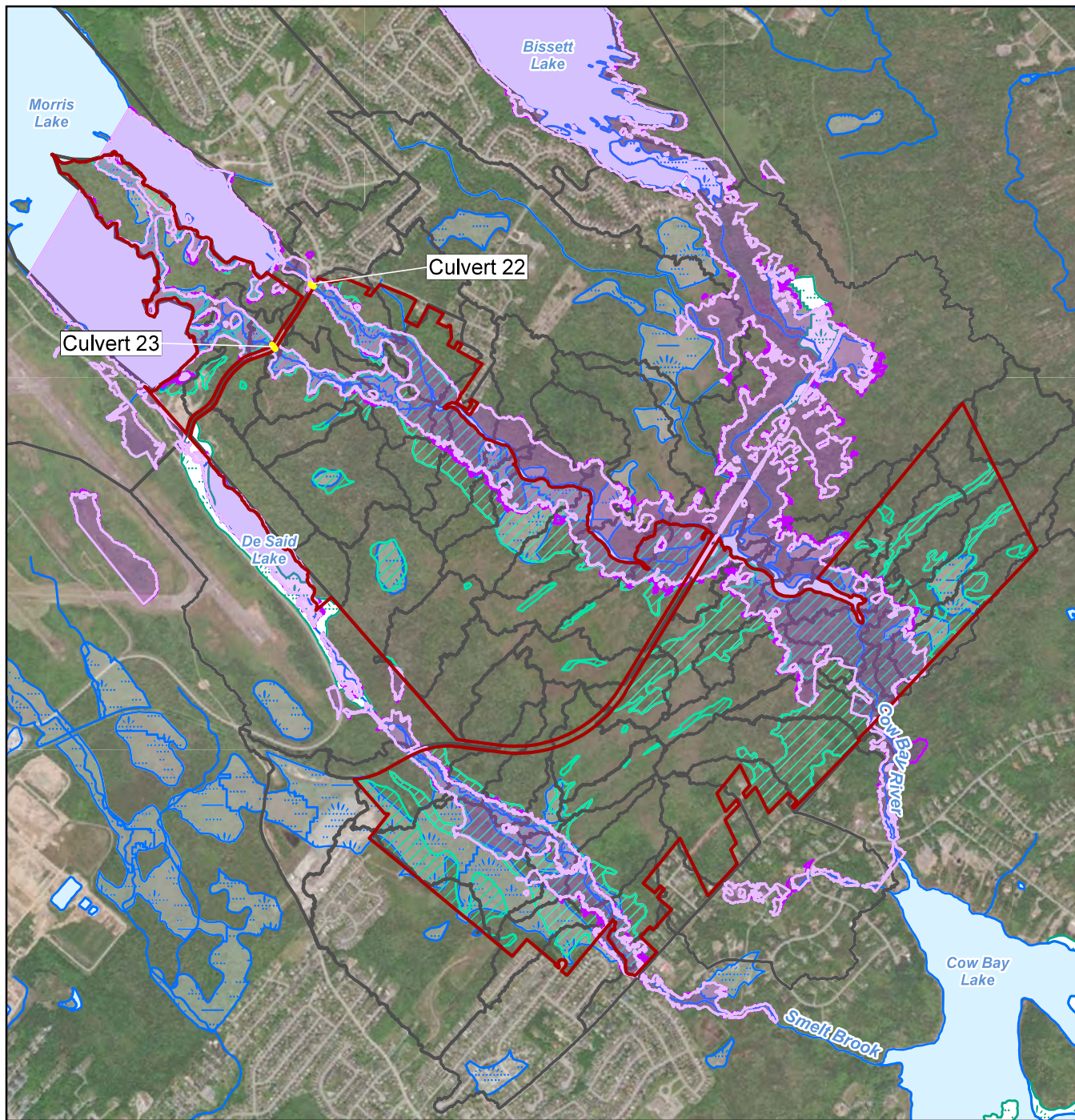


\\ao213-pplss01\work_group\1214\active\160410459\gis_data\mapping\ArcGIS Pro\HRM_Stormwater_Mgmt.aprx Revised: 2024-10-29 By: acuff



- Legend**
- Study Area
 - Culvert
 - Existing Subcatchment
 - 20yr Flood Extent (Draft, HRM 2023)
 - 100yr Flood Extent (Draft, HRM 2023)

