River Advisory Committee
Pickpocket Dam Update

May 9, 2024

Agenda

- Discuss next steps
- Questions and comments will be taken at the end of the presentation

Item	Presenters
Public Works Updates & Feasibility Study Next Steps & Recap	Paul Vlasich, PE Town Engineer & Project Manager
Discuss Permitting, Engineering & Construction Phase	Jacob San Antonio & Pete Walker, VHB
Example Project Photos	Jacob San Antonio & Paul Vlasich
Questions	

Feasibility Study Funding

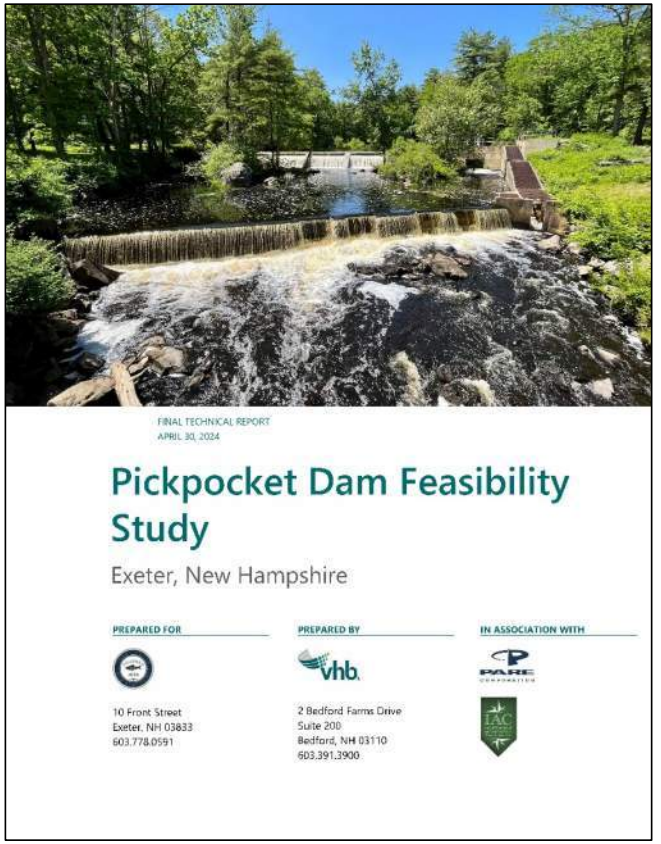
- NHDES & NOAA – New Hampshire Coastal Program – Coastal Resilience Grant
- NHDES – Clean Water State Revolving Fund – Planning Grant (ARPA Funds)

"This project was funded, in part, by NOAA's Office for Coastal Management under the Coastal Zone Management Act in conjunction with the New Hampshire Department of Environmental Services Coastal Program."

Competing Issues and Priorities

Finalize Feasibility Study Phase

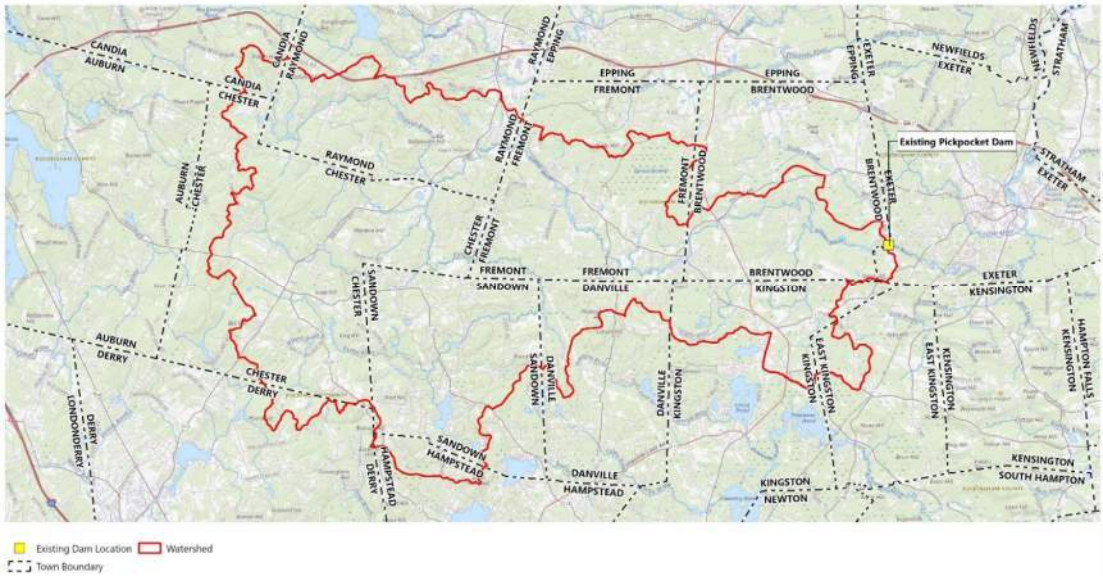
- Feasibility Study completed and posted to Town website
- NHDES Request for Action Deadlines
  - June 1, 2024: Application for reconstruction or removal of the dam
  - December 1, 2027: Construction completed
- Final decision by June 1, 2024



Hydrologic Analysis

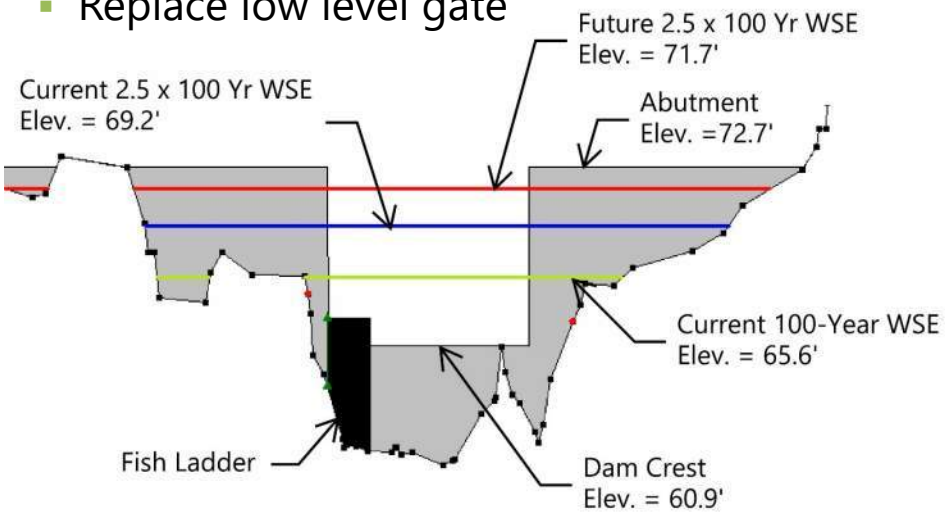
- Current Day Design Flood – 2.5 x 100 Year
- Future Rainfall
  - New Hampshire Coastal Flood Risk Summary
  - 15% Increase on best available rainfall data
  - 49% Increase of Design Flood
- NHDES rulemaking for Env – Wr 100-700
  - 1000 – Year – 13,900 cfs

Design Event	Flow(cfs)
Current Normal Flow	136
Current 2-year	504
Current 50-Year	3,030
Current 100-Year	3,980
Current 2.5 x 100-Year	9,940
Current 1,000-Year	13,900
Future 100-Year	5,940
Future 2.5 x 100-Year	14,900



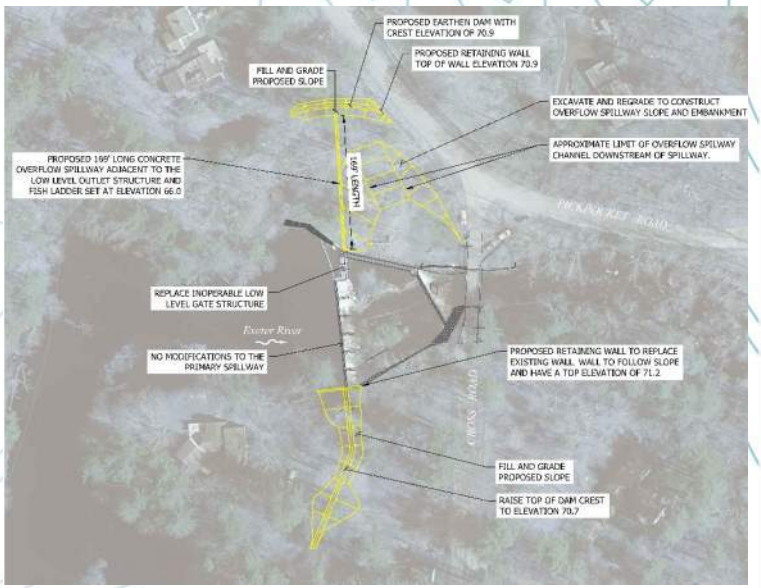
Alternative 1 – Raise Top of Dam

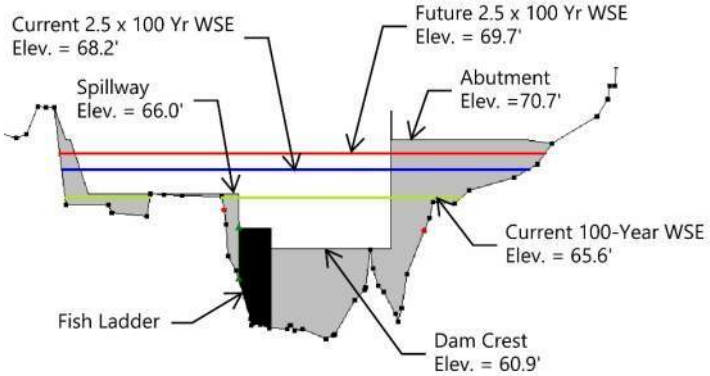
- Maintain existing spillway discharge structure
- Raise top of dam to contain design storm with 1′ of freeboard
- Left & right training walls extended
- Raise and extend earthen embankments
- Replace low level gate



Alternative 3 – Auxiliary Spillway

- Construct overflow auxiliary spillway through left abutment
  - Construct containment berm
  - Excavate exit channel
- Maintain existing spillway discharge structure
- Increase height of right training wall
- Construct earthen embankments
- Replace low level gate





Alternative 4 – Dam Removal

- Complete demolition and removal of dam, fish ladder, low level gate and associated appurtenances
- Preserve islands downstream of dam
- Reconstruct channel
- Upstream rehabilitation

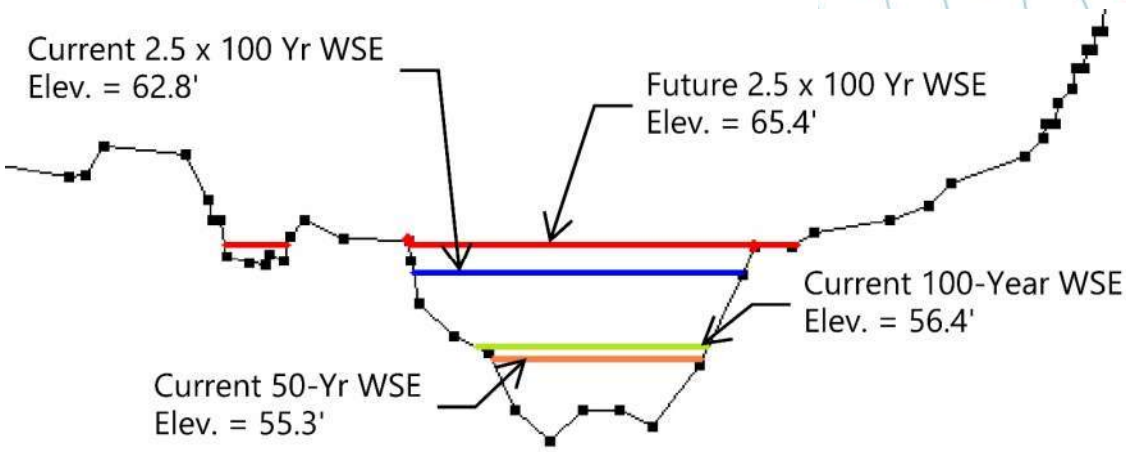
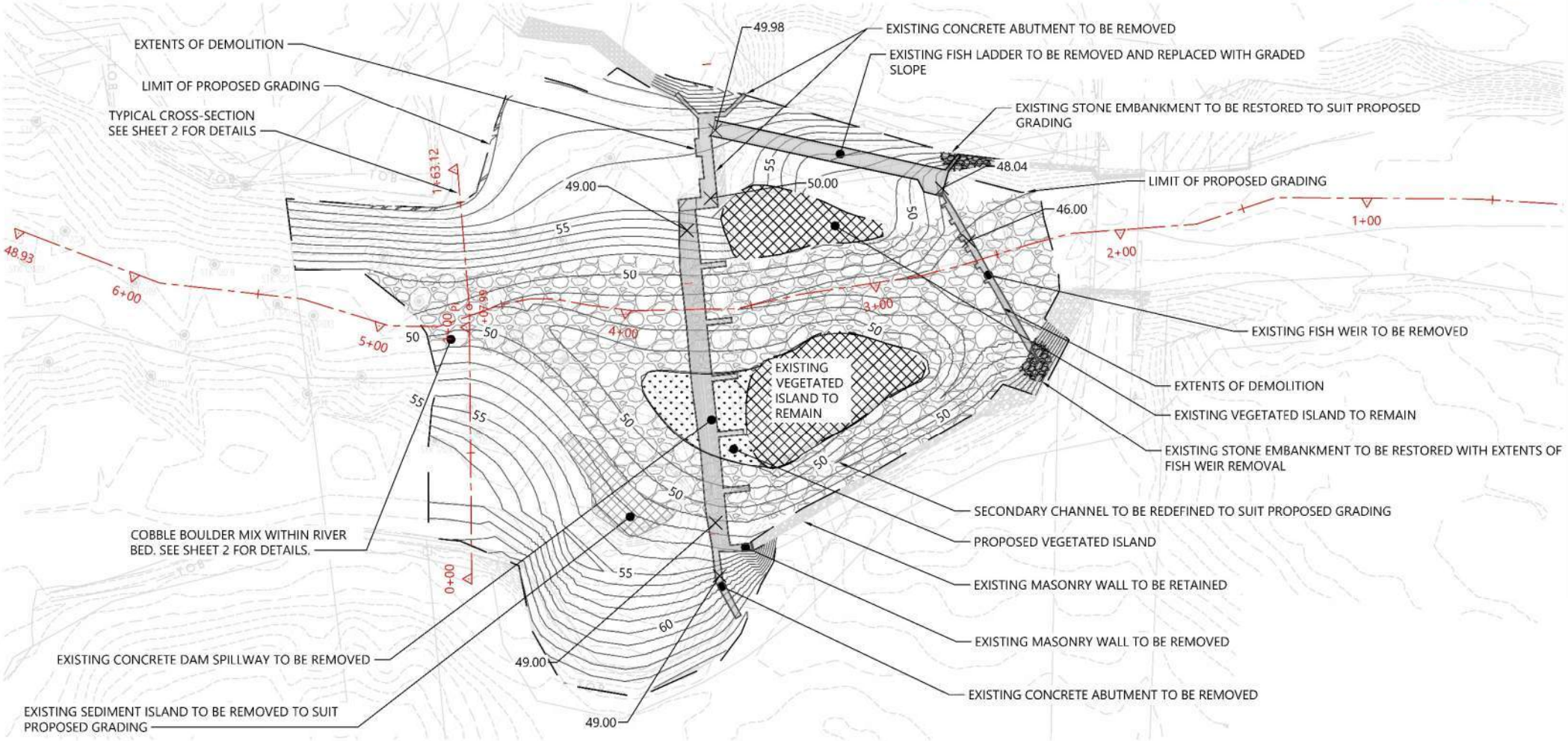


