# SSES Implementation and SSES Pilot Study Program Large-Scale Rehabilitation in Multiple Towns







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### **Presentation Overview**

Introduction MDC Clean Water Project SSO Program SSES Implementation SSES Pilot Study Lessons Learned



### Introduction

The MDC is a nonprofit municipal corporation chartered by the Connecticut General Assembly in 1929

Our mission is to provide our customers with safe, pure drinking water, environmentally protective wastewater collection and treatment and other services that benefit the member towns

We provide water, sewer and household hazardous waste collection to its member towns and treated water to portions of non-member towns





### **Clean Water Project**

2006 Consent Decree by USEPA 2007 Consent Order by CTDEEP Main Goals

- Eliminate Sanitary Sewer Overflows (SSO)
- Reduce the amount of combined sewage that enters the CT River
- Reduce the amount of Nitrogen released into the CT River

#### Clean Water Project Components

- WPCF Improvements
- Sewer Separation
- Storage and Conveyance Tunnels
- Relief and Consolidation Pipe
- Inflow and Infiltration (I/I) Reduction



### SSO Program Overview

Sewer System Evaluation Studies (SSES) Initial SSES Implementation Projects Modeling and Capacity Assessments Additional SSES Implementation Projects SSO Elimination Plans (2010) Approved by EPA January 4, 2013 • Eliminate Structural SSOs: 25-year Level of Service • Eliminate Manhole Flooding: 10-year Level of Service • Eliminate Sewer Backups: 5-year Level of Service • Assumed 10% I/I Reduction (Town-Wide)



## SSO Program Evolution



CDM Smith





### SSES Implementation Scope of Work

# Segment Replacement Point Repairs Cured-in-Place Pipe (CIPP) Lining CIPP Short Liners Lateral Repairs and CIPP Lining



#### **Manholes**

Frame and Cover Replacement Cementitious Lining Internal Chimney Lining Dead End Manholes









## Design Drawings

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Trenchless Design Drawing (GIS) The Metropolitan District Sist Main Street Matter & Convectore Segment Replacement Design Drawing (AutoCAD)

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## SSES Implementation Contracts 2009-2015

Contract	Town	Construction Cost	Sewer Main Lining (If)	Sewer Point Repairs (ea)	Sewer Main Replacement (lf)	Sewer Manhole Lining (ea)	Frame & Cover Replacement (ea)
2009-47A	West Hartford	\$ 2.7 M	0	40	1,420	0	0
2009-61	Newington	\$ 5.0 M	66,398	1	0	97	87
2009-96A	Rocky Hill & Wethersfield	\$ 7.9 M	58,000	1	0	100	250
2014B-22	Rocky Hill & Wethersfield	\$ 8.0 M	26,650	2	1,850	115	165
2012-59	West Hartford	Under Design	59,100	8	850	30	108
Totals		\$ 23.6 M	213,148	52	4,120	342	610



# SSES Implementation Totals

	Town	Sewer Main Lining (If)	% Total Pipe Lined	Sewer Pipe Replacement (lf)	Sewer Point Repairs (ea)	Sewer Manhole Lining (ea)	Sewer Manhole Sealing (ea)	Frame & Cover Replacement (ea)
	Newington	161,419	29%	1,396	1	142	39	763
	West Hartford	503,112	50%	16,469	169	403	21	1,617
	Windsor	117,999	31%	1,616	10	369	50	389
	Wethersfield	169,122	35%	2,522	15	361	43	453
	Rocky Hill	22,031	8%	0	2	90	0	142
	Totals	973,683	36%	22,003	197	1,365	153	3,364

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## **SSES Implementation Lessons Learned**

### Field Investigations

Survey and Borings

#### Closed-Circuit Television Inspection (CCTV)

- All Dig Locations
- Verify Any Completed/Existing Repairs

#### Manhole Inspections

- Verify Depth of Manhole
- Corbel Dimensions for Frame and Cover Sizing

#### Access Agreements

Resident Coordination

Permitting

Maintenance Approach











## SSES Pilot Study

### Goals

- Validate 10% I/I Reduction Target
- Develop 'Toolbox' of Rehabilitation Techniques
  - Sewer Mains, Manholes, Laterals and Private I/I
- Cost Effective Capacity Improvement Solutions

#### Key Aspects

- Project Area Selection
- Field Investigations
- Design and Construction
- Flow Data and Cost AnalysesSummary Report











