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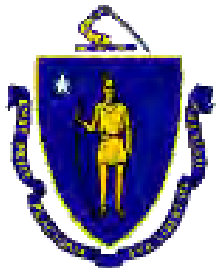
Watertown Dam Removal Alternatives Analysis Study
Second Community Meeting

dcr Massachusetts

Wednesday, September 25th, 2024

Massachusetts Department of Conservation and Recreation (DCR)



Commonwealth of Massachusetts

Governor

Maura Healey

Lieutenant Governor

Kim Driscoll

Energy and Environmental Secretary

Rebecca Tepper

Department of Conservation and Recreation Commissioner

Brian Arrigo

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To protect, promote and enhance our common wealth of natural, cultural and recreational resources for the well-being of all.

Study Purpose:

Develop conceptual design alternatives to breach, lower, and/or remove the Watertown Dam

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Meeting Agenda

1. Review of Watertown Dam Setting
2. Charles River Fisheries
3. Dam Removal Alternatives and Conceptual Designs
4. General Dam Removal Process
5. Hydrologic and Hydraulic Analysis of Dam Removal Alternatives
6. Groundwater Impacts
7. Sediment Management Assessment
8. Questions and Comments

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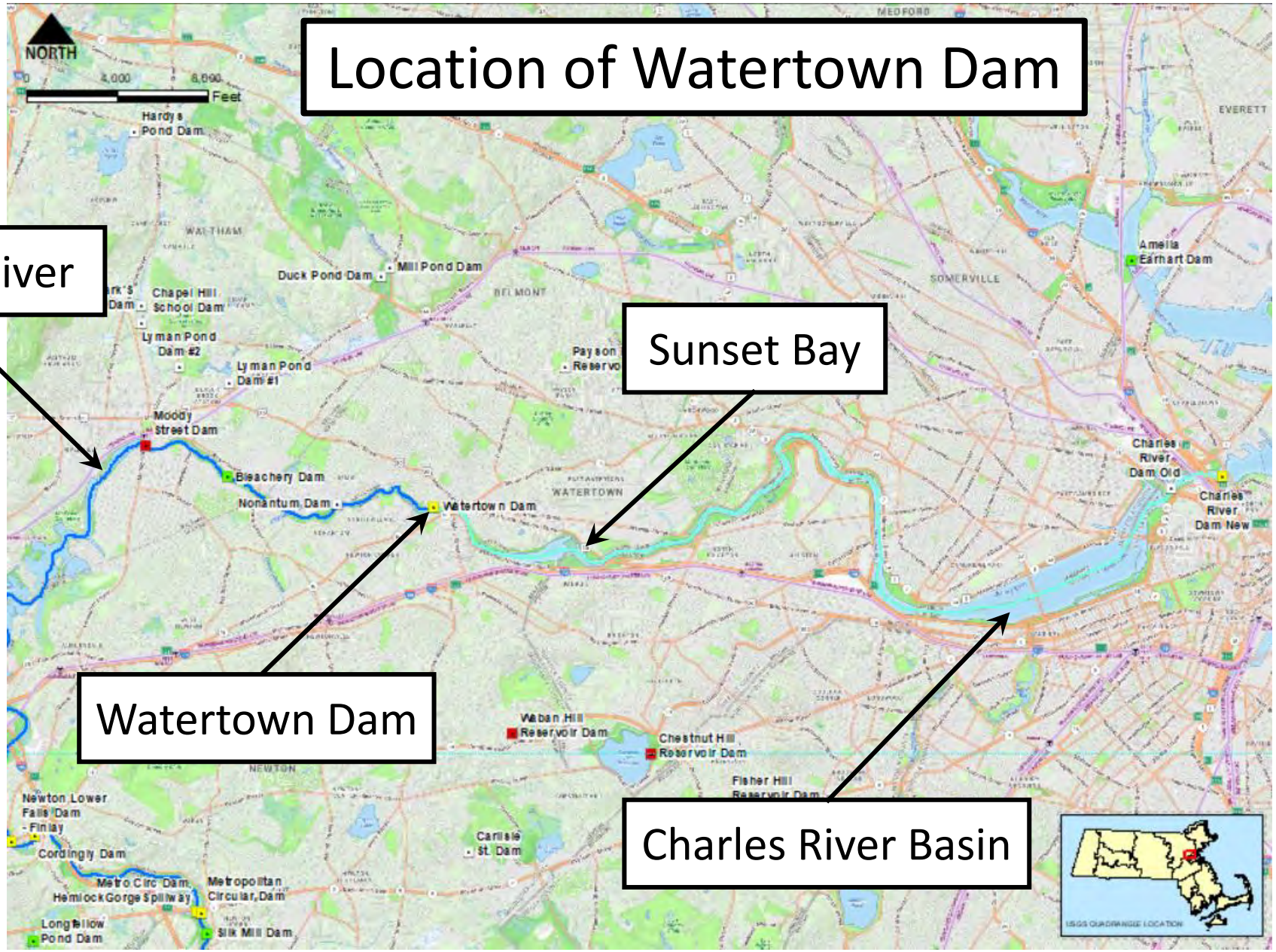
WATERTOWN DAM SETTING



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Overview of Watertown Dam

- Current Configuration:
  - Spillway (180 feet)
  - North (Left) Earth Embankment
  - South (Right) Earth Embankment Dike
  - Fish Ladder
- Current Purpose:
  - Aesthetic
  - Recreation
  - Flood Control

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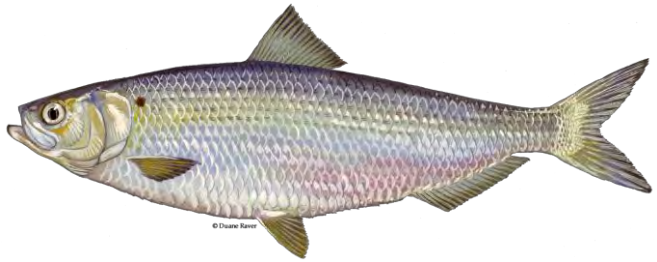
Diadromous Fish Passage at Watertown Dam

- Primary Target Species:
  - American Shad
  - Alewife and Blueback Herring (i.e. River Herring)
  - Rainbow Smelt
  - American Eel
- DMF Studies/Efforts in the Charles River:
  - Spawning Habitat Survey
  - Operations at the Charles River Locks
  - Fishway Surveys
  - Watertown Dam Video Monitoring
  - American Shad stocking
  - American Shad Acoustic Monitoring