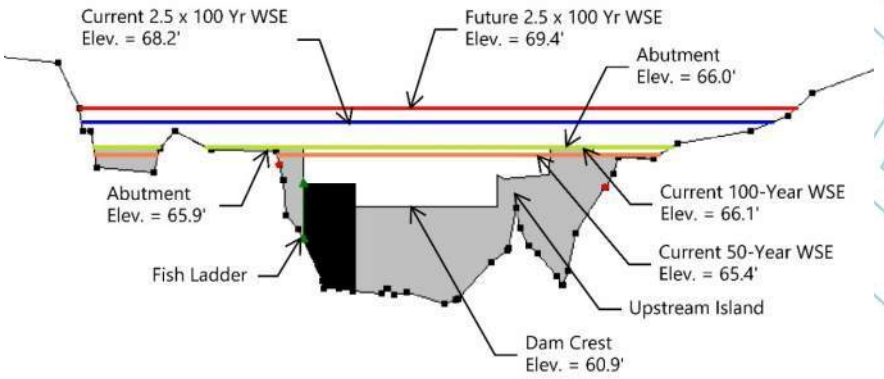
Figure 2.5-1 - Dam Removal Plan

Pickpocket Dam Feasibility Study | Brentwood & Exeter, New Hampshire



Alternative 5 – No Action/Hazard Reduction

- Probable loss of human life
  - Water levels rising above 1st floor greater than 1 foot
- High Hazard - Maintain existing dam
  - In order to reduce hazard classification
    - Purchase impacted residential property ($544,000)
    - Stabilize manufactured homes ($80,000)
- Significant Hazard - Overtopping of NH Route 111 (Kingston Rd) – Class II roadway
  - Replace Kingston Road Bridge to reduce hazard classification. More expensive than dam modification
  - $2,024,200 to raise dam 2 feet including life cycle costs
  - $2,648,200 including property acquisition/stabilization
- Low Hazard – Existing dam does not meet low-hazard safety requirements



Hazard Class	Discharge Capacity Flood	Water Surface Elevations (Current/Future)	Freeboard (Current/Future)
Low	50-Yr	65.4/NA	0.6/NA
Significant	100-Yr	66.1/67.0	-0.1/-1.0
High	250% of the 100-Yr	68.2/69.4	-2.2/-3.4

Alternative 6 – Lower Normal Pool

- Selective demolition of the spillway weir
- Replace low-level gate and fish ladder
- Reduced pool levels would have similar impacts as dam removal without the benefits

Design Storm	Spillway Crest Elevation (ft)
Current Spillway	60.9
2.5 X 100 yr (Current Rainfall)	56.5
2.5 X 100 yr (Future Rainfall)	53.9

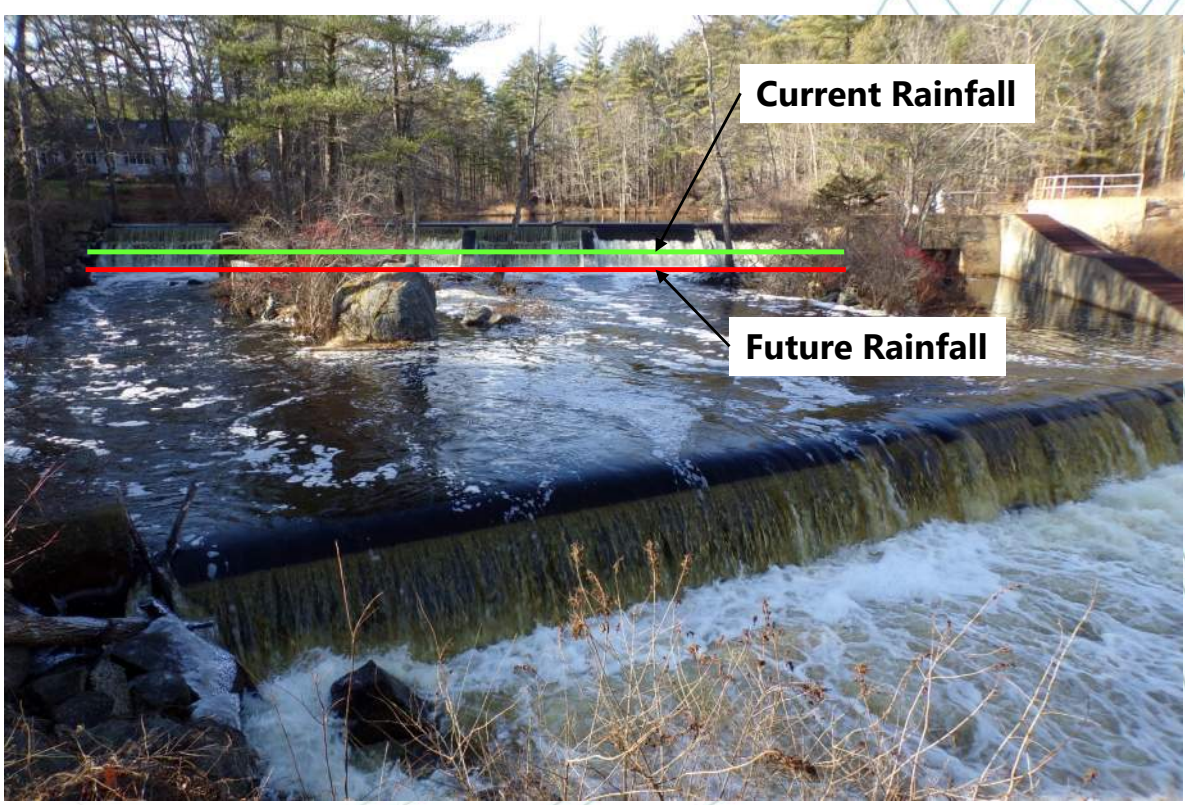
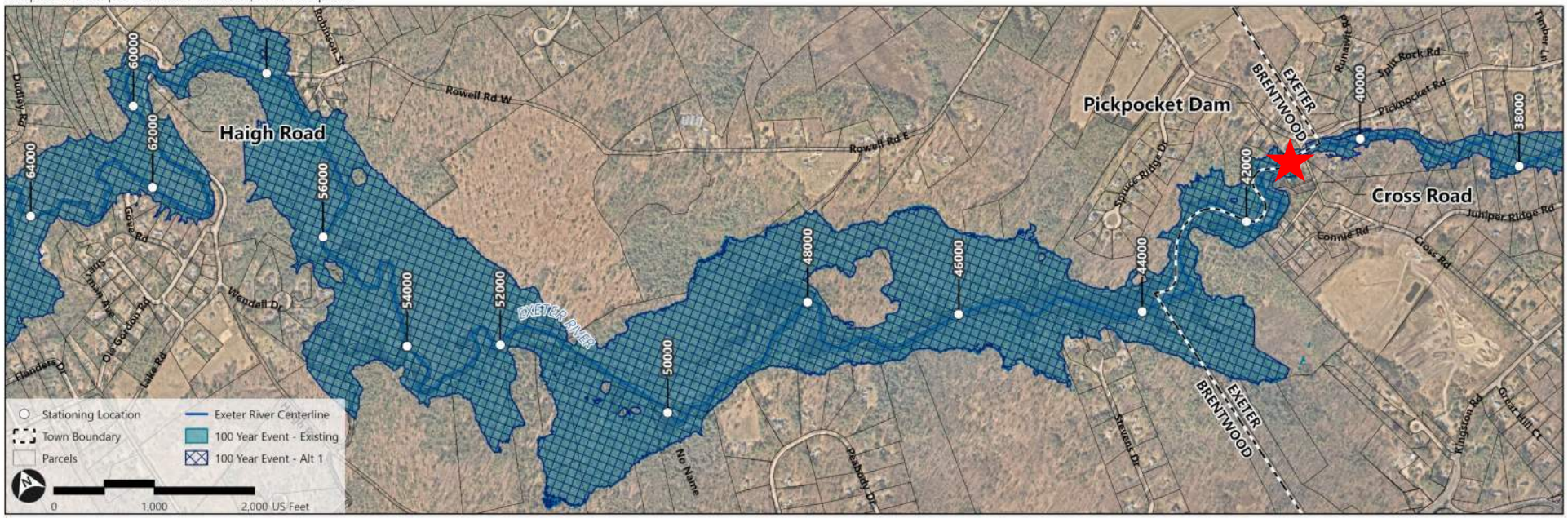
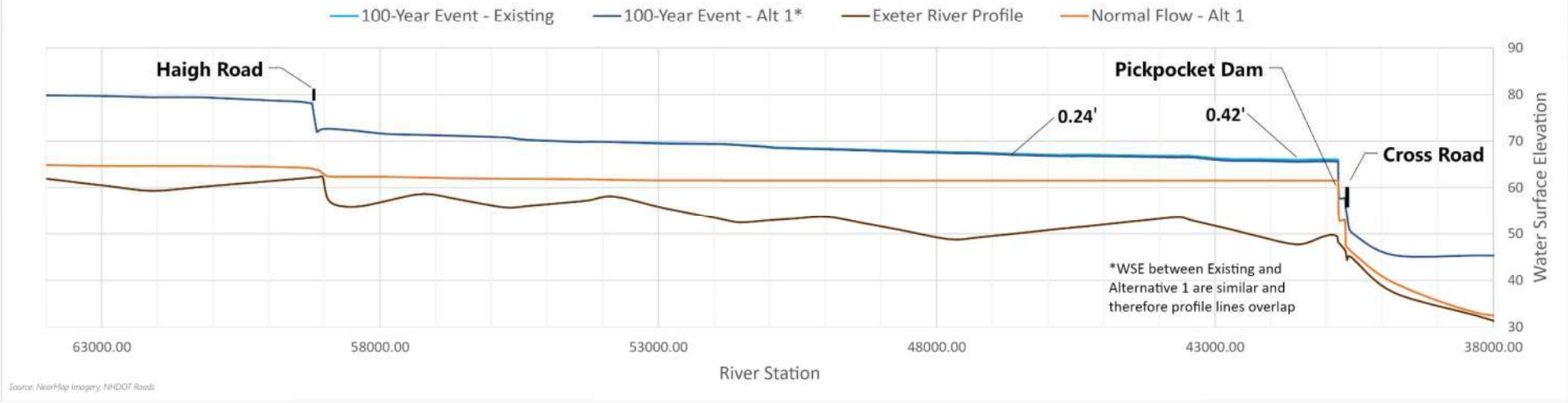


