

Understanding Flood Risks: Climate Data and Projections

Hatfield Comprehensive Plan Committee – Working Meeting #3
Hatfield Climate-Smart Comprehensive Plan
February 22, 2023

Presenters:

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Overview



- ▶ Meeting #2 Recap
 - Current conditions
 - FEMA regulatory context
 - Future conditions
- ▶ CPC Input on Project Work
 - Cross-sections to illustrate flood scenarios
 - Images and illustrations
 - Example mitigation and adaptation strategies
- ▶ Next Steps
 - Updated analysis
 - Discussion of mitigation and adaptation strategies



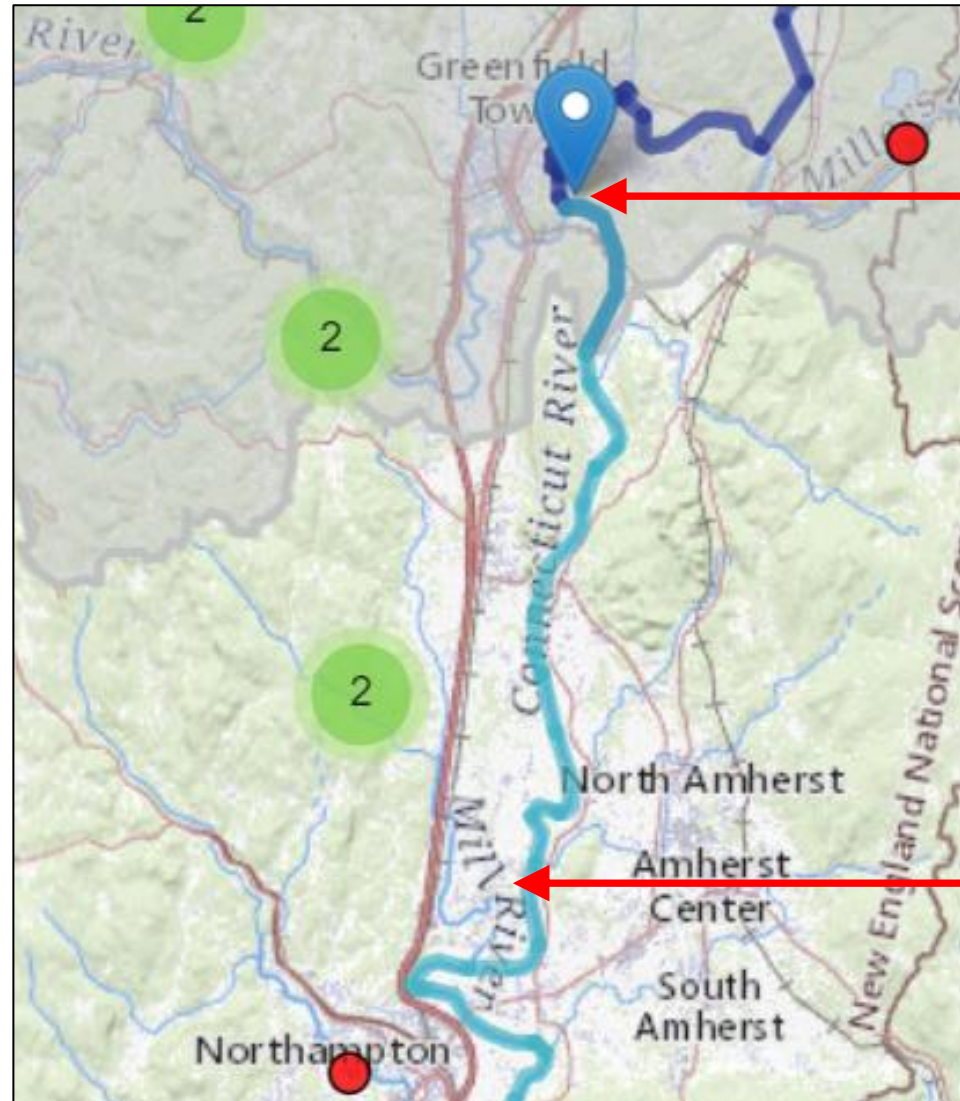
Meeting #2 Recap: Current Conditions



► Flood Risk

- Historic peak flows at Montague City river gage 01170500
- USGS est. 1% AEP 181,000 0.2% AEP 218,000
- FEMA Base Flood Flow = 180,000 cfs

Year	Highest Flow (cfs)
1936	236,000
1938	195,000
1928	179,000
1913	144,000
1984	143,000
1960	142,000
1949	139,000



