



# POLYCHLORINATED BIPHENYLS IN THE NEPONSET RIVER

Robert Breault  
Jason Sorenson  
Kimberly Campo  
Dave Armstrong

 **USGS**  
science for a changing world

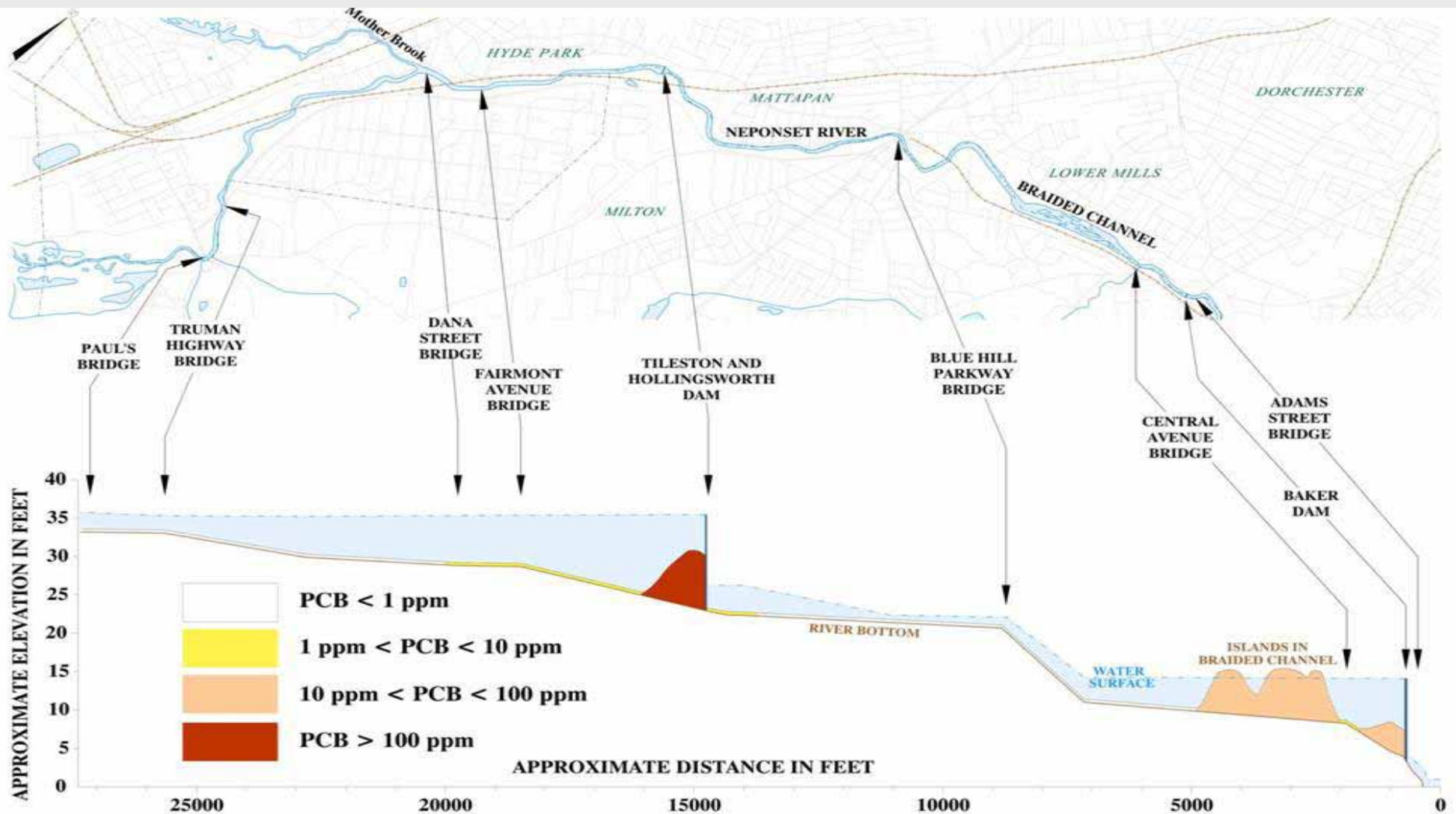


Commonwealth of Massachusetts

**RIVERWAYS PROGRAM**

*Building Partnerships, Protecting Rivers*

# Lower Neponset PCBs



**CONCEPTUAL PLAN AND PROFILE**

# Sediment Volumes at Dams

<i>Reference</i>	<i>Baker Dam</i>	<i>T&amp;H Dam</i>
USGS 2005	7,780	22,960
MMI 2006*	7,780	±4,000
MMI 2007*	3,100	4,000

