CAP 205: MERAMEC RIVER AT FENTON, MO

Flood Risk Management Study

EWG Water Resources Advisory Committee
February 27, 2024
10:30AM – 12:00PM

Matt Jones, Project Manager

U.S. ARMY

US Army Corps of Engineers®

Project website: www.mvs.usace.army.mil/missions/programs-project-management/fenton-mo-frm/

Introductions & Agenda	Study Area	Study Process	Tentatively Selected Plan	Path Forward	Comments & Questions

LOCAL SPONSOR:

City of Fenton, Missouri

AGENCY COORDINATION

FEMA

SEMA

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Metropolitan St. Louis Sewer District

Saint Louis COUNTY MISSOURI

STUDY AUTHORITY

U.S. Army Corps of Engineers Continuing Authorities Program (CAP)
Section 205, Flood Control Act of 1948, as amended. 33 USC 701s

<u>What is CAP?</u>

A suite of nine authorities under which the Corps can plan, design, and implement certain types of water resources projects without additional project specific congressional authorization.

Section 205 is for small flood risk management projects that are relatively small in size, scope, and complexity with limitations on costs and scope.

MERAMEC FLOODING IN THE STUDY AREA

Winter 2015 - 2016

Spring 2017

STUDY/PROJECT AREA

FEMA's National Flood Hazard Layer viewer

Legend

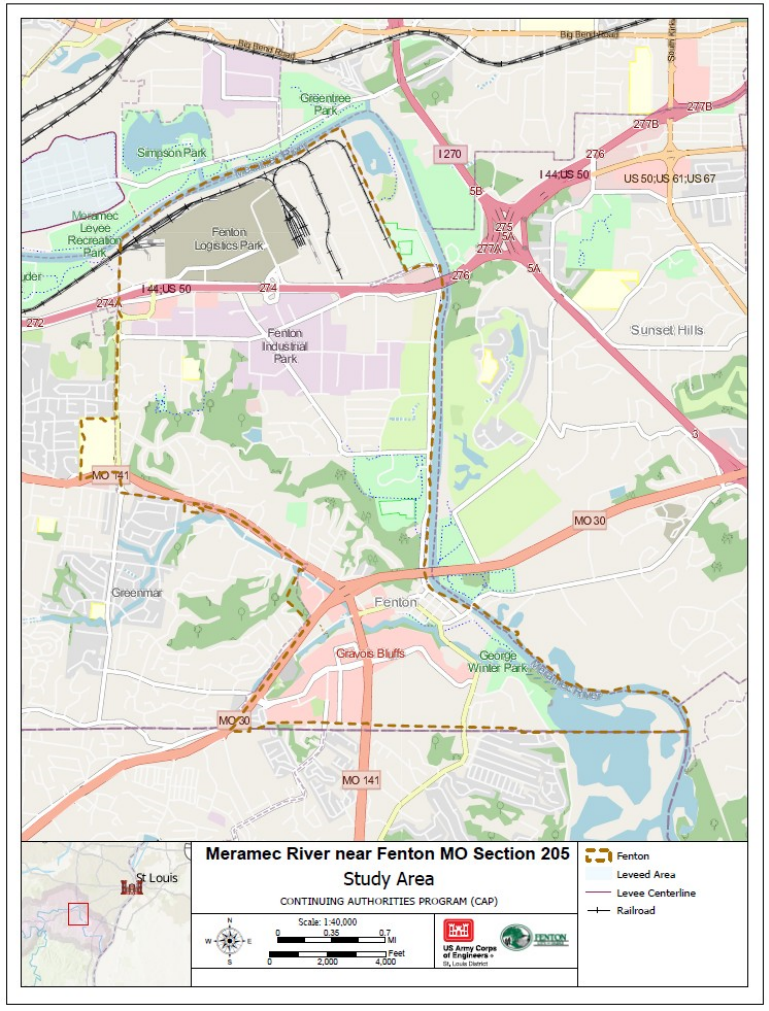
NFHL

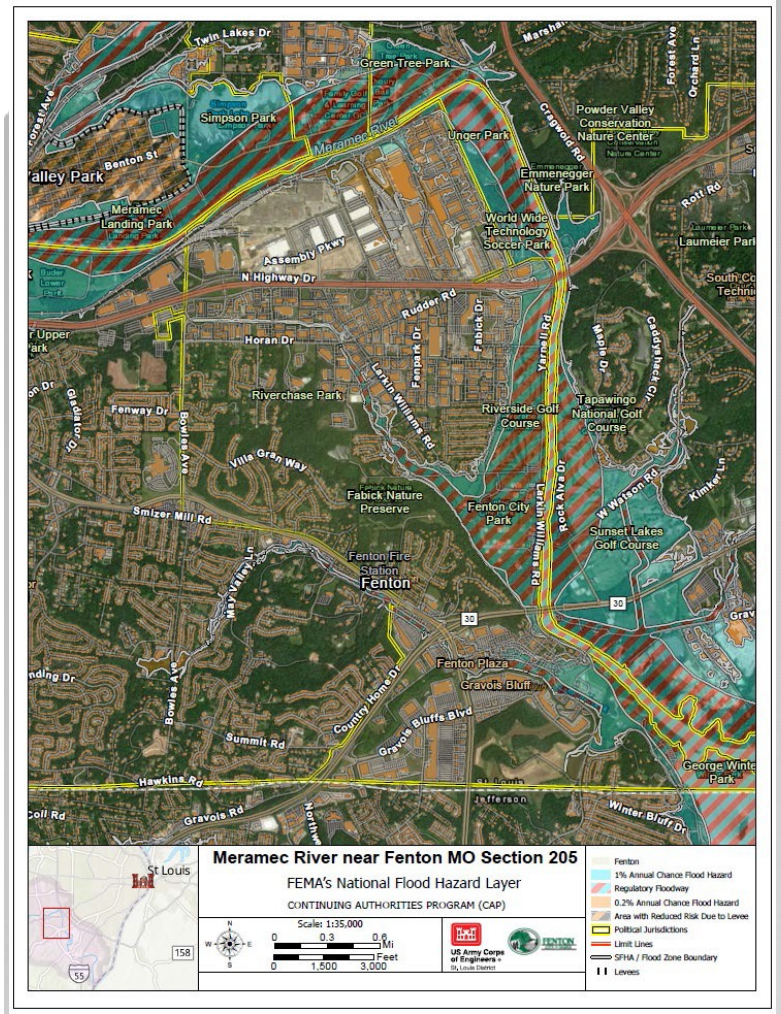
Political Jurisdictions

General Structures
- Flood Structure
- Bridge
- Dam, Weir, Jetty
- Other Structure

Flood Hazard Boundaries
- Limit Lines
- SFHA / Flood Zone Boundary
- Other Boundaries

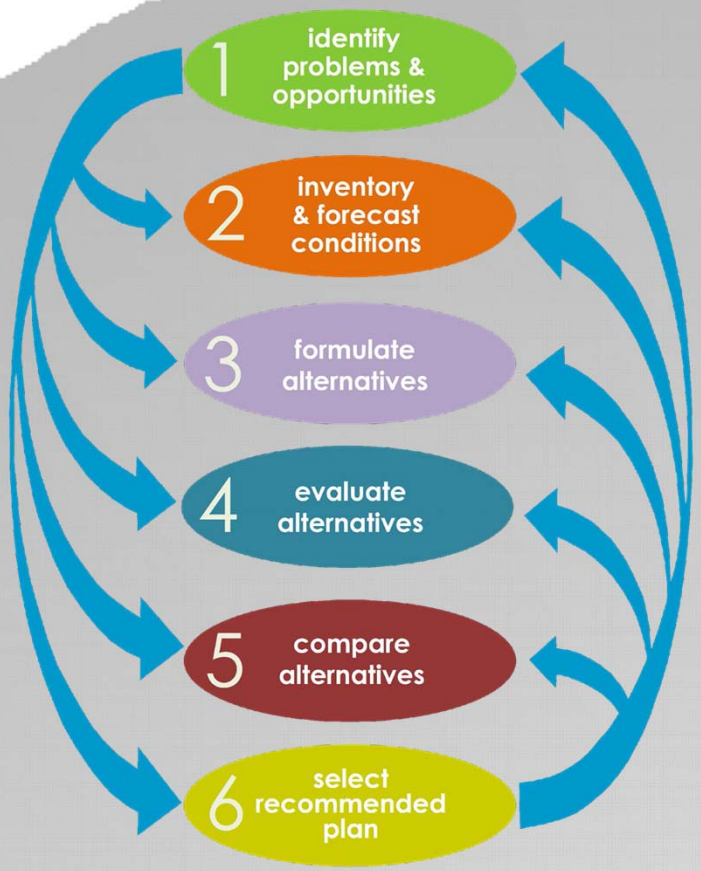
Flood Hazard Zones
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard





