Excellence in Engineering Since 1946

Varied Approaches to Wet Weather SSO & CSO Challenges

Ohio Water Environment Association
Collection Systems Specialty Workshop

May 17, 2018

Two Ohio River Drainage Sewer Utilities

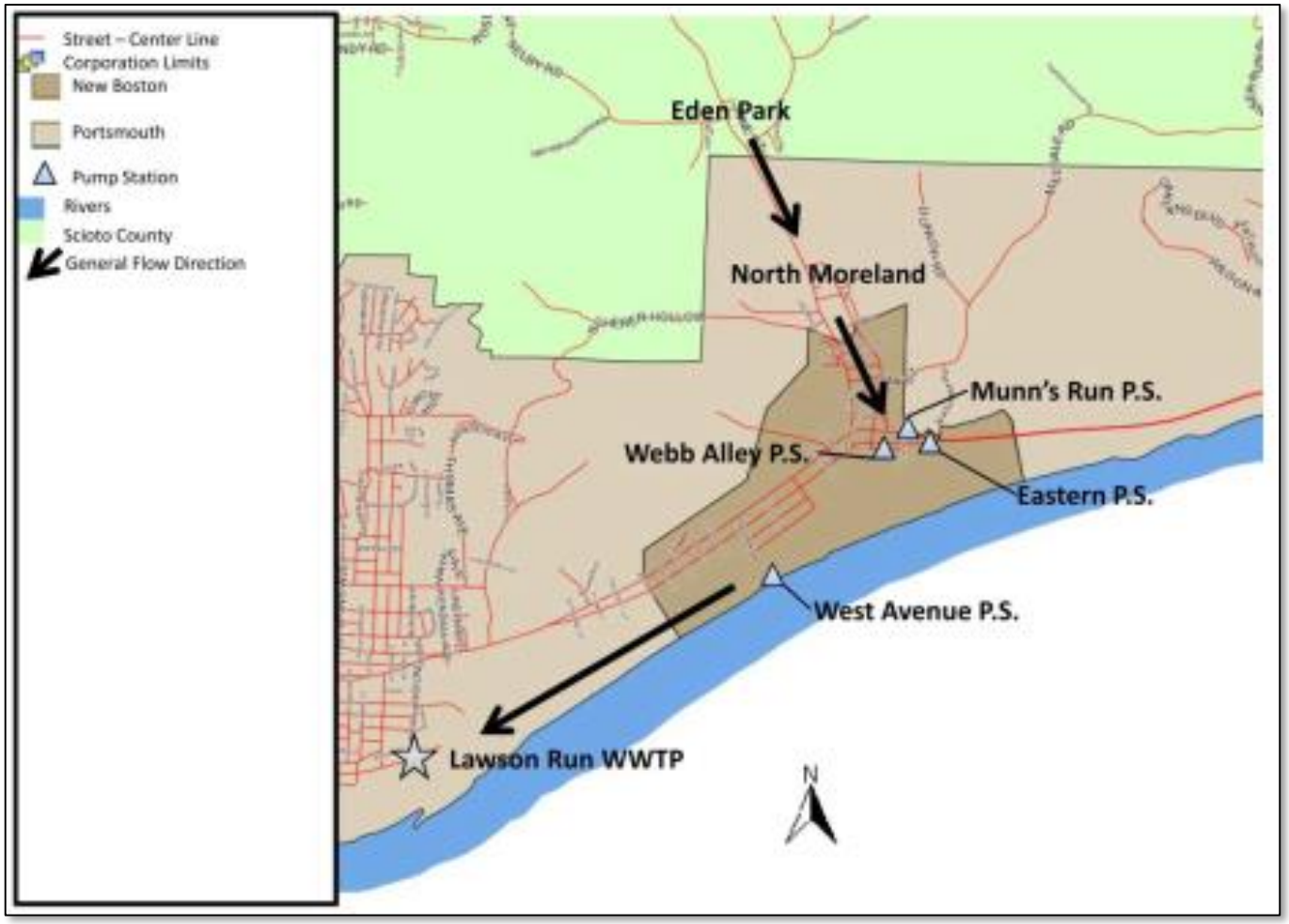
- Village of New Boston
- City of Portsmouth

Village of New Boston, Ohio
Ohio River CSO Community
Population: 2,775
MHI: $14,745
Poverty Level: 45%