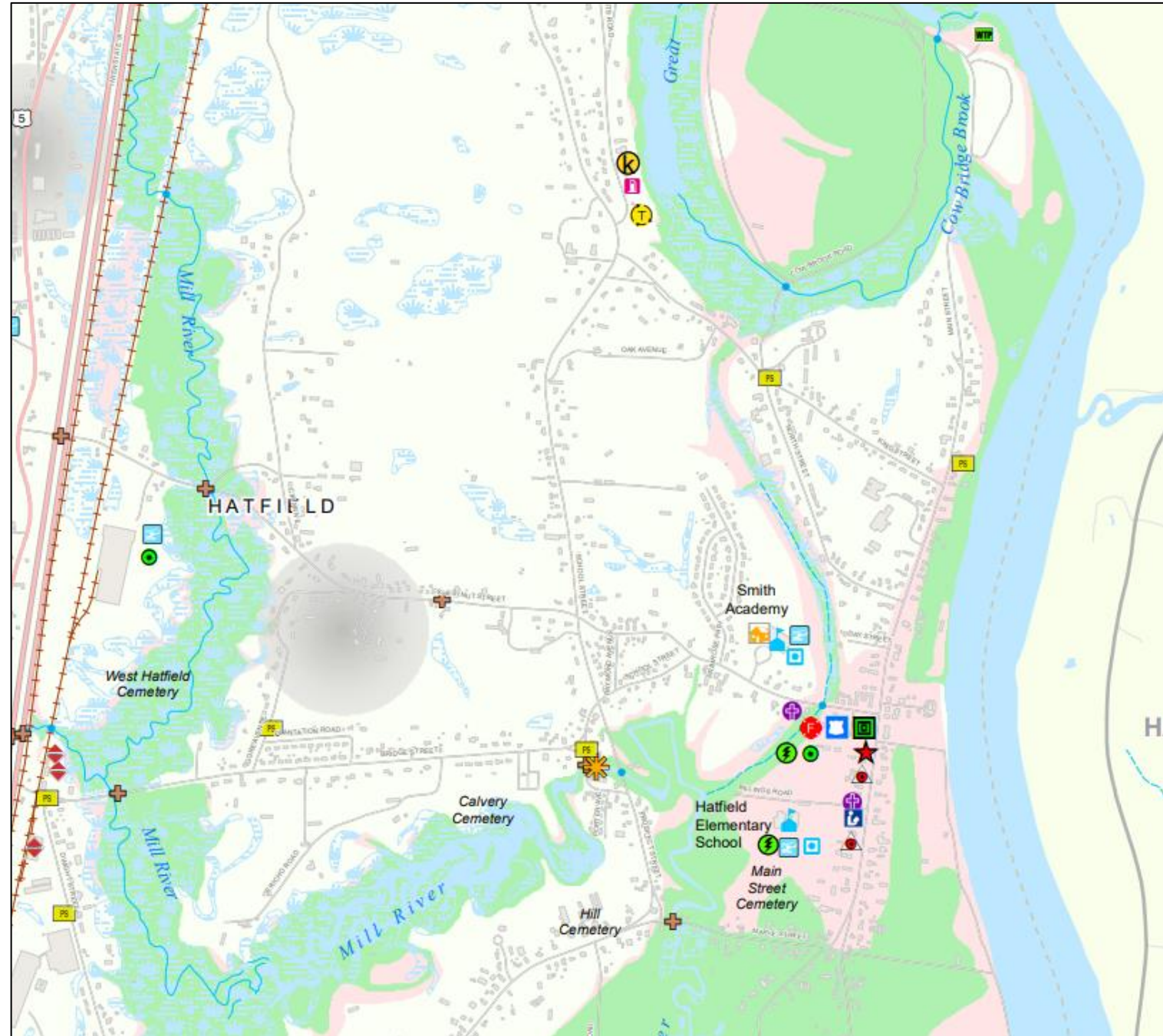
Monitoring Location

Town of Hatfield

Meeting #2 Recap: Current Conditions

► Critical Infrastructure From Hazard Mitigation Plan

- Fire Station
- Police
- Primary Emergency Operations Center
- Town Hall
- Hatfield Elementary School
- Library
- Church
- Helicopter Landing Zone
- Utility Infrastructure
 - Emergency Electrical Power
 - Pumping Station
 - Culverts
- Bridge
- Significant Hazard Dam
- Historic Place
- Recreation Areas

