



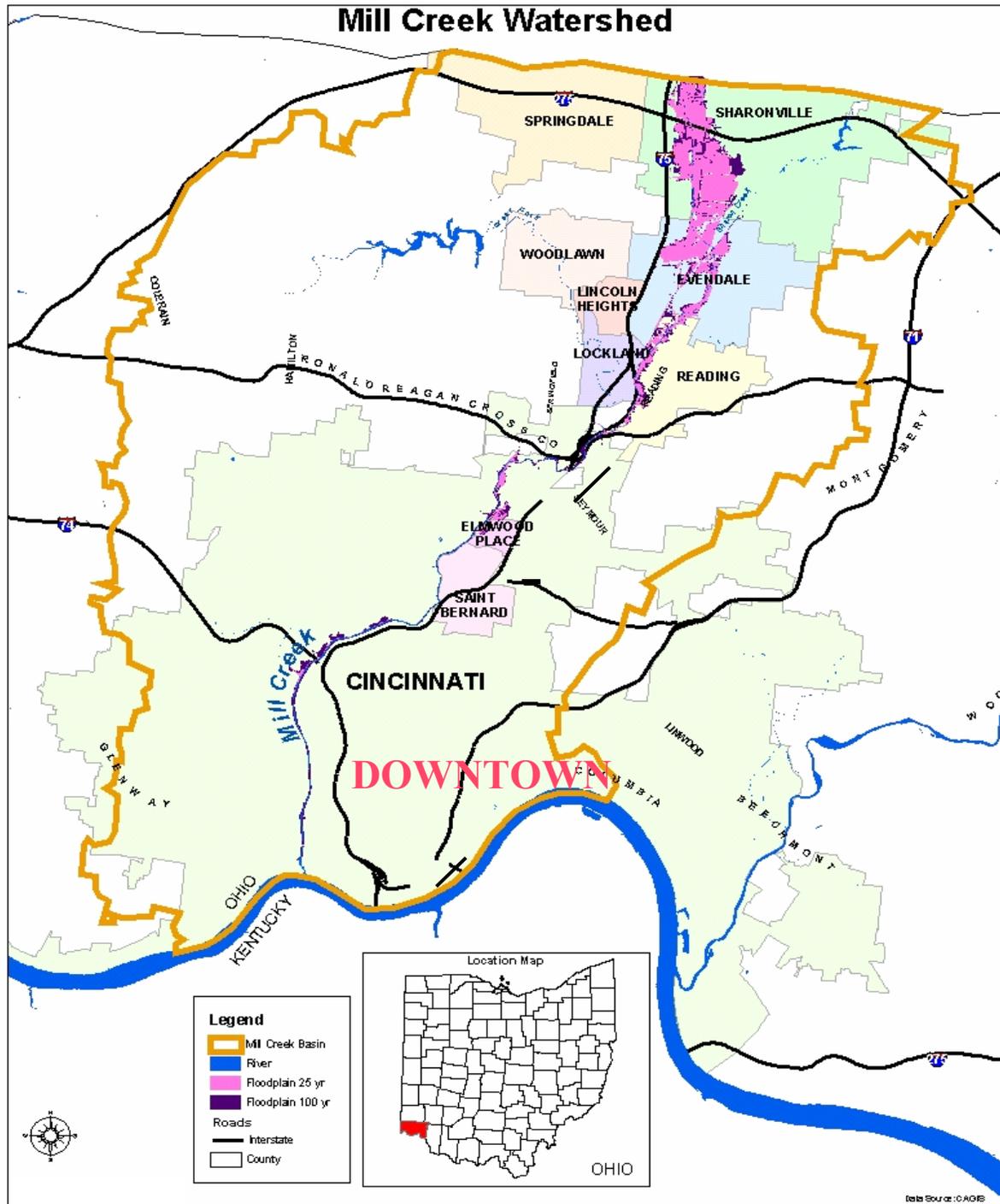
US Army Corps  
of Engineers

Louisville District



# MILL CREEK – AN URBAN FLOOD CONTROL CHALLENGE

# Mill Creek Watershed



# History of Flooding



- Flooding from Ohio River backwater :  
1913, 1937, 1945
- Flooding from storms and flash floods  
1958, 1959, 1964, 1971, 1996, 1998, and 2001