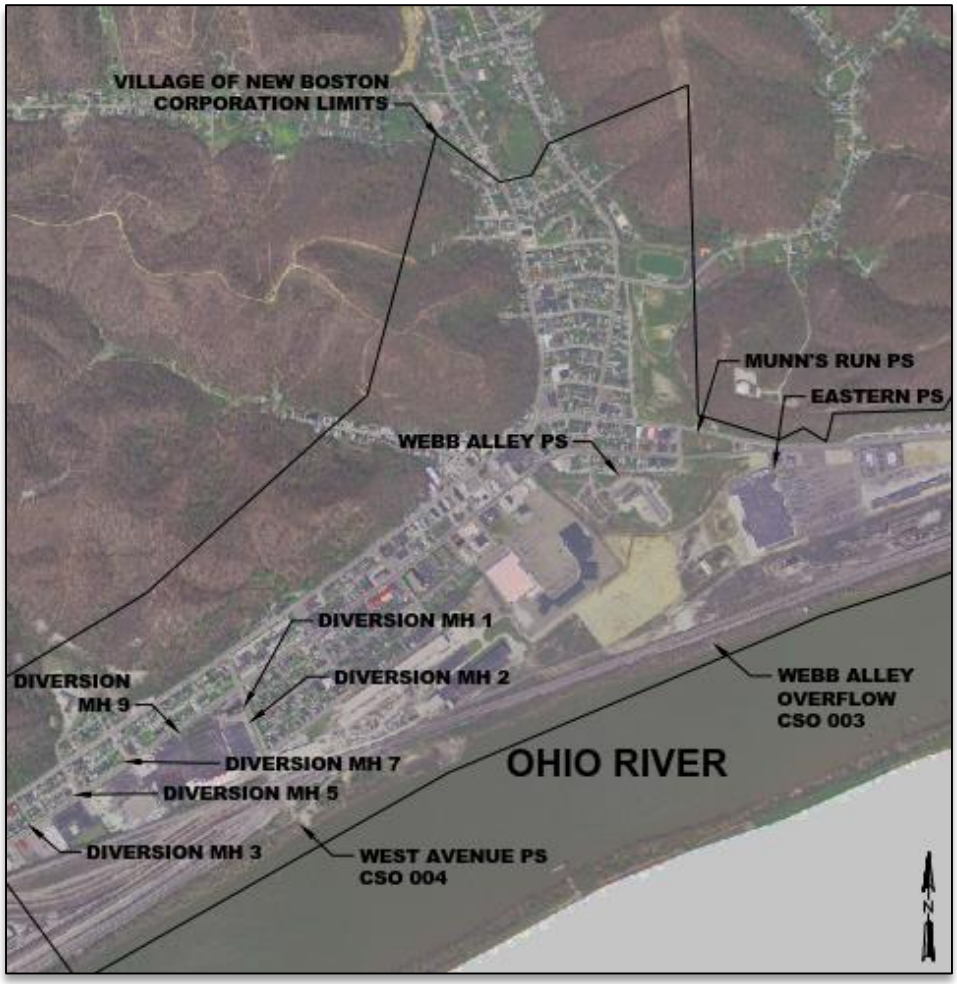
Location

Village of New Boston

Sewer System



CSO Structures



Village of New Boston

Wastewater Treatment Feasibility Study

- Concluded that constructing a New Boston WWTP resulted in substantial rate increases to users
- Recommended Village renegotiate agreement with Portsmouth for wastewater treatment at Lawson Run WWTP (expires in 2021)

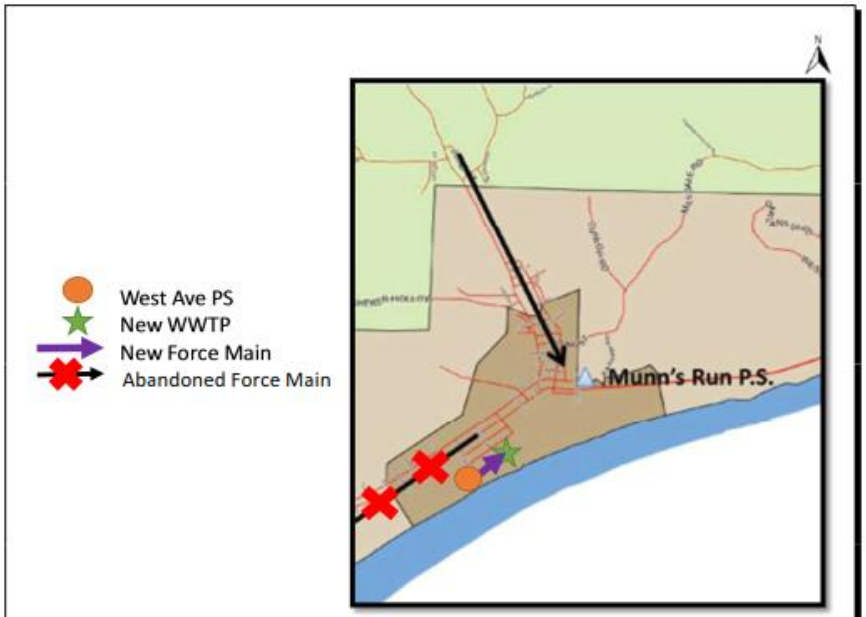


Figure not to scale.

Figure 2.01-2 Alternative B 1.0 mgd WWTP

CSO Abatement Facilities Plan

- Authored in July 2015
- Outlines eight phases of work required to separate the Village's sewer system (not all construction)

