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Watertown Dam Removal Alternatives Analysis Study
Third Public Meeting

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Massachusetts Department of Conservation and Recreation (DCR)
November 20th, 2025

Commonwealth of Massachusetts

Governor
Maura Healey

Lieutenant Governor
Kim Driscoll

Energy and Environmental Secretary
Rebecca Tepper

Department of Conservation and Recreation Commissioner
Nicole LaChapelle

dcr MASSACHUSETTS DEPARTMENT OF CONSERVATION AND RECREATION

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

Alternatives Analyses Project Purpose & Scope

Purpose:

Develop and assess conceptual design alternatives to breach, lower, and/or remove the dam, per appropriation 2810-0122 of the state operating budget.

Scope of Services:

- Field Survey and Underwater Inspection
- Sediment Quality/Quantity Assessment
- Dam Stability Analysis
- Hydrologic, Hydraulic, and Sediment Transport Analysis
- Groundwater Analysis
- Preliminary Designs & Renderings
- Discussion with Other Technical Experts

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Dam Removal Considerations & Items Assessed In this Study

1. Conditions and Functionality of Existing Dam
2. Dam Removal Alternatives
3. Estimated Costs of Dam Removal
4. Potential to Improve Fish Passage through Dam Removal
5. Impact of Removal on Flood Control
6. Possible Groundwater Impacts of Dam Removal
7. Sediment Issues resulting from Dam Removal (Transport, Exposure, Accumulation Downstream, Management)
8. Changes to Scenery / Aesthetics due to Dam Removal
9. Public Outreach and Technical Consultations
10. Potential Future Actions

Note: Dam Rehabilitation Design not within the scope of this study.

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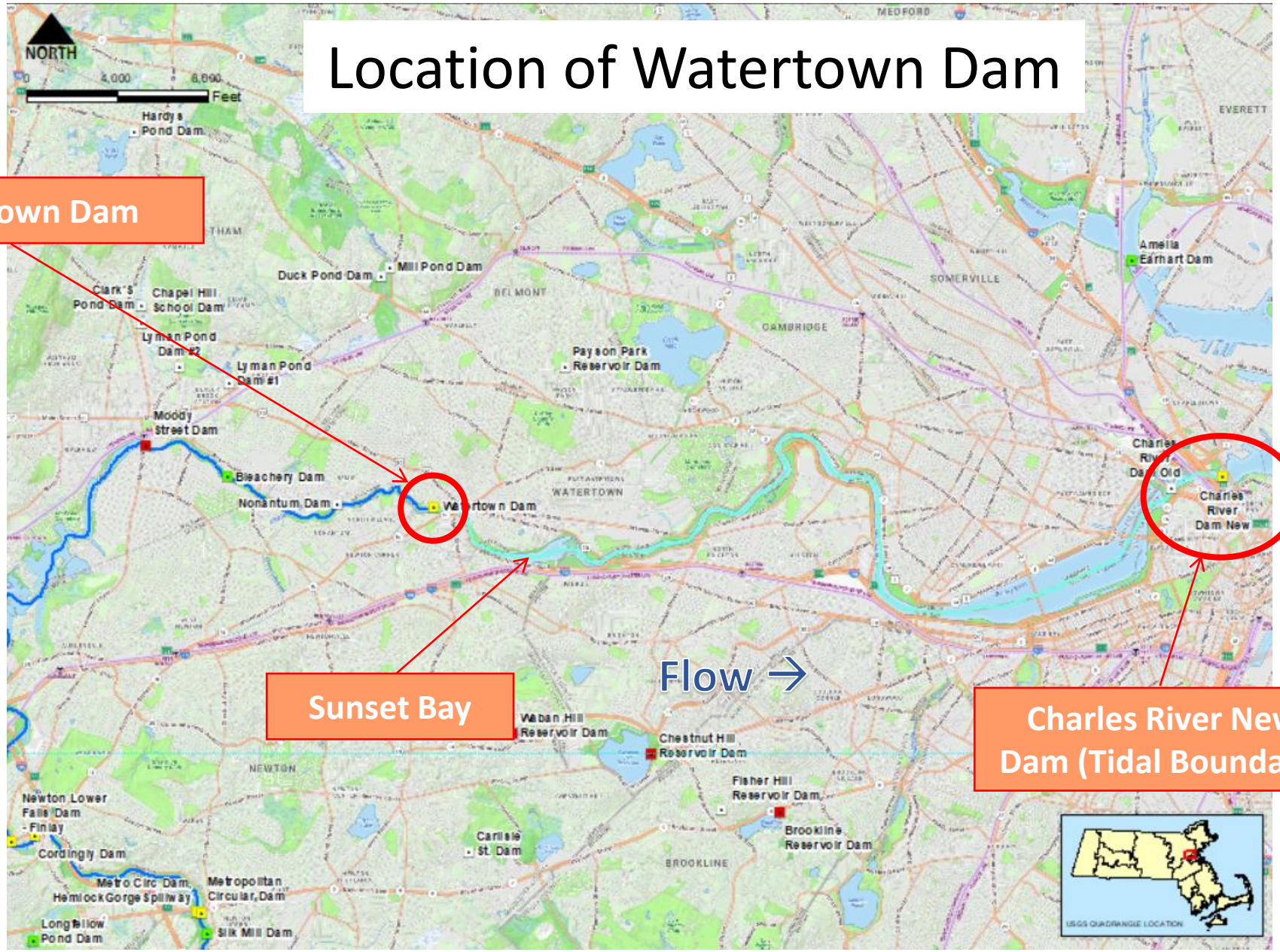
Location of Watertown Dam



Note:
Dam fully in Watertown but impoundment also in Newton

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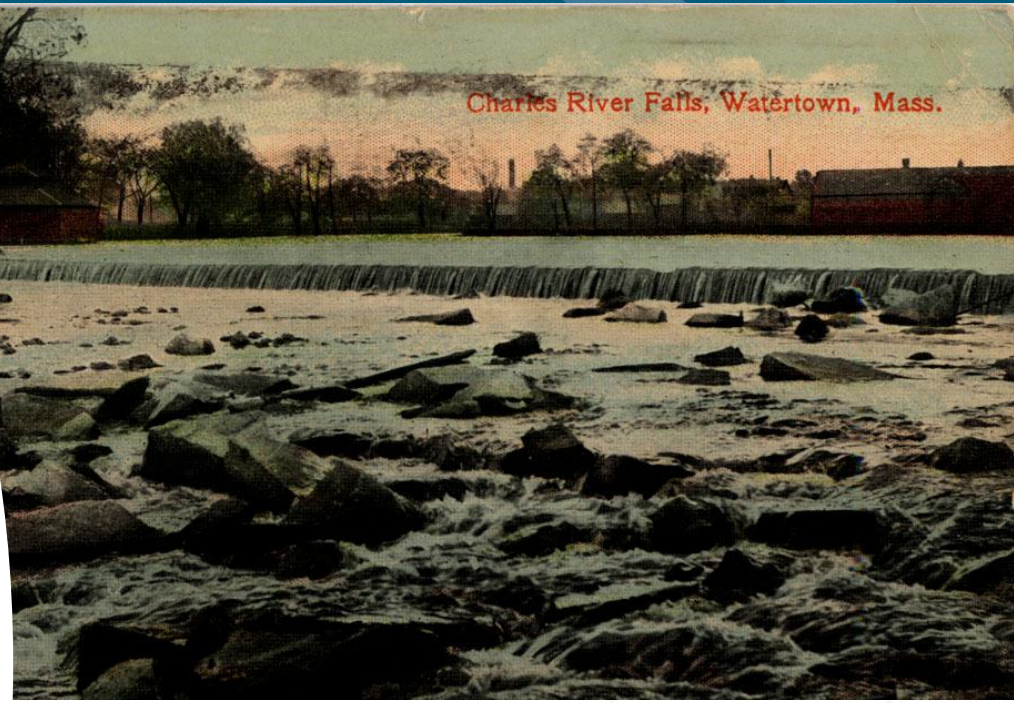
History of Watertown Dam

- **Pre-1600s** - Area on the Charles River included a fish weir by indigenous peoples
- **1600s** – Colonial government gives permission for construction of mills in area
- **Early 1900s** – Active use of dam for hydropower generation comes to an end.
- **1966** - Dam rebuilt with current concrete spillway
- **1972** - Fish ladder reconstructed by MDC
- Dam currently Owned and Operated by the Massachusetts Department of Conservation and Recreation.



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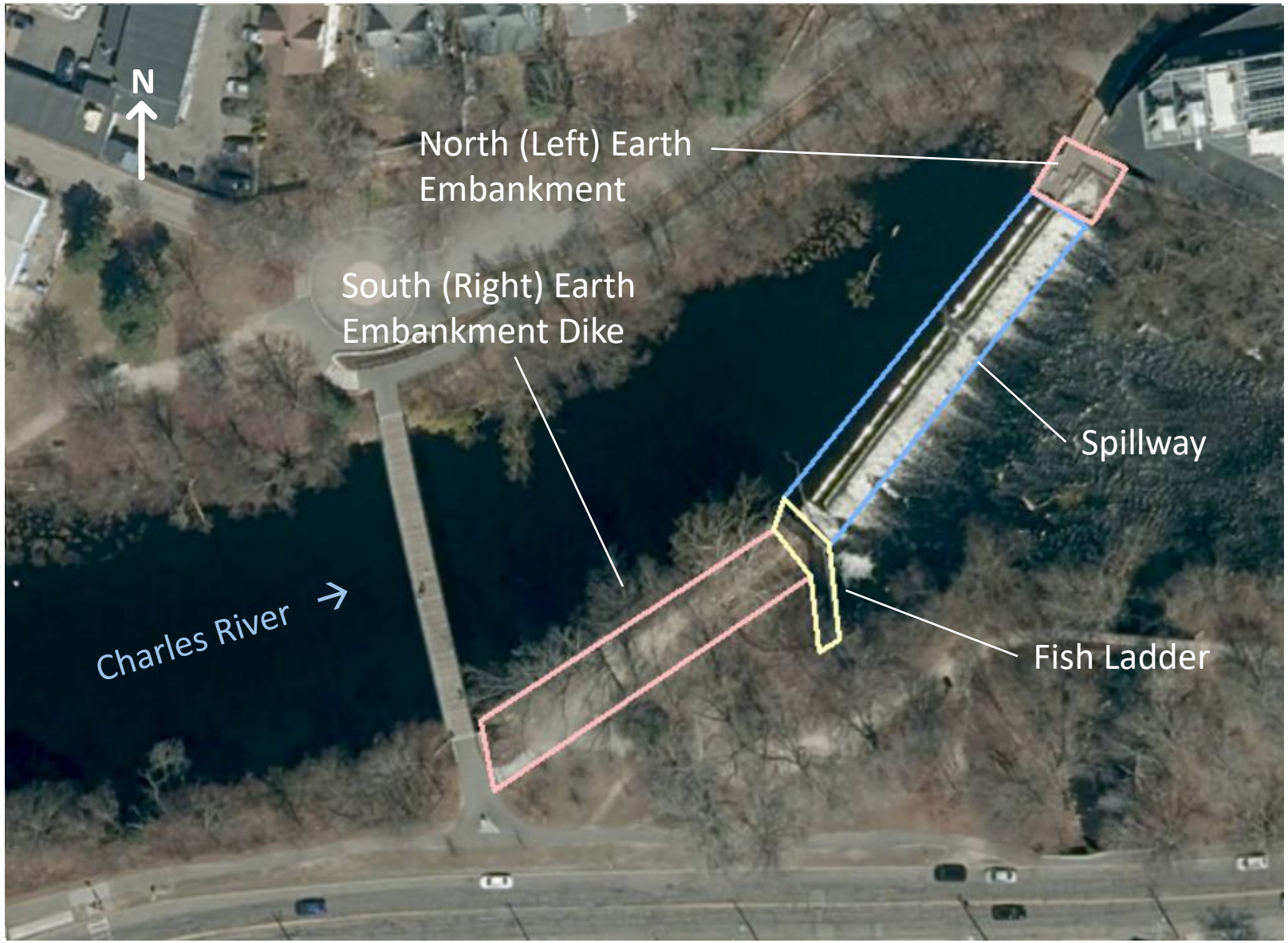
Images of Watertown Dam from Digital Commonwealth 1913 Above, 1866 Below

Overview of Watertown Dam



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Fish Passage at the Watertown Dam

Watertown Dam, Watertown. 83 ft Denil fishway at 198 ft long Watertown Dam. Fishway is in good condition but has poor attraction due to flows over the wide spillway. Priority List Score = 23 (tied for 2nd among 129 sites in the North Shore/Boston Harbor region).

