Ipswich Mills Dam Removal EENF Public Meetings September 13 & 14, 2023

- Project Purpose
- Background
- Proposed Project
- Env Impacts and Assessments
- Proposed Design

Project Team:

- Town of Ipswich
- IRWA
- DER
- HW

Information/ Comments

All project updates, FAQ's, and documents posted at:

Ipswichmillsdam.com

How to submit a comment on the MEPA filing…

- Search for "MEPA Environmental Monitor"
  https://eeaonline.eea.state.ma.us/EEA/MEPA-eMonitor/home
- Nicholas Moreno (MEPA Analyst)
  Nicholas.Moreno@mass.gov
- Neil Shea (IRWA)
  nshea@ipswichriver.org
- Frank Ventimiglia (Town of Ipswich)
  frankv@ipswichma.gov

Project Area

Purpose - Why Dam Removal ?

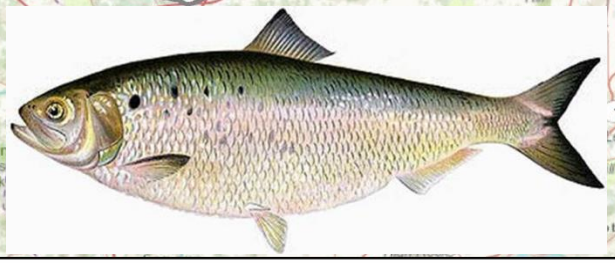
- The dam is over 100 years old and no longer serves purpose for which it was built
- Incurs maintenance costs and liability for Town
- Detriment to river ecology –
  - Impedes fish and other aquatic organism passage
  - Impedes natural sediment transport
  - Degrades water quality in impoundment
- High restoration value for removal
  - 90th percentile for dams across the state (MA DER)
  - 95th percentile for coastal dams from Maine to Virginia (Nature Conservancy)
- Significant funds are available to help dam owners remove dams like this for municipal vulnerability improvement and restoration purposes

Project Purpose

Goals:

- **Improved Fish Passage/ Habitat**
- **Improved Water Quality**
- **Flood Reduction**
- **Liability Removal**
- **Recreation Improvements**

Ipswich Mills Dam



Legend

- Ipswich Watershed

River Herring Access

- Unimpeded
- Reduced (1 Ladder)
- Severely Reduced (2 Ladders)
- Blocked

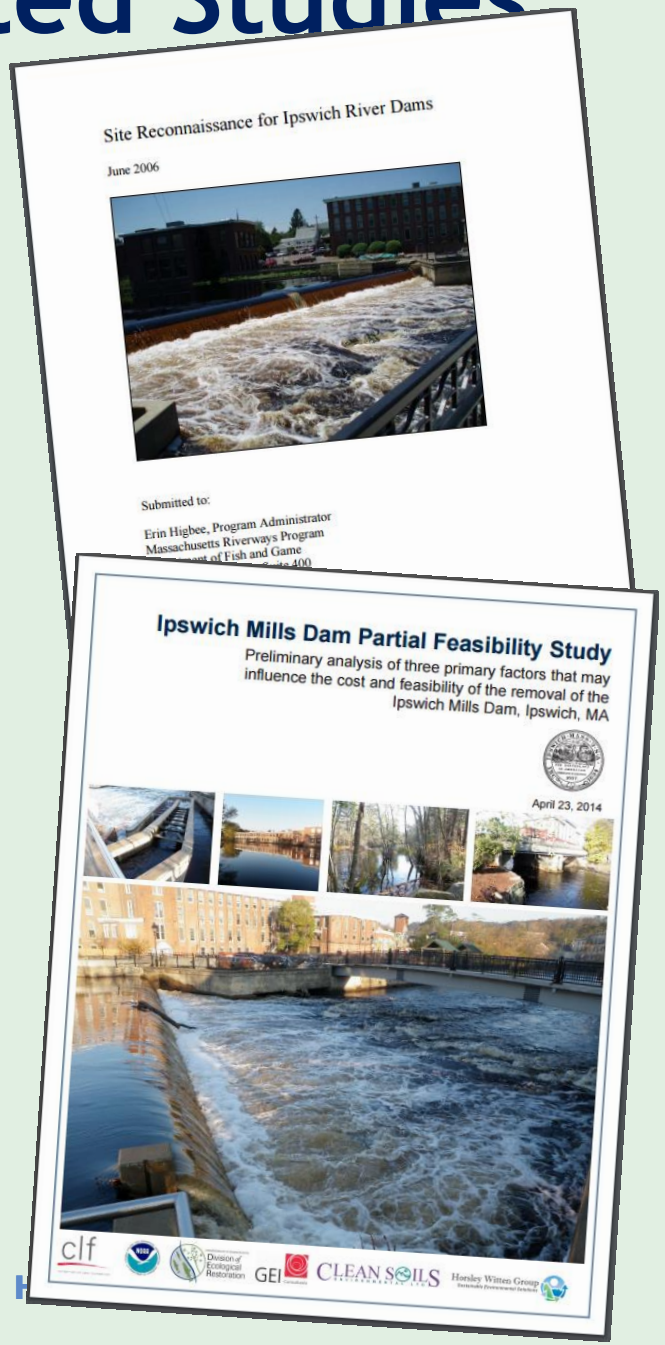
0 1.75 3.5 7 Miles

Existing Conditions Photos

Horsley Witten Group, Inc.

Background - Completed Studies

- 2006 – Site Reconnaissance for Ipswich River Dams
- 2014 – Pre-Feasibility Study - preliminary analysis of:
  - Flooding
  - EBSCO Foundation
  - Sediment Quality
- 2014 – Bathymetric Survey
  - Elevation of river bed upstream of dam



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The Voice of the River

Division of Ecological Restoration
Invested in Nature and Community

Background - Feasibility Study 2019

Goal – To provide the Town with enough information to decide whether or not to further pursue removing the dam

- Historical context of the dam site
- Existing conditions mapping
- Analysis of water levels and flows in a dam-out scenario considering effects on flooding, fish passage, and ecology
- Investigation of potential impacts to EBSCO building.
- Evaluation of potential impacts to other structures
- Conceptual plans and renderings
- Conceptual cost estimates

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Horsley Witten Group, Inc.

Background – Post Feasibility Study

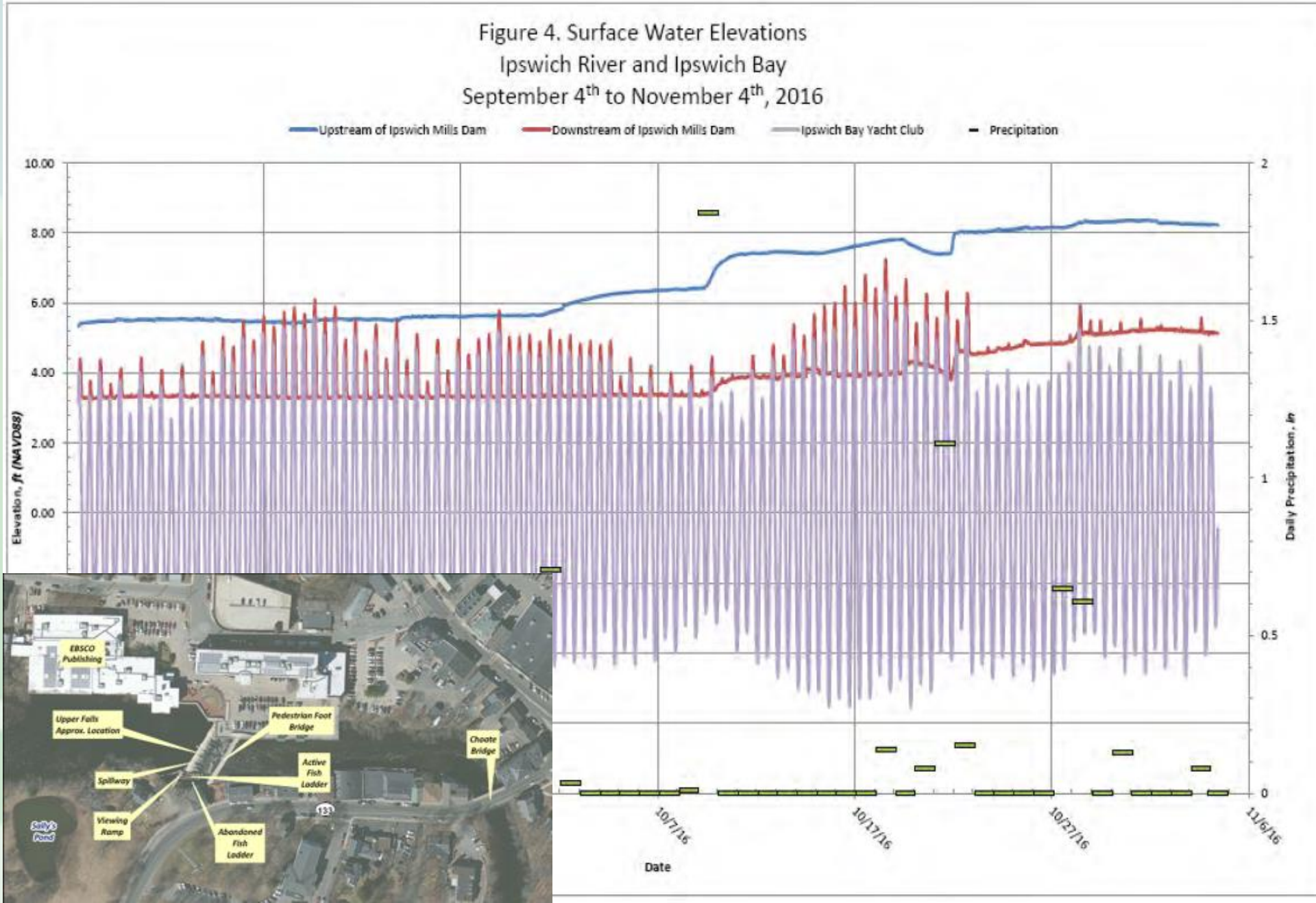
- Subsurface Investigations of EBSCO Structural Stability 2020 & 2021
- Hydrologic Study of Anticipated Groundwater Conditions in EBSCO Vicinity Post Dam Removal 2021
- Permit – Level H&H Analyses and Design 2022-2023.