Note: All sediment volumes in cubic yards

\*MMI sediment volumes computed in immediate vicinity of dams

USGS sediment volumes computed for significant distance upstream of dams

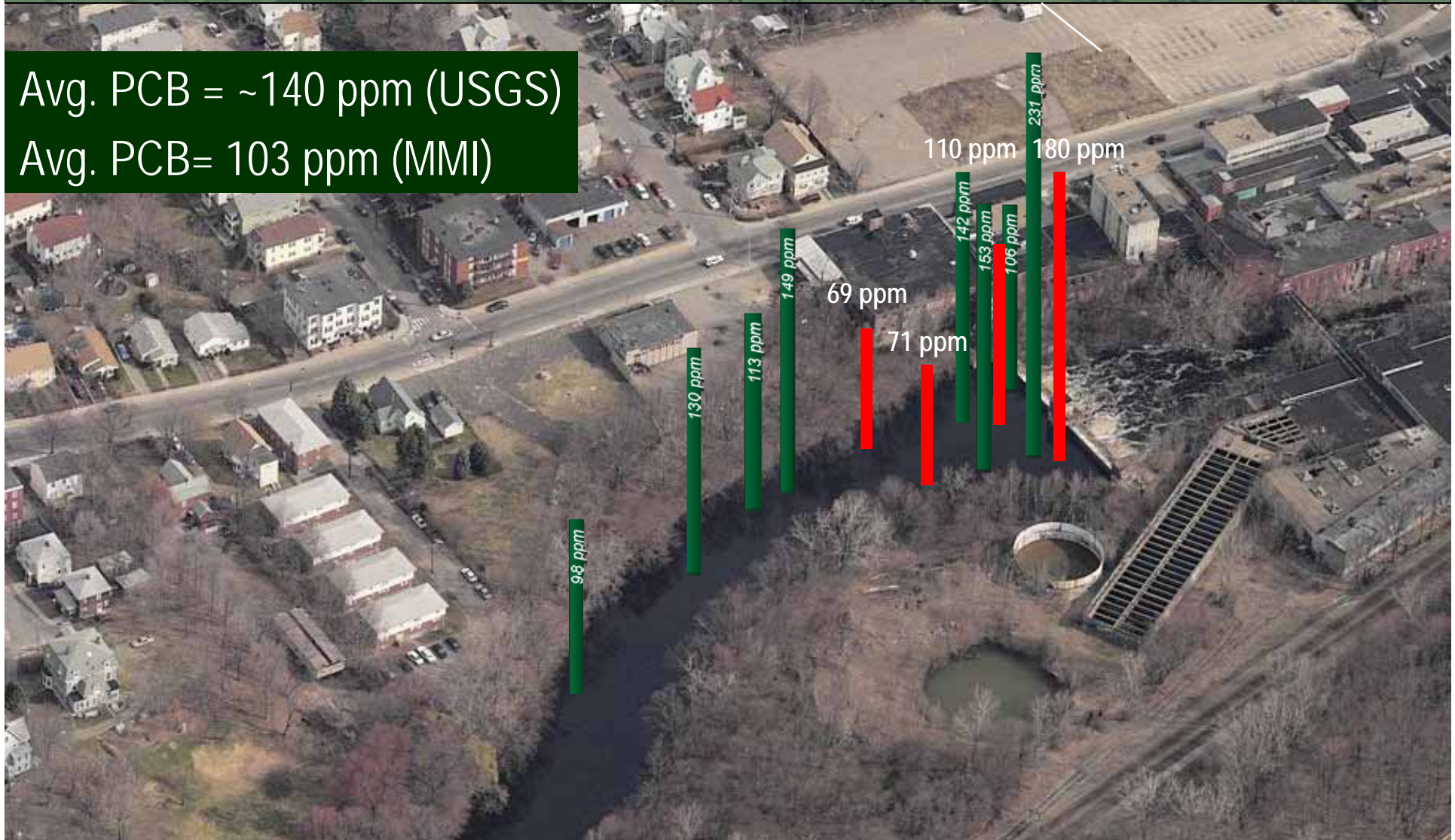
**Estimated Watershed Sediment Yield = 7,350 cubic yards/year**



# T&H Dam PCB ConcentrATIONS

Avg. PCB = ~140 ppm (USGS)