- DMF Memorandum on “Charles River Watershed Fish Passage Structures” Jan. 2025

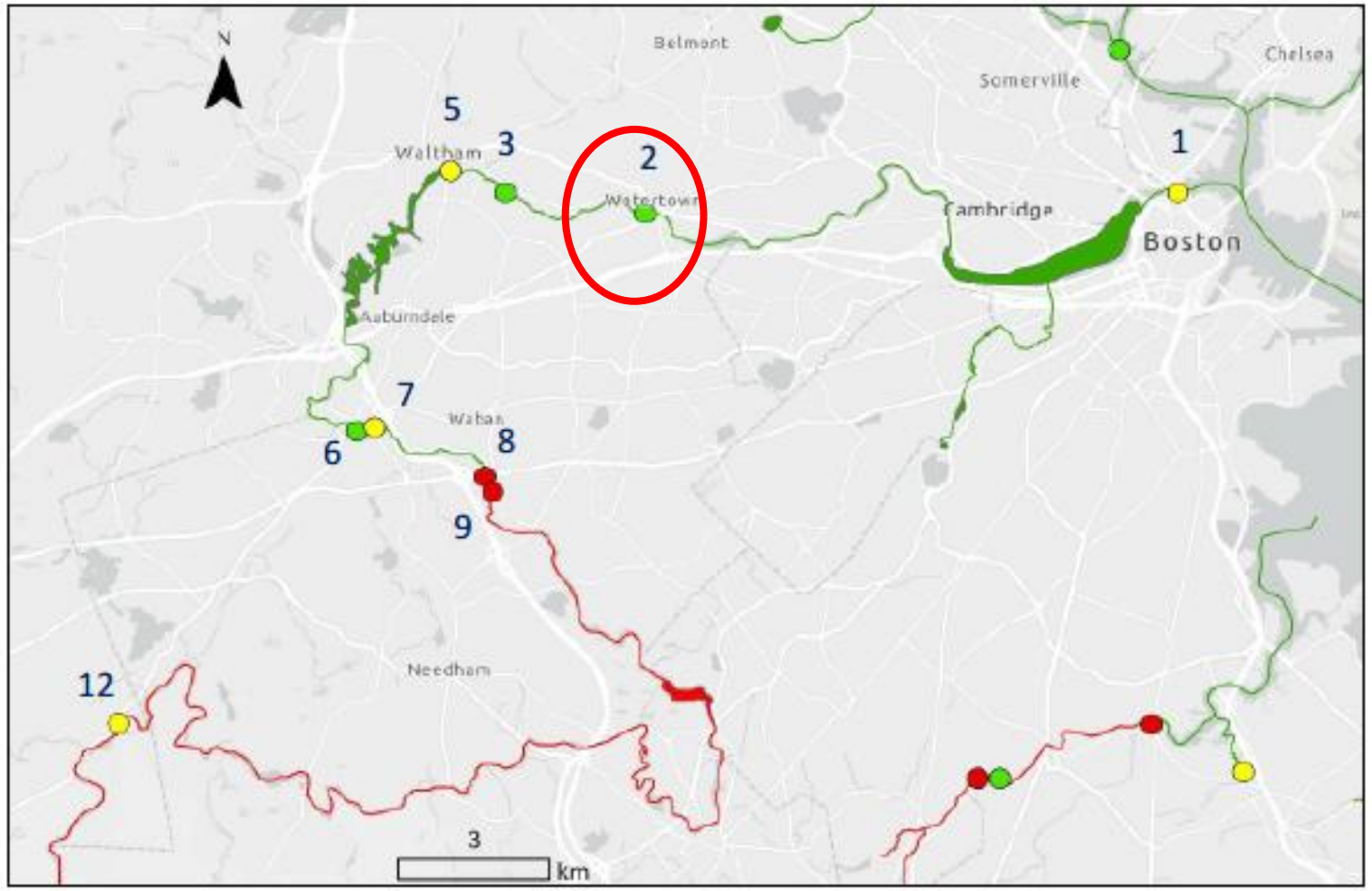

Figure 1. Charles River Fish Passage Structures listed in the DMF Diadromous Fish GIS data layer, MassGIS Data: Diadromous Fish | Mass.gov. Red locations and river channel indicates no passage. Green indicates suitable passage and yellow indicates work needed to improve passage.

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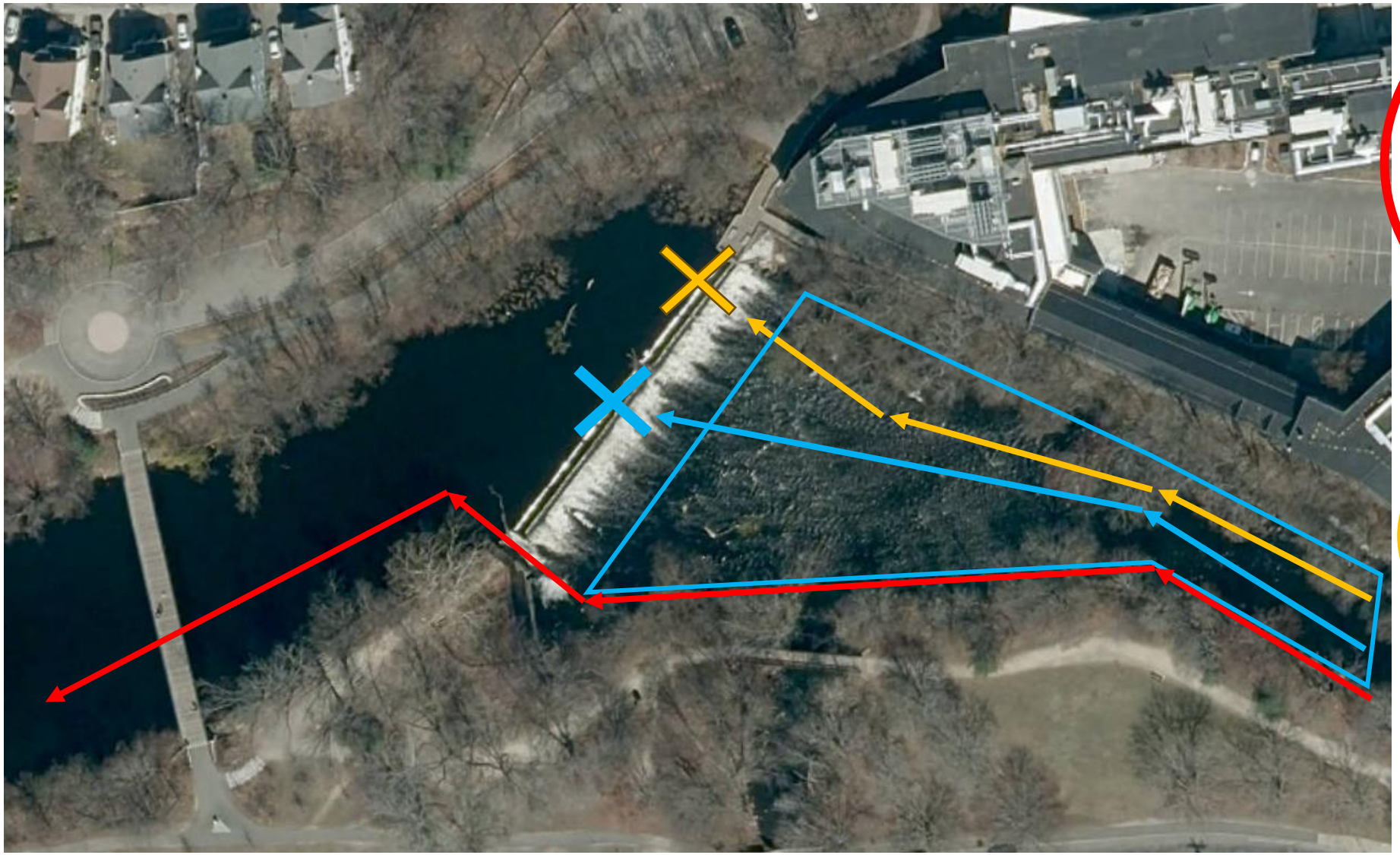

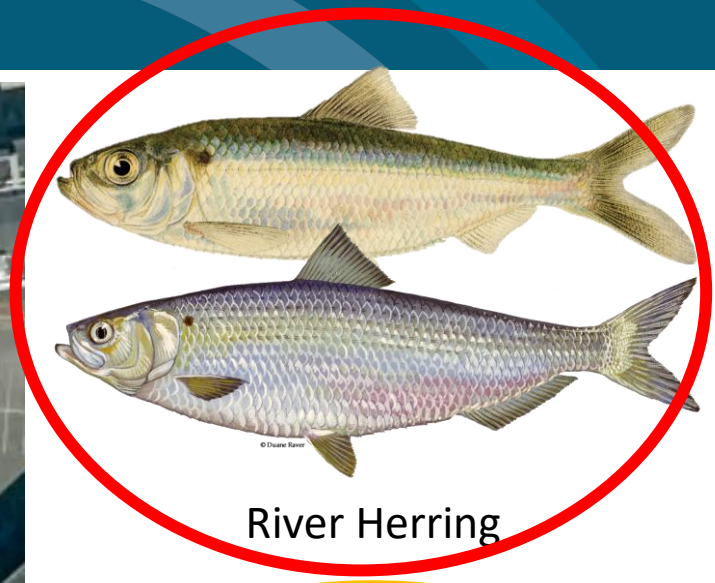

River Herring

American Shad

Rainbow Smelt

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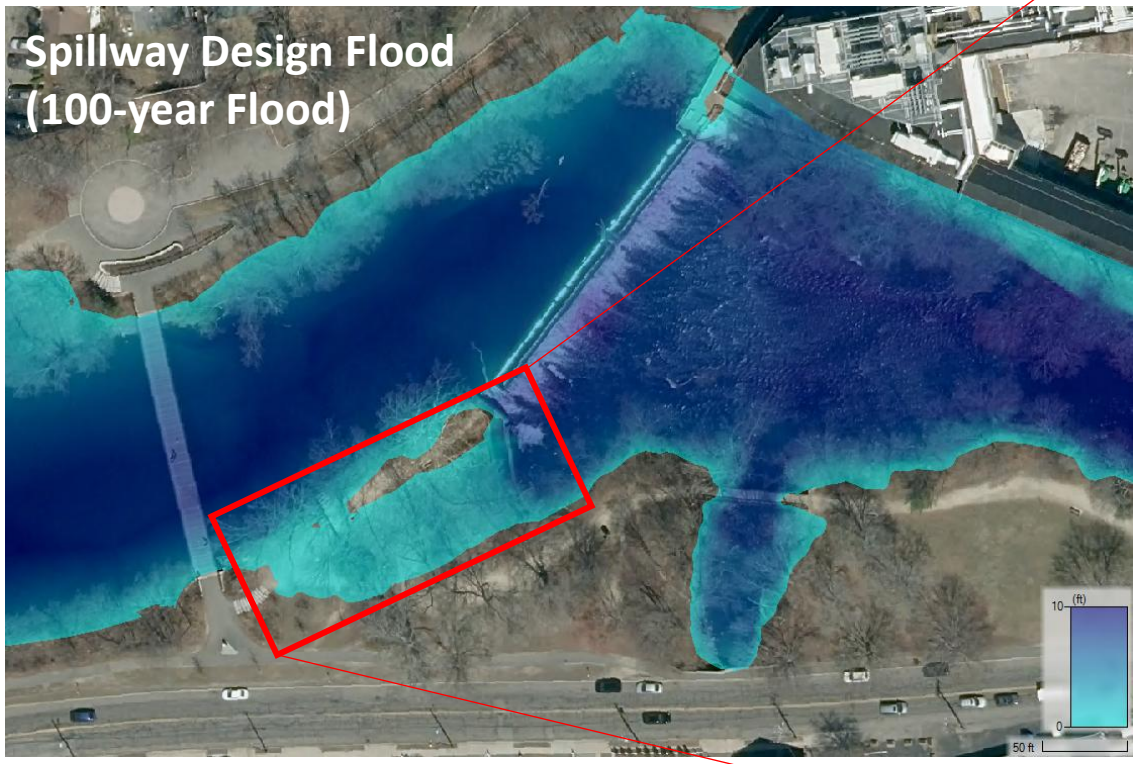
Diadromous Fish Passage at Watertown Dam

FRESHWATER FISH TOO!

Condition of Watertown Dam – Hydrology & Hydraulics

Right Embankment overtops during 100-year Flood



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RAS

2010 Flood ≈ 100-year Flood = Spillway Design Flood

Spillway Capacity inadequate to pass SDF.

