River Advisory Committee
Pickpocket Dam
Feasibility Study Update

Presented by
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September 21, 2023

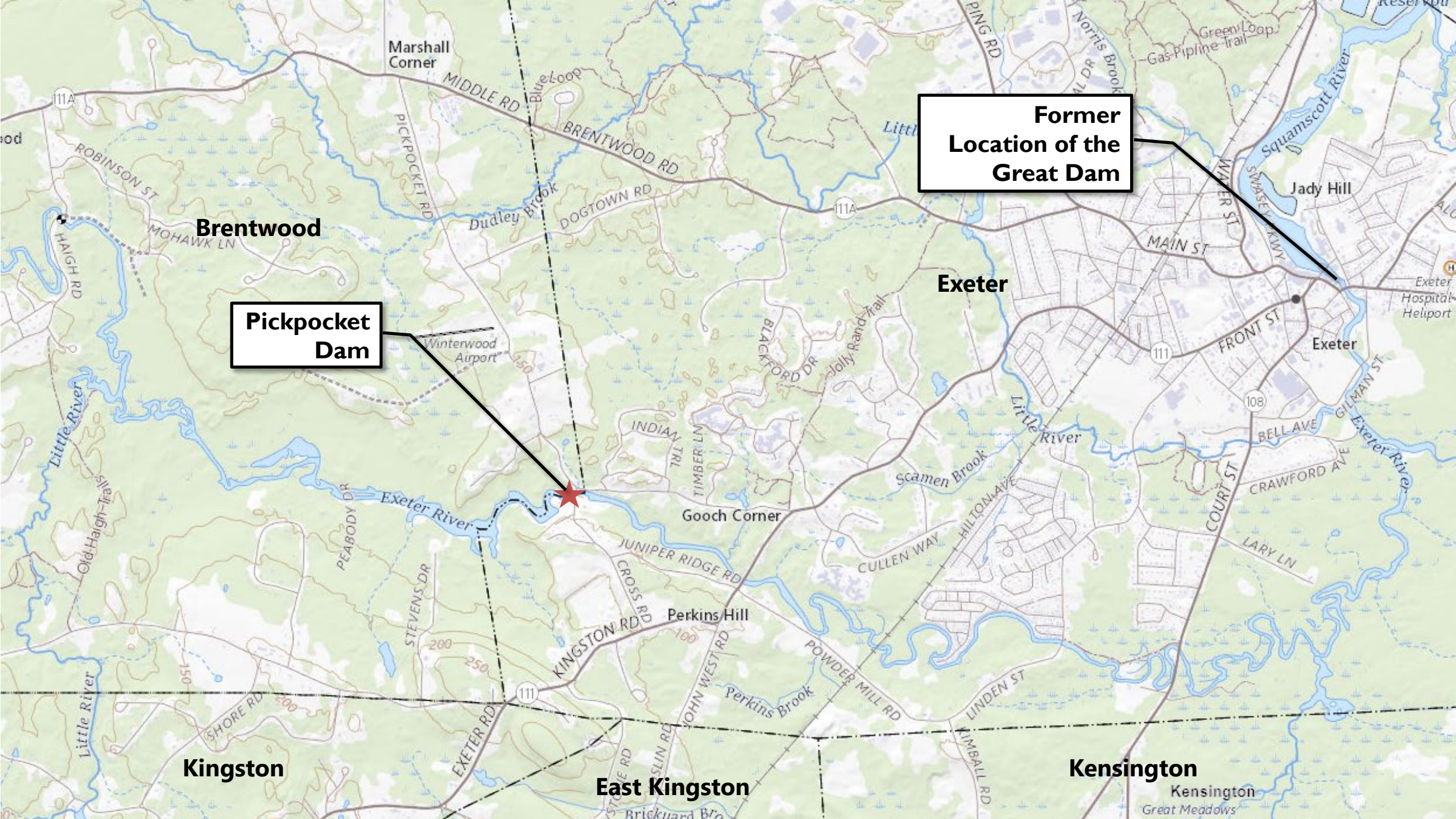
Project Funding

- 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.

