



FEMA

# Levee Analysis and Mapping Procedures (LAMP) for Non-accredited Levees

City of Binghamton  
Broome County, NY

February 16, 2017

**RiskMAP**  
Increasing Resilience Together



# Agenda

- Introductions
- Review of LAMP and LLPT Meeting #1
- Discuss Results of First Pass Analysis
- Discuss Finalization of LAMP study methods for Phase 2 Analysis
- LAMP Path Forward

# Introductions & Contact Information

## ■ FEMA Project Monitor

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## ■ Outreach Leads

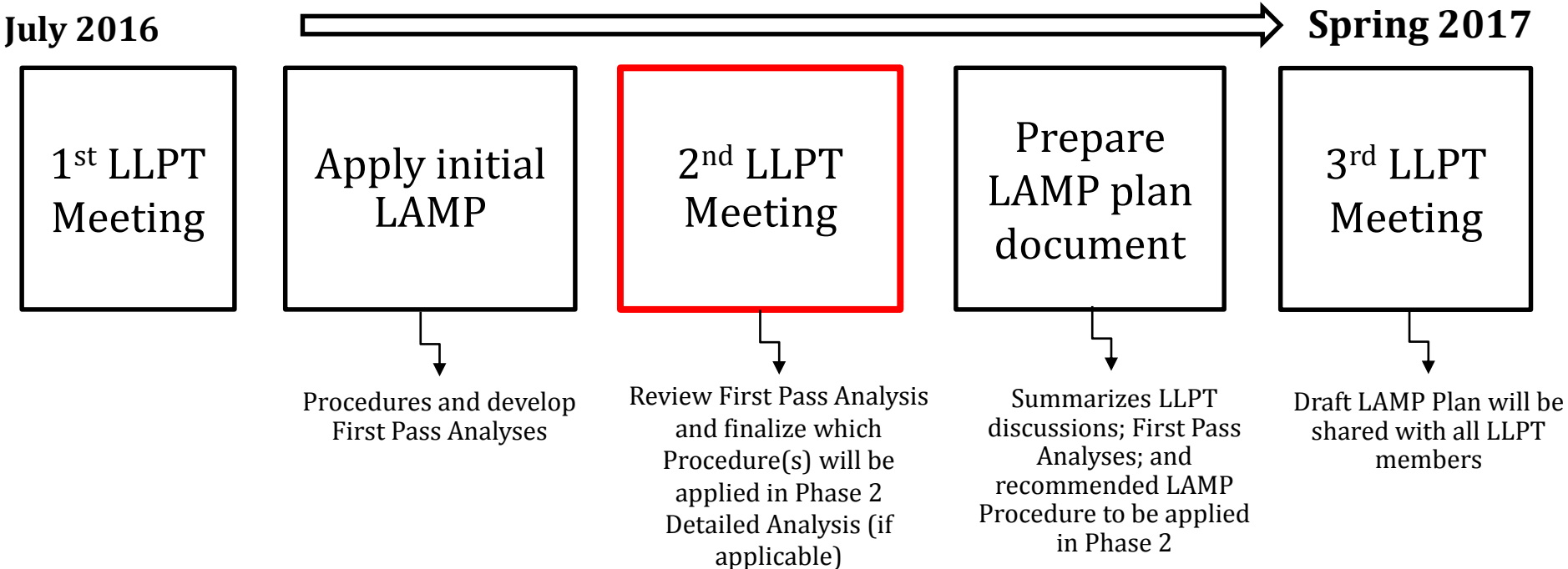
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## ■ Project Engineers

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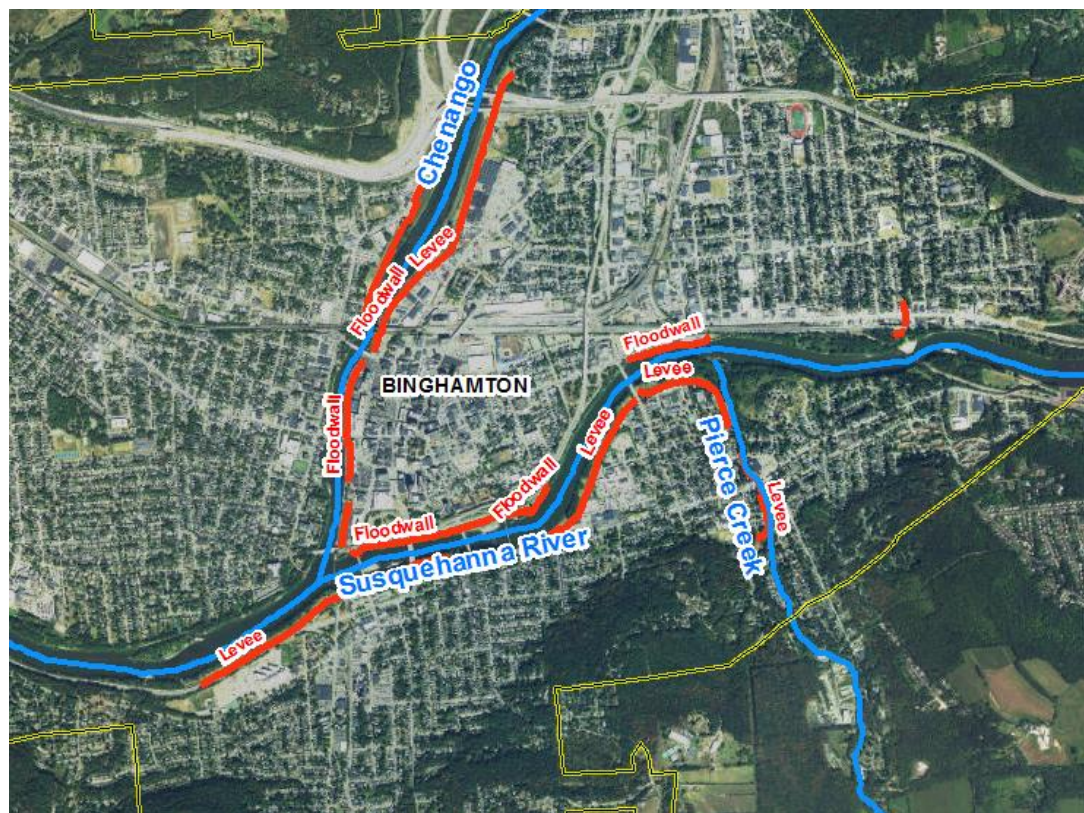
# LAMP Path Forward

## ■ LAMP PHASE 1



# Review of LLPT Meeting #1

- Discussion on the Levee Analysis and Mapping Procedure (LAMP) and Objectives
- Overview of the Levee System
- Outlined First Pass Analysis Methodology: Natural Valley
- Established a preliminary timetable



# Application of LAMP to Levees in the Town of Vestal

## ■ LAMP Procedures:

- **Natural Valley Procedure (Applicable)\***
- **Structural Based Inundation Procedure (Not Applicable)\*\***
  - Levee does not have known vulnerabilities or history of breaching
- **Overtopping Procedure (Potentially Applicable) \*\***
  - BFEs are above top of levee / floodwall, but can be managed
- **Freeboard Deficient Procedure (Potentially Applicable)\*\***
  - Will require documentation that levee meets 44CFR§65.10 except for freeboard
- **Sound Reach Procedure (Not Applicable)\*\***

Will require documentation that levee meets 44CFR§65.10

  - \* - No cost to community
  - \*\* - Potential additional cost to community



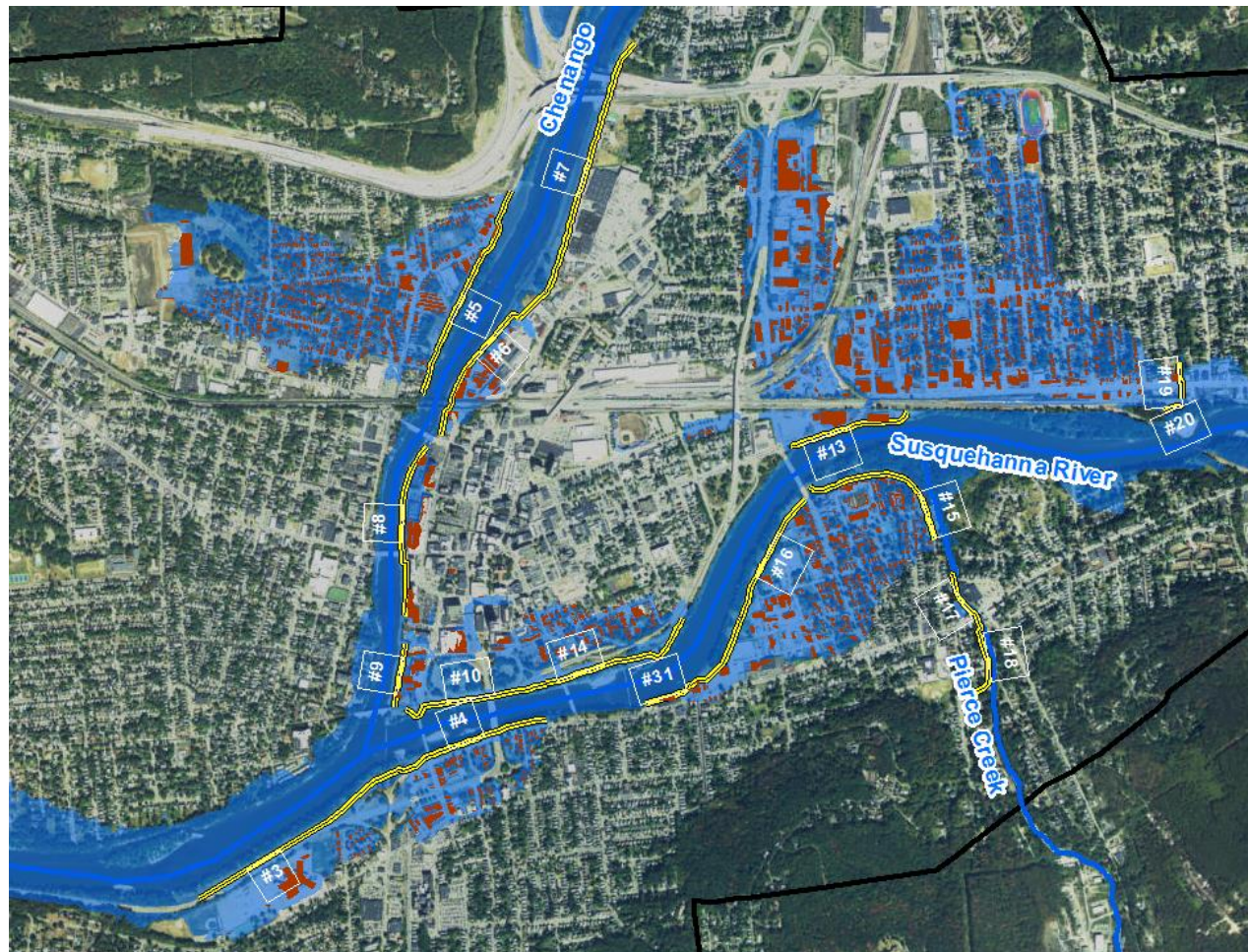
# First Pass Results Natural Valley Analysis