Current Status and Condition of Watertown Dam

Key Issues:

- Watertown Dam currently in **FAIR condition** and not subject to any current dam safety orders
- Dam has a good history of dam safety performance
- Some repairs are necessary to improve condition on the dam and bring it into better compliance with dam safety regulations
- In its current condition, the dam is judged to be a low risk of failure.
- Fish passage currently acceptable for river herring but could be improved for American shad and rainbow smelt

DAM REMOVAL ALTERNATIVES

Dam Removal Alternatives – three configurations considered

1. **Dam Lowering** (2.5 ft Lowering of Spillway)
   - Demolish top 2.5 ft of the spillway and cap
   - Modify fish ladder for new normal pool elevation

2. **Partial Breach** (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

3. **"Full" Removal** (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.

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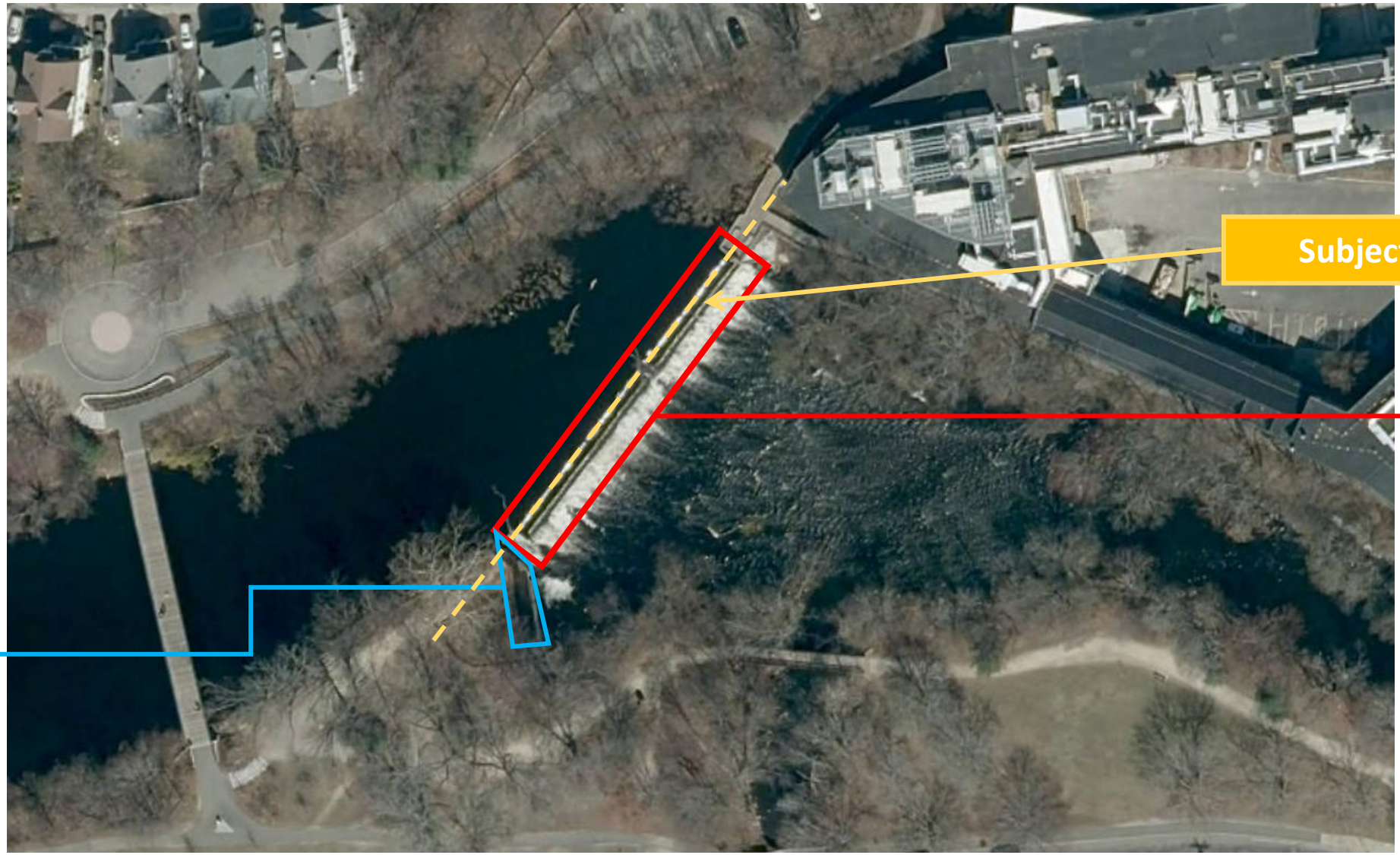
Dam Lowering – Alt. 1



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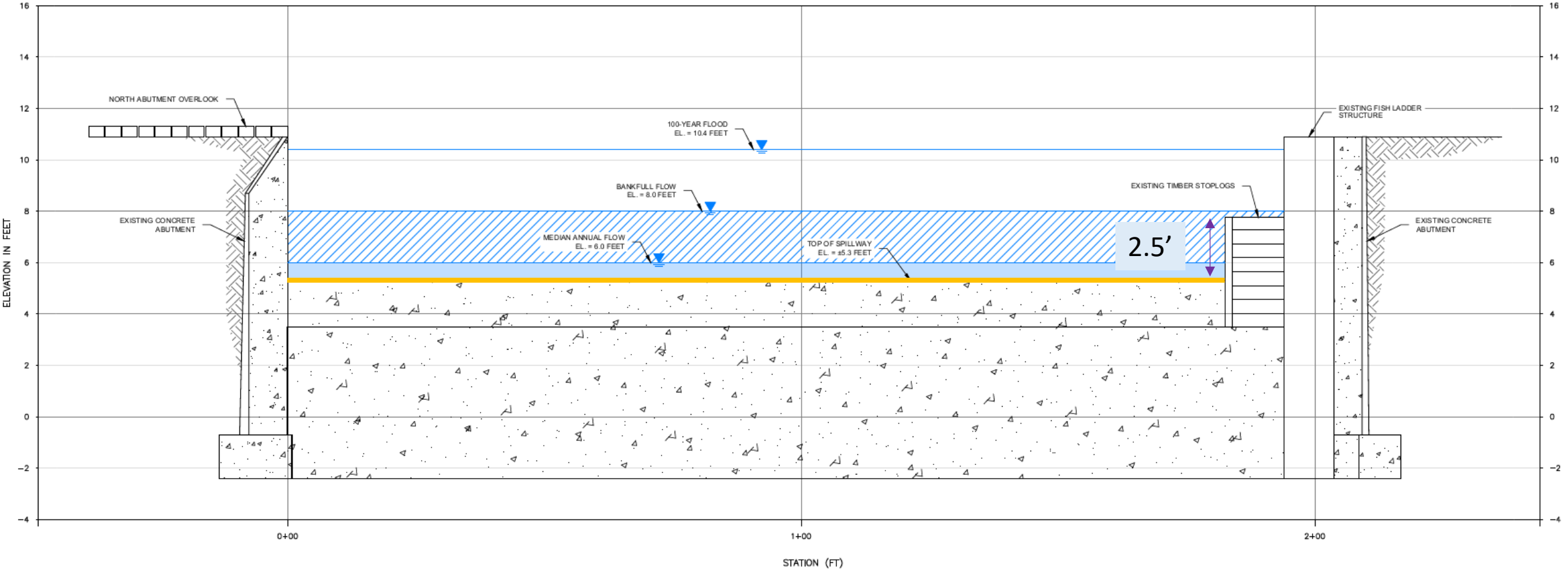
Dam Lowering – Alt. 1



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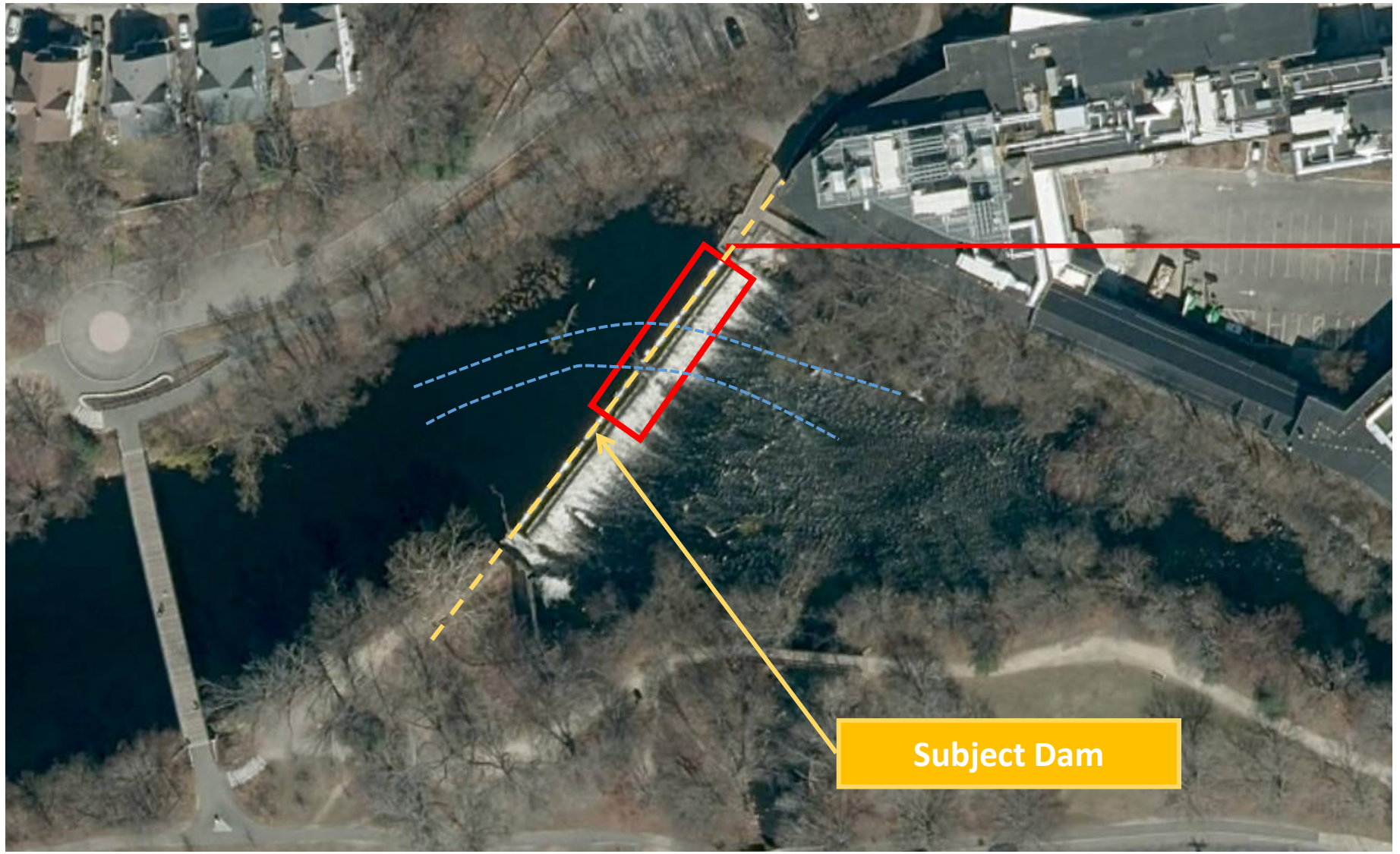
WHY? Might no longer qualify as a Jurisdictional “Dam”

VERTICAL SCALE IN FEET
0 1 2 4
0 5 10 20
HORIZONTAL SCALE IN FEET

WHY NOT? Still a dam.

