

Highway 101 Twinning and Avon River Aboiteau Replacement & Causeway Upgrading

COMMUNITY LIAISON COMMITTEE (CLC)

PROJECT UPDATE

NOV 30, 2022

Overview

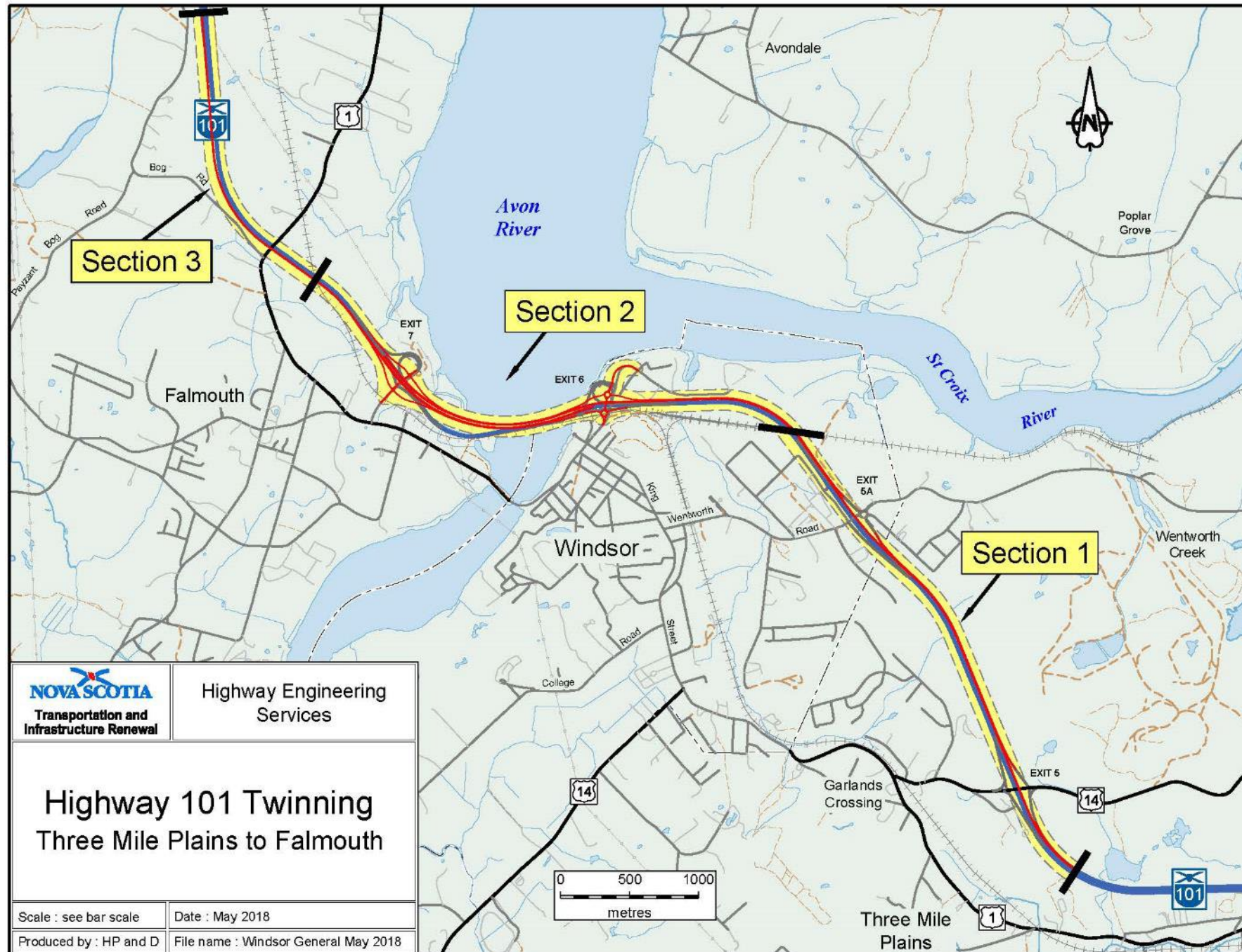
Presentation Outline:

- ▶ Highway 101 Twinning Update (NSDPW)
 - ▶ Project Update
- ▶ 'Burying Island' update
- ▶ Avon River Aboiteau and Causeway Upgrade (NSDPW / CBCL)
 - ▶ Project Recap
 - ▶ Status Update
 - ▶ Design Update
 - ▶ Post Construction Monitoring Plan
 - ▶ Next Steps
- ▶ Questions / Discussion



Photo from van Proosdij (2018)

Highway 101 Twinning: Three Mile Plains to Falmouth



Highway 101 Twinning

Section 2A: Windsor Railway Crossing to Exit 6

- ▶ Upgrading to eastbound lanes scheduled for spring 2023



HIGHWAY 101 LOOKING EAST NEAR EXIT 6

Highway 101 Twinning

Section 2B: Exit 6 to Exit 7 (including causeway)

- ▶ Final stage of preload fill along the causeway completed August 18th.
- ▶ Exit 6 Interchange/Nesbitt Connector started expected completion fall 2023
 - ▶ Completed new sanitary sewer for the Municipality
 - ▶ Completed pile installation for rail structure, south abutment of highway overpass
 - ▶ Completed south abutment of rail structure
 - ▶ Working on MSE wall installation, subgrade construction of Upper Water Street and WB on-ramp



HIGHWAY 101 EXIT 6 INTERCHANGE OVERVIEW

APRIL 2022



HIGHWAY 101 EXIT 6 INTERCHANGE OVERVIEW
NOVEMBER 2022



HIGHWAY 101 EXIT 6 INTERCHANGE

Highway 101 Twinning

Section 3: Exit 7 to Existing Twinning (Falmouth)

- ▶ Connection and tie-in of new eastbound lanes including upgrading westbound lanes started, expect to complete eastbound lanes before end of year, upgrading to westbound lanes to be completed in spring 2023.
- ▶ Exit 7 Interchange construction underway, expected completion spring 2023
 - ▶ Installation of abutments, centre pier, girders and deck complete
 - ▶ Working on structure barrier walls, Falmouth connector subgrade and westbound ramps.



HIGHWAY 101 AT EXIT 7 INTERCHANGE (FALMOUTH)

APRIL 2022



HIGHWAY 101 EXIT 7 INTERCHANGE
NOVEMBER 2022



HIGHWAY 101 EXIT 7 WESTBOUND OFF RAMP



HIGHWAY 101 WEST END TIE IN



Hwy 101 Three Mile Plains to Falmouth Twinning – CLC Meeting

November 30, 2022

Department of Public Works
Dr. Bob Pett, Environmental Services



Fort Edward Street
Archaeological Resource Impact Assessment
HRP A2022NS013



Prepared for: West Hants Regional Municipality
Prepared by: Jonathan Fowler
12 April 2022

CLC Meeting on July 20, 2022

A recent report
was mentioned on
Fort Edward that
noted the
“Burying Island”
in or near our
construction site