# **HISTORY before GRR**

**1970** – Project was authorized.

**1975** – A LCA was executed with the Millcreek Valley Conservancy District (MVCD) to construct the authorized project.

**1975** – The GDM was completed.

**1981** – Construction began.

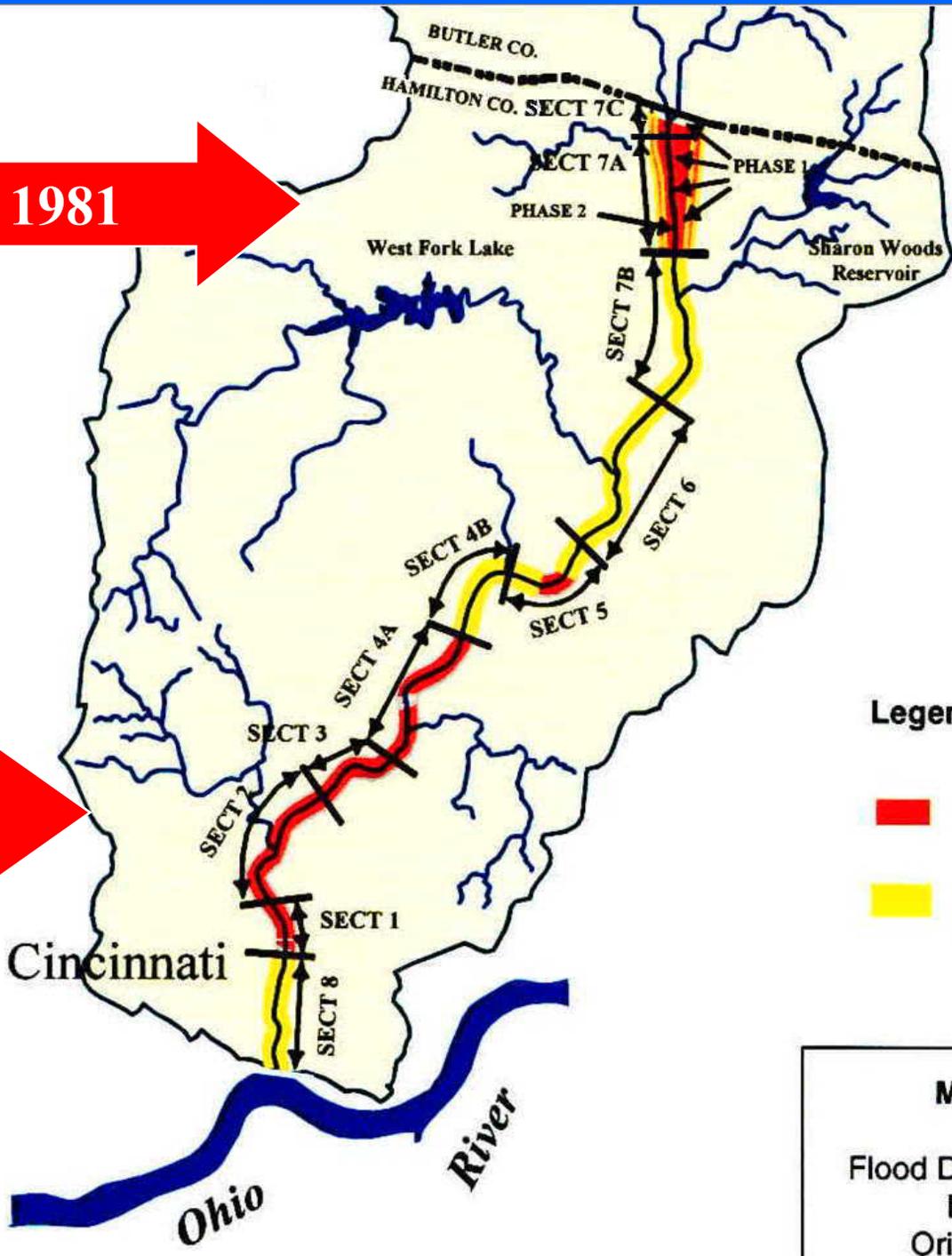
**1991** – All design efforts and future construction were suspended at the direction of the Assistant Secretary of the Army (Civil Works).

**1998** – Contributed Funds agreement on GRR and Cooperative agreement with MVCD re O&M of completed sections.

**Construction  
Started**

**1981**

**1983 - 91**



**Legend - Status of Work**

- █ Work Completed
- █ Work Required to Complete Original Project

**MILL CREEK, OHIO**  
Flood Damage Reduction Project  
Bridging Document  
Original Authorized Plan











AUG 26 2004



# Constraints

- Hazardous Waste
- Railroads
- Industry adjacent to creek
- Combined Sewer Overflows (CSOs)
- Utilities





# WARNING

## COMBINED SEWER OVERFLOW (CSO)

The water flowing from this pipe may be polluted during or after rainstorms. For more information about this CSO and effects on the water quality of our streams and rivers, call

Metropolitan  
Sewer District (MSD)  
(513) 352-4900

CSO No. 019

Please call MSD and report if water is flowing in dry weather.