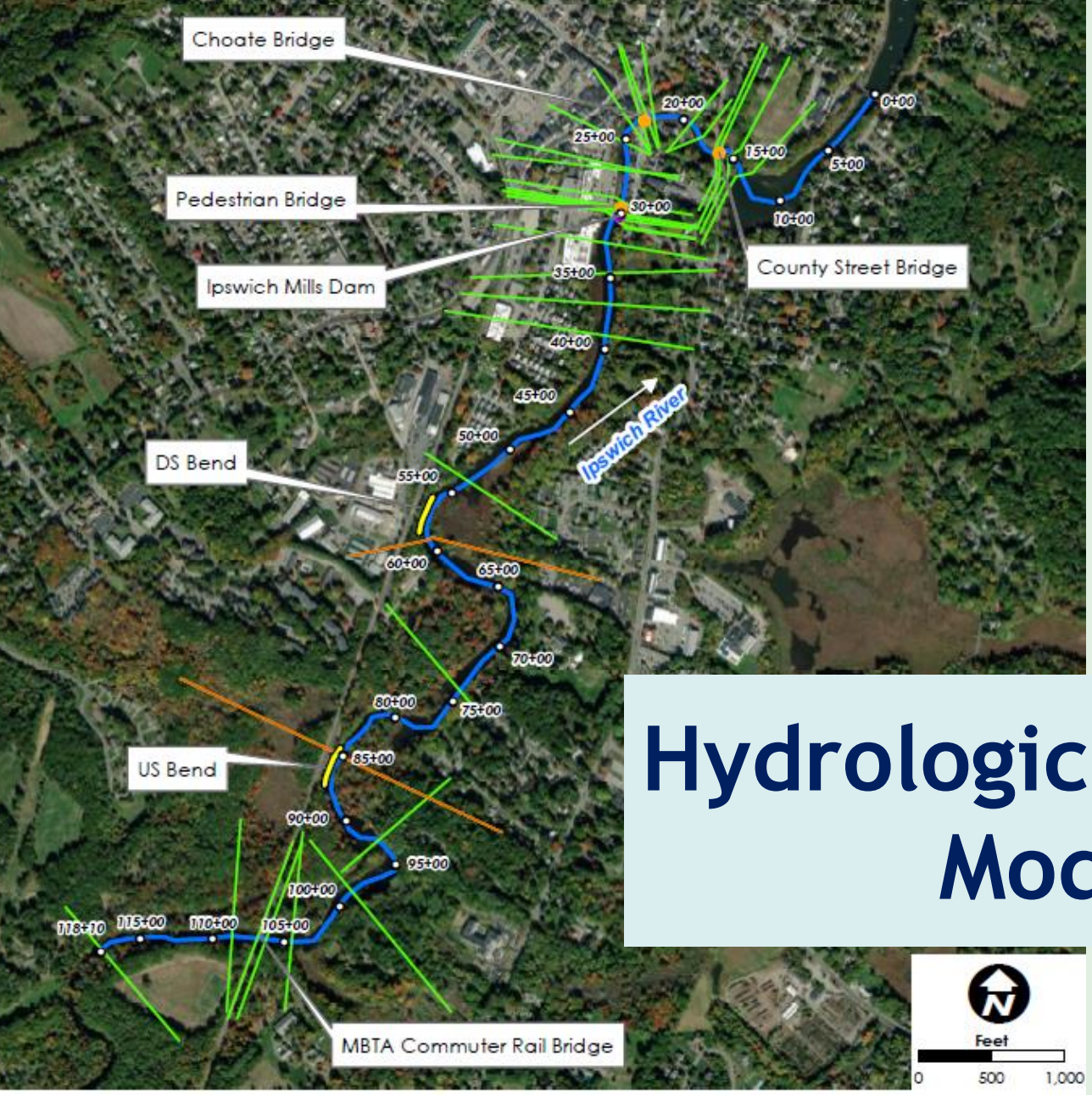
Feasibility Study – Historical

- Rich cultural history from PaleoIndian Period through Modern Period. Sea run fish important cultural component.
- At least 3 dams at site (Ca 1636, 1828, 1880 rebuilt 1908)
- 1928 Ipswich Mills closes
- 1982 Town of Ipswich
- Dam adjacent to, but not in, two historic districts listed in National Register
- Section 106 Historical process in future permitting
- Mitigation typically includes archaeological survey, permanent historic record, archival photography & public interpretive items.

Feasibility Study - Tidal Conditions

Figure 4. Surface Water Elevations
Ipswich River and Ipswich Bay
September 4th to November 4th, 2016





Hydrologic & Hydraulic Modeling

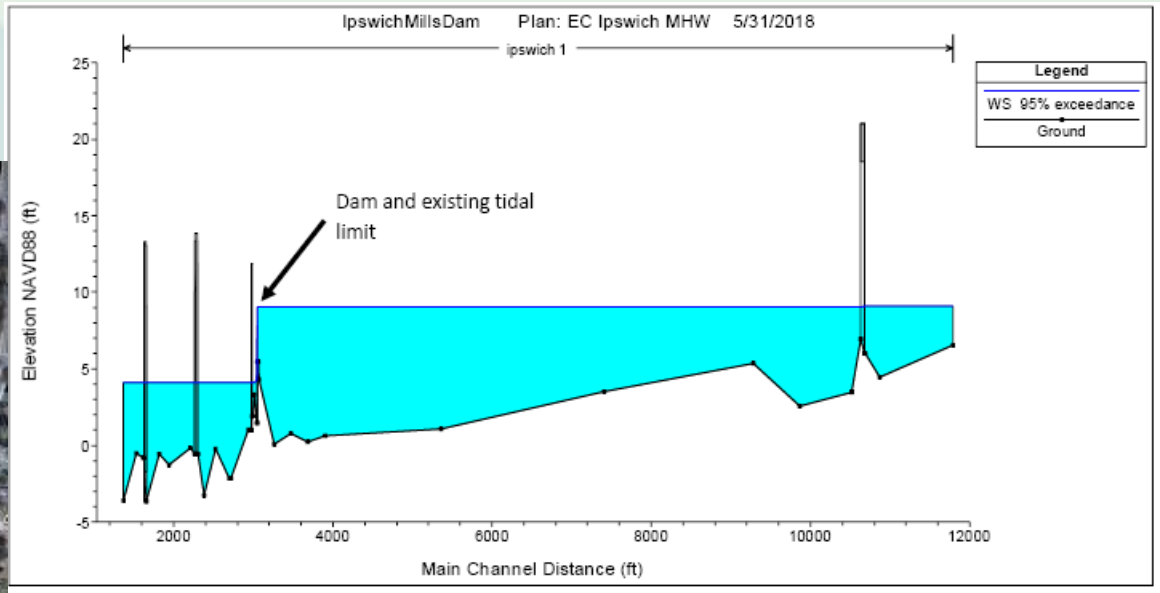
te: 7/19/2023
ta Sources: Bureau of Geographic
formation (MassGIS), ESRI
is map is for informational purposes and
ay not be suitable for legal, engineering,
surveying purposes.

Detailed H&H Modeling

- Flooding – Impacts either positive or none
- Fish passage – Greatly improved
- Paddling accessibility – Improved at dam & remain passable under all modeled conditions elsewhere
- Sediment migration – downstream migration spread over large area
- Structural impacts – Minimal erosion potential at retaining walls near dam addressed in design with stabilization. No modeled scour at bridges or other bank locations.

H & H Modeling

Low flow tidal influence



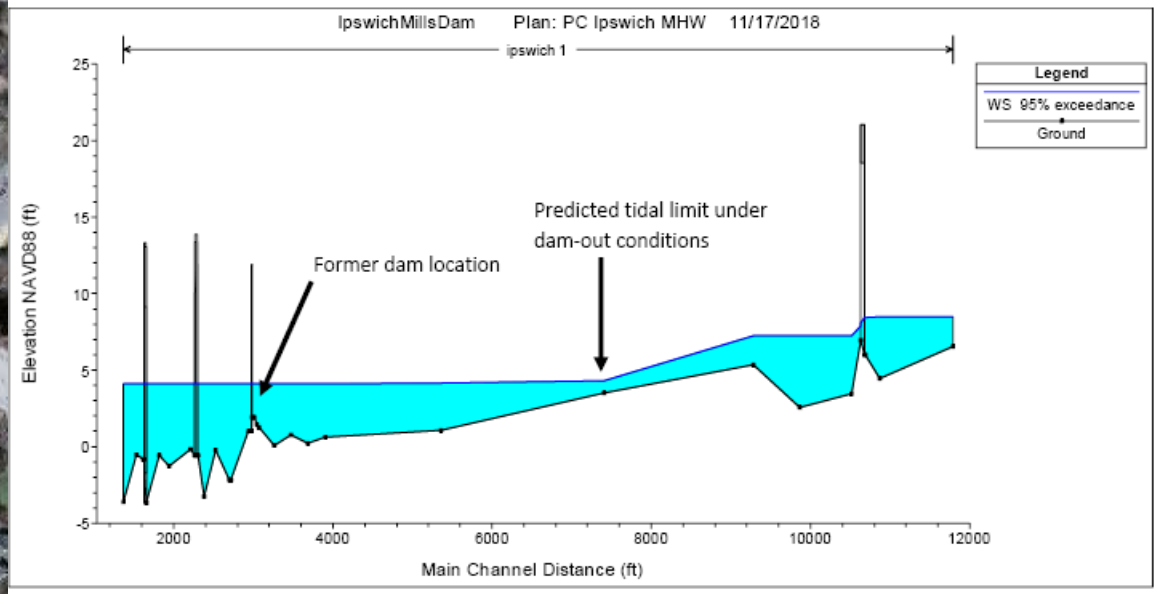
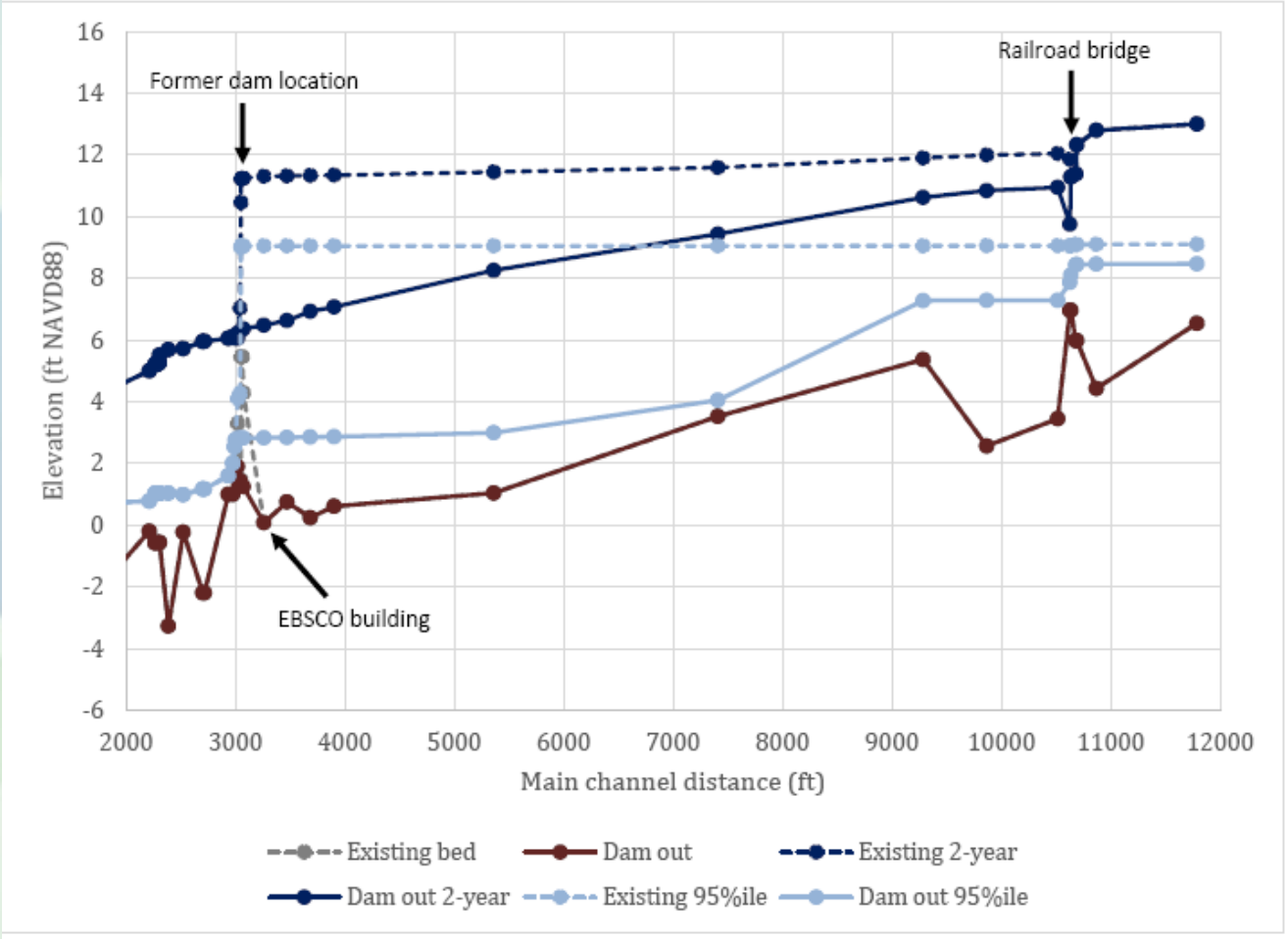