Figure 3.2-2: Alternative 1 - Raise Dam 100 Year Water Surface

Pickpocket Dam | Brentwood and Exeter, New Hampshire





Source: NearMap Imagery, NHDOT Roads

Figure 3.2-5: Alternative 4 - Dam Removal Normal Flow Water Surface

Pickpocket Dam | Brentwood and Exeter, New Hampshire

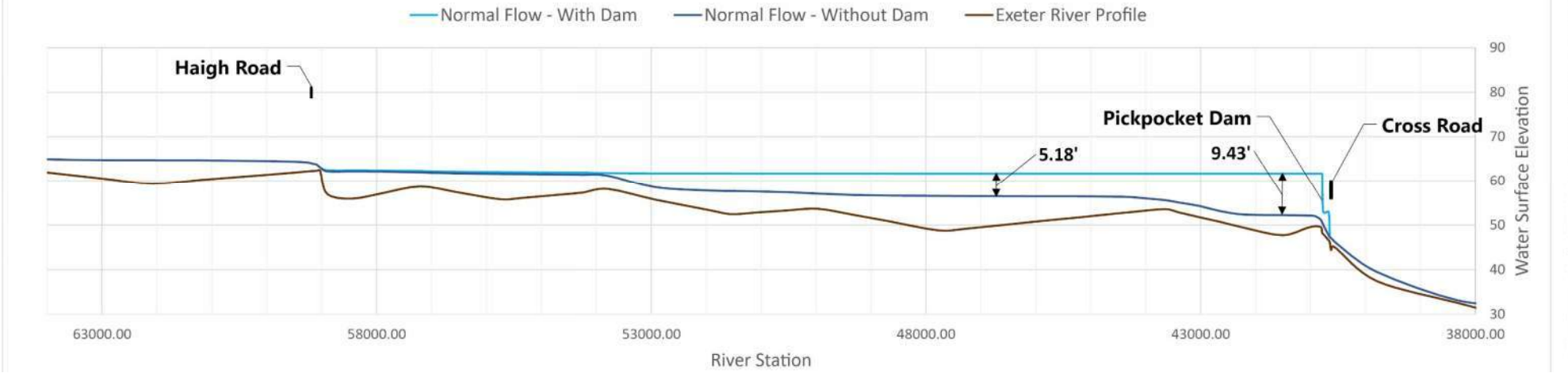
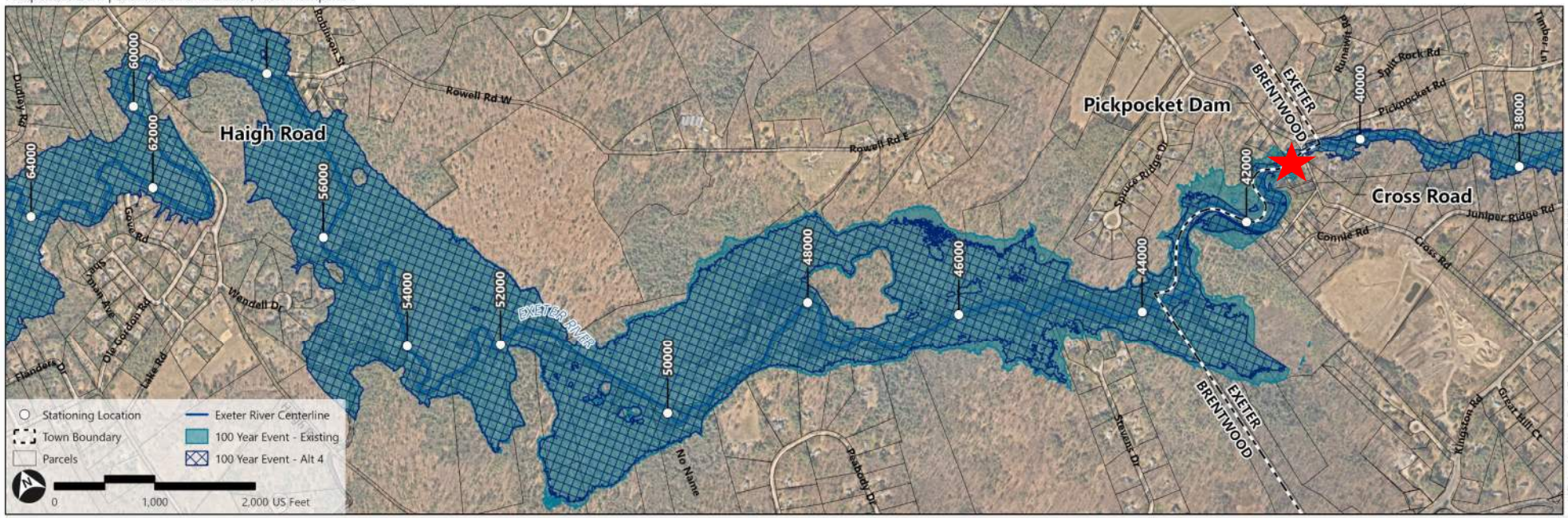
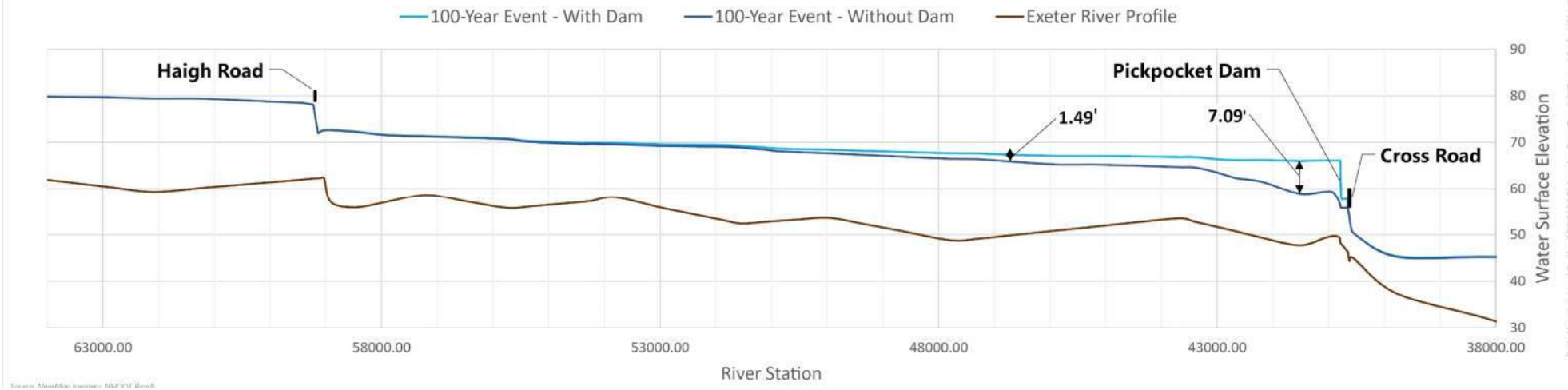


Figure 3.2-6: Alternative 4 - Dam Removal 100 Year Water Surface

Pickpocket Dam | Brentwood and Exeter, New Hampshire



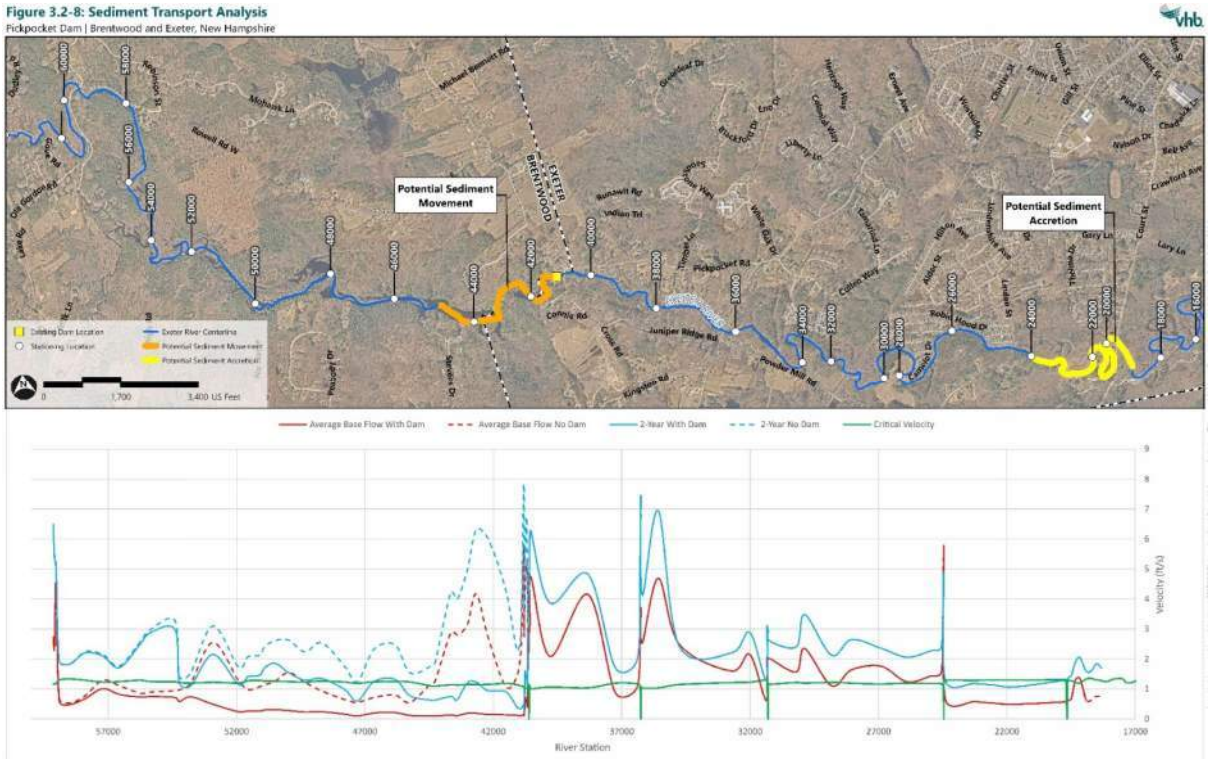


Sediment Sampling Results

- No concentrations of pesticides or PCBs detected in sediment samples
- PAHs and metals detected in all sediment samples
- Arsenic the only contaminant detected in excess of the NHDES EV-600 Soil Remediation Standards
  - Consistent with background, arsenic is a natural occurring component of sediment and bedrock in NH
- The ecological resource risk for contaminants
  - Low - Metals and PAHs in SED-1 through SED-5
  - Moderate - Arsenic in SED-2, SED-4, and SED-5
  - Moderate - PAHs in SED-3 and SED-4

Sediment Transport

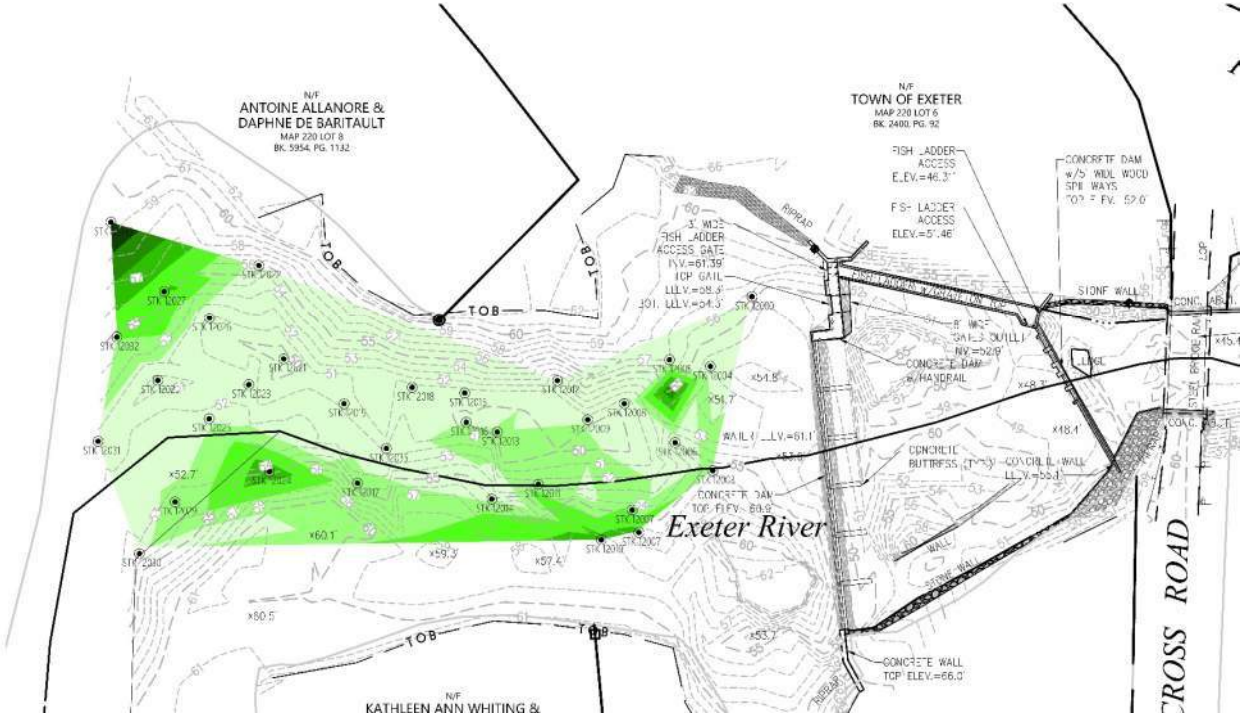
- 3 upstream sediment samples(SED-1, SED-2 & SED-5)
  - Mucky, Fine to very fine sand and silt with trace organic material
- Potential sediment movement 3,700' upstream of dam
- Potential sediment accretion in the Route 108/Court Street Bridge region
- Sediment removed near dam site under Dam Removal
- Controlled drawdown & seeding of exposed banks
- No sediment transport concerns for dam modification



Sediment Probing Results

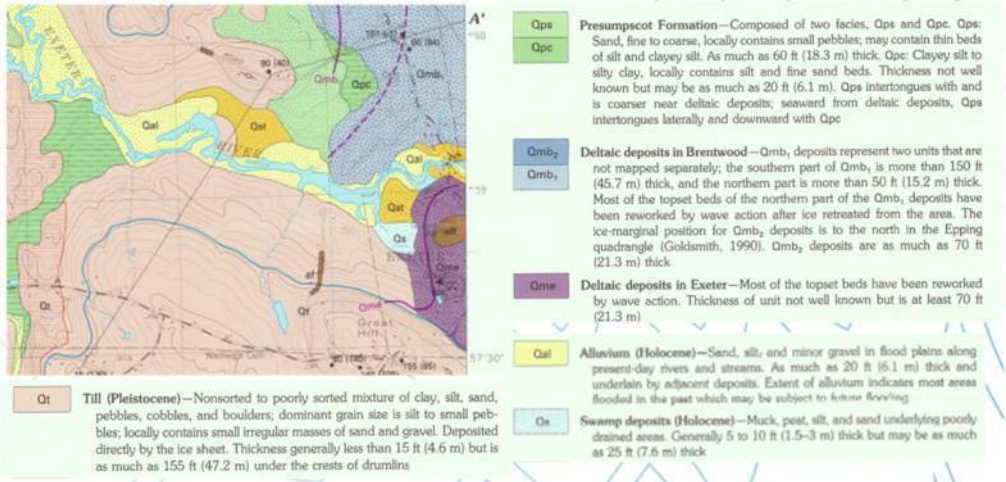
- Sediment probing investigation
- Depths range 0-2 feet in active conveyance portion of the channel
- Increasing depths towards banks
- Inoperable gate prohibited capturing depths at upstream face

Figure 3.2-9 - Silt Depth
Pickpocket Dam Feasibility Study | Brentwood & Exeter, New Hampshire



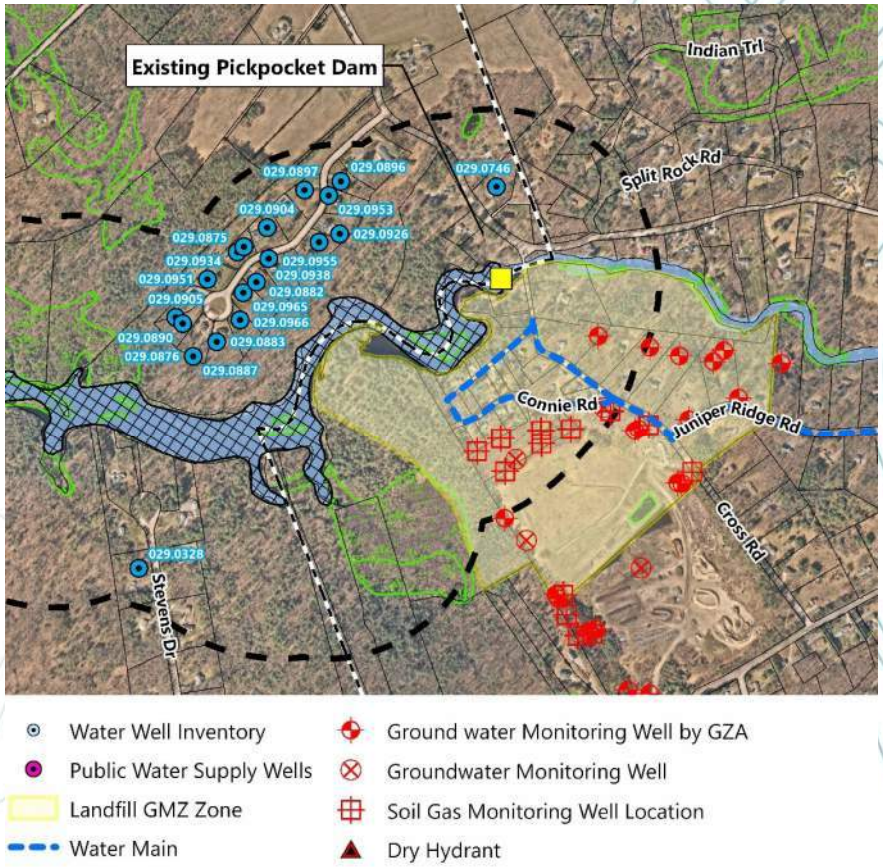
Infrastructure

- Dam modification: Increase in flood levels during design discharge
- Dam removal:
  - Decreased flood levels
  - No impact to bridges
  - Results show small increase in velocity
    - Potential erosion will be mitigated.
  - Induced Settlement
    - River drawdown resulting in groundwater changes
    - Increase effective stress could result in soil compression
    - Potential settlement of relatively loose soil layers
  - River Valley Slope Stability
    - Reduction in water level will increase total effective stresses
    - The unsaturated soil strengths are greater than saturated soil strengths
    - Minor increase in velocity - potential to impact slope stability
    - Slope protection evaluated during design phase