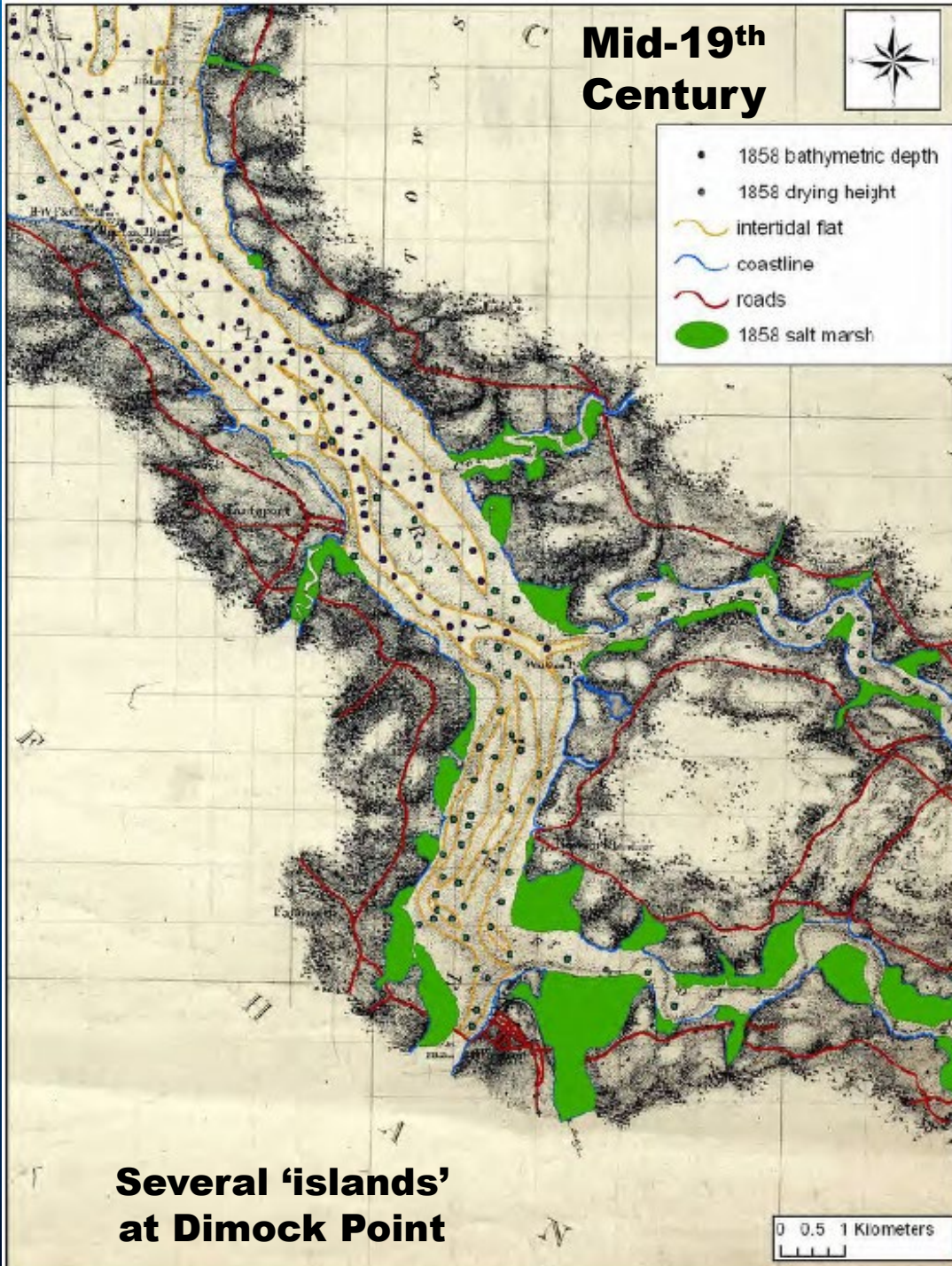






Figure 1: Detail of a 1753 watercolour showing what appears to be the Burying Island (circled, and actively eroding) north of Fort Edward:
SOURCE: John Hamilton. “View of Fort Edward on the Piziquid River, Nova Scotia.” Library and Archives Canada (LAC), Acc. No. 1996-361-3.

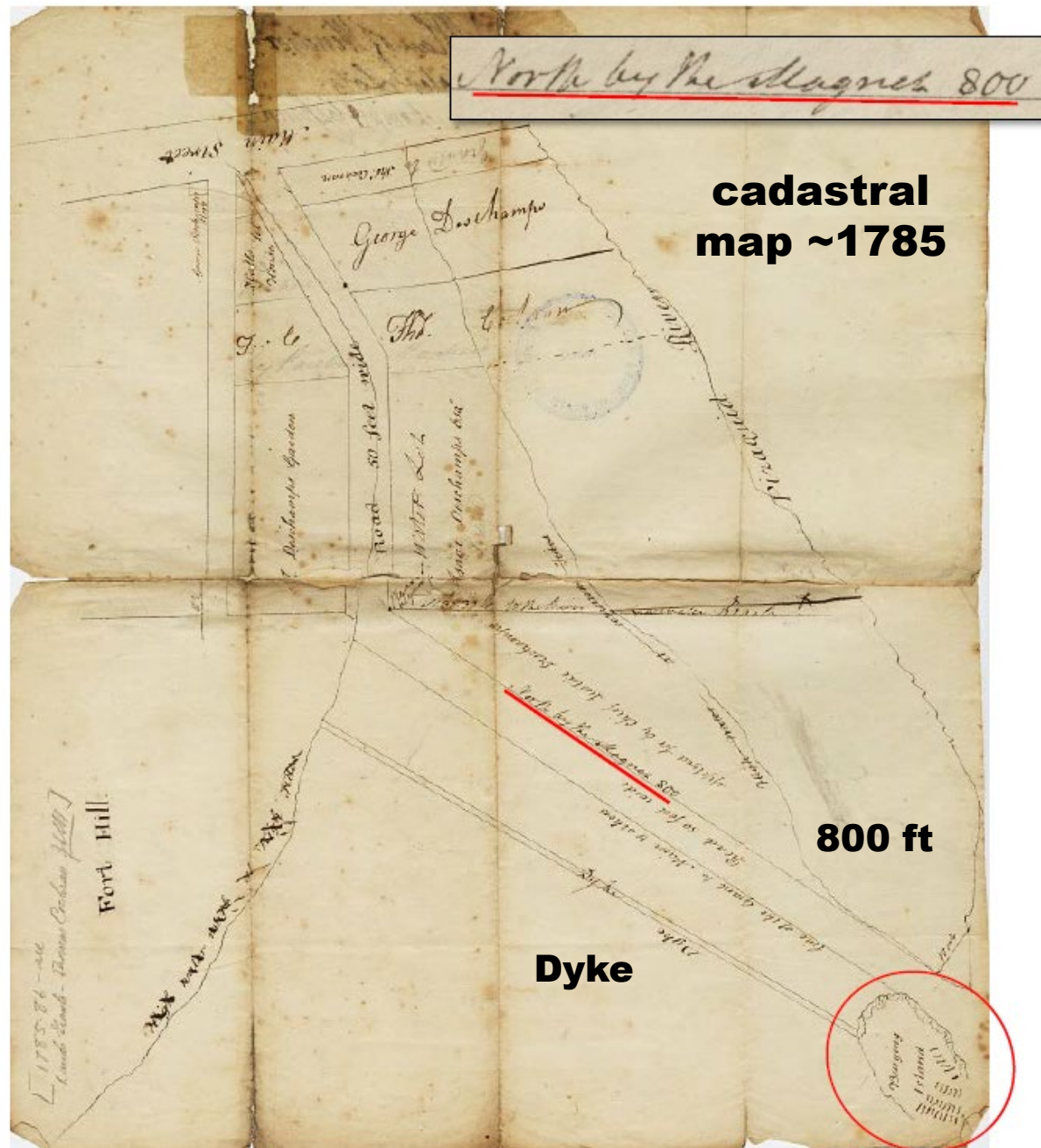
We spoke to the report author, Dr. Fowler, and commissioned a summary report about the Burying Island. We also discussed the issue with our archaeology consultants, Davis MacIntyre & Associates, and the issue was not identified in previous reports or discussions with Mi’kmaw KMK-archaeology staff.



Dr. Fowler recommends looking at a variety of maps and other imagery (including art) over time.

1858 British Admiralty Field Sheet D4801 (van Proosdij et al., 2007)

The area near the confluence of the Avon and St. Croix Rivers (*Pesikitk* in Mi'kmaw) was largely salt marsh and located near the 17th & 18th century Mi'kmaw village of *Pisiquit* (DMA, 2019, 2020).



Dr. Fowler's report includes an image of a "large scale cadastral map of the land between Fort Hill and the Avon River showing the location of Burying Island (circled *in red*)". This map, undated but circa 1785, allows comparison with later survey imagery including LiDAR.



Figure 4: Large scale cadastral map of the land between Fort Hill and the Avon River showing the location of the Burying Island at lower right (circled). North at right. SOURCE: Anon. n.d. "Plan of Windsor Water Lots Deschamps and Cochran." NSA RG 20 Series C Vol. 34.