Agenda

- Dam Overview
- Preliminary Investigations
- Preliminary Cost Estimates
- NOAA Grant
- Questions


Former Location of the Great Dam
Pickpocket Dam
Brentwood
Exeter
Kingston
East Kingston
Kensington
Marshall Corner
Gooch Corner
Perkins Hill
Jady Hill
Winterwood Airport
Exeter River
Little River
Squamscott River
Perkins Brook
Scamen Brook
Dudley Brook
MIDDLE RD
BRENTWOOD RD
DOGTOWN RD
PICKPOCKET RD
ROBINSON ST
MOHAWK LN
HAIGH RD
MAIN ST
FRONT ST
WATER ST
SWASEY PKWY
BLACKFORD DR
Jolly Rand Trail
INDIAN TRL
TIMBER LN
JUNIPER RIDGE RD
CROSS RD
KINGSTON RD
EXETER RD
JOHN WEST RD
POWDER MILL RD
LINDEN ST
KIMBALL RD
CULLEN WAY
HILTON AVE
COURT ST
BELL AVE
CRAWFORD AVE
GILMAN ST
LARY LN
PEABODY DR
STEVENS DR
SHORE RD
Old Haigh Trail
Green Loop
Gas Pipeline Trail
Exeter Hospital Heliport
Great Meadows
111A
111
108

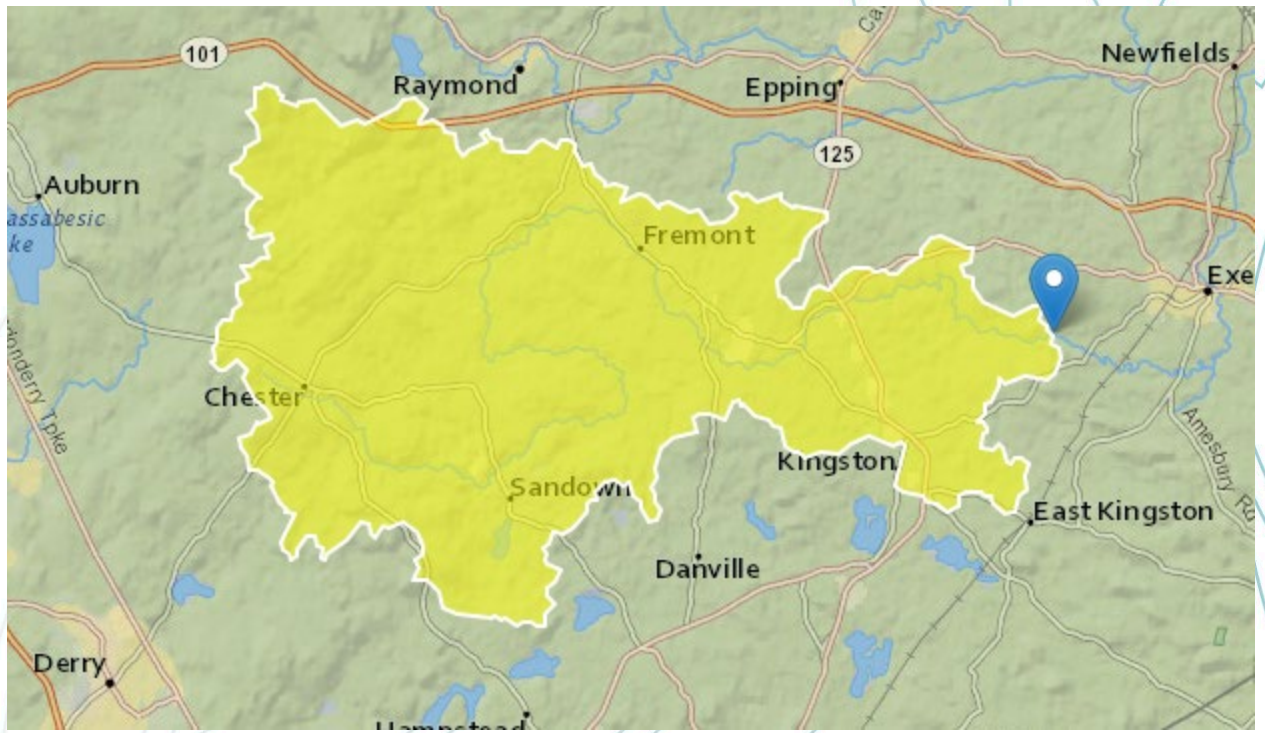
Height – 15 Feet

Length – 230 Feet

Main Spillway Length – 130 Feet

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)	

Alternatives Development

- Dam Stabilization (stabilize abutments, rock anchors, overbank armoring, etc.)
- Dam Modification (partial removal, lowering spillway)
- Dam Modification (spillway extension/Raising abutments)
- Dam Reclassification (purchase downstream affected properties)
- Dam Removal and River Restoration

