



CITY OF NORTHAMPTON

Flood Control and Stormwater Infrastructure Challenges

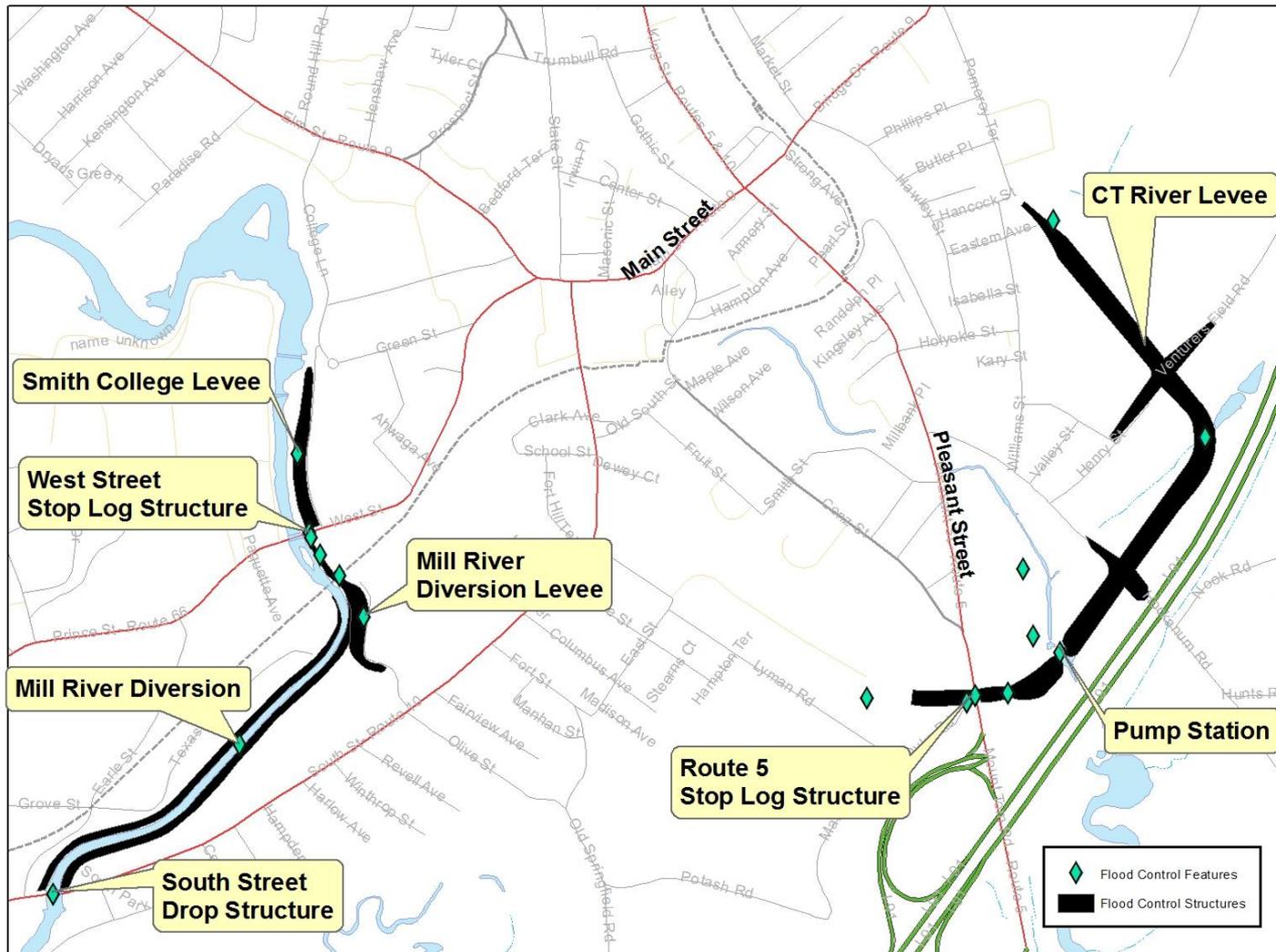


September 27, 2012

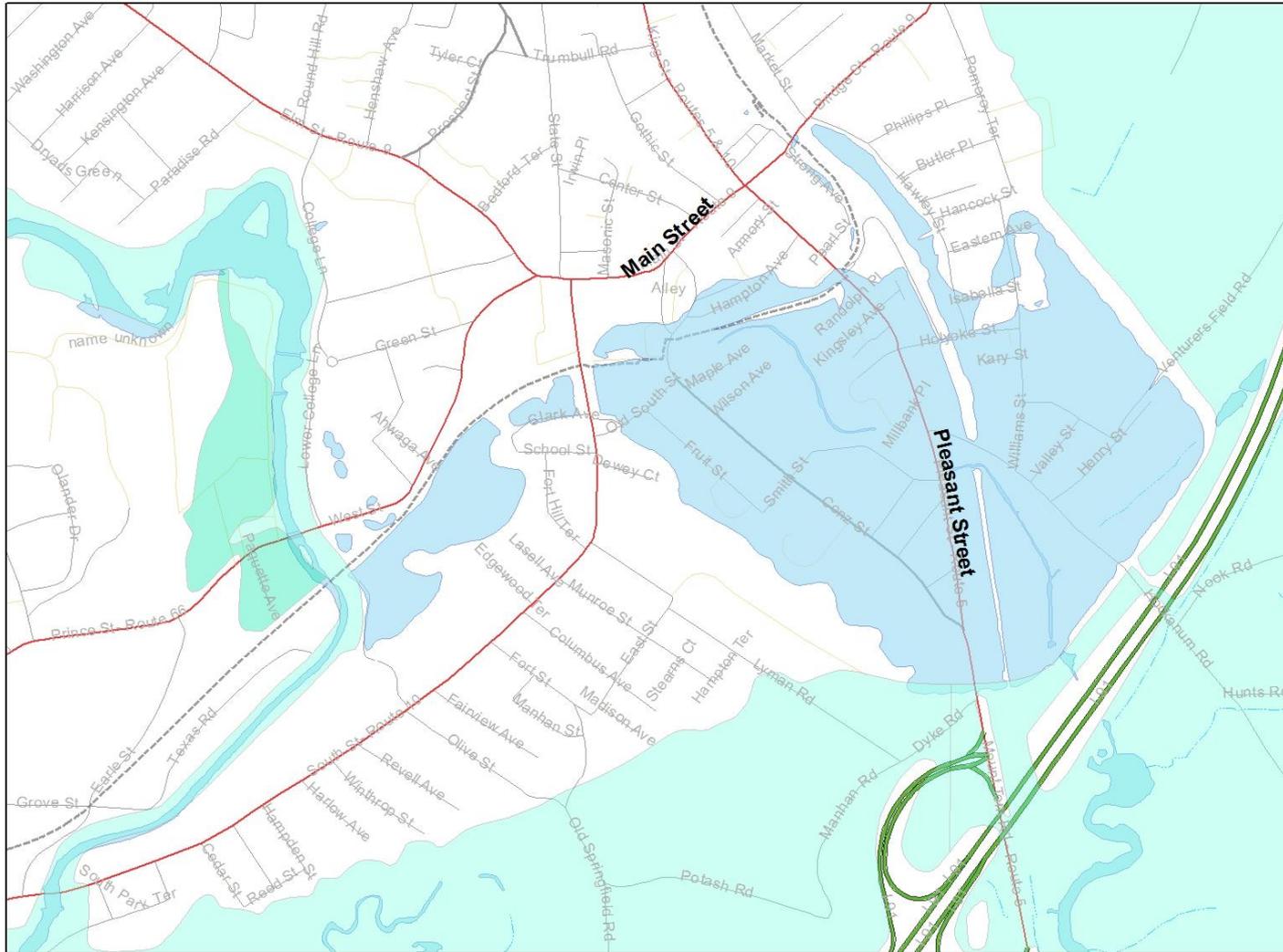
Flood Control - Overview

- Two Systems Constructed by Federal Government (Army Corps) – 1940
- Levees and Pumps built in response to Flooding in 1936 and 1938
- Connecticut River Levee and Pump Station
- Mill River Levee, Pump Station and River Diversion

Northampton Flood Control Structures