# Local Stakeholders

- Millcreek Valley Conservancy District (MVCD) – Local Sponsor
- Metropolitan Sewer District of Greater Cincinnati (MSD)
- Mill Creek Watershed Council (MCWC)
- Mill Creek Restoration Project (MCRP)
- Ohio, Kentucky, Indiana Regional Council of Governments (OKI)
- City of Cincinnati
- Cities of Sharonville, Evendale, and Reading
- Ohio EPA

# Goals of Various Stakeholders

- Flood Control
- Water quality – reduction of CSO's
- Economic viability of industrialized area – no loss of tax base
- Environmental restoration
- Greenway along creek with hike/bike paths



**ALTERNATIVES**

# With-Project Alternatives

- Total Relocation
- Non-Structural
- Non-Structural 2A
- Non-Structural 3
- Channel Modification
- Channel Modification 2
- Floodwall & Levee
- Deep Tunnel
- Deep Tunnel 2



# With-Project Alternatives

- Total Relocation
- Non-Structural
- **Non-Structural 2A**
- Non-Structural 3
- Channel Modification
- **Channel Modification 2**
- Floodwall & Levee
- **Deep Tunnel**
- Deep Tunnel 2



# Channel Modification 2 (CM-2)

- Completes the 1970 Authorized Project
- Provides protection to most structures within the 1% chance (100-yr) flood plain
- Utilizes environmentally sustainable design features
- Major Features
  - 52 residential structures demolished
  - 69 commercial structures demolished
  - Extensive channel modifications in Sections 6 and 7
  - Floodwalls and levees constructed in Sections 4B and 5
  - 19 road and railroad bridge replacements