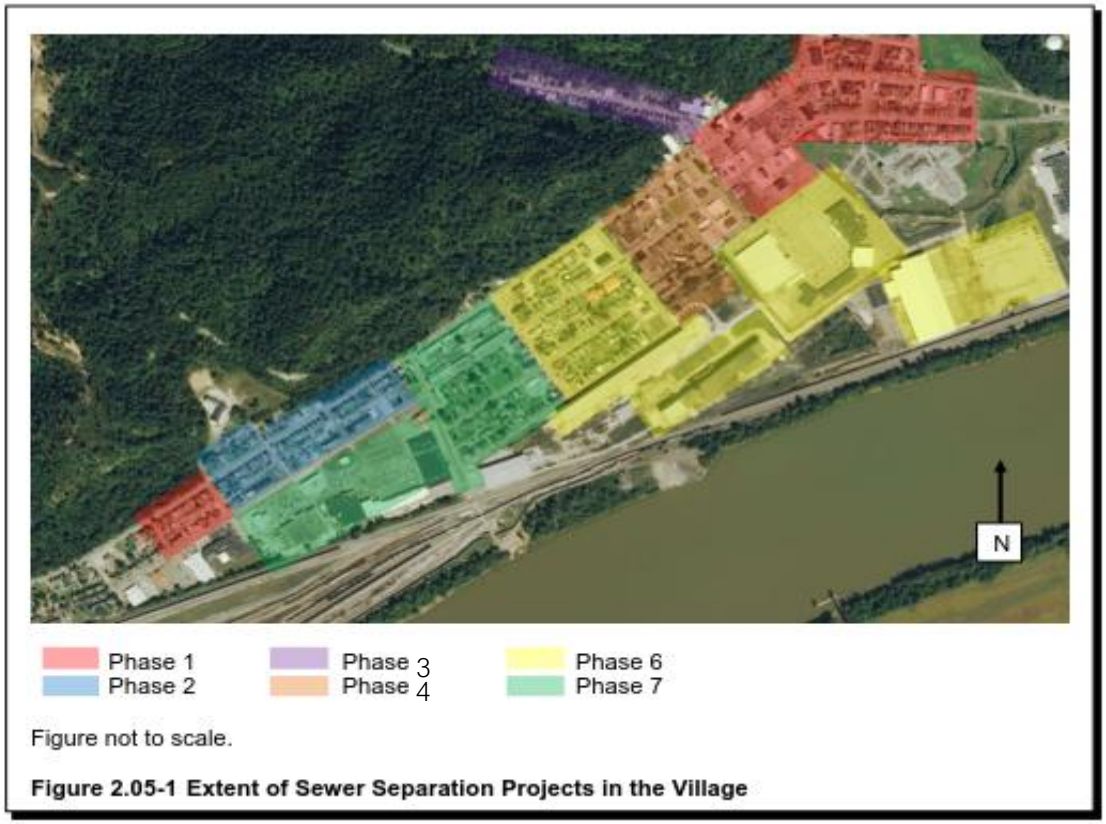
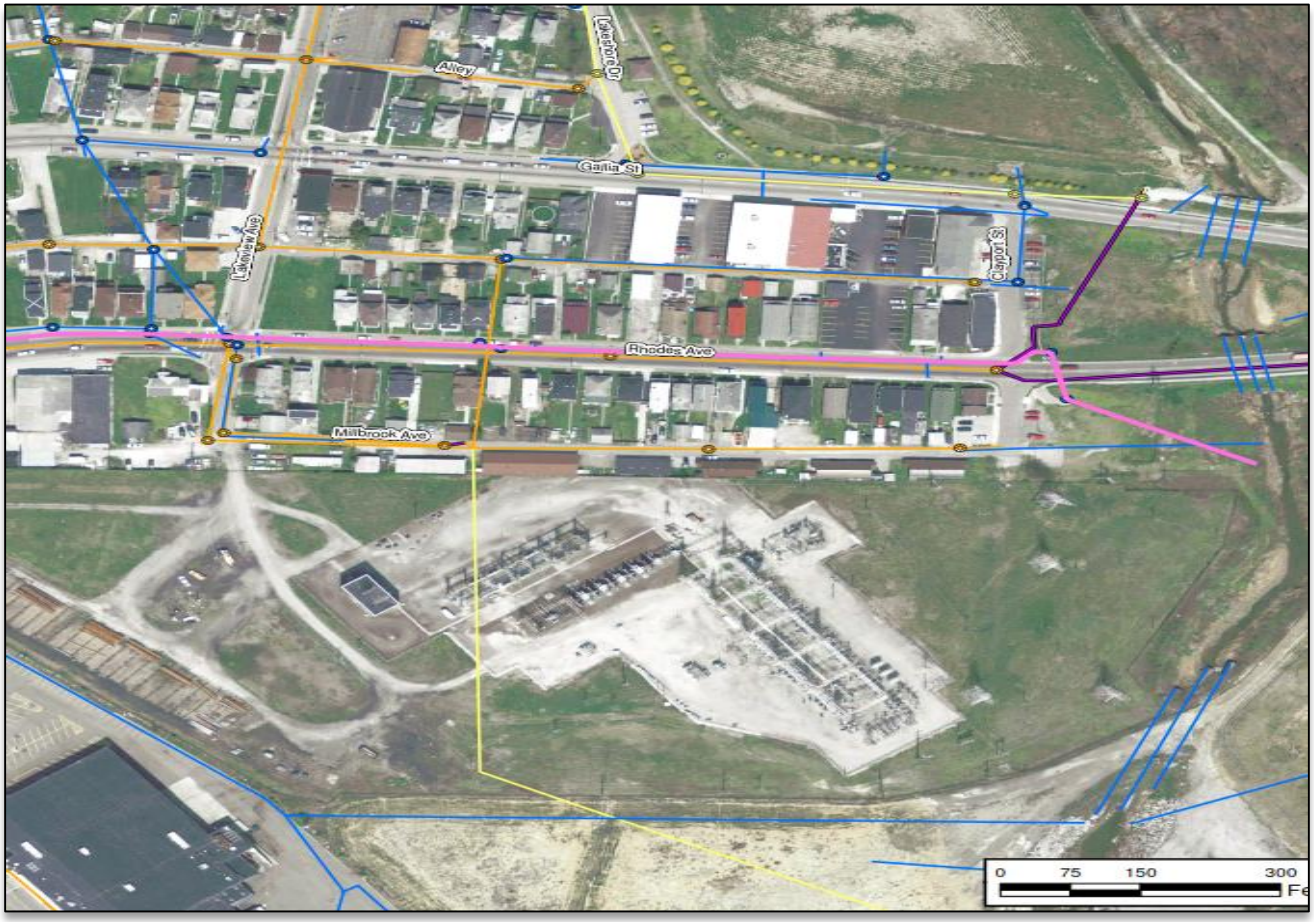