Northampton Flooding at Elevation 127' with no Flood Control System



Northampton Public Works

1:110,000

Property Values - Cost of Failure

- 2012 Assessor's values includes inside-the-dike value of land & buildings inundated:
\$ 199,610,148

Total building value: \$ 54,203,450

Acres: 189 (under water inside the dike system in a 127' elevation flood)

Connecticut River 2011





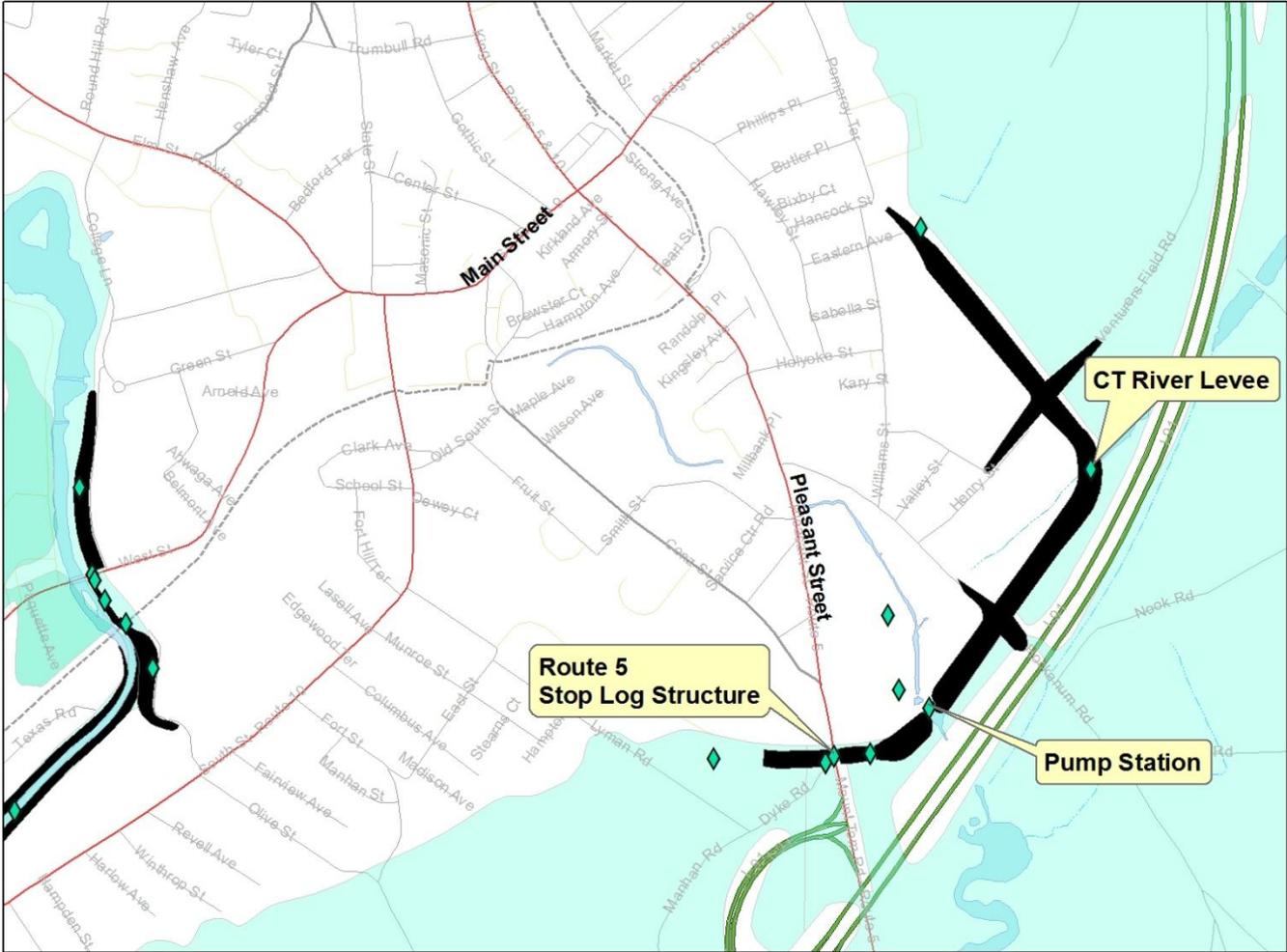
Connecticut River

Levee System holds back river water in August 2011.

