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2019 OWEA Conference

Planning & Design Track

June 26, 2019

3:30-4:15

Portsmouth, Ohio and New Boston, Ohio Navigating Regulatory Mandates with Limited Funds and Resources

Presented by:

Kris Ruggles, P.E., S.I.

Strand Associates, Inc.®



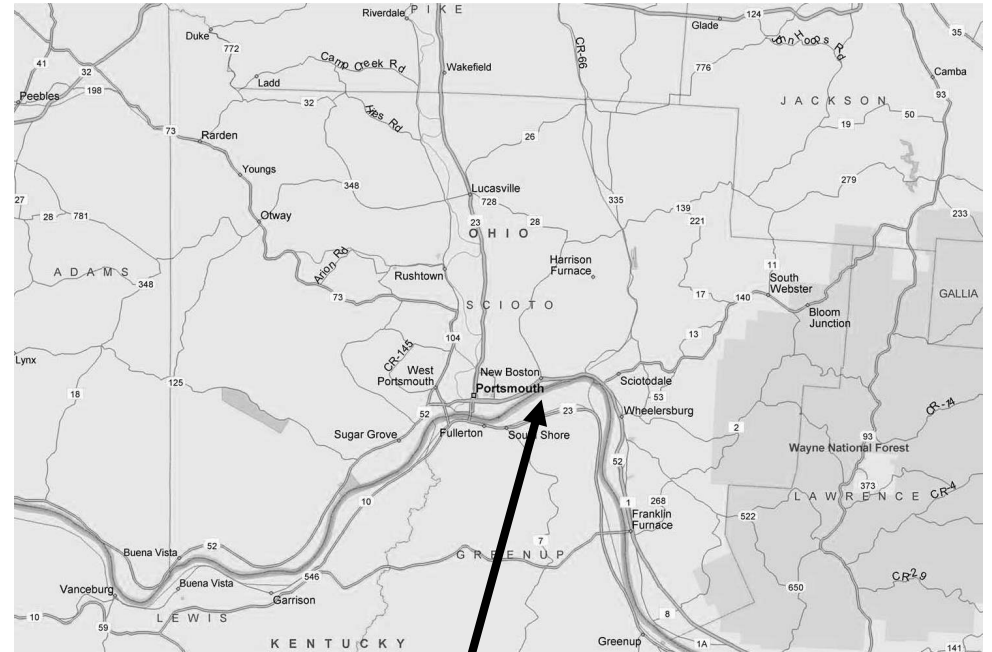
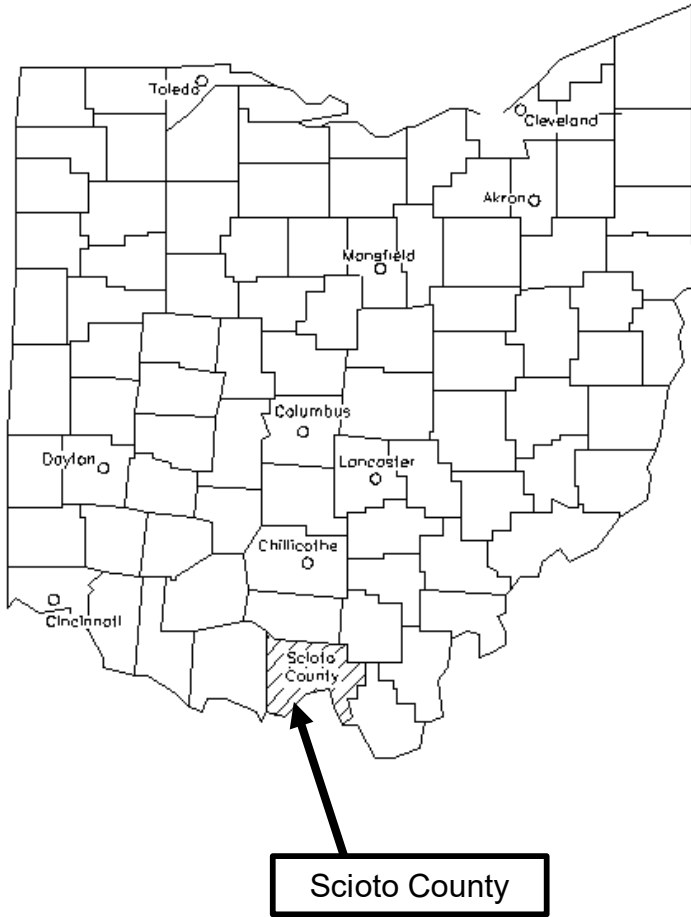
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Presentation Outline

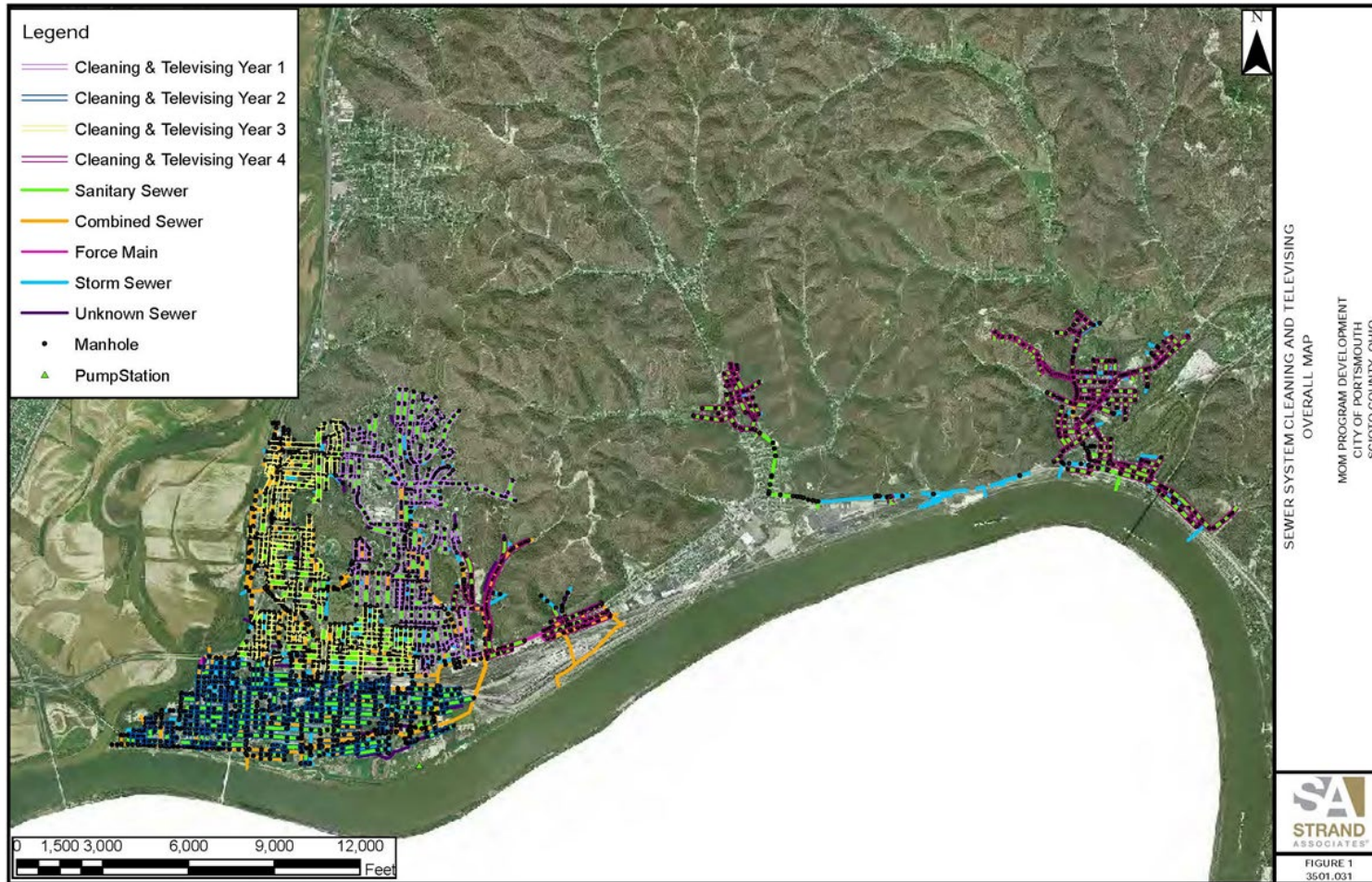
- Geography & Overview of Sewer Systems
 - Portsmouth
 - New Boston
- Recent Portsmouth Regulatory History
 - Problem Areas
 - Engineering Solutions
- New Boston Technical Approach
 - CSO Improvements Phases 1-8
 - Wastewater Treatment Plant Feasibility Study
 - Rhodes Avenue and West Avenue Sewer Cleaning and Televising
- Regulatory Approach for Everyone