- Wetlands and Waterways**
- Waterway
 - Waterbody
 - Designated Wetland of Special Significance
 - Wetland
 - Wetlands (Stantec, 2023)

0 500 1,000 Meters
(At original document size of 8.5x11)
1:25,000



Project Location
Halifax Regional Municipality,
Nova Scotia

Prepared by HB on 2024-02-13
Revised by AC on 2024-10-29

Client/Project
Halifax Regional Municipality
Future Serviced Communities
Morris Lake Stormwater Management Plan

160410459

Figure No.
8.5

Title
Existing Conditions Preliminary
Floodplain Extents

Notes

- Coordinate System: NAD 1983 CSRS UTM Zone 20N
- Data Sources: Stantec; Government of Nova Scotia, Department of Service Nova Scotia and Internal Services; Government of Nova Scotia Environment and Climate Change
- Background: ESRI; Government of Nova Scotia, Department of Service Nova Scotia and Internal Services.

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

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8.8 Existing Culverts

As illustrated in the existing storm drainage plan (refer to **Drawing EXSD-1** in **Appendix B** and **Figure 8.5**), the Study Area includes 2 existing culvert crossings along the Cow Bay River branches at Caldwell Road, as identified from the HRM Open data source. Each of the culverts was surveyed, and the gathered data was incorporated into the existing hydraulic model. The existing culvert dimensions and 100-year headwater to diameter ratios are presented in **Table 8.2** below.

Table 8.2 Existing Culverts

Culvert ID	Existing				
	Shape	Barrels	Width (m)	Height (m)	100-yr Design Storm - Hw/D
Culvert_22	Rectangular	1	2.000	1.000	1.8
Culvert_23	Circular	1	1.050	1.050	1.5

As shown in the above table, the existing culverts on Caldwell Road appear to be undersized based on the NSE's requirement to provide $Hw/D \leq 1$ in the 100-year design storm event. It is therefore recommended that these culverts be upsized to meet NSE's design criteria to provide adequate conveyance capacity. However, without finalizing development plans or calibrating the hydrologic/hydraulic model to confirm downstream water levels and peak flows, upsizing of these culverts will not be completed as part of this conceptual design. It is important to note that culvert upgrades will result in peak flow increases and increased flooding risks downstream and as such, it is recommended that further hydraulic analyses be completed, assuming external culvert upgrades, to assess flooding impacts downstream and to reduce the risk of exposing future residents in the area to flooding risks.

An additional crossing under the TransCanada trail, appears to be a bridge based on aerial images but was not included in the HRM Open data source. This crossing was not included in the model but should be included in future hydraulic analysis of the area to assess flood risk mapping and required culvert upgrades.



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9 Post Development Conditions

Stantec's planning team has engaged landowners to help establish a potential development scenario for the Morris Lake Study Area and built on that scenario to provide lower and higher density scenarios. However, it is noted these scenarios are subject to change based on recommendations from this study.

For the purpose of this stormwater management assessment, the high-density scenario has been selected given that it has the most impermeable surface cover and provides a comprehensive understanding of severe runoff conditions. It should be noted that the current development plan is conceptual and subject to change based on results of further analysis and studies within the Study Area and to adhere to the recommendations made in Stantec's 2024 Land Suitability Analysis for the Morris Lake Study Area. Refer to **Figure 9.1** for proposed development conditions.

Moreover, it is anticipated that the stormwater management strategies for the high-density scenario will also be applicable and effective for both the low and medium density scenarios.

In the post development conditions, development is being considered in areas identified as wetlands and as such, it is recommended that the final concept plans be revised to accommodate existing environmental features or that appropriate compensation plans be put in place.

The subsequent subsections detail the various characteristics of the post-development conditions. Additionally, the post-development storm drainage plan is presented in **Drawing SD-1** in **Appendix B**.

9.1 Site Grading & Land Use

The high-density development scenario has been used to create a master grading plan designed to follow existing drainage patterns as much as possible, provide sufficient cover over trunk sewers, provide an overland flow outlet, take into account sufficient cover over future culvert crossings and incorporate bottom and high-water elevations at end-of-pipe SWM facilities.

The proposed development plan consists of a diverse mix of land uses that encompasses low-density residential areas, institutional areas, commercial areas, as well as green space areas.