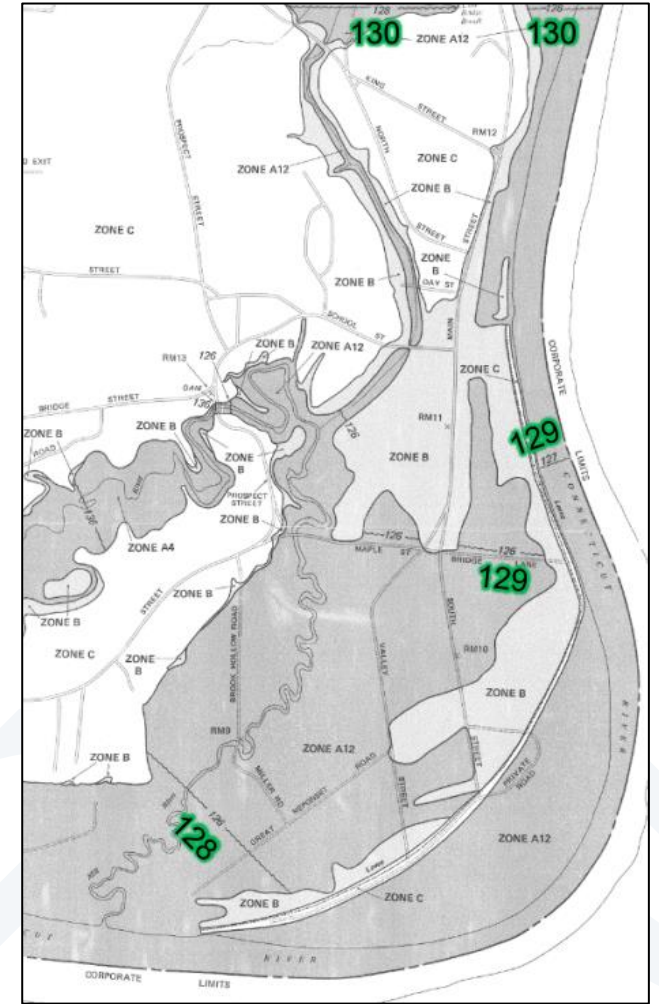
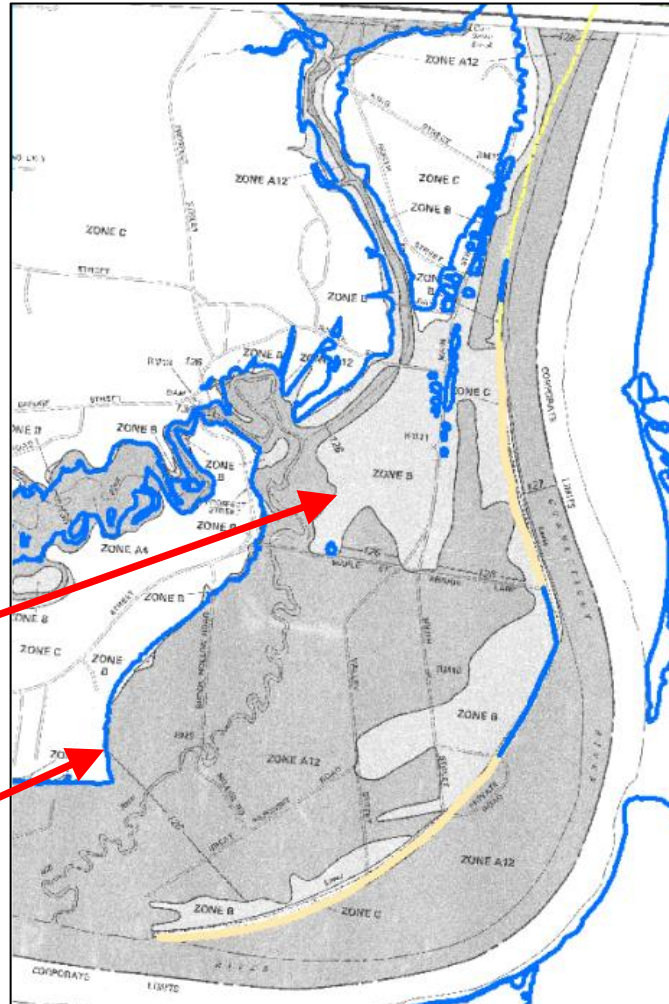


Meeting #2 Recap: FEMA Regulatory Context

- ▶ Remapping Process and Potential Impacts
 - Updated Base Flood Flow = 182,000 cfs
 - Levee does not offer protection
 - 2-to-3-foot increase in BFE