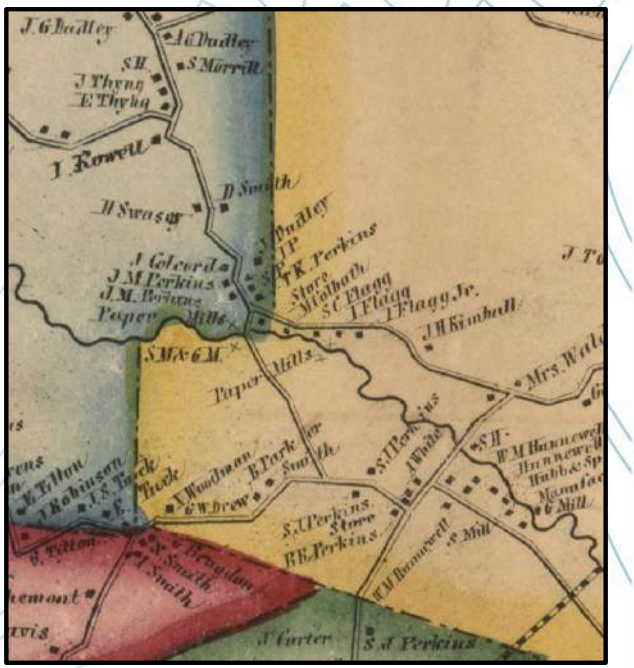
Water Supplies

- Evaluated wells within 1000’ buffer
- Impoundment not connected to deep bedrock aquifer
- Drinking water and geothermal wells rely on water from deep bedrock aquifer
  - No wells are installed in overburden aquifer
- Impoundment would drain too quickly to be used as a viable backup source of drinking water supply
- Cross Road Landfill groundwater contamination
  - Dam removal may steepen groundwater hydraulic gradient towards upstream of dam
  - No increase in overall landfill related contaminant loading to Exeter River



Cultural Resources

- Various mill operations near Pickpocket Falls since mid-17th century
- Current dam: Construction 1920 and modified with fish ladder in 1969
- NH Division of Historical Resources determined that the Pickpocket Dam is Eligible for Listing on the National Register
- Identified two archaeologically sensitive areas that are sensitive for Pre-Contact Native American cultural deposits; Numerous Post-Contact sites also present
- "Adverse Effects" under both dam modification and removal
- Further review under Section 106 of the National Historic Preservation Act



Water Quality

- Class B: Downstream segment Impaired for Aquatic Life designated used due to low DO concentration
- Dam In Conditions – Slow moving water result in:
  - Lower dissolved oxygen
  - Disruption to sediment transport process
  - Increased growth of algae & vegetation
  - Increased water temperature
- Dam removal would improve water quality upstream and downstream of dam
  - Improvement in upstream water quality will result in improvement to downstream water quality

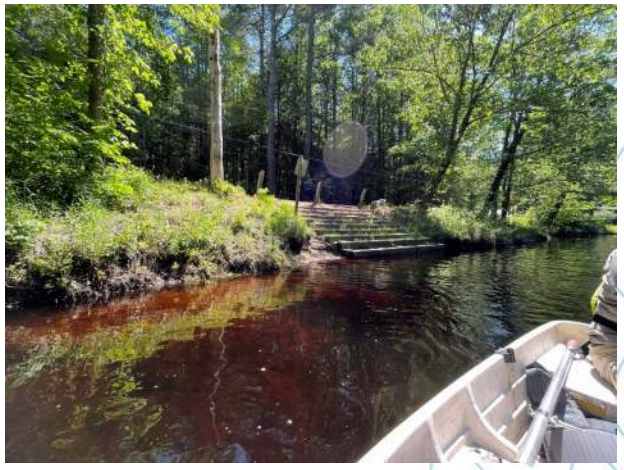
Fisheries & Fish Passage

- Diadromous fish species rely on access to upstream freshwater river habitat
- Other fish species also present
- Dams are barriers to fish passage – Both Upstream and Downstream
- Dam Modification alternatives would retain the existing fish ladder
- Dam Removal
  - Barrier removal and reshaped channel would improve fish passage conditions
  - Would reconnect 14.1 river miles of stream habitat
  - May 2024 Alewife reported at Pickpocket Ladder

Natural Resources

- Dam Modification:
  - Negligible change to existing wetlands, surrounding habitat and invasive species
- Dam Removal:
  - Would result in changes to habitat, wetlands, and natural communities, including:
    - Improve fish passage (existing fish ladder limits passage).
    - Improve water quality.
    - Restore "Natural Flow Regime" which drives riparian ecological diversity.
    - Would affect wetlands and floodplain forests that border the impoundment based on changing flood regimes
  - Primary change would be shift in wetland cover type, but loss of wetland at periphery may occur
  - Implement measures to limit spread of invasive species

Recreation



- Boating, fishing, swimming, snowmobiling, skating and bird watching
- Cartop boat launch at Haigh Road
- Public land at Pickpocket Dam and Peabody Drive
- Conservation easement land surrounds the impoundment
- Dam Modification: No impact to recreation opportunities
- Dam Removal:
  - Loss of open water, narrower and shallower boating conditions
  - Increase in angling due to improvement in fish passage. Different angling locations.

Cost Analysis

	Alt 1: Raise Dam		Alt 2: Spillway Replacement - Labyrinth		Alt 3: Auxiliary Spillway		Alt 4: Dam Removal
	Current	**Future**	**Current**	**Future**	**Current**	**Future**	
Initial Capital Cost	$2,090,200	$2,365,200	$7,132,600	$7,410,900	$2,153,300	$2,252,200	$1,468,000
Capital Replacement Costs	$861,200	$974,500	$2,978,600	$3,053,300	$887,200	$927,900	$0
Operations and Maintenance	$315,000	$332,200	$222,200	$273,700	$311,600	$335,600	$45,000
Total Present Cost	**$3,266,400**	**$3,671,900**	**$10,293,500**	**$10,737,900**	**$3,352,100**	**$3,515,700**	**$1,513,000**

Public Comments and Responses

- Final Feasibility Study provides response to comments in Appendix H
  - Response to verbal comments grouped by subject to provide detailed response
  - Individual responses to written comments

Response to Verbal Comments

The Town of Exeter welcomes and appreciates the active participation and valuable insights shared by the community-at-large through public comments. To address the wide range of verbal comments and concerns made at various public meetings, we have grouped similar comments and questions into several categories. Please note that a unified response has been provided for each category, capturing common concerns and ideas. This approach ensures that we comprehensively address all shared perspectives. Even though individual replies are not provided for the verbal comments, every comment has been thoroughly reviewed and is being taken into account in the Town's decision-making process. Additionally, some comments have also been submitted in writing. All written comments have specific written responses found in Appendix H of the final Pickpocket Dam Feasibility Study.

1) **Why has there been a lack of communication, transparency, abutter notification and stakeholder coordination as part of the Feasibility Study? And why hasn't the Pickpocket Dam been awarded the same level of public involvement as the Great Dam?**

We acknowledge concerns regarding the project's schedule and perceived lack of transparency and communication regarding this project. The Town has been, and remains, committed to taking into account all public input as part of the feasibility study process to ultimately come into compliance the NHDES rules and regulations. To-date, all public meetings, presentations, and project documents specific to Pickpocket Dam have been made available on

back to 2018. The Town will continue to post updates on its website.

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C35.1 I oppose the actions taken by the Town of Exeter Select Board, which allowed the River Advisory Committee (RAC) of the Town of Exeter to apply for a NOAA Grant to remove the Pickpocket Dam completely in order to improve fish passage on the Exeter River. The RAC did not engage or contact or inform stakeholders or property owners or the community about this NOAA grant, and applied for $2MM to remove the dam entirely without talking with Exeter or Brentwood residents beforehand. This process of changing our town without engaging a full conversation on the impacts to the environment, the loss of this historical piece of Exeter, loss of recreational activity, the loss of wetlands, wildlife, and more is UNACCEPTABLE.

C35.2 The Exeter River has been a reservoir within Brentwood and Exeter for over 100 years. The Pickpocket Dam dates back to the 1600's and has been a low-risk dam until recently when the rainfall numbers changed due to the impact of climate change. The members of the Friends of Exeter River (which includes Brentwood residents) agree that this process needs to be SLOWED DOWN and reviewed with ALL stakeholders prior to any decisions being made on dam removal. After all, I believe the town line of Exeter and Brentwood runs down the middle of the existing dam, does it not?

C35.3 In October, the River Advisory Committee posted a long list of questions during its meeting – these questions were on a piece of paper that ran floor to ceiling practically, and yet none of these questions have been answered due to limited time and another group meeting which followed this RAC meeting (they "needed the room".) Why aren't there multiple meetings scheduled in the town hall as there were for the community impact discussions re: the Great Dam?

C35.4 The Town of Exeter River Advisory Committee sought approval for the NOAA grant to have money in place to remove the structure BEFORE VHB of Bedford engineers had completed the study of the Pickpocket Dam, and whether it could be modified to meet state requirements OR whether the dam should be removed. There are FEMA grants available to modify and repair dams, vs. complete removal. This covert action on the part of the Town of Exeter is unfair to hundreds of taxpayers, abutters, and their friends and family who enjoy the river, the dam, and all that it brings to this community. No abutters to this day had been contacted by the Town of Exeter on this issue. I personally delivered notice to many abutters. The lack of transparency about the Pickpocket Dam is beyond reprehensible.

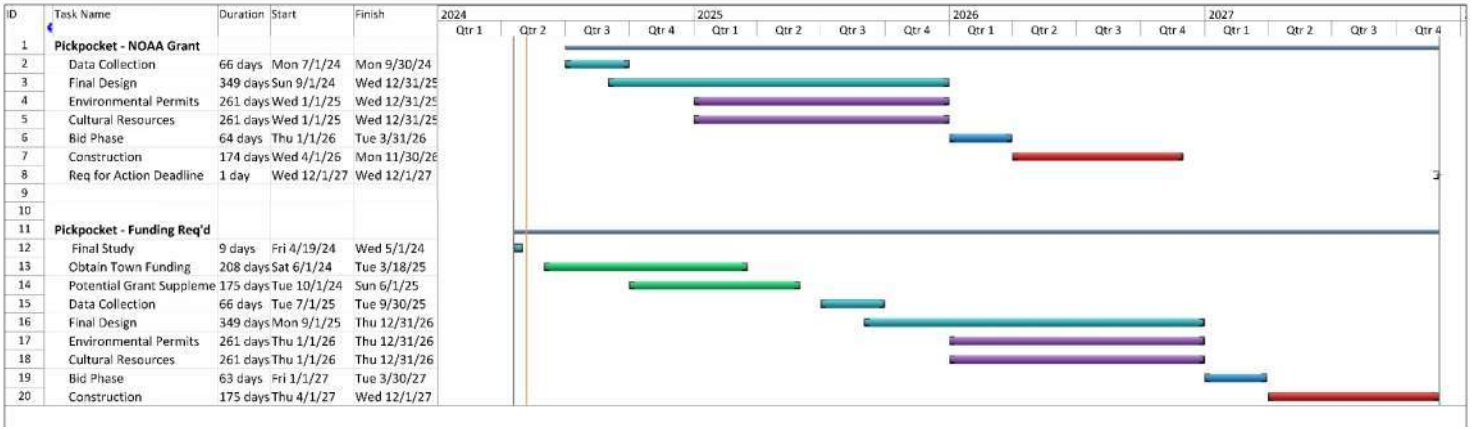
Less than 20 people combined are on the Town of Exeter Select Board and Town of Exeter River Advisory Committee and not all are for dam removal. There are over 15,000 people in the Town and all may be affected if those who lead continue to act with poor judgement and rush this through. We don't need hardheads here – we need reviews and input from all stakeholders who should have a say in the matter and love the river the way it is.

Comment #	Date	Commenter	Comment	Response
C6.4	2/28/2024	Mark Rieder	"My neighborhood has 15 houses that use Geothermal from well water for heating and cooling the houses. The Geo systems use up to 10X the water compared with normal well use. Has this been considered in the well analysis for dam removal? I read the analysis stating that the dam removal will not affect wells in the area. Can the analysis include a statement such as, 'Geothermal system in the affected area were considered in the analysis?'"	The geothermal wells based on the public records were evaluated and found to also be connected to the deep bedrock aquifer. The removal of the dam will not affect groundwater levels in the deep bedrock aquifer and therefore there will be no impact to the geothermal well water supply. Additionally, it was found that the geothermal systems are "open loop" and any water drawn from the aquifer is also injected back into the aquifer. A more detailed discussion of the impact of dam removal on water supplies is provided in Section 3.5 of the Feasibility Study.
C6.5	2/28/2024	Mark Rieder	"Is there any consideration for re-planting the newly exposed land with native species and control for the invasives? For Brentwood as well as Exeter?"	Yes. As described in Section 3.13 of the Feasibility Study, the detailed design of the dam removal alternative would include seeding the newly exposed land with native and appropriate species for land located in both Towns. Additional measures at the dam site may also be considered. These measures will help to limit the spread of invasives into the newly exposed land. There is currently no plan to address invasive species for the dam modification alternatives.
C7.1	2/28/2024	Mark Edison	"After reading the report sent to Ms. Garnett it seems that no real in depth analysis has been done on our properties yet. In addition it sounds as if the potential volumes of water being used to justify removal of the dam area not being used to study erosion. I would insist that the same 2.5 times 100 year flood volumes be used for erosion studies as well."	VHB performed an analysis of potential changes in river characteristics along the entire length of the river for each alternative identified in the Feasibility Study. This includes the section of the Exeter River along Stoney Water Road. The flow rates used to meet dam safety requirements, are different than what is used to evaluate erosion and sediment transport. It is industry standard to evaluate erosion and sediment transport for the bankfull flow, the 2-year storm is typically used as an approximation of bankfull flow and is used to estimate sediment transport as bankfull flow is considered to channel forming flow.
C8.1	2/29/2024	Robert Span	"Since the Pickpocket Dam is a run-off-the-river dam, how specifically would dam removal affect water temperature and dissolved oxygen levels downstream of the dam location?...What, if any, other impacts would there be on water quality downstream?"	The Pickpocket Dam reduces water quality in the impoundment created by the dam. Impounded waters are typically prone to low DO conditions due to the oxygen demand caused by decomposition of organic material in the bottom waters. Additionally, impounded waters are warmer and therefore have lower DO saturation thresholds, with less opportunity for aeration and oxygen exchange in slow moving waters as compared to free-flowing waters with riffles. For example, with the reduced surface water size, decreased residence time and reduced solar