USACE PROCESS

1. Generally identify the flooding problems and determine objectives for flood risk reduction
2. Identify the existing conditions in detail and estimate future conditions
3. Develop several alternatives to reduce flood risk
4. Evaluate the effectiveness and impacts of each alternative
5. Compare the alternatives to each other
6. Select the best plan



- Stakeholder involvement - throughout
- Gather evidence - throughout

PRIOR RELATED STUDIES

- 2018 - USACE and local communities developed a Lower Meramec Multi-Jurisdictional Floodplain Management Plan with mitigation techniques.

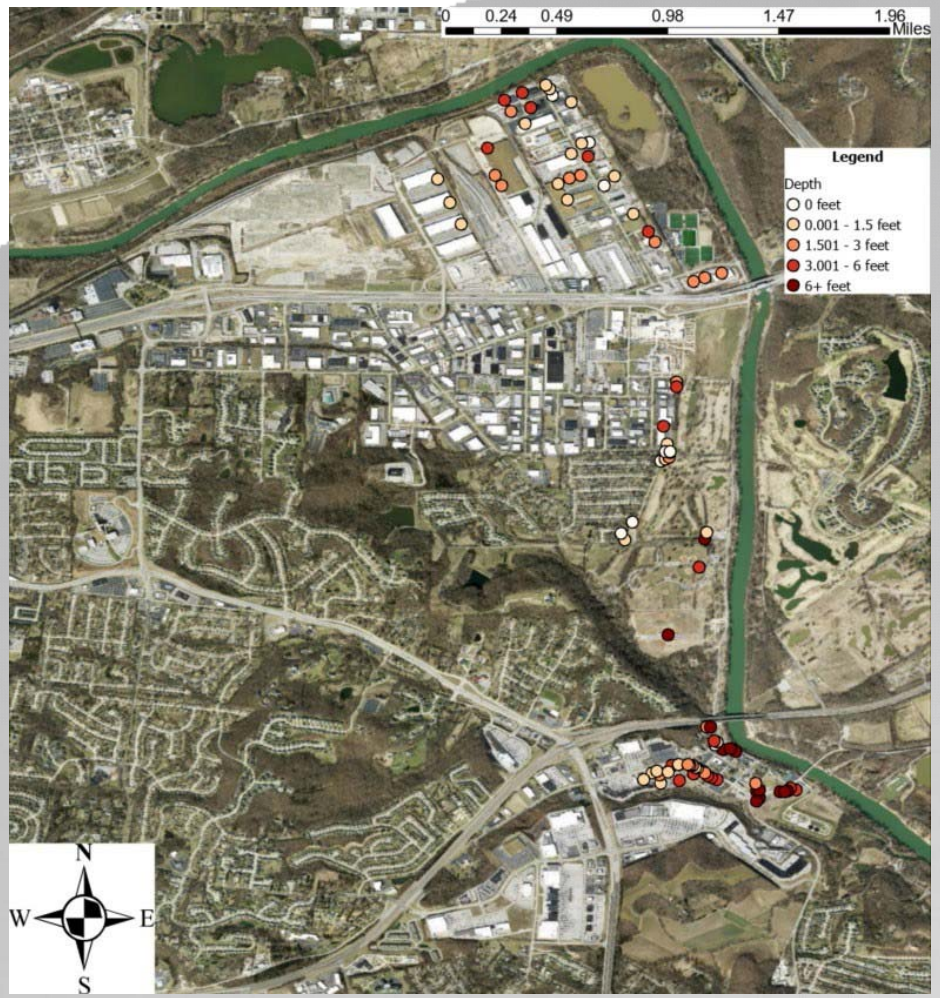
- 2022 – Yarnell Creek PAS Flood Risk Evaluation for City of Fenton; Federal Interest Determined under the Corps' CAP Program; Feasibility Cost Sharing Agreement signed by City of Fenton.

