



1

Project Funding

The logos shown are: Town of Exeter (a circular seal with a fish and the text 'TOWN of EXETER FOUNDED 1638 NEW HAMPSHIRE'), NHDES (New Hampshire Department of Environmental Services, featuring a tree and mountains), and NOAA (National Oceanic and Atmospheric Administration, U.S. Department of Commerce, featuring a bird in flight).

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

2

Agenda

- Background
- Study Area and Dam Overview
- Prior Studies
- Feasibility Study Components and Schedule
- Preliminary Investigations
- Status Update
- Next Steps
- Questions

3

Background

- (March 2011) NHDES issues Letter of Deficiency – Breach Analysis Required
- (December 2016) VHB completes dam breach analysis
- (October 2017) Follow-up building survey by VHB
- (December 2017) Revised Dam breach analysis by VHB
- (January 2018) Dam breach analysis submitted to NHDES Dam Bureau
- (March 2018) Dam Bureau issues determination letter: High-Hazard
- (July 2019) Revised Letter of Deficiency (DSP#19-016)
- (August 2021) Request for Action - Extension of time to develop rehabilitation alternatives

4



7



8

Prior Studies

- Pickpocket Dam Breach Analysis
 - High Hazard: Showed impacts to first floor of one residential property with a foundation, and structural support for multiple mobile residential structures
 - Significant Hazard: Overtopping of Route 111 (Class II Roadway)
- Survey of Downstream Properties
- Development of Emergency Action Plan
- Hydrologic Study to Determine Design Storm
 - 10,000 CFS (250% of the 100-Year Flood)
- Preliminary Investigations of Potential Dam Modifications
 - Re-classification
 - Cross Road
 - Alt 1: Increase abutment height to pass the design storm
 - Alt 2: Add a second abutment to pass the design storm.
 - Alt 3: Remove the dam & fish weir

9

Feasibility Study Components

- Data Collection and Survey
- Alternatives Identification and Conceptual Design
- Sediment Sampling
- Hydrology and Hydraulics Analysis
- Cultural Resources
- Impact Analysis
- Feasibility and Impact Analysis Report



10

Feasibility Study Schedule

	Part Fund	2022		2023												2024					
		Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Task 1	Data Collection																				
Task 2	Alternatives Identification and Conceptual Design																				
Task 3	Sediment Sampling																				
Task 4	Hydrologic and Hydraulic Analysis																				
Task 5	Cultural Resources																				
Task 6	Impact Analysis																				
Task 7	Feasibility and Impact Analysis Report								★ ₁										★ ₂		
Task 8	Project Management				☆				★										☆		

June 1, 2024 - Submit application to reconstruct the dam or a plan otherwise.

December 1, 2027 - Complete dam modification

Coastal Resilience Grant



Stormwater Planning Grant



Meetings:



Consultant Update



Draft Final Report



11

Preliminary Investigation Dam Alternatives

Existing Conditions

Cross Road

Alt 1: Increase abutment height to pass the design storm

Alt 1a: Remove sediment island + above alterations

Alt 2: Add a second abutment to pass the design storm.

Alt 2a: Remove sediment island + above alterations

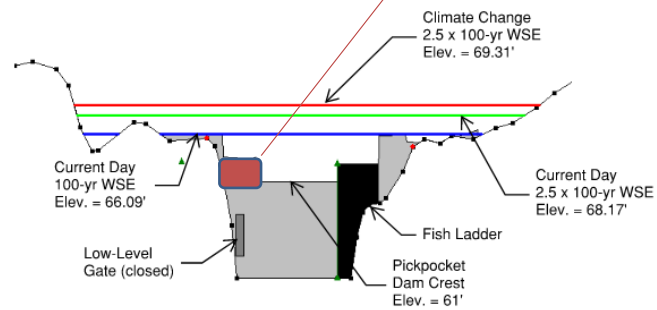
Alt 3: Remove the dam & fish weir



12

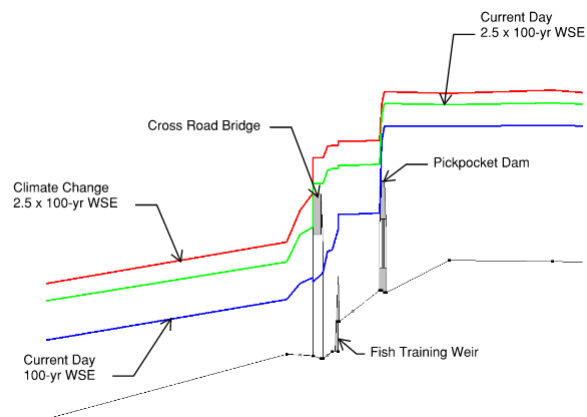
Existing Conditions

- Existing Abutment Elevation: 66.00
- Current dam consists of a crest, abutment, fish weir and ladder
- Portion of existing crest is obstructed by a sediment island