Connecticut River Flood Control

- 4,950 feet of Levee - earthen embankment – starts at Pomeroy Terrace and ends 500 westerly of Route 5
- Two 8 foot tall stop log structures – Route 5 and Pan Am Railroad.
- 150,000 gallon per minute pump station – pumps down the Old Mill River Bed Drainage Area (over 770 acres of land drainage)
- Includes downtown areas, Main, Pleasant and Konz Streets and their neighborhoods

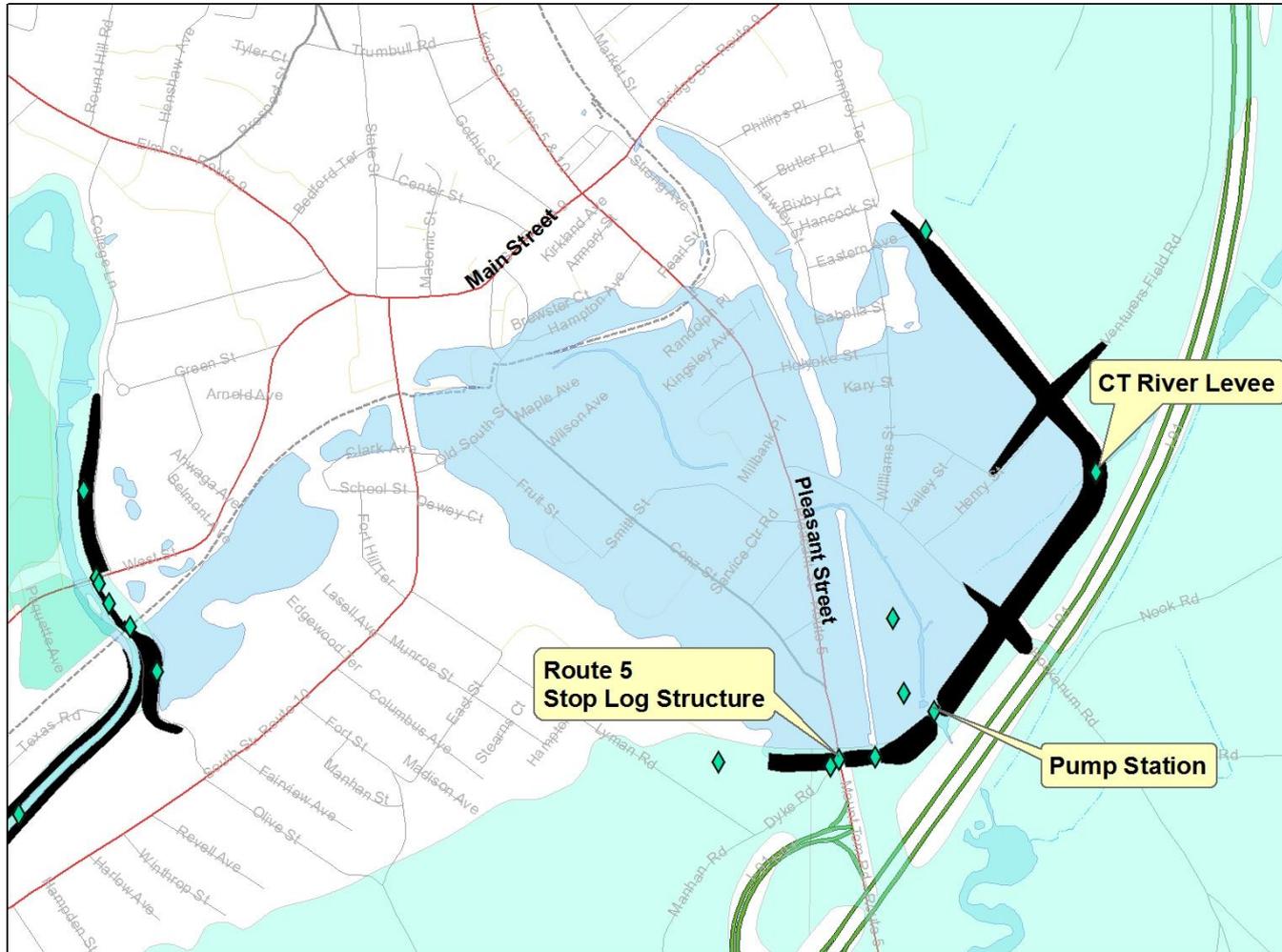
Flooding at Elevation 127' with levees



Northampton Public Works

19,000

Flooding at Elevation 127'-No Levee



Northampton Public Works

 1:9,000

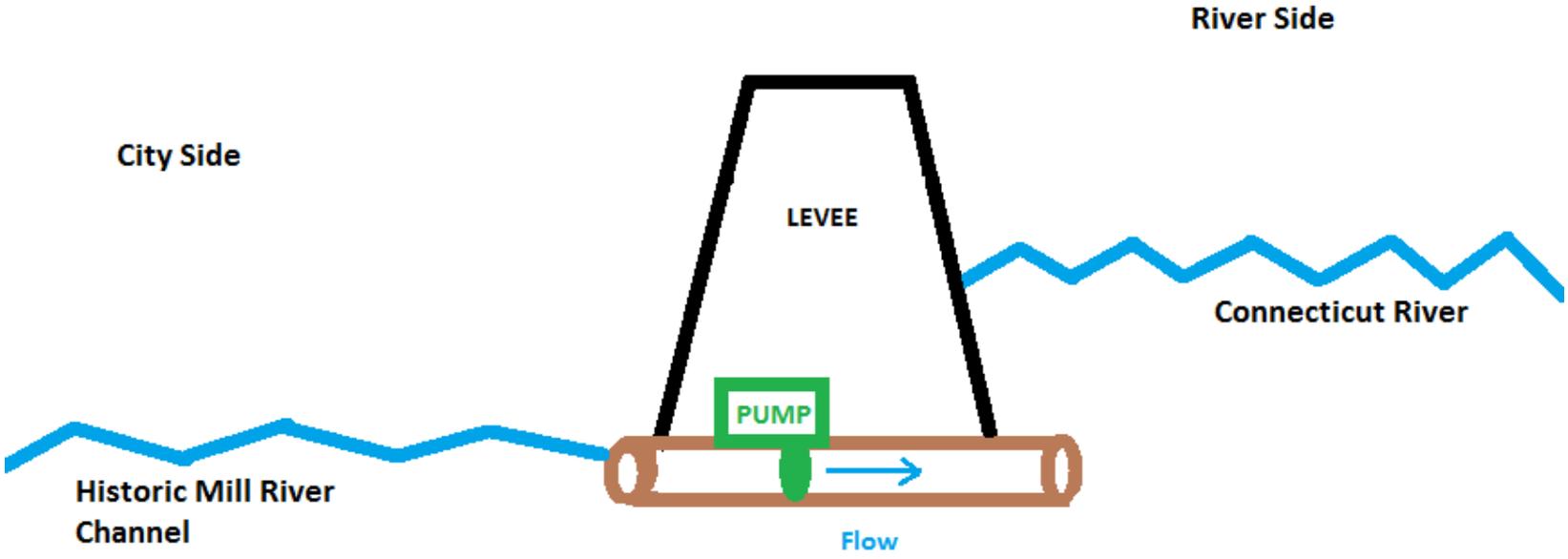
Pleasant Street Flood of 1936