Figure 19. Predicted low-flow water surface profiles for existing (top) and dam-out (bottom) conditions during high tide

H & H Modeling

Flood Impacts:

- Water levels decline above dam & remain same below dam
- Choate Bridge currently is & remains restriction for large events



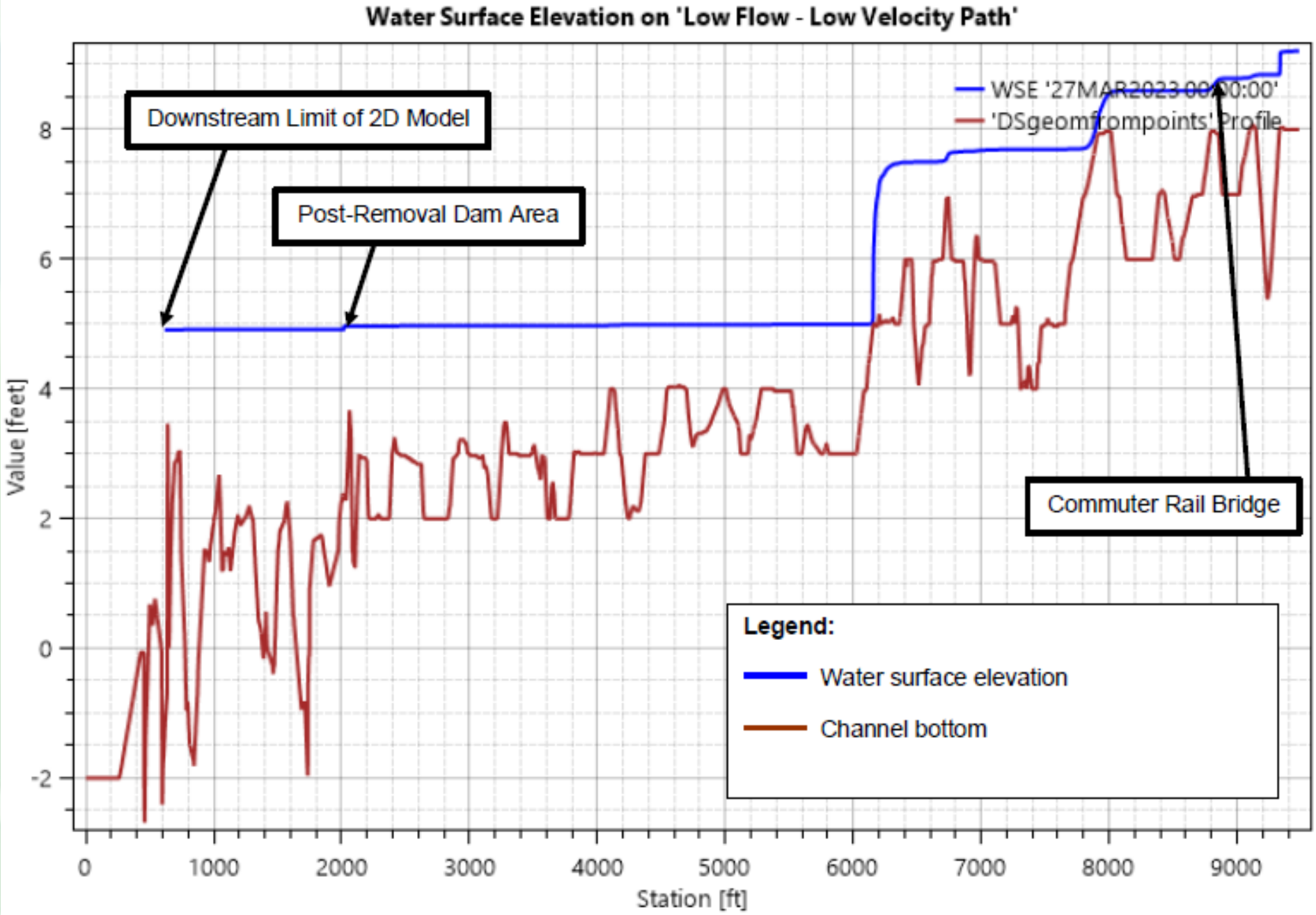


Figure 12. Water Surface Elevation Profile Along Path of Feasible Low Flow and Low Tide Passage

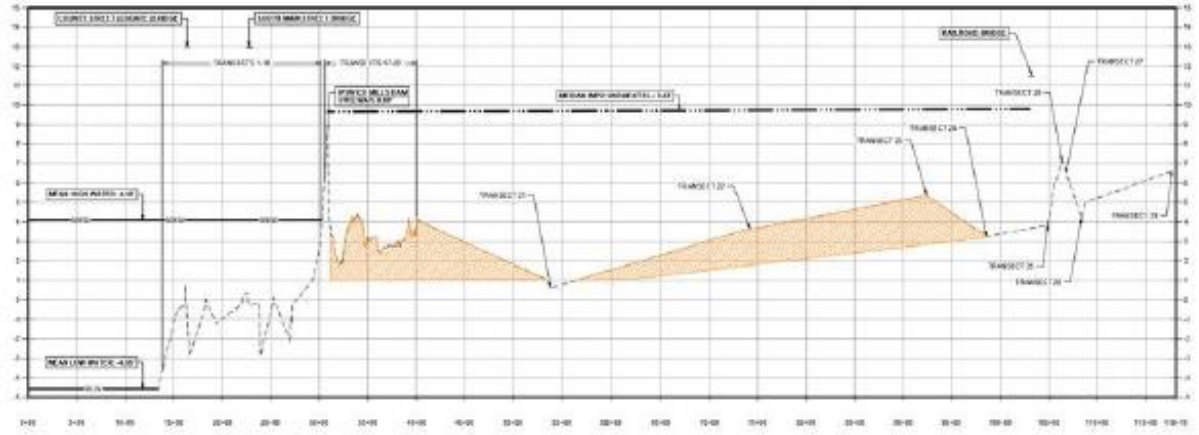


Figure 22. Profile of Anticipated Sediment Loss in the Vicinity of Ipswich Mills Dam

Orange: profile of predicted sediment transport

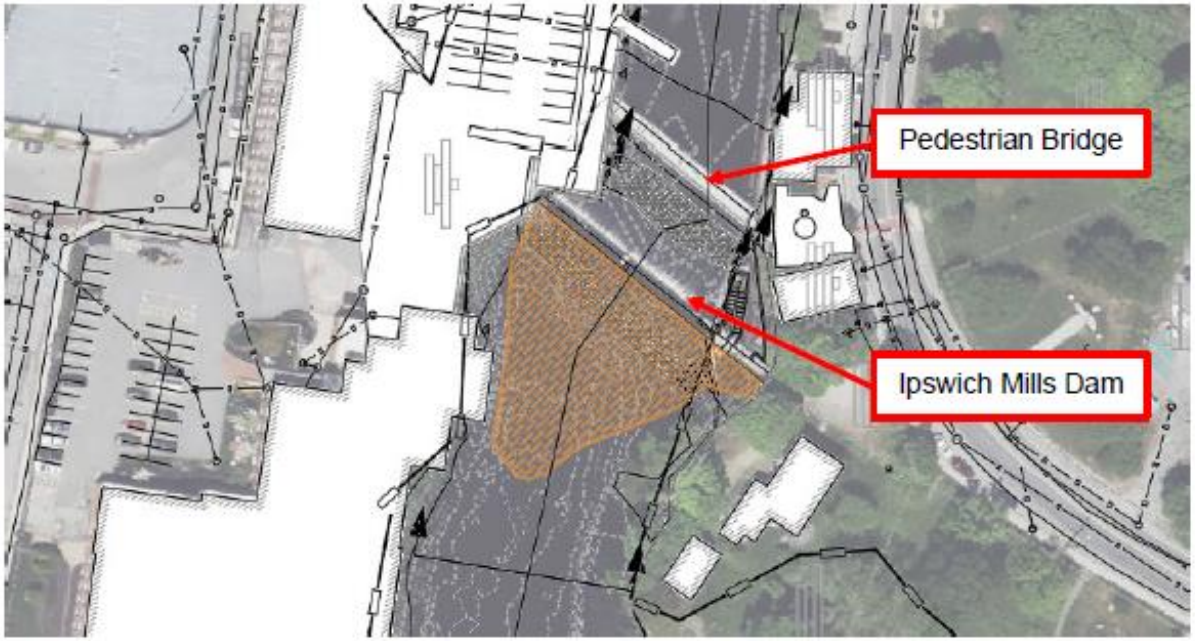


Figure 23. Approximate Extents of Anticipated Coarse Sediment Transport Immediately Upstream of Ipswich Mills Dam