Partial Breach – Alt. 2



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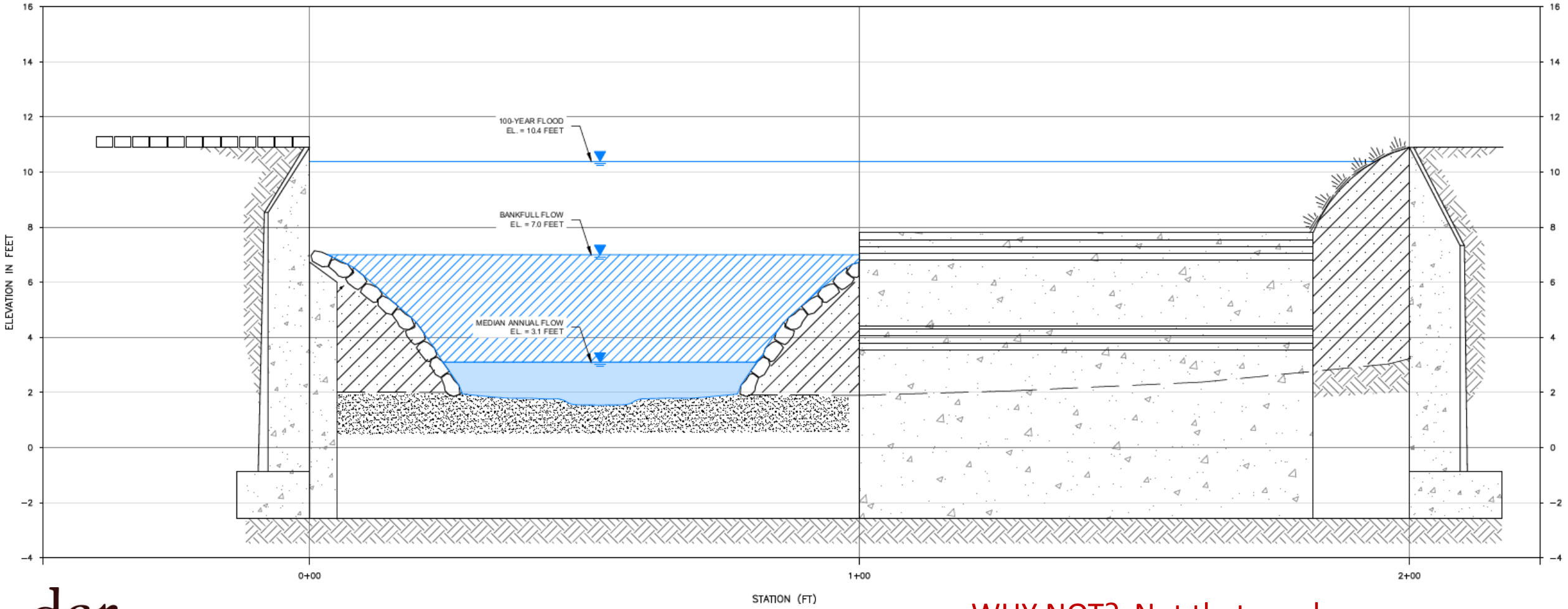
Partial Breach – Alt. 2



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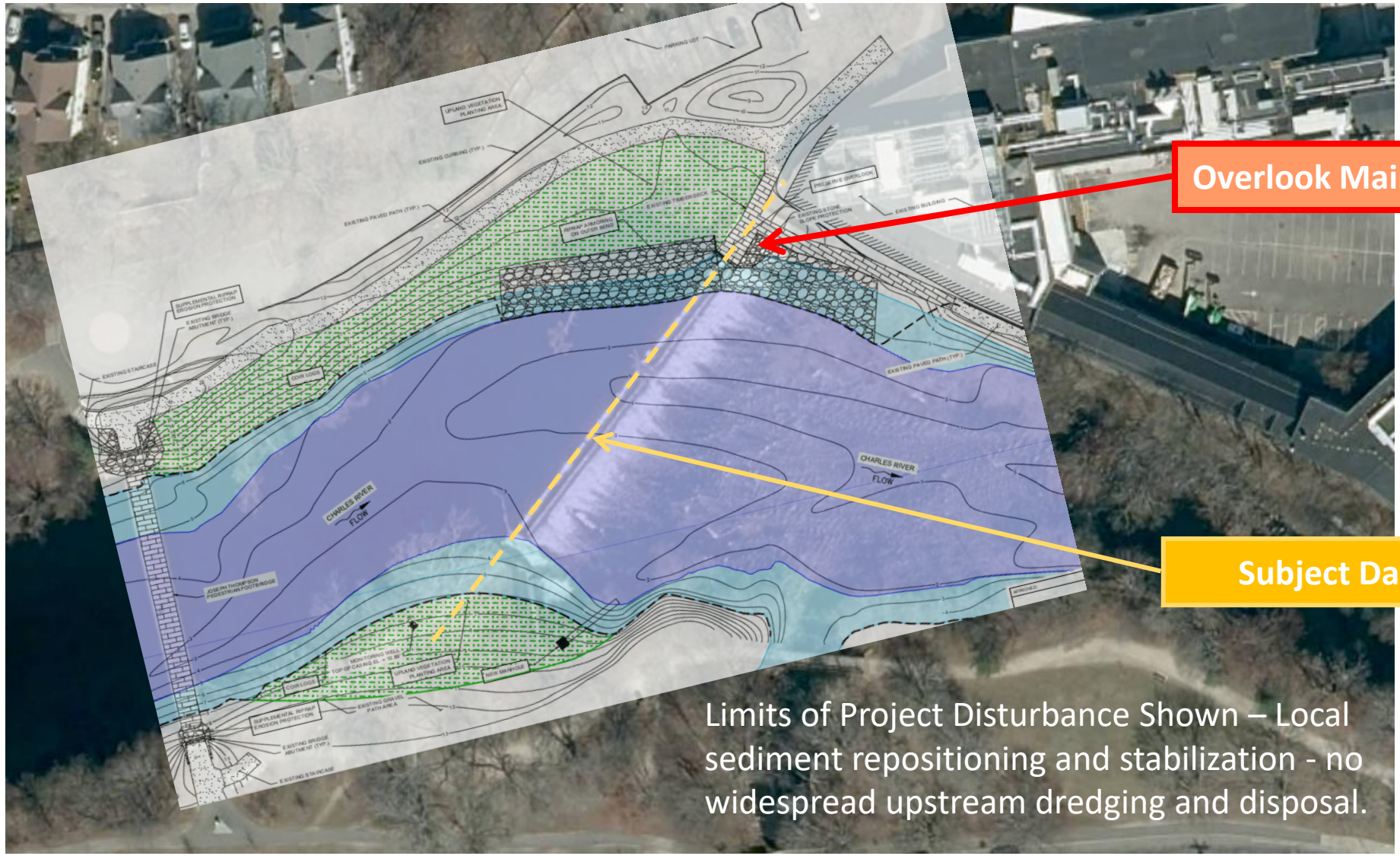
WHY? Reduction in the extent of demolition work required.

WHY NOT? Not that much cheaper. Not an "ecological restoration project."

Full Removal – Alt. 3



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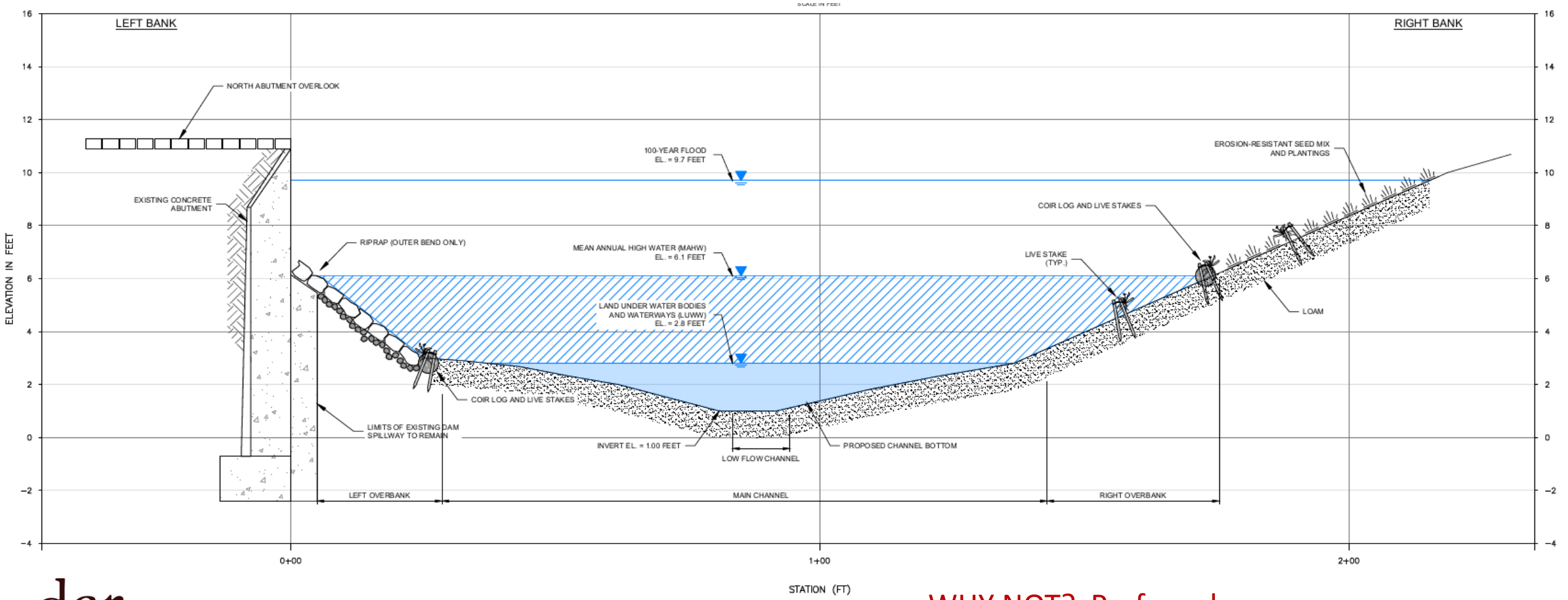
Full Removal – Alt. 3



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WHY? No Dam. Greatest ecological restoration value.

WHY NOT? Preferred alternative (repair vs removal) still under consideration.

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Dam Removal Design Alternatives – Preferred Removal Alternative

Goal	No Action	Lower Spillway	Partial Breach	Full Removal	Dam Rehabilitation
Mitigate Dam Safety Risk	No	Partially	Yes	Yes	No
Meet Dam Safety Standards	Yes*	Yes	Yes	Yes	Yes
Restore Natural Channel	No	No	Partially	Yes	No
Improve Natural Oxygen Levels	No	No	Yes	Yes	No
Improve Water Temperatures	No	No	Yes	Yes	No
Restore Natural Sediment Transport	No	No	Partially	Partially	No
Improve Fish Passage	No	No	Partially	Yes	No

* Dam listed in FAIR condition

Dam Rehabilitation
Design not evaluated

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Dam Removal Design Alternatives – Cost Estimates

Goal	No Action	Lower Spillway	Partial Breach	Full Removal
Mitigate Dam Safety Risk	No	Partially	Yes	Yes
Meet Dam Safety Standards	Yes*	Yes	Yes	Yes
Restore Natural Channel	No	No	Partially	Yes
Improve Natural Oxygen Levels	No	No	Yes	Yes
Improve Water Temperatures	No	No	Yes	Yes
Restore Natural Sediment Transport	No	No	Partially	Partially
Improve Fish Passage	No	No	Partially	Yes
Cost Estimate:	**Annual O&M**	**$2,330,000**	**$2,770,000**	**$3,300,000**

Cost of local sediment repositioning included.

Upstream or downstream dredging costs NOT included.

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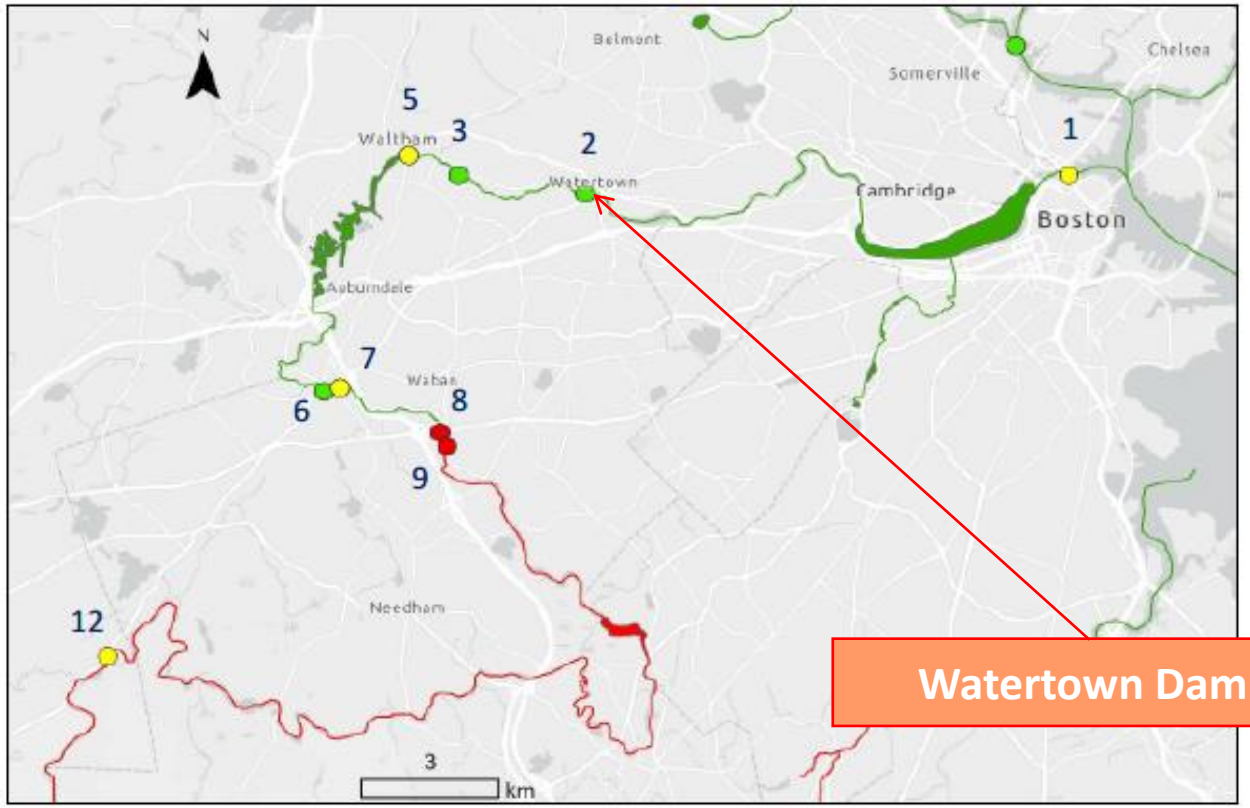
* Dam listed in FAIR condition