Rainbow Smelt

American Shad

Alewife



Blueback Herring

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American Eel

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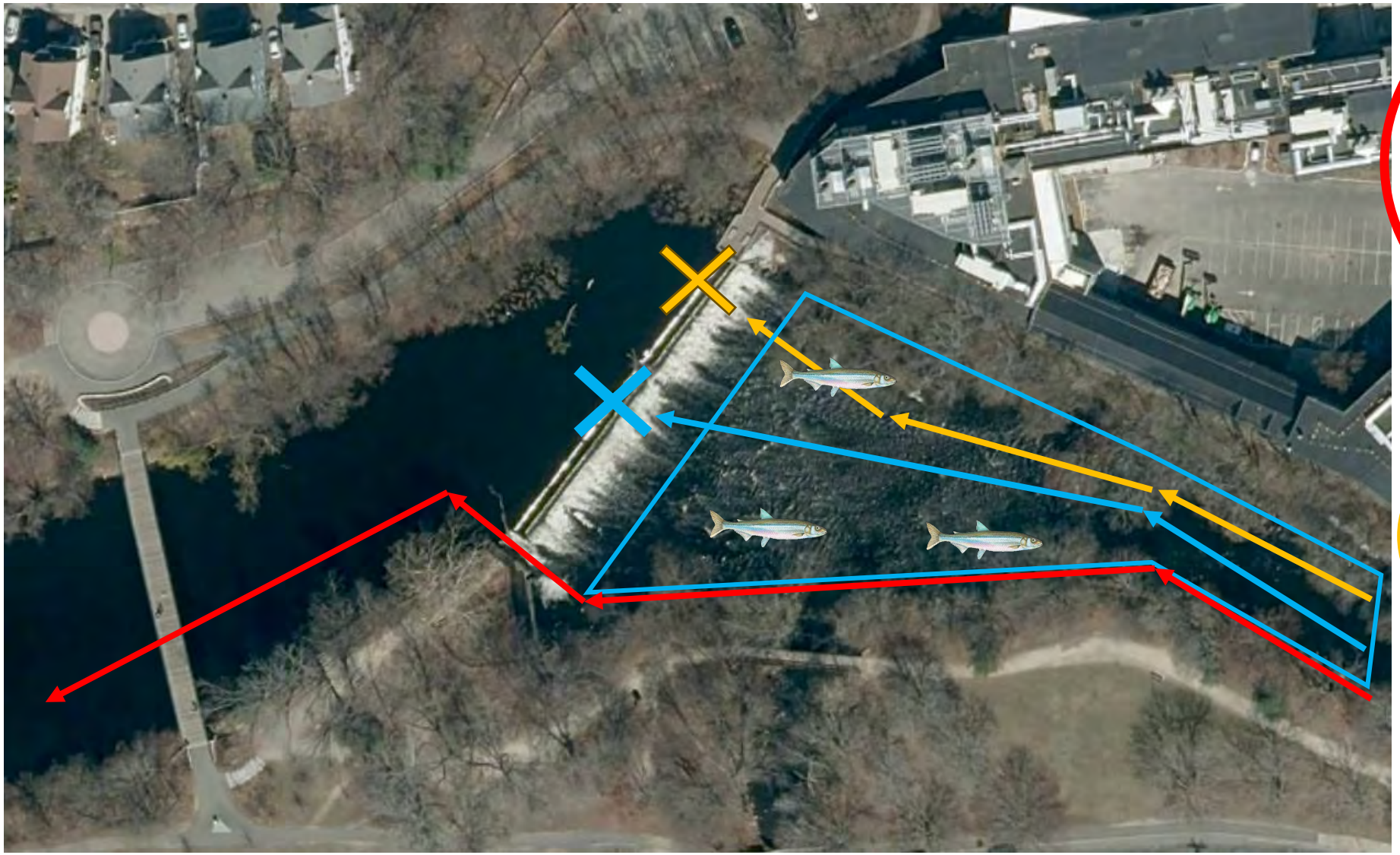
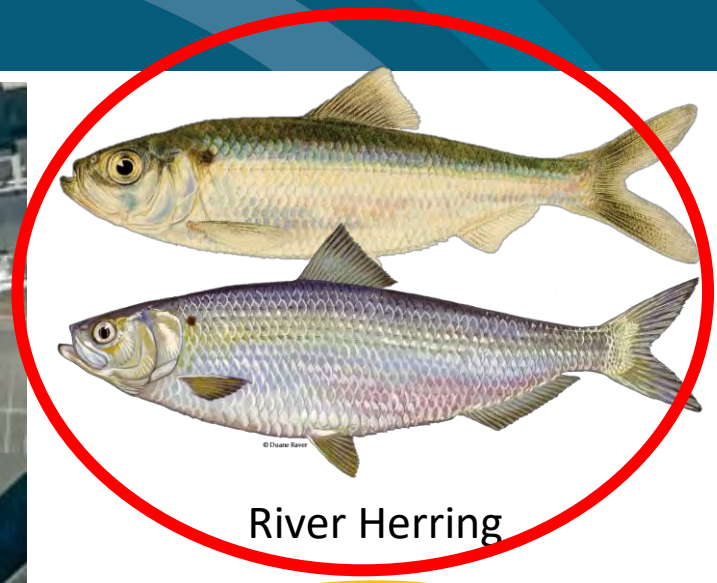
FRESHWATER FISH TOO!





River Herring

American Shad

Rainbow Smelt

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Diadromous Fish Passage at Watertown Dam

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Dam Removal Design Alternatives

1. **<u>Partial Breach</u>** (50 ft Breach in Spillway)
   - Demolish portion of the spillway adjacent to left (north) bank sufficient to provide for 50-foot-wide river channel.
   - Leave remaining portion of spillway in place
   - Backfill or remove existing fish ladder
   - Left (north) abutment left as viewing platform

2. **<u>"Full" Removal</u>** (Remove fundamentally all of the Spillway)
   - Remove entire existing spillway (other than left side "buttress")
   - Shape new channel to connect to existing d/s primary channel
   - Remove fish ladder and regrade right (south) bank.
   - Left (north) abutment left as viewing platform

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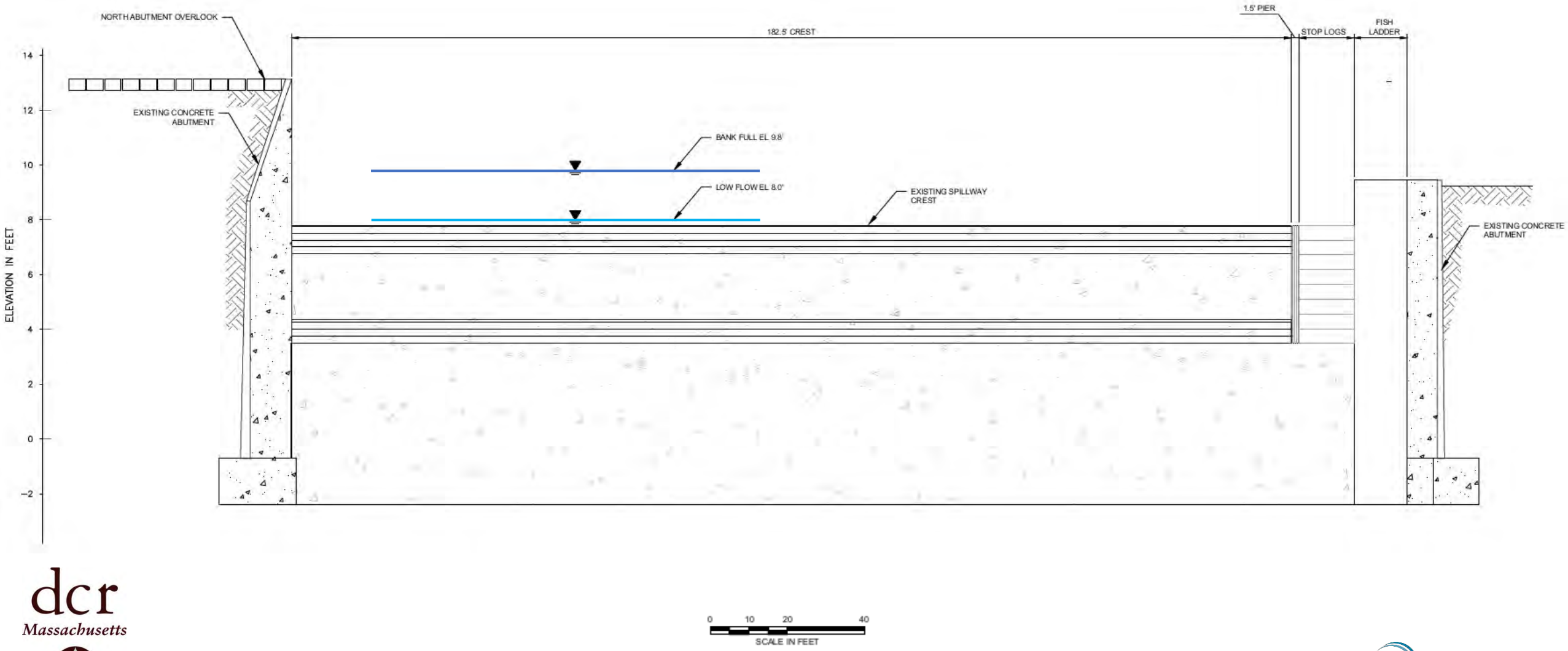
Dam Removal Design Alternative Requirements