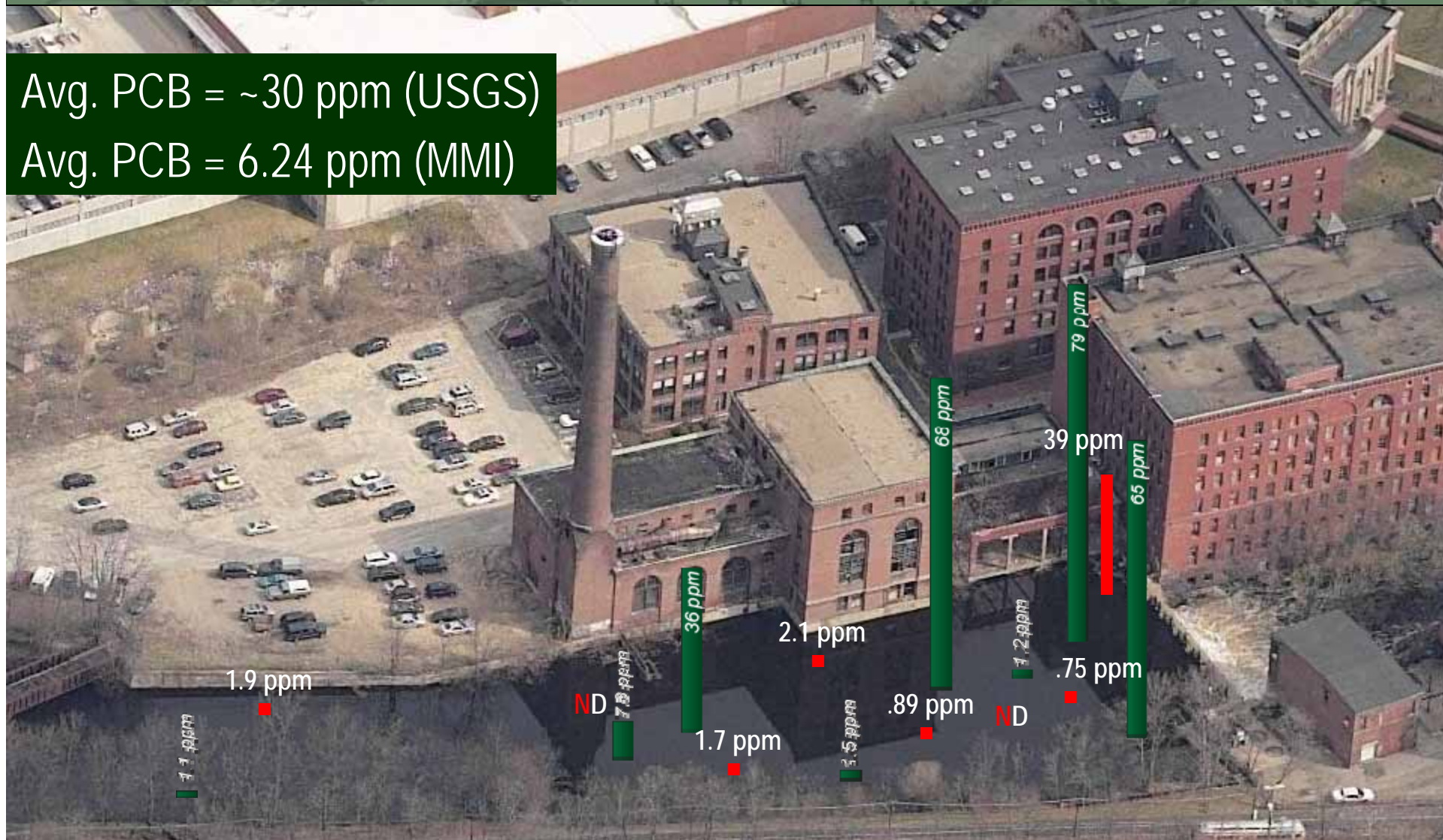
Avg. PCB = 103 ppm (MMI)