Scioto County, Ohio



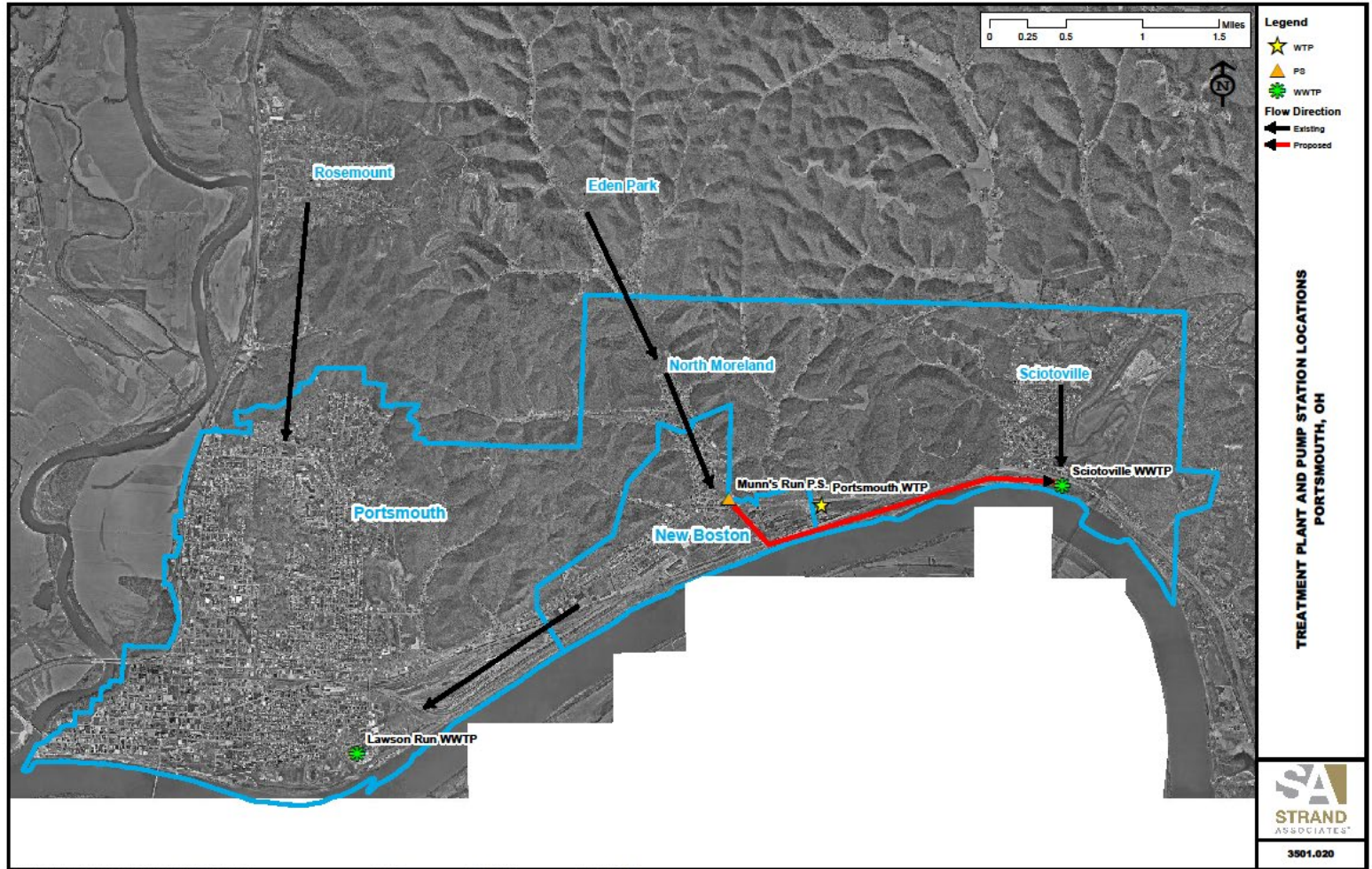
Village of New Boston

Portsmouth and New Boston Systems

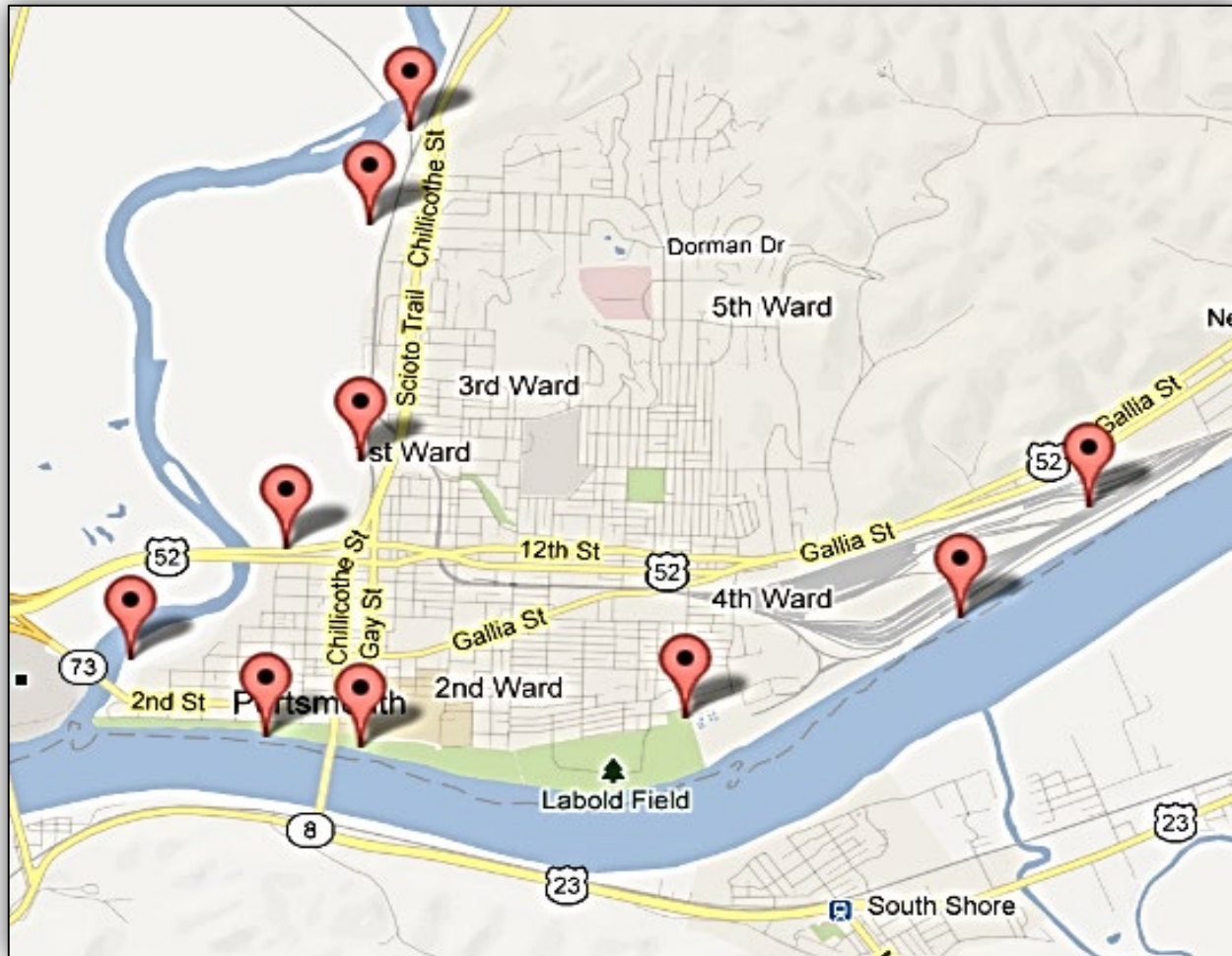


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Portsmouth Service Areas



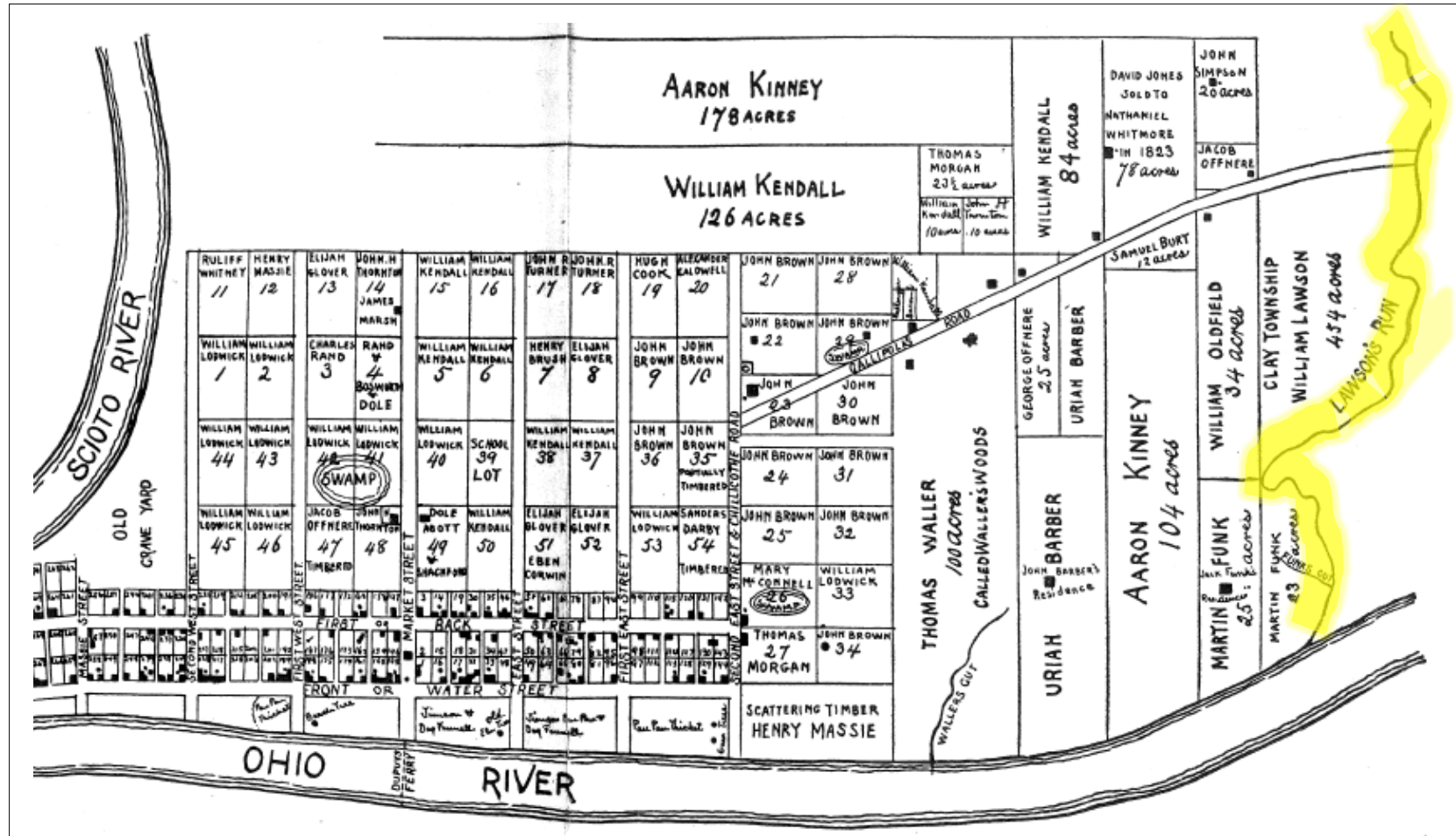
Portsmouth CSO Locations



<http://wwwapp.epa.ohio.gov/dsw/maps/cso/index.php>

Portsmouth System History and Overview

- City of Portsmouth, 1819



Used with Permission of: City of Portsmouth

Portsmouth System Data

- Collection and conveyance system
 - CSOs – 10
 - Combined sewers – 171,000 linear feet
 - Sanitary sewer – 356,000 linear feet
 - Sewer type unlisted – 30,000 linear feet
 - Force mains – 7,300 linear feet
 - Sewer pumping stations – 17
 - Flood defense pumping stations

**From 42,000 people in the 1940s with large industries...
to present day with 20,000 people and nearly no industry.**

Portsmouth and New Boston

- 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)

Portsmouth Sewer Utility 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