Preliminary Investigation - Dam Alternatives

Existing Conditions

Alt 1: Increase abutment height to pass the design storm

Alt 1a: Remove sediment island + above alterations

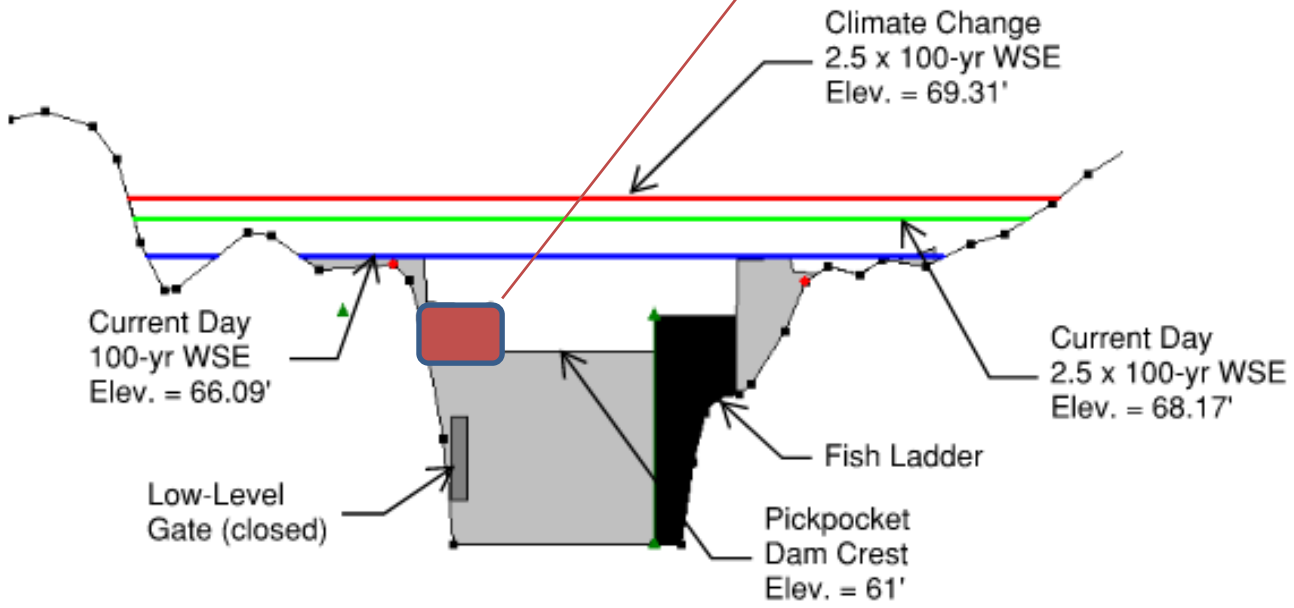
Alt 2: Add a second abutment to pass the design storm.