Dr. Jonathan Fowler, 2022

**“resembles ... nearby... Mi’kmaw cemetery at Avonport...
other burial islands ... in literature ... Cultural memory of
a cemetery ... survives in the Mi’kmaq community”**

**“Ship Yard Island”
in late 18th Century**

approximate
location of
“Burying Island”

Church site
(1722-1750)

**Lidar modelling with
simulated tidal flooding**

Figure 17: 3D LiDAR model with simulated tidal flooding showing the ca. 350m distance separating the known Acadian church site from the “Burying Island” identified by Henry Youle Hind as the parish cemetery. The distance seems too great for this to have been an Acadian cemetery. This area appears recently to have been substantially altered by the Highway 101 twinning project. SOURCE: Province of Nova Scotia (2011).

Dr. Jonathan Fowler, 2022

**cadastral map
late 18th century**

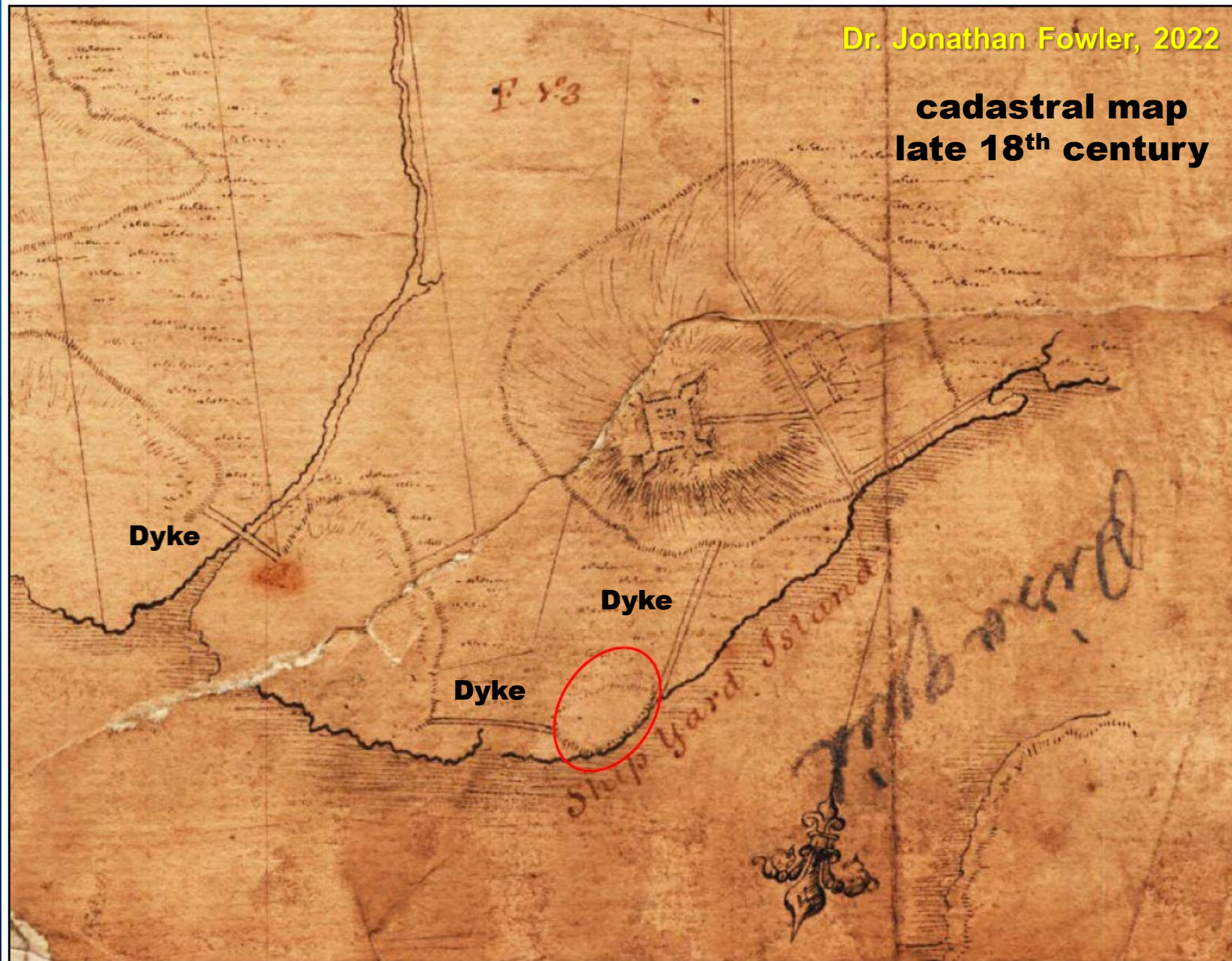


Figure 6: Detail of an undated cadastral map of the Burying Island (circled) showing dykes. The island was evidently being used for ship building at this time. SOURCE: Anon. n.d. [late 18th c.] Untitled. CLIMC Hants County Portfolio no. 15.

**Davis MacIntyre &
Associates 2020**

**Archaeological
monitoring prior to
Windsor Marsh
infilling noted
wharf timbers –
on the edge of
“Burying / Ship Yard
Island”**

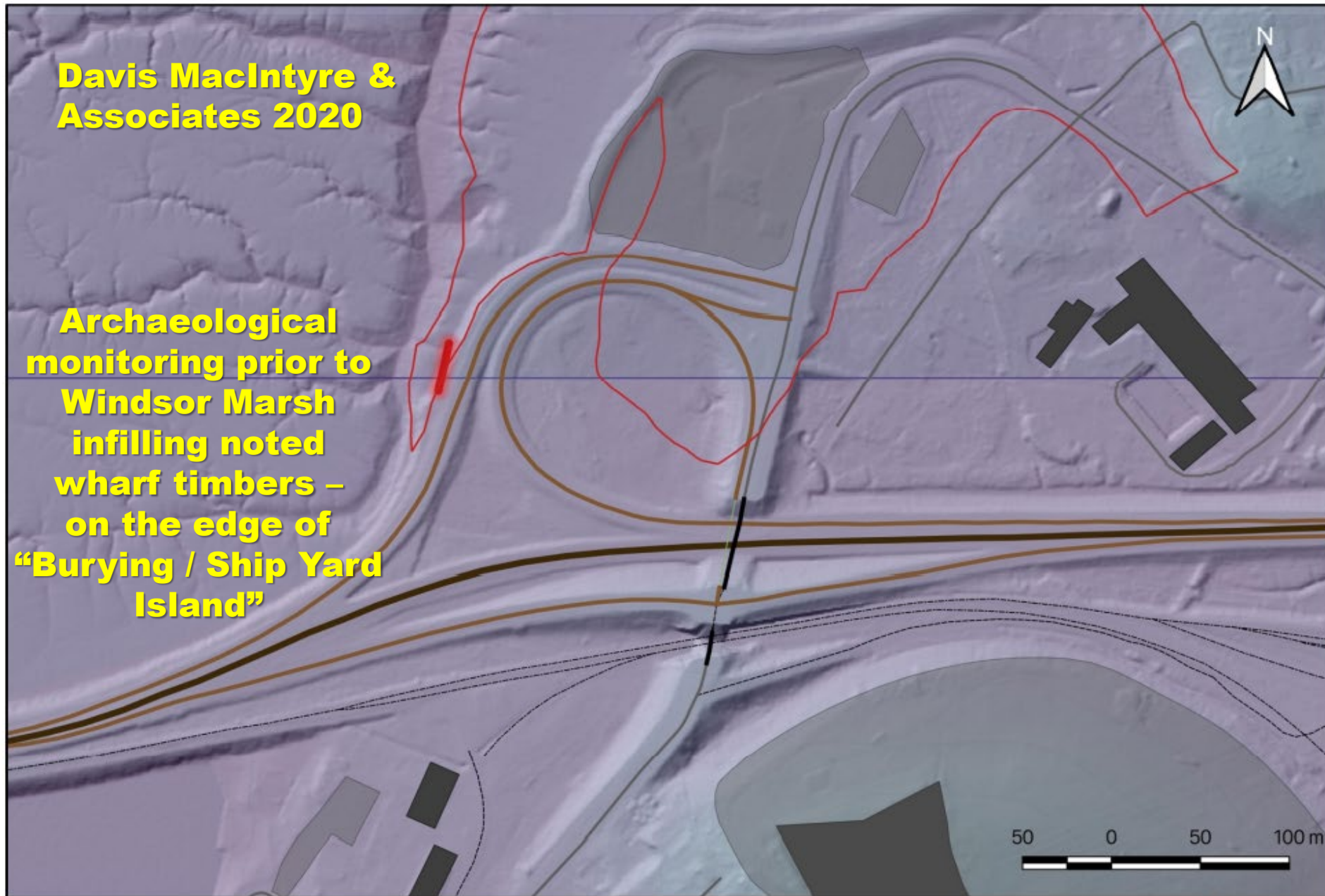


Figure 3.5-1: The approximate location of the wharf timbers (highlighted red) shown on modern LiDAR imagery.