Regulatory History

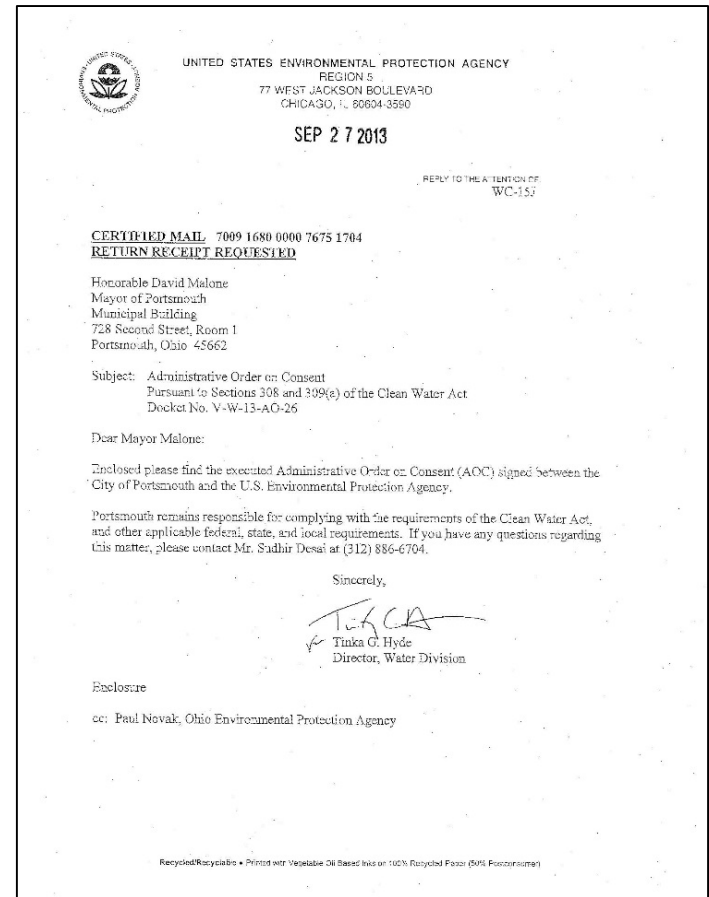
- EPA compliance
 - 2006 LTCP submitted
 - 2007 USEPA takes over Long Term Control Plan (LTCP) Case
 - 2009 LTCP alternatives costs updated and resubmitted
 - 2010 (January) Mayor Jane Murray takes office, **FIRES** water and sewer operators leaving City out of operation compliance
 - 2010 (October) 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, SSOs**
 - 2013 Administrative Order on Consent executed

Negotiated and Ranked Environmental & Regulatory Priorities

1. Basement backups/overland CSO releases
2. SSOs
3. 24/7 plant operations
4. System maintenance and operation
5. Wet-weather CSO mitigation

USEPA Administrative Order on Consent (AOC)

- Grandview Avenue area
 - Lawson Run Tunnel tributary sewers separated north of 23rd Street
- Eliminates CSS releases, overland CS flooding
 - Flooding occurring north of 23rd is now storm flows
- Underground storage at available space to maximize \$/gallon stored, not based on design storm
- Detention basin to help reduce peaking factor into LRTS