Alt 2a: Remove sediment island + above alterations

Alt 3: Remove the dam & fish weir

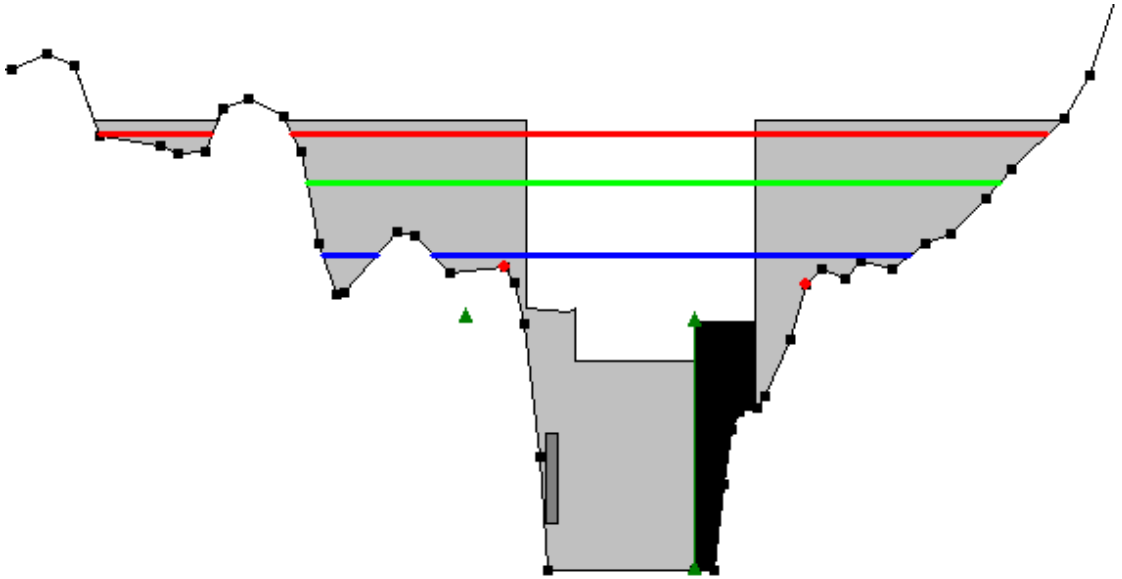
Existing Conditions

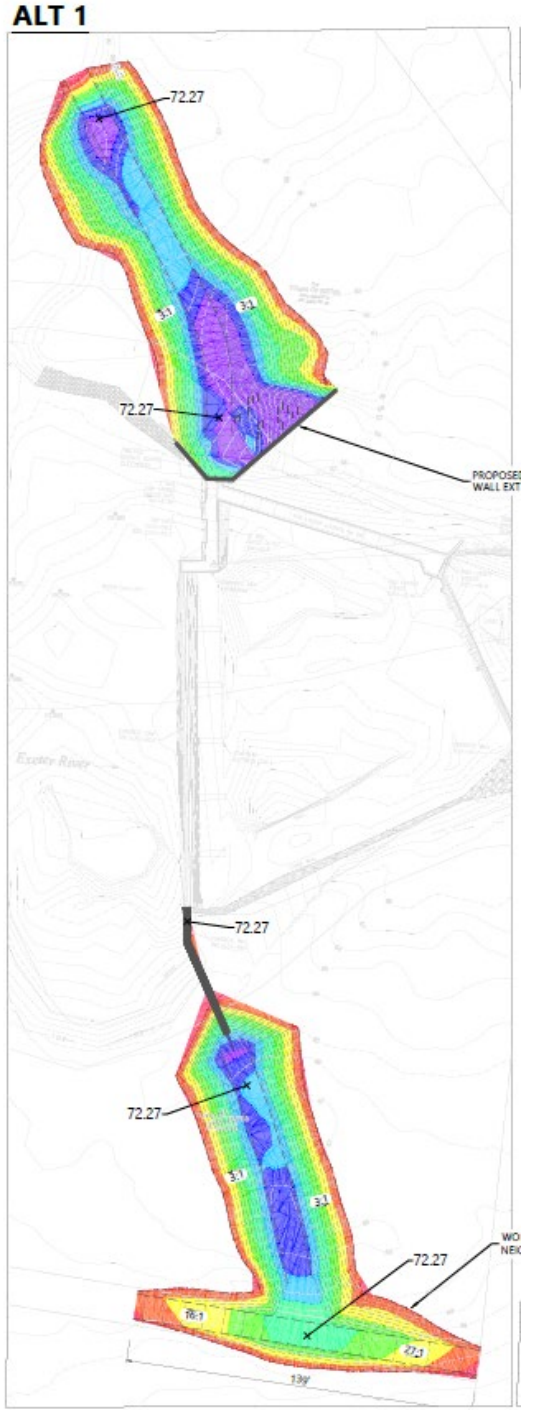
- Existing Abutment Elevation: 66.00
- Current dam consists of a crest, abutment, fish weir and ladder
- Portion of existing crest is obstructed by a sediment island



Alt 1: Increase Abutment Height

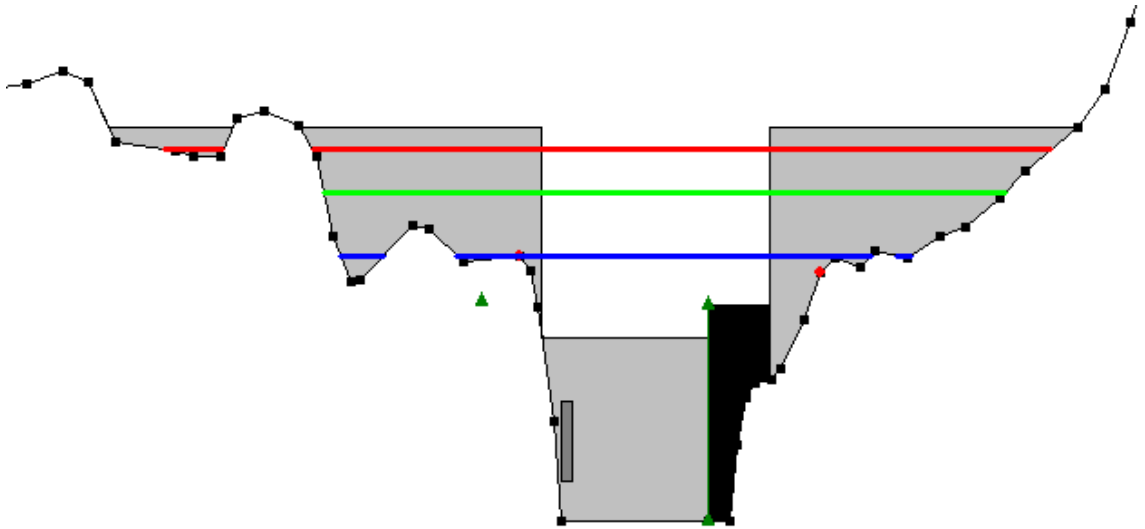
- Regulatory - Minimum Abutment Elevation: 69.96’ **(+3.96)**
- Climate Change - Minimum Abutment Elevation: 72.27’ **(+6.27)**
- Creates an increase in the 100-yr flood elevation (+0.16)
- No change to crest elevation & sediment island
- Impacts two abutting parcels, Requires raising driveway 1.2’ R(3.6’ CC)