Plate 49: The short section of in situ timber and the in situ upright post, looking west.

Archaeological excavation of a post and timber scatter (resembling corduroy road) along Exit 6 on-ramp (DMA, 2020)



Plate 46: Recent ground disturbance and timber scatter beside the Exit 6 on-ramp, looking north.



Plate 51: Notched timbers recovered during monitoring.



Figure 7: Detail of a Victorian map of Windsor showing the Burying Island area as occupied by "Bennet Smiths Shipyard" (circled). SOURCE: W.A. Hendry and D.Y. Sw...[?] 1879. "Plan shewing the granted and ungranted Water lots in front of the Town of Windsor on the Avon River." North at top. CLIMC, Hants Portfolio no. 026.

1878 Artwork (T.M. Fowler) – Bird's Eye View of Windsor



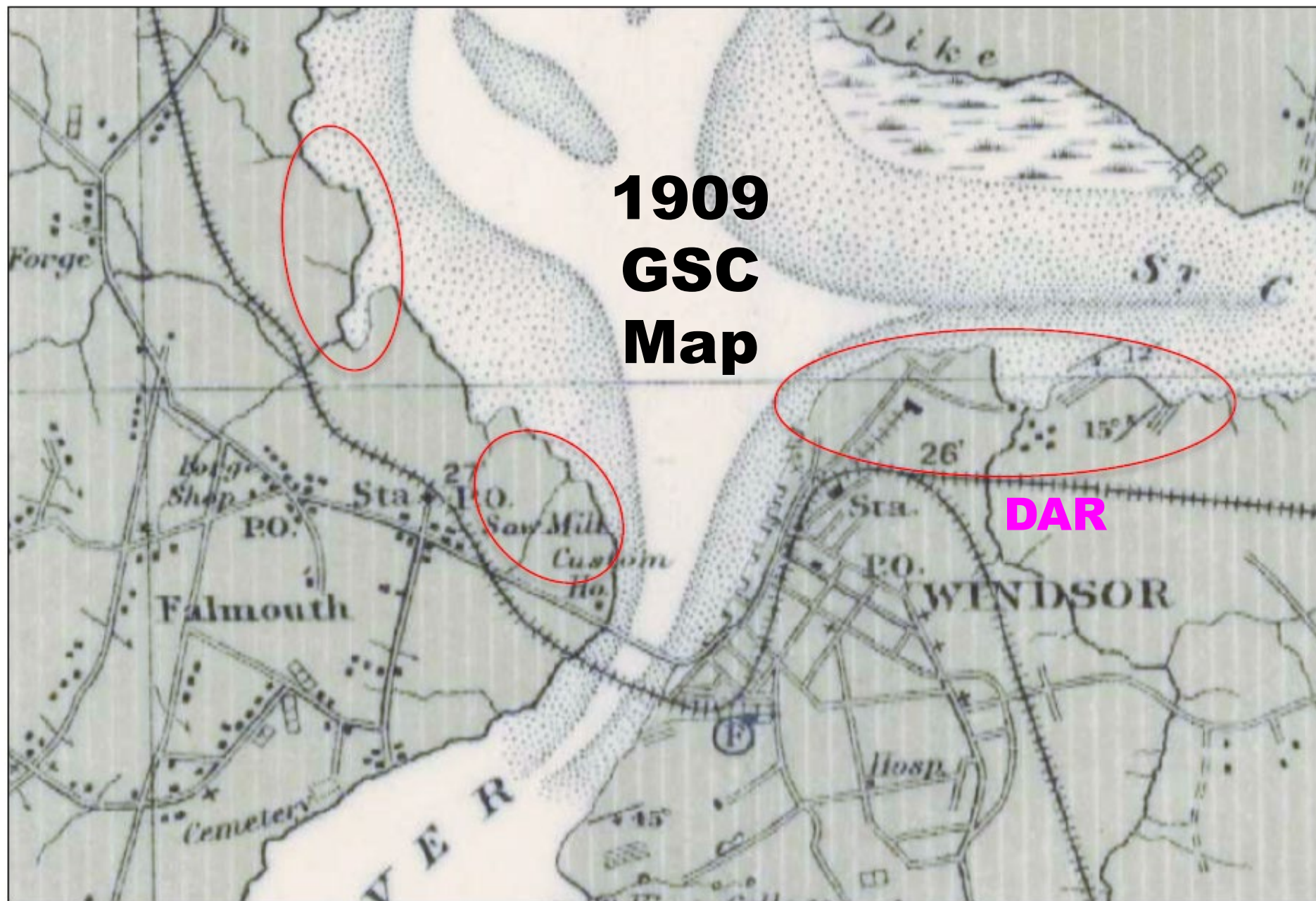


Figure 3.2-9: 1909 Geological Survey of Canada map, north at top, with the approximate study area locations highlighted in red.⁸²