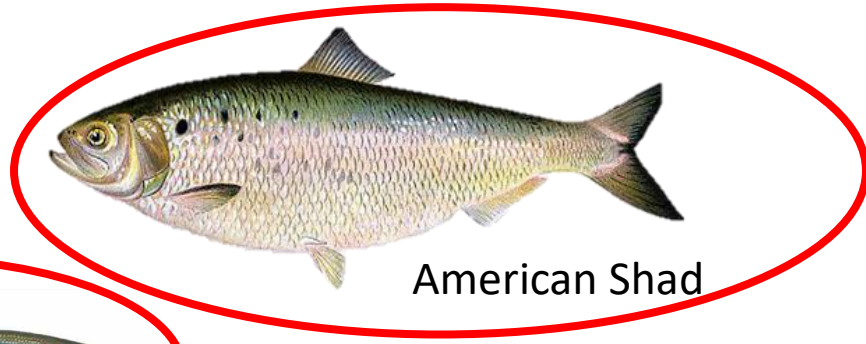
Previous report minor repair estimate = > $200,000

FULL DAM REMOVAL CONSIDERATIONS

Key Issues: **Potential to Improve Fish Passage through Full Dam Removal**

- Existing fish ladder works, but not perfectly
- Full dam removal will improve fish passage




American Shad

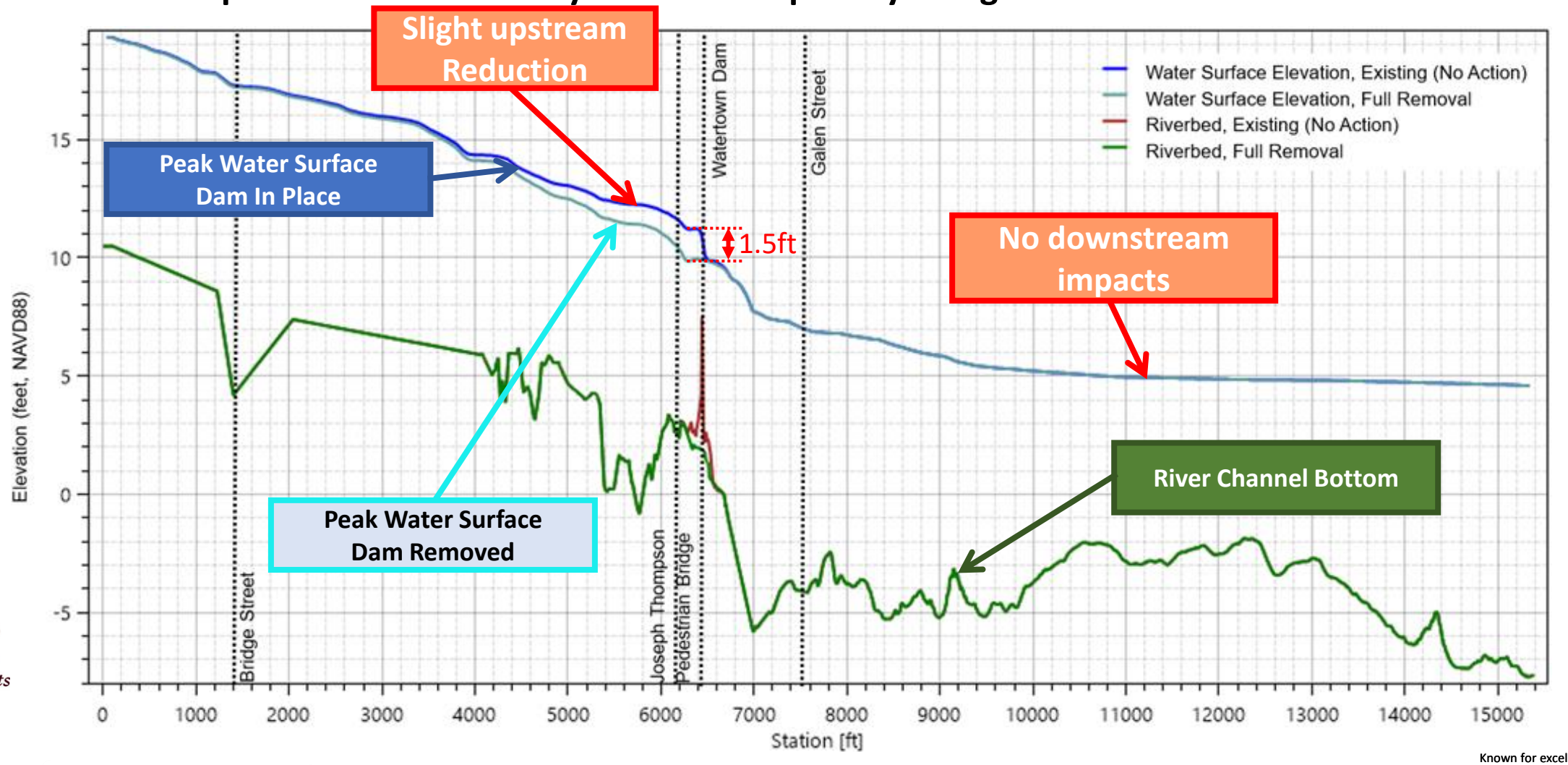

Rainbow Smelt


Blueback Herring


Alewife

Key Issues: **Impact of Full Dam Removal on Flood Control**

March-April 2010 Flood ≈ 100-year Flood = Spillway Design Flood



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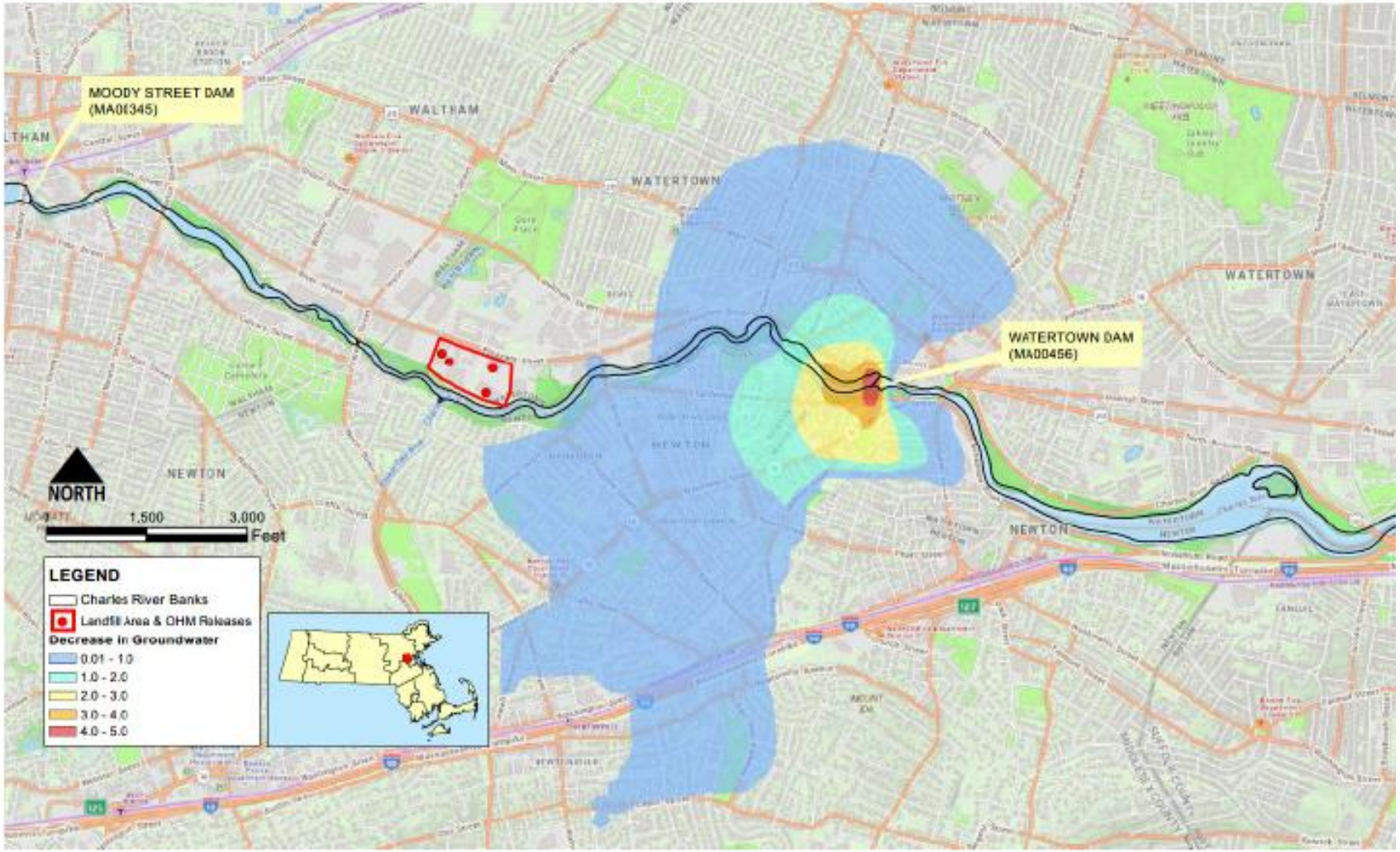
Key Issues: **Possible Groundwater Impacts of Full Dam Removal**



- Significant groundwater impacts likely to be confined to immediate area.
- Impacts to u/s landfill unlikely.
- **Potential impacts to foundation of adjacent former mill building on Pleasant St. requires more assessment.**

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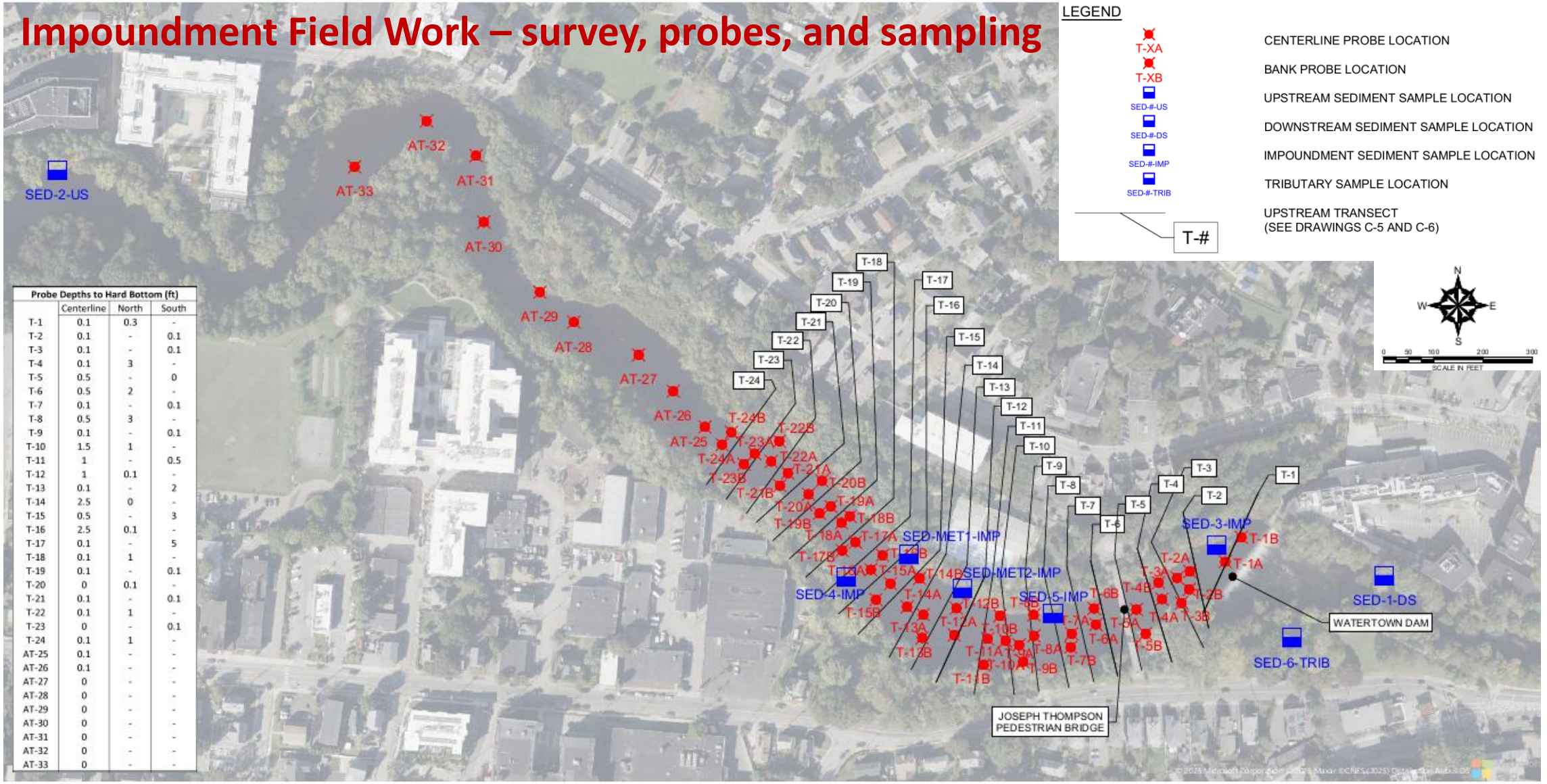
Key Issues: **Sediment Issues**