Downtown Underpass Flood of 1936



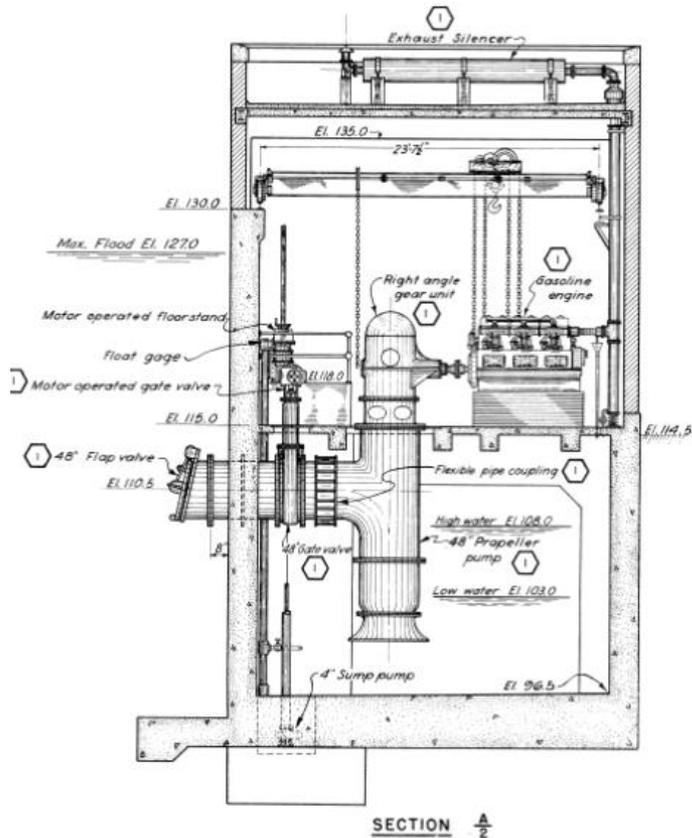
Flood Control Pump Station at Flood Stage



Hockanum Road Pump Station



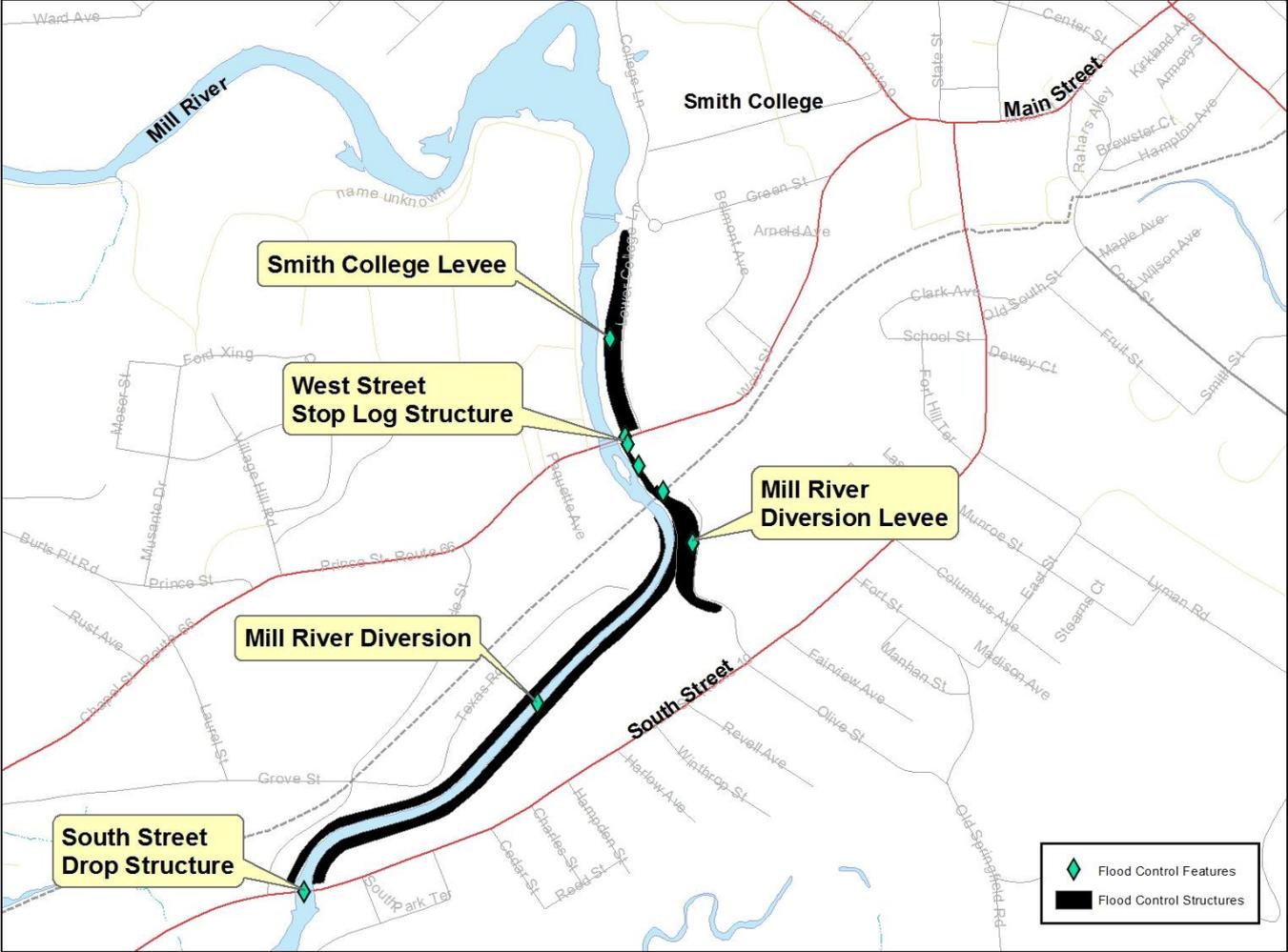
Pump Engine



Mill River Flood Control

- 2,300 feet of levee
- 14 foot high stop log structure – West Street
- One pump station – pumps stormwater from West Street storm pipes when Mill River reaches critical elevations.
- 450 feet of concrete flood wall from West Street to Manhan Rail Trail Bridge
- 3,200 feet of armored Mill River channel from West Street to South Street
- 15 foot drop structure under South Street Bridge
- 8,000 foot Mill River diversion from South Street to the Connecticut River Oxbow.