- Support public use and enjoyment of site and river
- Protect public safety
- Provide improved fish passage
  - Over appropriate range of flows
- Decommission existing dam as jurisdictional structure
- Address sediment management concerns

Existing Conditions



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DAM REMOVAL PROCESS

A similar run-of-river dam removal project in Massachusetts

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DAM REMOVAL PROCESS

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DAM REMOVAL PROCESS

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DAM REMOVAL PROCESS

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DAM REMOVAL PROCESS

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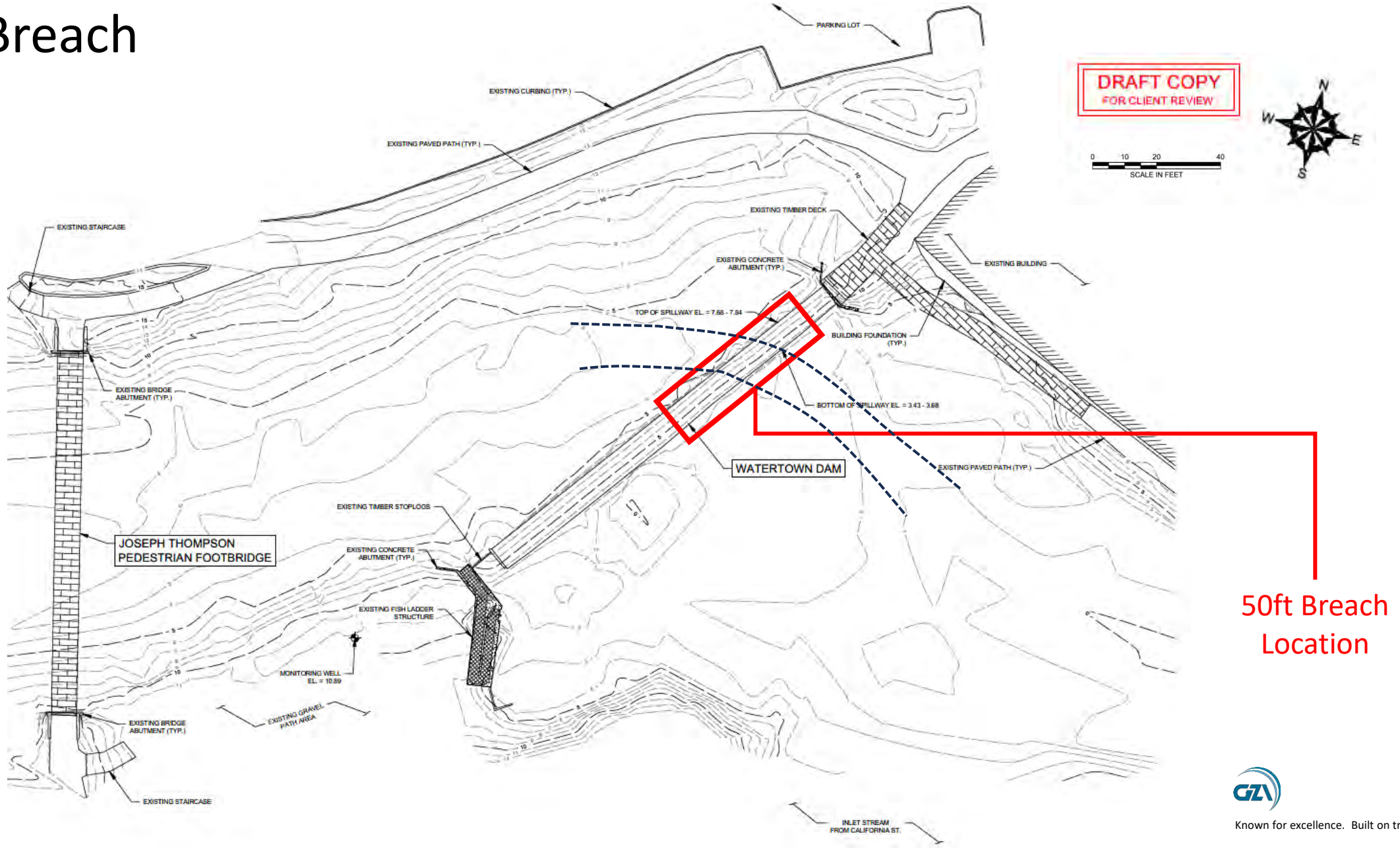
Partial Breach



50ft Breach Location

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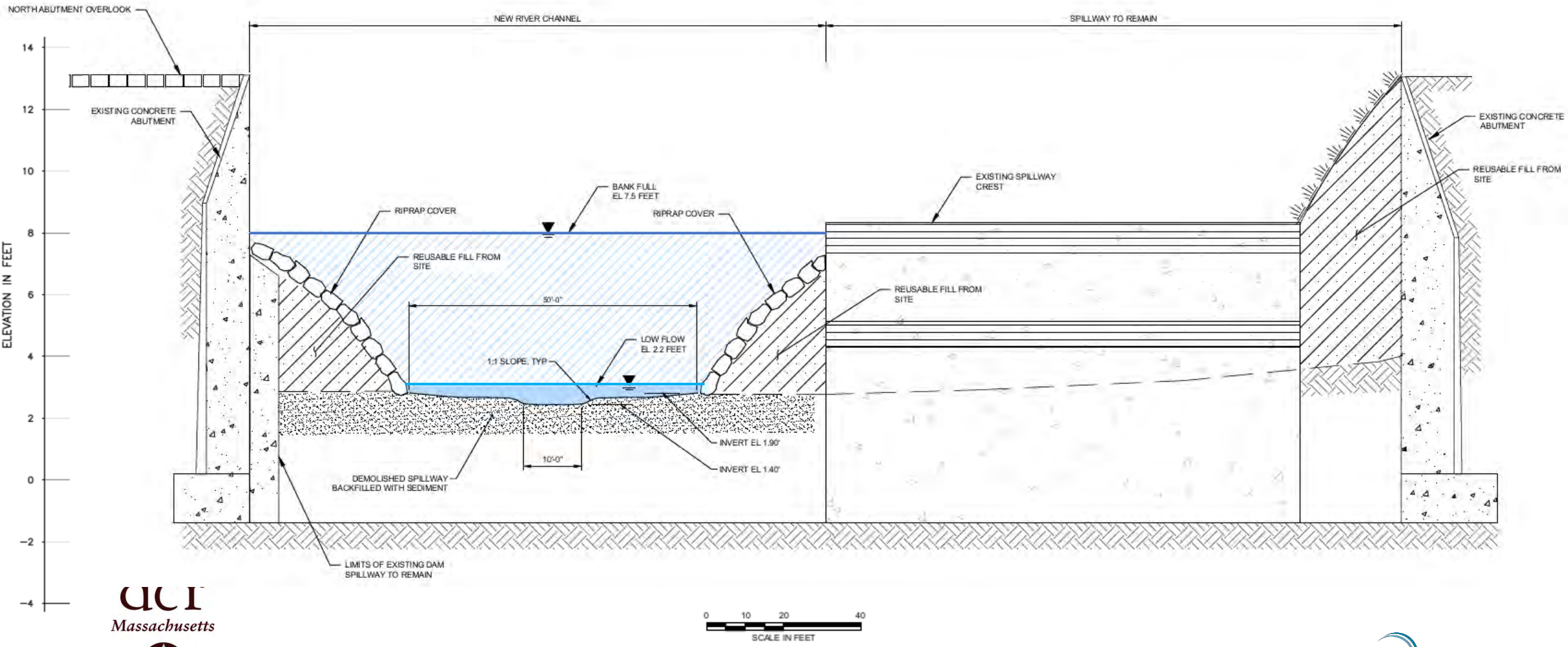
DESIGN ALTERNATIVES

