



# City of Berea Fair Street Area Sewer Investigation Project

Commencing Fall 2011

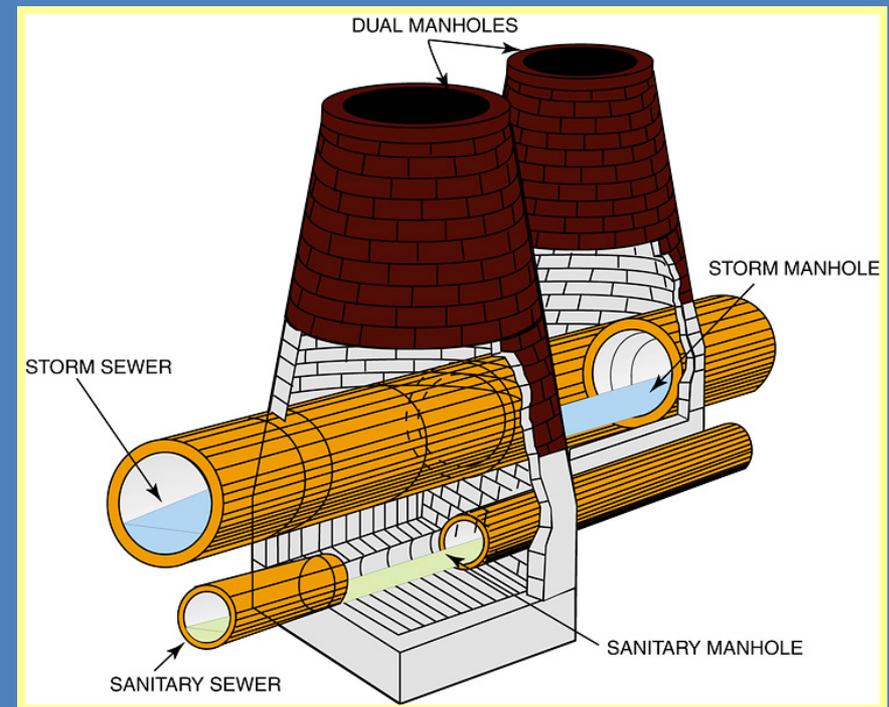
# Project Introduction

- The City of Berea has experienced severe basement flooding in 2011
- The City is embarking on this first phase to identify leaks that allow clean water into the sanitary system that cause basement flooding
- This project will not only identify the leaks that cause basement flooding, but it will identify other needed improvements to the public and private sanitary collection system

# Understanding the Types of Sewers in Berea- “Sewers 101”

- Three Types of Sewers:
  - **Storm Sewers-** Carry stormwater to streams and Lake Erie
  - **Sanitary Sewers-** Carry all sanitary wastewater from inside homes and businesses to the Wastewater Treatment Plant
  - **Combined Sewers-** Carry both Storm and Sanitary in the same pipe. None exist in Berea’s public system but may occur on private property

## Common Trench Sewer

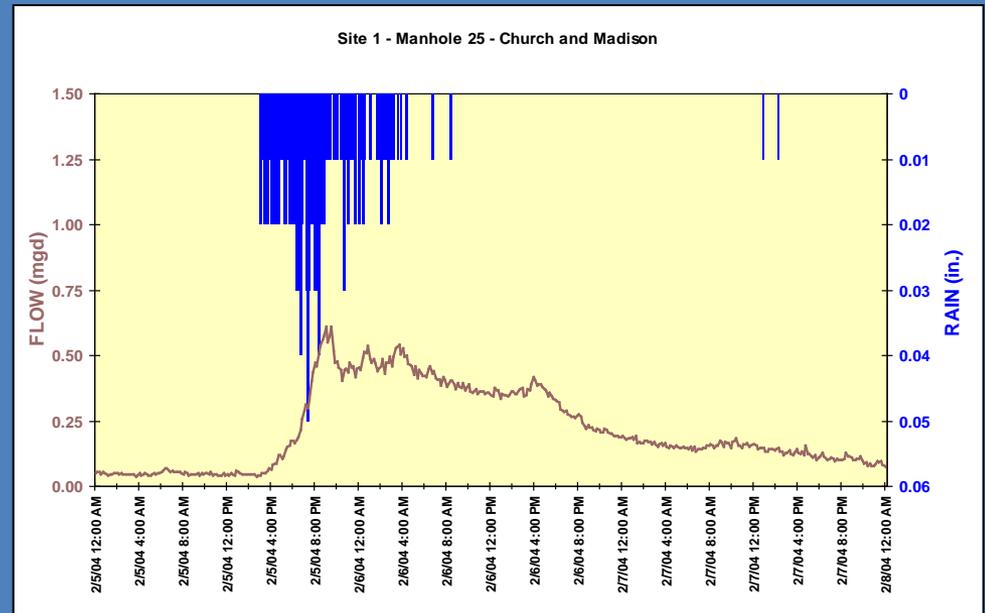
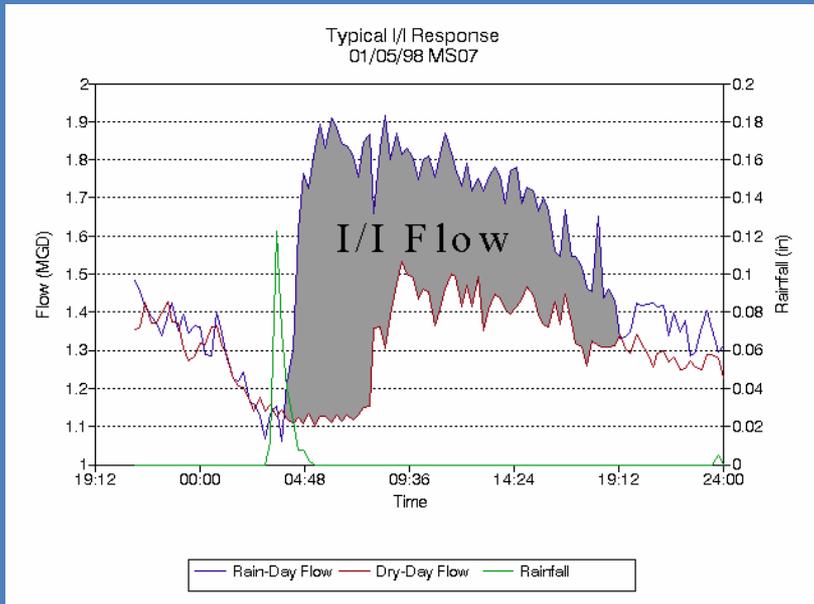