## Hydrology

- Updated Gage Analysis (Including T.S. Lee)
- 3.59% increase in Susquehanna Flow and 7.82% increase in Chenango Flow (relative to Prelim)

## Hydraulics

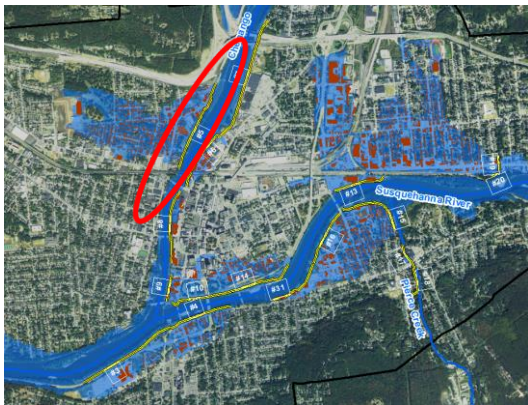
- HEC-RAS 1D Steady State Model
- Approximately 2,336 Structures impacted





# First Pass Results

## Natural Valley Analysis



- Approximate Number Structures impacted:
  - #5 – 606

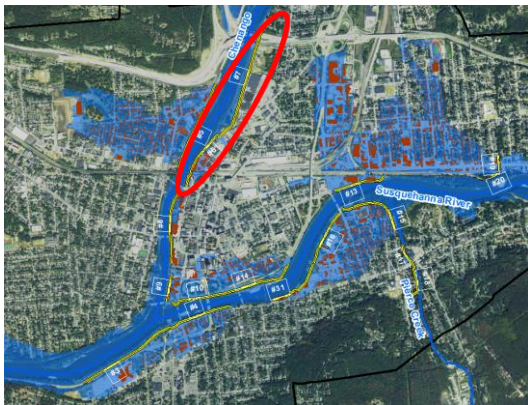
### Levee System Components: Natural Valley

#### Levee #5 (Chenango River)

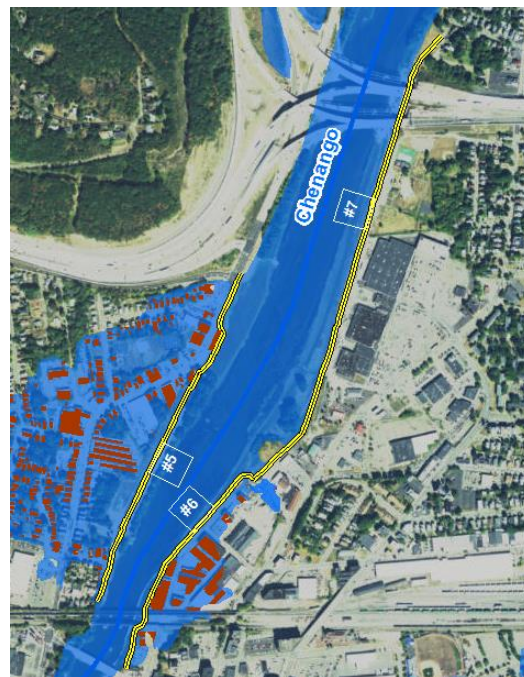




# First Pass Results Natural Valley Analysis

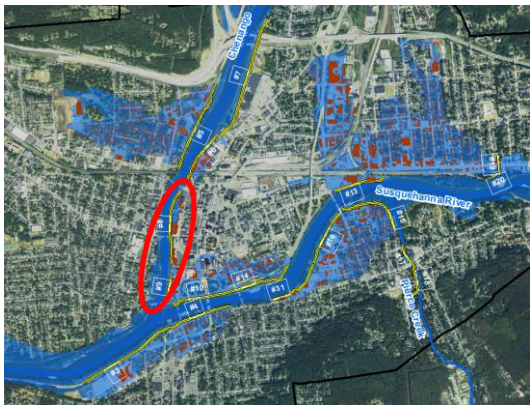


## Levee System Components: Shared Natural Valley Levee #6 and #7 (Chenango River)

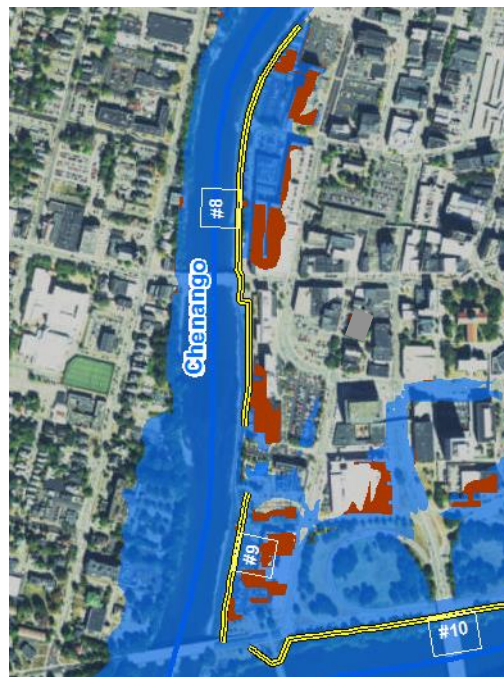


- Approximate Number Structures impacted:
  - #6 – 15
  - #7 – 0

# First Pass Results Natural Valley Analysis



## Levee System Components: Shared Natural Valley Levee #8 and #9 (Chenango River)



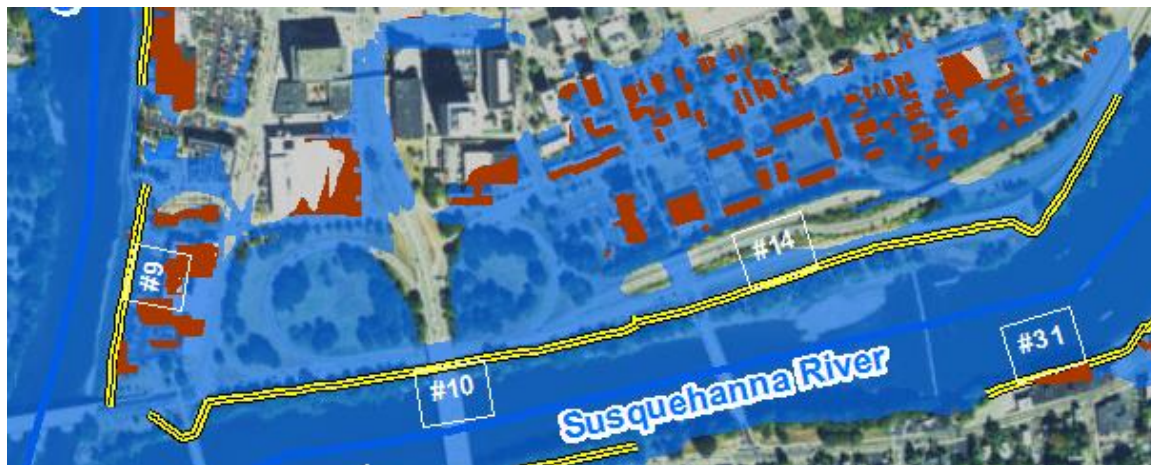
- Approximate Number Structures impacted:
  - #8 – 10
  - #9 – 22

# First Pass Results Natural Valley Analysis



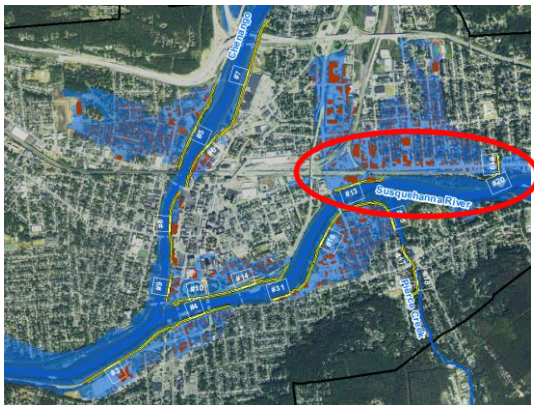
- Approximate Number Structures impacted:
  - #10 – 70
  - #14 – 100