- This Study:
  - Completed Federal Interest Determination (FID) in March 2022.
  - 2023 – Federal and sponsor funds received to initiate Feasibility Study; study kick-off.

EXISTING CONDITIONS - POPULATION & STRUCTURES

- In the Meramec River 1% AEP (100-year) floodplain in the City of Fenton there are approximately 87 flood prone structures which include:
  - Commercial - 58
  - Residential - 12
  - Public - 1
  - Industrial – 16

- The average depth of flooding on these structures for the 1% AEP event varies from 1.1 to 3.6 feet.



FLOOD RISK REDUCTION MEASURES

Structural

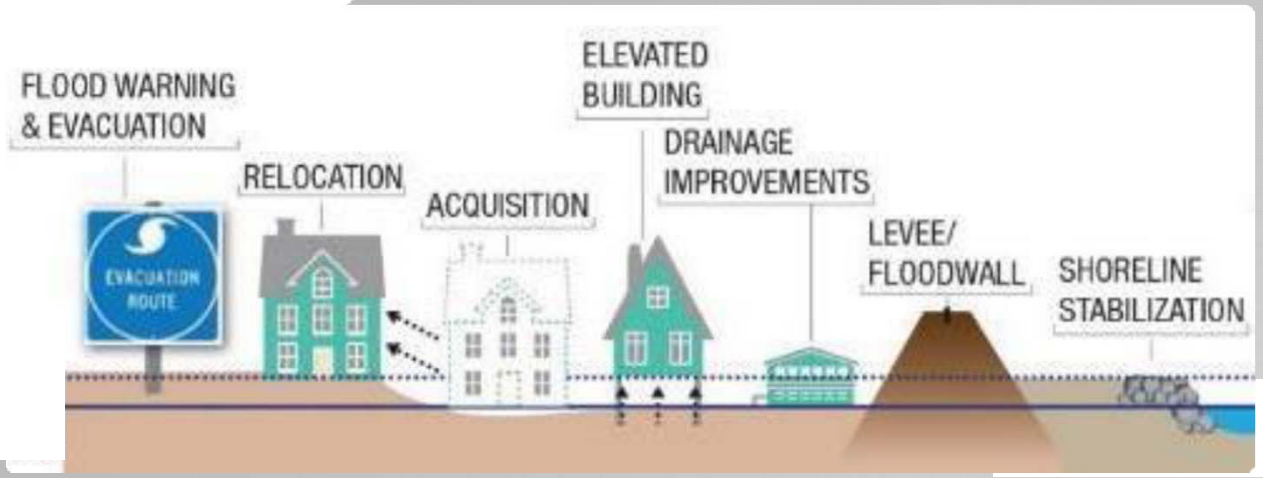
- Detention structures
- Diversion structures
- Channel modifications
- Levees/Floodwalls

Non-Structural

- Floodproofing (wet and dry)
- Elevating structures in-place
- Buyouts or permanent relocations
- Flood forecasting/warning system
- Risk communication/education
- Ordinances/regulations