Portsmouth Focus Area for Combined Sewer Release

- 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



Map Data: Google

Water in Basements

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



Photo Provided by City of Portsmouth

Combined Sewer Flooding

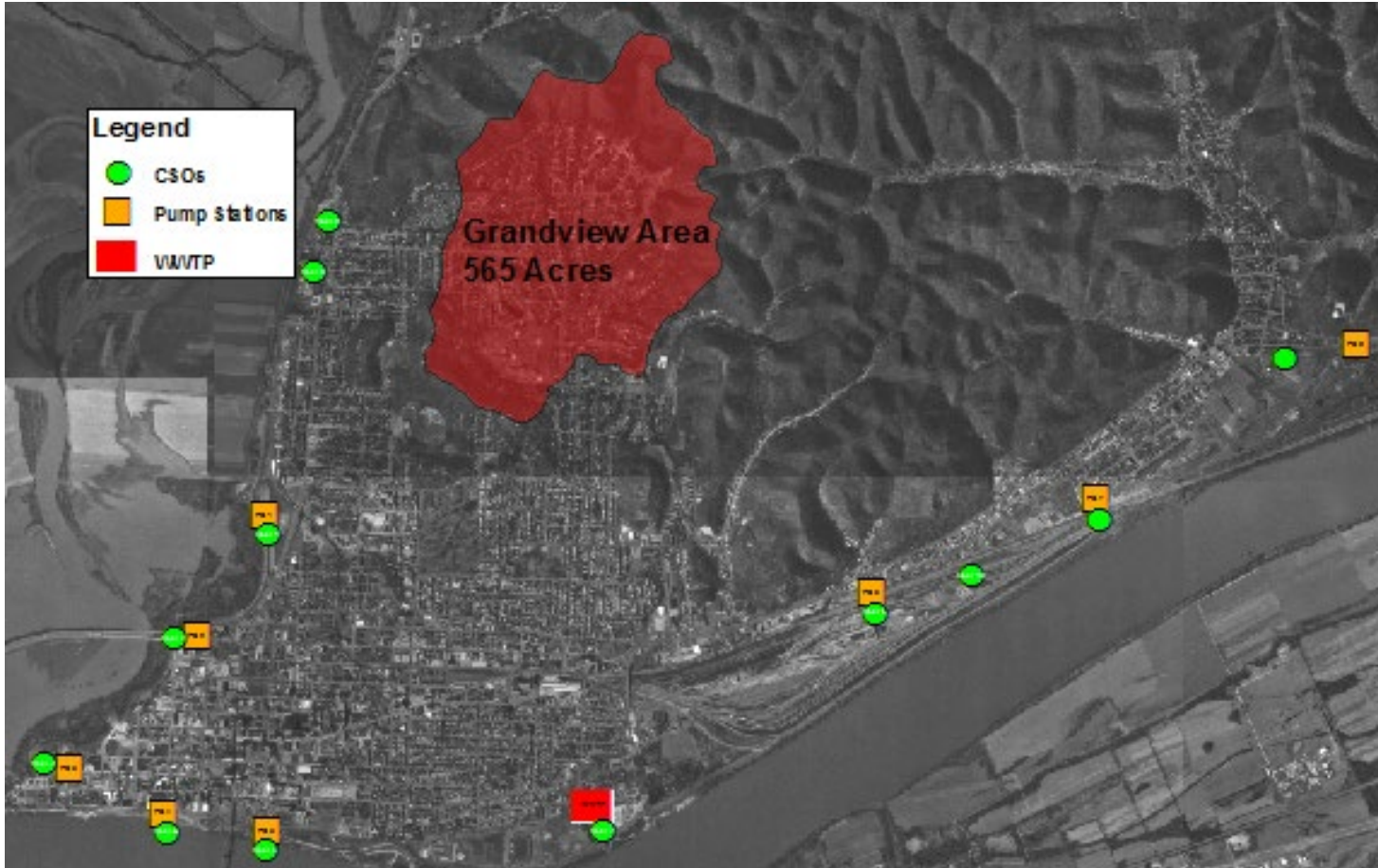
- Challenges – surface flooding in Grandview Avenue
 - June 2008
 - March 1997



Photos Courtesy of City of Portsmouth

AOC Projects

- Grandview Avenue drainage area



Lawson Run Tunnel Sewer (LRTS) drains 565 acres at 23rd St. and Grandview Avenue.

Map Data: Google

AOC Projects

- Grandview Avenue area hydraulic constriction

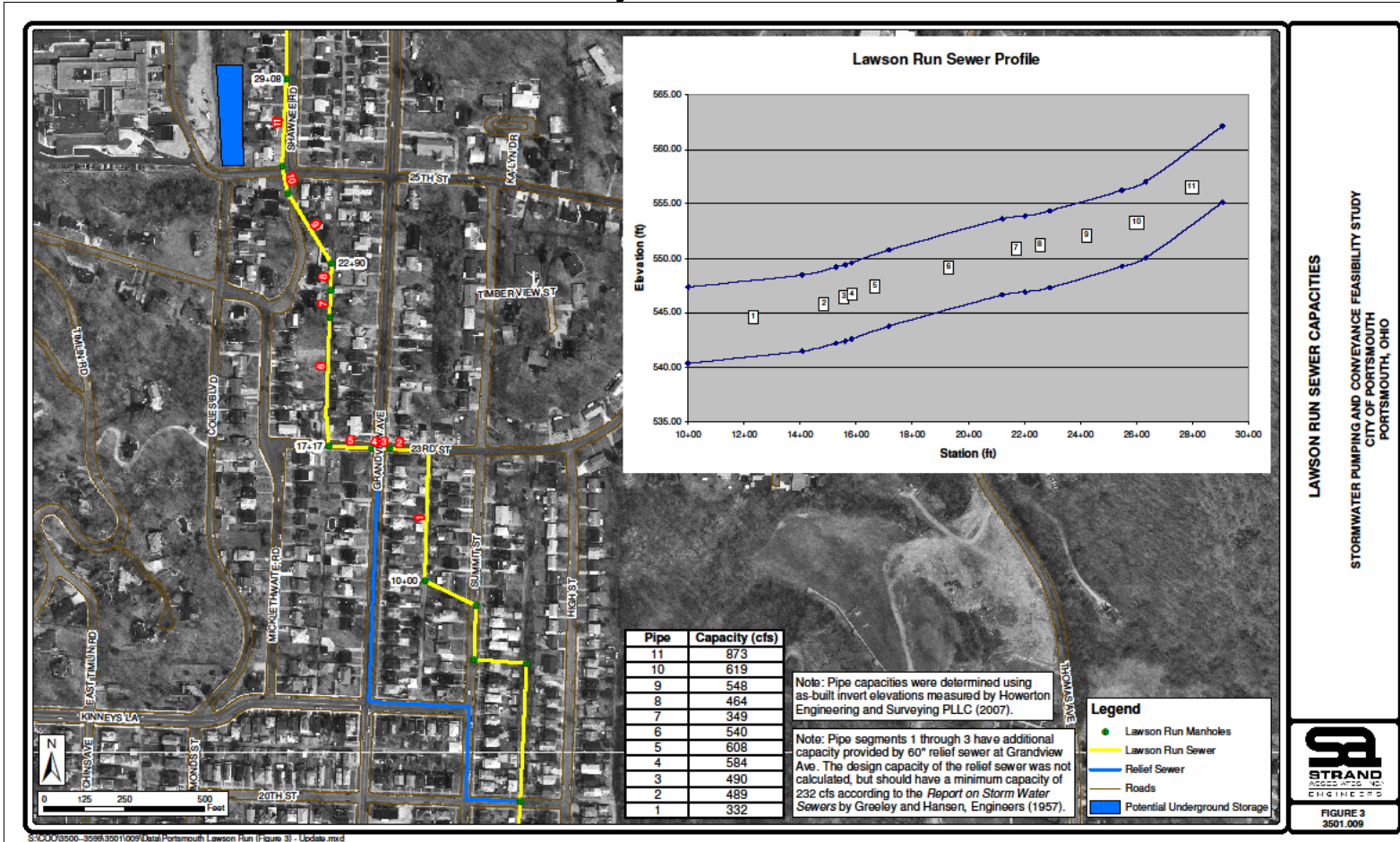
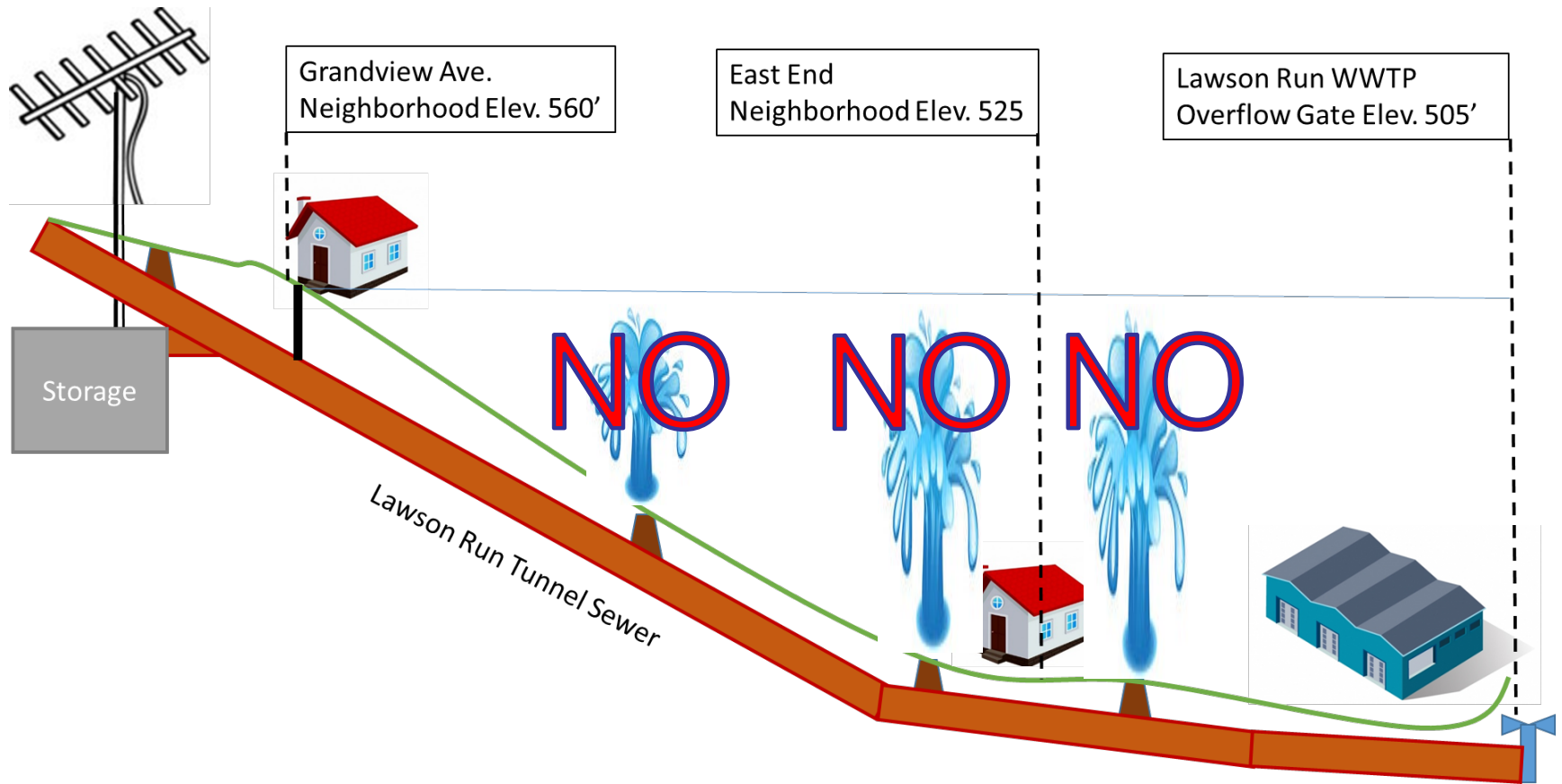