## Levee System Components: Shared Natural Valley Levee #10 and #14 (Susquehanna River)

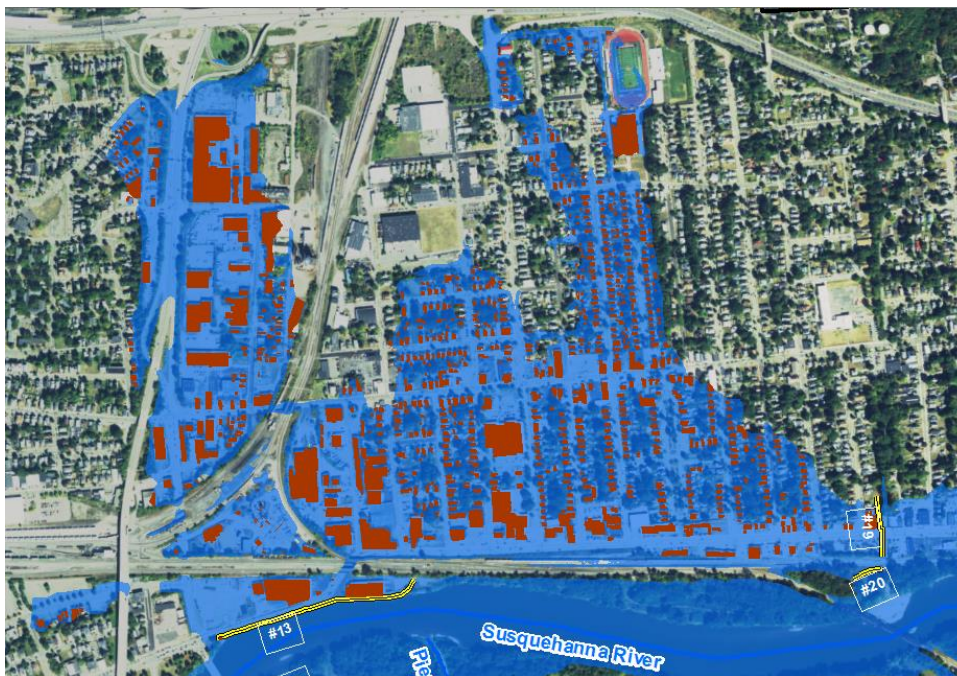




# First Pass Results Natural Valley Analysis



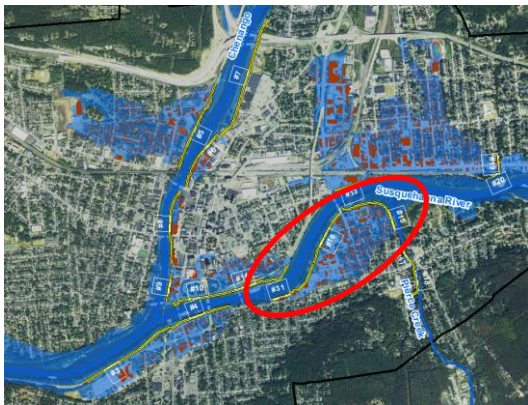
## Levee System Components: Shared Natural Valley Levee #13, #19 and #20 (Susquehanna River)



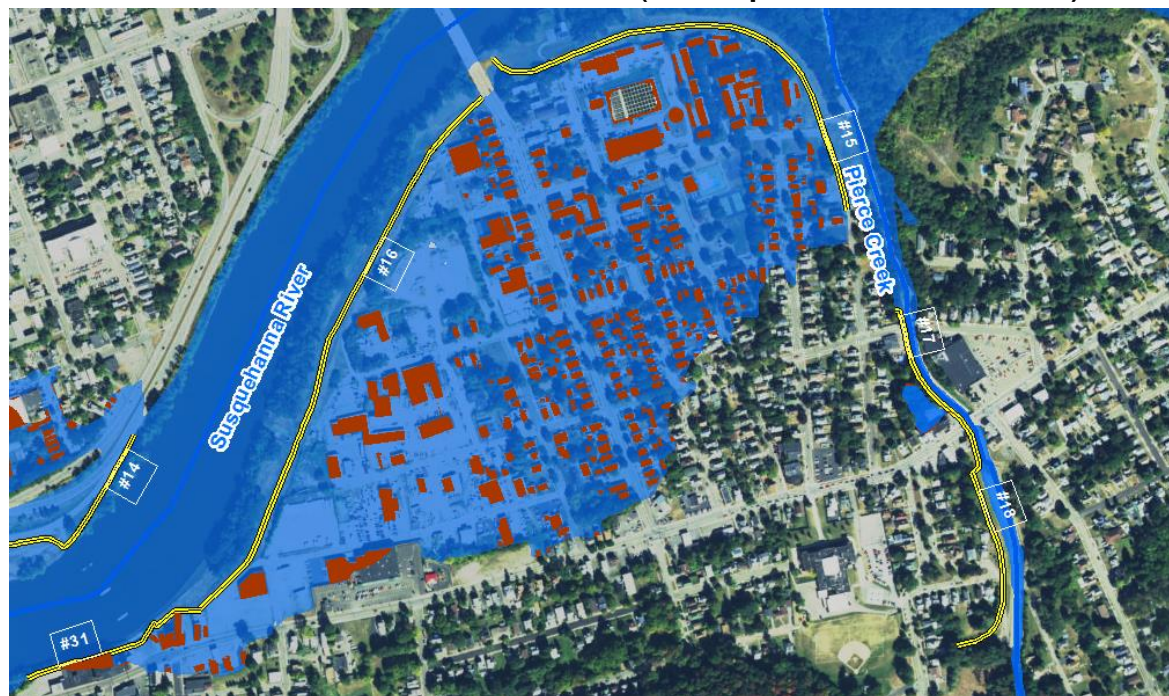
- Approximate Number Structures impacted:
  - #13 – 305
  - #19 & 20 – 675



# First Pass Results Natural Valley Analysis



## Levee System Components: Shared Natural Valley Levee #15, #16 and #31 (Susquehanna River)

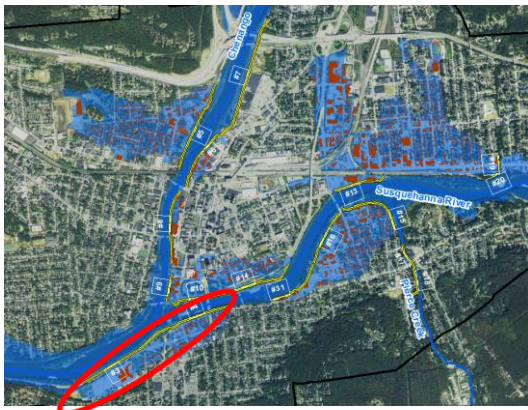


- Approximate Number Structures impacted:
  - #15 – 250
  - #16 – 150
  - #31 – 13

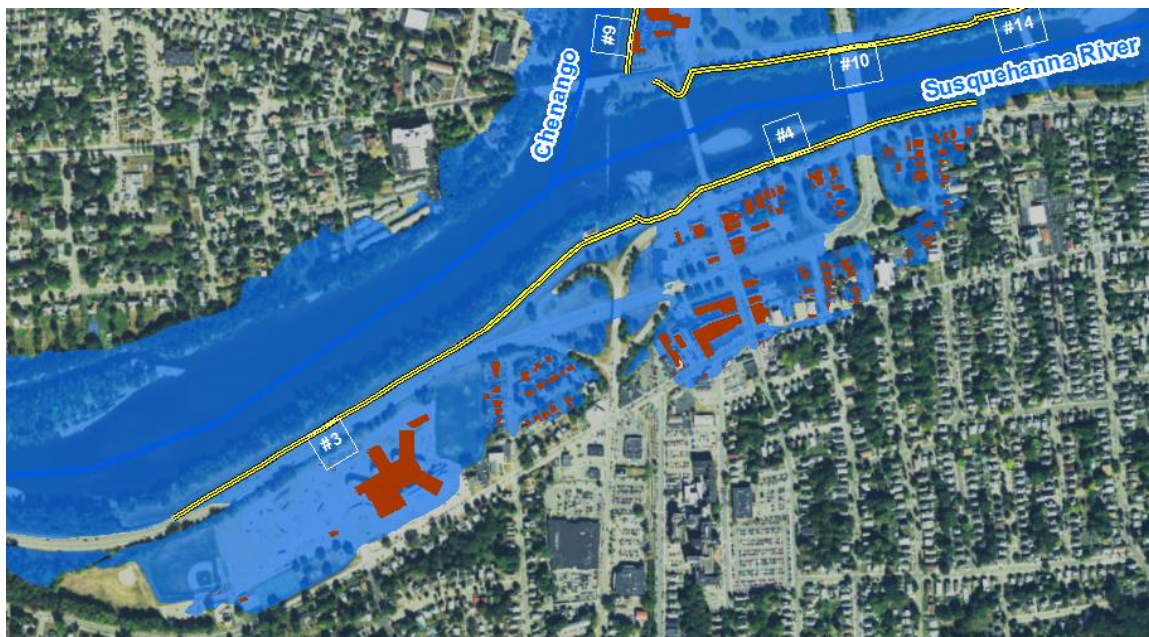
\* #31 is not part of the USACE project (verified during meeting).

\*\* Discussed during the meeting: #31 is a private levee.