Mill River Flood Control Structures



West Street (Mill River) August 2011





Mill River Levee

Mill River level rising during Tropical Storm Irene – Smith College

August 2011

Flood Control Mandates

- Army Corps mandated engineering studies and maintenance requirements
 - Analysis includes seismic, hydraulics, stability and settlement, topographic surveys and geotechnical borings.
- Mill River System - Maintenance and Analyses
Deadline - January 2013
- Connecticut River System - Maintenance and Analyses
Deadline - January 2014

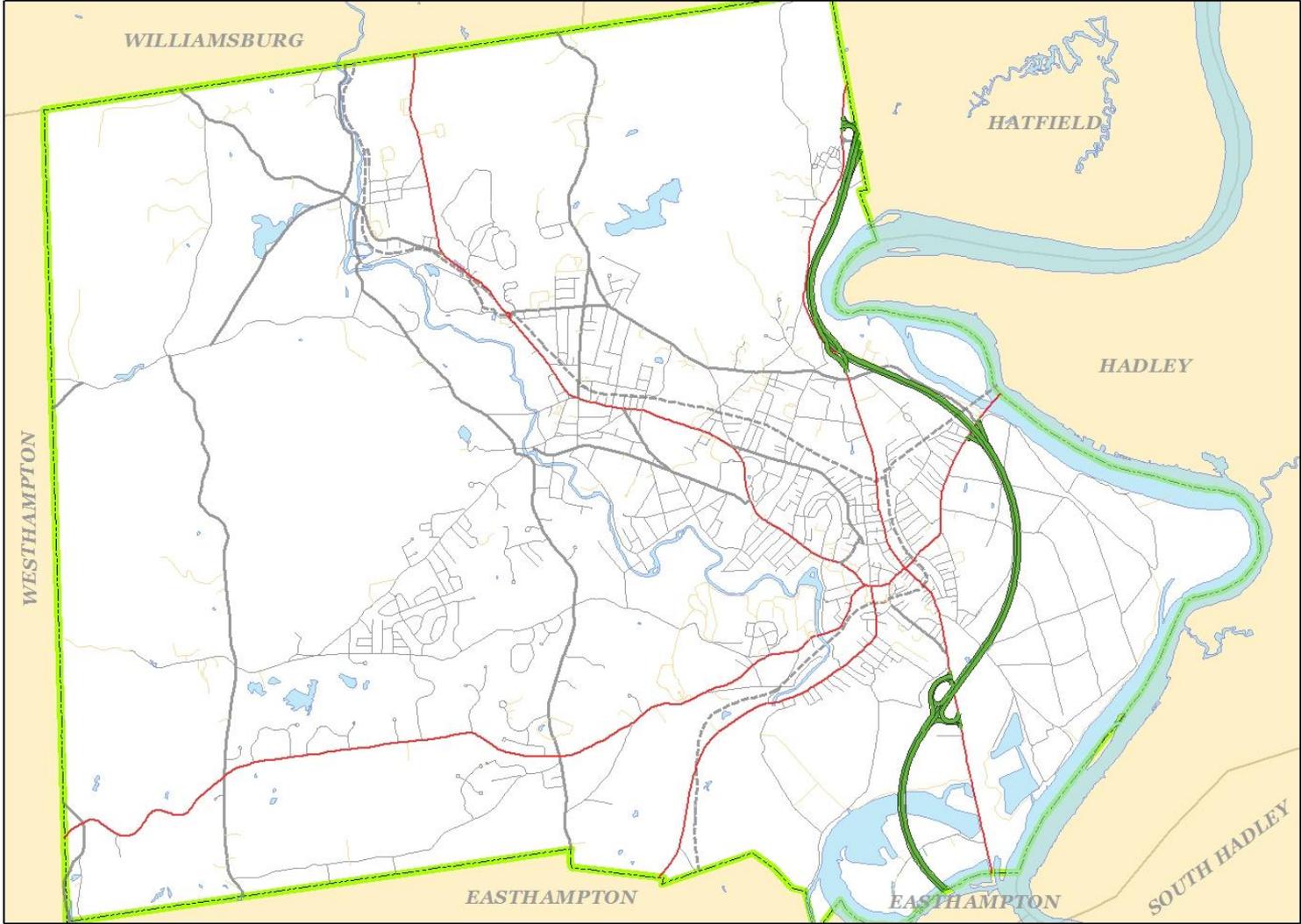
Flood Control Mandate (cont.)

- Estimated minimal cost is \$1,200,000 for engineering and maintenance construction
- Unknown \$\$ to repair possible deficiencies
- Estimated mandates at the pump station are in the \$1,000,000 range