Davis MacIntyre & Associates 2020

1929 airphoto

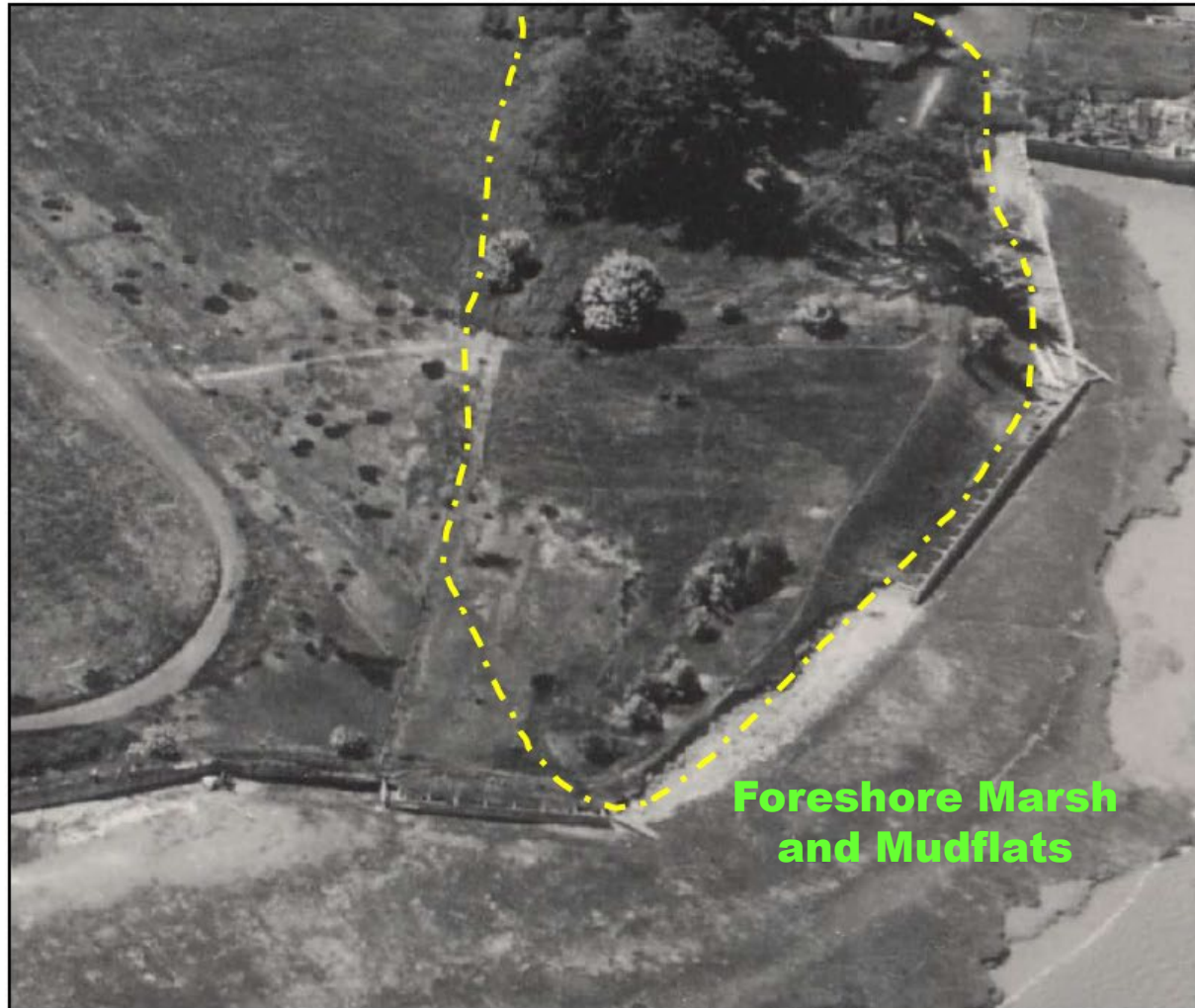


Figure 8: Detail of a 1929 aerial photograph of Windsor showing surviving portions of the Burying Island, outlined. SOURCE: National Air Photo Library A1236-83.

1945 airphoto

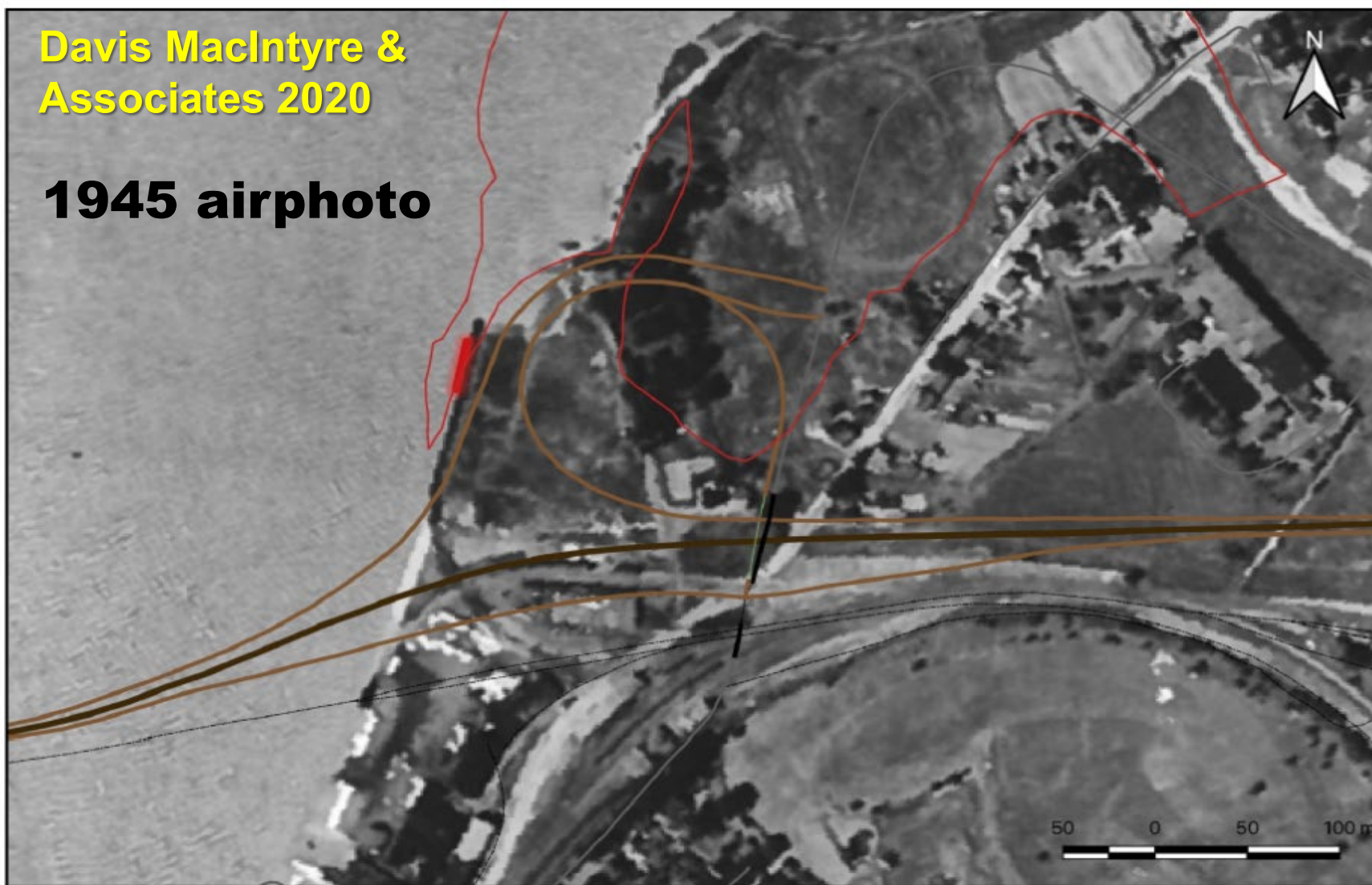


Figure 3.5-2: The approximate location of the wharf timbers (highlighted red) overlaid on a georeferenced 1945 aerial photo shows that the timbers are likely the remnants of a base for a spur rail line and pier used for loading the contents of rail cars onto ships at high tide.

1963 Airphoto – Dyke and remnant marsh (wet area) to the east



1970 Airphoto – Little evidence of “Burying Island”

Avon River Causeway Shortly
Before October 1970 Opening



NS Dep't of Highways –
1971 Annual Report

TIA



**Over 250 years of ground disturbance
of the “Burying Island”**

Fort Edward overlooking the new Exit 6

PE Lyle Russell, Nov. 29, 2022



Looking north over Exit 6

PE Lyle Russell, Nov. 29, 2022



**Burial /
Ship Yard
Island**

TIA

Looking north over Exit 6

PE Lyle Russell, Nov. 29, 2022



More archaeological monitoring going-forward

- **Exit 6 construction is continuing and includes tie-in of an updated NSDA dyke system to the new road system;**
- **NSCCTH has reviewed the information and has asked for continued monitoring during construction;**
- **Davis MacIntyre & Associates will be conducting the work under a new NSCCTH Heritage Research Permit;**
- **Monitoring results to be shared in future CLC meetings.**