Current Base Flood Limit

Updated Base Flood Limit



Meeting #2 Recap: FEMA Regulatory Context

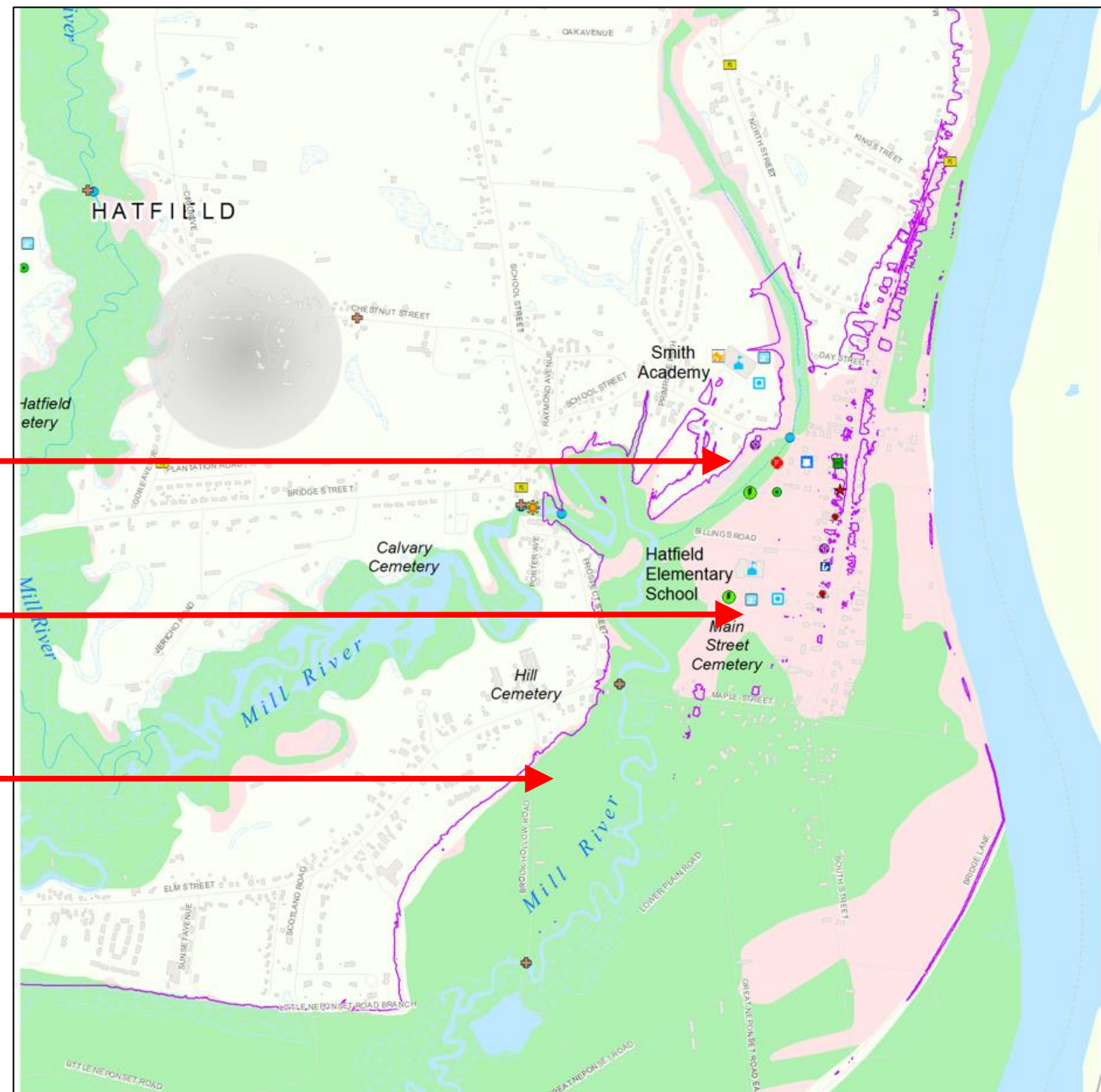
► Potential Impacts

- Updated Base Flood Flow = 182,000 cfs

Updated Base
Flood Limit

Entire Area within
Base Flood Limit

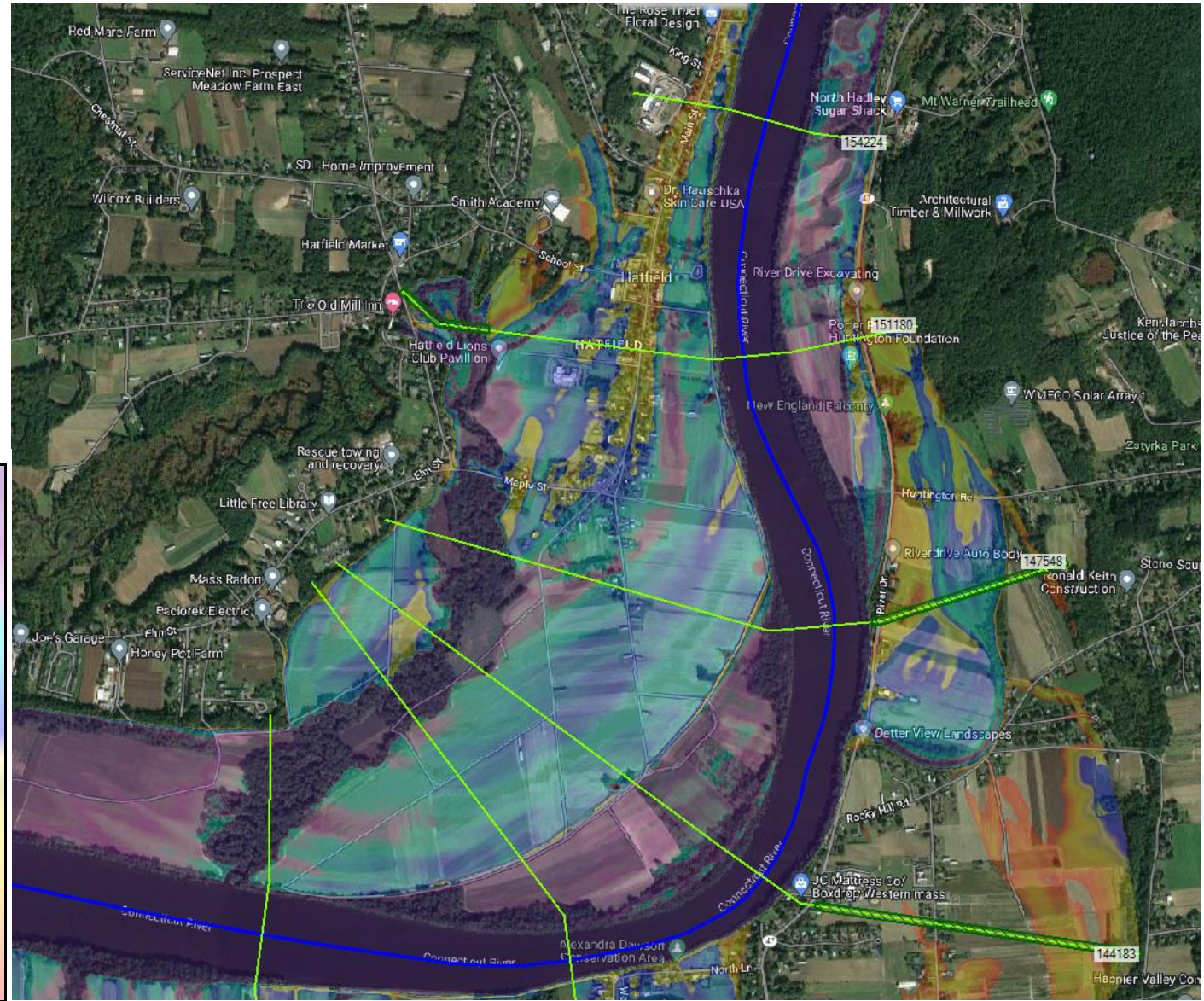
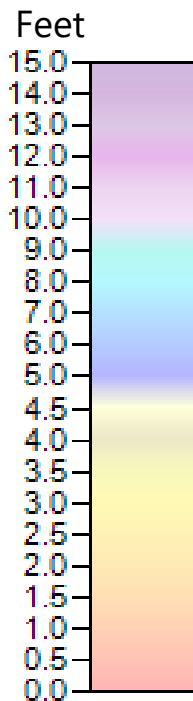
Current Base
Flood Limit