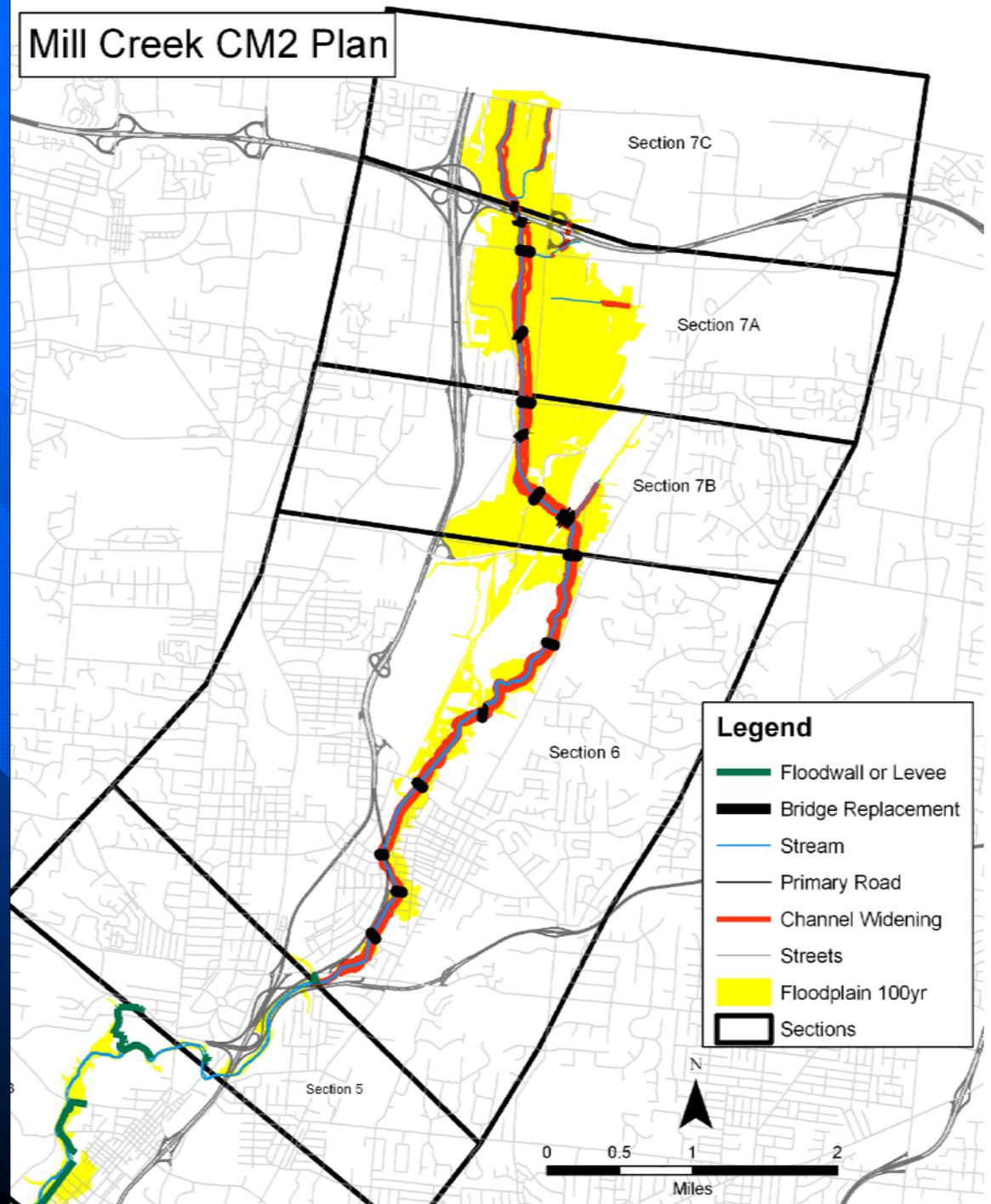
## Major Features

52 residential structures  
demolished

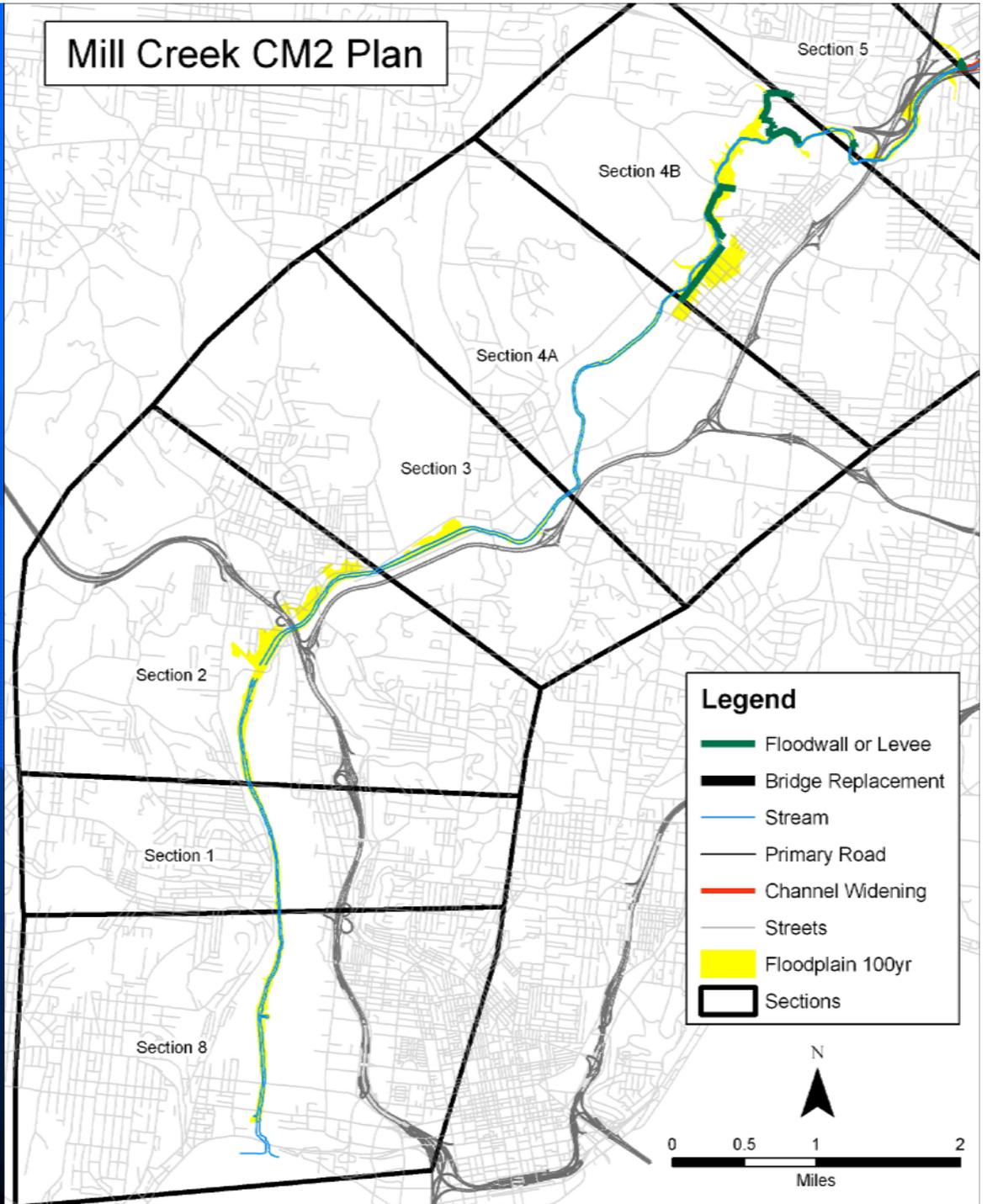