Partial Breach



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DESIGN ALTERNATIVES

Existing Conditions
Low Fish Passage
Flow

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DESIGN ALTERNATIVES

Partial Breach
Low Fish Passage
Flow

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DESIGN ALTERNATIVES

Existing Conditions
Median Fish
Passage Flow

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DESIGN ALTERNATIVES

Partial Breach
Median Fish
Passage Flow

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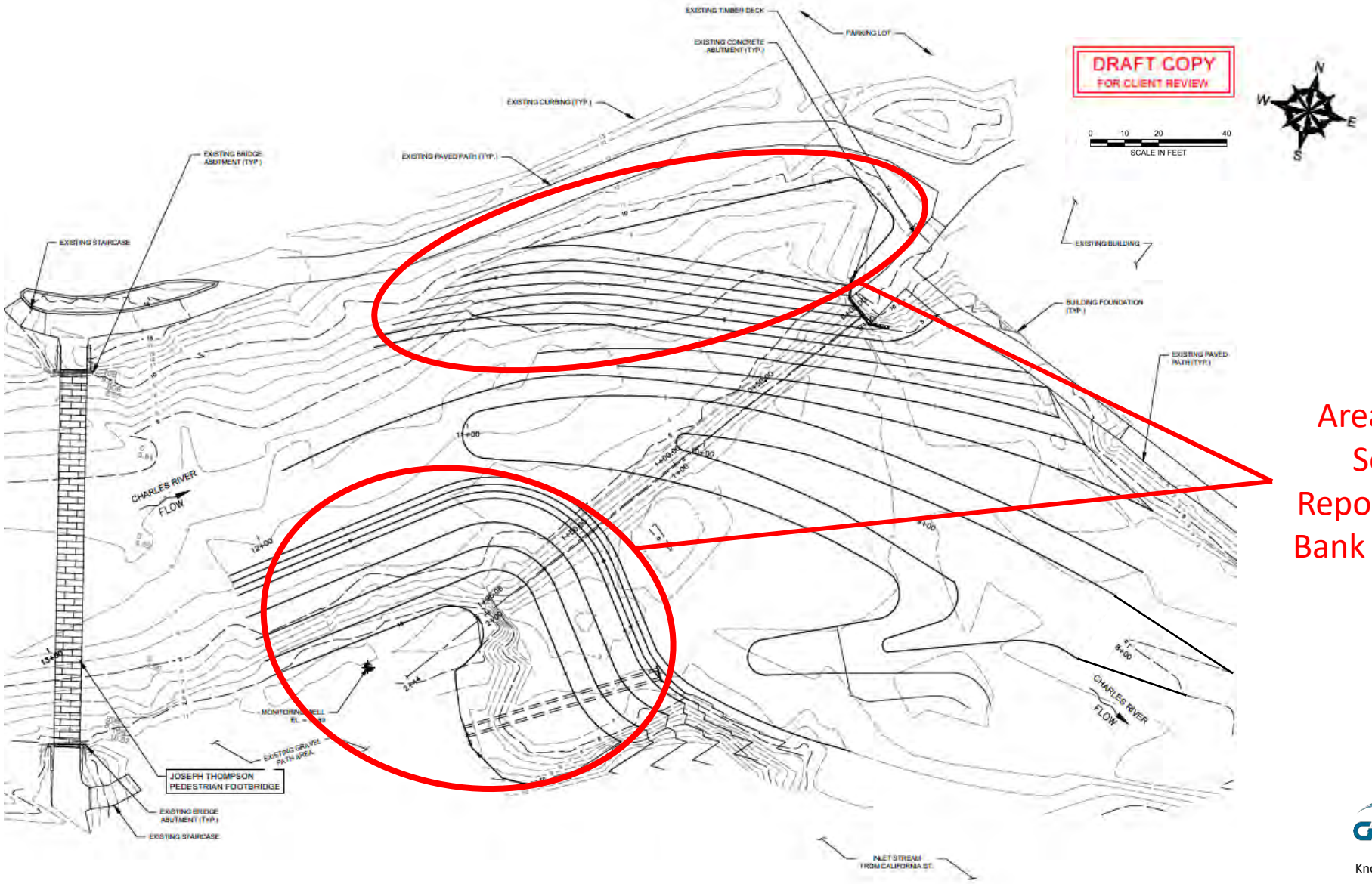
Partial Breach Example

"Full" Removal



Area of Onsite Sediment Repositioning for Bank Stabilization

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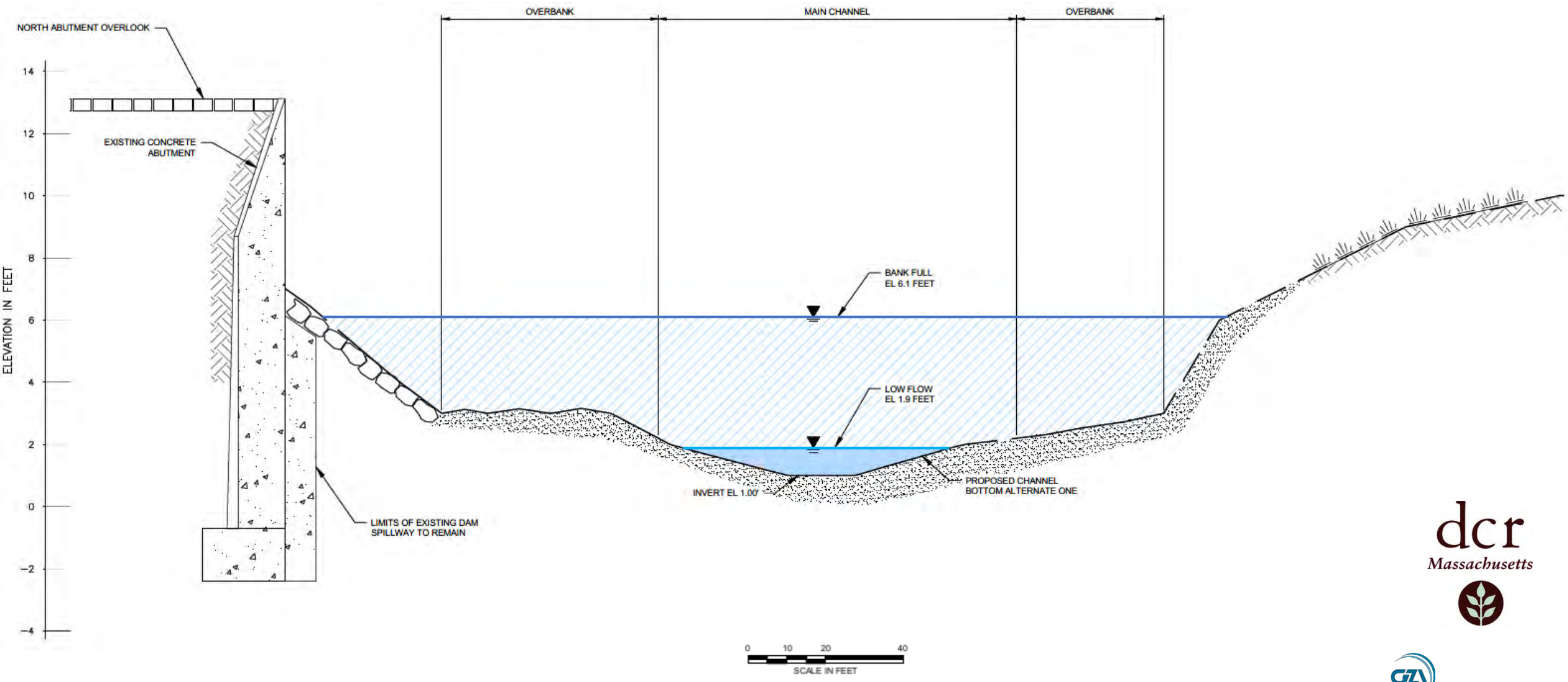
DESIGN ALTERNATIVES