Orange: area of predicted sediment transport

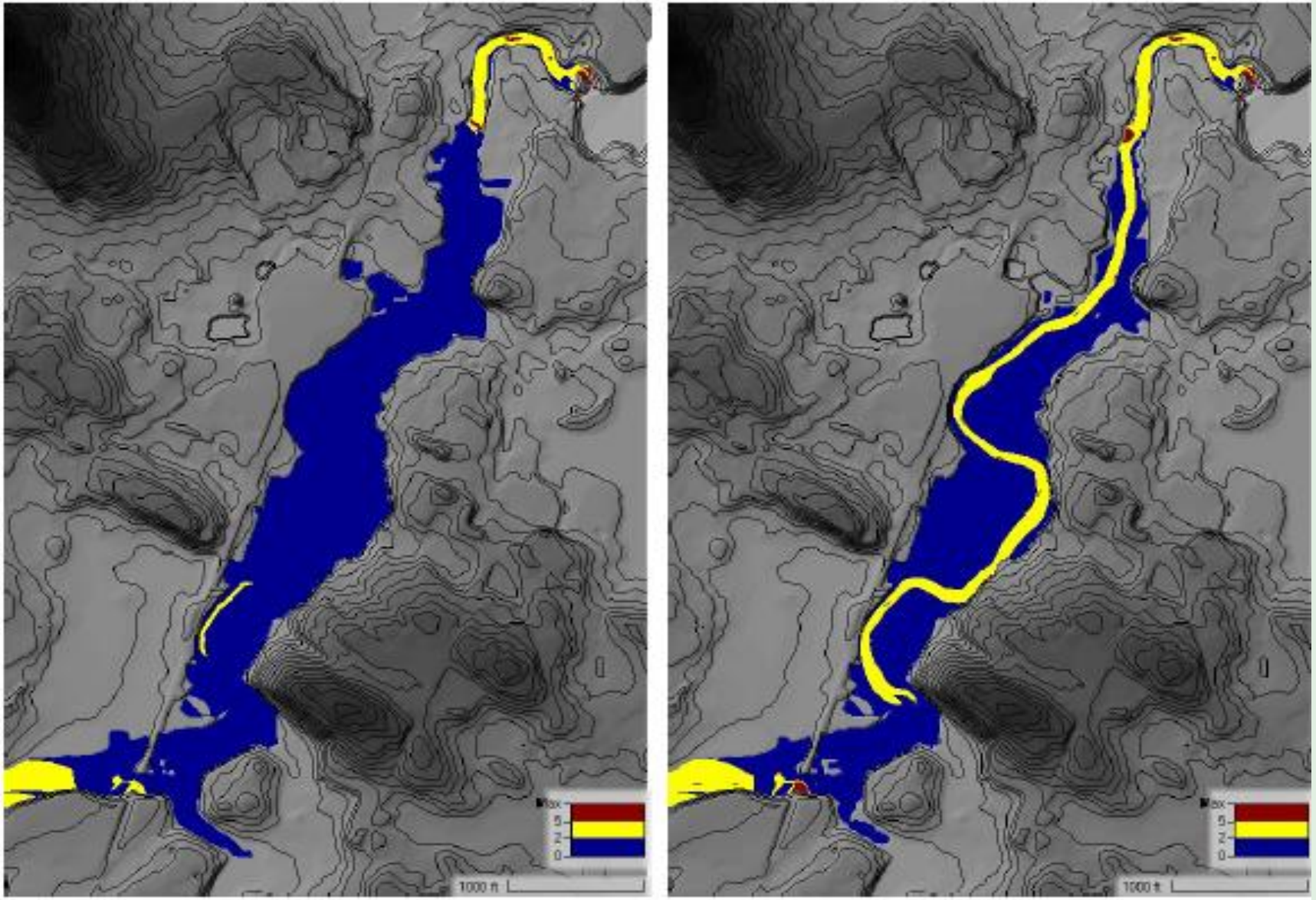


Figure 20. Existing (left) and Proposed (right) Channel Velocity During 2-Year Flow

Blue:	*no sediment transport expected (0-2 fps)*
Yellow:	*transport of silt is feasible (2-5 fps)*
Maroon:	*transport of silt, sand, and gravel is feasible (5 fps or greater)*

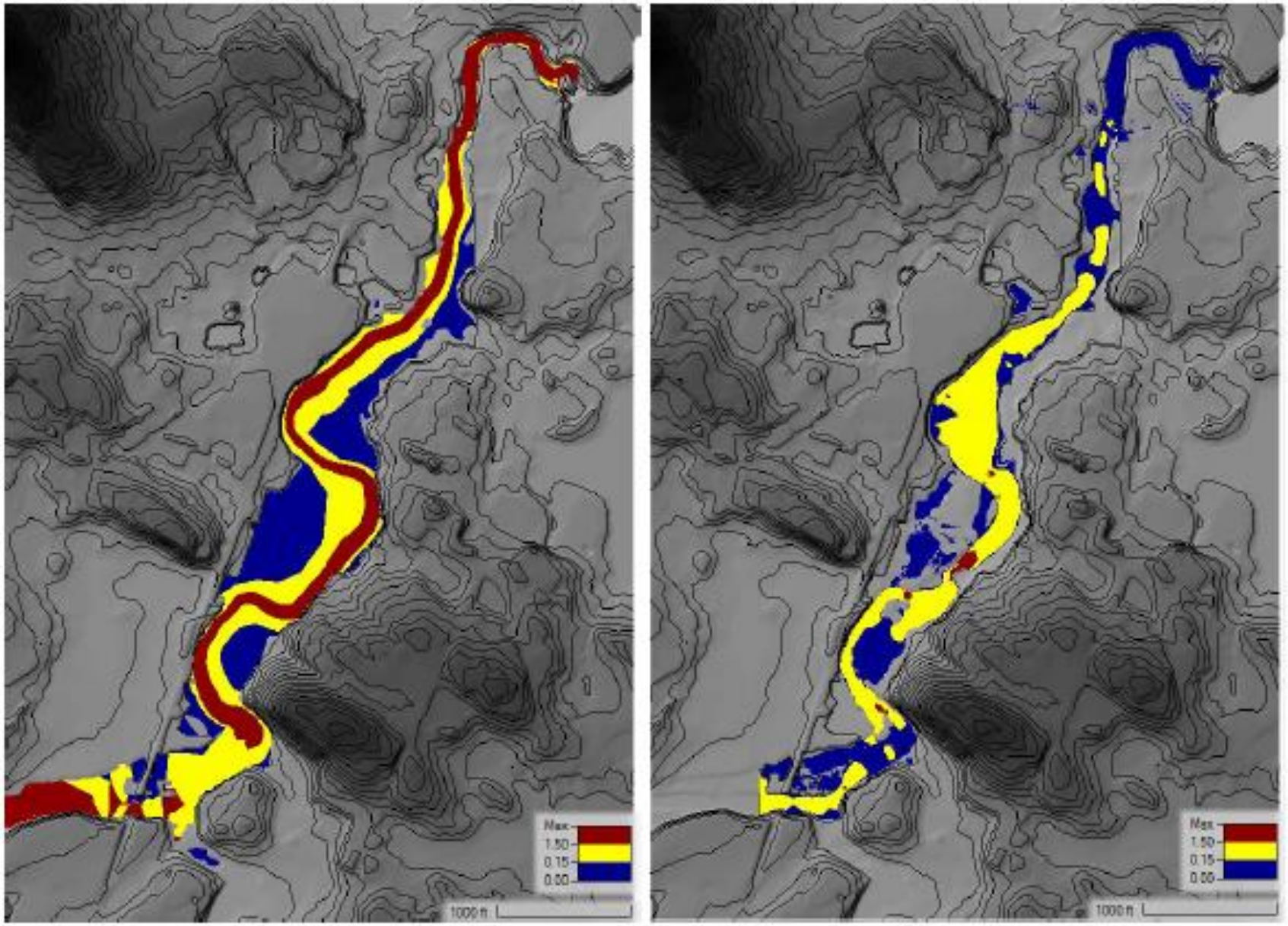
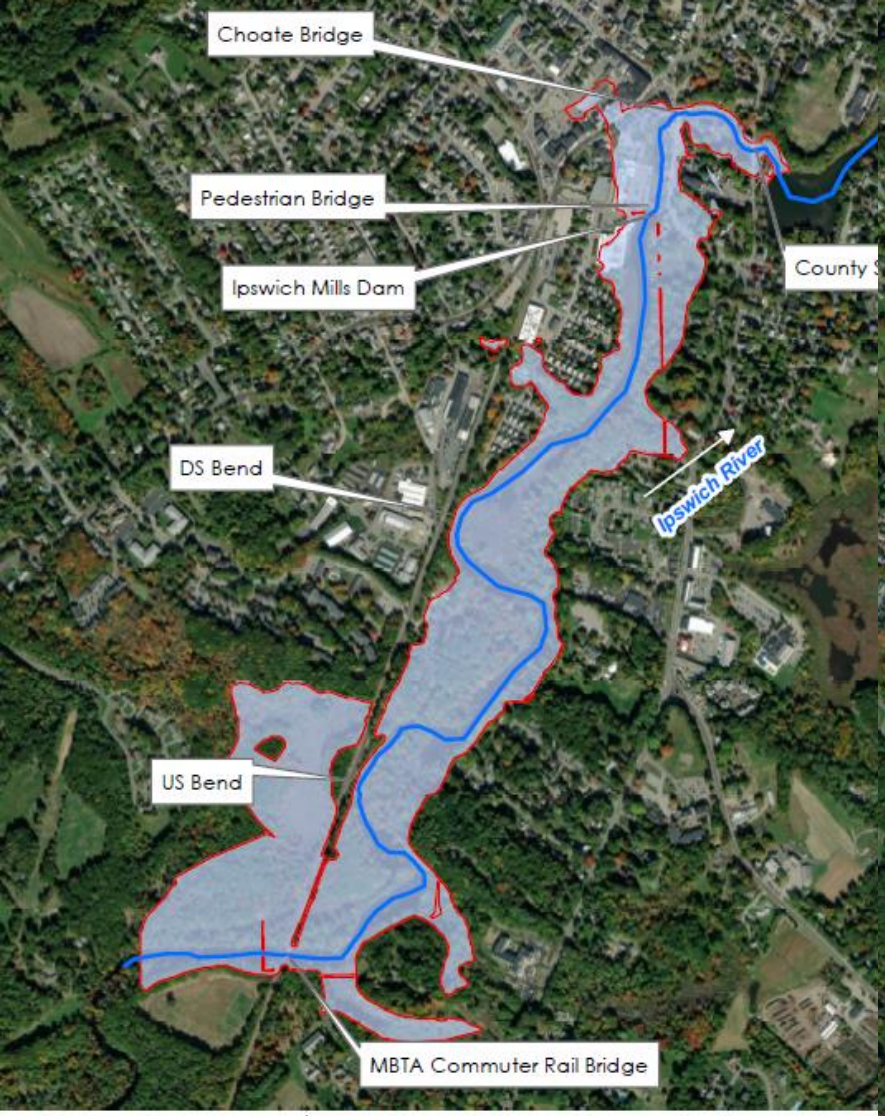