69 commercial  
structures demolished

37,250 lf of channel  
modification

10,150 lf of floodwall

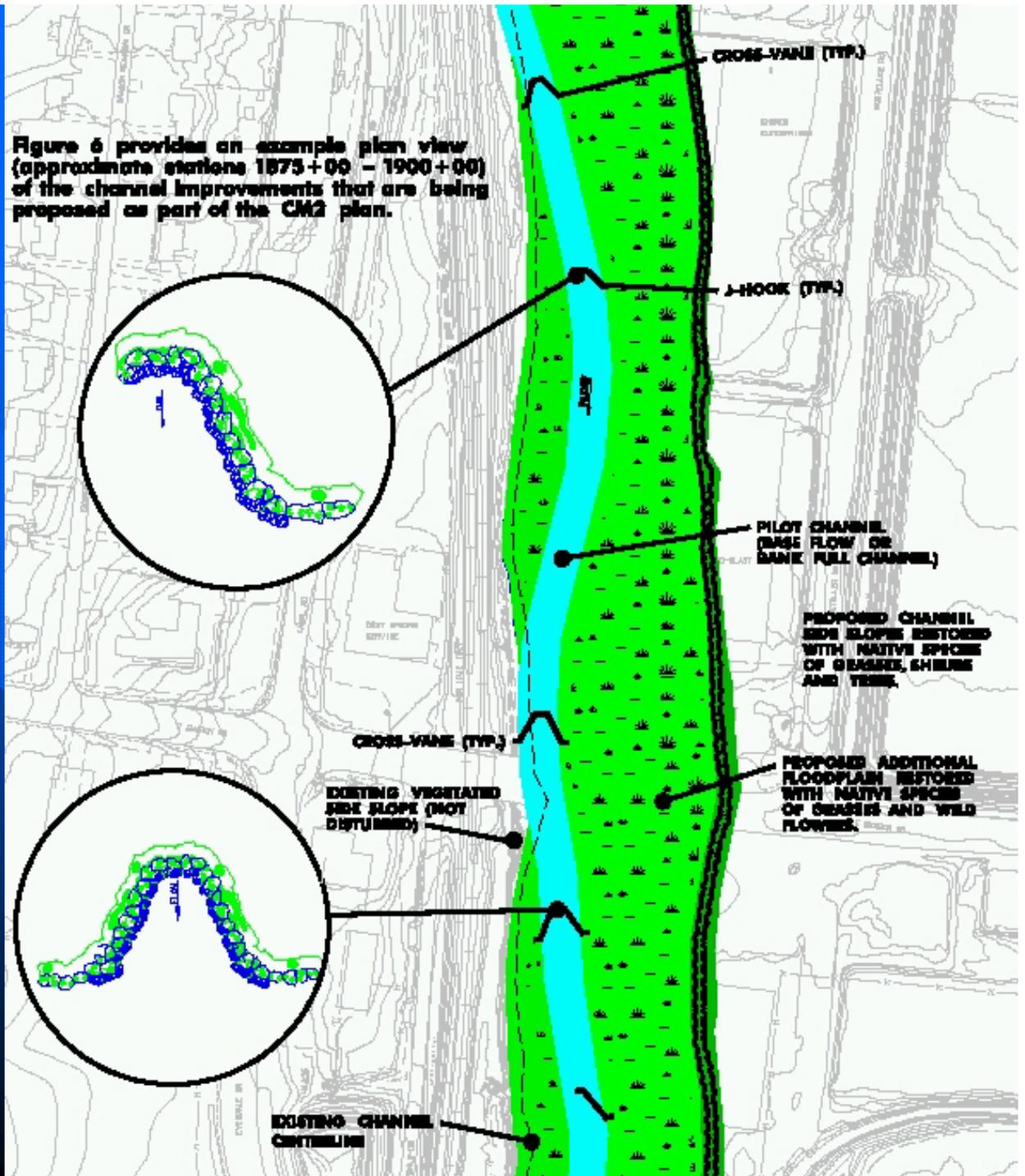


# Mill Creek CM2 Plan

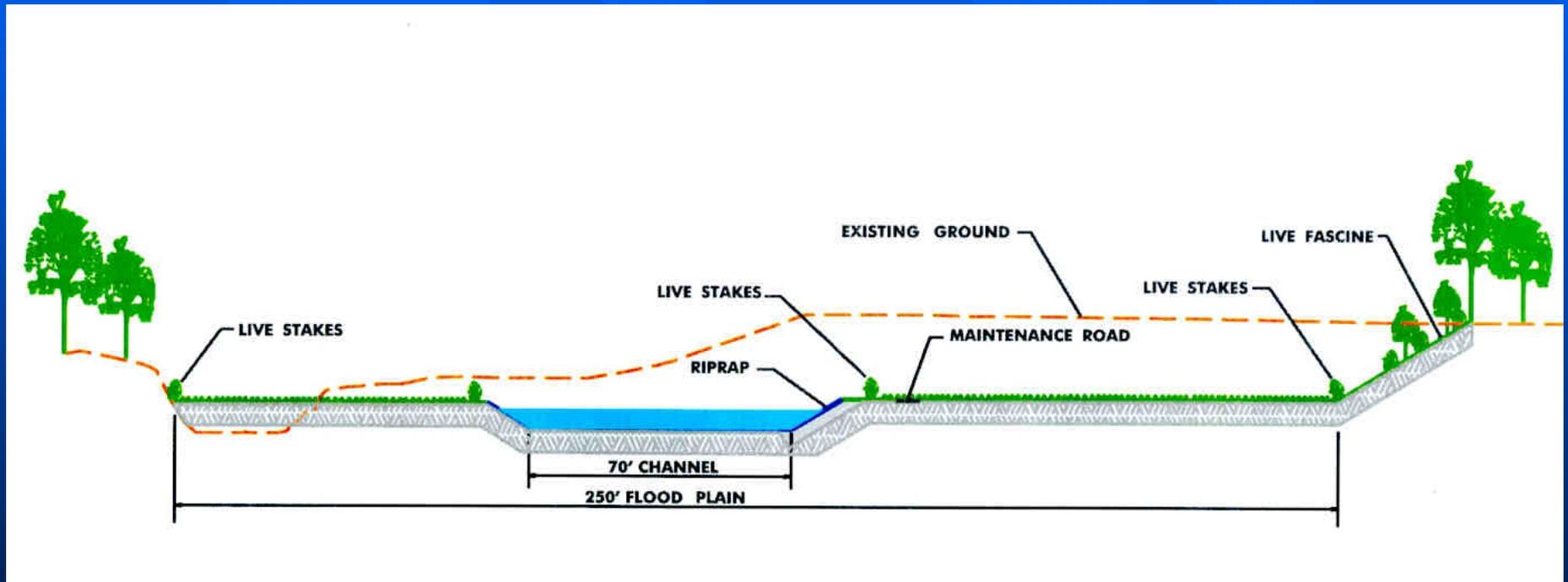


# CM-2 PLAN

(typical layout)