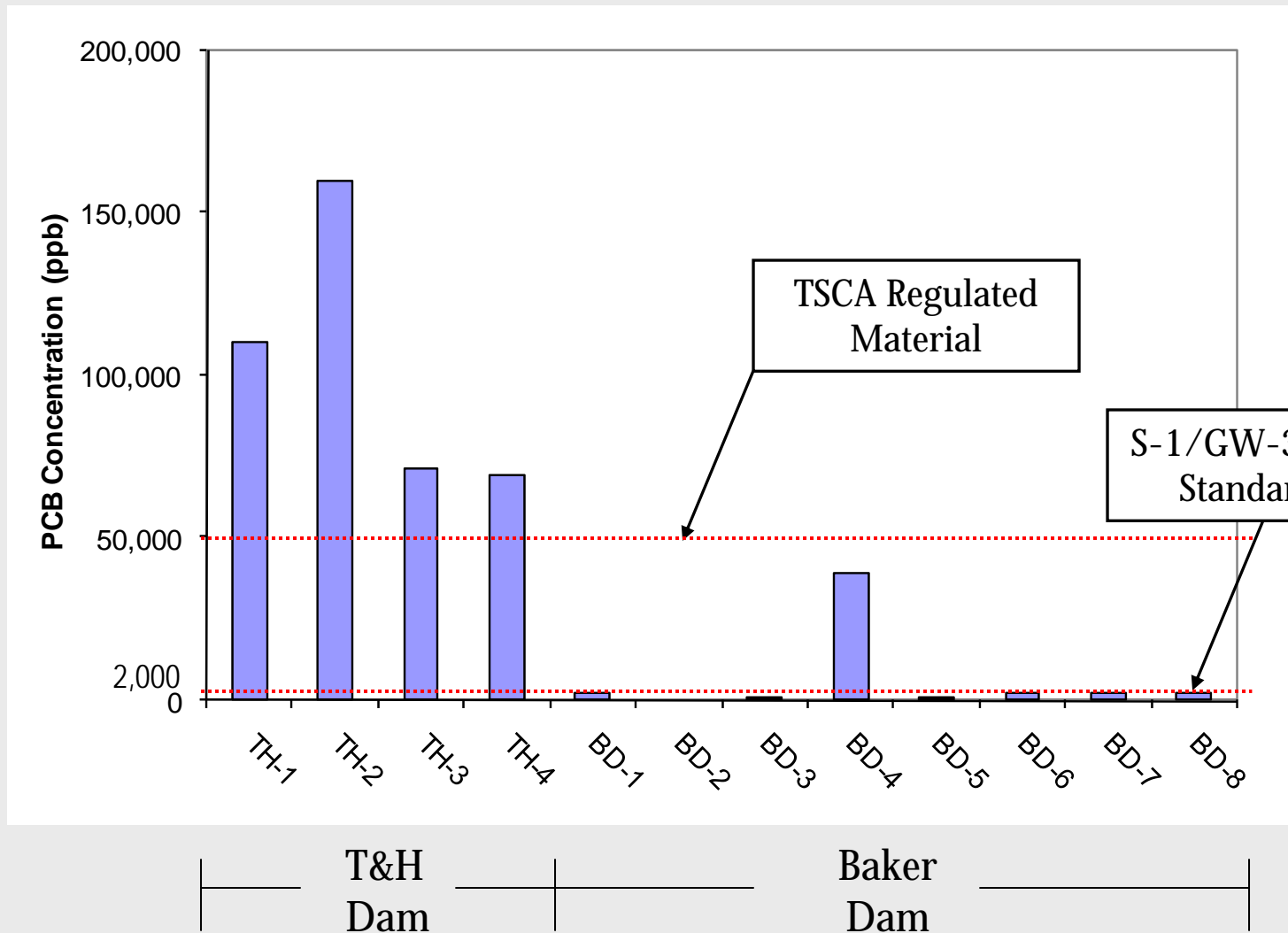
# Baker Dam PCB ConcentrATIONS

Avg. PCB = ~30 ppm (USGS)

Avg. PCB = 6.24 ppm (MMI)



# Findings: Sediment Quality



# END

- Sources:
  - USGS, Prepared for Riverways Program, Restoring an Urban River—Polychlorinated Biphenyls and Other Contaminants in Bottom Sediment of the Lower Neponset River, Massachusetts, Robert F. Breault and Matthew G. Cooke, 2004
  - Milone and MacBroom, Prepared for Riverways Program and Division of Marine Fisheries, Supplemental Report, Neponset River Fish Passage and Habitat Restoration Project, Neponset River Basin, 2008