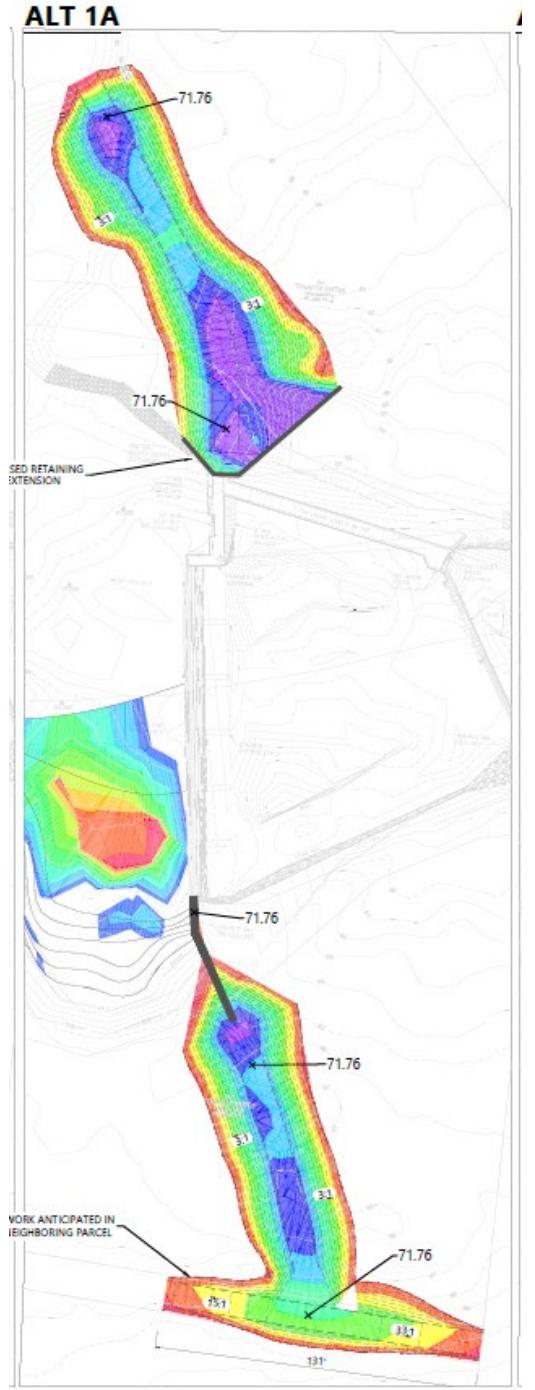




Alt 1A: Increase Abutment Height, and Remove Sediment Island

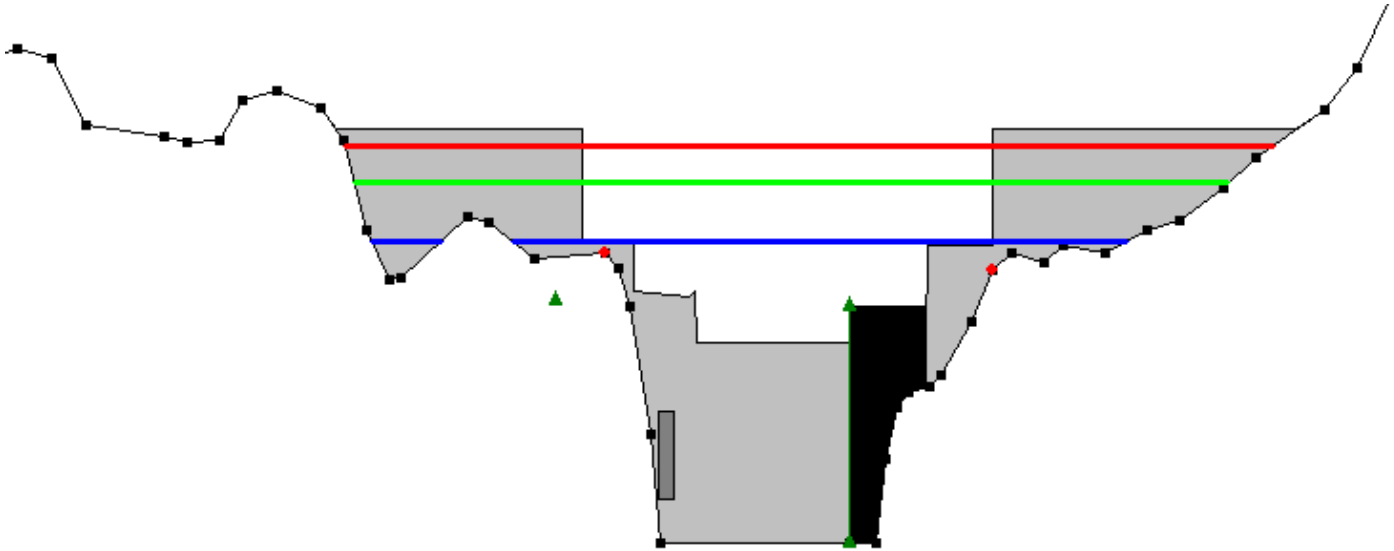
- Regulatory – Minimum Abutment Elevation: 69.33’ **(+3.33)**
- Climate Change - Minimum Abutment Elevation: 71.76’ **(+5.76)**
- Creates a decrease in the 100-yr flood elevation (-0.35)
- No change to crest elevation
- Impacts two abutting parcels, Requires raising driveway 0.6’ R(3.1’ CC)