# Plan CM-2 SAMPLE CROSS-SECTION





# Deep Tunnel (TU)

- Consists of constructing a deep tunnel along the length of Mill Creek
- Provides flood protection from the 1% chance (100 -year) flood event
- Provides capacity to store CSOs for up to a 50% chance (2-year) storm event
- Locally preferred plan
- Major Features:
  - 300+ feet below ground
  - 31 foot diameter
  - 15.8 miles long
  - 7 flood water drop shafts / 16 CSO drop shafts

## Major Features

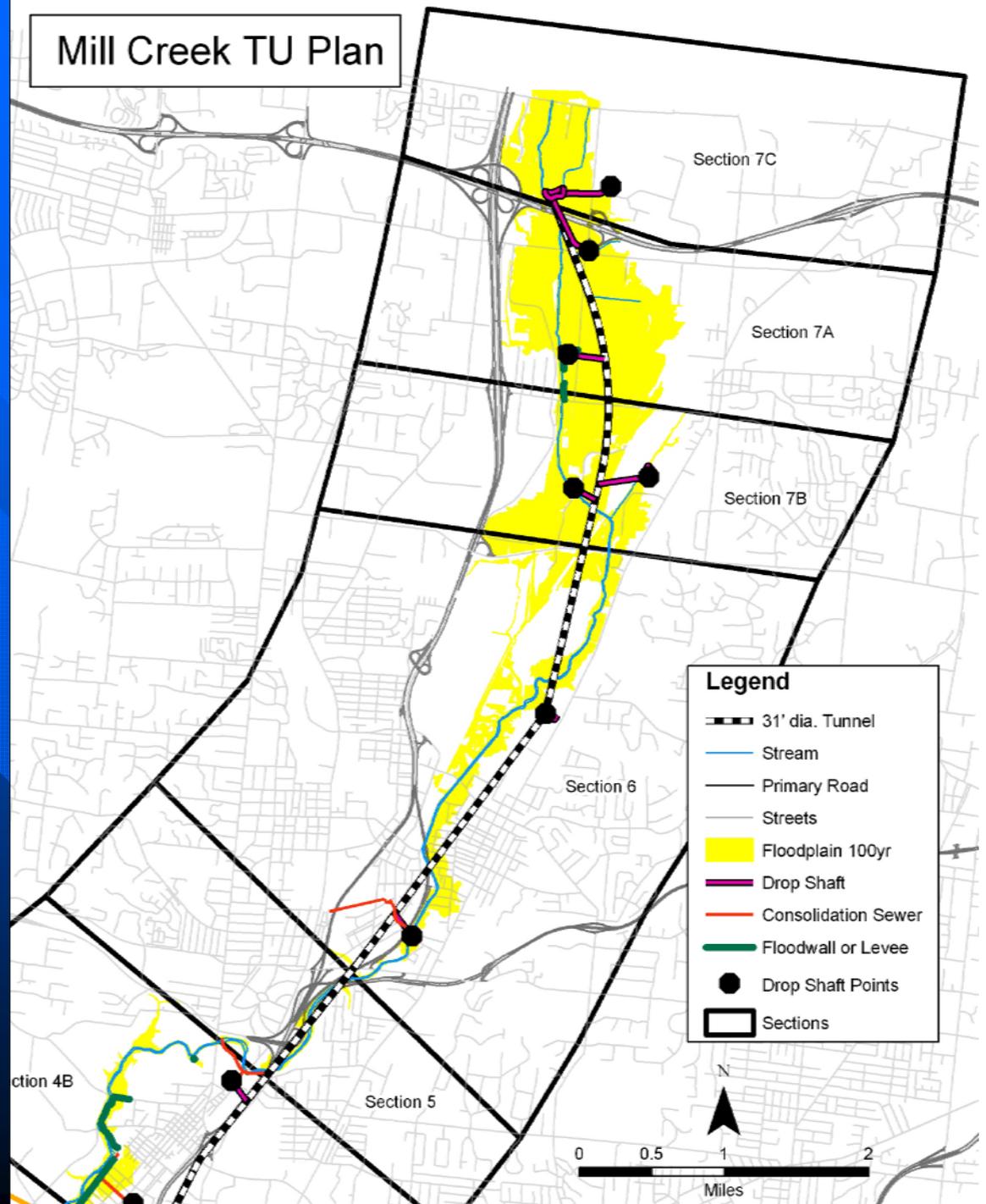
200-300 feet below ground

31 foot diameter

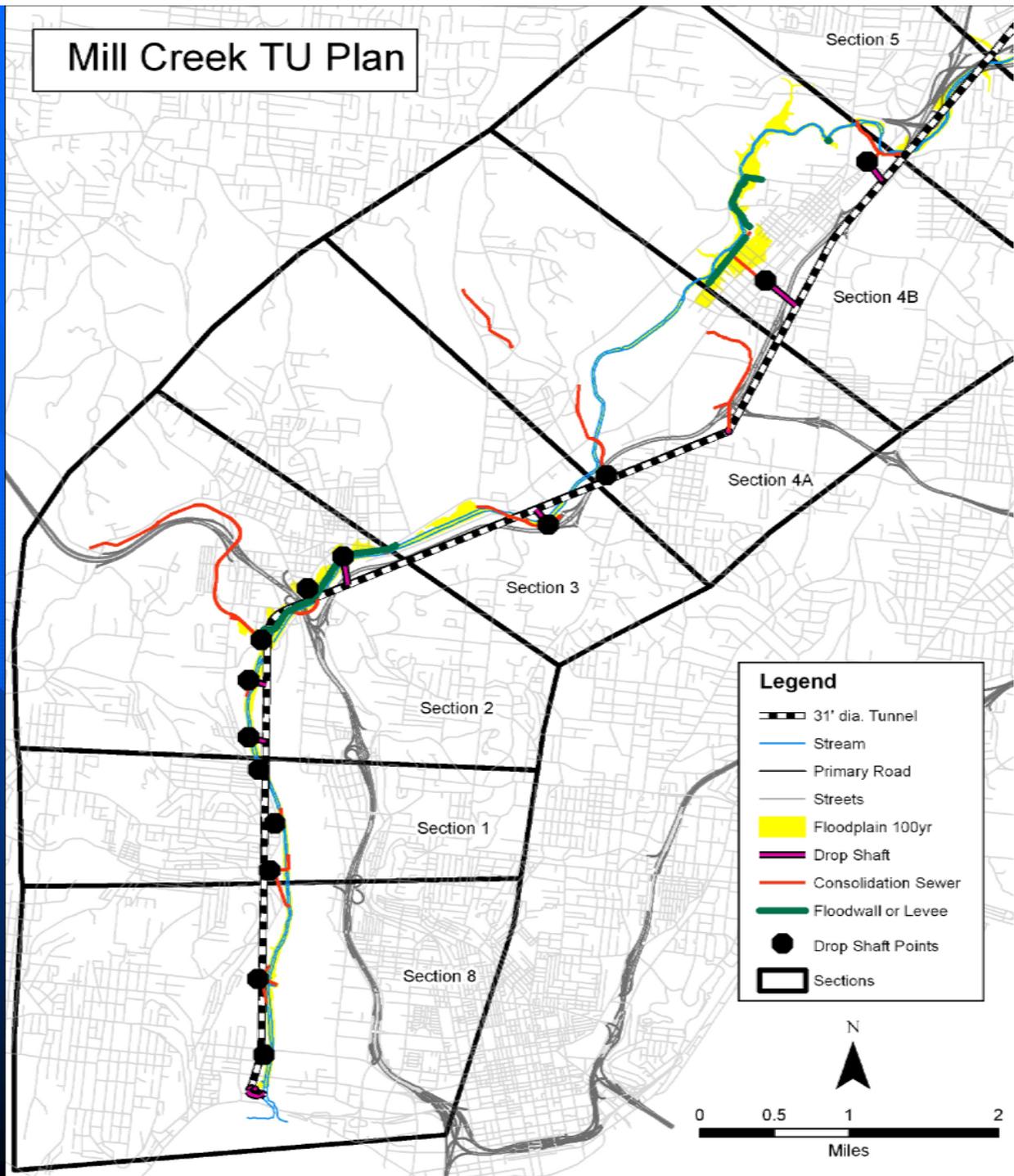
15.8 miles long

7 floodwater drop shafts

16 CSO drop shafts

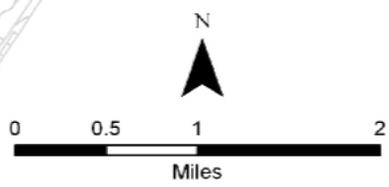


# Mill Creek TU Plan



**Legend**

- 31' dia. Tunnel
- Stream
- Primary Road
- Streets
- Floodplain 100yr
- Drop Shaft
- Consolidation Sewer
- Floodwall or Levee
- Drop Shaft Points
- Sections



# Plan NS-2a

- Construct 3 sections of floodwalls and levees to protect 28 high value / high damage facilities against the 1% chance (100-yr) flood
- No relocations of non-protected structures
- Major Features:
  - 30,700 LF of floodwalls or levee constructed
  - 10 automated gate closure structures (road and railroad)
  - 6 pump stations
  - 7,580 LF of channel modifications (Section 7 only)