## SSES Pilot Study Areas

#### Newington

- N6
- West Hartford
- WH8, WH9N-S, WH29, WH34
- Wethersfield
  - FB2, FB3, RH2AN-S
- Windsor
- WI3A, WI8-9-10-11
  6 SSES Implementation Areas
  7 Pilot Study Areas
- 2 Control Areas





### SSES Pilot Study Reduction Analysis

Pre-Rehabilitation: Spring 2005 and Spring 2011 Post-Rehabilitation: Spring 2014 Analysis Methods

- Two-Week Common Period (2005 and 2014)
- R-Value Calculations
- Control Area R-Value Correlation (2011 and 2014)
- Linear Regression of Rainfall vs. RDII Volume





# 2011

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## SSES Pilot Study Implementation and Results

Windsor WI3A	West Hartford WH8	West Hartford WH34		
\$2.14M	\$1.11M	\$2.51M		
<u>Private I/I Removal</u>	<u>Comprehensive</u>	<u>Comprehensive</u> <u>Mainline Rehabilitation</u> 27,647 LF CIPP (89%) 130 Lined Manholes (98%) 500 Top Hats (96%) 68 F&C (51%)		
55 Sump Pumps/Pits	<u>Manhole Lining</u>			
1,700 LF of Storm Drain 2,100 LF of Collector Drain	110 Lined Manholes (96%)			
1,800 LF of Drain Service				
4,174 LF CIPP (26%) 20 Lined Manholes (25%) 29 F&C (36%)	14,417 LF CIPP (59%) 63 F&C (55%)			
Total R-Value 47% Reduction	No Reduction	30% Reduction R-value		
wi 1% Reduction	62% Reduction	No Reduction		
		CDM Smith		

### SSES Pilot Study Implementation and Results

Wethersfield FB2 \$2.91M Private I/I Removal 40 Sump Pumps/Pits 1,620 LF of Storm Drain 1,200 LF of Collector Drain 1,600 LF of Drain Service 6,820 LF CIPP (33%) 15 Manholes Lined (17%) 30 F&C (34%) Total 8% Reduction **R-Value** 

19% Reduction

Wethersfield RH2A South

\$3.07M

Full Lateral Rehabilitation w/ Cleanout

202 Laterals 11,130 LF Lateral CIPP

6,957 LF CIPP (73%) 3 Manholes Lined (7%) 21 F&C (47%)

32% Reduction

No Reduction

Wethersfield RH2A North \$6.79M Lateral Replacement to Property Line

240 Laterals 6,500 LF Replacement 3,600 LF Lateral CIPP

17,188 LF CIPP (96%) 10 Manholes Lined (13%) 36 F&C (46%)

40% Reduction



55% Reduction





GWI

## SSES Pilot Study Implementation and Results

	West Hartford WH9 South	<u>SSES Only</u>	Total R-Value	<b>W</b> I	Four Mile Road Project
	\$1.65M	WI8-9-10-11	-15%	-9%	\$6.00M
	Lateral Rehabilitation to	\$2.62 M			<u>Comprehensive Relief</u>
	Property Line	N6			<u>(Non-Pilot)</u>
	191 Laterals	\$0.25 M	-32%	+/9%	4,000 LF Sewer Replacement
	7,000 LF Lateral CIPP				1,000 LF Lateral Replacement
		WH9N く0.45 M	0%	-63%	1,200 LF Lateral CIPP
	1 Manhole Lined (2%)	φ0.45 W			50 Sump Pumps/Pits
	25 F&C (37%)	Control Areas			2,600 LF of Drain Service
		FB3	-10%	+100%	
To R-V	No Reduction	WH29	-29%	+67%	25% Reduction R-Val
Ģ	30% Reduction				23% Reduction
MDC					CDM Smit

### SSES Pilot Study Lessons Learned

#### Comprehensive vs. Focused Approach

Sewer Mains, Manholes, Laterals (Public/Private) and Private I/I

#### Piecemeal Approach = Inconclusive Results

Water Will Migrate!

#### System-Wide Standards are Challenging

- Different Conditions in Every Town, Neighborhood and Street
- Antecedent Moisture Conditions

Investigate and Prioritize!

Better Data Collection = Better Analysis

Maximize I/I Reduction Minimize Overall Cost





## Thank You!!



## Questions?