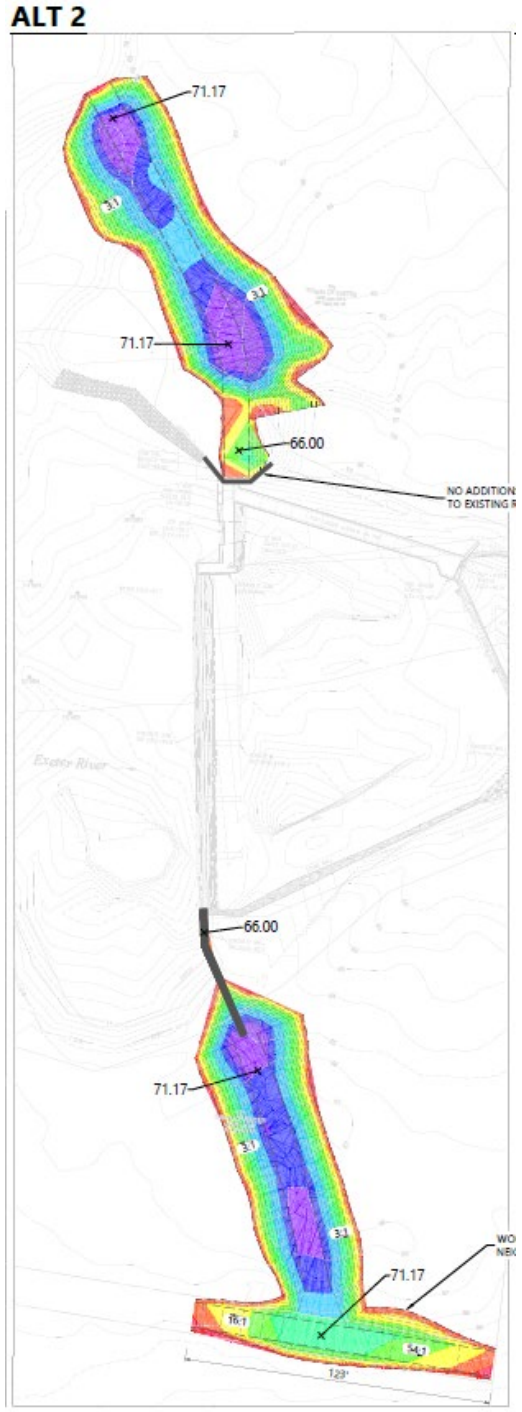




Alt 2: Add Second Abutment

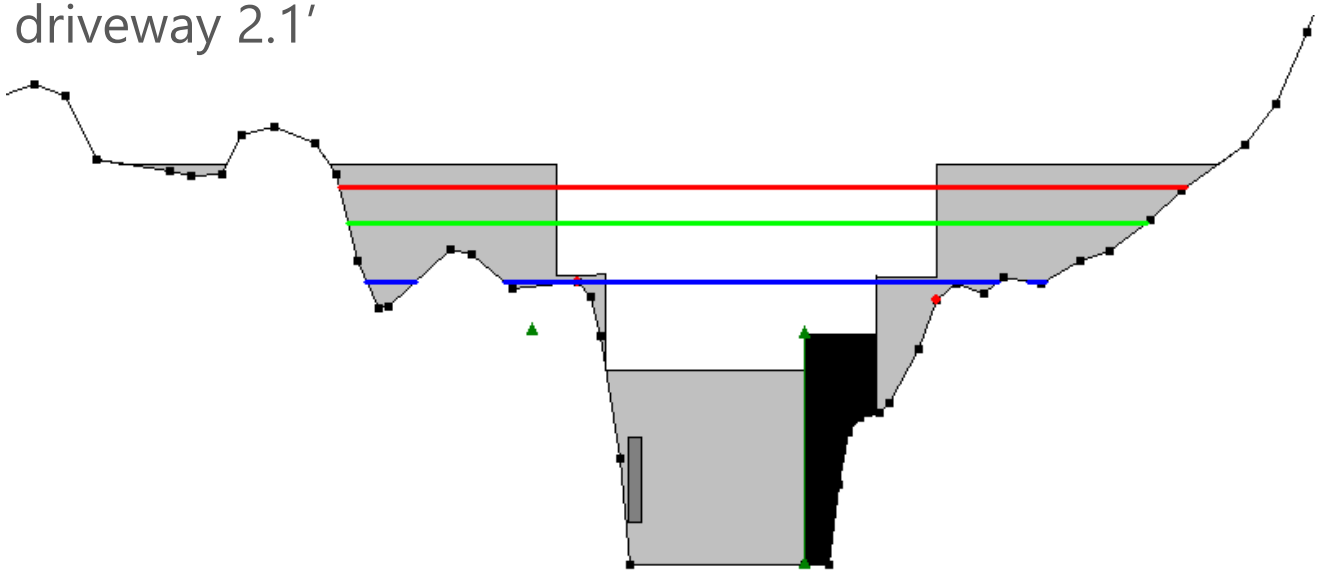
- Regulatory - Minimum Second Abutment Elevation: 69.24’ **(+3.24)**
- Climate Change - Minimum Second Abutment Elevation: 71.17’ **(+5.17)**
- Creates an increase in the 100-yr flood elevation (+0.13)
- No change to sediment island, crest or existing abutment elevations
- Impacts two abutting parcels, Requires raising driveway 0.6’ R(2.5’ CC)