Meeting #2 Recap: Future Conditions

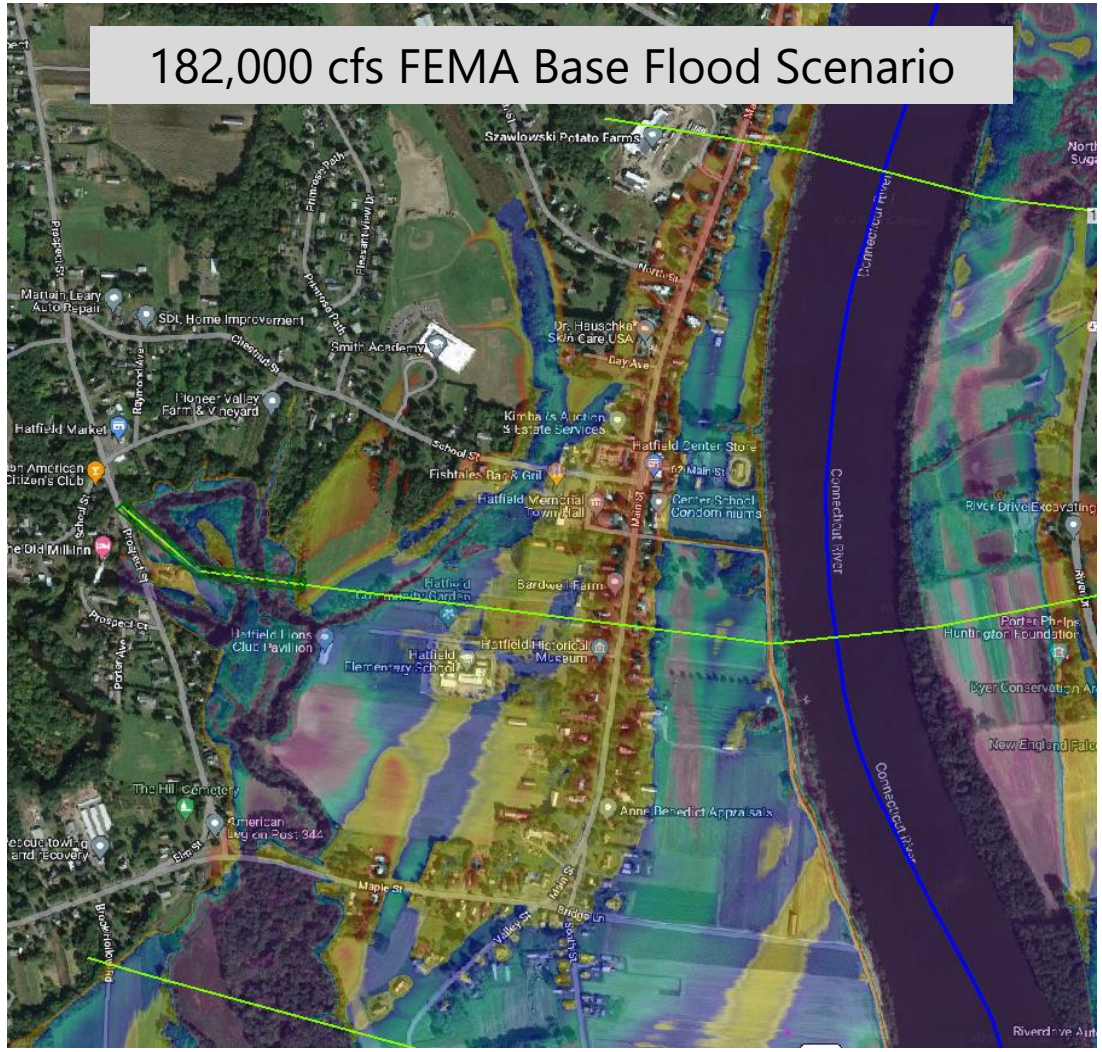
▶ Future flow consideration

- 182,000 cfs = FEMA updated base flood flow
- 15% increase in flows – using % change from 2019 UMass/MassDOT study
 - Looks at climate projections through 2100
- 209,300 cfs = future flow scenario