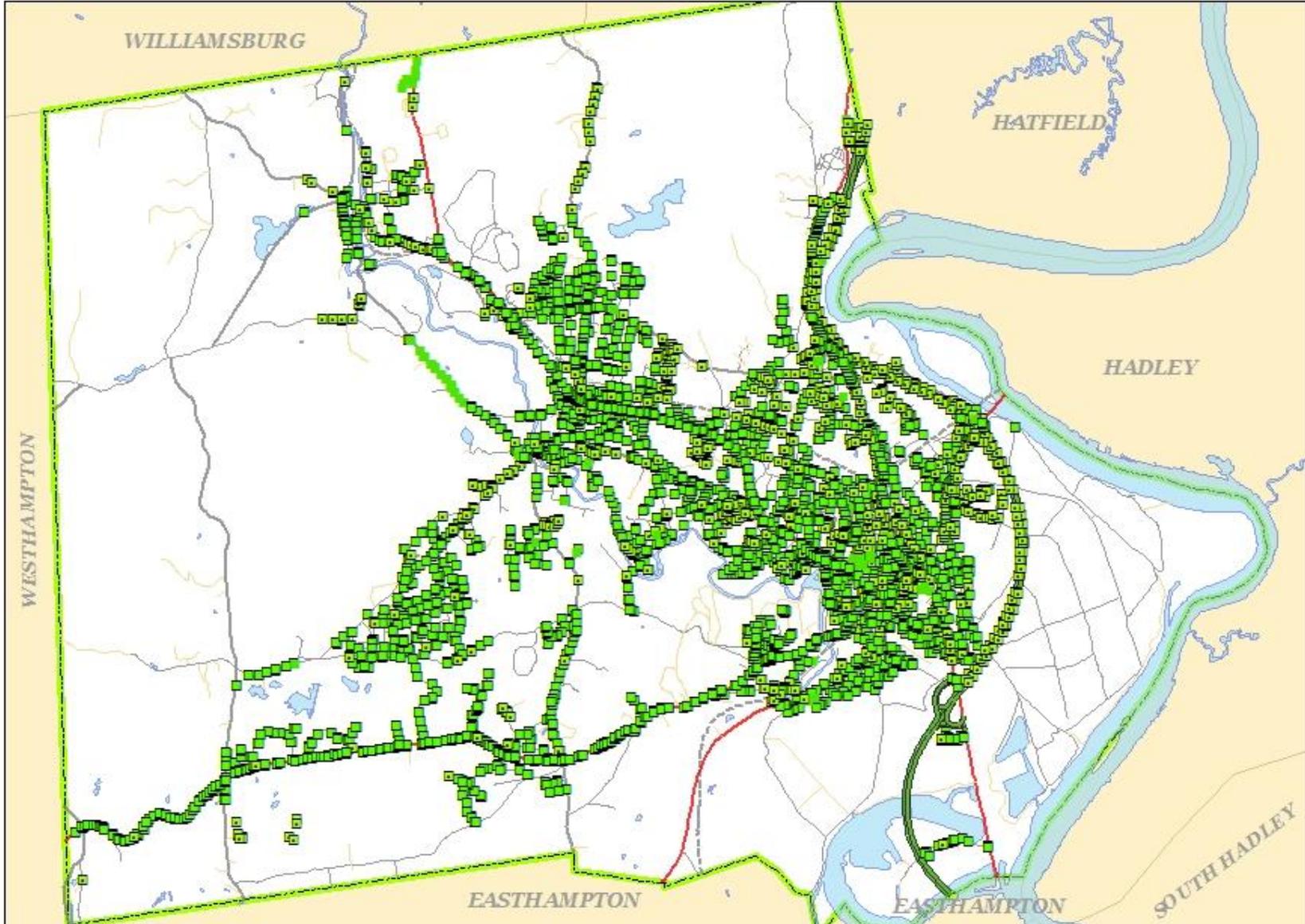
Aging Stormwater Infrastructure

- System is over 100 years old in many areas
- System is under capacity in many areas
- Some City areas don't have drainage systems and need improvements
- Limited funds for replacing/repairing/constructing