Figure 2.05-1 Extent of Sewer Separation Projects in the Village

CSO Improvements Phase 1



Village of New Boston

West Avenue Cleaning and Televising Work

Village of New Boston

CSO Improvements Cost Summary

Phase	Cost	Grant (Principal Forgiveness and USACOE)	Loan
1	$3,217,216	$2,000,000	$1,217,216
2	$708,235	$323,409	$384,825
3	$1,283,334	$1,558,000	$0
4	$968,192	$719,000	$249,192
5	NA	NA	NA
6	$1,627,000	$1,627,000	$0
7	$1,920,000	$1,920,00	$0
Total	$9,723,977	$8,147,409	$1,851,233

- Village encumbered approximatey $97,000 in annual loan payments for Phases 1 through 4 of CSO work

- Annual Average Sewer Rate - $307 (>2% of MHI)
  - Portsmouth may be forced to raise rates
  - New Boston raised rates an average of $6/month during Phase 1
  - New Boston may need to raise rates for future phases

Portsmouth

Portsmouth Residential Customer Demographics

	Portsmouth	New Boston	Ohio
Customers	6722	809	
MHI*	$30,144	$14,745	$48,849
% Poverty	32.3%	45%	15.8%

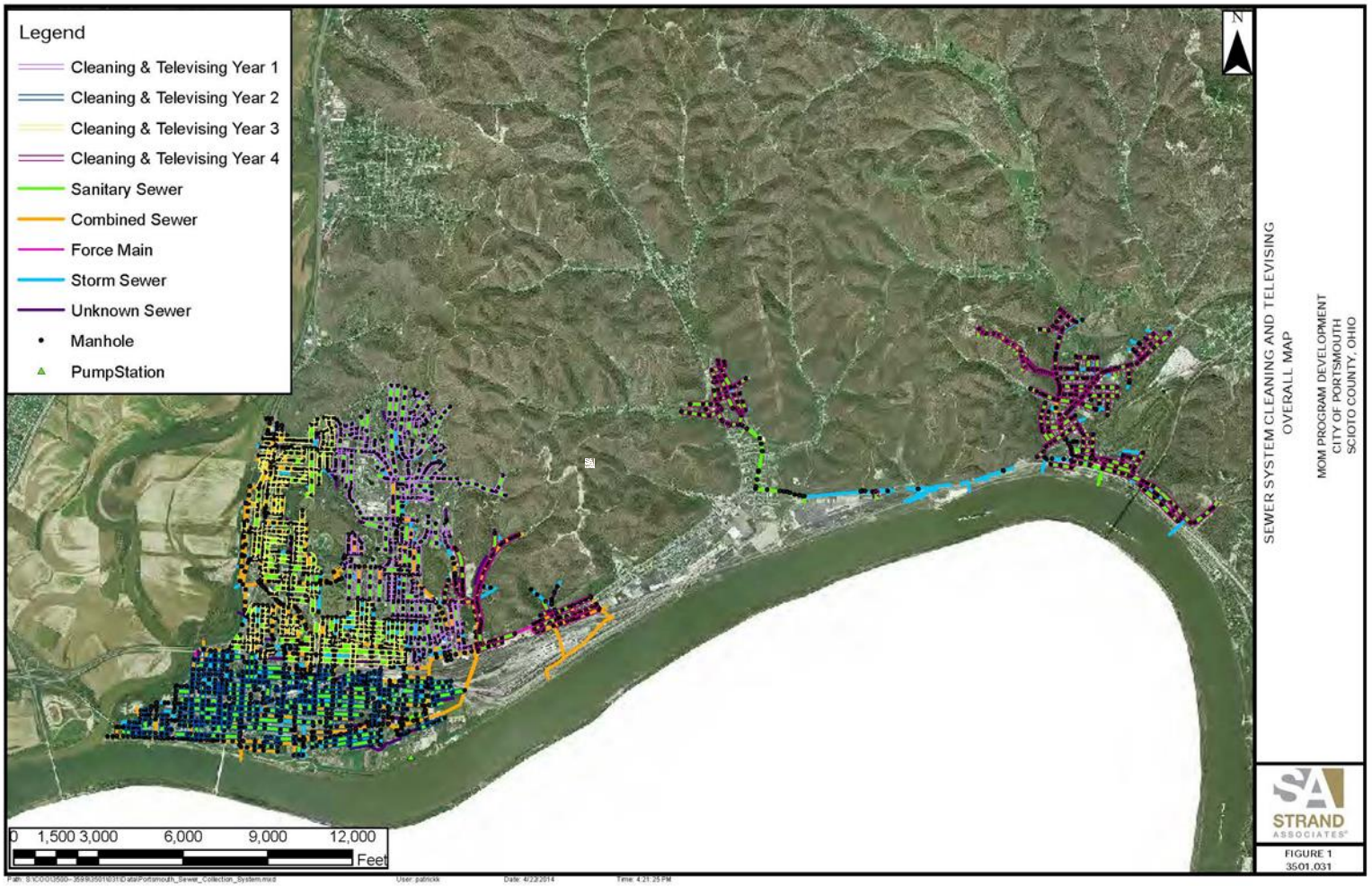
*Disparaged Neighborhood Area Income Surveys not accounted for (East End)