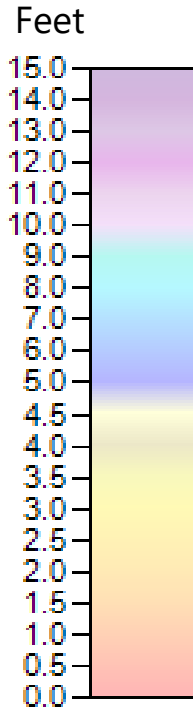
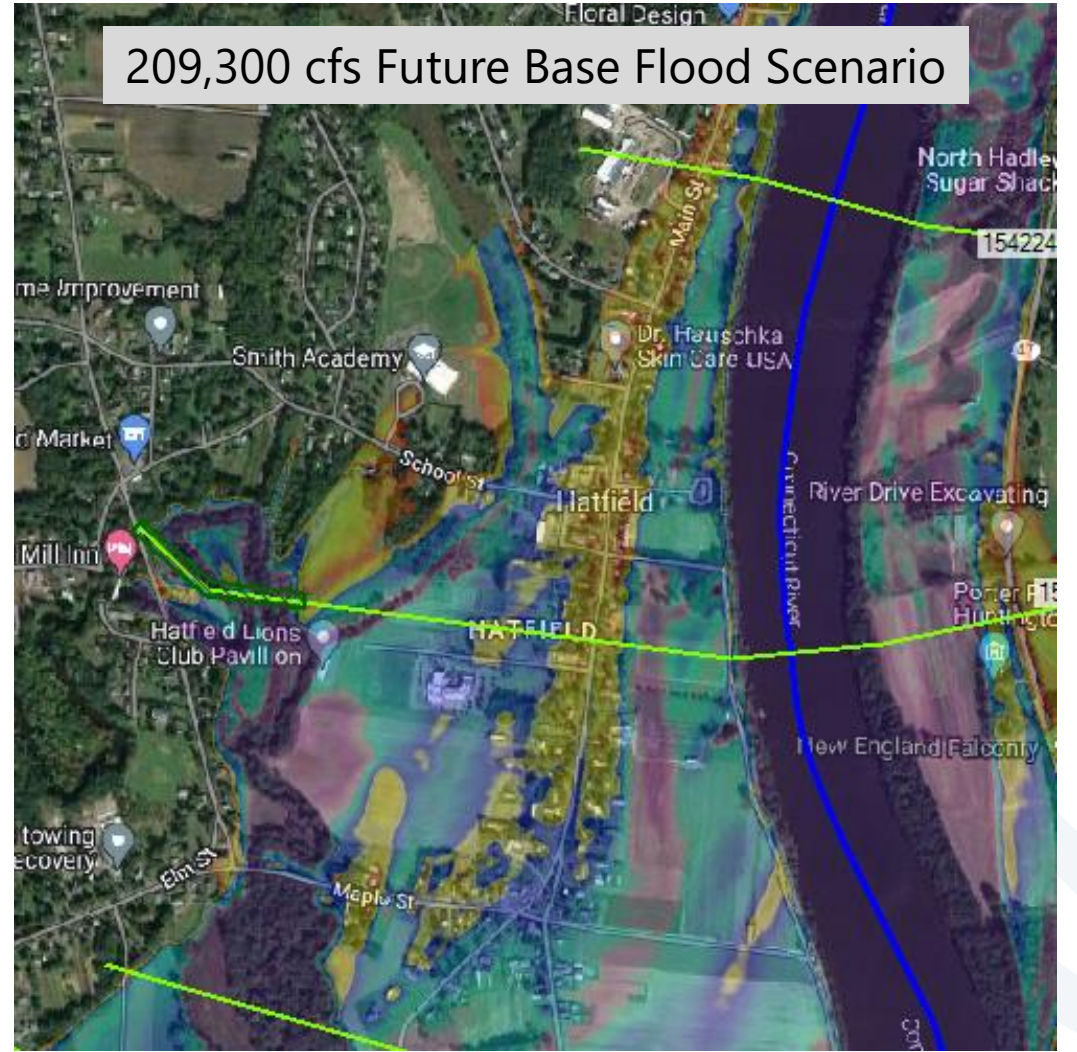