Avon River Aboiteau and Causeway Upgrade



Project Recap

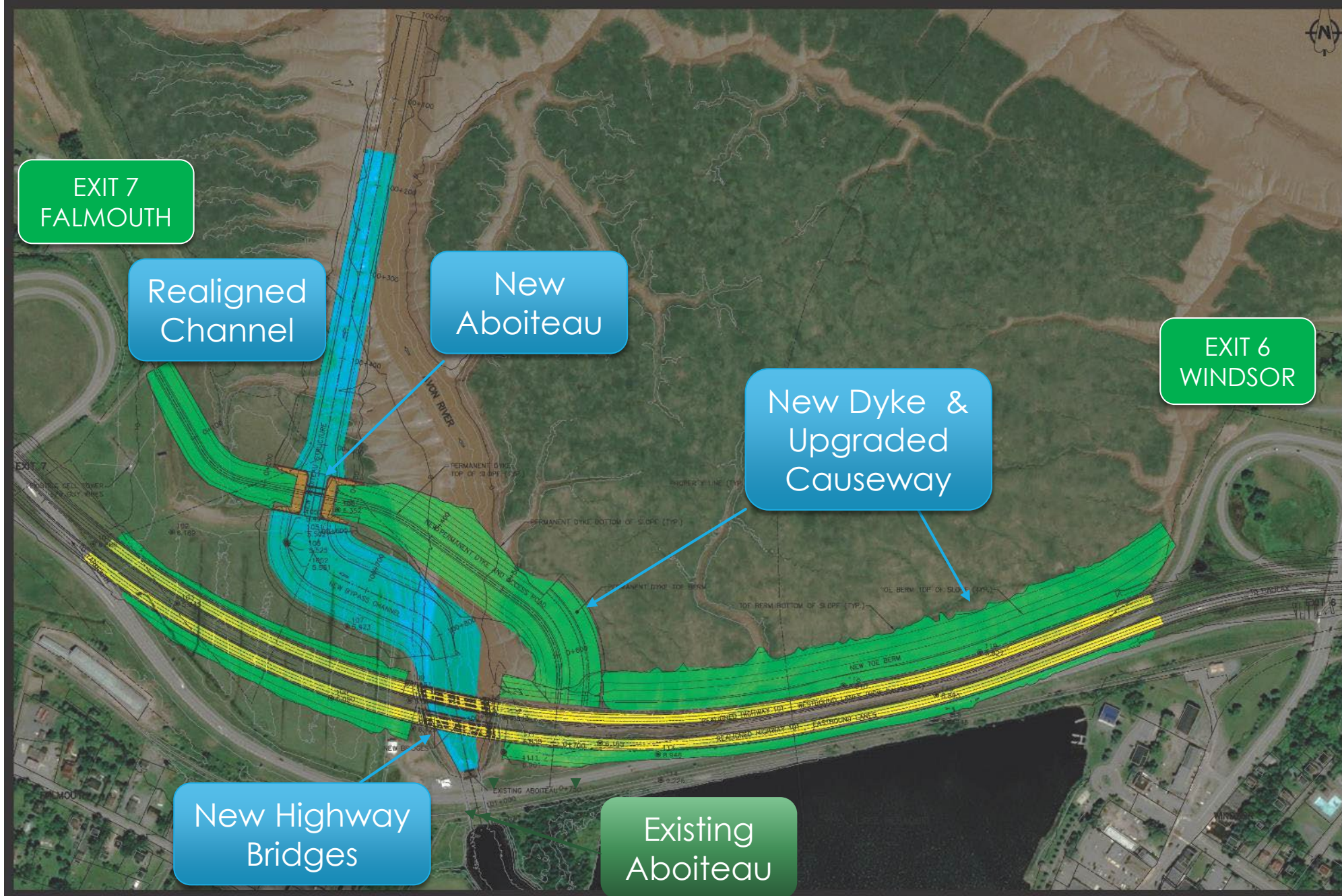
Primary Objectives:

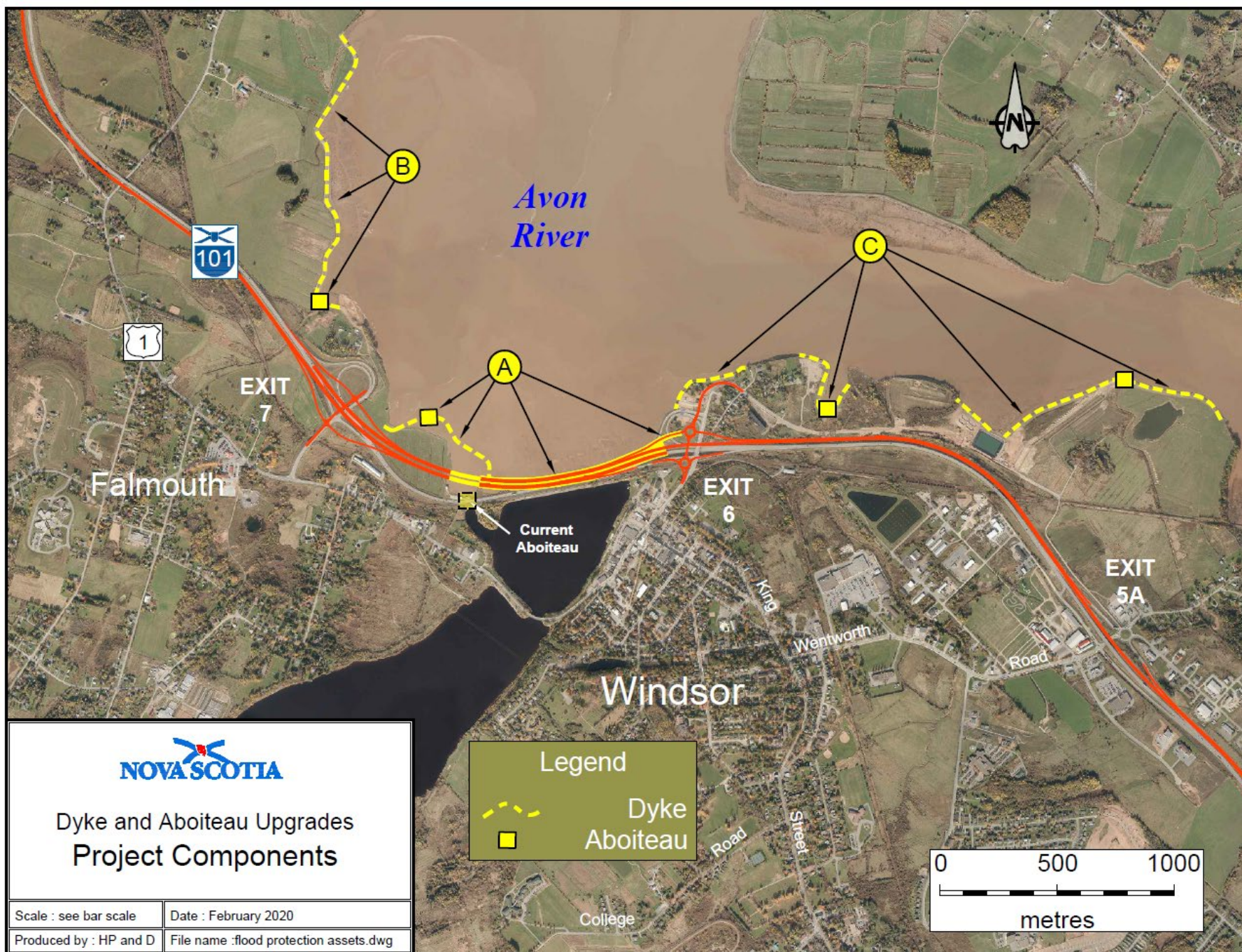
- ▶ To improve **public safety**:
 - **Enhanced flood protection** (& climate change resilience) to protect against flood risks and vulnerability to sea level rise, coupled with the need to protect critical public infrastructure, communities, and valuable agricultural land
 - **Improve highway safety** through the completion of twinning Highway 101 across the Avon River, while also benefitting from the enhanced flood control system to protect the highway and associated bridges

Project Recap

Other Requirements:

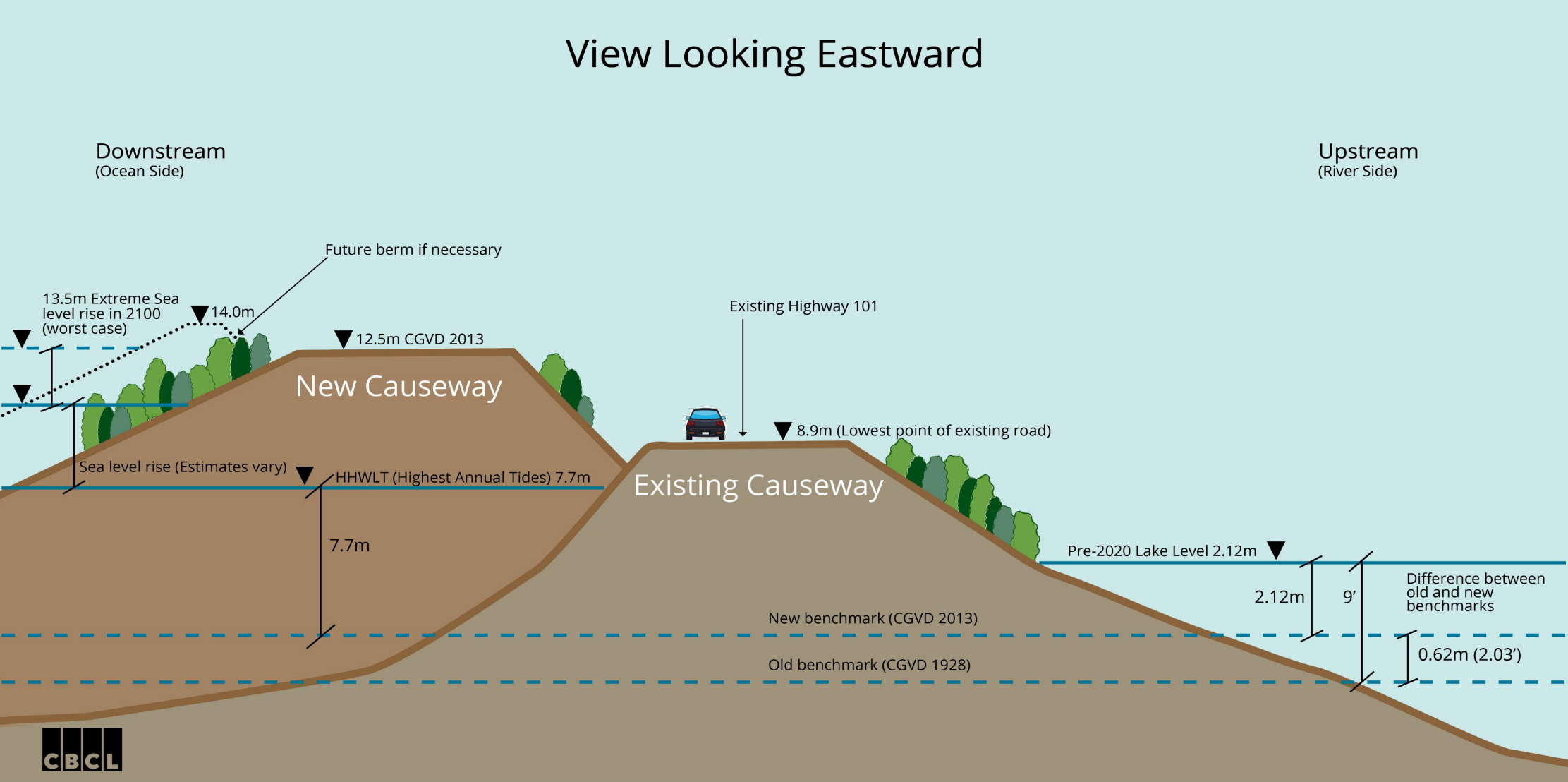
- ▶ In addition to meeting the public safety objectives, the project must also satisfy several **regulatory requirements**:
 - **Fish Passage** in compliance with the *Fisheries Act* (DFO) and Environmental Assessment conditions (NSE), including consideration of potential impacts to asserted or established Mi'kmaq Aboriginal or treaty rights
 - **Minimize environmental and societal impacts** through obtaining applicable permits/authorizations and satisfying several EA terms and conditions