Financial Indicators

- Challenges
  - Sewer Rates Recently Raised
  - Exceptionally High Utility Bill Delinquency
  - $1+Million Sewer Utility Deficit
  - State Fiscal Watch
    - Greater than one month behind (in deficit) accounts
  - Area Unemployment Twice State Rate June, 2016
  - USEPA Financial Capability Indicator: WEAK

Portsmouth Service Area, Boundaries

…and WWTP's



Portsmouth System Overview

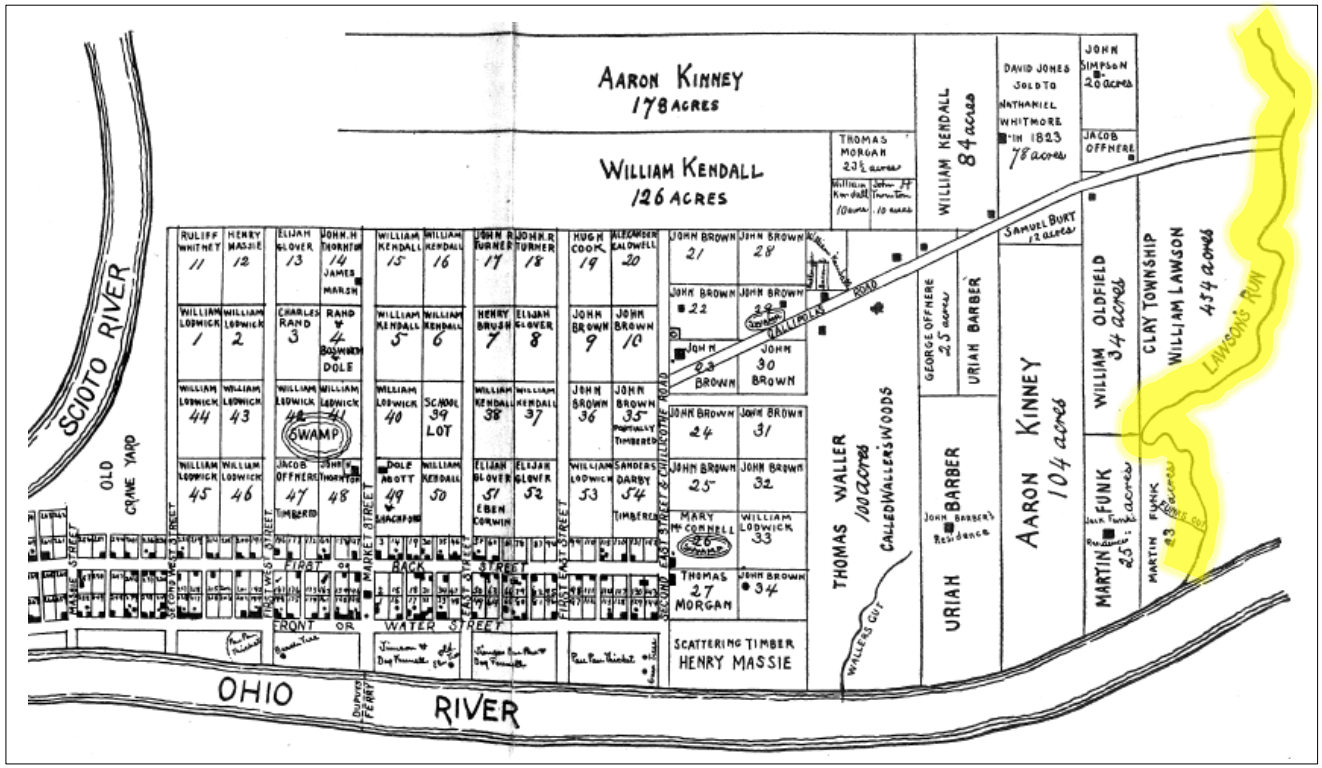
- Collection and Conveyance System
  - CSO's – 10
  - C
  - S
  - S
  - F
  - S
  - Flood Defense Pumping Stations

From 50,000 People in the 1950's with large industries…

To present day with 20,000 people and no industry.