# First Pass Results Natural Valley Analysis



## Levee System Components: Shared Natural Valley Levee #3 and #4 (Susquehanna River)



- Approximate Number Structures impacted:
  - #3 – 38
  - #4 – 109



# First Pass Results

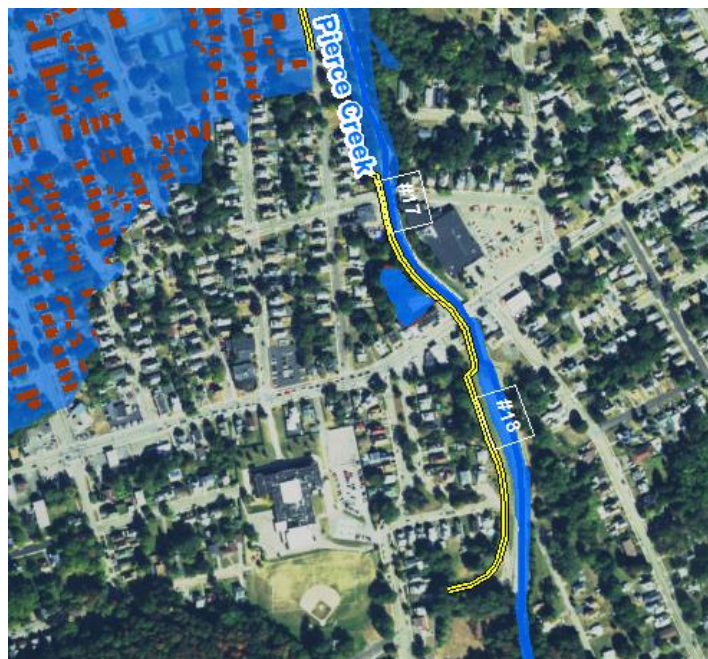
## Natural Valley Analysis



- Approximate Number Structures impacted:
  - #17 – 4
  - #18 – 0

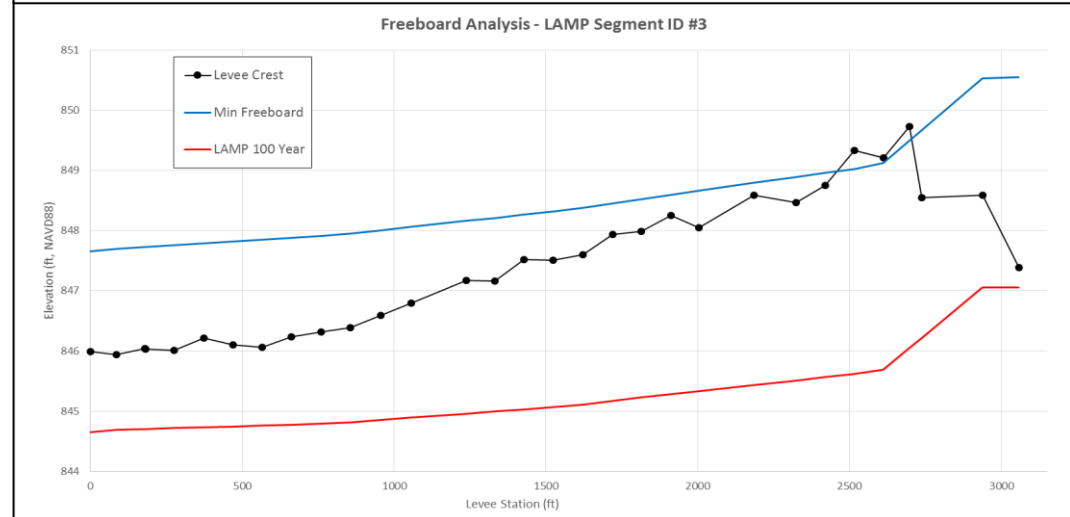
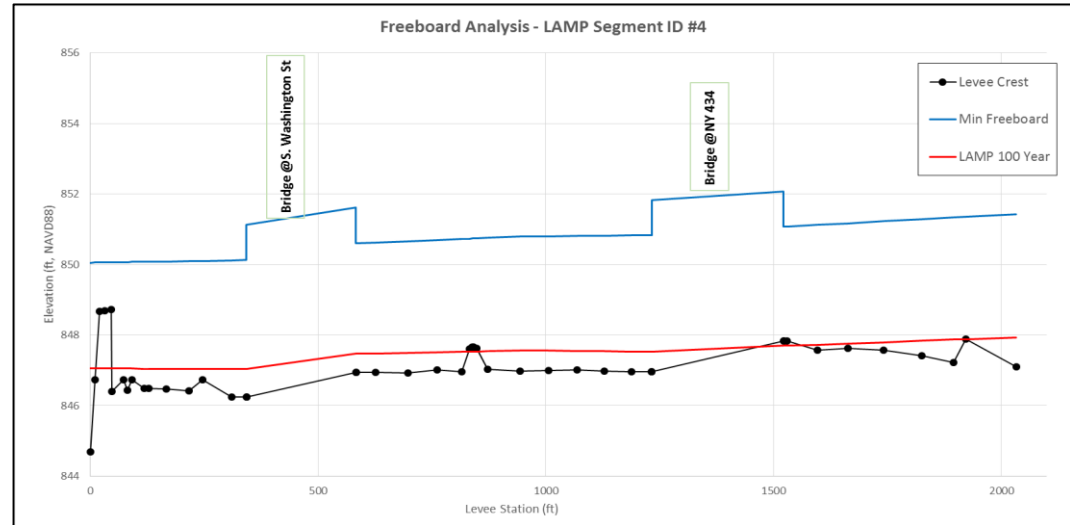
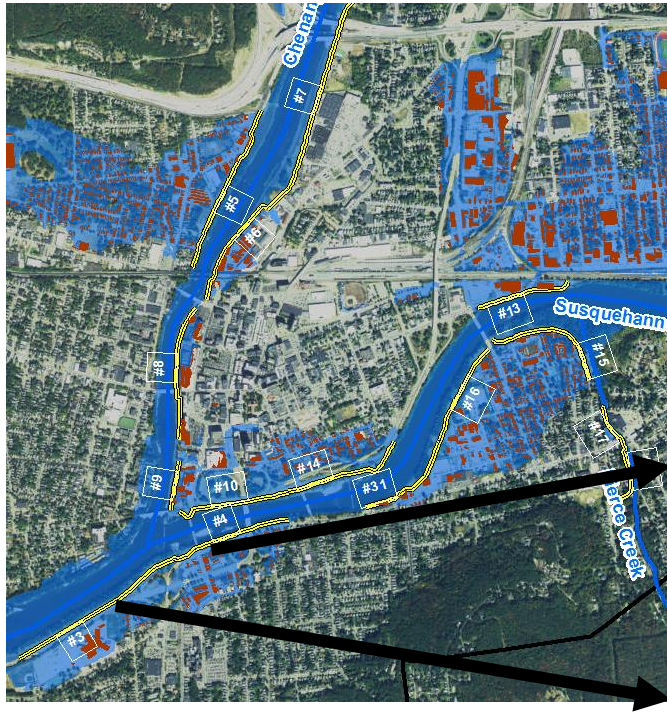
### Levee System Components: Natural Valley

#### Levee #17 and #18 (Pierce Creek)



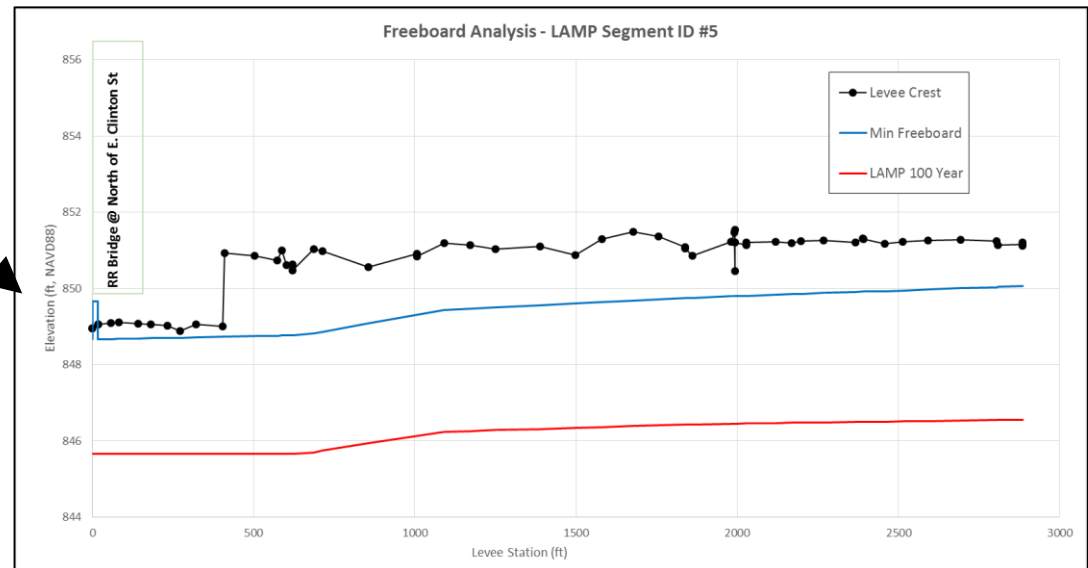
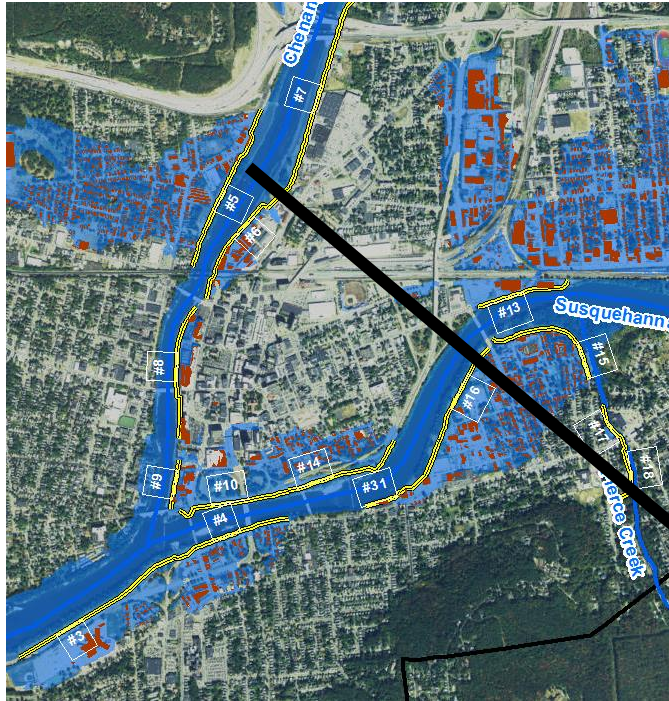
# First Pass Results