"Full" Removal



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DESIGN ALTERNATIVES

Existing Conditions
Low Fish Passage
Flow

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DESIGN ALTERNATIVES

Full Removal
Low Fish Passage
Flow

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DESIGN ALTERNATIVES

Existing Conditions
Median Fish
Passage Flow

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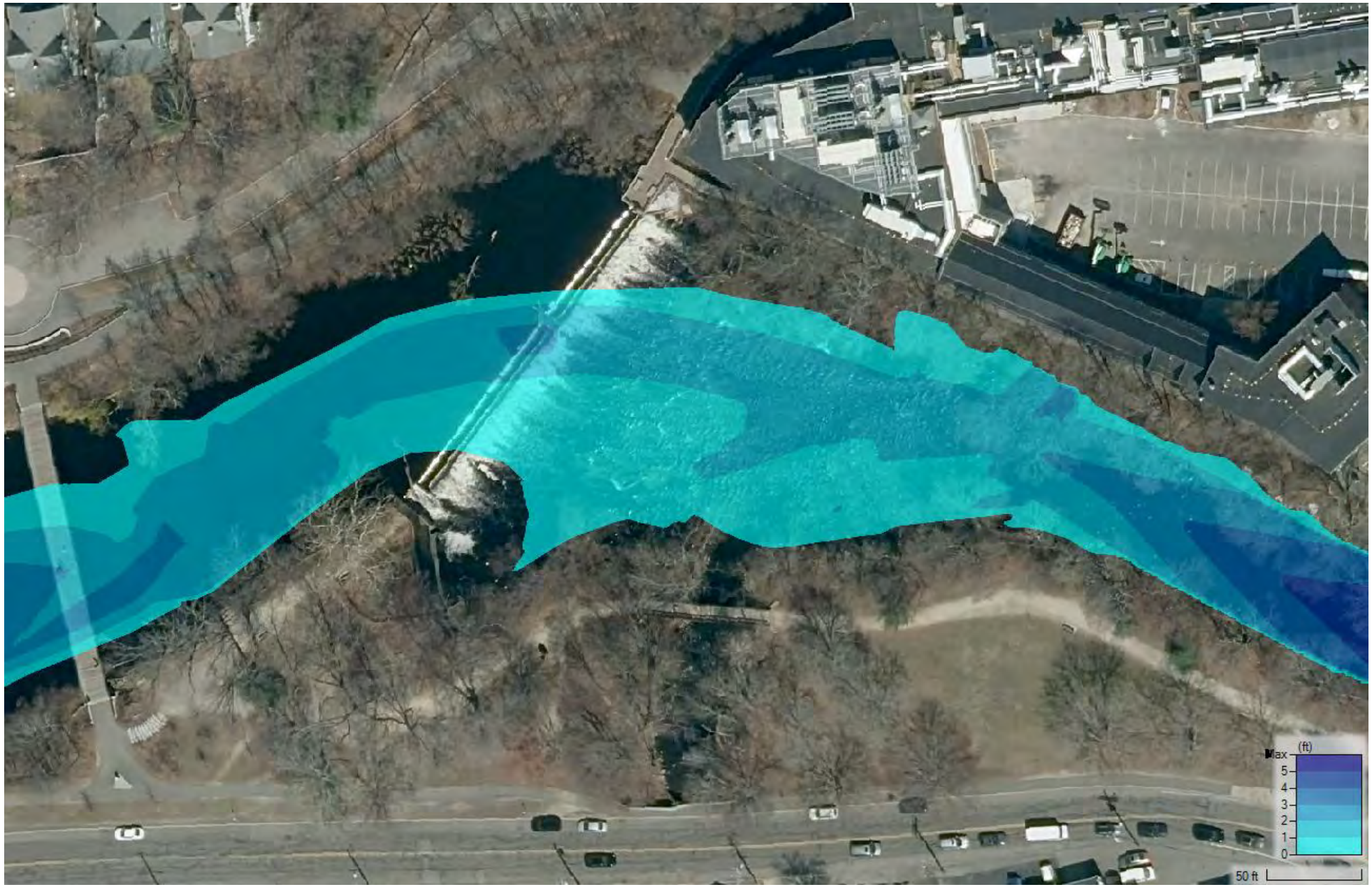
DESIGN ALTERNATIVES



Full Removal
Median Fish
Passage Flow

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"Full" Removal Renderings – Northern Platform View

Design Alternative – Pros and Cons

Partial Removal (50 ft Breach in Spillway)

Pros:

- Allow for passage of American Shad and other fish species
- Less material to move (less impact and lower construction costs)
- Remaining structure likely Non-Jurisdictional

Cons:

- Re-impounds during flood flows
- Not full habitat restoration
- High velocities are worse for fish passage and likely impact smelt spawning habitat

"Full" Removal (Remove Most of the Spillway)

Pros:

- Full habitat restoration – more "natural"
- Lower velocities more advantageous to fish passage (particularly rainbow smelt)
- No re-impoundment during flood flows

Cons:

- More material to move (higher construction costs and wider impacts)
- May still impact downstream smelt spawning habitat

POTENTIAL GROUNDWATER IMPACTS

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Department of Conservation and Recreation
Watertown Dam Removal Alternatives Analysis
California Street
Watertown, MA

BORING NO.: B-1
SHEET: 1 of 2
PROJECT NO: 01.0177598.00
REVIEWED BY: DJS

Drilling Co.: New England Boring Contractors	Type of Rig: Truck	Boring Location: See Plan	H. Datum:
Foreman: Ken Smith	Rig Model: GT6	Ground Surface Elev. (ft.): 10.9	V. Datum: NAVD88
Logged By: H. McLeod	Drilling Method: Drive & Wash	Final Boring Depth (ft.): 27.8	
		Date Start - Finish: 5/31/2024 - 5/31/2024	

Auger/Casing Type: HW	Sampler Type: Split Spoon	
I.D./O.D.(in): 4/4.5	I.D./O.D (in.): 1.375/2	
Hmr Weight (lb.): 140	Sampler Hmr Wt (lb): 140	
Hmr Fall (in.): 30	Sampler Hmr Fall (in): 30	
Other: Auto Hammer	Other: Auto Hammer	

Groundwater Depth (ft.)