Portsmouth System History and Overview

- City of Portsmouth, 1819

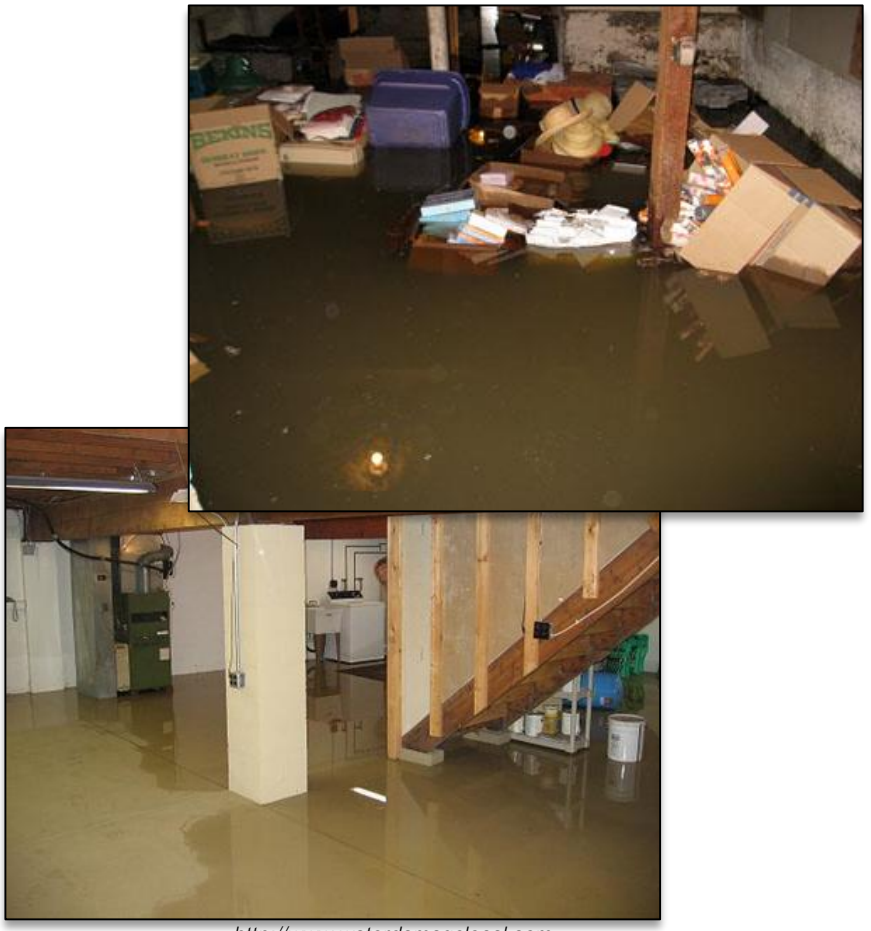


Portsmouth Focus Areas

- Challenges: Grandview Avenue Area
  - TWO SEPARATE ISSUES
    - Basement flooding
      - » Downspouts Tied Directly into Sanitary Laterals and Sanitary Sewer
    - Surface flooding
      - » Only occurs during severe rain events

System History and Overview

- Challenges
  - Basement Flooding in Grandview Avenue Area
    - January 2000 (8 residences)
    - May 2001 (3 residences)
    - May 2004 (12 residences)
    - August 2005 (1 residence)
    - July 2011 (2 residences)