13

Existing Conditions; Cross Road Impacts

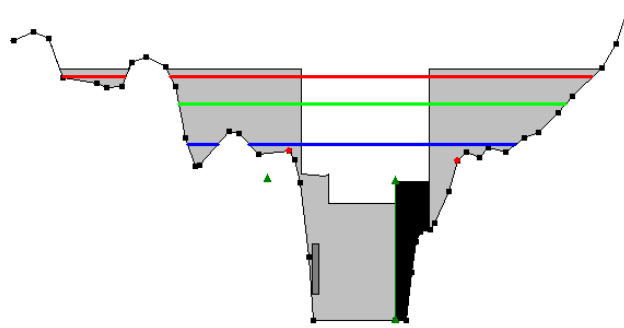


The Cross Road bridge found to have negligible impacts on water elevations at the dam's crest

14

Alt 1: Increase Abutment Height

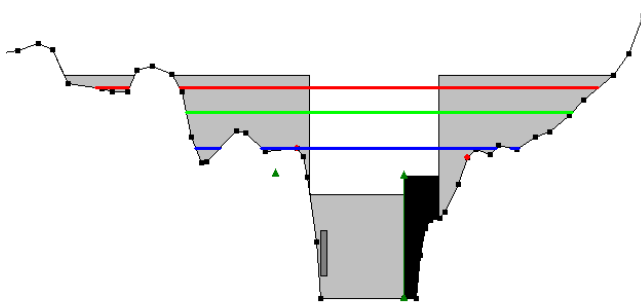
- Regulatory - Minimum Abutment Elevation: 69.96' **(+3.96)**
- Climate Change - Minimum Abutment Elevation: 72.27' **(+6.27)**
- Creates an increase in the 100-yr flood elevation (+0.16)
- No change to crest elevation & sediment island



15

Alt 1A: Remove Sediment Island, Increase Abutment Height

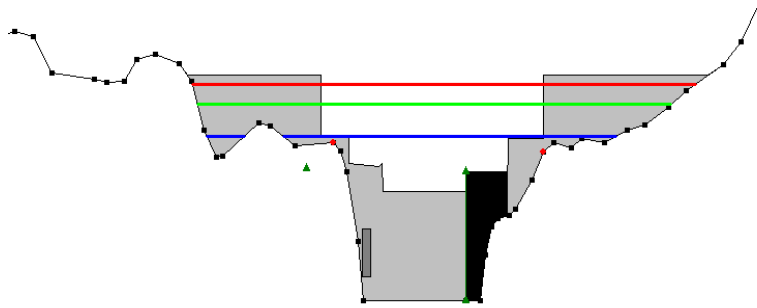
- Regulatory – Minimum Abutment Elevation: 69.33' **(+3.33)**
- Climate Change - Minimum Abutment Elevation: 71.76' **(+5.76)**
- Creates a decrease in the 100-yr flood elevation (-0.35)
- No change to crest elevation



16

Alt 2: Add Second Abutment

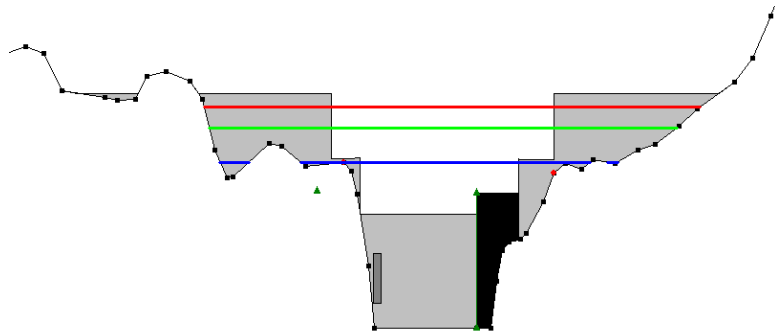
- Regulatory - Minimum Second Abutment Elevation: 69.24' (+3.24)
- Climate Change - Minimum Second Abutment Elevation: 71.17' (+5.17)
- Creates an increase in the 100-yr flood elevation (+0.13)
- No change to sediment island, crest or existing abutment elevations