Impoundment Field Work – survey, probes, and sampling



Probe Depths to Hard Bottom (ft)

	Centerline	North	South
T-1	0.1	0.3	-
T-2	0.1	-	0.1
T-3	0.1	-	0.1
T-4	0.1	3	-
T-5	0.5	-	0
T-6	0.5	2	-
T-7	0.1	-	0.1
T-8	0.5	3	-
T-9	0.1	-	0.1
T-10	1.5	1	-
T-11	1	-	0.5
T-12	1	0.1	-
T-13	0.1	-	2
T-14	2.5	0	-
T-15	0.5	-	3
T-16	2.5	0.1	-
T-17	0.1	-	5
T-18	0.1	1	-
T-19	0.1	-	0.1
T-20	0	0.1	-
T-21	0.1	-	0.1
T-22	0.1	1	-
T-23	0	-	0.1
T-24	0.1	1	-
AT-25	0.1	-	-
AT-26	0.1	-	-
AT-27	0	-	-
AT-28	0	-	-
AT-29	0	-	-
AT-30	0	-	-
AT-31	0	-	-
AT-32	0	-	-
AT-33	0	-	-

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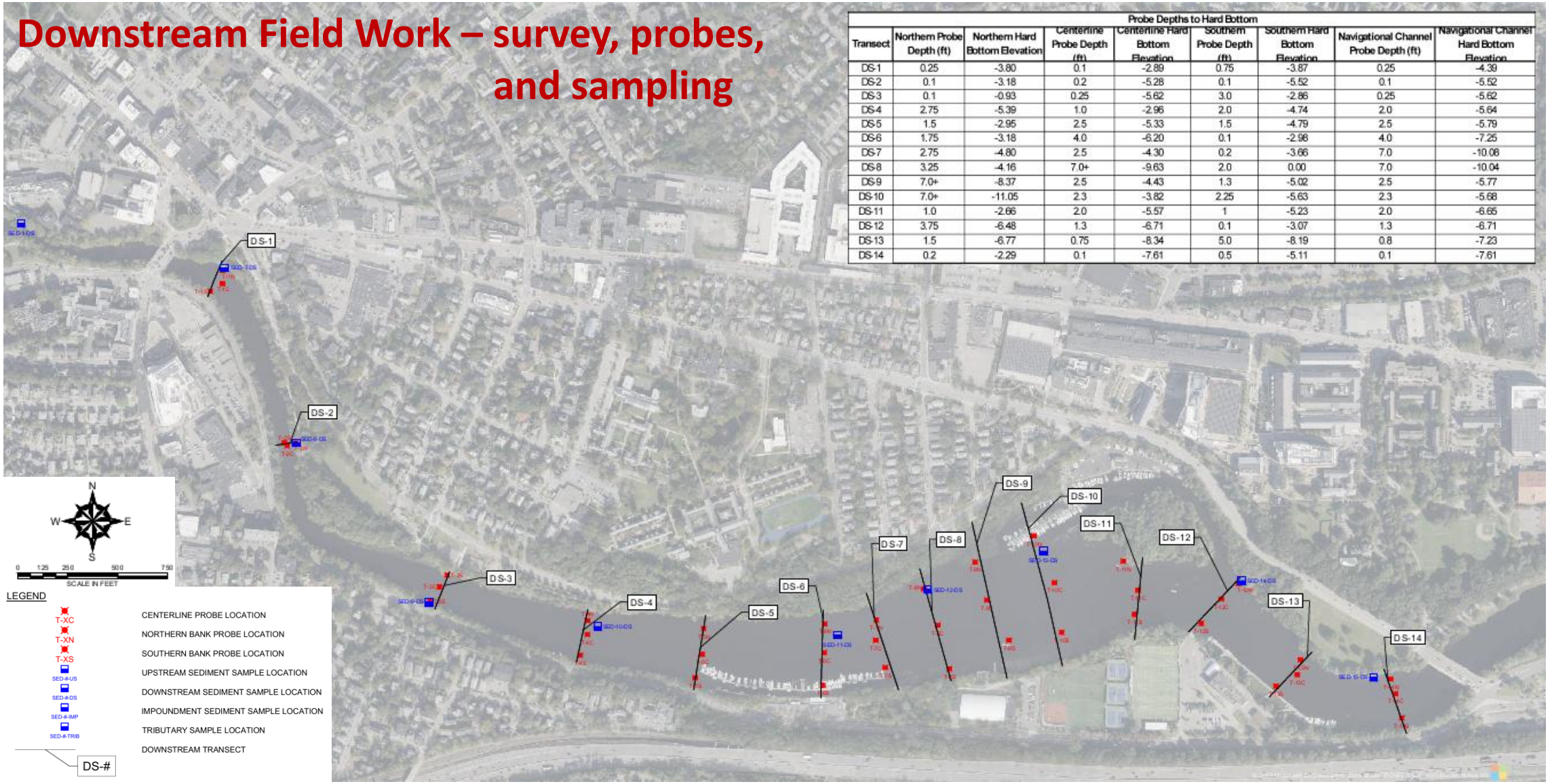
Key Issues: **Sediment Issues**

Downstream Field Work – survey, probes, and sampling

Probe Depths to Hard Bottom								
Transect	Northern Probe Depth (ft)	Northern Hard Bottom Elevation	Centerline Probe Depth (ft)	Centerline Hard Bottom Elevation	Southern Probe Depth (ft)	Southern Hard Bottom Elevation	Navigational Channel Probe Depth (ft)	Navigational Channel Hard Bottom Elevation
DS-1	0.25	-3.80	0.1	-2.89	0.75	-3.87	0.25	-4.39
DS-2	0.1	-3.18	0.2	-5.28	0.1	-5.52	0.1	-5.52
DS-3	0.1	-0.93	0.25	-5.62	3.0	-2.86	0.25	-5.62
DS-4	2.75	-5.39	1.0	-2.96	2.0	-4.74	2.0	-5.64
DS-5	1.5	-2.95	2.5	-5.33	1.5	-4.79	2.5	-5.79
DS-6	1.75	-3.18	4.0	-6.20	0.1	-2.98	4.0	-7.25
DS-7	2.75	-4.80	2.5	-4.30	0.2	-3.66	7.0	-10.08
DS-8	3.25	-4.16	7.0+	-9.63	2.0	0.00	7.0	-10.04
DS-9	7.0+	-8.37	2.5	-4.43	1.3	-5.02	2.5	-5.77
DS-10	7.0+	-11.05	2.3	-3.82	2.25	-5.63	2.3	-5.68
DS-11	1.0	-2.66	2.0	-5.57	1	-5.23	2.0	-6.65
DS-12	3.75	-6.48	1.3	-6.71	0.1	-3.07	1.3	-6.71
DS-13	1.5	-6.77	0.75	-8.34	5.0	-8.19	0.8	-7.23
DS-14	0.2	-2.29	0.1	-7.61	0.5	-5.11	0.1	-7.61



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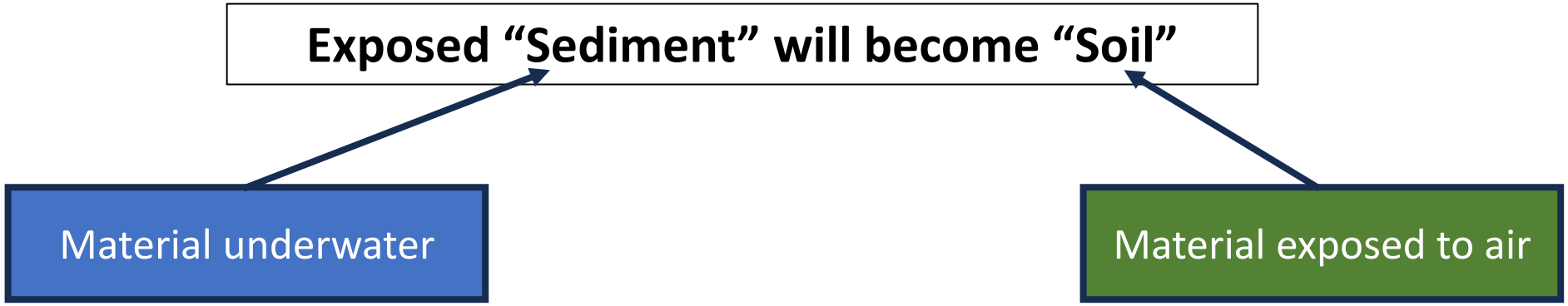
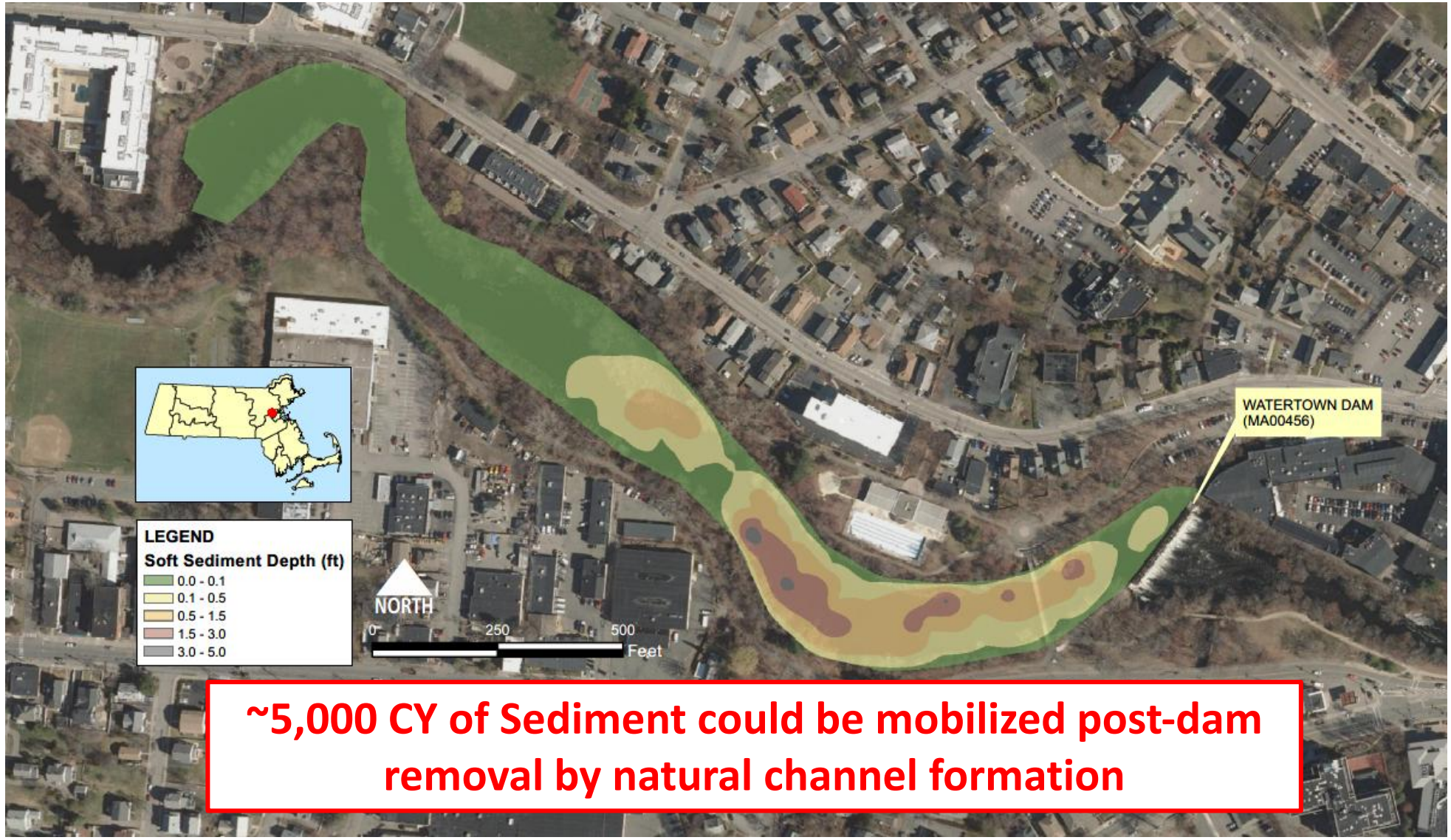
Key Issues: **Sediment Quality**