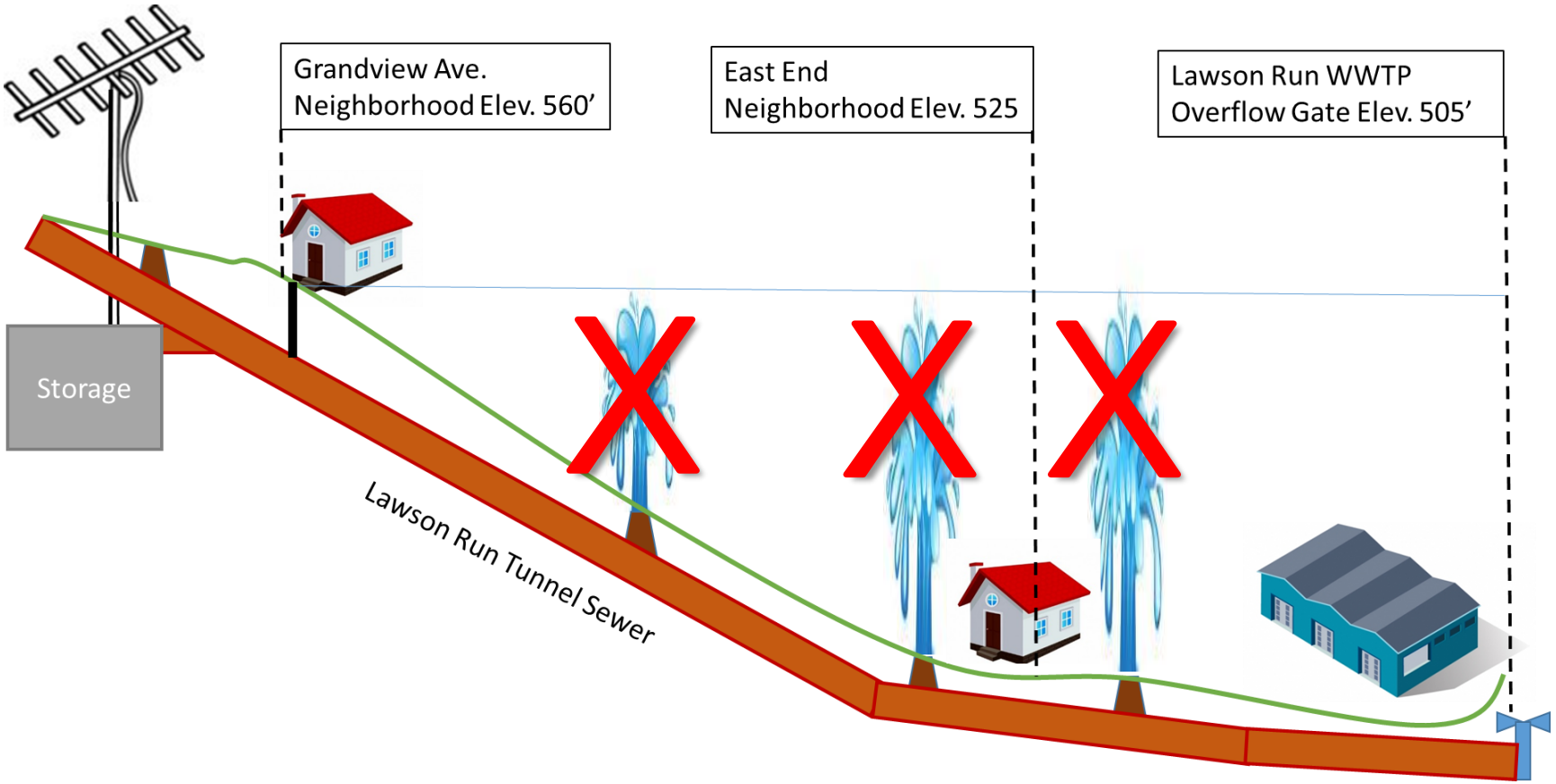


http://www.waterdamagelocal.com

System History and Overview

- Challenges
  - Surface Flooding in Grandview Avenue Area
    - June 2008
    - March 1997

LRTS Operation and Telemetry



System History and Overview

- EPA Compliance
  - 2006 LTCP Submitted
  - 2009 LTCP Alternatives Costs Updated and Resubmitted
  - 2010 (January) Mayor Jane Murray Takes Office Fires, Water and Sewer Operators Leaving City Out of Operation Compliance
  - 2010 (October) Murray Submitted LTCP, Approved by USEPA
  - 2010 (December) Mayor Jane Murray Recalled
  - **2011 City and USEPA Deem Plan Unaffordable and Did Not Address Basement Backups, 24/7 Needs, SSO's**
  - 2013 AOC Executed
  - 2013-Present City has Met All AOC Deadlines and Requirements

Negotiated Regulatory Priorities

- Focus on Items that Directly Impact Health and Safety
  - Basement Backups
  - Overland/Unauthorized CSO Releases
  - SSO's
  - 24/7 WWTP Operations
  - System Maintenance and Operation
  - Wet Weather CSO Mitigation

Negotiated Regulatory Priorities

- Administrative Order on Consent (AOC) Components
  - Overflow Emergency Response Plan
  - Management, Operation, and Maintenance (MOM) Plan
    - Capacity not included
  - Overland/Unauthorized CSO Releases
  - Munns Run SSO
  - Grandview Avenue Area Projects
    - Downspouts
    - Separation
    - Storage
  - LRTS Sewer Separation Feasibility