Figure 25. Sediment Settling Areas During the Low Tide, 5% Flow (left) and Low Tide, 95% Flow (right)

Blue: *settling of all suspended sediment is feasible (0-0.15 fps)*



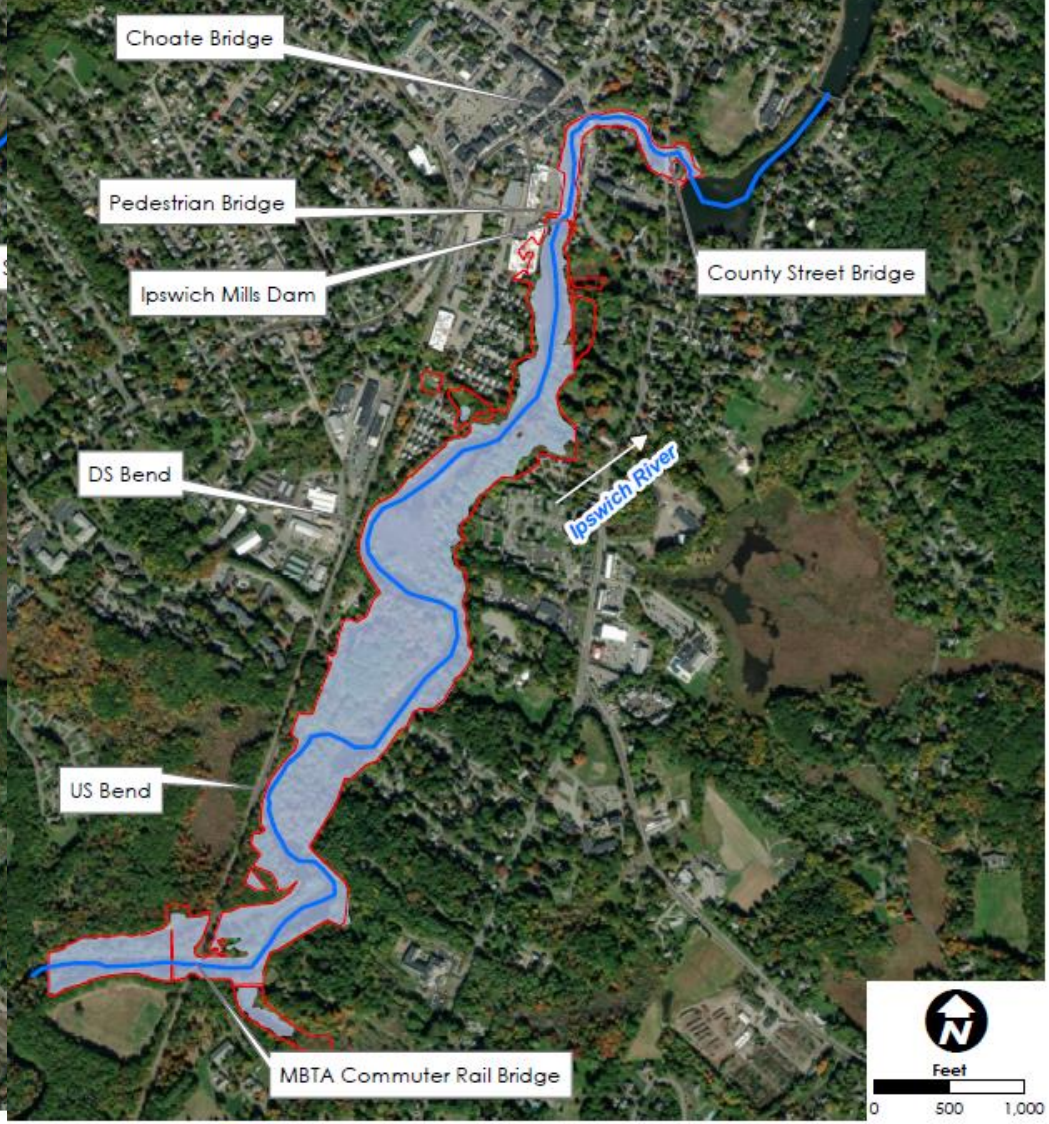
Date: 8/30/2023
Data Sources: Bureau of Geographic Information (MassGIS), ESRI

This map is for informational purposes and may not be suitable for legal, engineering, or surveying purposes.

River Centerline
PR 100yr WSE MHW
EX 100yr WSE MHW

Ipswich Mills Dam Removal
Ipswich, MA

100-year
MHW Tide Downstrea



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s: Bureau of Geographic (MassGIS), ESRI

or informational purposes t be suitable for legal, or surveying purposes.

River Centerline
PR 2yr WSE MHW
EX 2yr WSE MHW

Mills Dam Removal
MA

Figure 6
2-year Flow Inundation Areas
MHW Tide Downstream Boundary Condition

Potential EBSCO Impacts

- EBSCO impacts assessment by structural engineer SGH, Inc.
  - Wooden pilings & at what elevation?
  - Settlement?
- Concern from 2014 Pre-Feasibility Study based on
  - -age of buildings
  - -compressible soils south end
- Field studies 2016,2018,2020
- 2 in-river test pits
- 9 geotechnical borings
- 2 Rounds of Geophysics

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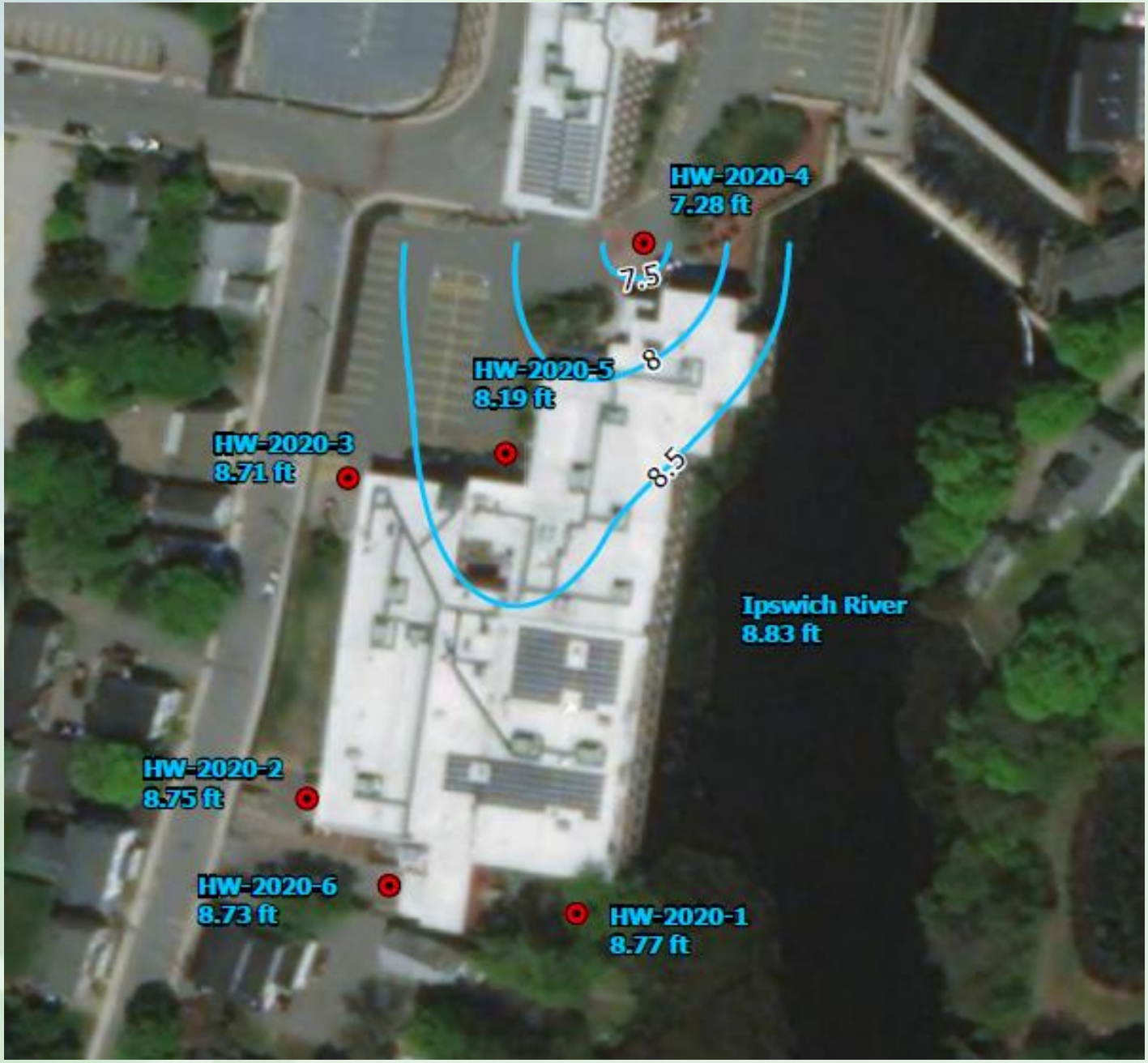
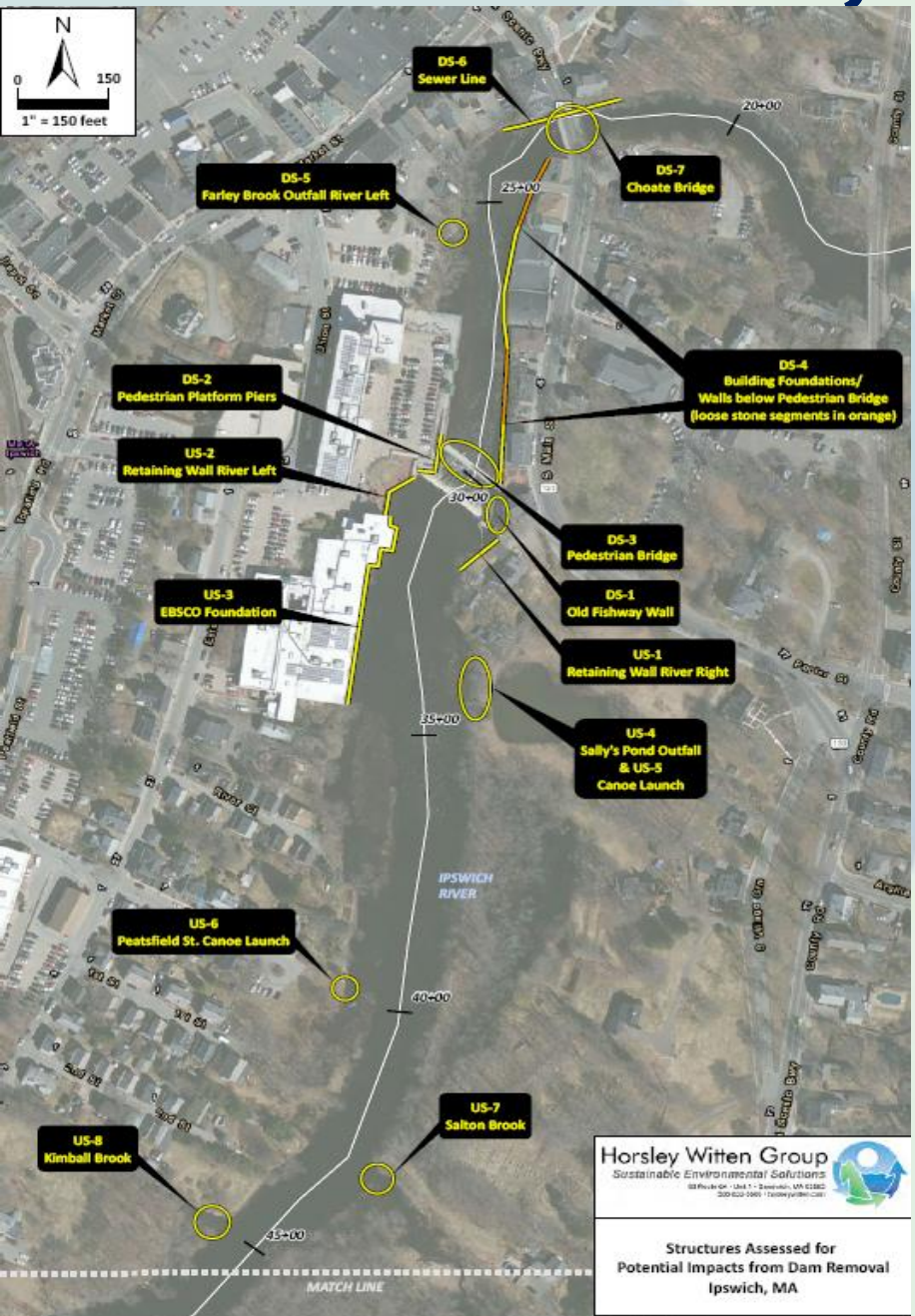