17

Alt 2A: Remove Sediment Island, Add Second Abutment

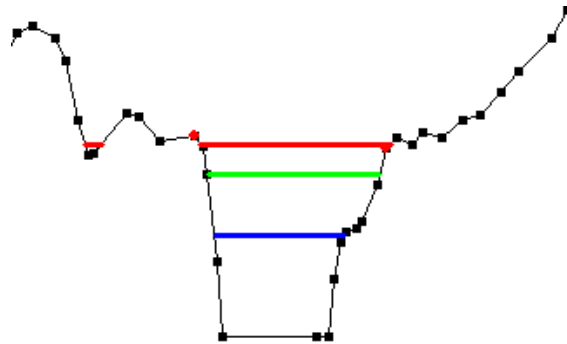
- Regulatory - Minimum Second Abutment Elevation: 68.82' (+2.82)
- Climate Change - Minimum Second Abutment Elevation: 70.76' (+4.76)
- Creates a decrease in the 100-yr flood elevation (-0.35)
- No change to crest or existing abutment elevations



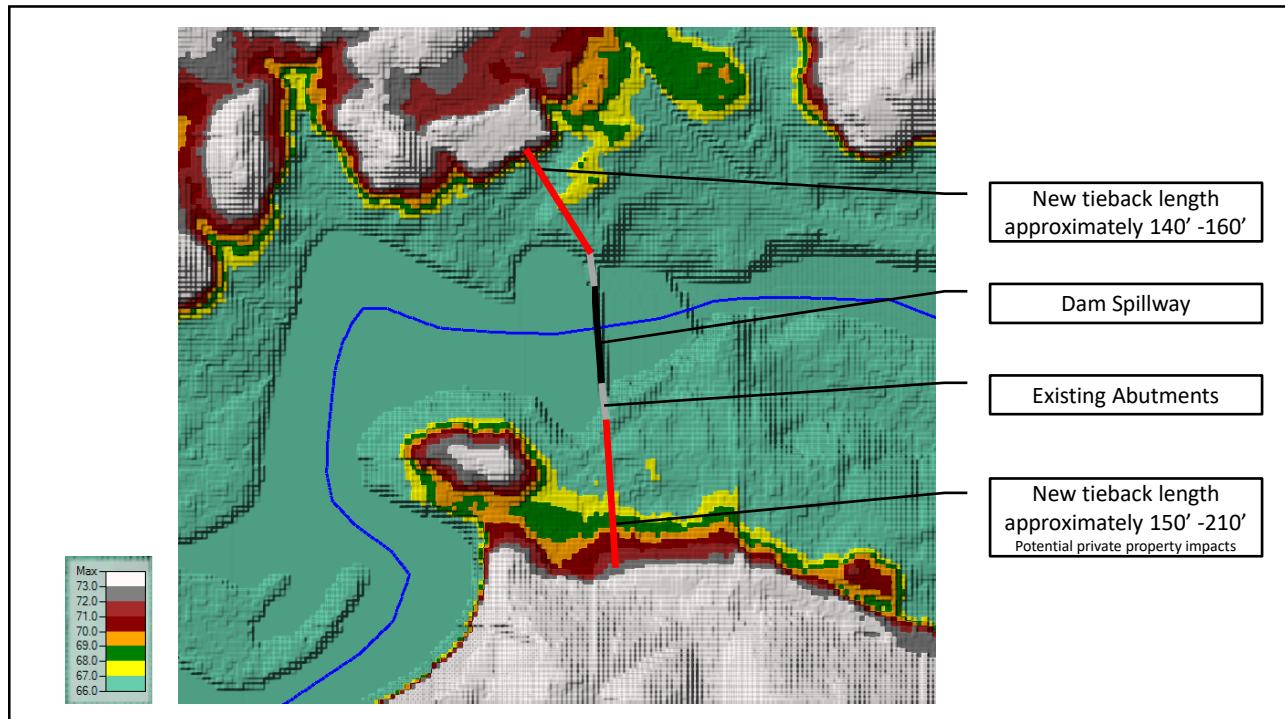
18

Alt 3: Dam Removal

- Creates a decrease in the 100-yr flood elevation (-7.87)
- Removal of crest, abutments, fish weir, sediment island.