ONLY

Ford  
Main Entrance  
Shipping & Receiving  
←

## Major Features

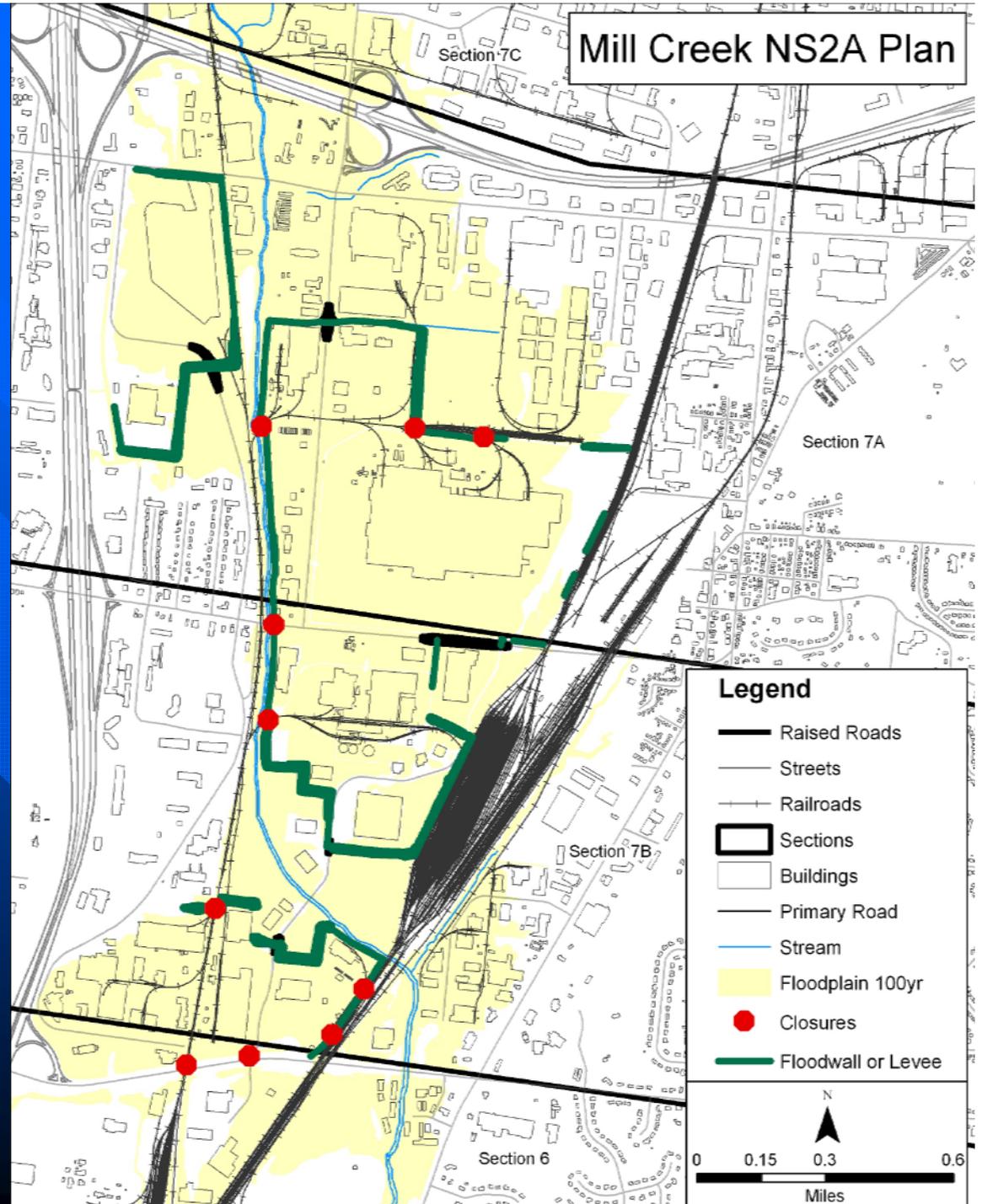
30,700 lf of floodwalls and levees

2 road closures

8 railroad closures

6 pump stations

7,580 lf of channel widening



# PLAN COMPARISON

Plan	Initial Cost (2004 price-levels)	% of Flood Damages Reduced	Net Annual Benefits (2004 price levels)	Benefit- Cost Ratio
NS-2a	\$99,235,000	31%	\$10,358,000	2.5
CM-2	\$562,896,000	98%	\$14,207,000	1.4
TU	\$1,563,505,000	98%	(\$26,379,000)	0.7

# CONCLUSION

Plan CM-2 is the Federally Supportable Plan especially since it is the National Economic Development (NED) plan. Plan CM-2 reduces approximately 98% of flood damages along Mill Creek, at an initial cost of \$562,896,000.

# RECOMMENDATION

- Recommend that further Federal efforts on this project be DEFERRED until such time as the local sponsor (MVCD) or another local non-Federal interest, can provide the necessary assurances of local financial capability and willingness to support project implementation.
- If assurances of financial capability are provided, recommend that plan CM-2 be carried on to final design with the ultimate goal of project construction.

**THE END**

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