Meeting #2 Recap: Future Conditions

182,000 cfs FEMA Base Flood Scenario



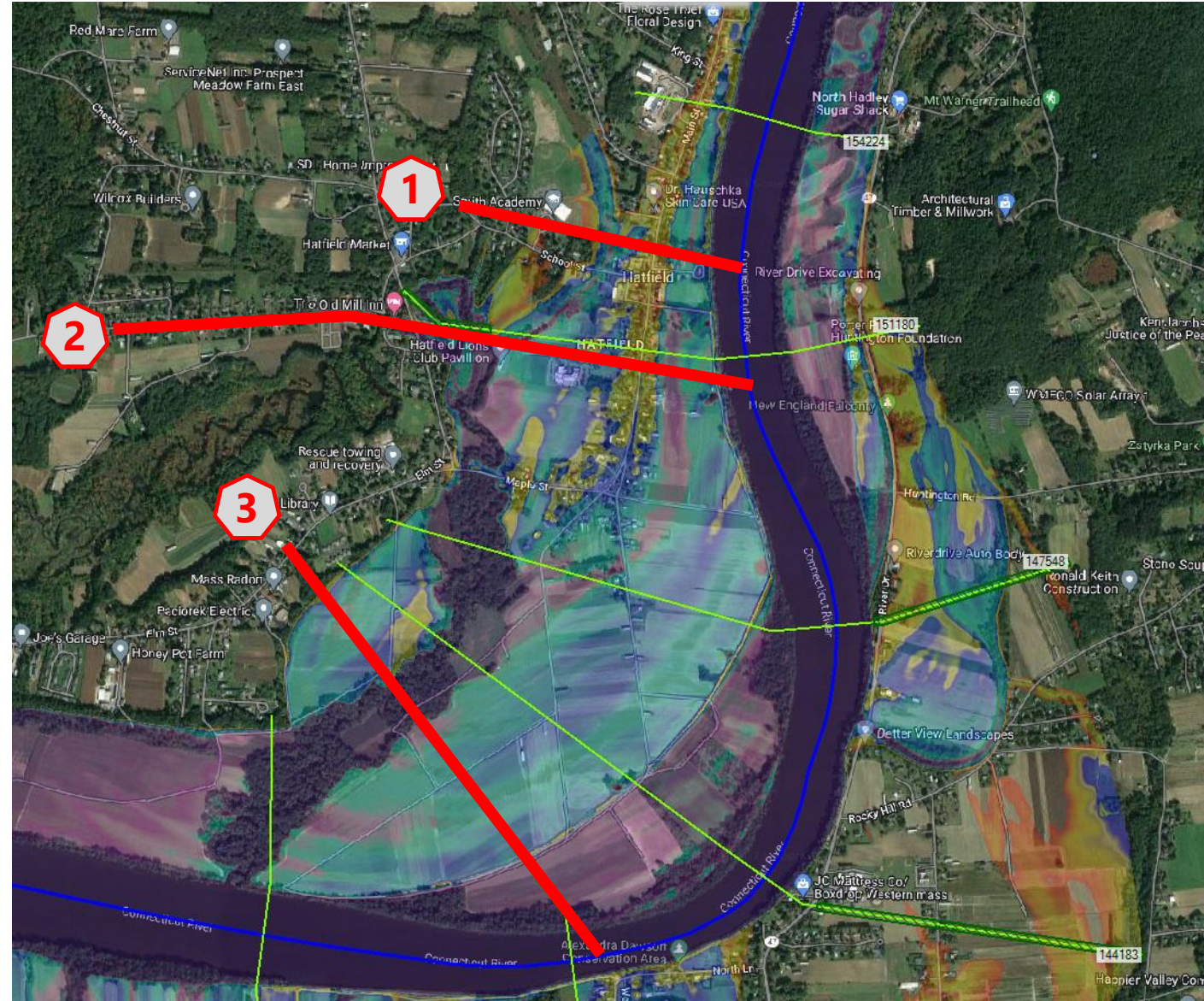
209,300 cfs Future Base Flood Scenario



CPC Input on Project Work



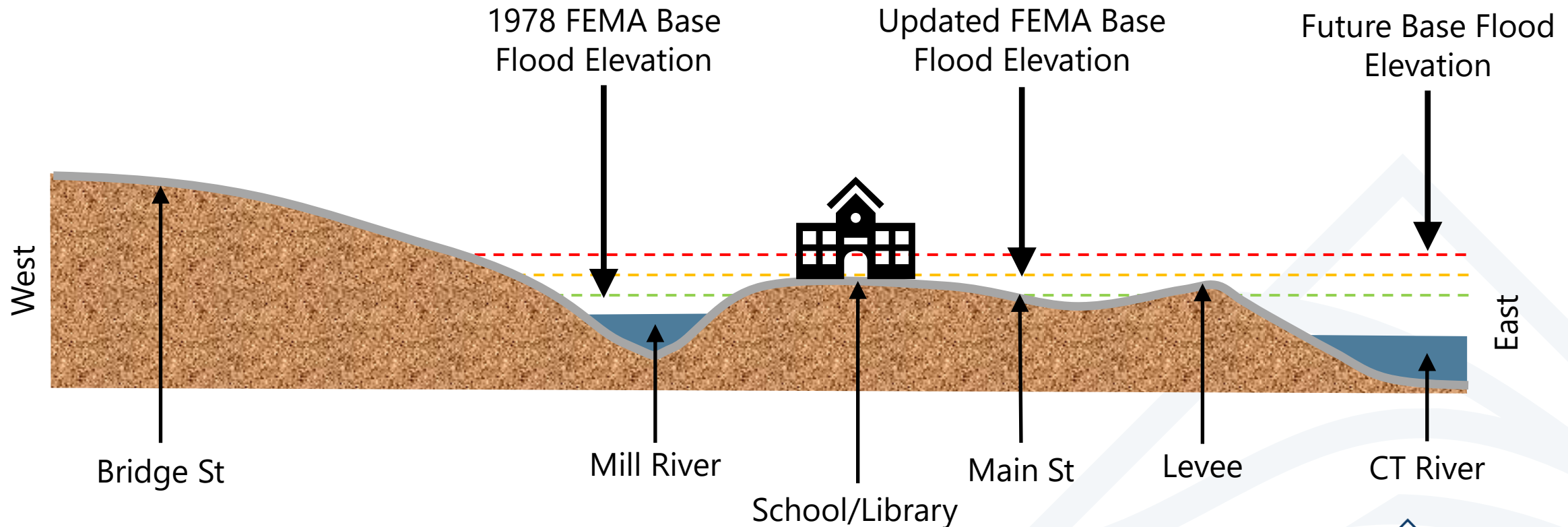
- ▶ What are best cross-sections for critical areas to illustrate flood scenarios?
- ▶ Some ideas:
 1. Chestnut St to School St to Town Hall/Main St to Levee to CT River
 2. Bridge St to Elementary School to Main St to Levee to CT River
 3. Elm St to Mill River to Levee to CT River