Nature-Based

- Floodplain restoration
- Watershed restoration/ conservation



PLAN FORMULATION – ALTERNATIVES AND FINAL ARRAY

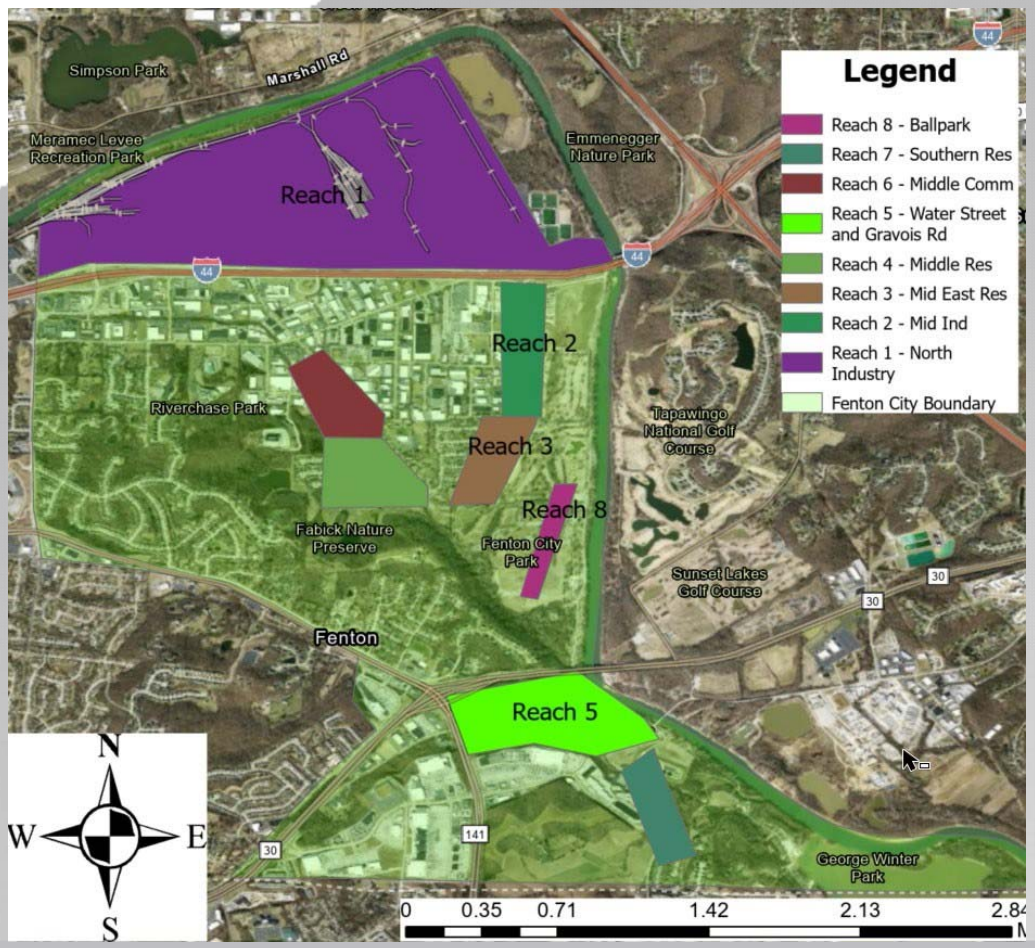
The following alternatives were developed and carried forward for development and evaluation:

- No Action Alternative
- Alternative 2: Levees
- Alternative 3: Nonstructural
- Alternative 4: Combination of Levees and Nonstructural

ALTERNATIVE 3 – NON-STRUCTURAL FORMULATION

Grouped structures by:
- Structure type
- Flood risk – depth, frequency
- Left/right bank (of Yarnell Creek)
- Physical separation (major roads)
- Overlap with prior levee alternatives

Results:
- 8 Initial Reaches
- 3 reaches screened out that had minimal flood damages through the 1% event
- Retained for analysis:
  - Reach 1 – large purple area to the north
  - Reach 2 – green area directly south of reach 1
  - Reach 3 – brown area directly south of reach 2
  - Reach 5 – neon green area just south of Hwy 30 (Gravois)
  - Reach 8 – purple area in Fenton City Park



EVALUATION OF FINAL ARRAY – CRITERIA AND COSTS

Primary Evaluation Criteria:
Meets Planning Objectives
Economic costs and benefits

Alternative	Project First Cost
No Action Alternative	$0
Alternative 2 – Levees	NA
Alternative 3 – Non-Structural	$3,349,000