- Sediment quality tests consistent with expected findings in a typical urban river – some elevated concentrations but no primary concern
- Some upstream sediment will be exposed if the dam is removed and will become "soil" from a regulatory standpoint
- Some "soil" may not meet S1 Standards (e.g. lead) per the MCP
- **Additional risk assessment and mitigation considerations needed.**



Key Issues: **Sediment Quantity (potentially mobile sediment)**



~5,000 CY of Sediment could be mobilized post-dam removal by natural channel formation

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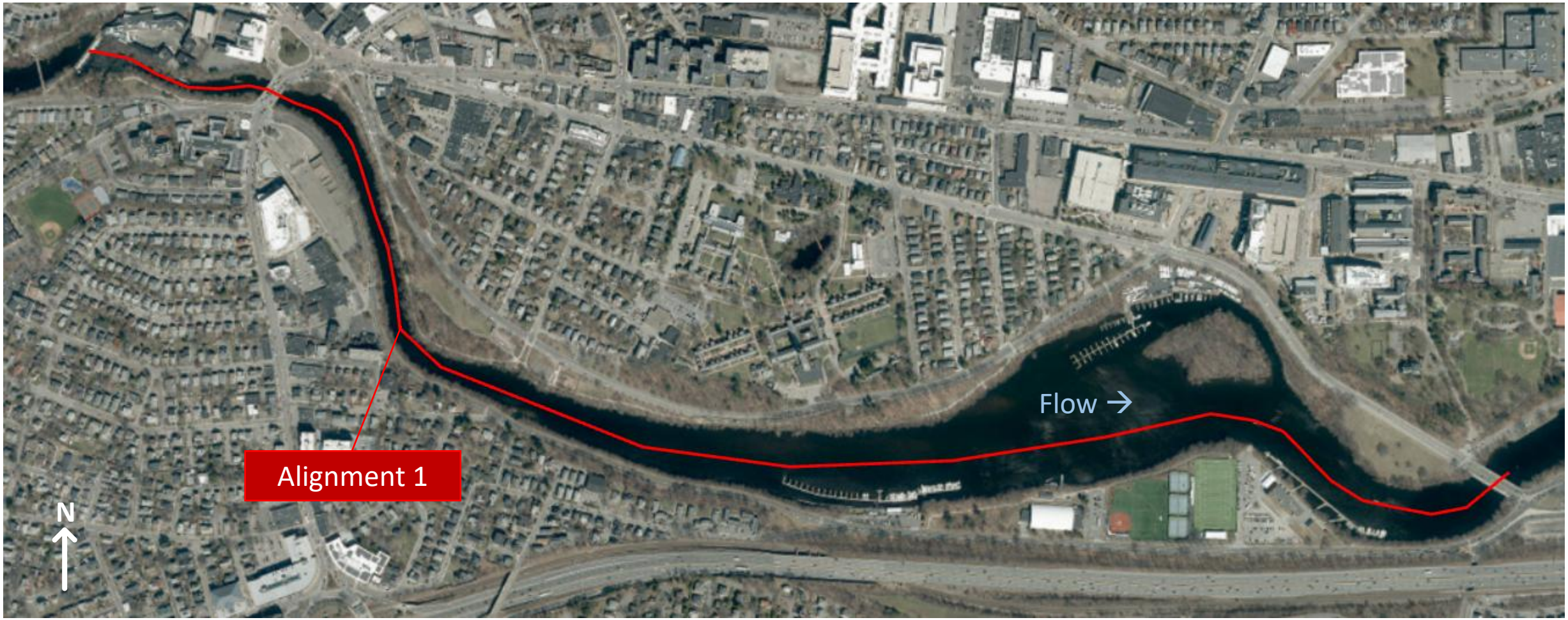
Key Issues: **Downstream Sediment Conditions – Alignment 1**



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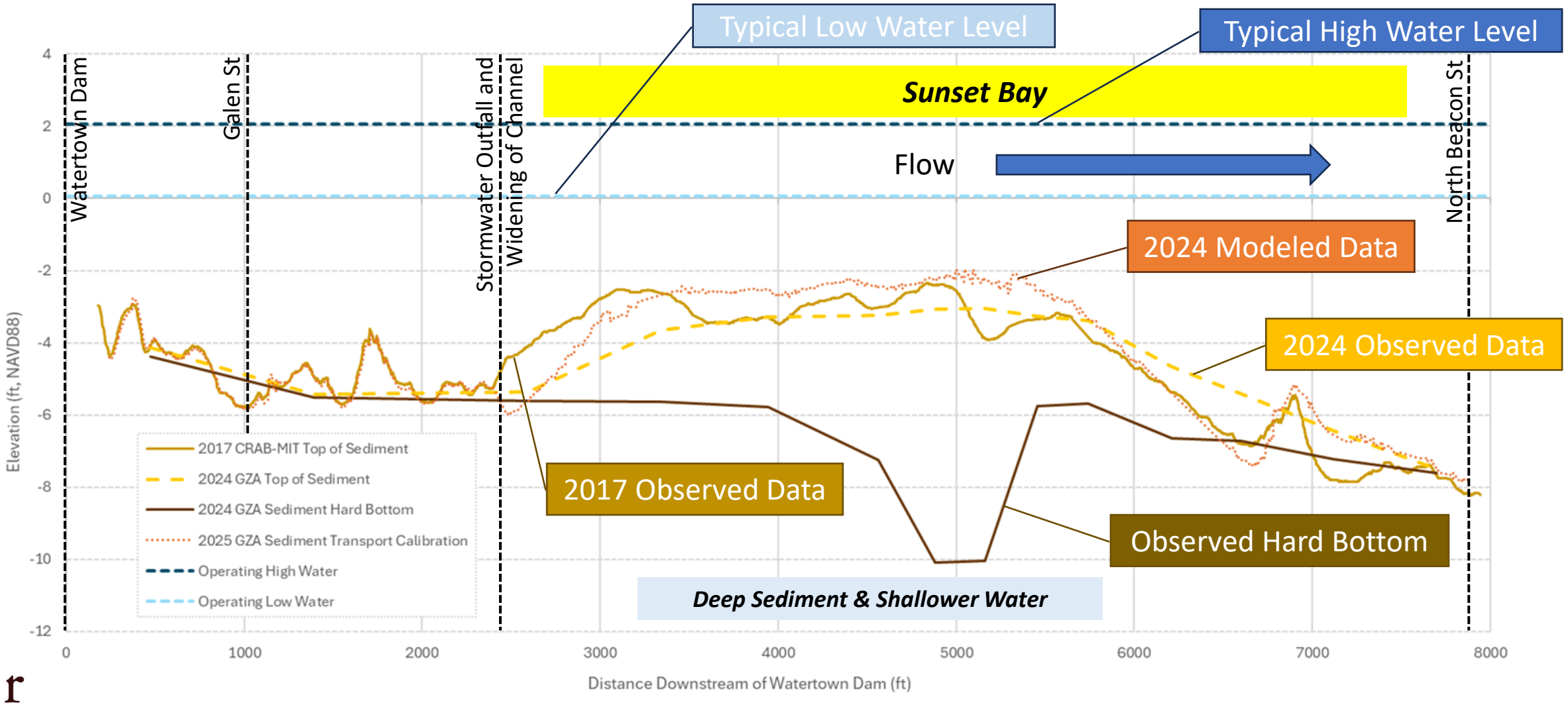
Key Issues: **Downstream Sediment Conditions (Dam In-Place) – Alignment 1**



Sediment Transport Observed and Modeled 2017 to 2024

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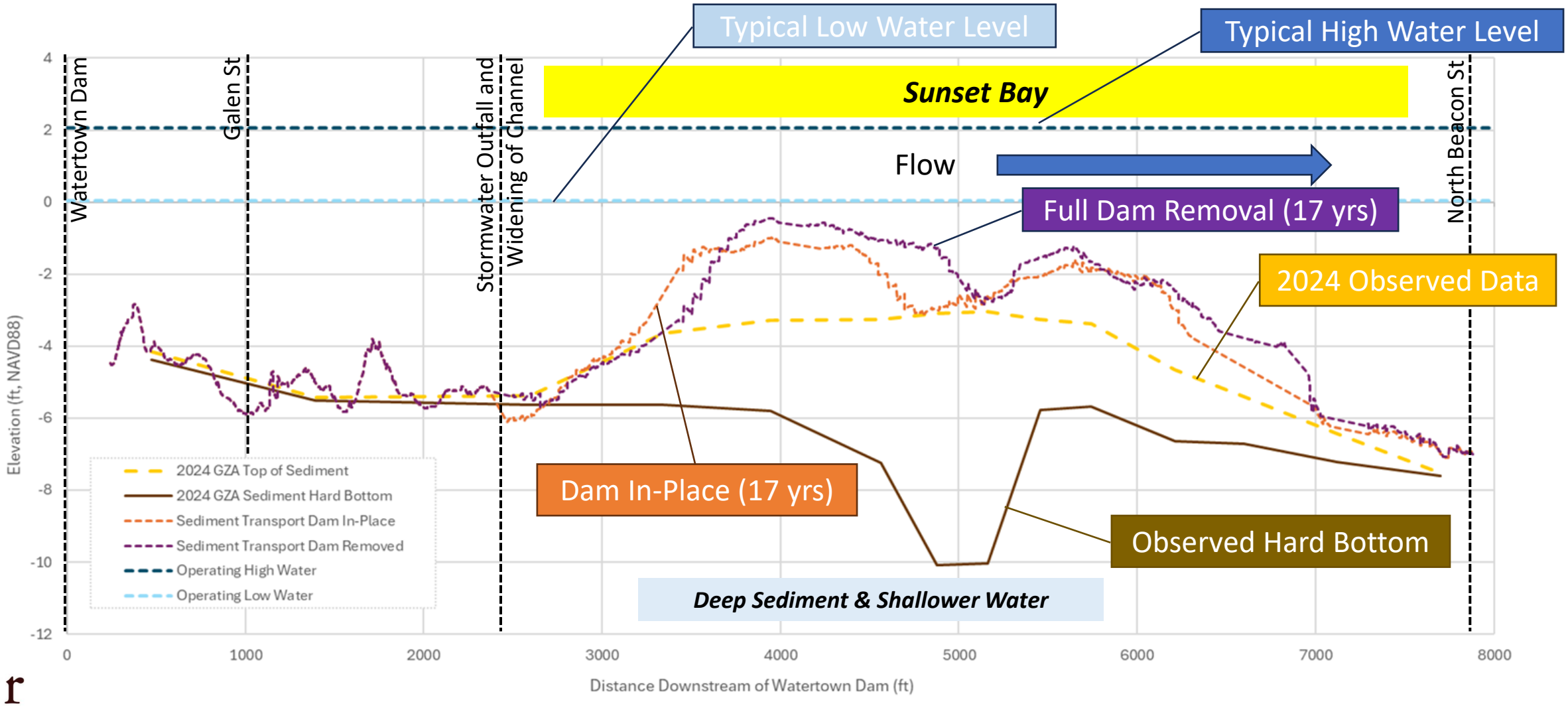
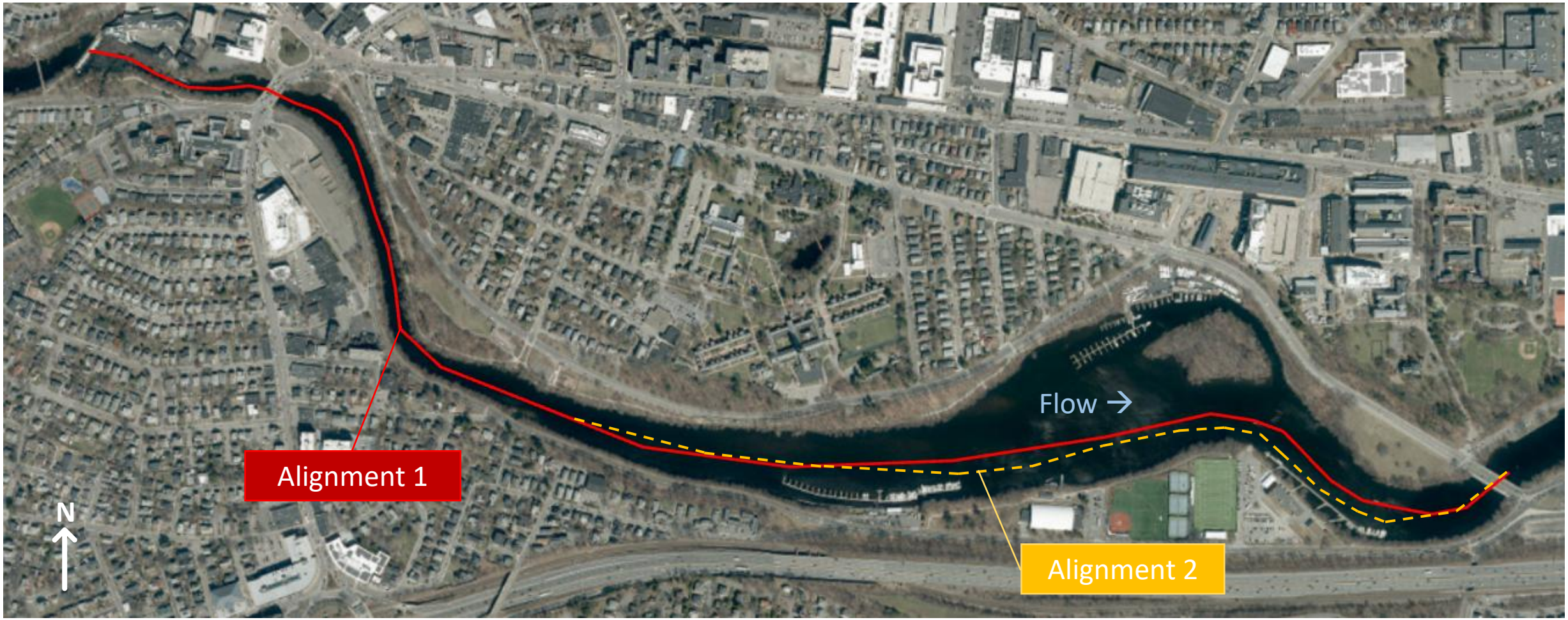
Key Issues: **Sediment Transport Modeling Results – Alignment 1**