Date	Time	Water Depth	Casing	Stab. Time
5/5/24	9:35	4.5	WELL	5 Days

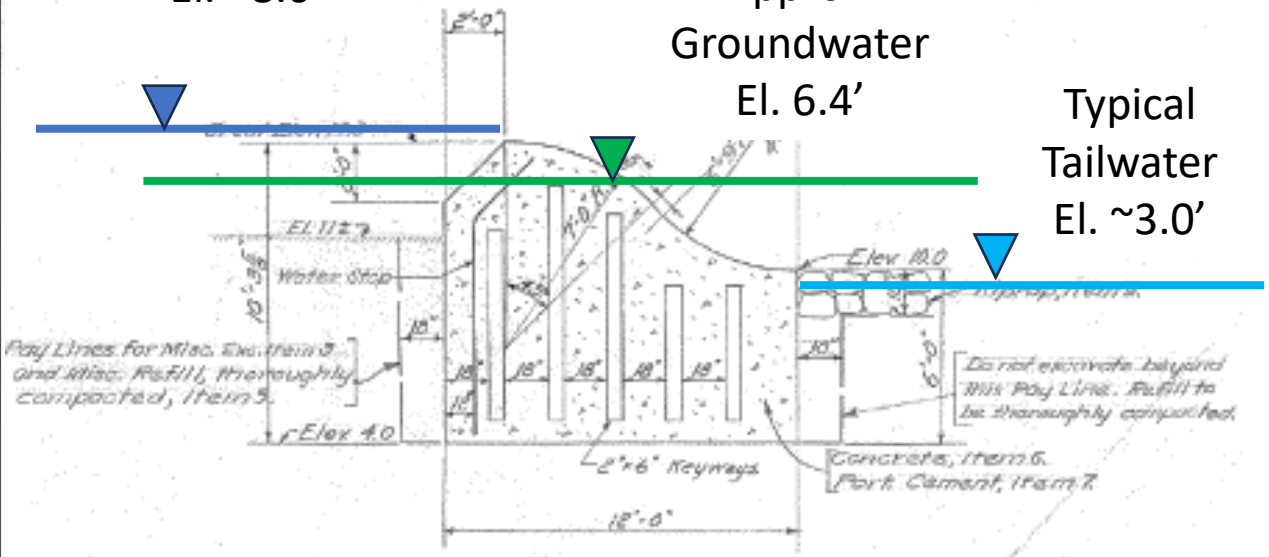
Depth (ft)	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Description Depth (ft)	Stratum Description Elev (ft)
0	S-1	0-2	24	12	6 6 7 8	13	S-1: Medium dense, dark brown, fine to coarse SAND, some Gravel, little Silt, trace Wood.	1			
	S-2	3-4	24	8	5 5 4 6	9	S-2: Loose, dark brown, fine to coarse SAND and GRAVEL, little Silt, trace Coal, trace Wood.				
5	S-3	4-6	24	0	5 5 3 3	8	S-3: No Recovery.			FILL	
	S-4	6-8	24	8	2 10 15 8	25	S-4: Medium dense, dark brown, GRAVEL, and fine to coarse SAND, trace Silt.				
	S-5	8-10	24	16	13 9 14 21	23	S-5A: (Top 10") Dark brown, GRAVEL, some fine to coarse Sand, little Silt, trace Brick.	2		8.4' 2.5'	
10	S-6	10-12	24	14	14 21 19 60	40	S-5B: (Bottom 6") Brown, fine to coarse SAND, some Clayey Silt, trace Gravel.				
	S-7	12-14	24	18	40 25 13 18	38	S-6: Dense, brown to gray, fine to coarse SAND, some Gravel, little Clayey Silt.				
	S-8	14-16	24	14	33 41 59 63	R	S-7A: (Top 11") Brown, fine to coarse SAND and GRAVEL, little Silt.	3			
15	S-9	16-18	24	1	7 24 28 29	52	S-7B: (Bottom 7") Gray, fine to coarse SAND, some Clayey Silt, little Gravel.	4		TILL	
	S-10	18-20	24	18	13 19 25 45	44	S-8: Very dense, brown to gray, fine to coarse SAND and SILT & CLAY, little Gravel.				
	S-11	20-22	24	20	36 63 93 65	R	S-9: Very dense, gray, GRAVEL, little fine to coarse Sand, little Clayey Silt.				
20	S-12	22-23.6	19	19	7 14 41 75/1"	55	S-10: Dense, gray, fine to coarse SAND and SILT & CLAY, some Gravel.	5		23.6' -12.7' 24.2' BOULDER -13.3'	
	S-13	25-27	24	17	19 34 39 43	73	S-11: Very dense, brown, fine to coarse SAND and Clayey SILT, little Gravel.			TILL	
25	S-14	27-27.8	9	8	45 86/3"	R	S-12: Very dense, brown, fine to coarse SAND, some Clayey Silt, little Gravel.	6		27.8' -16.9'	
30							S-13: Very dense, brown, fine to				

Equipment Installed: FLUSH MOUNTED ROAD BOX; Riser (0-5'); Bentonite (1-3'); Sand (3-17'); 2" Well Screen (5-15'); Cuttings (17-27.8')

Typical Headwater El. ~8.0’

Approx. Groundwater El. 6.4’

Typical Tailwater El. ~3.0’