# Sediment Remediation Alternatives



Commonwealth of Massachusetts

**RIVERWAYS PROGRAM**

*Building Partnerships, Protecting Rivers*

# Baker and T&H Dam Preliminary Sediment Remediation Alternatives

- Full Dredging
- Channel Dredging with *In-Situ* Natural Cap

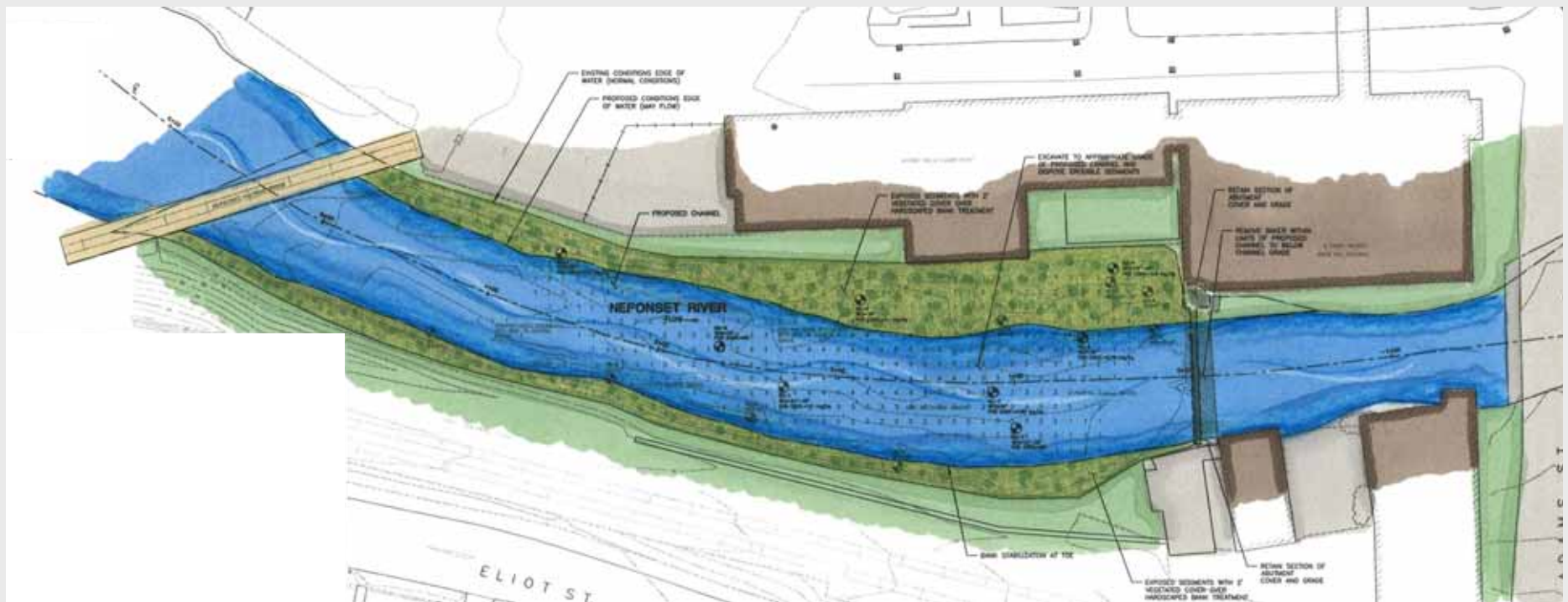


# Preliminary Guidance from DEP & EPA on Sediment Management

- Habitat restoration projects such as the Neponset River Restoration are not to be treated as typical remediation sites as defined under the Massachusetts Contingency Plan.
- Sediments from sources of PCBs  $>50$  ppm will be regulated under TSCA and cannot be disposed of on-site. This eliminates alternatives involving containment walls.
- Newly exposed bank sediments can be removed and disposed of off-site. Alternately, they may remain with proper stabilization, cover, and long-term monitoring and maintenance, subject to regulatory approval.