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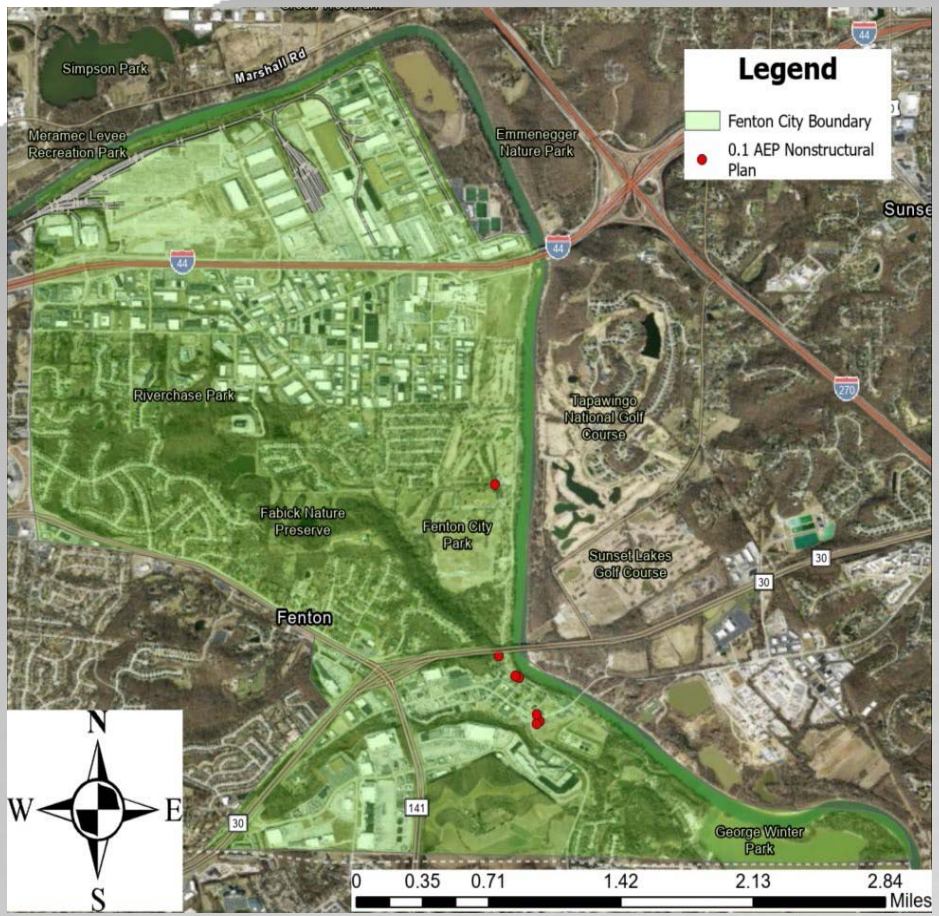
TSP - ALTERNATIVE 3 – NON-STRUCTURAL

Nonstructural Plan	
Nonstructural Action	
Floodproofing	13 Commercial, 0 Residential
Acquisition	0 Commercial, 0 Residential
Elevation	1 Residential
Costs	
Total Project Cost	$3,349,000
Annual O&M Costs	$0
Annualized Costs	$127,000
Economic Benefits	
Annual Damages Reduced (Benefits)	$332,000
Net Benefits	$205,000
Benefit to Cost Ratio	2.6
Environmental Impacts	None
Cultural Impacts	TBD
Real Estate	14 properties - $348,000
Residual Risk	
Life Safety	Unchanged - minimal
Economic Damages	$2,082,000
Critical Infrastructure	Unchanged - minimal