19



20

Status Update

- Data Collection – Survey and Sediment probing – Complete
 - Currently processing the data to finalize base plan
- Alternatives Development – Underway
 - Dam Stabilization (stabilize abutments, rock anchors, etc.)
 - Dam Modification (partial removal, lowering spillway)
 - Dam Modification (spillway extension or modification)
 - Dam Reclassification (purchase downstream affected properties)
 - Dam Removal and River Restoration
- Sediment Sampling – Complete
 - Processing Results
- Hydrology and Hydraulics Analysis – Underway



21

Sediment Sampling Plan

- Purpose to determine proper sediment management protocols and assess the potential for adverse effects downstream
- Due Diligence Review
- 5 Sediment Sample locations

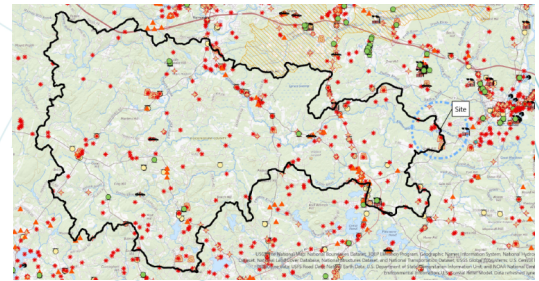
Table 2 Proposed Supplemental Sediment Sampling Scheme

Sample ID(s)	Sample Location Description	Grain Size Analysis	Chemical Analysis	Rationale
SED-1	Upstream of Pickpocket Dam	1	1	Evaluate existing conditions upstream
SED-2 ¹				
SED-2MS; SED-2MSD; SED-2FD	Upstream of Pickpocket Dam	1	4 ²	Evaluate existing conditions upstream
SED-3 A-E; SED-4 A-E	Downstream of Pickpocket Dam	2	2	Evaluate current downstream conditions
SED-5	Further upstream of Pickpocket Dam	1	1	Confirm sediment condition near previous 1,4-dioxane detection in surface water
EB-1 ²	Equipment blank	0	1	Equipment blank.
	Total:	5	9	

- > VOCs including 1,4-Dioxane and MTBE via EPA method 8260
- > Priority Pollutant 13 (PP-13) metals
- > Iron
- > Manganese
- > Chloride
- > TKN
- > Polycyclic aromatic hydrocarbons (PAHs) by EPA method 8270
- > Organochlorine pesticides by EPA method 8081
- > Polychlorinated biphenyl (PCBs) by EPA method 8082

Table 1 Summary of Environmental Database Search Results

Type of Site	No. of Sites Located within the Dam Watershed
Aboveground Storage Tank (AST) Sites	12
Underground Storage Tank (UST) Sites	44
Remediation Sites	193
Hazardous Waste Generators	36
Solid Waste Facilities	16
NPDES Outfalls	0
Local Potential Contamination Sites	25
TOTAL:	326



22

Preliminary 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



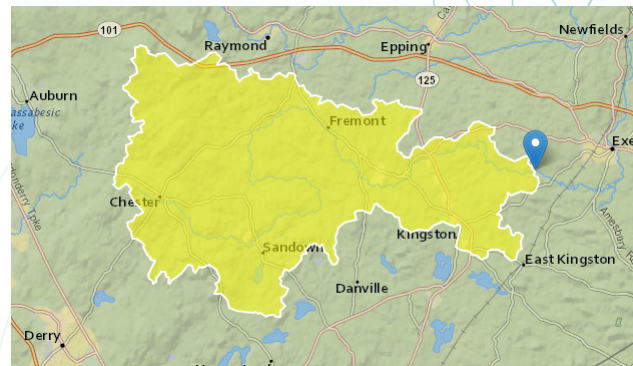
23

Status of Hydrologic and Hydraulic Analysis

- Hydrologic Analysis - New Hampshire Coastal Flood Risk Summary
 - Current Day Design Flood – 2.5 x 100 Year
 - 100 Year – 3,980 cfs
 - 3,980 cfs x 2.5 = 10,000 cfs
 - Evaluated Climate Change – 15% Increase
 - 100 Year – 5,940 cfs
 - 5,940 cfs x 2.5 = 14,900 cfs
 - 49% Increase of Design Flood

STEP 6 TABLE: APPROACH FOR CALCULATING PROJECTED EXTREME PRECIPITATION ESTIMATES BASED ON TOLERANCE FOR FLOOD RISK.

	HIGH TOLERANCE FOR FLOOD RISK	MEDIUM TOLERANCE FOR FLOOD RISK	LOW TOLERANCE FOR FLOOD RISK	VERY LOW TOLERANCE FOR FLOOD RISK
PROJECTED EXTREME PRECIPITATION ESTIMATE =	(Best available precipitation data) x (1.15)	(Best available precipitation data) x (1.15)	(Best available precipitation data) x (1.15)	(Best available precipitation data) x (1.15)



24

Next Steps

- Finalize alternatives to carry through the analysis
- Cultural Resources Studies
 - Phase 1A Archaeological Survey
 - NHDHR Project Area Form
 - Individual Inventory Form
- Impact Analysis of the various alternatives
 - Rare species, fish passage, wetlands, recreational, invasive species, ice, water supplies, water quality, infrastructure, visual simulations
- Dam Inspection

Draft Feasibility Study

1. Hydrology and Hydraulics
2. Impoundment Profiles
3. Floodplains
4. Dam Current Condition
5. Alternative Screening
6. Alternative Sketches and Estimate
7. Sediment and Scour Analysis
8. Cultural Resources
9. Impact Study – Fish Passage, Wetlands, Recreation
10. Water Supplies and Quality
11. Visual Simulations

Hatchette Hargrett Brantley, Inc.