# Baker Dam Sediment Management

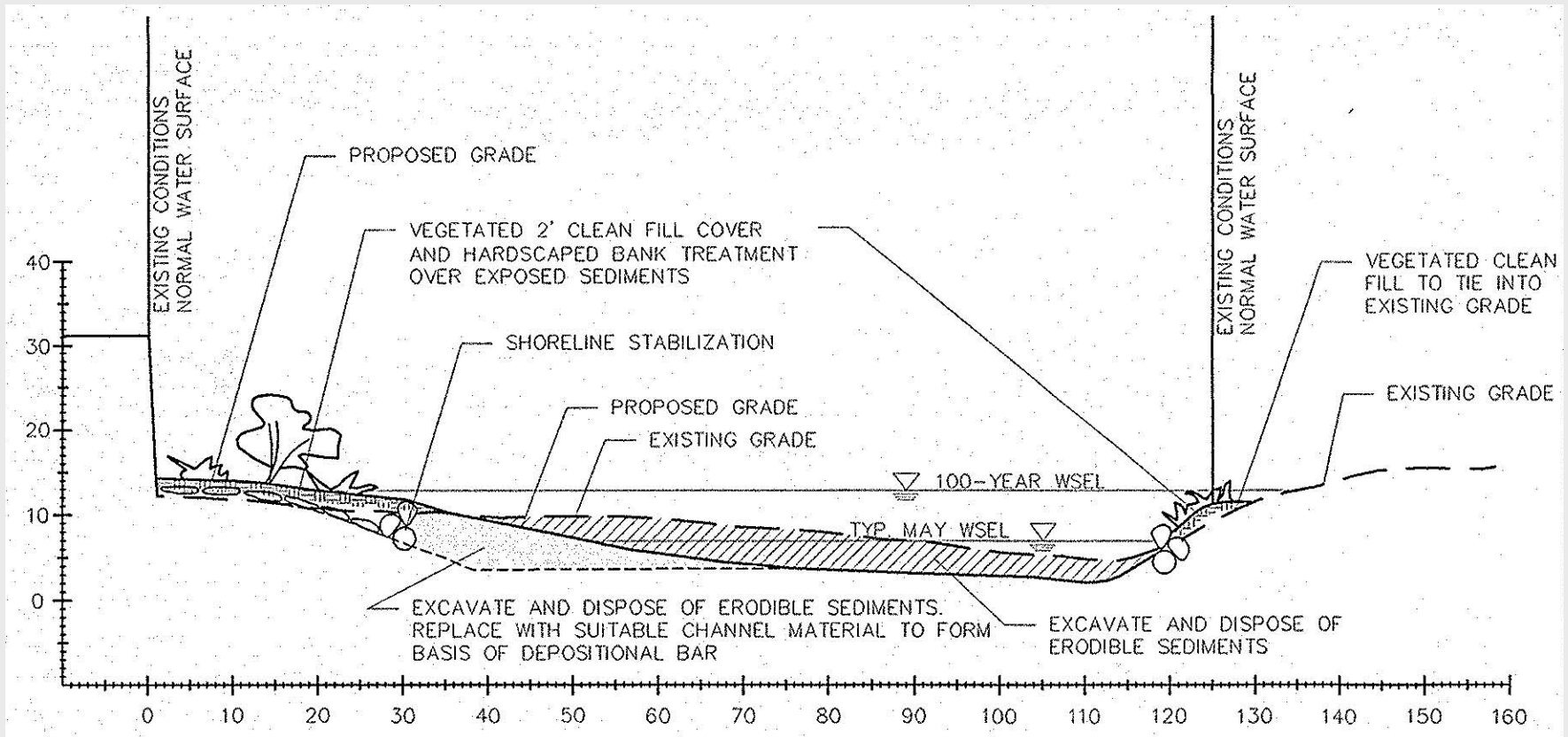


Full Dredge: ~3,100 CY

Partial Dredge: ~2,600 CY

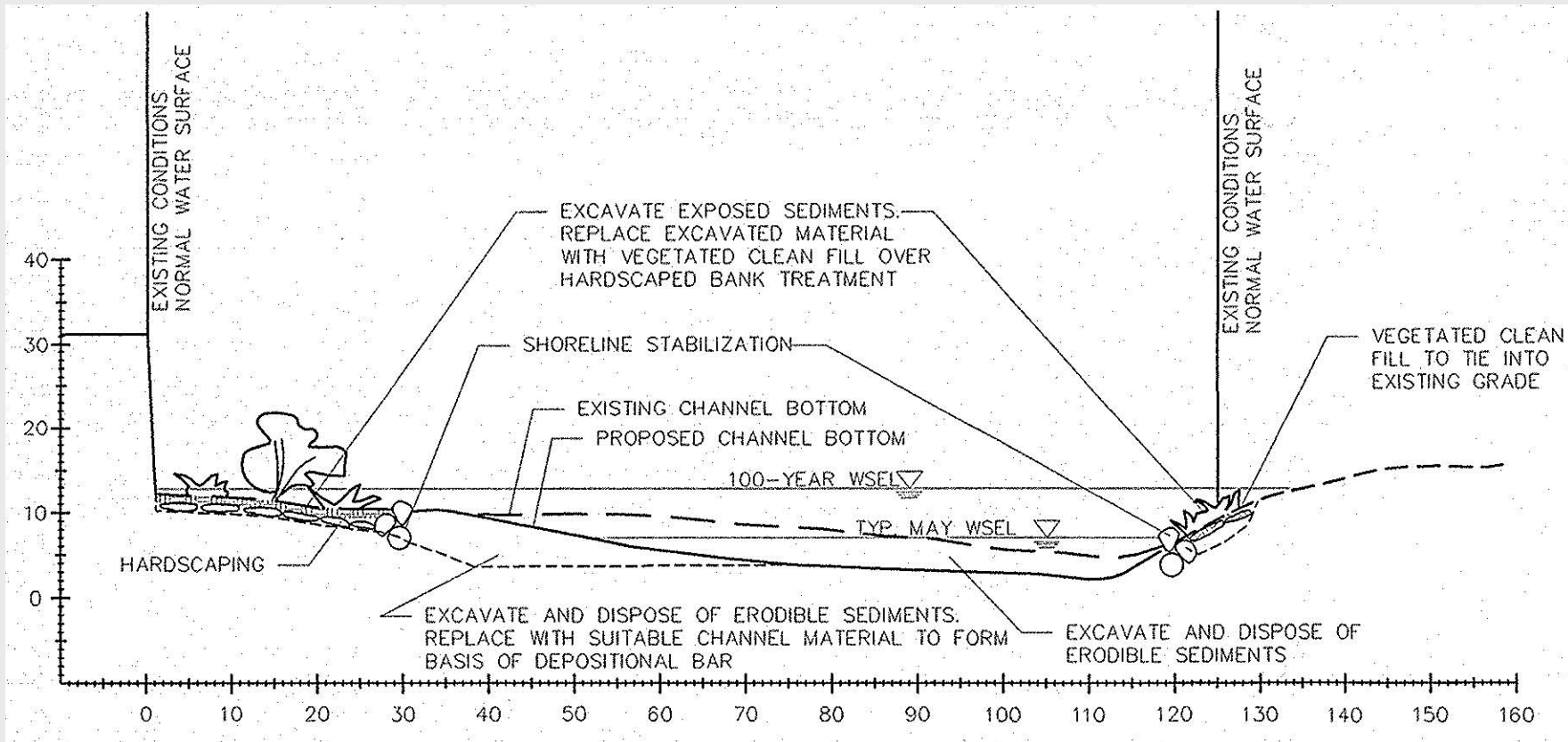


# Baker Dam: Partial Dredging



Exposed Bank Sediments:  
Partial Dredge – Cover exposed  
sediments with 2' clean cover,  
vegetate, monitor, and maintain