WET FLOODPROOFING (NON-STRUC

Image: USACE

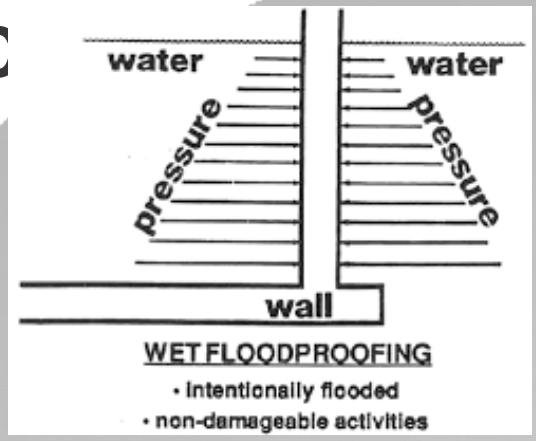


Image: FEMA

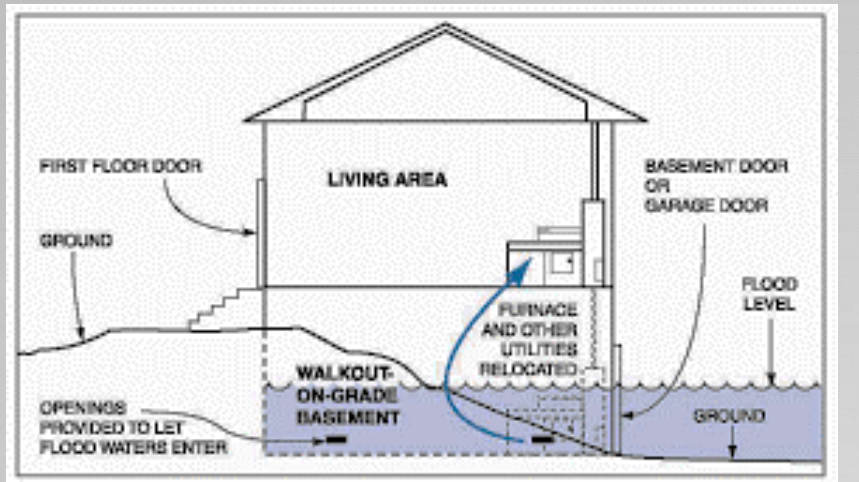
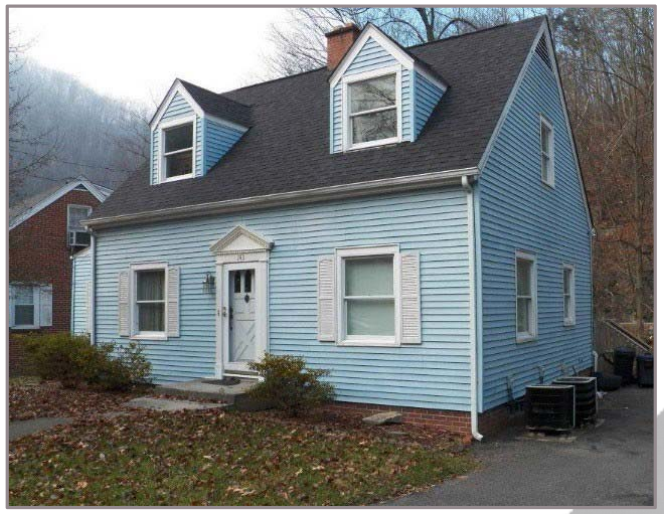


Image: FEMA

ELEVATION (NON-STRUCTURAL)



Images: USACE

OVERALL STUDY TIMELINE

We are here!

Nov 2022
- Project Initiation
- Alternative Development

Feb - Sep 2023
- Public & Agency Scoping Meetings
- Alternatives Evaluation

Jan 2024
- Tentatively Select Plan Identified
- Public Review, Technical Review

Jun 2024
- Agency Endorsement of Recommended Plan

Dec 2024
- Approval of Final Report

REMAINING TASKS TO REPORT APPROVAL

1. Document and consider all public, agency and Tribal comments on the draft report
2. Refine the TSP and complete a detailed cost estimate
   - Refine structure information to confirm nonstructural actions
   - Consider inclusion of a flood warning system
   - Consider emergency corridors
3. Finish environmental compliance tasks
   - Identify National Register eligible properties and coordinate with SHPO
   - Coordinate with Tribes
   - Complete environmental coordination
4. Complete District and Agency technical, policy and legal reviews
5. Report approval

COMMENTS & QUESTIONS

Comments or information can also be provided to:
Matthew.A.Jones@usace.army.mil

Or by mail to:
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St. Louis, MO 63103

Project website: www.mvs.usace.army.mil/missions/programs-project-management/fenton-mo-frm/