SECTION C-C

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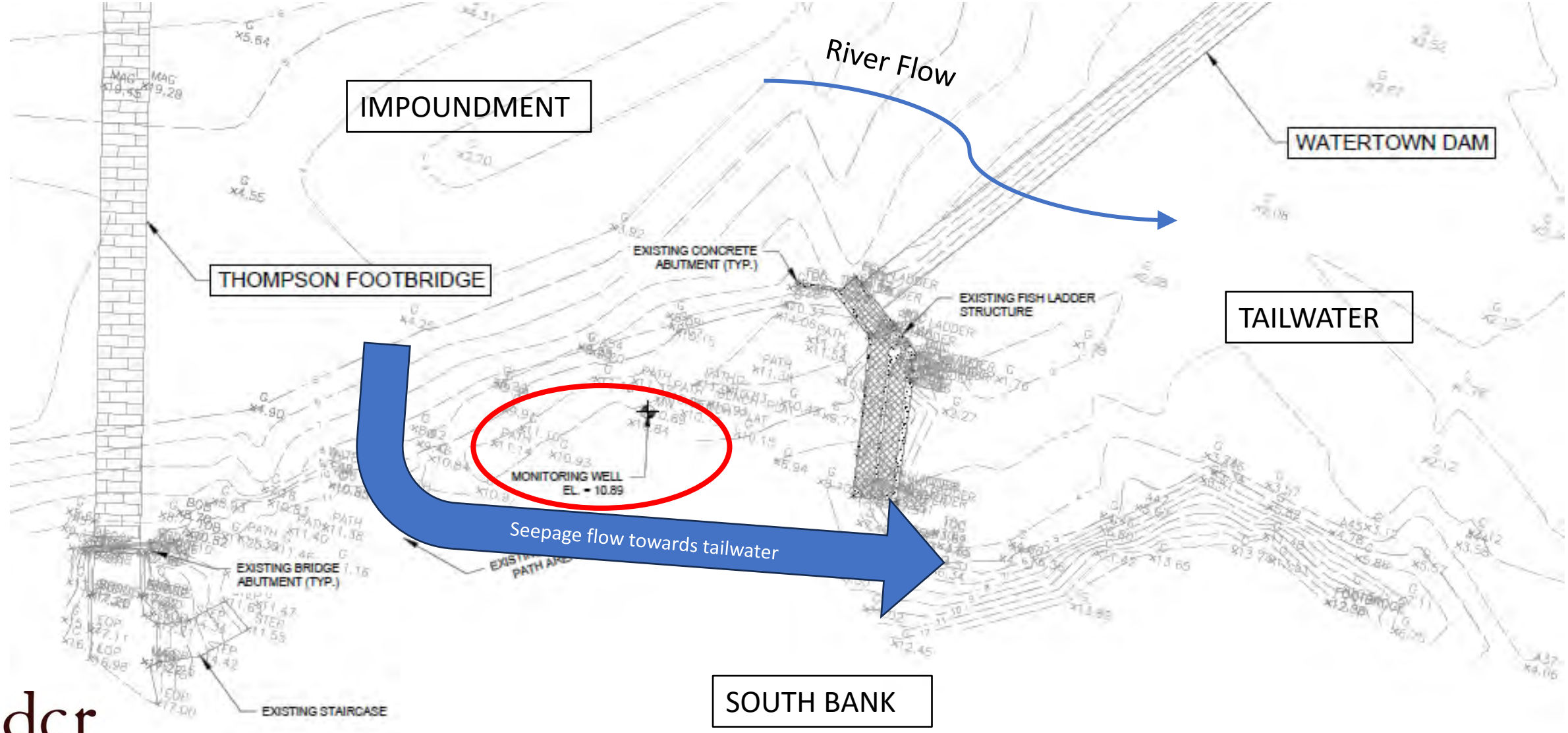
POTENTIAL GROUNDWATER IMPACTS



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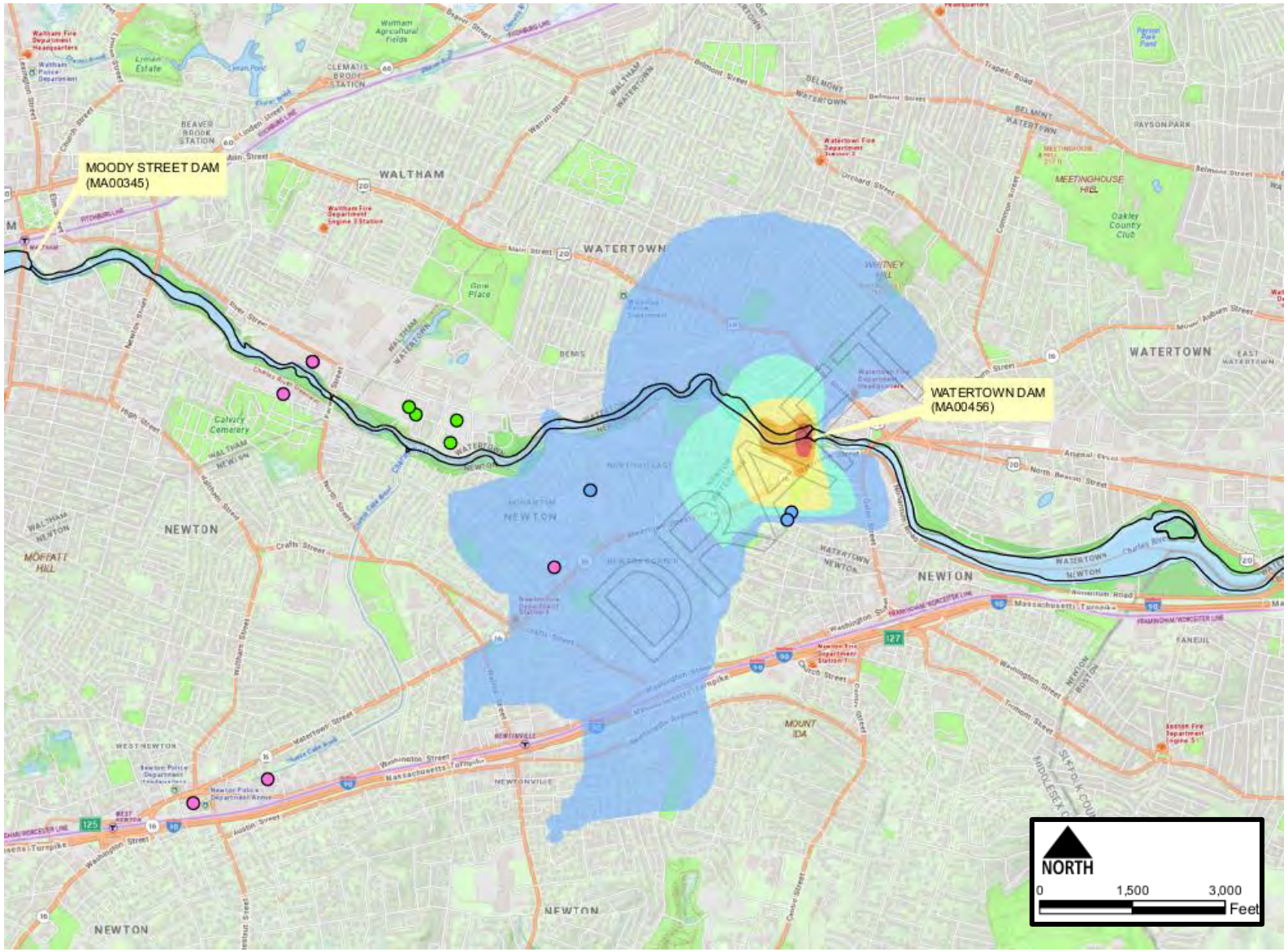
Groundwater Model – Change in Median Groundwater Surface



LEGEND

Charles River Banks

OHM Release Contamination Source

- Landfill
- Manufacturing
- Unspecified

Decrease in Groundwater (ft)