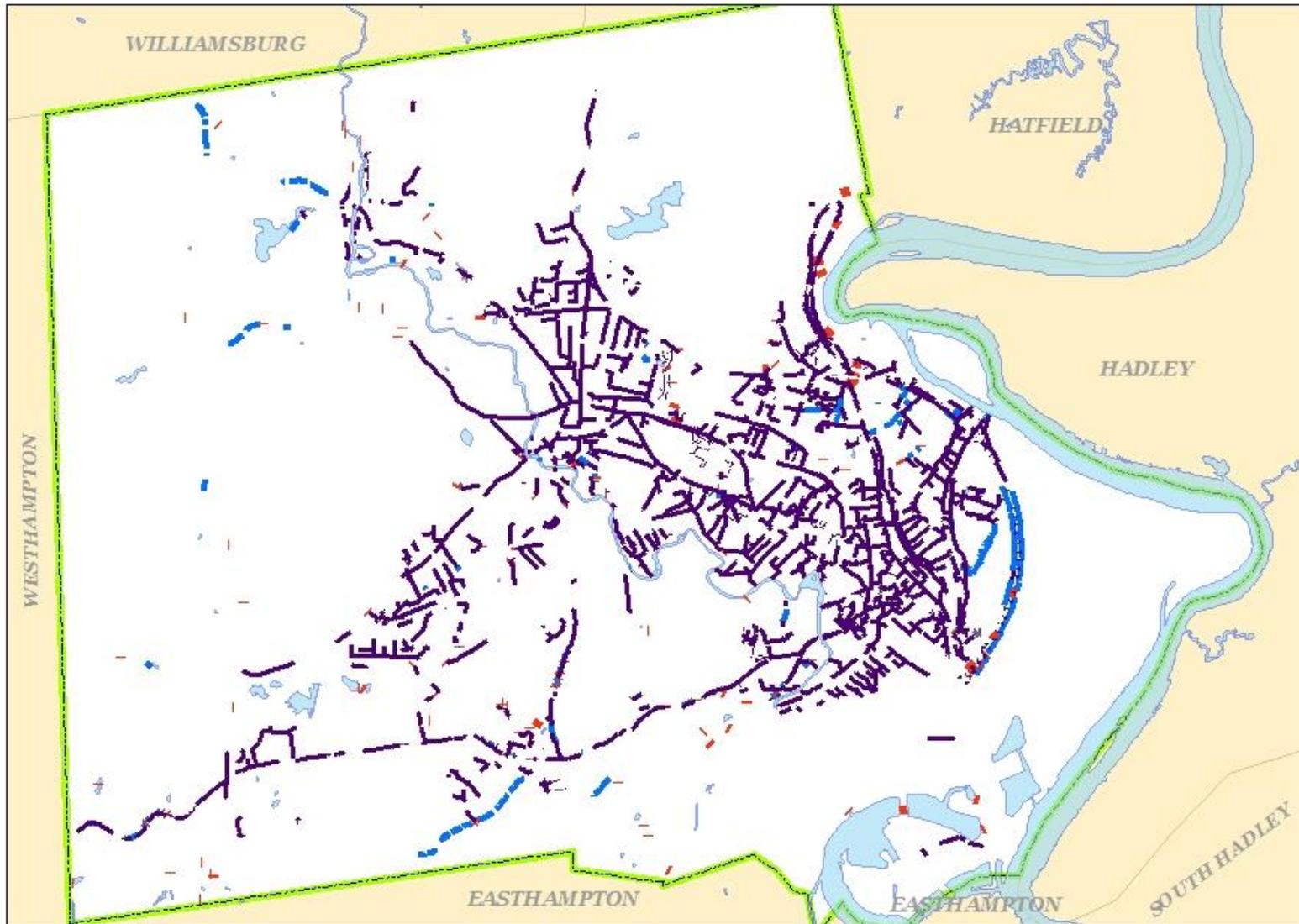
NORTHAMPTON



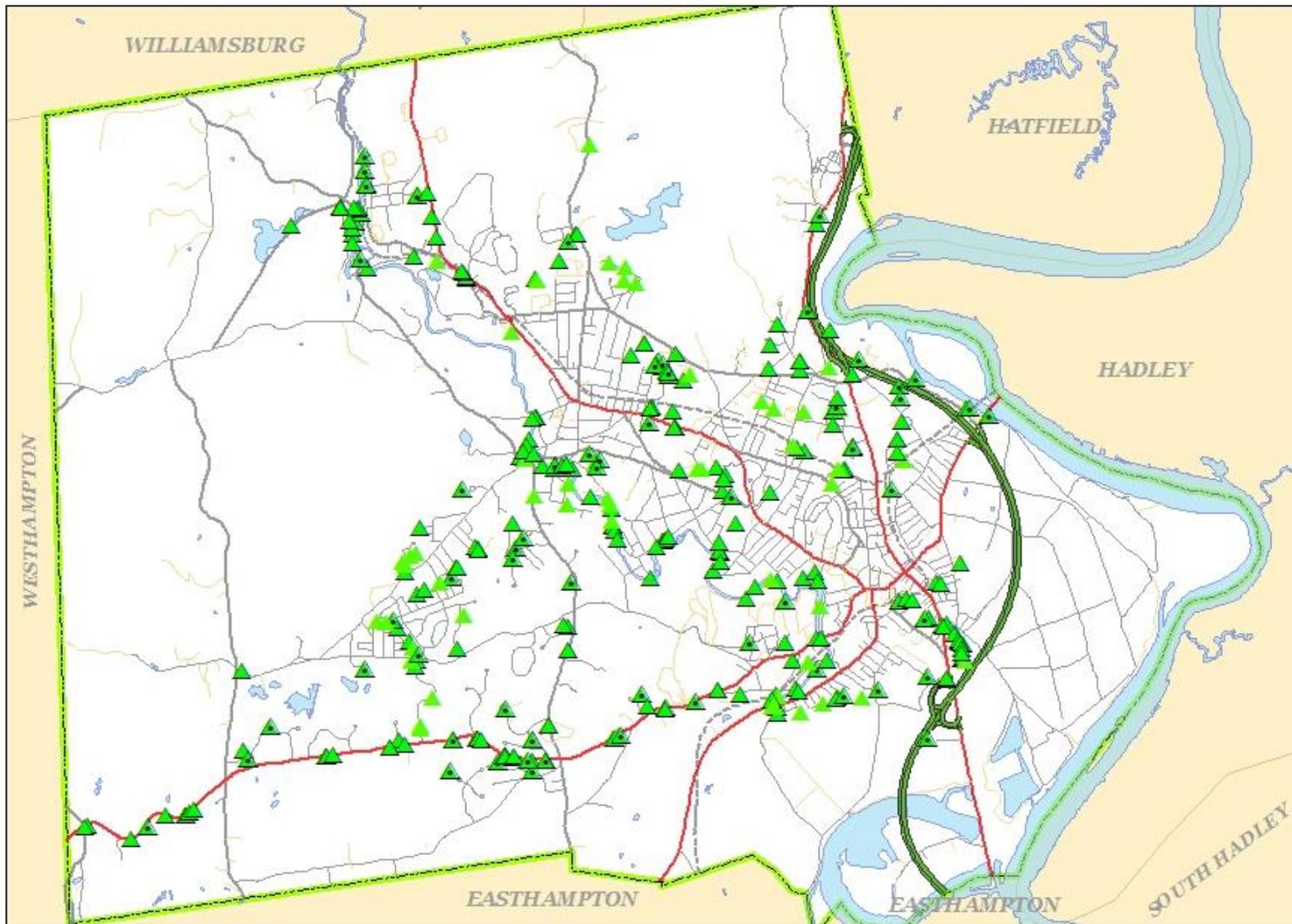
4,835 Catch Basins



114 Miles of Pipe, 190 Culverts & Drainage Channel



326 Drain Outfalls





Main Street Drainage

Under capacity stormwater drainage system causes surcharging of drain manhole during this rain event



North Street Flooding 2010

Under capacity
stormwater drainage
system causes
ponding in the
underpass after
thunderstorm



Hatfield Street Drainage

Hatfield Street emergency drainage repair completed in 2011. (Note yellow gas pipeline).



Prospect Street Culvert Collapse 2004

Emergency Repair required costing \$29,000



Florence Street

Stormwater drainage pipe – emergency repair by Public Works personnel.



Elm/Riverside/Milton Streets Flooding

Under capacity stormwater drainage system causes brook to overflow and flood the roadway and properties during rain storm



Vicinity of Austin Circle

Example of location that may require new drainage infrastructure.

New EPA Stormwater Permit - Mandates

- EPA permit regulates City stormwater discharges to Brooks and Streams
- The new EPA permit drastically increases costs for stormwater systems
- Increase O&M for permit compliance = \$525,000
- Permit expected FALL 2012



EPA MANDATE - Catch Basin Cleaning

New EPA permit will require all catch basins to be maintained at less than 50% full with sediment. Currently, only certain catch basins are routinely cleaned of sediment.



Catch Basin Cleaning with Vactor Truck



EPA MANDATE - Street Sweeping

New EPA permit will require sweeping 2 times per year in Spring and Fall. Currently, streets are swept once each year.



EPA MANDATE – OUTFALL SAMPLING

Vernon St– Outfall to the Mill River

New EPA permit will require outfall sampling of 25% of City 326 outfalls. This is about 80 outfalls that will require sampling in dry and wet weather.



EPA MANDATE – GREEN INFRASTRUCTURE

Drainage Green Retrofit on Conz Street – Water Quality Swale

EPA MANDATE – PUBLIC EDUCATION



Other EPA Permit Mandates:

- Illicit Discharge Detection and Elimination
- Nitrogen Reduction in discharges
- Municipal floor drain inspection/improvements

River and Brook Erosion Threats

- City is blessed with scenic brooks and rivers
- BUT – Stream bank erosion may threaten property and infrastructure
- No funding source for these threats
- City aggressively chases limited grant money but this is inadequate funding and lacks responsiveness required for needs



River Road Retaining Wall – Mill River

This retaining wall is failing and threatens River Road and sewer interceptor line.