Figure from 2009 evaluation.

Courtesy of: Strand Associates, Inc. ©

Tunnel Sewer Operation and Telemetry



AOC Projects

- Grandview Avenue area separation



Map Data: Google

AOC Projects

- Grandview Avenue area 25th and Coles detention basin



Courtesy of: Strand Associates, Inc. ®

AOC Projects

- Grandview Avenue area underground storage



Courtesy of: Strand Associates, Inc. ®



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New Boston Sewer System



Photo Courtesy of Strand Associates



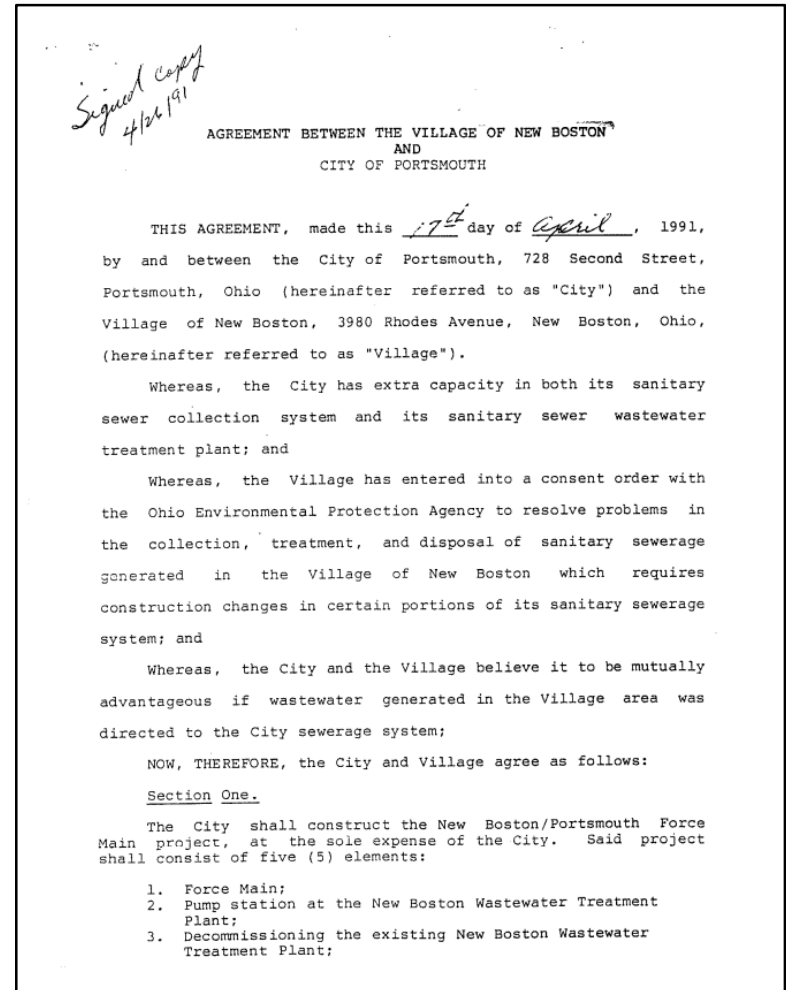
Photo Courtesy of Strand Associates

New Boston Financials

- MHI in New Boston - **\$14,745**
 - (Source: 2012-2016 American Community Survey)
- Annual residential sewer rate - **\$488 (3.3% of MHI)**
 - Portsmouth may be forced to raise rates, which will impact New Boston residents
- Annual New Boston sewer income - **\$91,534**
- Annual loan payment (Phases 1-7) - **\$108,271**
 - **118%** of annual sewer income

New Boston/Portsmouth Agreement


- Established in 1991
- Up for renewal in 2021
- Requires Portsmouth treats all New Boston wastewater
- Requires Portsmouth to maintain and operate New Boston pump stations
- Eden Park (Scioto County) flows to North Moreland (Portsmouth), which flows into New Boston



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New Boston Findings and Orders

- Issued in 2006
- Requires New Boston to address CSOs
- Also requires New Boston to coordinate and cooperate with Portsmouth to address their CSOs

 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGIONS 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

SEP 29 2006

REPLY TO THE ATTENTION OF: WC-15J

CERTIFIED MAIL 7001 0320 0005 8920 6779
RETURN RECEIPT REQUESTED

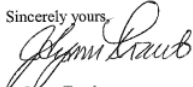
Mr. Mic Sturgill
Village Manager
Village of New Boston, Ohio
Village Hall
3980 Rhodes Avenue
New Boston, Ohio 45662

Subject: Combined Sewer Overflow Long Term Control Plan
Order Pursuant to Sections 308 and
309(a) of the Clean Water Act
Docket No.: V-W-06-AO-07

Dear Mr. Sturgill:

The Village of New Boston, Ohio, has two combined sewer overflow (CSO) points that frequently discharge large volumes of untreated sewage into the Ohio River. Those discharges are regulated by a National Pollutant Discharge Elimination System Permit (NPDES) issued to New Boston on August 8, 2003, by the Ohio Environmental Protection Agency (OEPA). Part I.A of that permit required that, by September 1, 2006, New Boston develop and submit to the OEPA a Combined Sewer System Long Term Control Plan (LTCP Plan) to minimize the discharge of untreated pollutants from CSO points. New Boston is also required to coordinate and cooperate with the City of Portsmouth, Ohio, to study the impact that New Boston's flows have on Portsmouth's CSOs. New Boston has failed to comply with these requirements.