- 0.01 – 1.0
- 1.0 – 2.0
- 2.0 – 3.0
- 3.0 – 4.0
- 4.0 – 5.0

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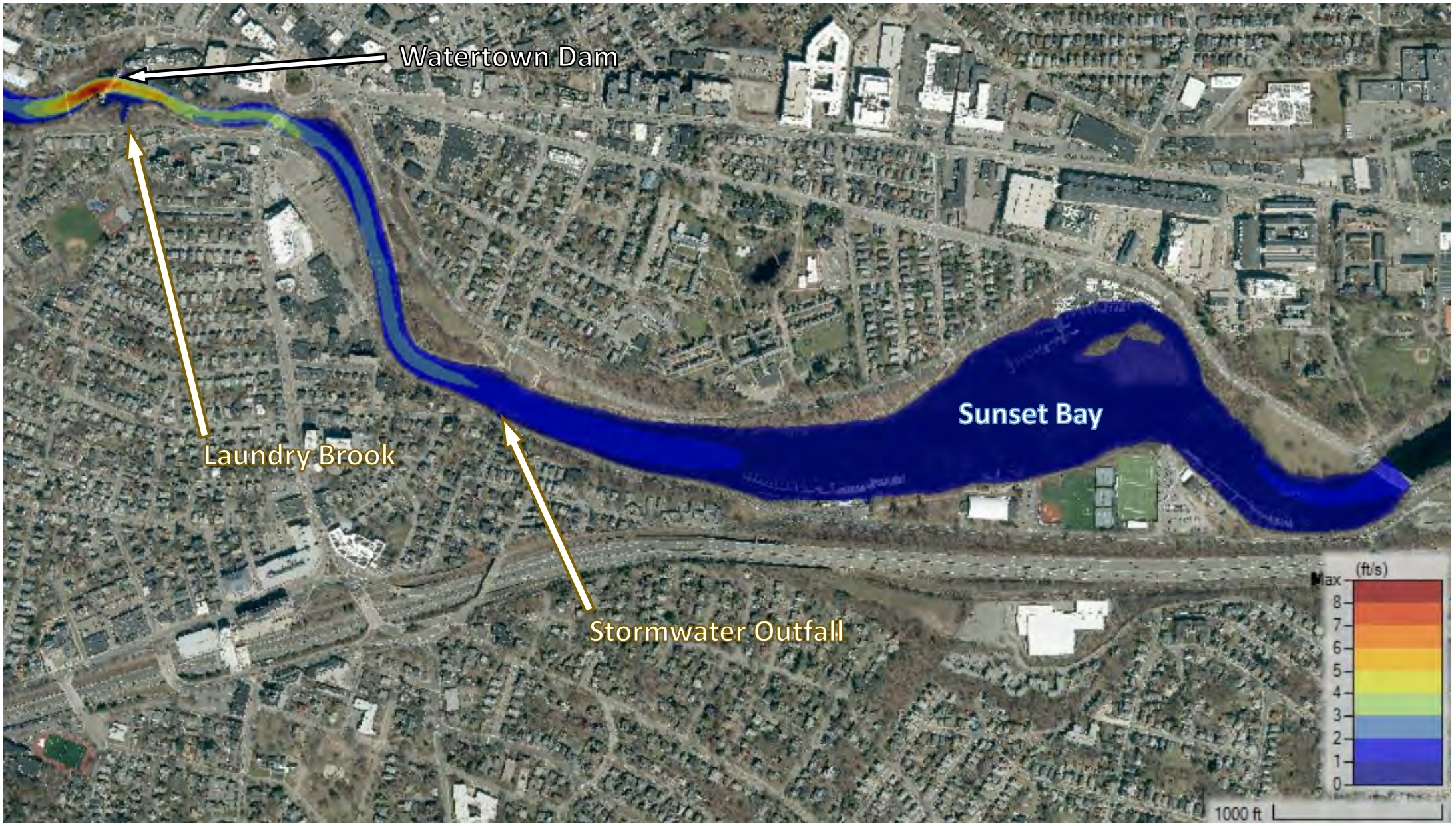
SEDIMENT MANAGEMENT ASSESSMENT



Post-Removal Down-stream Velocity Profile

(Bankfull Flow)

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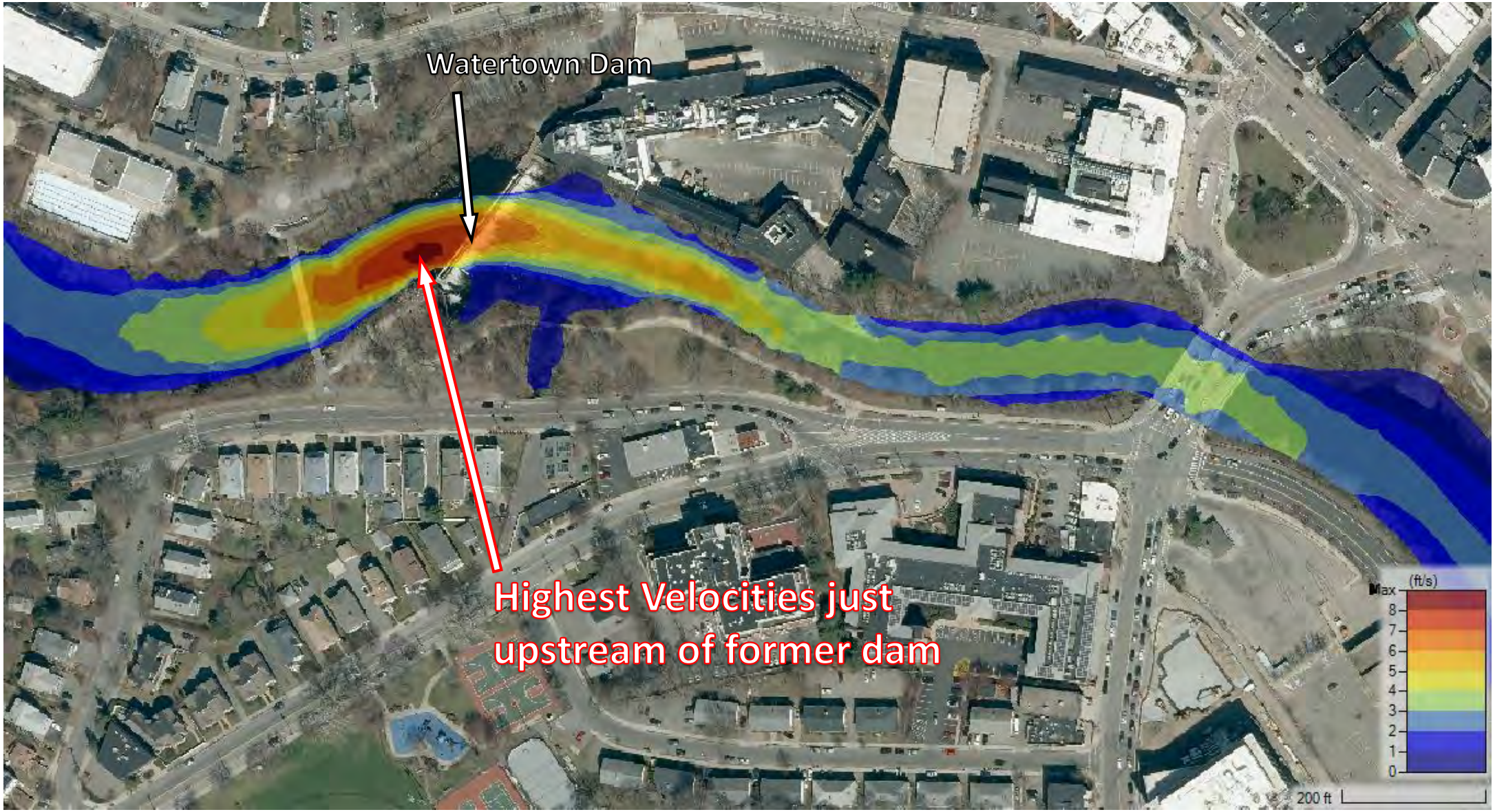
SEDIMENT MANAGEMENT ASSESSMENT



Post-Removal Down-stream Velocity Profile

(Bankfull Flow)

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Questions?

DCR Public Outreach

- Tonight's slide deck will be available at:
  - www.mass.gov/dcr/past-public-meetings
- If you have comments on this project:
  - Submit online: www.mass.gov/dcr/public-comment
  - Deadline: Wednesday, October 9th, 2024

    Please note: the contents of comments submitted to DCR, including your name, town and zip code, will be posted on DCR's website. Additional contact information provided, notably email address, will only be used for outreach on future updates to the subject project or property.
- If you wish to subscribe to a DCR general information or project-related listserv: contact DCR's Office of Community Relations via email at mass.parks@mass.gov or call 617-626-4973.