2.11.4 Total Estimated Costs by Alternative 204

2.11.5 Other Financial Risks, Costs and Benefits 206

2.11.6 Financial Cost-Benefit Comparison 206

Chapter 3. Evaluation of Alternatives

3.1 Introduction 31

3.2 Hydrology, Hydraulics and Sediment Transport 32

3.2.1 Hydrology Study 32

3.2.2 Development of HEC-RAS Model 34

3.2.3 Residual Hydraulic Changes in the Dam Impoundment 34

3.2.4 Hydraulic Changes in Down-Well Transport 36

3.2.5 Geomorph Assessment 37

3.3 Geomorph Safety 37

3.3.1 Channel Bank Erosion and Dam Foundation or Abutment 38

3.3.2 Sediment Quality 38

3.4 Sediment Quality 38

3.4.1 Sediment Quality 38

3.4.2 Airborne and Lip Aerosols 39

3.4.3 Fuel Spilling Methods 39

3.4.4 Sediment Quality Results 40

3.5 Sediment Management 40

3.5.1 Sediment Quantity 40

3.5.2 Sediment Resources & Likely Disposal Sites 41

3.5.3 Management of Damages to Sediment Deposits 41

3.5.4 Other Risks 42

3.5.5 Occurrence on Air or the Outer River 42

3.5.6 Fuel Spilling on Damming 43

3.5.7 Discussion of Potential Effects 44

3.6 Infrastructure 44

3.7 Wetlands, Wildlife and Foundations 44

3.7.1 Wetland Wetland 44

3.7.2 Wetland Wetland 44

3.7.3 Wetland 44

3.8 Wetland Quality 44

3.9 Wetland Quality 44

3.9.1 Wetland Quality 44

3.9.2 Wetland Quality 44

3.9.3 Wetland Quality 44

3.9.4 Wetland Quality 44

3.9.5 Wetland Quality 44

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3.9.100 Wetland Quality 44

Table of Contents

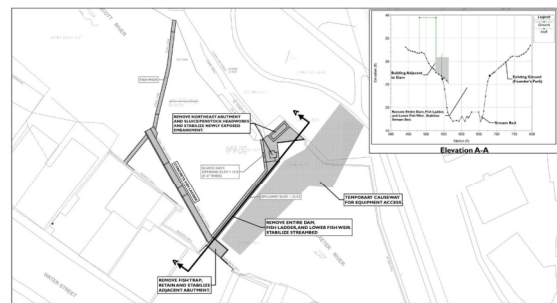
Table 2.11-4. Initial Construction and Mitigation Costs

Alternative	Design, Permitting and Construction	Infrastructure and Environmental Mitigation	Total
Alt A - No Action	-	\$550,000	\$550,000
Alt B - Dam Removal	\$732,150	\$512,608	\$1,244,758
Alt F - Partial Removal	\$1,338,630	\$512,608	\$2,251,238
Alt G - Stabilize in Place	\$418,000	\$565,000	\$983,000
Alt H - Dam Modification	\$1,016,000	\$795,200	\$1,811,200

Table 2.11-5. Total Costs including O&M and Replacement (30 Year Analysis)

Alternative	Initial Cost	O&M and Replacement Costs	Total
Alt A - No Action	\$550,000	-	\$550,000
Alt B - Dam Removal	\$1,244,758	\$0	\$1,244,758
Alt F - Partial Removal	\$2,251,238	\$385,170	\$2,636,408
Alt G - Stabilize in Place	\$983,000	\$181,894	\$1,164,894
Alt H - Dam Modification	\$1,811,200	\$616,724	\$2,427,924

Note: No direct or O&M costs were calculated for the No Build Alternative because this alternative is not feasible due to safety concerns. However, lack of compliance with the NHDES Letters of Deficiency leaves the Town liable for potential future enforcement actions.



All Elevations Referenced to the National Geodetic Vertical Datum of 1989 (NGVD 89)

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Figure 2.11-1
Alternative B - Dam Removal
Dam Removal Area
Dam Modification Area
Dam Stabilization Area
Scale: 1" = 100'