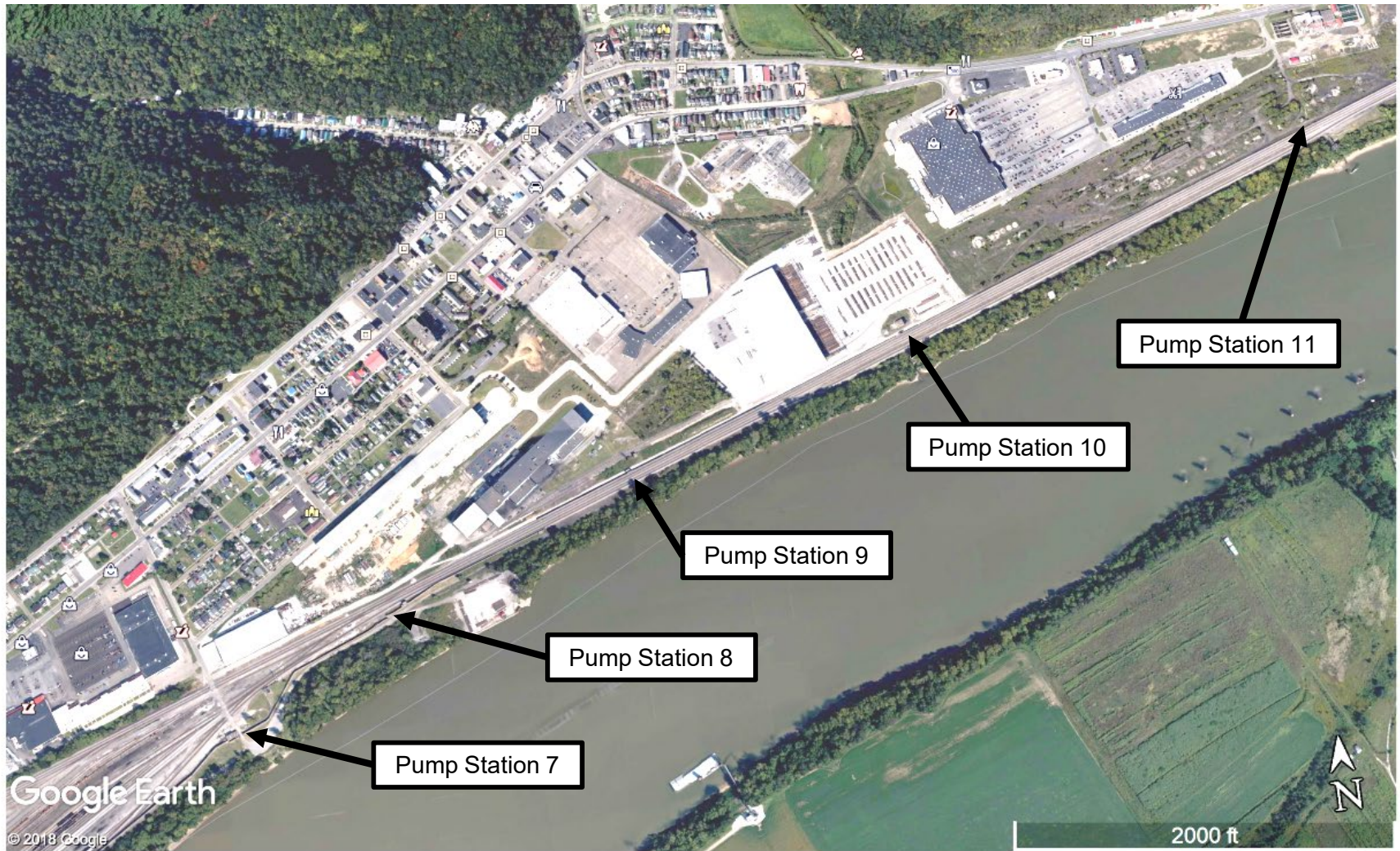
Enclosed is an Administrative Order issued pursuant to Sections 308 and 309(a) of the Clean Water Act, requiring that New Boston comply with the requirements of Part I.A. of its NPDES Permit. We hope to work cooperatively with New Boston to ensure these requirements are complied with as expeditiously as possible, given New Boston's financial constraints. Please contact Mr. Sudhir V. Desai of my staff at (312) 886-6704 to begin that process.

Sincerely yours,

Lynn Traub
Director, Water Division

Enclosure
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New Boston Flood Control Pump Stations



Map Data: Google

West Avenue Cleaning and Televising Work

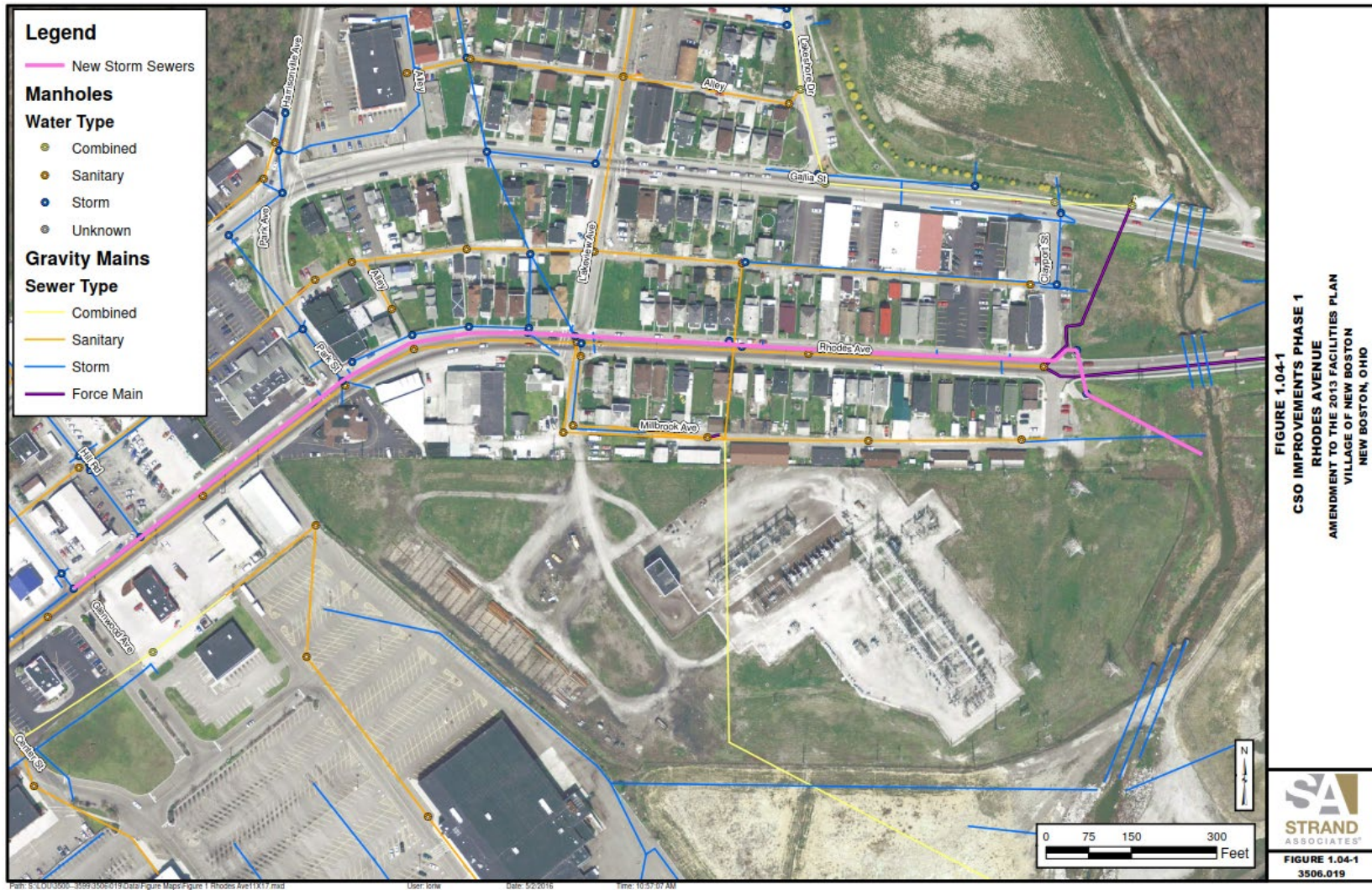


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CSO Improvements Phase 1



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CSO Improvements Phase 1

Components:

- New 72-inch storm sewer along Rhodes Avenue with new outfall into Munn's Run (previous slide)
- Stormwater separation of Manning Street and Peebles Street
- Conduct critical cleaning and televising work on Rhodes Avenue and West Avenue (not shown)

Objectives:

- Stormwater separation upstream of Webb Alley CSO 003
- Partial stormwater separation upstream of West Avenue CSO 004
- Remove debris in Rhodes Avenue and West Avenue sewers



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CSO Improvements Phase 2

Components:

- Stormwater separation of Finney Street and Stewart Street

Objectives:

- Partial stormwater separation upstream of West Avenue CSO 004



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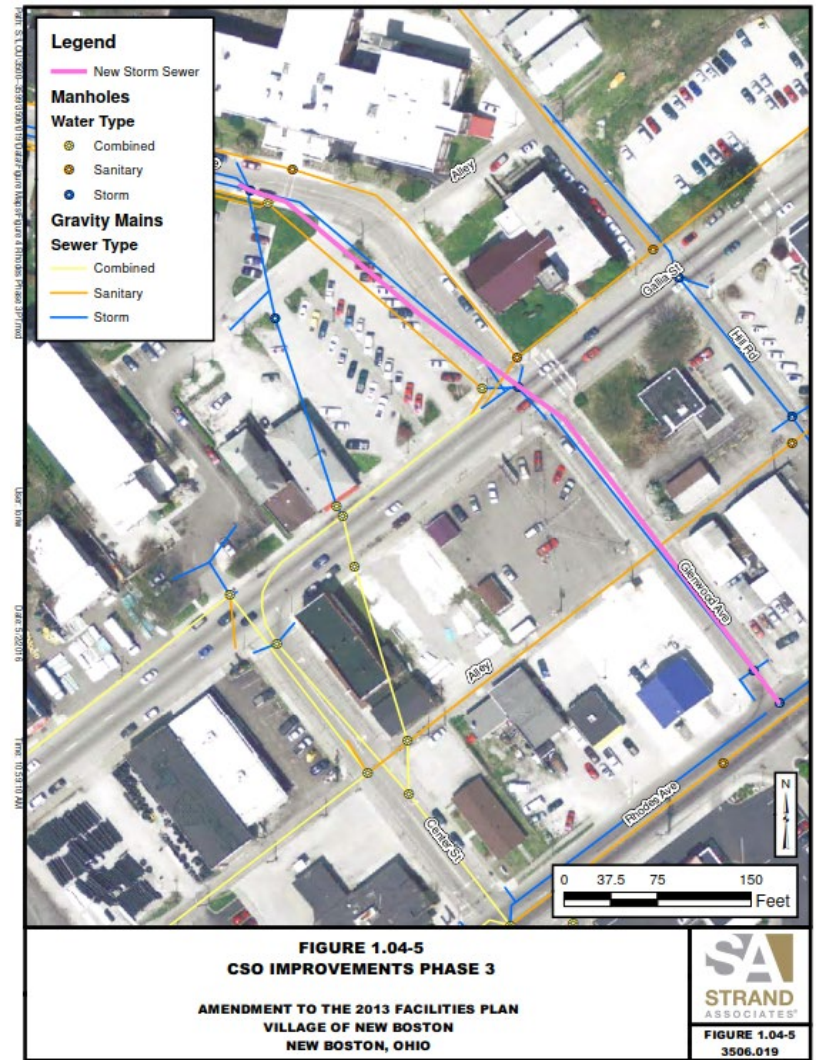
CSO Improvements Phase 3

Components:

- Stormwater separation of Glenwood Avenue
- Glenwood Avenue Creek separation from the combined sewer system

Objectives:

- Partial stormwater separation upstream of West Avenue CSO 004



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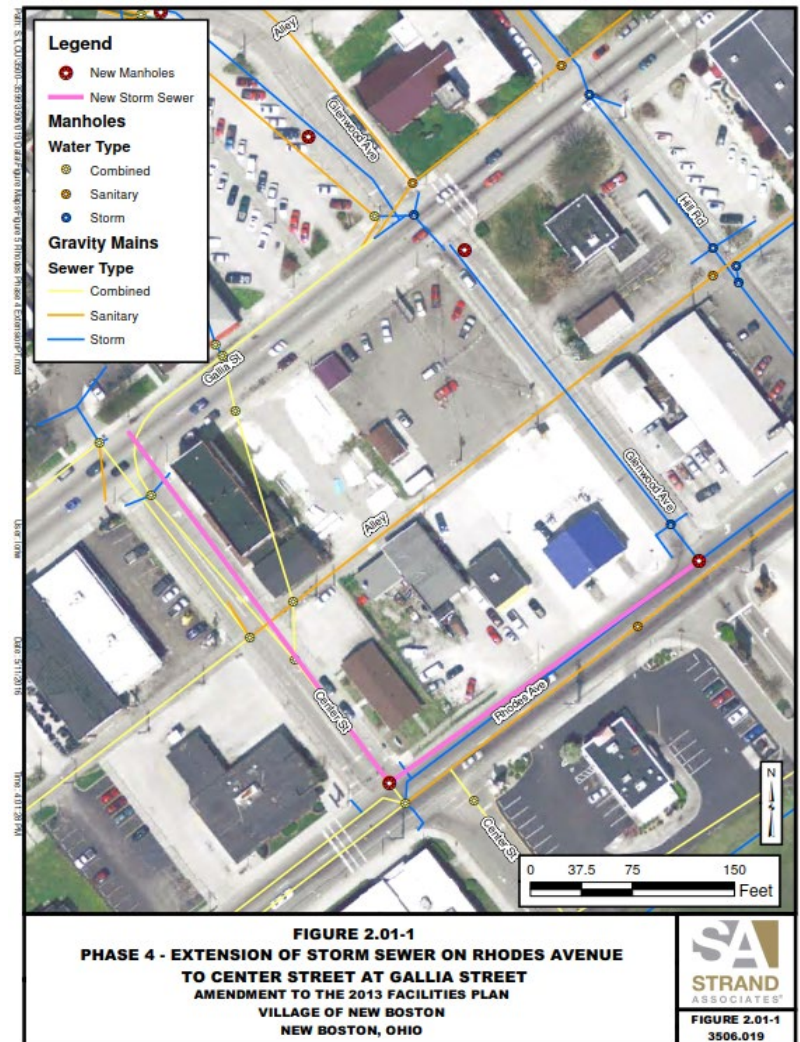
CSO Improvements Phase 4

Components:

- Stormwater separation of Center Street and on Rhodes Avenue

Objectives:

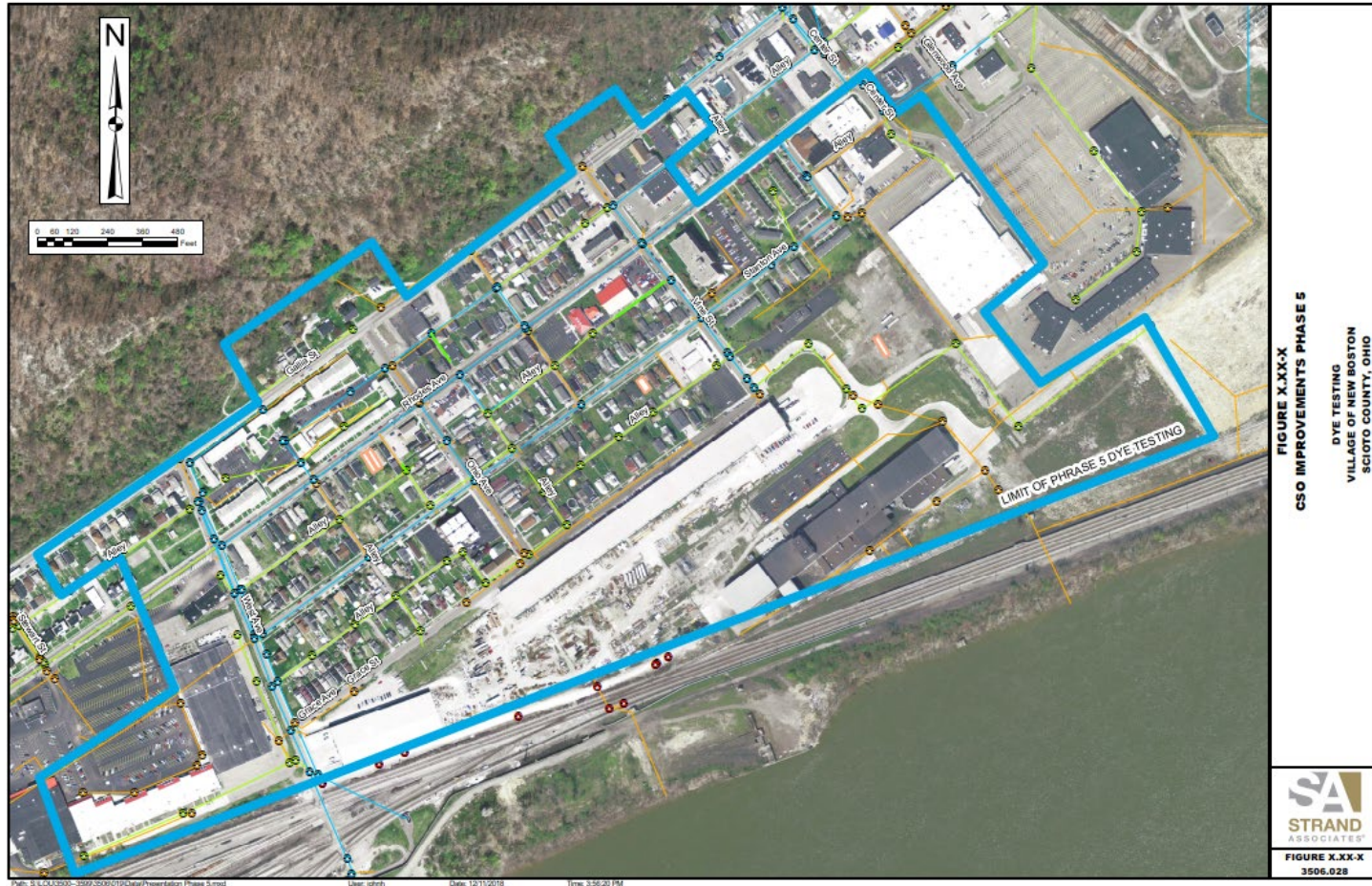
- Partial stormwater separation upstream of West Avenue CSO 004