Permitting, Engineering & Construction Phase

Project Schedule & Funding

	Dam Removal NOAA Grant Successful	Dam Removal NOAA Grant Unsuccessful	Dam Modification
Funding Secured	Spring 2024	Spring 2025	Spring 2025
Begin Design Phase	Summer 2024	Summer 2025	Summer 2025
Begin Permitting Phase	Winter 2025	Winter 2026	Winter 2026
Begin Construction	Summer 2026	Summer 2027	Summer 2027
Construction Complete	Fall 2026	Fall 2027	Fall 2027



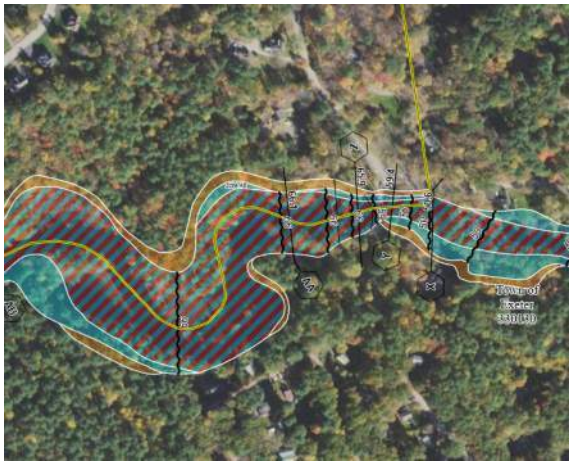
ID	Task Name	Duration	Start	Finish
1	**Pickpocket - NOAA Grant**			
2	Data Collection	66 days	Mon 7/1/24	Mon 9/30/24
3	Final Design	349 days	Sun 9/1/24	Wed 12/31/25
4	Environmental Permits	261 days	Wed 1/1/25	Wed 12/31/25
5	Cultural Resources	261 days	Wed 1/1/25	Wed 12/31/25
6	Bid Phase	64 days	Thu 1/1/26	Tue 3/31/26
7	Construction	174 days	Wed 4/1/26	Mon 11/30/26
8	Req for Action Deadline	1 day	Wed 12/1/27	Wed 12/1/27
9				
10				
11	**Pickpocket - Funding Req'd**			
12	Final Study	9 days	Fri 4/19/24	Wed 5/1/24
13	Obtain Town Funding	208 days	Sat 6/1/24	Tue 3/18/25
14	Potential Grant Suppleme	175 days	Tue 10/1/24	Sun 6/1/25
15	Data Collection	66 days	Tue 7/1/25	Tue 9/30/25
16	Final Design	349 days	Mon 9/1/25	Thu 12/31/26
17	Environmental Permits	261 days	Thu 1/1/26	Thu 12/31/26
18	Cultural Resources	261 days	Thu 1/1/26	Thu 12/31/26
19	Bid Phase	63 days	Fri 1/1/27	Tue 3/30/27
20	Construction	175 days	Thu 4/1/27	Wed 12/1/27

Environmental Permitting

- **NHDES Wetlands Permit (NH RSA 482-A)**
  - Required for impacts below top of bank or within wetlands
  - Abutter notifications – Direct Abutters
  - Submissions through Exeter and Brentwood Town Clerks
  - Coordination:
    - NH Natural Heritage Bureau (T&E Plant Species)
    - NH Fish and Game (T&E Animal Species)
    - Conservation Commissions
    - Exeter-Squamscott River River Local Advisory Committee
- **US Army Corps of Engineers (Section 404 Clean Water Act)**
  - Required for impacts below ordinary high water and within wetlands
  - Possibly authorized through the NH General Permit (NAE-2022-00849)
  - Coordination:
    - USFWS
    - NH State Historic Preservation Office (NHDHR)

Additional Permitting

- **NHDES Water Quality Certification (CWA Section 401)**
  - Triggered by USACE Permit
- **NHDES – Shoreland Water Quality Protection Act (RSA 483-B)**
  - Upland construction, excavation, or filling activities within the 250 ft of river
  - Includes review of stormwater and clearing
- **NHDES - Alteration of Terrain (NH RSA 485-A:17)**
  - Project may qualify for a General Permit by Rule under Env-Wq 1503.03(g)
- **NHDES Dam Bureau Safety Review (RSA 482)**
  - Dam Modification: Env-Wr 400, RSA 482:9 and 482:29
  - Dam Removal Attachment to Wetlands Permit Application
- **FEMA - No Rise Certification**
  - Triggered by impacts to the regulatory floodway to verify the project would not raise base flood elevation



Cultural Resources

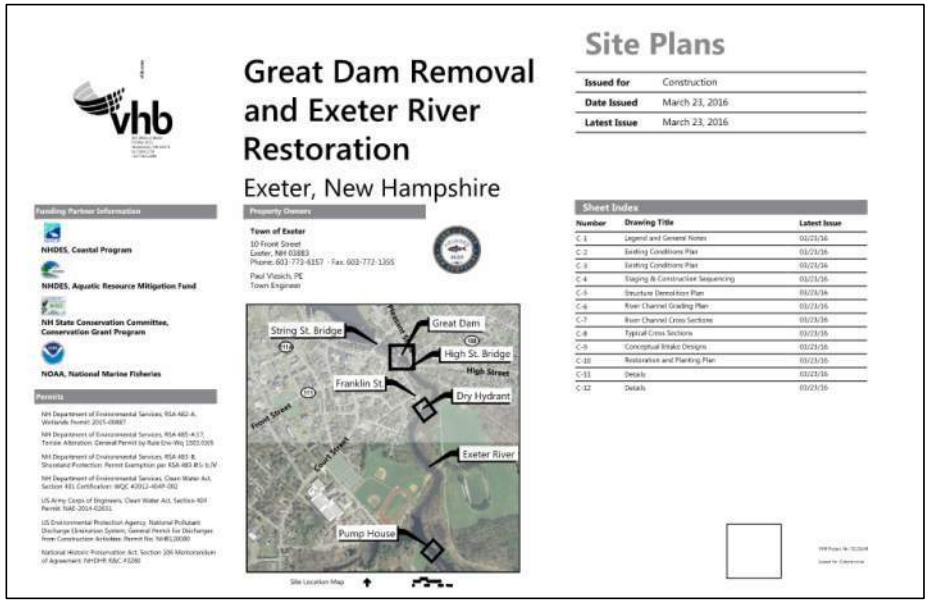
- **Section 106 of the National Historic Preservation Act** of 1966 (NHPA): *Federal agencies must consider the effects on historic properties for projects they carry out, assist, fund, permit, license, or approve.*
- Assignment of a **Lead Federal Agency** – likely the Army Corps of Engineers
- **Process:**
  - **Initiate** via *Request for Project Review* to **NH Division of Historic Resources (SHPO)**
  - **Identify** Historic Properties (In Progress)
    - Pickpocket Dam is **Eligible for Listing** on the National Register of Historic Places
    - Phase IA Archaeological Study found two Sensitive Areas; Phase IB recommended
  - **Assess** Adverse Effects (Effect Memo)
  - **Resolve** Adverse Effects (Memorandum of Agreement with mitigation)
- **Consulting Parties** may include SHPO, Tribes, local agencies, community groups, and others.

Final Surveys & Pre-Design

- Geotechnical Investigation
  - Dam Removal – Soil samples for sieve analysis for locations with higher velocities to evaluate scour potential
  - Dam Modification – Borings along embankments alignments
- Topographic Survey
  - Dam Modification – Additional ground survey along embankment alignments
- Sediment Management Plan
  - Samples for disposal characterization

Engineering Design

- Refined HEC-RAS Model
- 4 submittals with increasing level of design detail
  30%, 60%, 90%, 100% - Final Plans
- Design Plans
  - Existing conditions, demolition, grading
  - Construction Sequencing, stabilization measures, water control, restoration plan
  - Details
- Specifications and Estimate
- Design Basis Memorandum

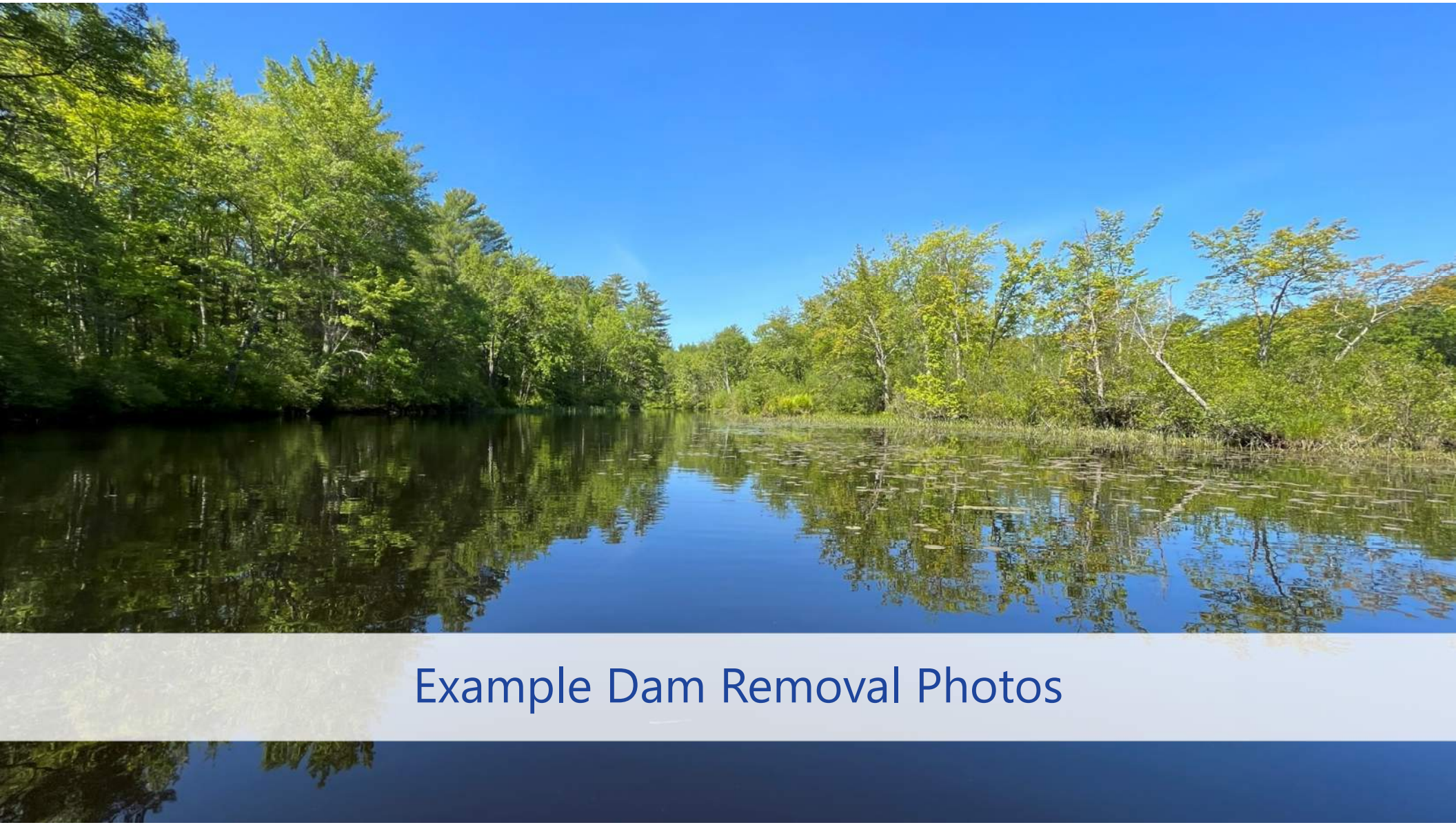


Bid Package Development & Support

- Develop minimum standards for contractor qualifications and issue RFQ
- Review contractor qualification statements
- Issue Request for Proposals
  - Bid advertisement
  - Final Construction Plans, Specifications and Estimate
  - Prepare front end contract documents and bid forms
  - Pre-bid conference
  - Address bidding questions and clarifications and prepare addendums
  - Review bid submittals
- Recommendation of contract award

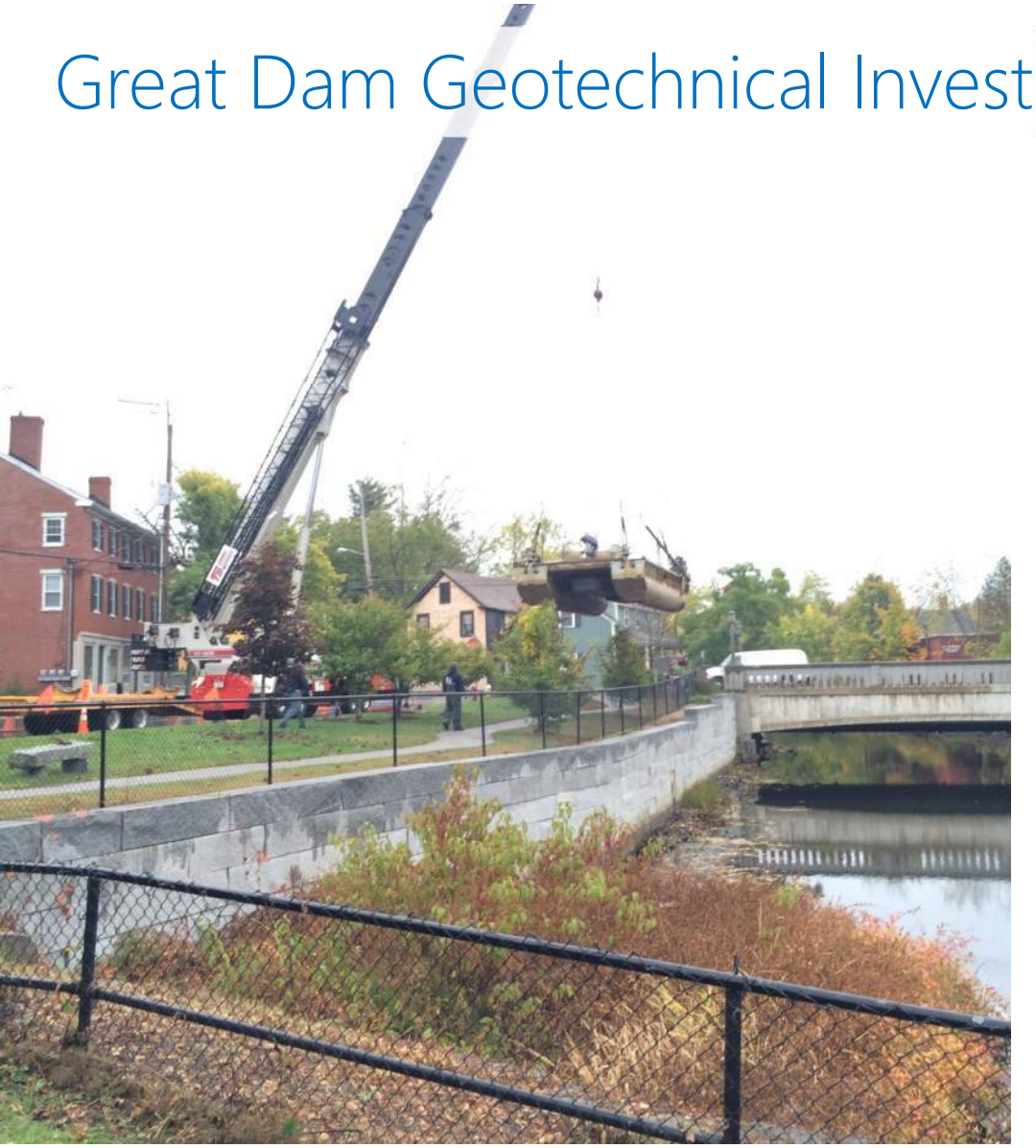
Construction & Construction Administration