# Baker Dam: Full Dredging



–Full Dredge – Excavate deposited sediments, restore existing grade, cover with clean fill, vegetate to stabilize

## Findings: Bathymetry

- Significant sediment transport has occurred in the Baker impoundment since 2006. Physical composition is more coarse grained. Volumes are significantly less.
- Remaining sediment accumulations in the Baker impoundment are concentrated on river left (Boston) side of the pool.
- The main channel and right side of the Baker pool have little to no sediment.

# T & H Sediment Management

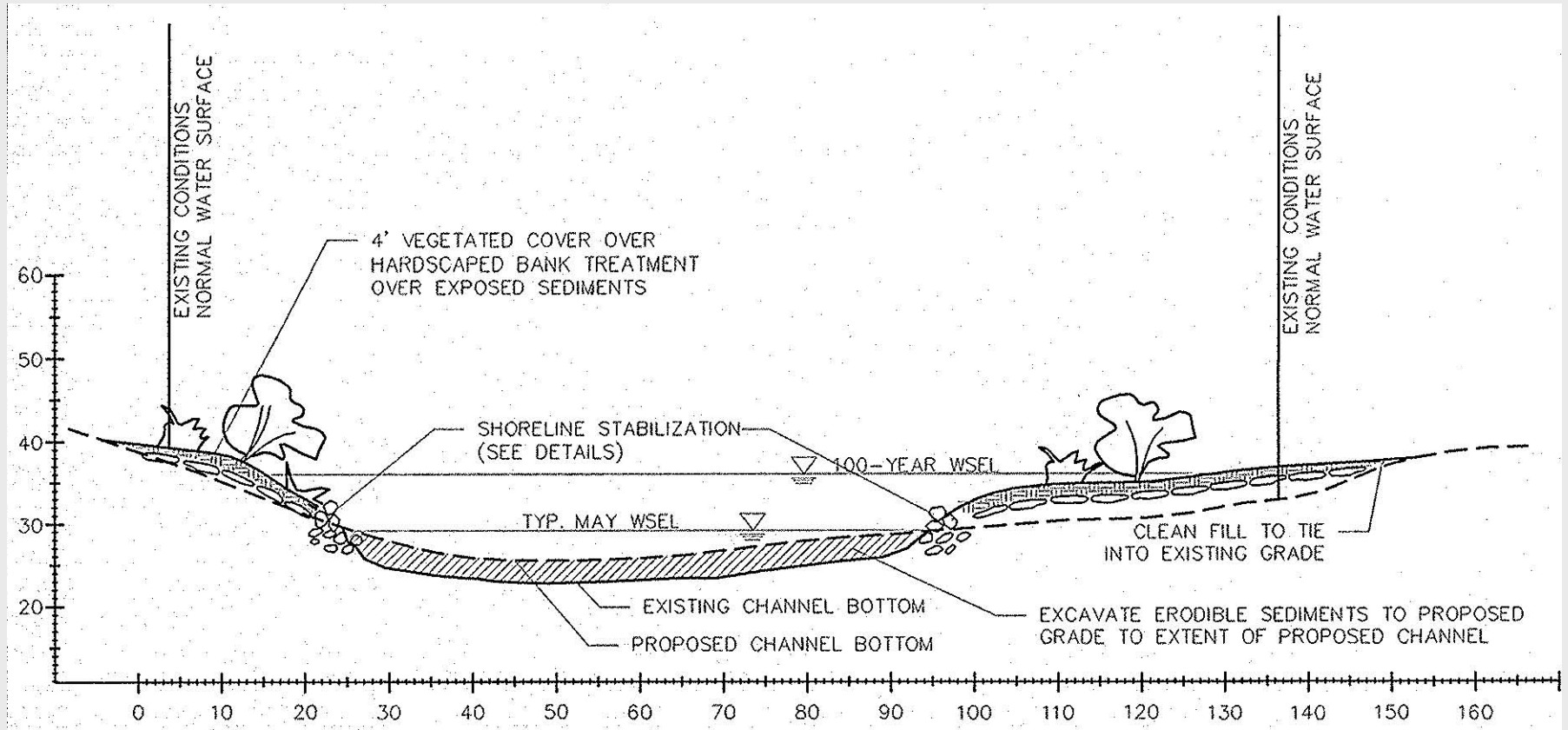


Full Dredge: ~4,000 CY

Partial Dredge: ~3,000 CY

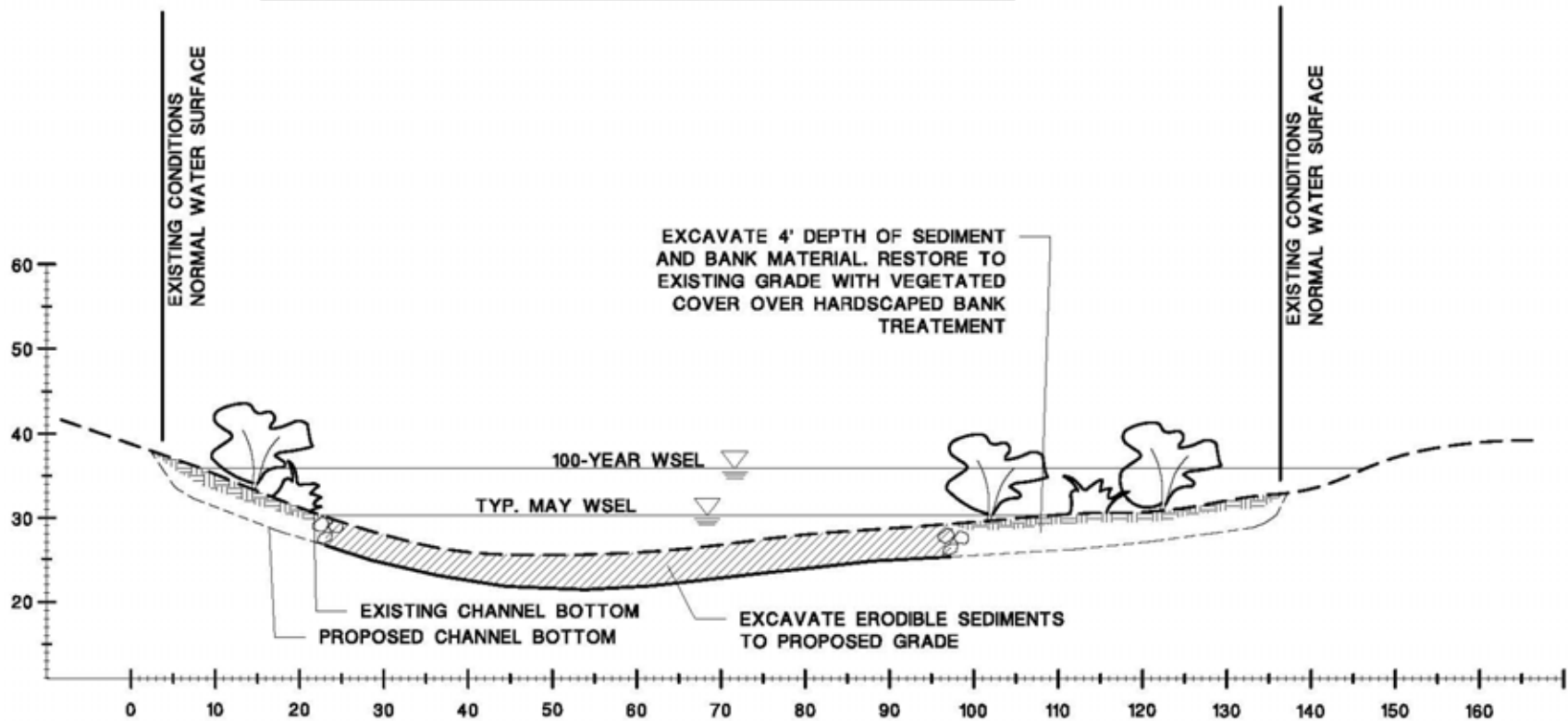


# T&H Dam Partial Dredge



# T&H Dam Full Dredge

**TAH ALTERNATIVE 3 - FULL DAM REMOVAL WITH FULL SEDIMENT DREDGING**



# Milone and MacBroom Recommended Options

## Baker Dam

- Sediment Removed from Proposed Channel Bed:
  - Seek MA DEP approval for disposal of sediments with PCBs < 50 ppm at state approved landfill
- Exposed Bank Sediments:
  - Cover exposed sediments with 2' clean cover, vegetate, monitor, and maintain
  - Excavate deposited sediments, restore existing grade, cover with clean fill, vegetate to stabilize

# Milone and MacBroom Recommended Options

## T&H

- Sediment Removed from Proposed Channel:
  - To be disposed of as a TSCA Remediation Waste at an appropriate disposal facility.
- Exposed Bank Sediments:
  - Cover exposed sediments with 4' clean earth fill, vegetate, monitor, and maintain.
  - Excavate deposited sediments, restore existing grade, cover with clean earth fill, vegetate to stabilize.

# End

- Preferred alternatives will be compliant with all applicable regulations and statutes and completed in concert with DEP, DFG, DCR and other regulatory agencies.