HW-2020-4
7.28 ft
7.5
8
8.5
HW-2020-5
8.19 ft
HW-2020-3
8.71 ft
Ipswich River
8.83 ft
HW-2020-2
8.75 ft
HW-2020-6
8.73 ft
HW-2020-1
8.77 ft


Two Exploratory Test Pit Locations, Excavated from River.

Potential EBSCO Impacts

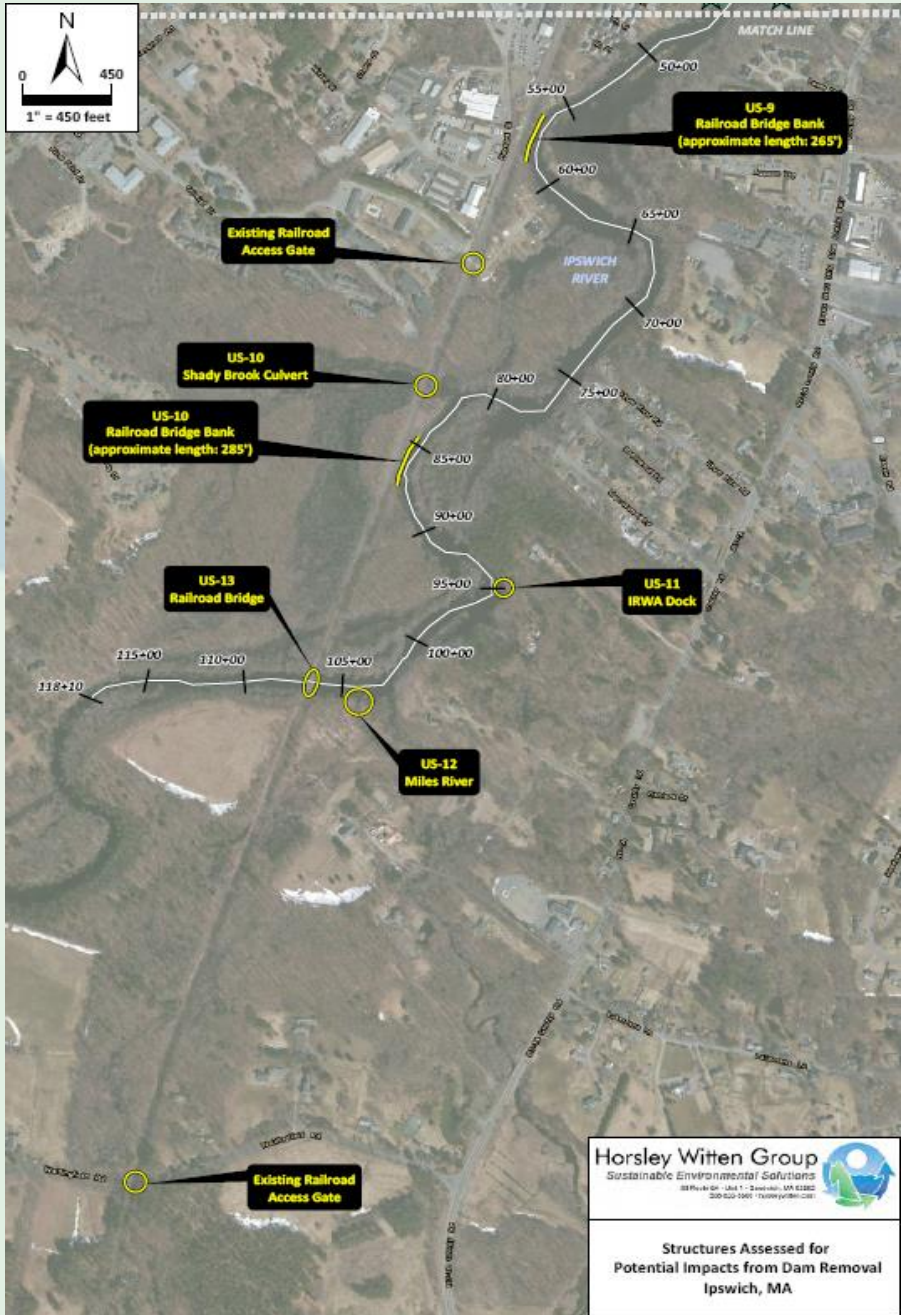
- Exterior borings and test pits indicate perimeter foundation supported on competent till or bedrock
- Exterior and interior geophysics (GPR & seismic) indicate structural grid holding building interior up via columns. Material type of subsurface columns could be concrete or timber
- Interior test pit planned 2023 to determine column material

Evaluation of Other Structures



Horsley Witten Group
Sustainable Environmental Solutions

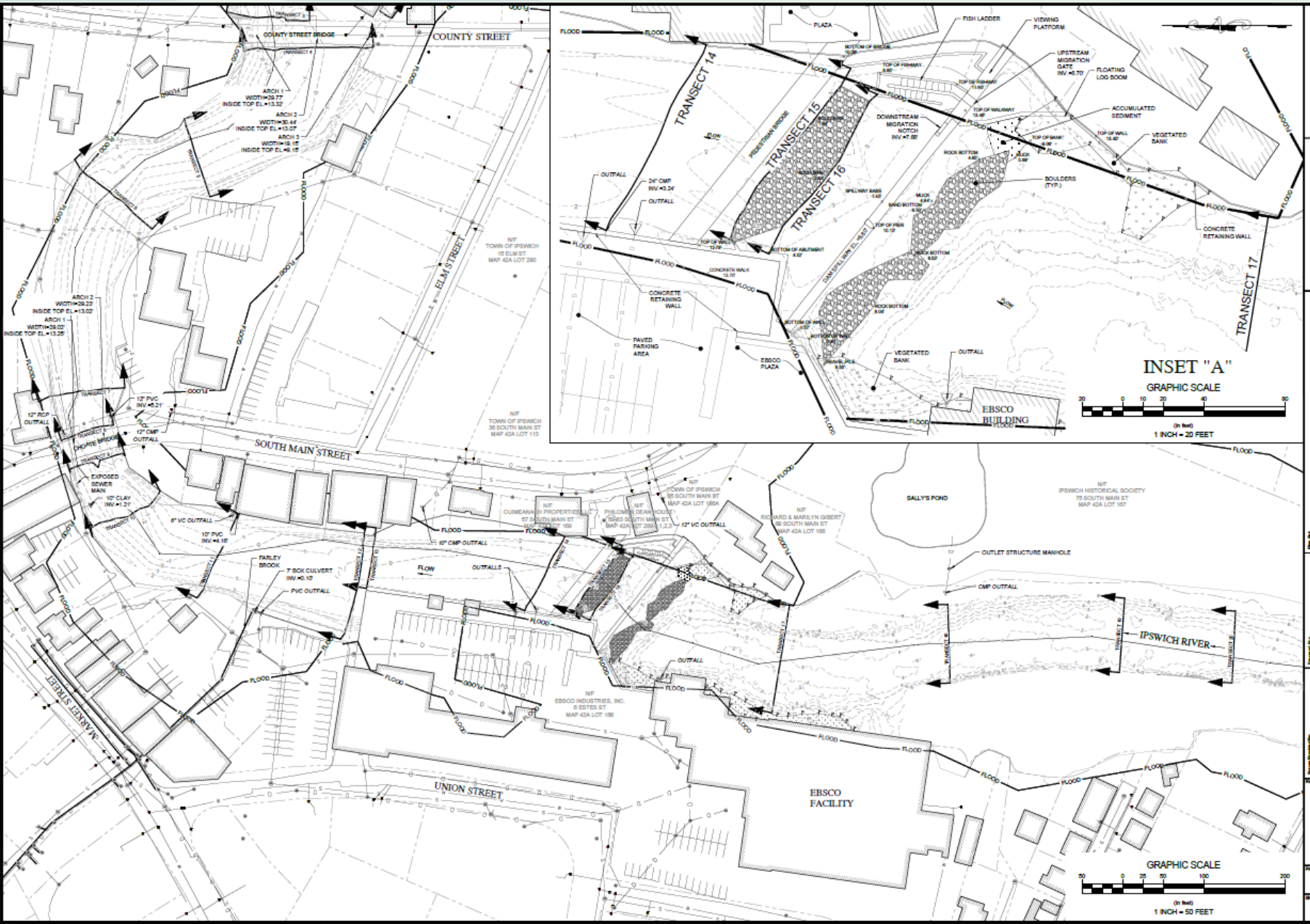
Structures Assessed for
Potential Impacts from Dam Removal
Ipswich, MA