- Compile executed contract documents including review of performance bond, payment bond and contractor's insurance
- Pre-construction meeting
- Contractor coordination – shop drawings, submittals, RFIs, change orders, pay requests
- One construction season July-December
- Site visits & observation
- Project close out including punch lists and letter of completion
- 3-5 years of long term monitoring and permit closeout
- Letter of Map Revision (LOMR) within 6 months of dam removal



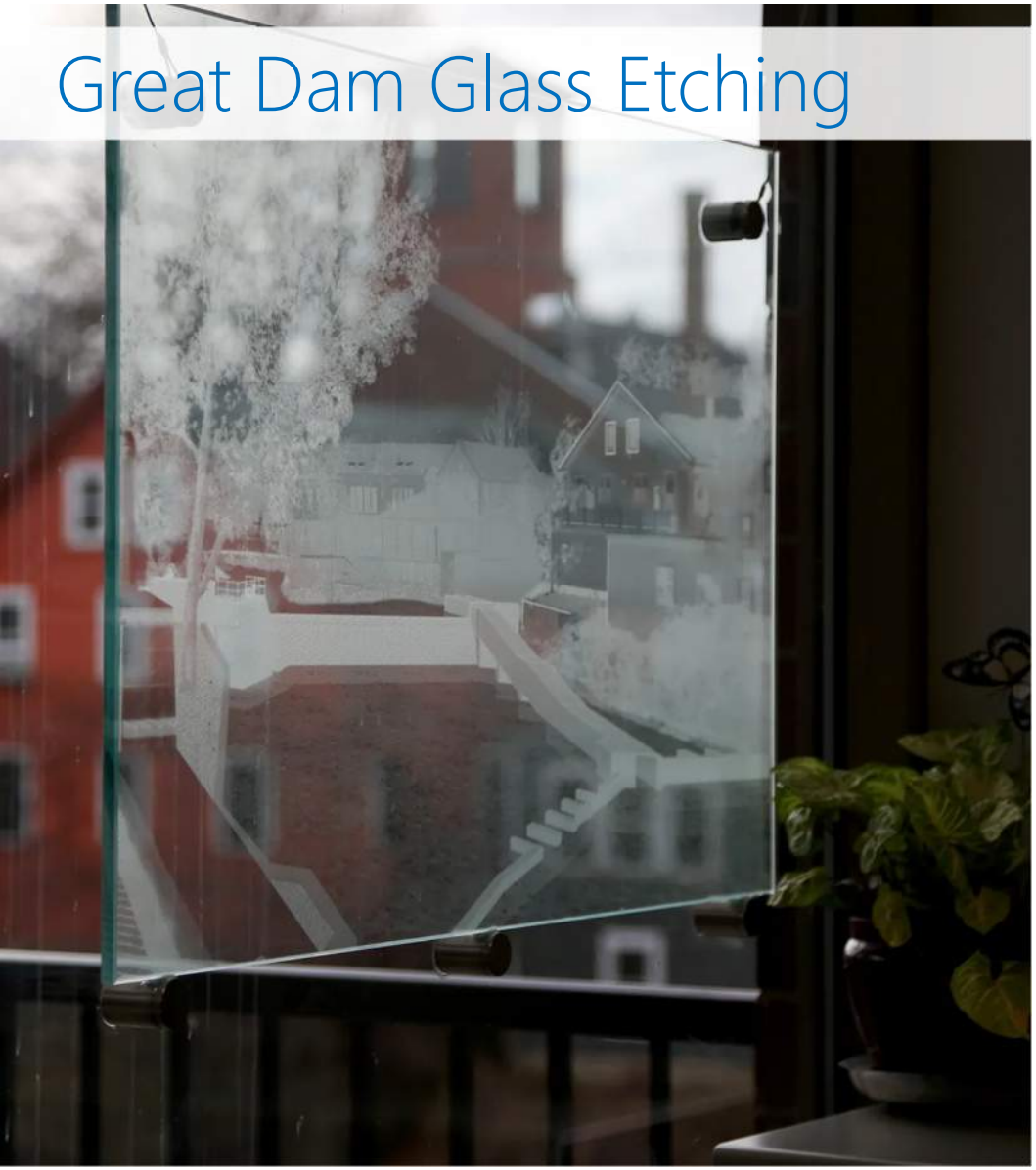
Example Dam Removal Photos