## Free Board Analysis

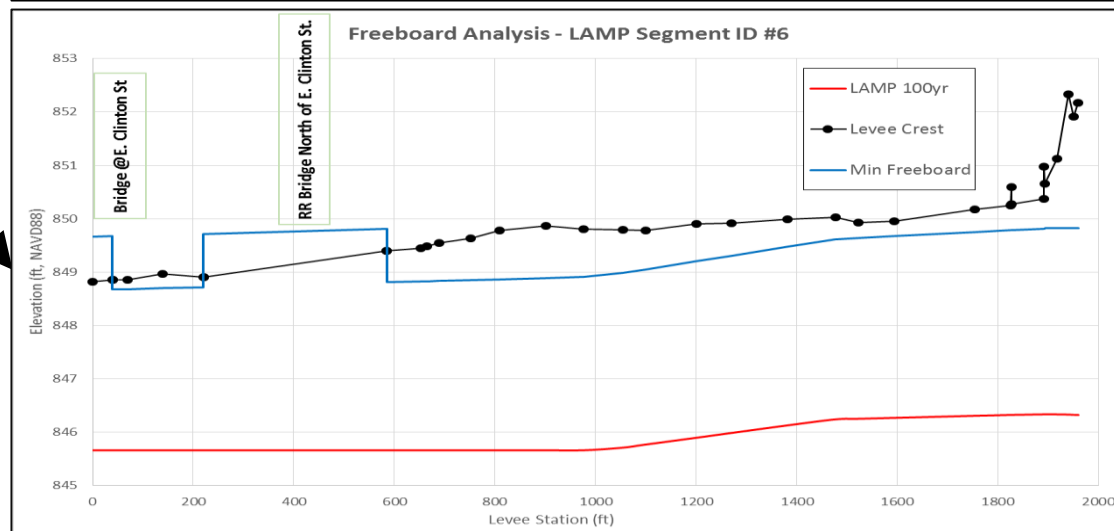
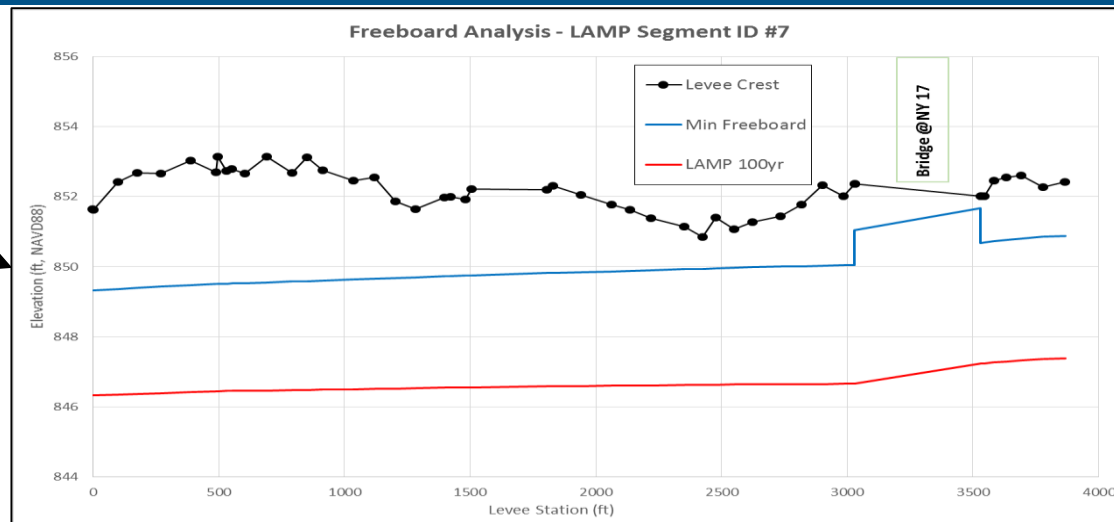
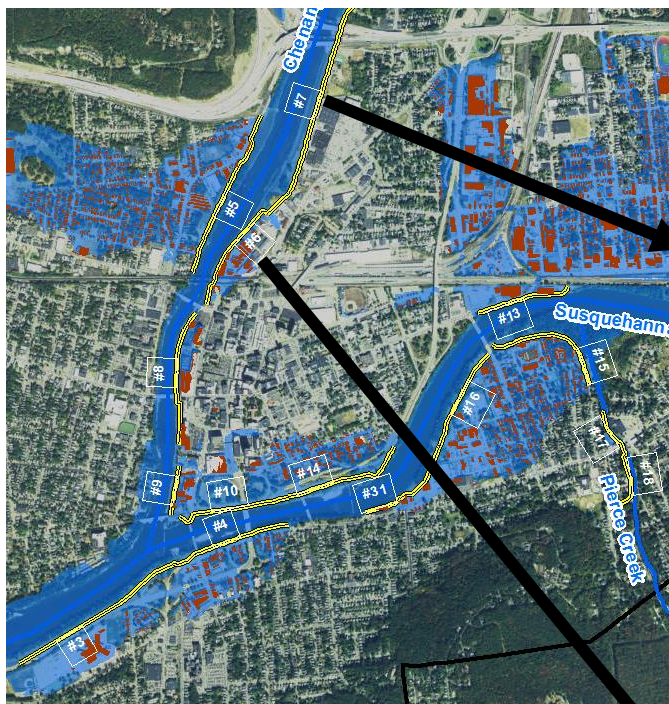




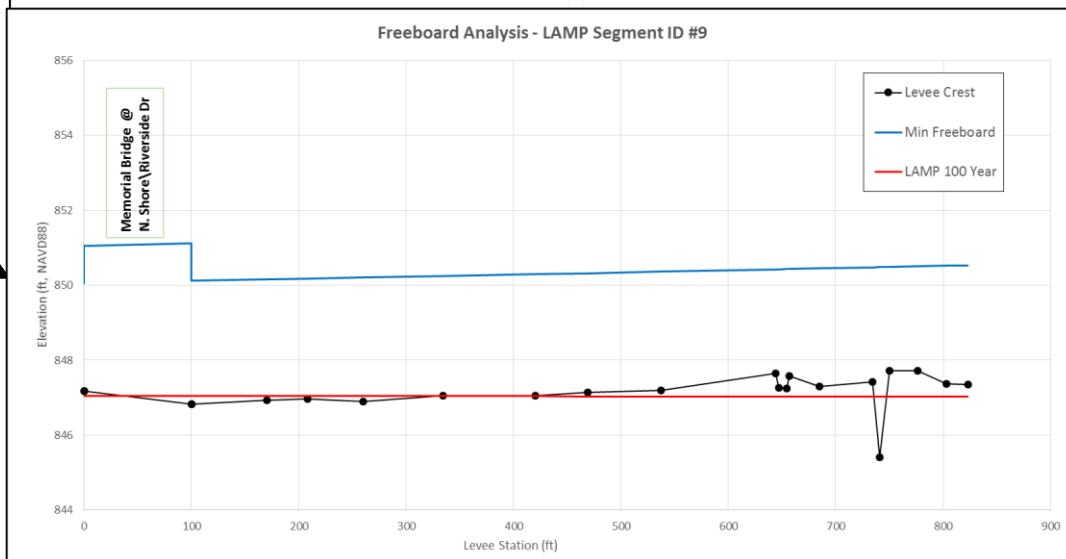
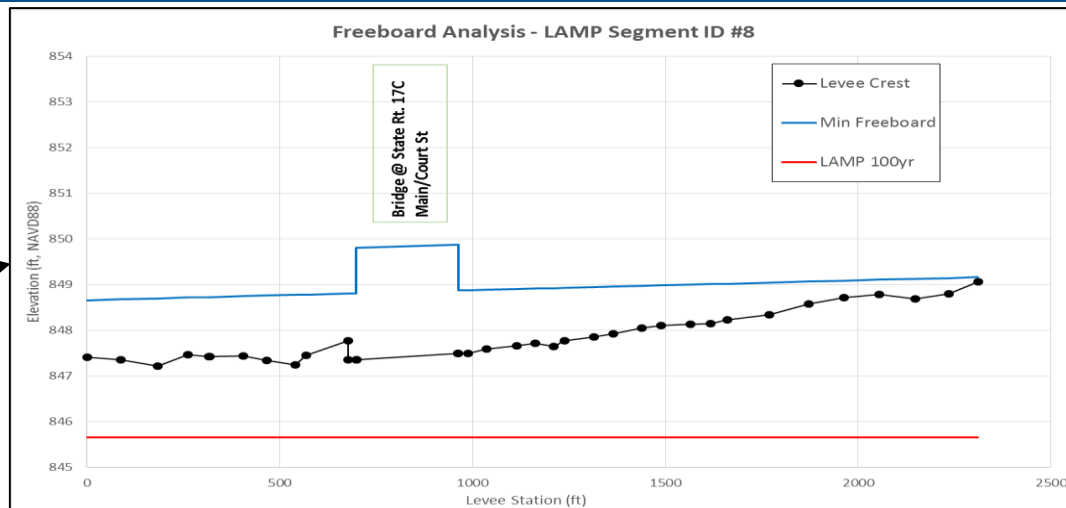
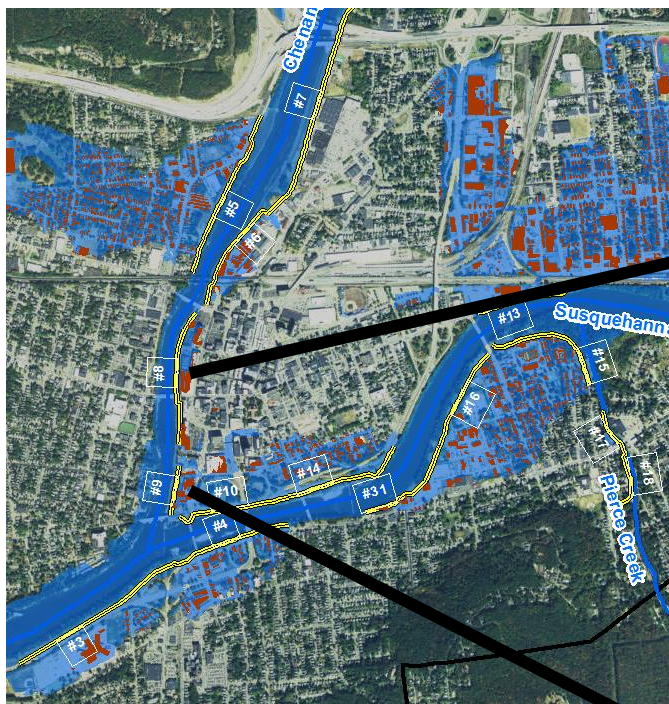
# First Pass Results Free Board Analysis