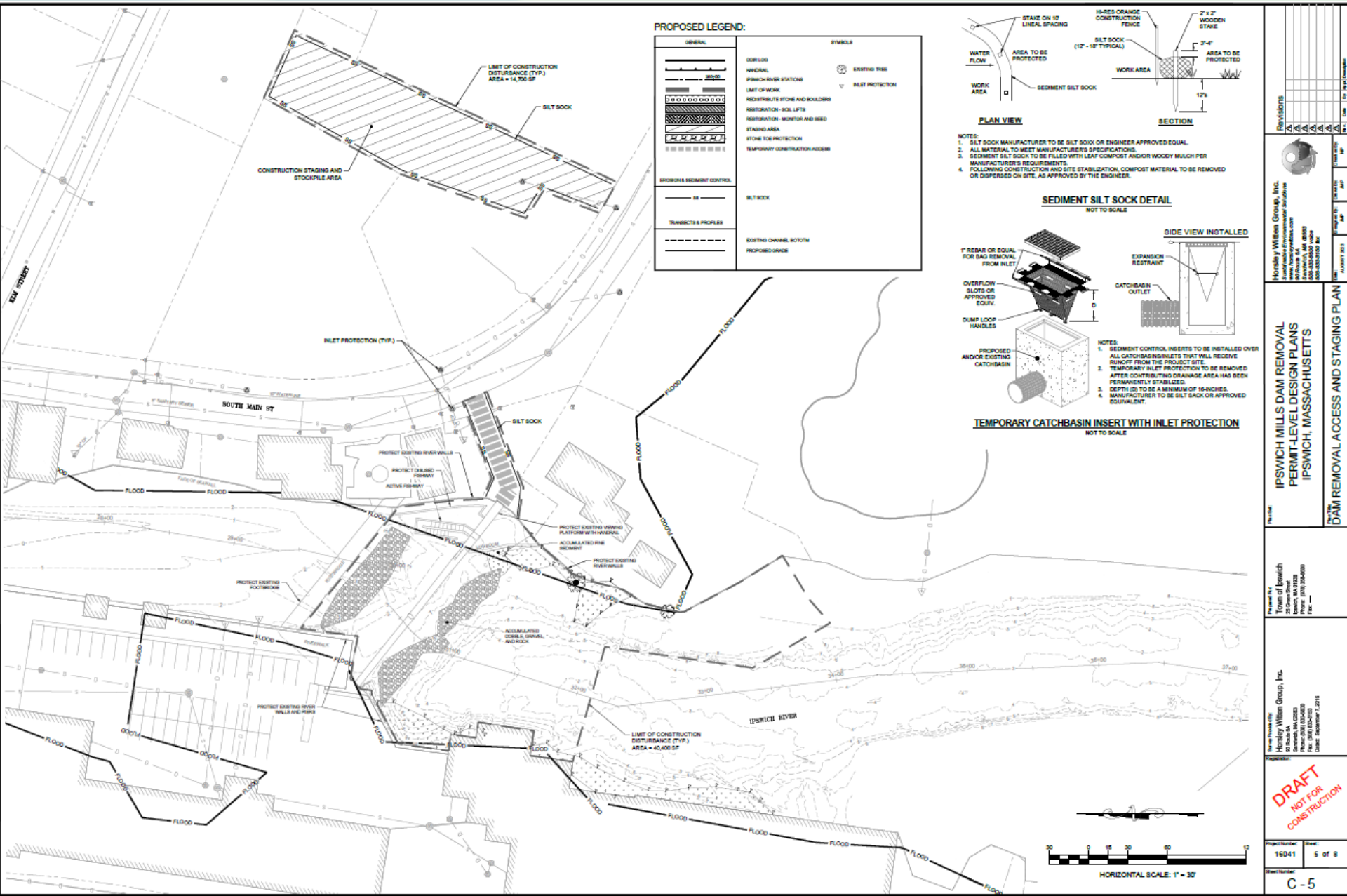
Horsley Witten Group
Sustainable Environmental Solutions

Structures Assessed for
Potential Impacts from Dam Removal
Ipswich, MA

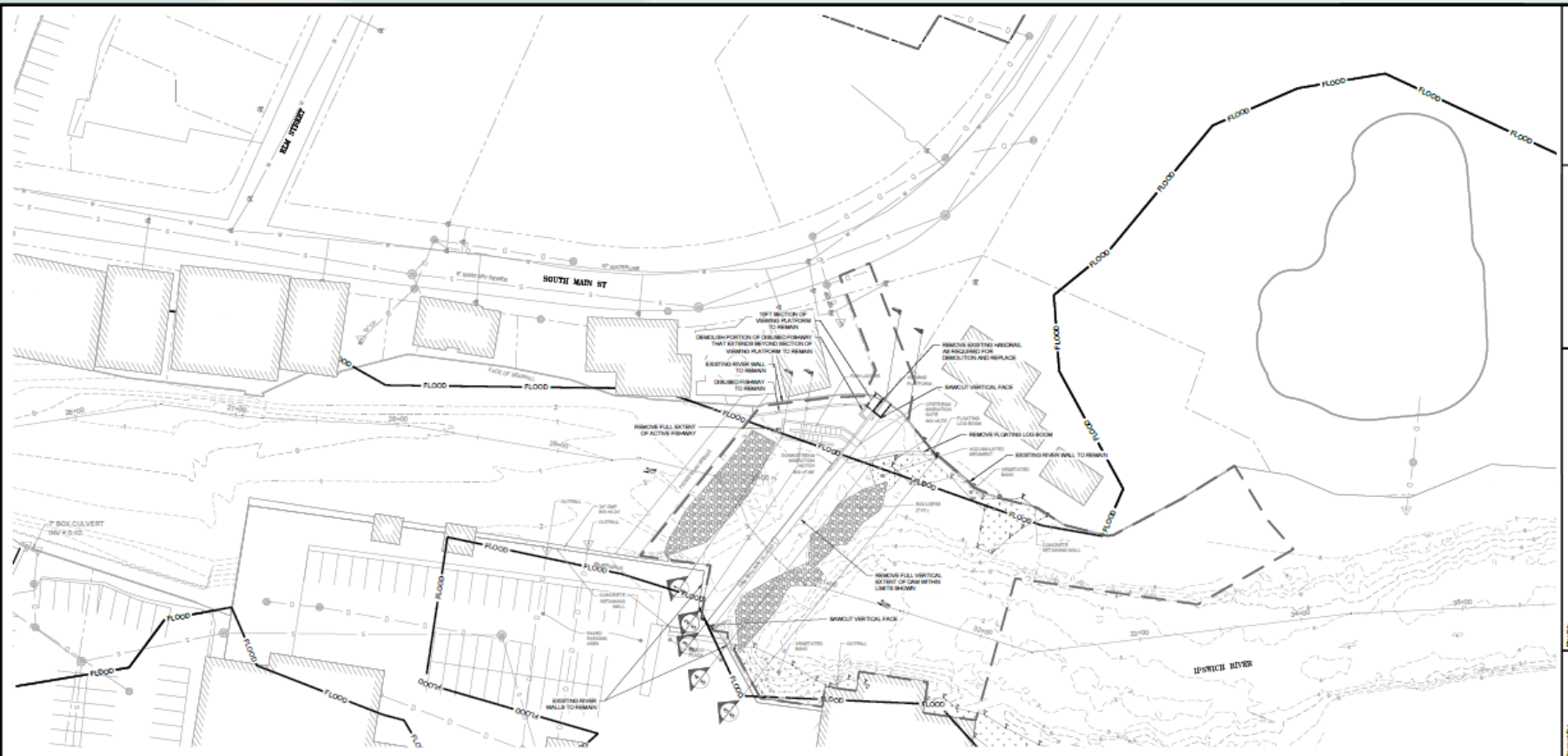
Existing Conditions Plan

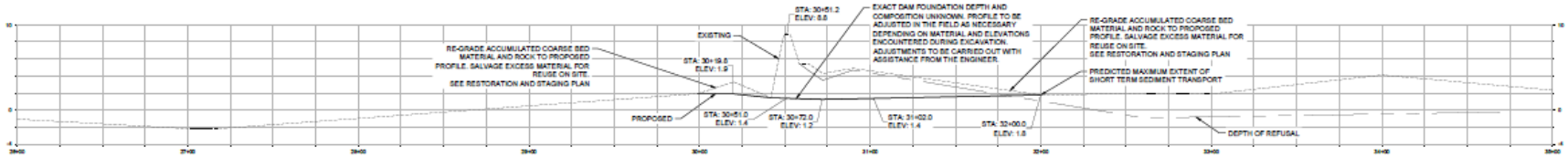


Access and Staging Plan



Demolition Plan





CHANNEL PROFILE VIEW

GRAPHIC SCALE
30 0 15 30 60 120
(in feet)
1 INCH = 30 FEET

Revisions

Horsley Witten Group, Inc.
Sustainable Environmental Solutions
90 Route 6A
Sandwich, MA 02563
508-833-6600 voice
508-833-6100 fax
www.horsleywitten.com