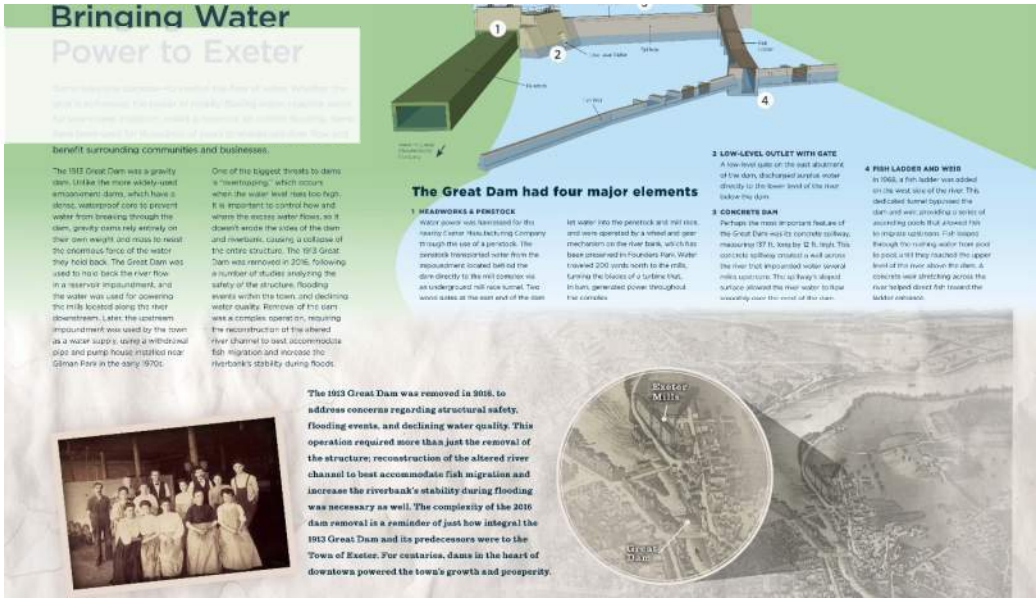
Great Dam Geotechnical Investigation



Great Dam Historical Marker

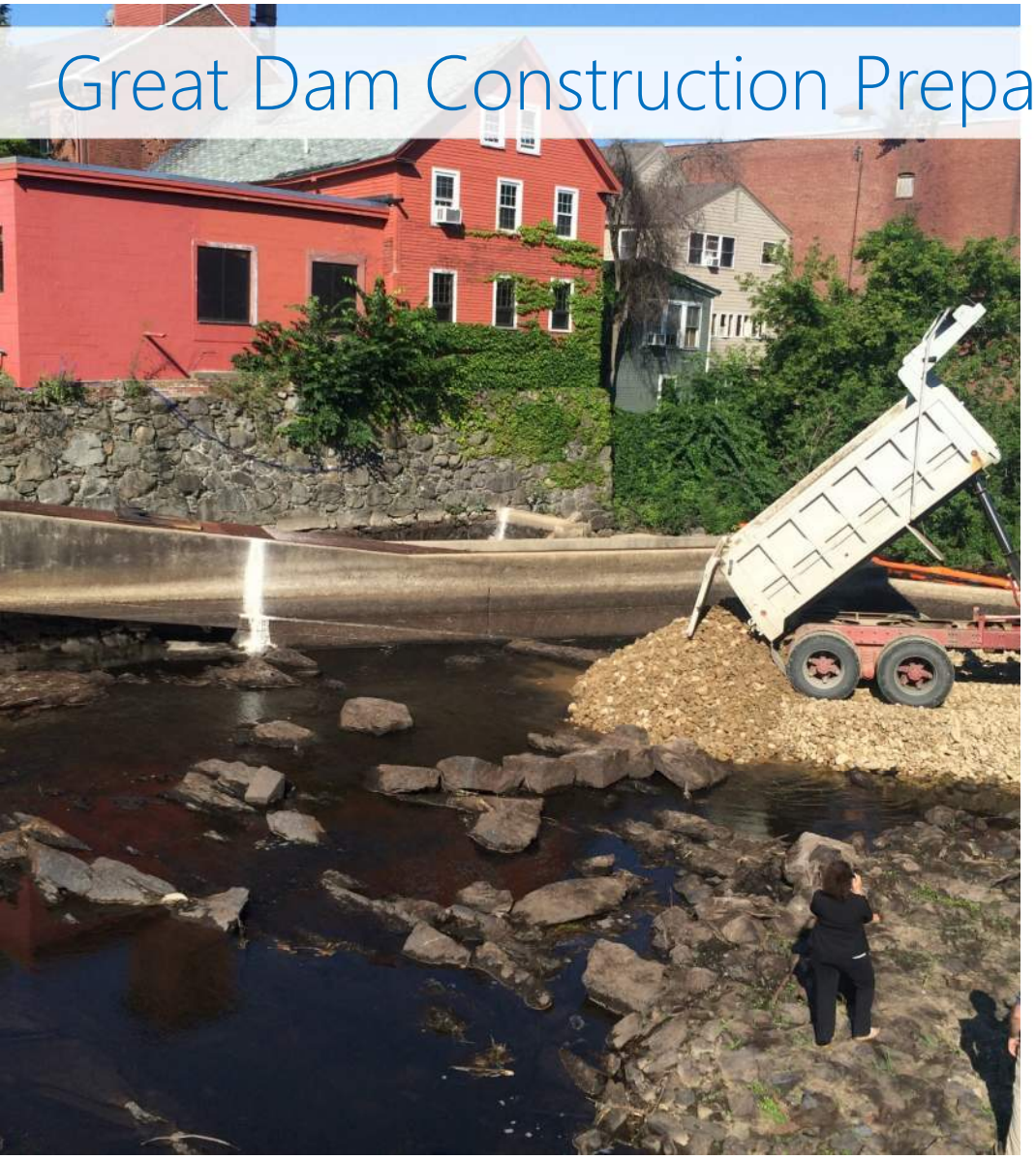
Great Dam Glass Etching



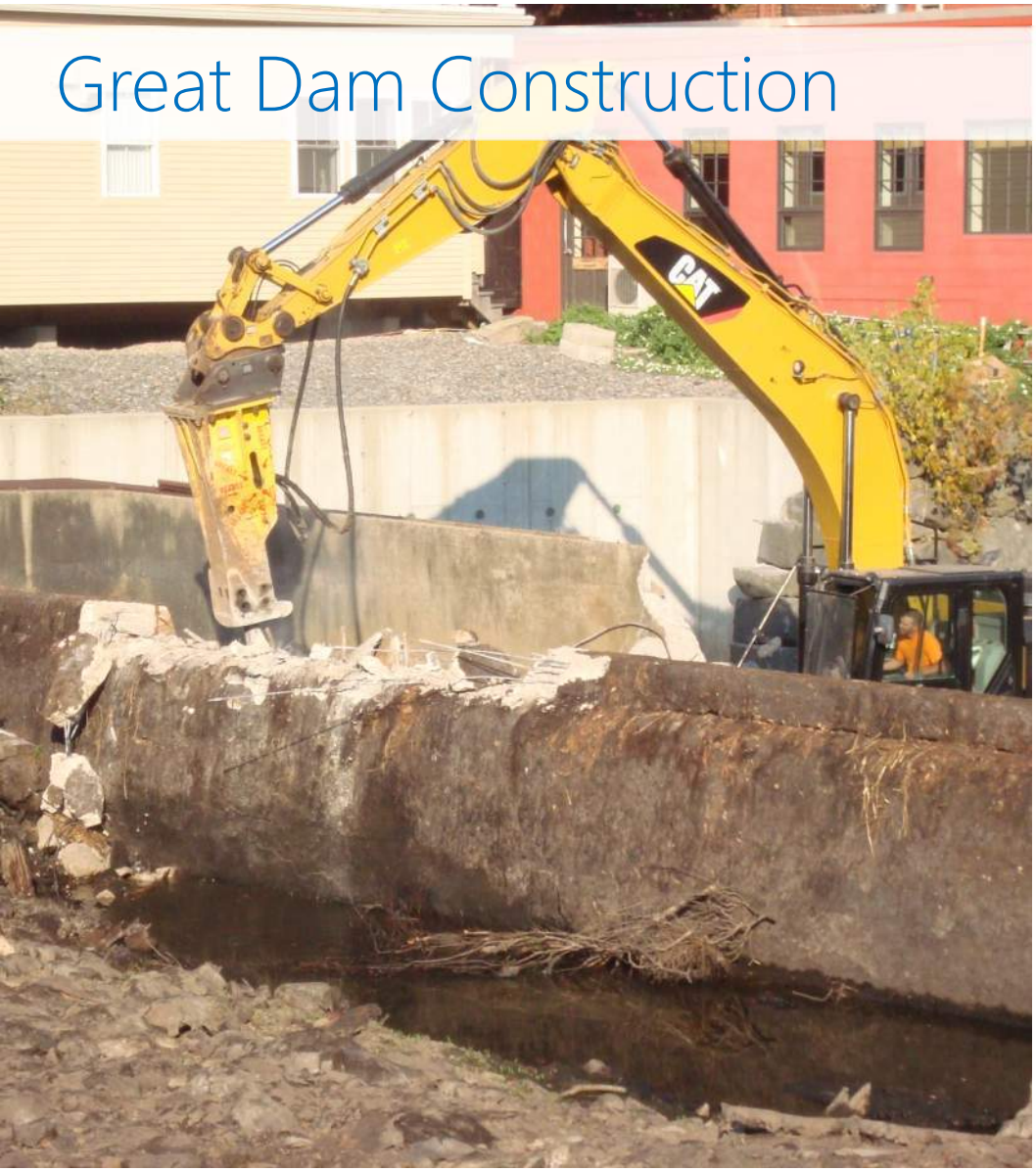


Great Dam Impoundment Drawdown

Great Dam Construction Preparation



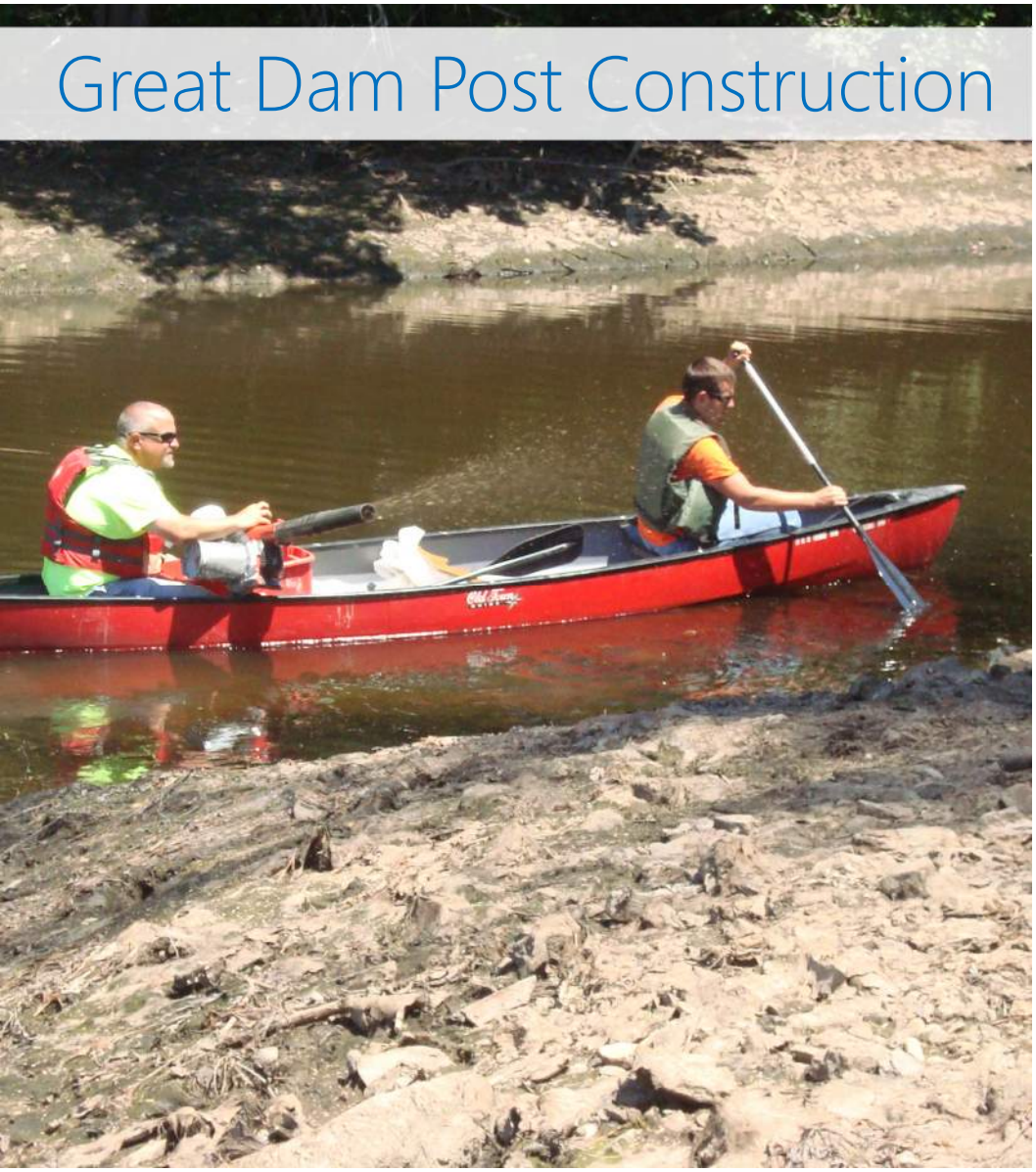
Great Dam Construction



Great Dam Construction

Great Dam Construction

Great Dam Post Construction



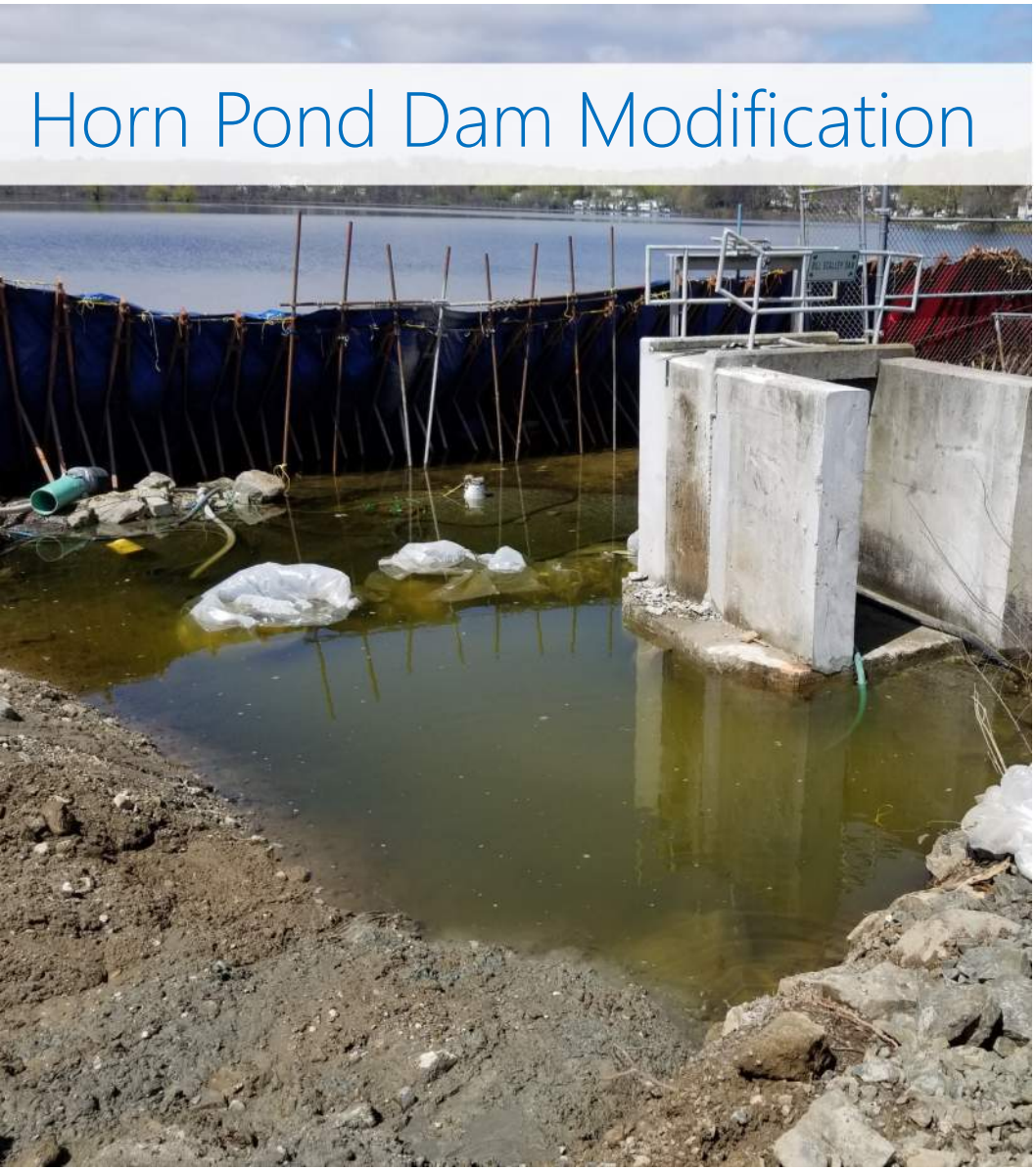
Great Dam Post Construction 2016

Great Dam Post Construction 2016