# First Pass Results Free Board Analysis

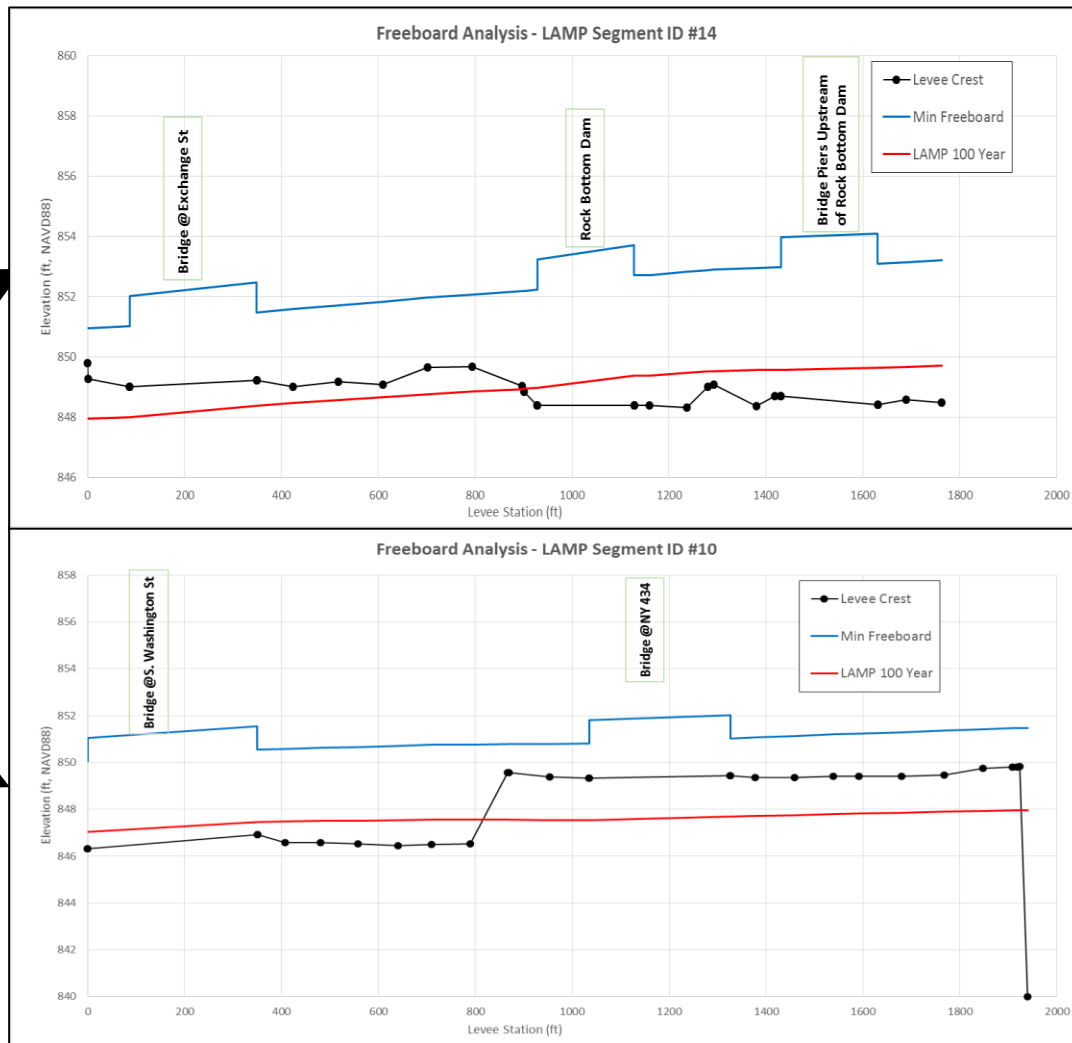
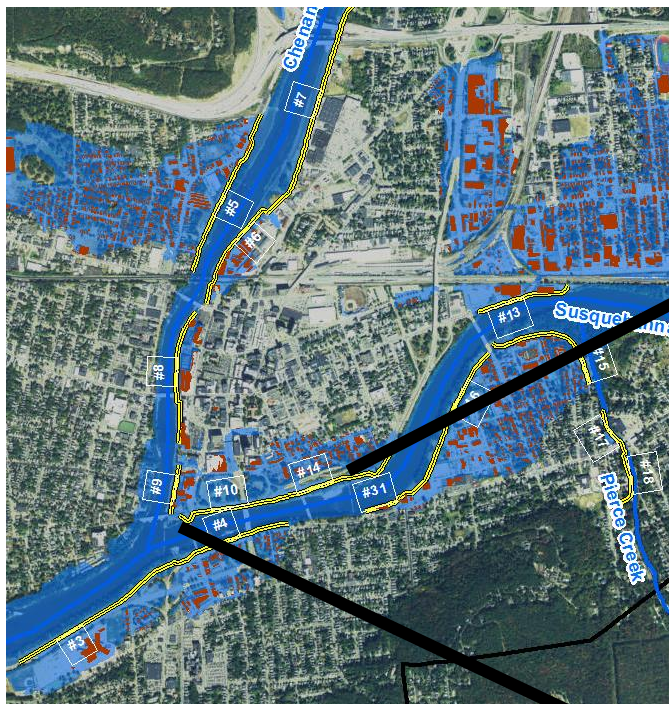


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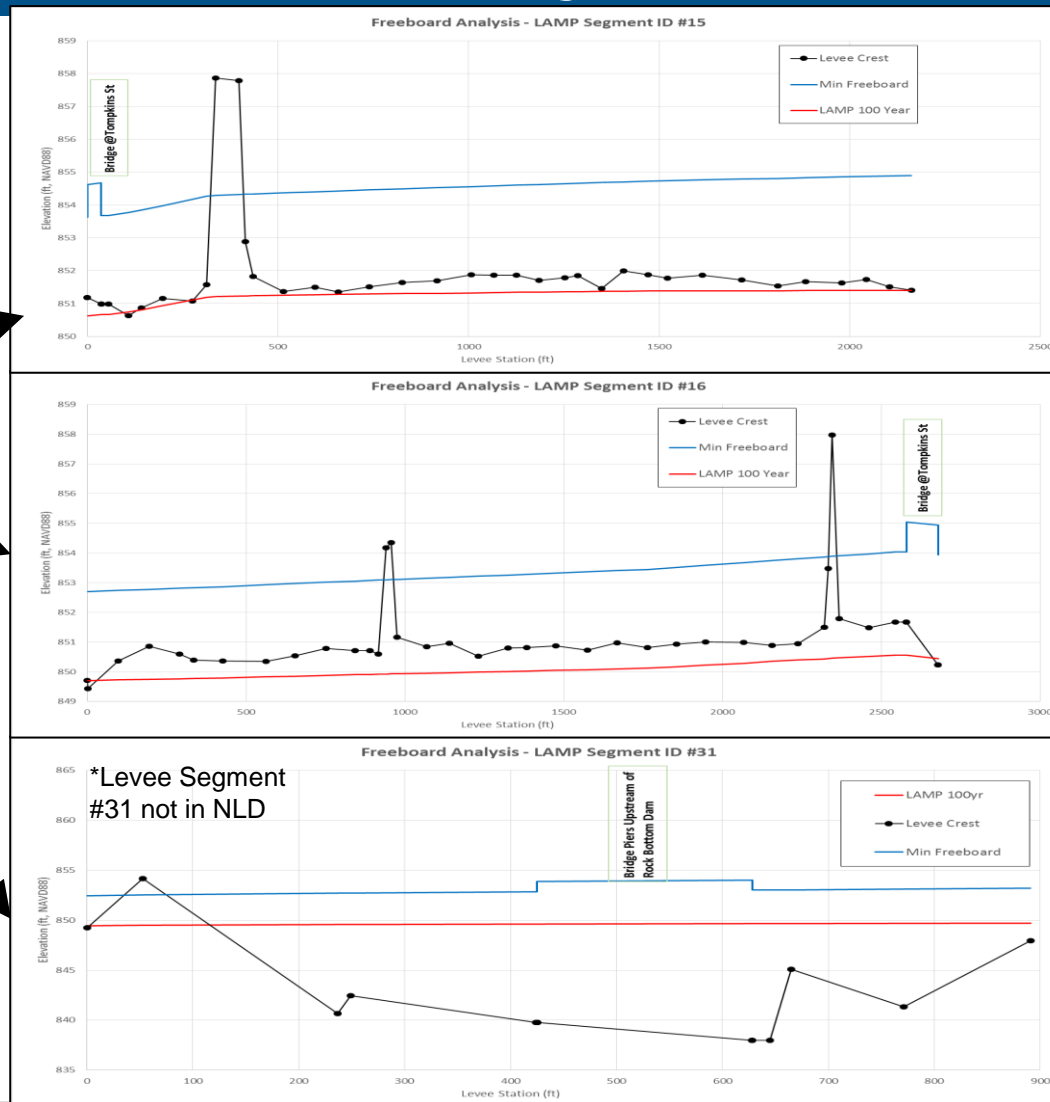
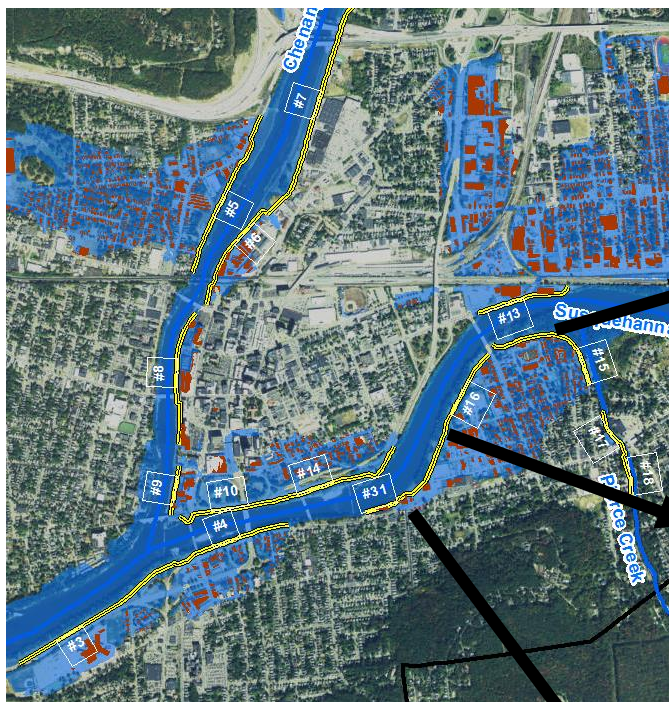