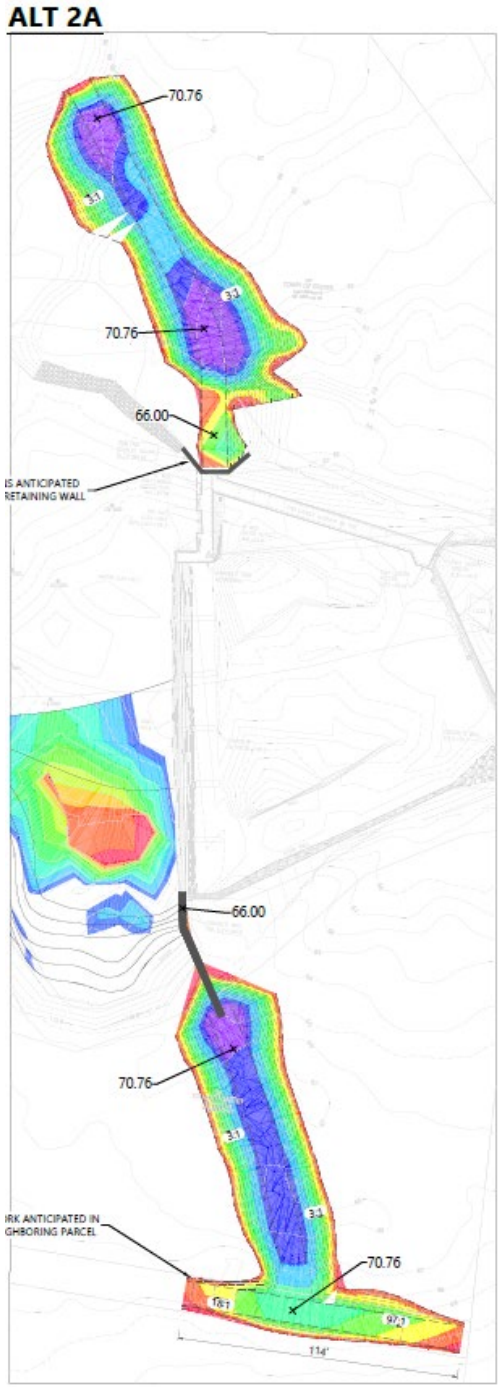




Alt 2A: Add Second Abutment, and Remove Sediment Island

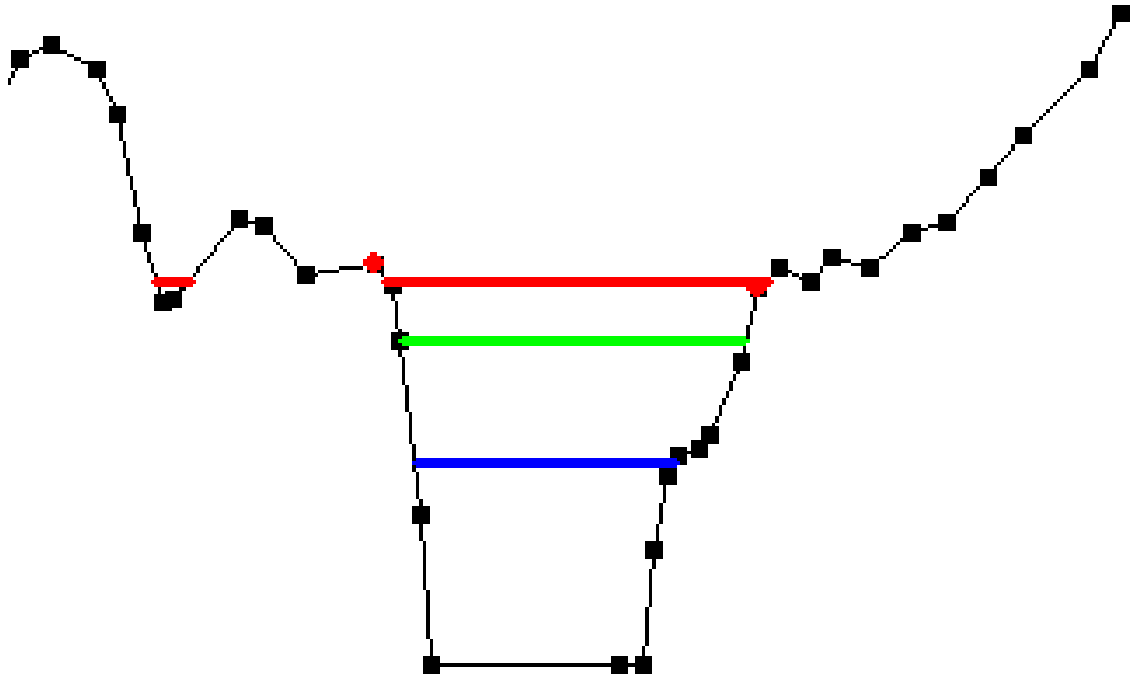
- Regulatory - Minimum Second Abutment Elevation: 68.82’ **(+2.82)**
- Climate Change - Minimum Second Abutment Elevation: 70.76’ **(+4.76)**
- Creates a decrease in the 100-yr flood elevation (-0.35)
- No change to crest or existing abutment elevations
- Designing for Climate change impacts two abutting parcels, Requires raising driveway 2.1’





Alt 3: Dam Removal

- Creates a decrease in the 100-yr flood elevation (-7.87)
- Removal of crest, abutments, fish weir, sediment island
- Reduce normal water levels to just downstream of Haigh Rd in Brentwood ~3.5 miles



Preliminary Dam Alternative Cost Estimates

Present Value Total Costs (30 Year Analysis)

Alternative	Initial Capitol Cost (Design, permitting, and construction)	O&M and Replacement Costs	Total
Alt 1: Increase Abutment Heights	$1,014,000	$568,000	**$1,582,000**
Alt 1A: Increase Abutment Heights/ Remove Sediment Island	$1,192,000	$592,000	**$1,784,000**
Alt 1 -CC: Increase Abutment Heights	$1,289,000	$682,000	**$1,971,000**
Alt 1A - CC: Increase Abutment Heights/ Remove Sediment Island	$1,455,000	$690,000	**$2,145,000**
Alt 2: Add Second Abutment	$920,000	$530,000	**$1,450,000**
Alt 2A: Add Second Abutments/ Remove Sediment Island	$1,020,000	$571,000	**$1,591,000**
Alt 2 - CC: Add Second Abutment	$1,119,000	$612,000	**$1,731,000**
Alt 2A - CC: Add Second Abutments/ Remove Sediment Island	$1,297,000	$685,000	**$1,982,000**