Sediment Transport Model Dam In-Place and Removed (modeled over 17 years – including large flood)

Key Issues: **Downstream Sediment Conditions – Alignment 2**



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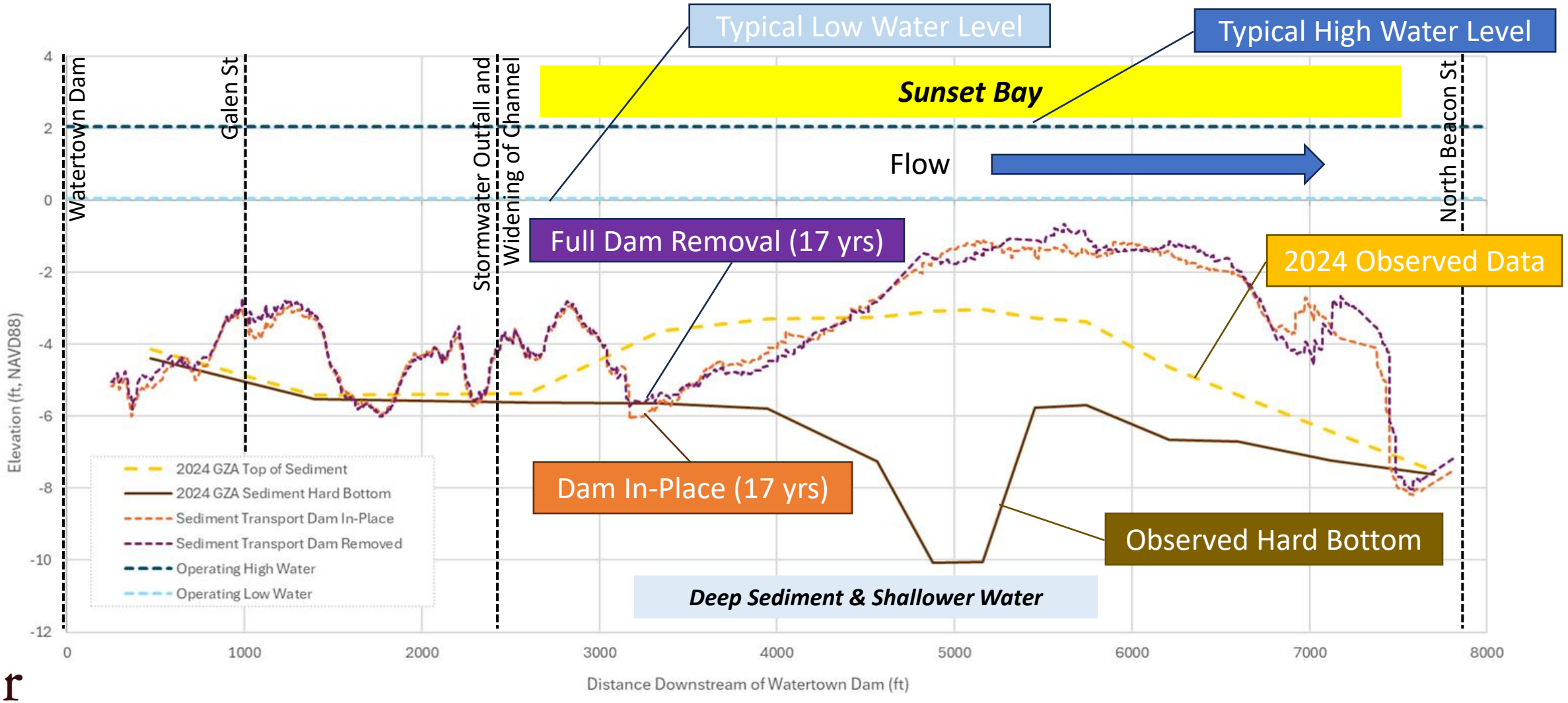
Key Issues: **Sediment Transport Modeling Results – Alignment 2**



Sediment Transport Model Dam In-Place and Removed (modeled over 17 years – including large flood)

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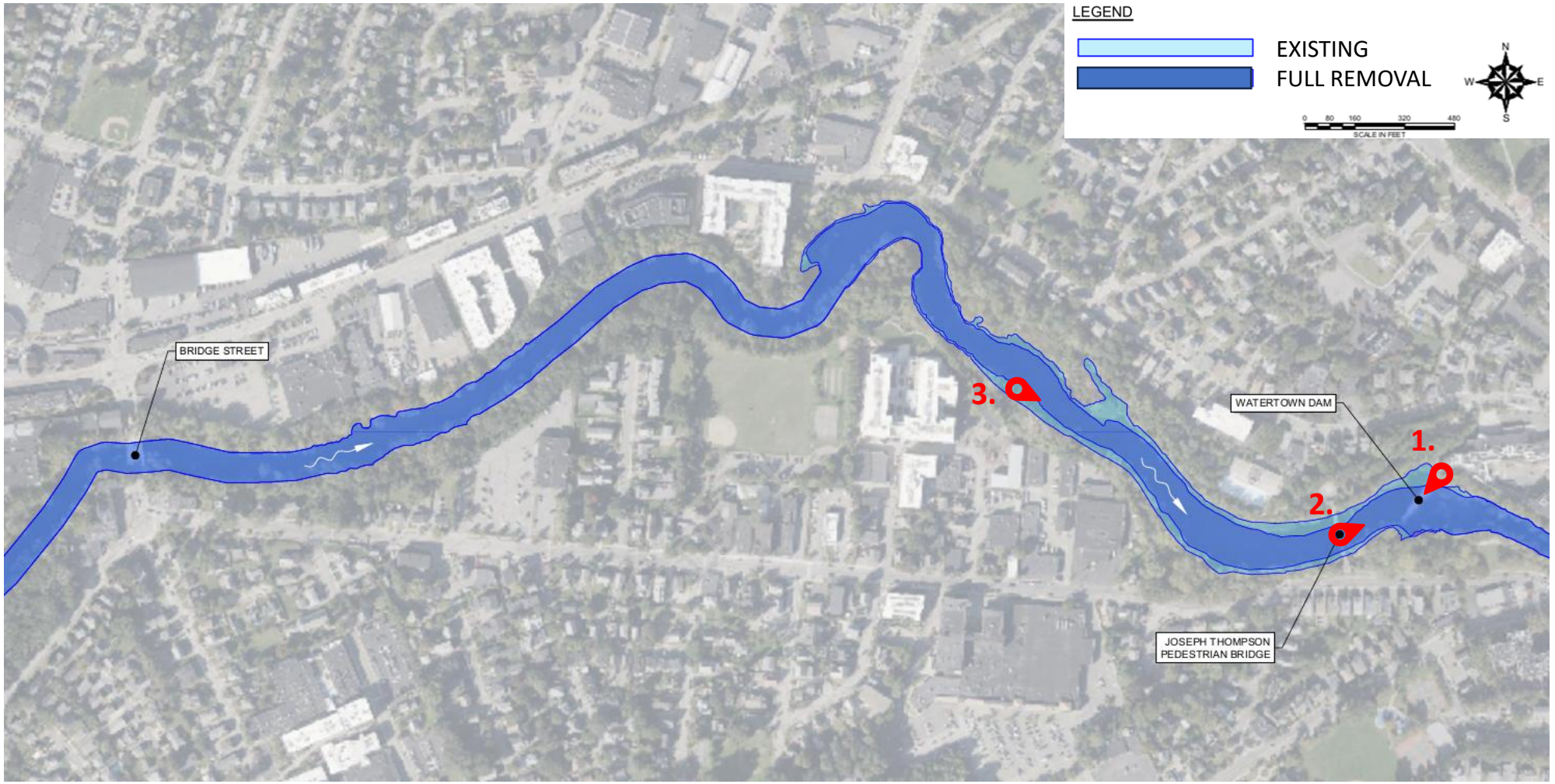
Changes to Scenery / Aesthetics due to Full Dam Removal

Changes to upstream inundated areas under median annual flow



Visualizations at three locations

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Changes to Scenery / Aesthetics due to Full Dam Removal

1. Overlook at Dam - Median Annual Flow

Existing

Immediately Post-Construction

Changes to Scenery / Aesthetics due to Full Dam Removal

1. Overlook at Dam - Median Annual Flow

Existing

After Establishment of Vegetation

FULL DAM REMOVAL (rendering)

Changes to Scenery / Aesthetics due to Full Dam Removal

2. Overlook at Pedestrian Bridge (400 ft Upstream) - Median Annual Flow

Existing

Post-Construction


FULL DAM REMOVAL
(rendering)

Changes to Scenery / Aesthetics due to Full Dam Removal

3. Overlook at DCR Overlook (1,300 ft Upstream) - Median Annual Flow

Existing

Post-Construction


FULL DAM REMOVAL
(rendering)

Key Issues: **Changes to Scenery / Aesthetics due to Full Dam Removal**

- The visual character of the upstream area will change from “stillwater” to “riverine” with greater water level fluctuations.

- Existing overlook areas should remain viable.
  - **Visual changes will be greatest at the location of the former dam and will be most apparent during low flow conditions**
  - **Change in visual character of the site immediately after construction, will require up to 2 growing seasons until vegetation is established**
  - **Additional vegetated bank will require DCR maintenance and invasive species control efforts.**

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Key Issues:

Observations and Uncertainties

- Commonwealth may choose no action, repair, or removal.
- No “fatal flaws” to a proposed dam removal project
- Removal would involve significant permitting and public comment

- Remaining potentiality significant uncertainties for removal project include:
  - **Possible impacts to adjacent former mill building foundation**
  - **Potential need for modifications to stormwater outfalls and other utilities**
  - **Final disposition of exposed upstream sediment**
  - **Impacts to downstream recreation appears minimal**
  - **Possibility of cultural resources present and exposed if removal occurred**
  - **USACE understanding of impacts to the full Charles River system**