Federal Street Retaining Wall – Mill River

This failing retaining wall threatens sewer interceptor line. Temporary repairs have been done.



Roberts Meadow Brook – Musante Beach Area

Stream bank erosion on Roberts Meadow Brook threatens the house in the photo as well as a bridge a little further downstream.

Budget Discussion

**Stormwater and Flood Control
Projected Revenue Requirements (FY 2012)**

	FY 2012
Existing Operation Budget Allocations	
Overtime (Storms)	\$23,000
Flood Control	\$32,625
Personnel (w/benefits)	\$164,096
Stormdrains O&M	\$54,050
<i>Total Allocated O&M</i>	<i>\$273,771</i>
Increase in O&M Budget (due to new EPA permit)	
Monitoring	-
Engineering Staff (w/benefits)	-
Operations Staff (w/benefits)	-
Catch basin cleaning vehicle	-
Vactor truck	-
Street sweeper	-
Public education	-
Energy costs	-
<i>Total incremental O&M</i>	
Infrastructure Investments	
Conz Street Drainage Improvements	\$64,426
North St Drainage	
Drainage infrastructure	
Municipal green design/construction	
Flood Control Pump Station Analysis	
<i>Total Infrastructure Investments</i>	<i>\$64,426</i>
Total Operating Expenses	\$338,197
Debt Service	
General Bond:	\$67,436
<i>Ridgewood Terrace/Crescent St</i>	
<i>Barrett St/Utility Study</i>	
Anticipated Future Debt:	
Levee Repair(FY13 to FY15)	
Pump Station Mandate Repair (FY13 and FY14)	
River Road Retaining Wall (FY13 and FY14)	
Roberts Meadow Brook (FY13 and FY14)	
Levee Certification (FY13 and FY14)	
Total Debt Service	\$67,436
Total Revenue Requirement	\$405,632

**Stormwater and Flood Control
Projected Revenue Requirements (FY 2012 and 2013)**

	FY 2012	FY 2013
Existing Operation Budget Allocations		
Overtime (Storms)	\$23,000	\$23,000
Flood Control	\$32,625	\$32,625
Personnel (w/benefits)	\$164,096	\$164,459
Stormdrains O&M	\$54,050	\$54,050
<i>Total Allocated O&M</i>	<i>\$273,771</i>	<i>\$274,134</i>
Increase in O&M Budget (due to new EPA permit)		
Monitoring	-	\$51,500
Engineering Staff (w/benefits)	-	\$46,350
Operations Staff (w/benefits)	-	\$77,250
Catch basin cleaning vehicle	-	\$9,517
Vactor truck	-	\$75,138
Street sweeper	-	\$37,569
Public education	-	\$10,300
Energy costs	-	\$10,300
<i>Total incremental O&M</i>		<i>\$317,924</i>
Infrastructure Investments		
Conz Street Drainage Improvements	\$64,426	
North St Drainage Drainage infrastructure		\$225,000
Municipal green design/construction		
Flood Control Pump Station Analysis		
<i>Total Infrastructure Investments</i>	<i>\$64,426</i>	<i>\$225,000</i>
Total Operating Expenses	\$338,197	\$817,058
Debt Service		
General Bond:	\$67,436	\$68,746
<i>Ridgewood Terrace/Crescent St Barrett St/Utility Study</i>		
Anticipated Future Debt:		
Levee Repair(FY13 to FY15)		\$61,100
Pump Station Mandate Repair (FY13 and FY14)		\$13,750
River Road Retaining Wall (FY13 and FY14)		\$160,800
Roberts Meadow Brook (FY13 and FY14)		\$54,600
Levee Certification (FY13 and FY14)		\$55,000
Total Debt Service	\$67,436	\$413,996
Total Revenue Requirement	\$405,632	\$1,231,053

**Stormwater and Flood Control
Projected Revenue Requirements (FY 2012-2015)**

	FY 2012	FY 2013	FY 2014	FY 2015
Existing Operation Budget Allocations				
Overtime (Storms)	\$23,000	\$23,000	\$23,690	\$24,401
Flood Control	\$32,625	\$32,625	\$33,884	\$35,194
Personnel (w/benefits)	\$164,096	\$164,459	\$169,392	\$174,474
Stormdrains O&M	\$54,050	\$54,050	\$55,672	\$57,342
<i>Total Allocated O&M</i>	\$273,771	\$274,134	\$282,638	\$291,411
Increase in O&M Budget (due to new EPA permit)				
Monitoring	–	\$51,500	\$106,090	\$109,273
Engineering Staff (w/benefits)	–	\$46,350	\$95,481	\$98,346
Operations Staff (w/benefits)	–	\$77,250	\$159,135	\$163,910
Catch basin cleaning vehicle	–	\$9,517	\$9,517	\$9,517
Vactor truck	–	\$75,138	\$75,138	\$75,138
Street sweeper	–	\$37,569	\$37,569	\$37,569
Public education	–	\$10,300	\$21,218	\$21,855
Energy costs	–	\$10,300	\$21,218	\$21,855
<i>Total incremental O&M</i>		\$317,924	\$525,366	\$537,463
Infrastructure Investments				
Conz Street Drainage Improvements	\$64,426			
North St Drainage		\$225,000		
Drainage infrastructure			\$250,000	\$250,000
Municipal green design/construction			\$30,000	\$30,000
Flood Control Pump Station Analysis			\$100,000	\$100,000
<i>Total Infrastructure Investments</i>	\$64,426	\$225,000	\$380,000	\$380,000
Total Operating Expenses	\$338,197	\$817,058	\$1,188,004	\$1,208,874
Debt Service				
General Bond:	\$67,436	\$68,746	\$63,926	\$62,176
<i>Ridgewood Terrace/Crescent St Barrett St/Utility Study</i>				
Anticipated Future Debt:				
Levee Repair(FY13 to FY15)		\$61,100	\$59,573	\$58,045
Pump Station Mandate Repair (FY13 and FY14)		\$13,750	\$65,906	\$102,938
River Road Retaining Wall (FY13 and FY14)		\$160,800	\$156,780	\$152,760
Roberts Meadow Brook (FY13 and FY14)		\$54,600	\$53,235	\$51,870
Levee Certification (FY13 and FY14)		\$55,000	\$53,625	\$52,250
Total Debt Service	\$67,436	\$413,996	\$453,044	\$480,039
Total Revenue Requirement	\$405,632	\$1,231,053	\$1,641,048	\$1,688,912

THANK YOU!

We'd be happy to address any questions!