CPC Input on Project Work

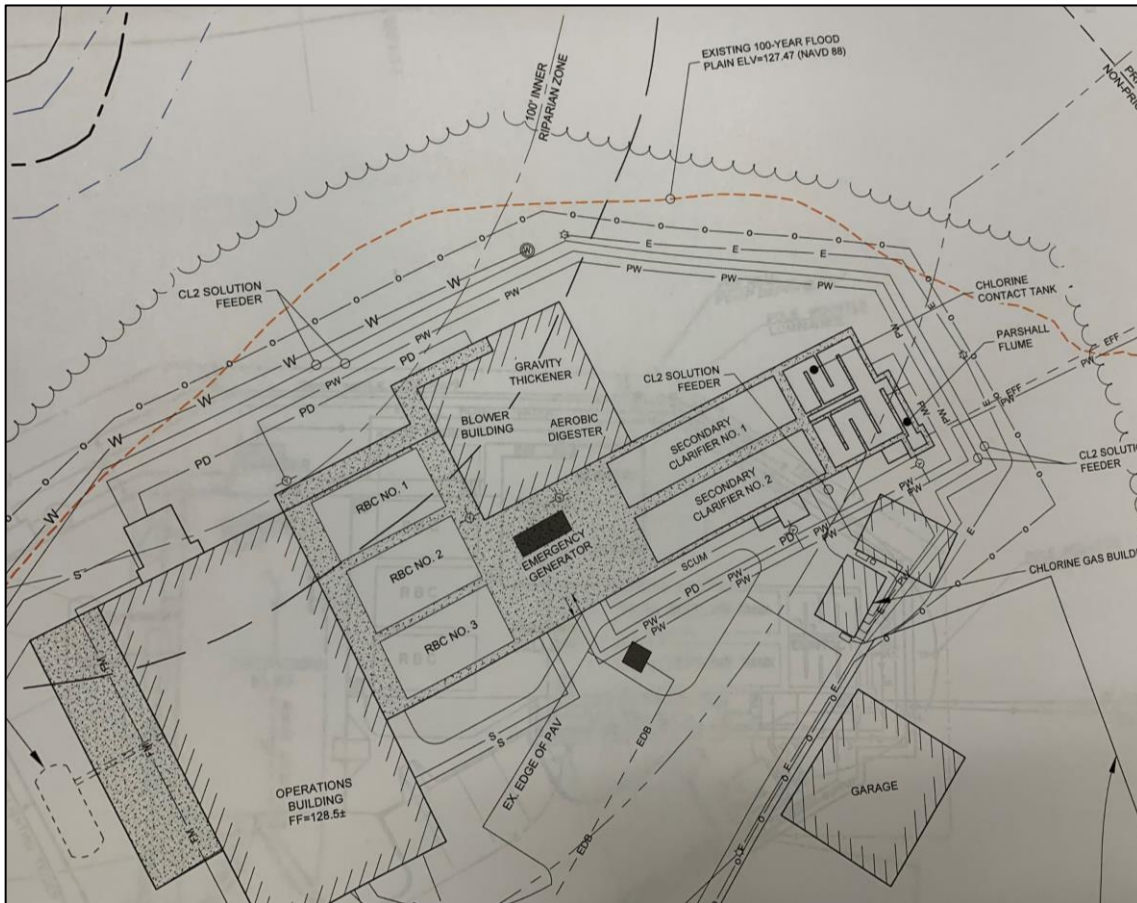


- ▶ Typical cross-section (not to scale – for initial illustration and discussion purposes only)



CPC Input on Project Work

- ▶ What are best images and illustrations to consider?



- ▶ Wastewater Treatment Plant
- ▶ 1978 FEMA BFE = EL 127.47
- ▶ Operations Building First Floor = EL 128.5
- ▶ Updated FEMA BFE = EL 130 (approx.)

CPC Input on Project Work



Wastewater Treatment Plant

- Updated FEMA BFE = EL 130
- First Floor = EL 128.5
- 1978 FEMA BFE = EL 127.47

CPC Input on Project Work

- ▶ Images and illustrations to consider



Potentially Date Historic
Flood Elevations

CPC Input on Project Work



- ▶ Examples of mitigation and adaptation strategies
 - Adaptation of buildings, facilities, and roads to withstand flood flows (flood proofing)
 - Elevate critical components
 - Elevate roads to improve access and response
 - Install barriers for what can't be elevated
 - Raise ground around buildings (if first floor is above BFE)
 - Relocation of certain critical facilities
 - Retreat and move structure
 - Build a secondary structure to support operations during flood events
 - Improvements to or replacement of levee or berm
 - Property-specific
 - Add to existing system
 - Updated zoning that requires new flood mitigation standards in any new development or redevelopment
 - Opportunities for storage in upper reaches, specifically the Mill River (likely not feasible without a closure structure and pump facility)

CPC Input on Project Work

- ▶ Examples of mitigation and adaptation strategies
 - Kennebunk Sewer District Levee, Kennebunk, Maine



Protected Area

Levee Berm

Flood Zone

Next Steps

- ▶ Updated technical results:
 - Additional floodplain projections
 - Flood inundation depth updates
 - Incorporation of additional building floor elevations, if available
 - Cross-sections for critical areas
- ▶ Further discussion of mitigation and adaptation strategies:
 - Initial thoughts on strategies (pros/cons, feasibility)
 - Risk tolerance and level of investment
 - Recommended strategies



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