# First Pass Results Free Board Analysis

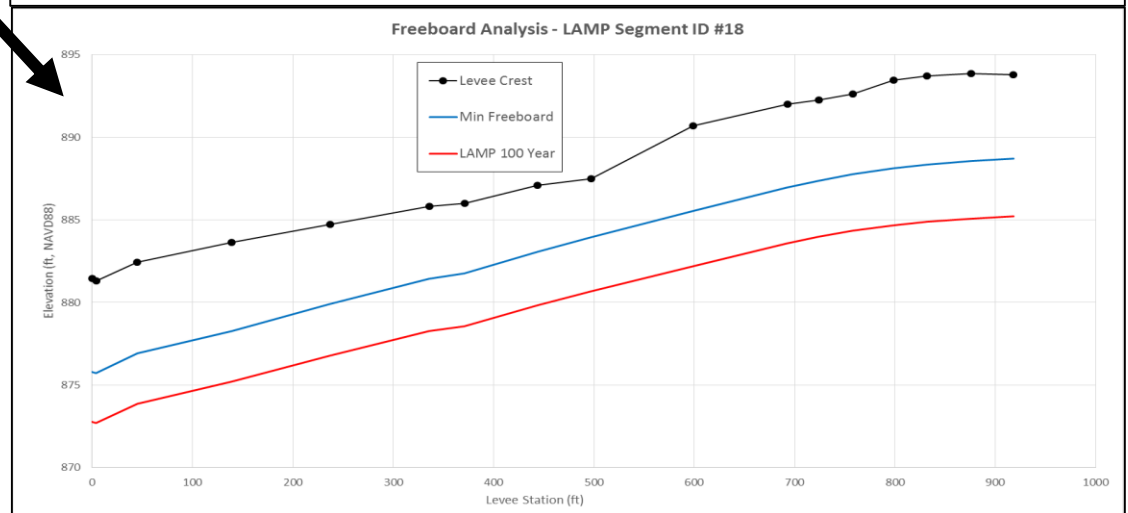
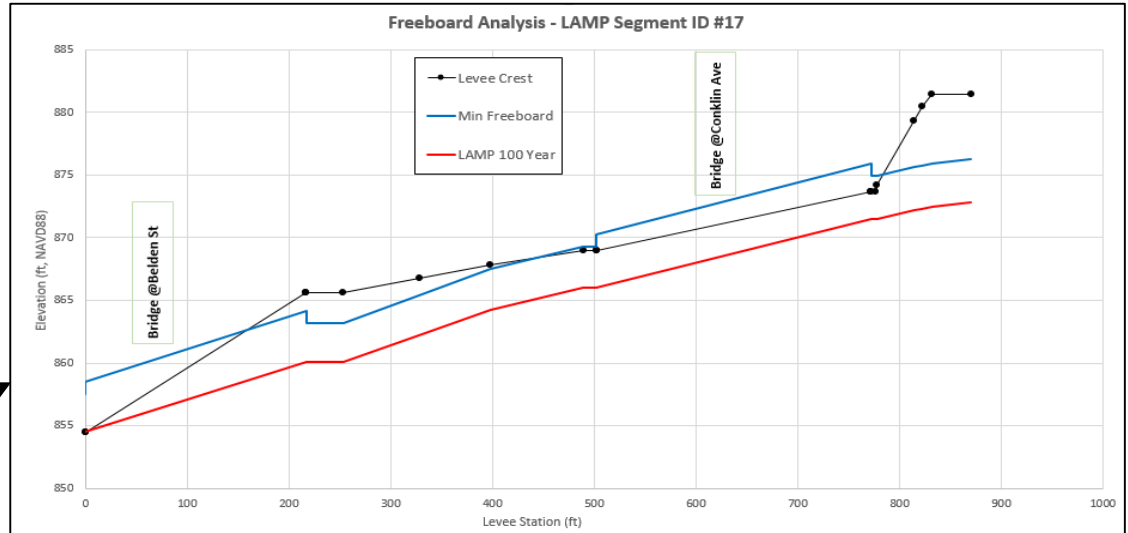
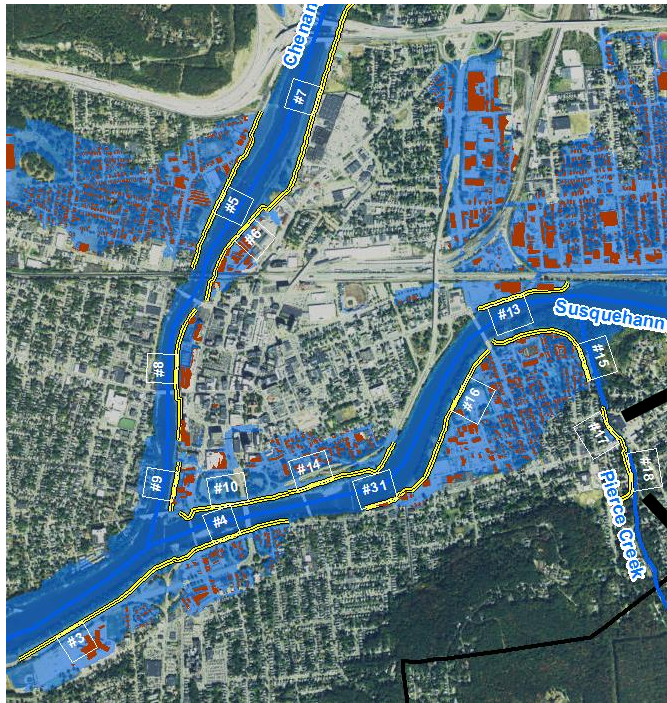




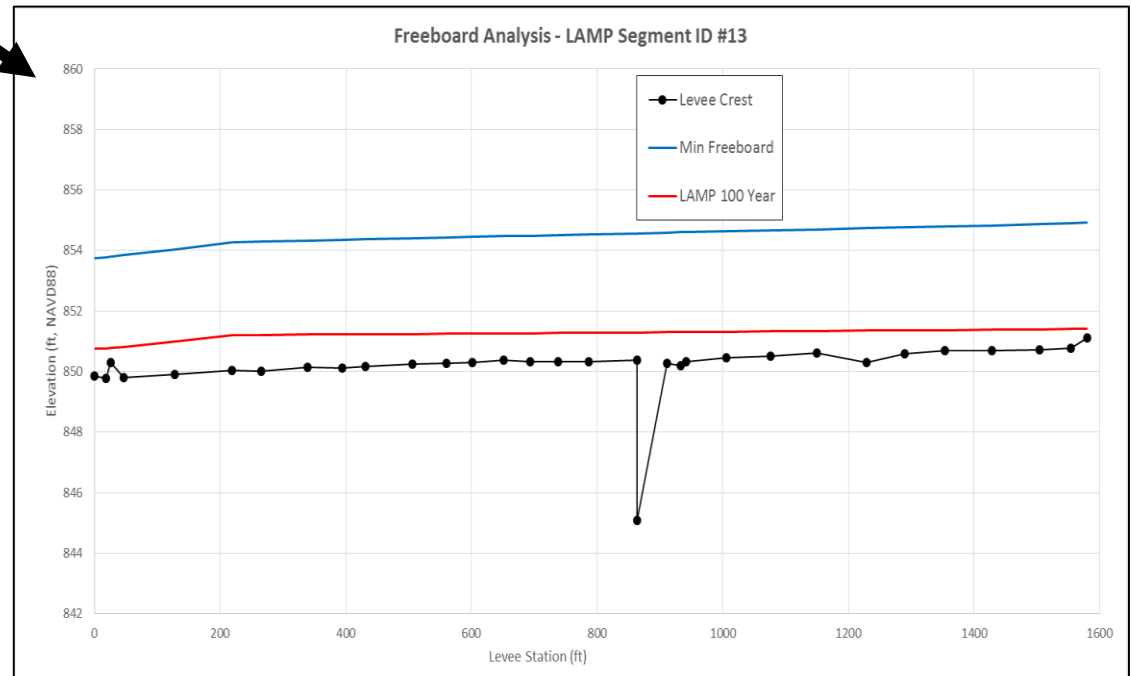
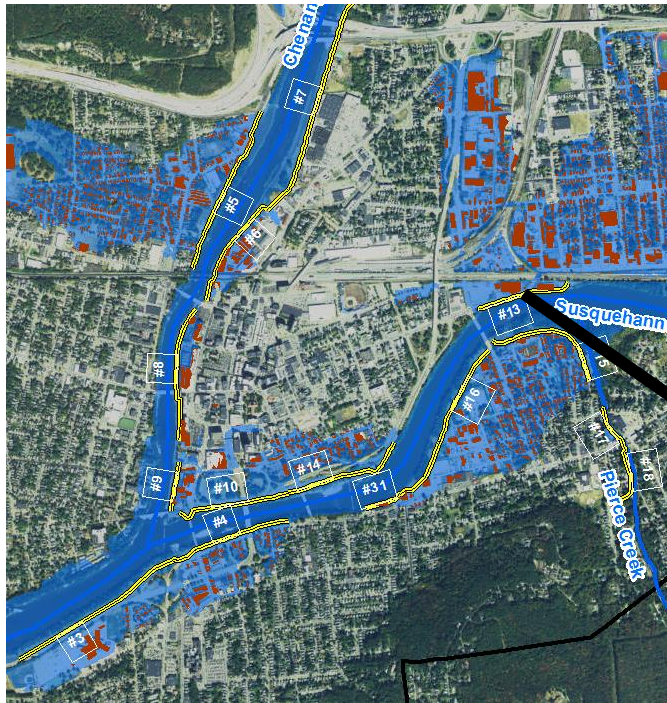
# First Pass Results Free Board Analysis