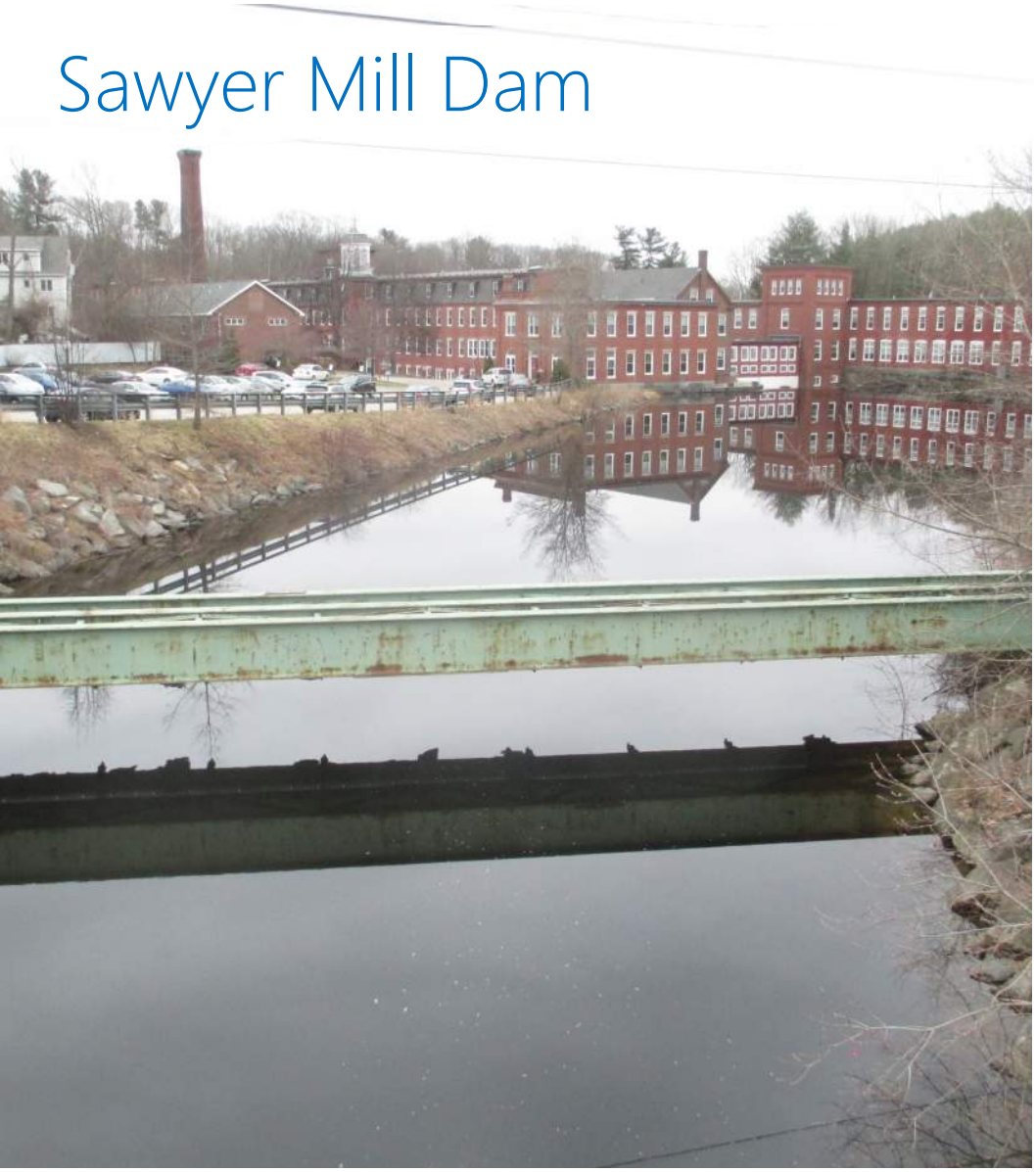
Great Dam Post Construction 2019

Great Dam Post Construction 2023

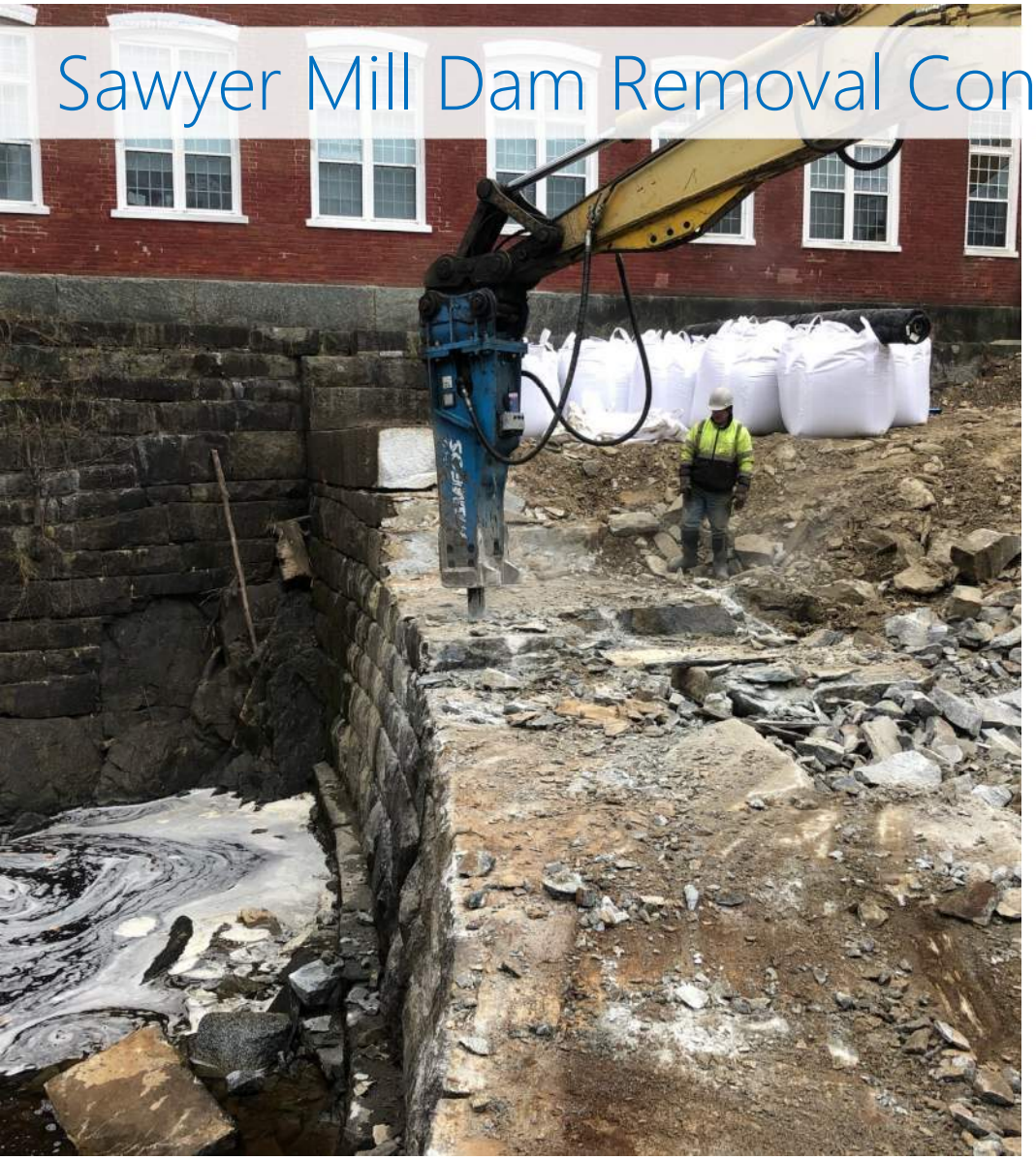
Horn Pond Dam Modification

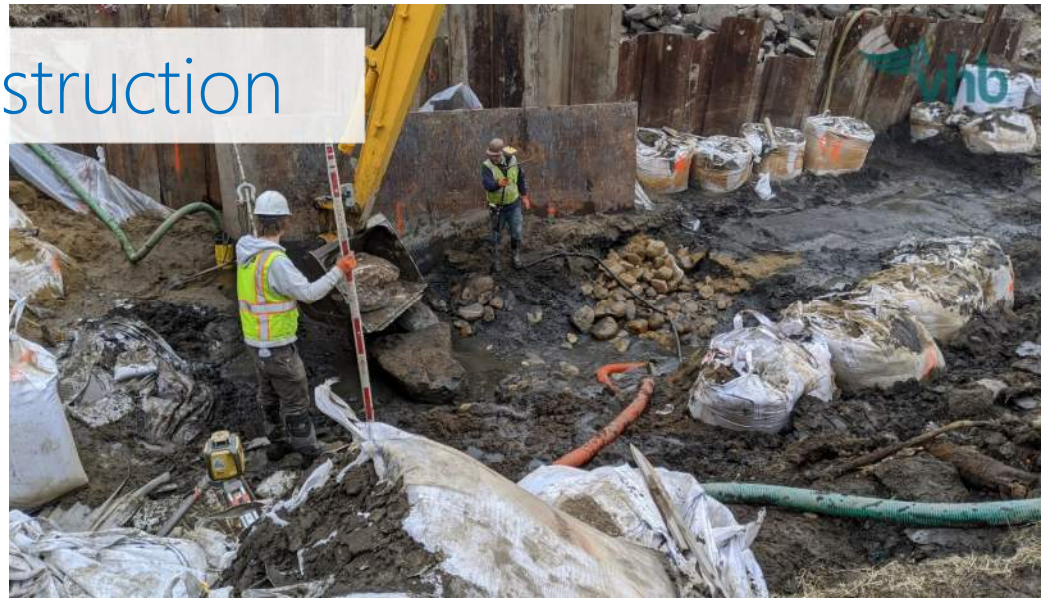


Sawyer Mill Dam

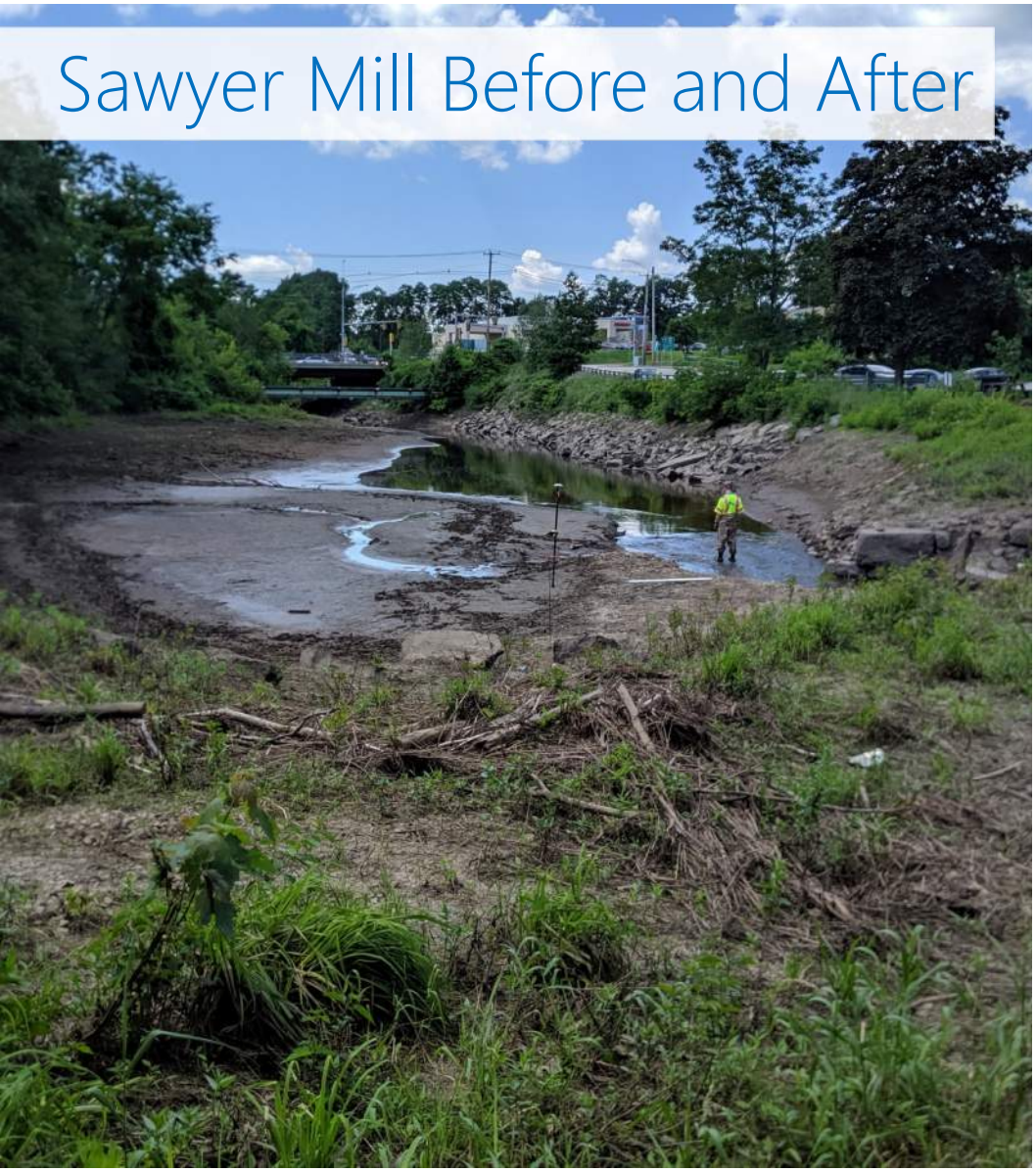


Sawyer Mill Dam Removal Construction





Sawyer Mill Before and After



Sawyer Mill – River Morphology

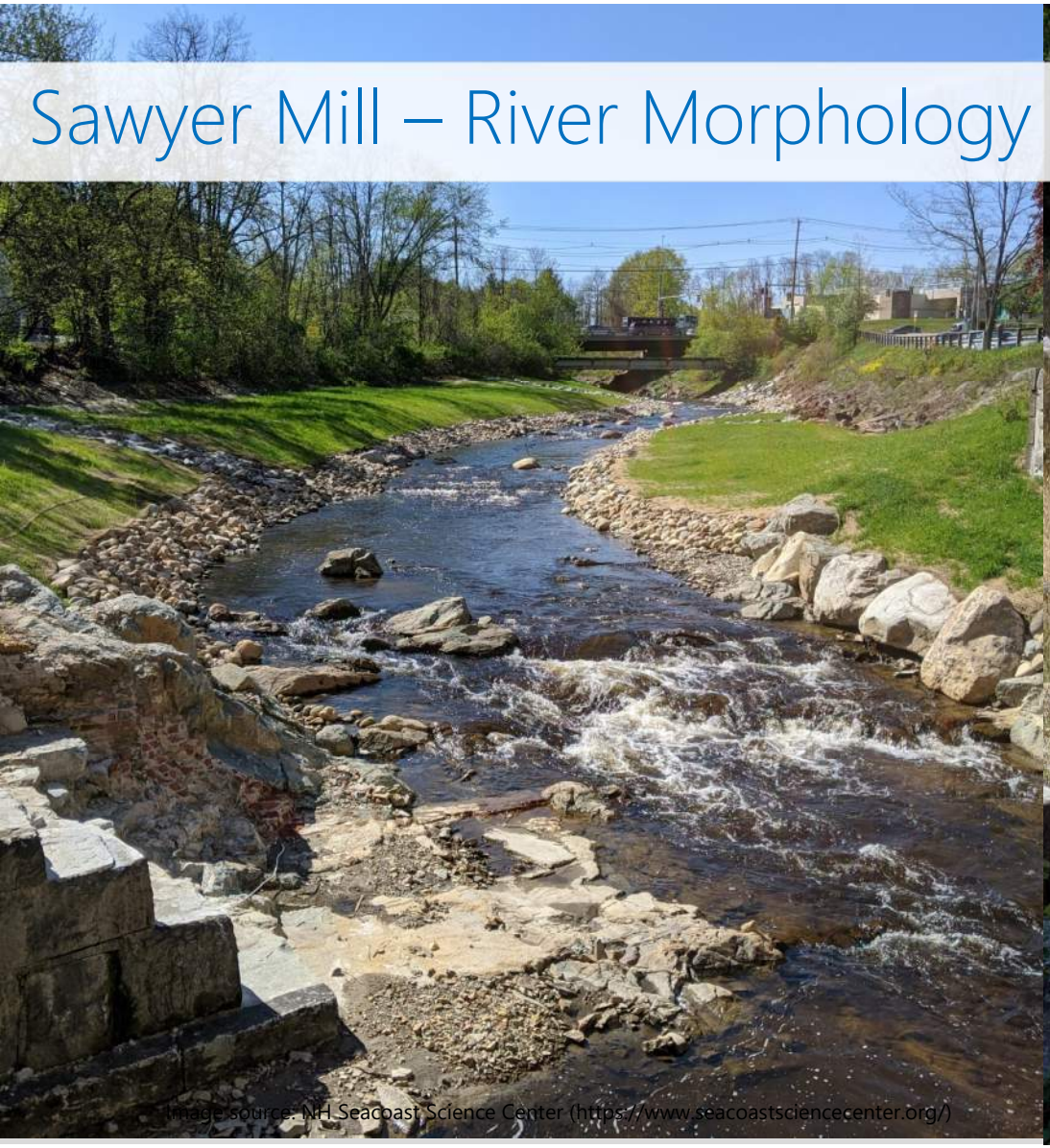
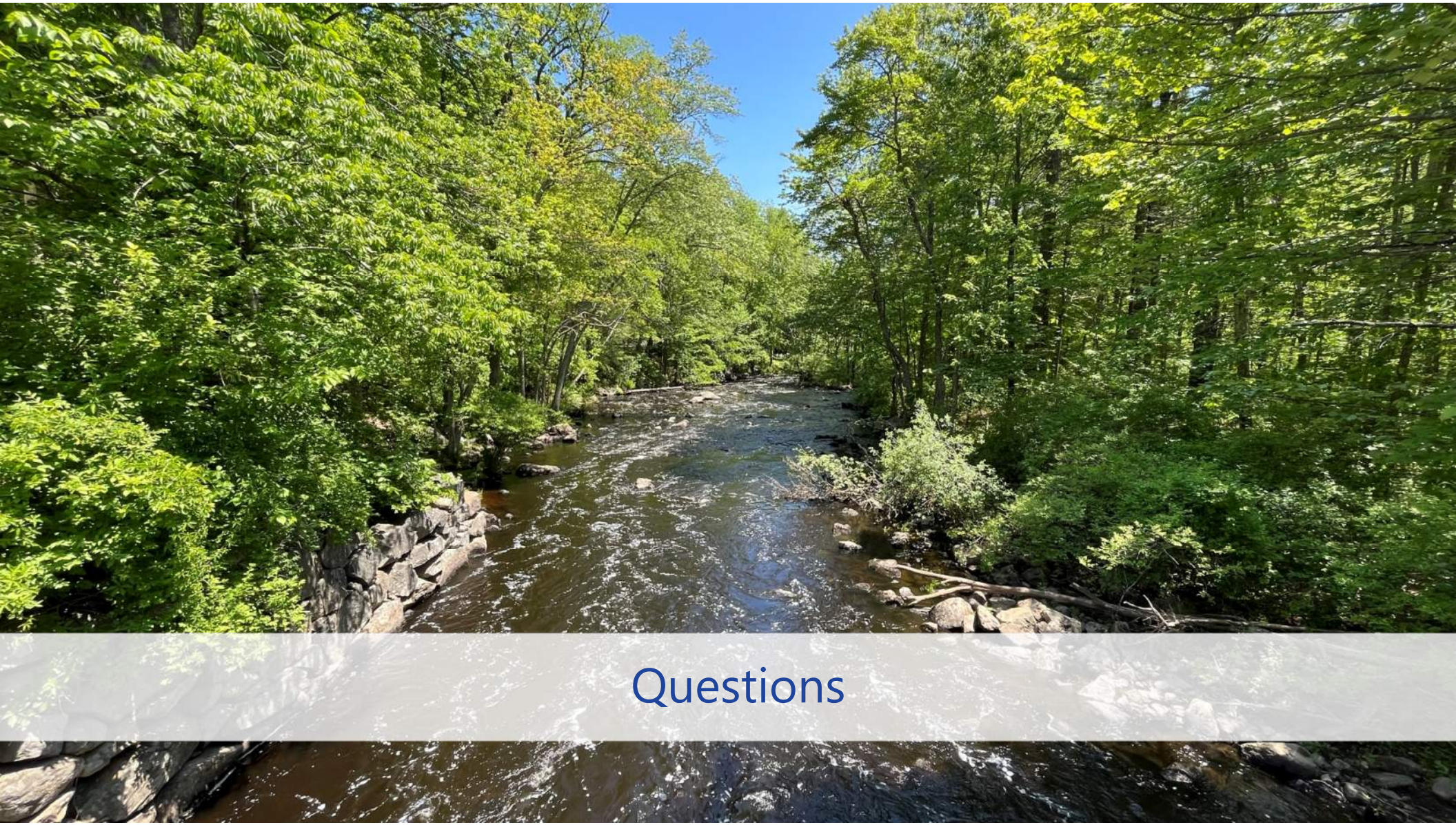


Image source: NH Seacoast Science Center (https://www.seacoastsciencecenter.org/)



Questions