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CSO Improvements Phase 5

- Dye testing of laterals and catch basins to determine connectivity



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CSO Improvements Phase 6



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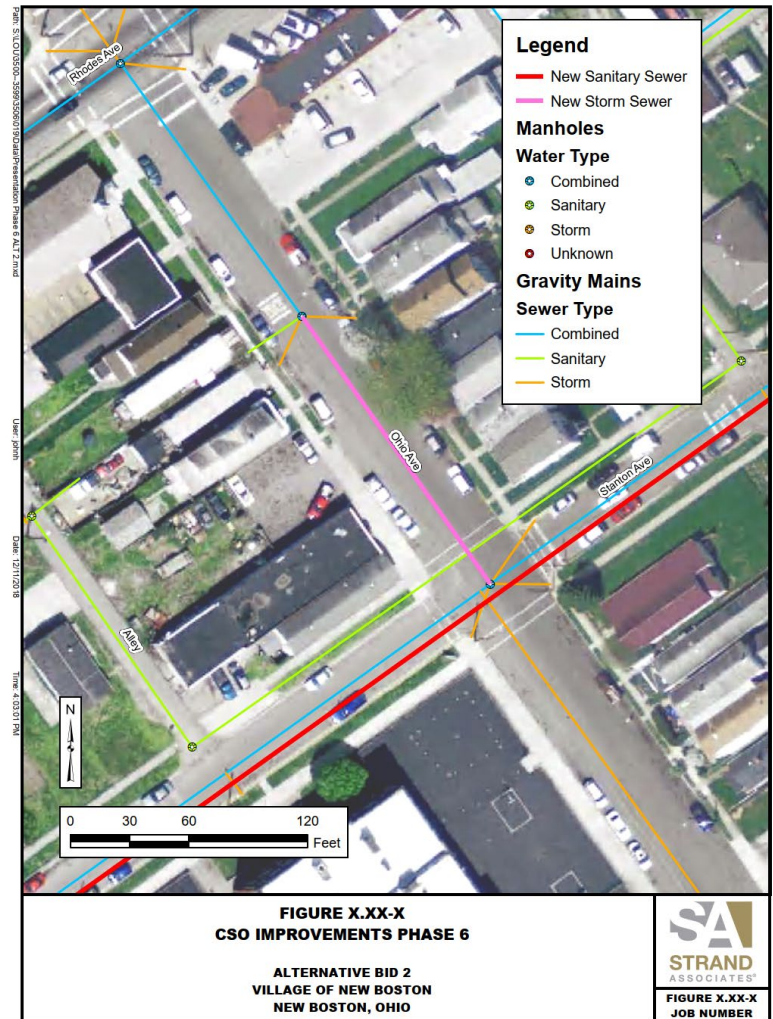
CSO Improvements Phase 6

Components:

- Stormwater separation of Stanton Avenue, Vine Street, Alley, and Rhodes Avenue (previous slide)
- Stormwater separation of Ohio Avenue

Objectives:

- Partial stormwater separation upstream of West Avenue CSO 004



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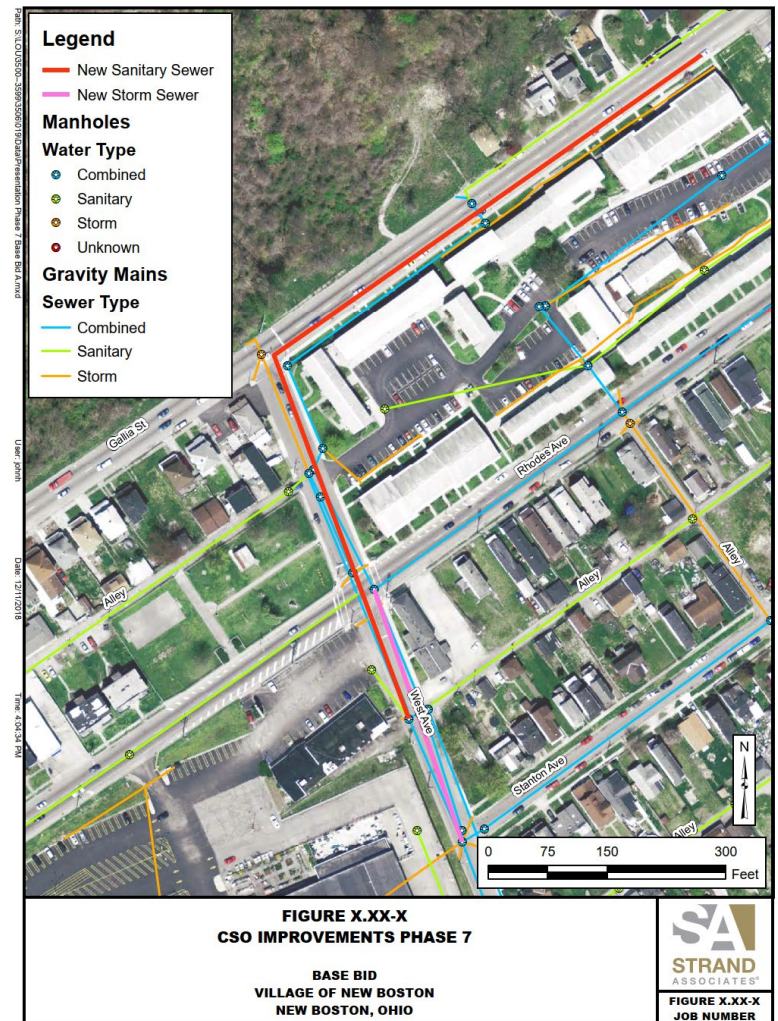
CSO Improvements Phase 7

Components:

- Stormwater separation of West Avenue and on Gallia Street

Objectives:

- Partial stormwater separation upstream of West Avenue CSO 004
- Improve drainage on West Avenue
- Allow for increase in capacity to West Avenue pump station
- Restore function of aged failing infrastructure



Courtesy of: Strand Associates, Inc. ®

CSO Improvements Phase 7

Components:

- Install flow meters on the Webb Alley CSO and West Avenue CSO (not shown)
- Stormwater separation on Alley and Vine Street

Objectives:

- Allow for flow metering of the Webb Alley CSO and West Avenue CSO
- Partial stormwater separation upstream of West Avenue CSO 004



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Summary of Past Projects Costs

Phase	Total Cost	DEFA Principal Forgiveness	DEFA 0% Loan	Annual Payment
1	\$3,217,216	\$2,000,000	\$1,217,216	\$60,861
2	\$708,235	\$323,409	\$384,825	\$19,241
3	\$1,145,387	\$550,196	\$0	\$0
4	\$968,192	\$658,591	\$309,602	\$15,480
5	\$70,969	\$0	\$0	\$0
6	\$1,880,784	\$1,627,000	\$253,784	\$12,689
7	\$1,735,998	\$1,754,648	\$0	\$0
Total	\$9,726,782	\$6,913,844	\$2,165,428	\$108,271

Proposed CSO Improvements Phase 8

Components:

- New gravity trunk sewer
- New West Avenue pump station
- Connect to existing force main to Portsmouth
- Sewer lining

Opinion of project cost **\$2,500,000**

Total annual loan payment after Phase 8 without principal forgiveness with 0% loan - **\$233,271**

Requires a New Boston rate increase of 155%

New Boston rates become 4.3% of MHI

Phase 8 – New Gravity Trunk Sewer

Objectives:

- Reduce wet-weather flows
- Increase conveyance capacity to the West Avenue pump station
- Reduce overflow at West Avenue CSO 004



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Phase 8 – New Pump Station

Additional Critical Infrastructure Needs

Flooding From February 2018 Exposed New Critical Needs

- Flood pump station No. 10
 - (2 pumps and power supply failed)
- Sedimentation in Munns Run flood control ponding area
- Munns Run channel wall failure
- New Boston maintains four other flood pump stations dating back to the 1950s in desperate need of upgrades
- Funding requests from FEMA and OEMA have been denied

Thank you to all who have helped make prior projects possible!



Prioritization and Approach Recap

Basement backups/overland CSO releases

SSOs

24/7 plant operations

System maintenance and operation

Wet-weather CSO mitigation

***ENGAGE REGULATORS & FUNDING ENTITIES**

Questions?

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Thank you!



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