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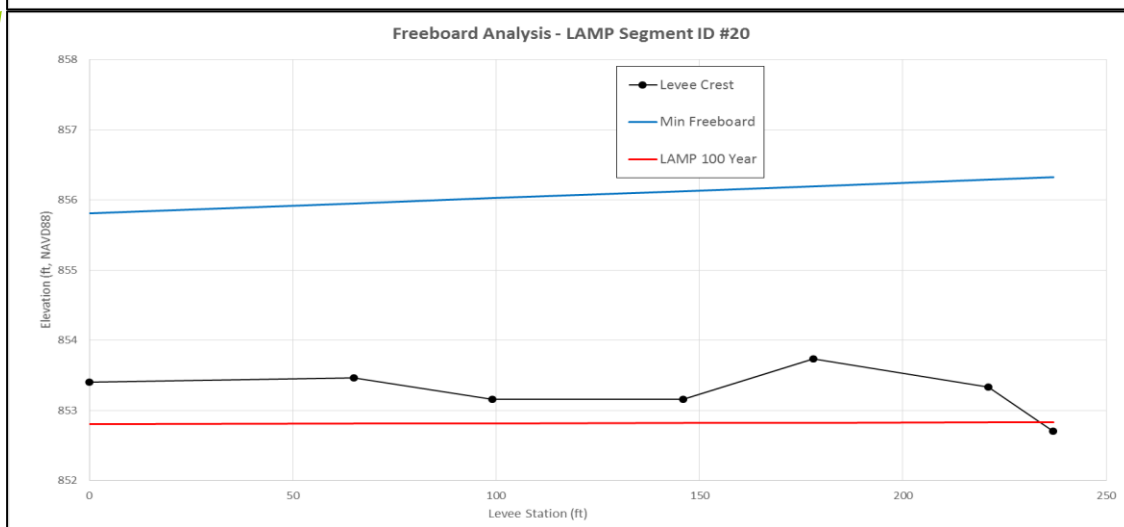
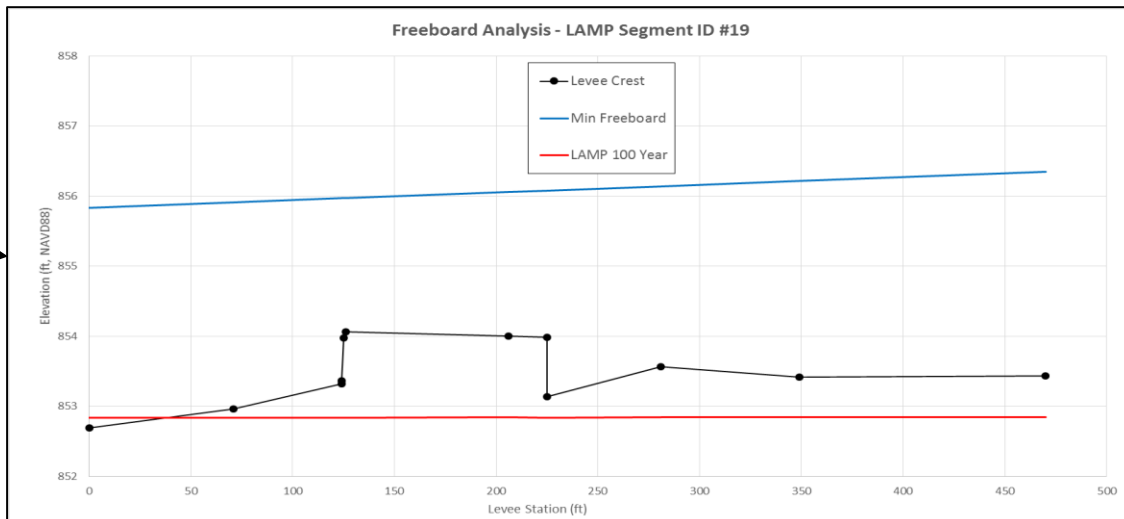
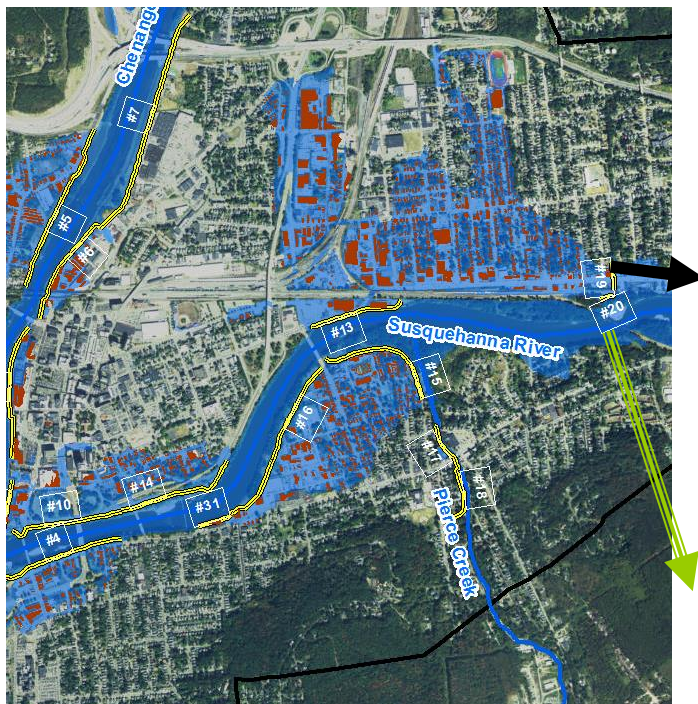
# First Pass Results Free Board Analysis



\* Discussed during the meeting: levee has potential to be overtopped.



# First Pass Results Free Board Analysis



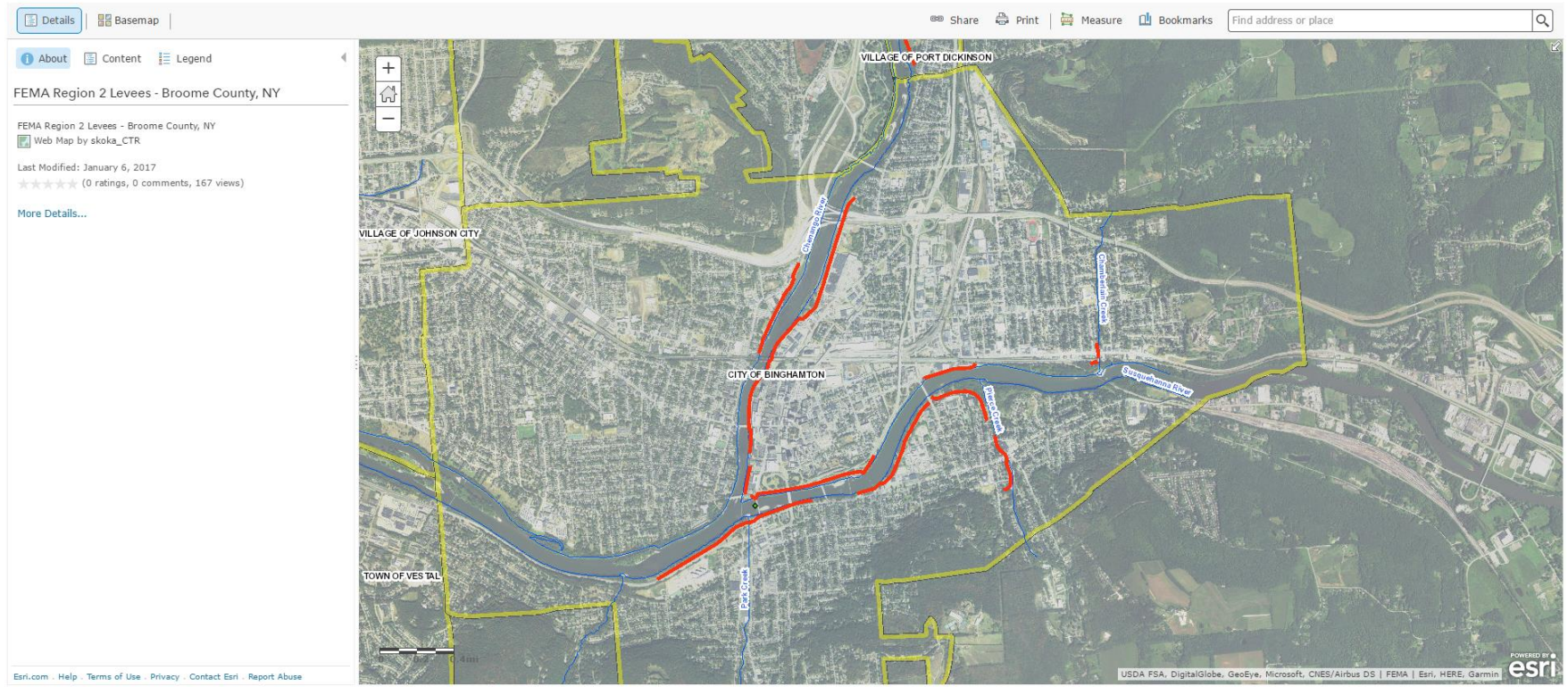


# Local Levee System

Access LAMP Data Here: <http://arcg.is/2hXqGBB>

ArcGIS ▼ FEMA Region 2 Levees - Broome County, NY

Modify Map Sign In



# Data Requirements

	Natural Valley *	Structural-Based Inundation **	Overtopping Approach**	Freeboard Deficient **	Sound Reach**
Elevation Information for the Levee Crest	-	Required	Required	Required	Required
Operations and Maintenance Plan	-	Recommended	Required	Required	Required
Structural Design Requirements	-	Recommended	Required	Required	Required
Inspection Reports	-	Recommended	Required	Required	Required
Evaluation of Overtopping Erosion Potential	-	-	Required	-	-
BFE Less than Levee Crest	-	-	-	Required	Required
BFE + Freeboard Less than Levee Crest	-	-	-	-	Required

\* - No cost to community

\*\* - Potential additional cost to community

# LAMP: Current Step

## ■ LAMP – Current step in Phase 1

1<sup>st</sup> LLPT Meeting

Apply initial LAMP Procedures and develop First Pass Analyses

2<sup>nd</sup> LLPT Meeting

Review First Pass Analysis and finalize which Procedure(s) will be applied in future Phase 2 Detailed Analysis (if applicable)

Prepare a LAMP Plan document that summarizes LLPT discussions; First Pass Analyses; and recommended LAMP Procedure to be applied in Phase 2

3<sup>rd</sup> LLPT Meeting

Draft LAMP Plan will be shared with all LLPT members

Finalize LAMP Plan.

Share Final LAMP Plan with all LLPT members

July 2016

Spring 2017





# FEMA

*Know, plan for, mitigate against and communicate about the risks in your community.*