AOC Projects

- 563 Acre Drainage Basin

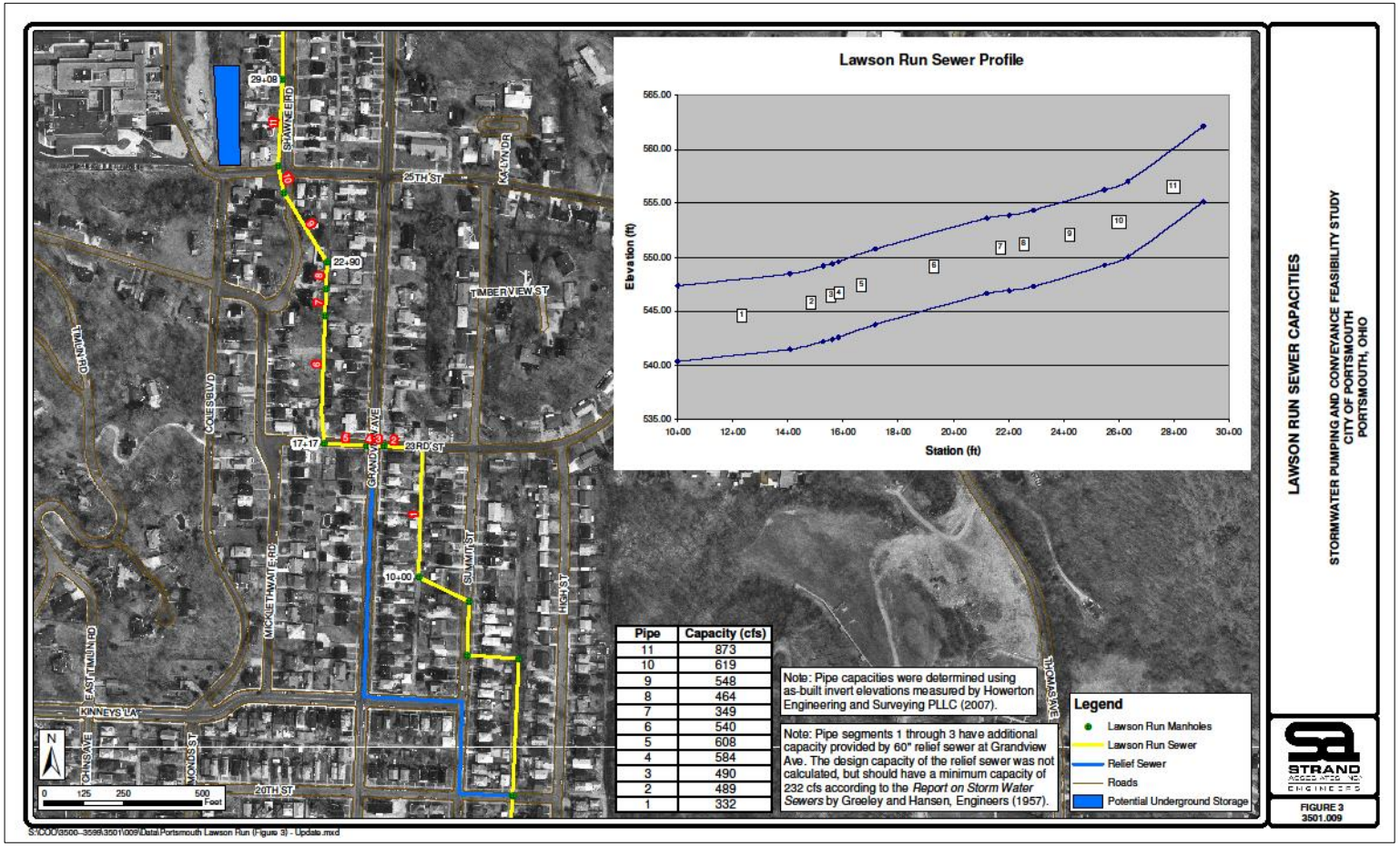


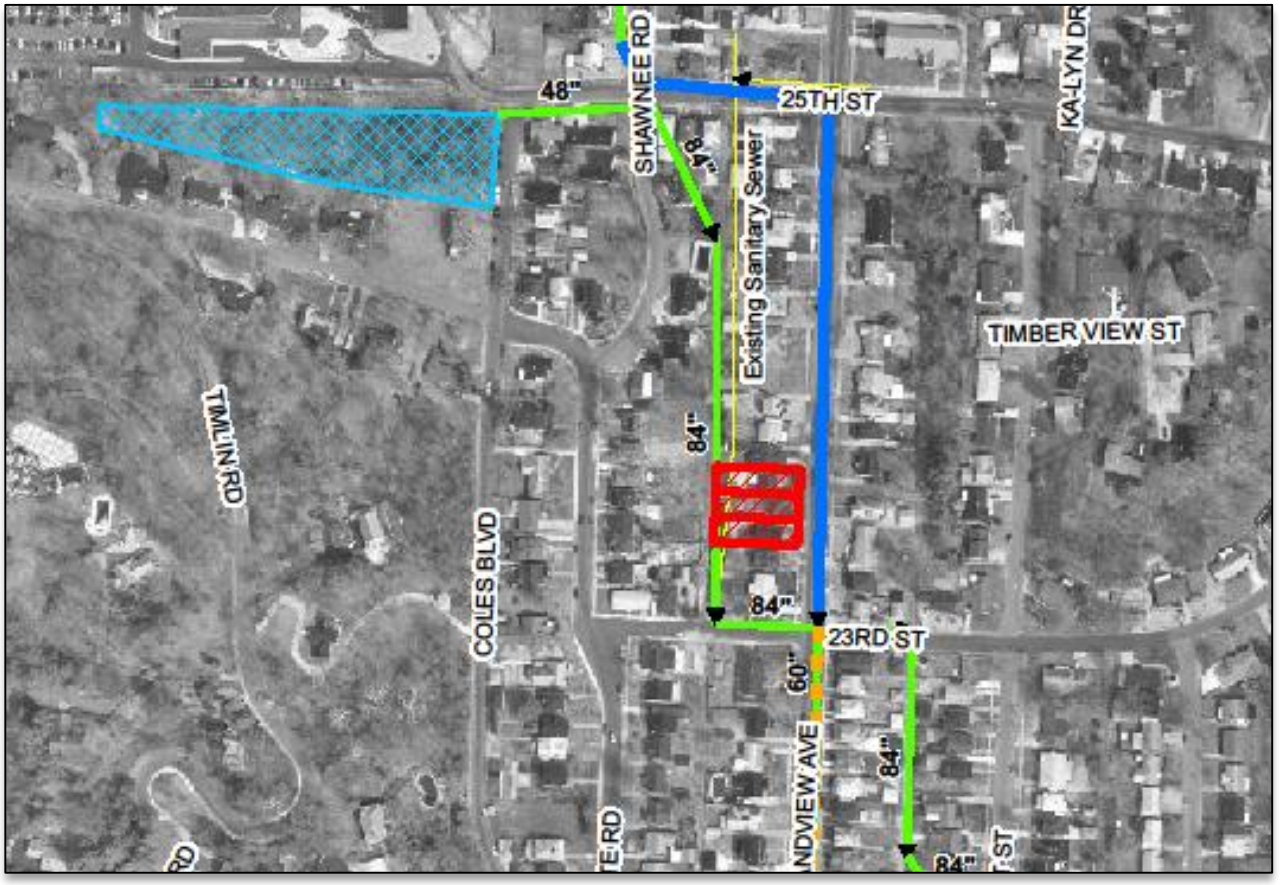
Figure from 2009 Evaluation

AOC Projects – Grandview Avenue Area

- LRTS Tributary Sewers Separated North of 23rd Street
  - Eliminates Overland CS Flooding
    - Flooding Occurring North of 23rd Street is now Storm Flows
- Underground Storage Constructed at Available Space to Maximize $/Gallon Stored, Not Based on Design Storm
- Detention Basin Constructed to Help Reduce Peaking Factor into LRTS

AOC Projects – Grandview Avenue Area

Separation



AOC Projects – Grandview Avenue Area

Surface Detention

AOC Projects – Grandview Avenue Area

Underground Storage

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