Drawn By: AMP
Checked By: AMP
Checked: MP
Date: AUGUST 2013

Project: IPSWICH MILLS DAM REMOVAL
PERMIT-LEVEL DESIGN PLANS
IPSWICH, MASSACHUSETTS

Plan Title: DEMOLITION PLAN AND PROFILE

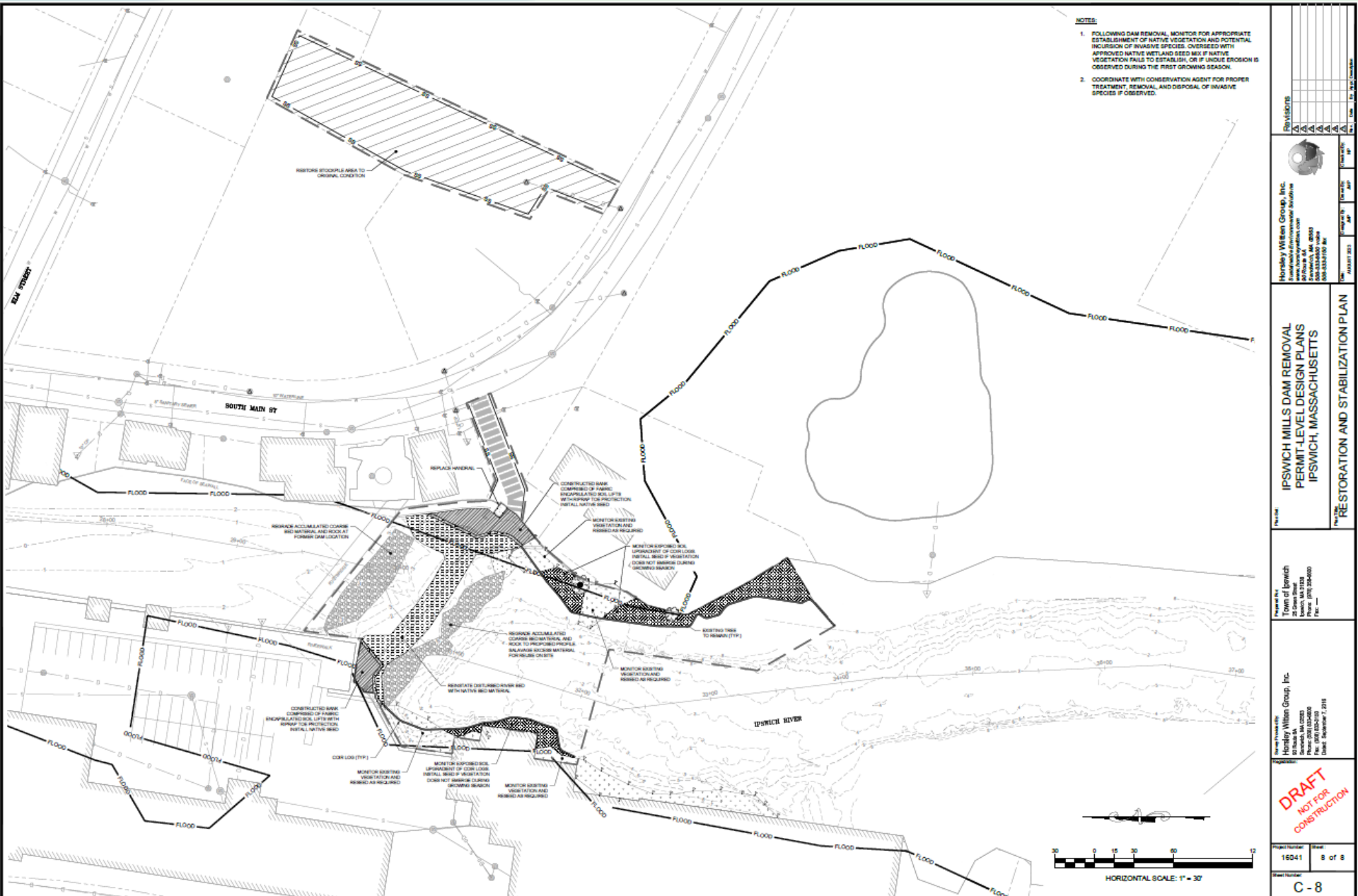
Prepared For: Town of Ipswich
25 Green Street
Ipswich, MA 01938
Phone: (978) 356-6600
Fax: —

Horsley Witten Group, Inc.
90 Route 6A
Sandwich, MA 02563
Phone: (508) 833-6600
Fax: (508) 833-6100
Date: August 7, 2013

Regulation:
DRAFT
NOT FOR CONSTRUCTION

Project Number: 16041
Sheet: 6 of 8
Sheet Number: C - 6

Restoration Plan



Prepared by JMP
2/16/2023

TOTAL LIMIT OF WORK		87,300	SF
	Alteration		**Notes**
Resource Area	Temporary	Permanent	Most alterations will be Temporary (i.e.within limit of work).
	(SF)	(SF)	Permanent impacts are those in which resource areas are converted, lost, or from which structures are removed.
Bordering Vegetated Wetland (BVW)	0	+7,110	
Bank (**linear feet**)	560	-30	Predicted bank length is slightly less than length of existing retaining wall and EBSCO Building
Land Under Water (area below OHW or MHW)	70,760	-7,110	Converted to BVW
Flood Zone (BLSF)	1,730	0	Construction access path
Riverfront Area			
Total RA altered within 0-100 feet	1,730	0	Construction access path
Total RA altered within 100-200 feet	2,370	0	Staging area
Total Riverfront Area **altered**	4,100	0	0% of total existing RA will be permanently altered
Buffer Zone			
altered from 0-**50** feet	1,440	0	Construction access path
altered from 50-100 feet	290	0	
Total Alteration 0-100 feet	1,730	0	Equivalent to RA altered from 0-100
	Area	Volume	
Dredging & Filling (below OHW)	(SF)	(CY)	
Dredging	-5,230	-440	Removal of dam and fishway; relocation of boulders and cobbles
Filling	2,960	170	Relocation of boulders and cobbles
Net Dredge/Fill	-2,270	-270	

Anticipated Permitting

- MEPA Ecological Restoration Notice of Project Form
  - Not within 1 Mile of EJ
  - No NHESP Estimated or Priority Habitats
- Ecological Restoration NOI
  - Dam Removal
  - Fish Passage (Listed on DMF Technical Reports)
  - Tidal Restoration
- Combined MassDEP 401 WQC/ Ch 91 Permit
- USACE Section 404/ Section 10
- Section 106 Historical
- CZM Consistency
- ODS Determination/ Permit
- FEMA LOMR?

Conceptual Rendering

IPSWICH DAM REMOVAL FEASIBILITY STUDY
RENDERING OF CONCEPTUAL DAM REMOVAL DESIGN
NOVEMBER, 2018

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Division of Ecological Restoration

inter·fluve

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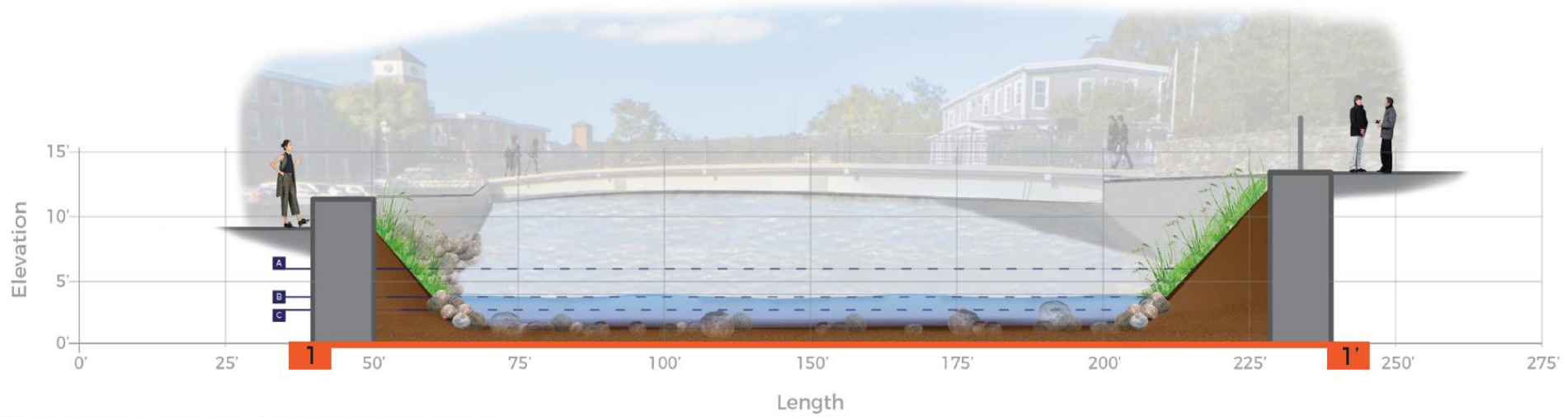
Conceptual Rendering



A 5% Exceedance Flow, High Tide at Elevation 6.0' (NAVD88)
B 50% Exceedance Flow, Low Tide at Elevation 3.8' (NAVD88)
C 95% Exceedance Flow, Low Tide at Elevation 2.8' (NAVD88)

IPSWICH DAM REMOVAL FEASIBILITY STUDY

CROSS SECTION OF CONCEPTUAL DAM REMOVAL DESIGN

NOVEMBER, 2018

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CONDITION DEPICTED: HIGH FLOW (ONLY EXCEEDED 5% OF THE TIME) & HIGH TIDE (APPROXIMATE RIVER ELEVATION 5.8 FEET NAVD88)

CONDITION DEPICTED: AVERAGE FLOW (EXCEEDED 50% OF THE TIME) & LOW TIDE (APPROXIMATE RIVER ELEVATION 3.8 FEET NAVD88)

CONDITION DEPICTED: LOW FLOW (EXCEEDED 95% OF THE TIME) & LOW TIDE (APPROXIMATE RIVER ELEVATION 2.8 FEET NAVD88)

1. For reference, the elevation of top of wall is 12.73 feet (NAVD88)
2. For reference, the elevation of viewing platform is 13.46 feet (NAVD88)

EENF

- Cover Letter
- Environmental Notification Form
- Form attachments (RMAT Climate Tool, EJ Map Printout, etc.)
- Project plans
- Project narrative
- Appendices
  - 2019 Feasibility Study
  - Updated H&H Study
  - 2020 Geophysical Investigation Memo
  - 2021 Geophysical Investigation Memo

Permitting Pathway

- Obtain MEPA Certificate
- Submit NOI (Ipswich Con Comm)
- Submit Ch. 91 (DEP) (Must have proof of NOI submittal), WQC (DEP) and 404 (USACE)
- ODS Permit (anytime)
- MHC Project notification form - anytime
- FEMA
- NEPA – only if federal funding and lead federal partner
- Fishway Permit (DMF) – after contractor chosen
- NPDES – filed by contractor at end

Information/ Comments

All project updates, FAQ's, and documents posted at:

Ipswichmillsdam.com

How to submit a comment on the MEPA filing…

- Search for "MEPA Environmental Monitor"
  https://eeaonline.eea.state.ma.us/EEA/MEPA-eMonitor/home
- Nicholas Moreno (MEPA Analyst)
  Nicholas.Moreno@mass.gov
- Neil Shea (IRWA)
  nshea@ipswichriver.org
- Frank Ventimiglia (Town of Ipswich)
  frankv@ipswichma.gov