Alt 3: Full Dam Removal	$1,063,000	$0	**$1,063,000**

NOAA Fisheries Grant

Restoring Fish Passage through Barrier Removal

Opportunity Number: NOAA-NMFS-HCPO-2023-2008056

- **Objective:** To support **fish passage** for native migratory and **sea-run fish in coastal ecosystems**, including the Great Lakes. Projects selected through this funding opportunity will result in the **removal of dams** and other in-stream barriers to fish passage. Target fish species under this funding opportunity are those native species that spend a portion of their lives in **rivers** and/or ponds and a portion in the **ocean**, estuaries or Great Lakes.
- **Additional emphasis:** Proposals that address community resilience
- **Eligibility**: institutions of higher education; non-profit and for-profit organizations; U.S. territories; and state, **local**, and Native American tribal governments.
- There is ***no*** non-federal matching or cost-sharing ***requirement*** for these funding opportunities.
- Applicants should anticipate the earliest start date for awards will be **July 1, 2024.**

Competition	Anticipated Funding Level	Range of Funding
National Fish Passage	up to $175M	will not accept proposals with a federal request for **less than $1M or more than $20M** over the award period, per proposal.

Feasibility Study - Underway

- Evaluating impacts of the various alternatives, including:
  - Cultural resources
  - Rare species
  - Fish passage
  - Wetlands
  - Recreation
  - Invasive species
  - Water supplies
  - Water quality
  - Sediment transport
  - Infrastructure

Discussion