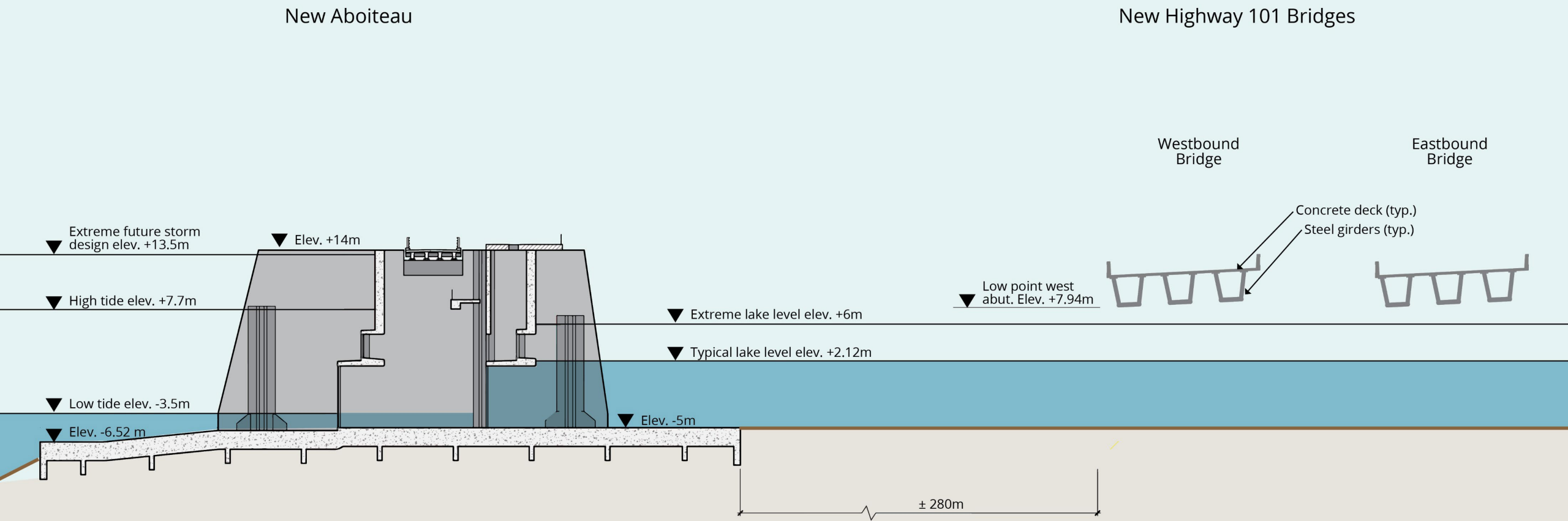




Project Area Elevations



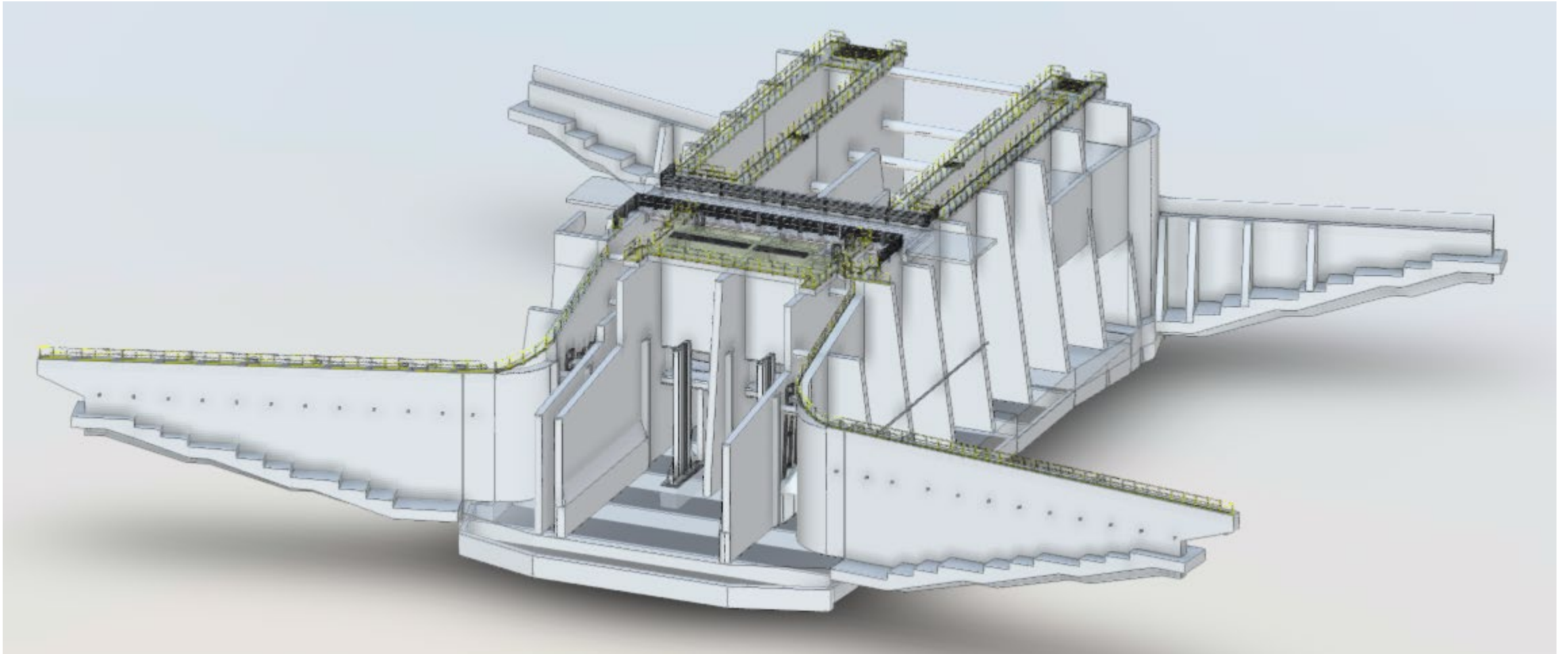
Project Area Elevations



3D View of Proposed Structure

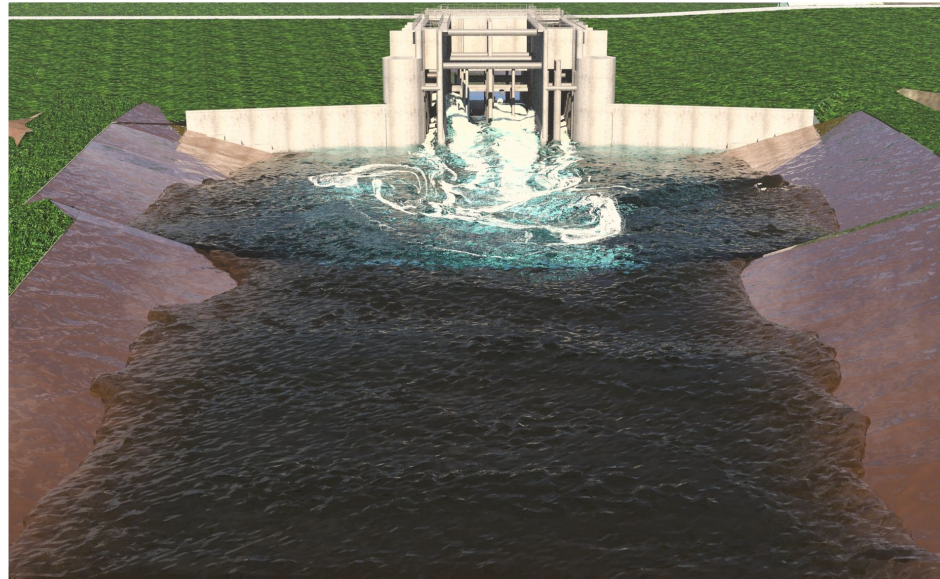
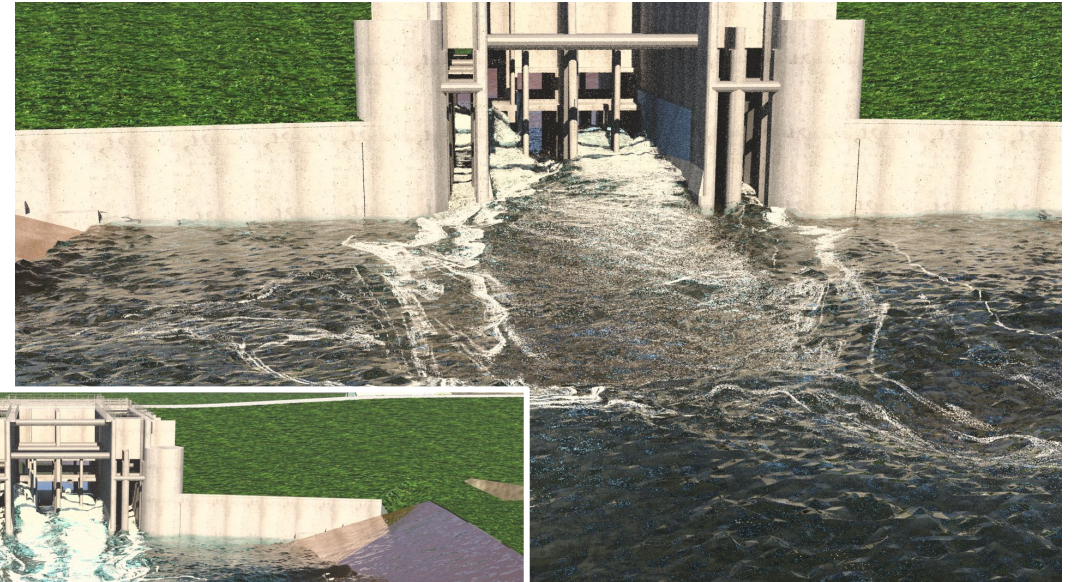
[Link to 3D model](#)

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Regulatory Approvals Status Update

- ▶ NSECC – Environmental Assessment Project Description Update
- ▶ Transport Canada
- ▶ DFO



Status Update - NSECC

NSECC – Environmental Assessment Project Description Update:

- ▶ Highway 101 Twinning Three Mile Plains to Falmouth Project received approval (with conditions) in **June 2017** (EA Approval).
- ▶ NSECC requested additional information on the changes to the Project, specifically the Avon River Aboiteau.
- ▶ NSDPW provided an update to the Environmental Assessment in **April 2022** to describe the advanced engineering design and operational abilities of the aboiteau structure, their context and rationale and a directed assessment of environmental effects related to the design changes that have evolved since the initial evaluation of the 2017 EA.
- ▶ NSECC is still reviewing the document
- ▶ Continuing Consultation w/ Mi'kmaq (**Ongoing**)

Status Update – Transport Canada

Transport Canada – CNWA Approval Update:

- ▶ Original application submitted in **December 2020**
- ▶ NSDPW provided Updated design drawing in April 2022
- ▶ Transport Canada is still reviewing the document waiting on DFO Approval and Consultation
- ▶ Continuing Consultation w/ Mi'kmaq (**Ongoing**)

Status Update - DFO

DFO *Fisheries Act* Authorization (FAA) Application:

- ▶ Original application submitted in **November 2020** focused on Freshwater Lake operating scenario
- ▶ DFO responded in **March 2021** that the application was incomplete / inadequate & requested additional information focused on other operating scenarios that included tidal exchange
- ▶ A Supplemental Information Package was submitted to DFO in **August 2021**
- ▶ Several meetings have taken place since August to review/discuss the information and subsequent analysis to address DFO's comments
- ▶ Further modelling and assessments were submitted in **June 2022** to address DFO's latest comments and to provide confidence that the new aboiteau will function and accommodate fish appropriately
- ▶ DFO responded in **October 2022** requesting additional information focused on other operating scenarios, sediment and fishway options

Next Steps

- ▶ Respond to DFO comments
- ▶ Continue a Pre-Construction Monitoring Program (**Spring 2023 through 2024**)
- ▶ Tender Ready for Construction Start (**likely Spring 2023**)
- ▶ DFO/Regulatory Approvals (**TBD**)
- ▶ Construction (**TBD - 2 to 3 years**)
- ▶ Initiate Post-Construction Monitoring Program (**TBD – 5+ years**)
- ▶ Continuing Consultation w/ Mi'kmaq (**Ongoing**)
- ▶ Engagement w/ Community Liaison Committee (**Ongoing**)

Thank you

Questions?