# What is I/I?

## Inflow and Infiltration

- **Inflow** is surface water that leaks flow into the sanitary sewer through improper connections such as storm sewers, catch basins, downspouts, foundation drains, house laterals, sump pumps and area drains
- **Infiltration** is groundwater that seeps into cracks in underground pipes

# I/I in Graphic Format



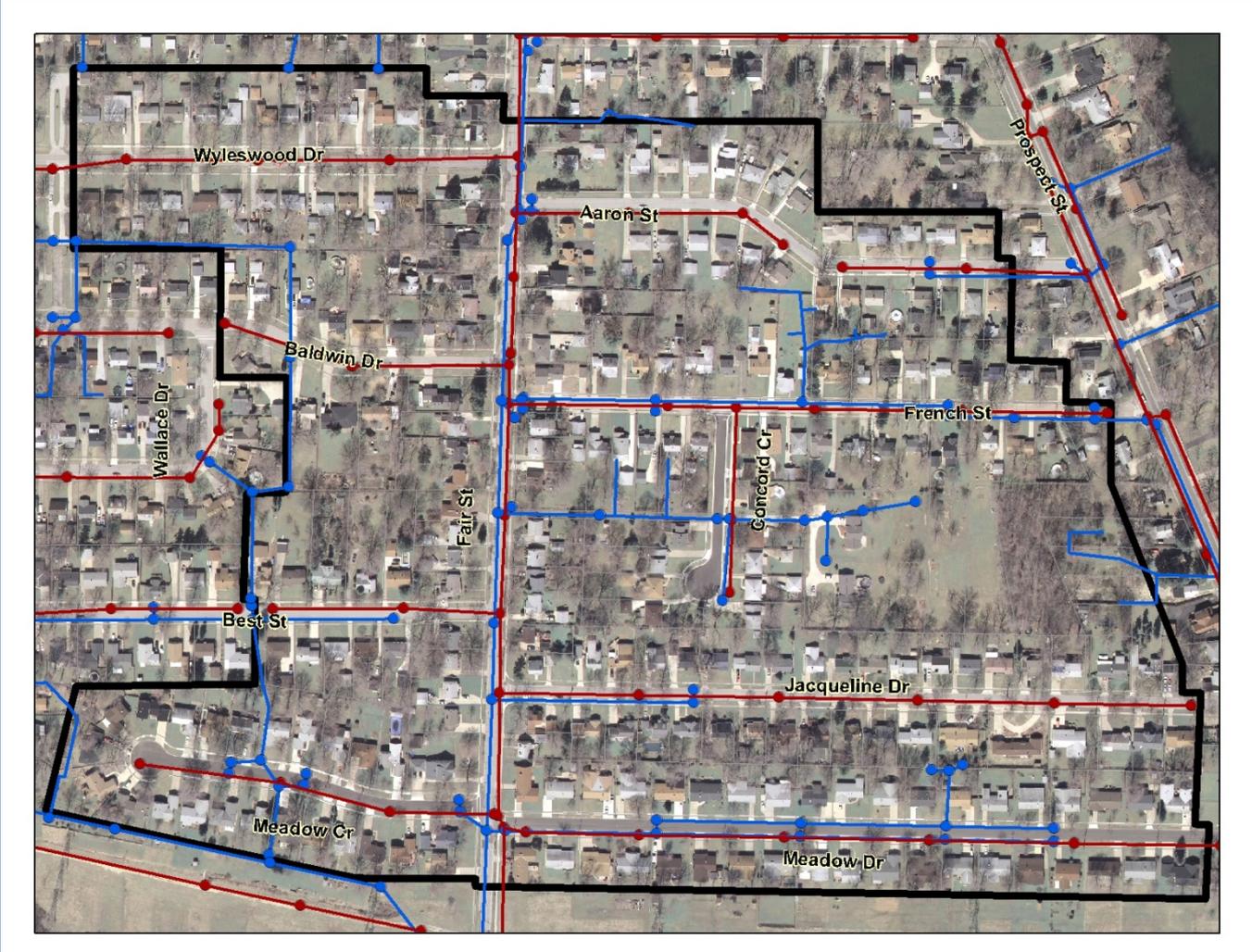
# Fair Street Area Project Components

- Public Outreach
- Mainline Dye Testing
- Residential Dye Testing
- Closed Circuit Television (CCTV) Inspection
- Basement Elevation Survey
- Report with Findings and Recommendations that include a Cost Analysis

# Project Introduction

- This project will identify deficiencies that exist within **Public** Property such as:
  - storm and sanitary sewers
  - catch basins and storm sewers that leak into the sanitary sewer that contributes excessive flow in the sewer
- This project will also identify deficiencies that exist within **Private** Property such as:
  - downspouts, yard drains, driveway cracks, leaks to foundation drains and other areas that leak into, or are directly connected to, the sanitary sewer that contributes excessive flow in the sewer

# Fair Street Project Study Area



# Project Schedule

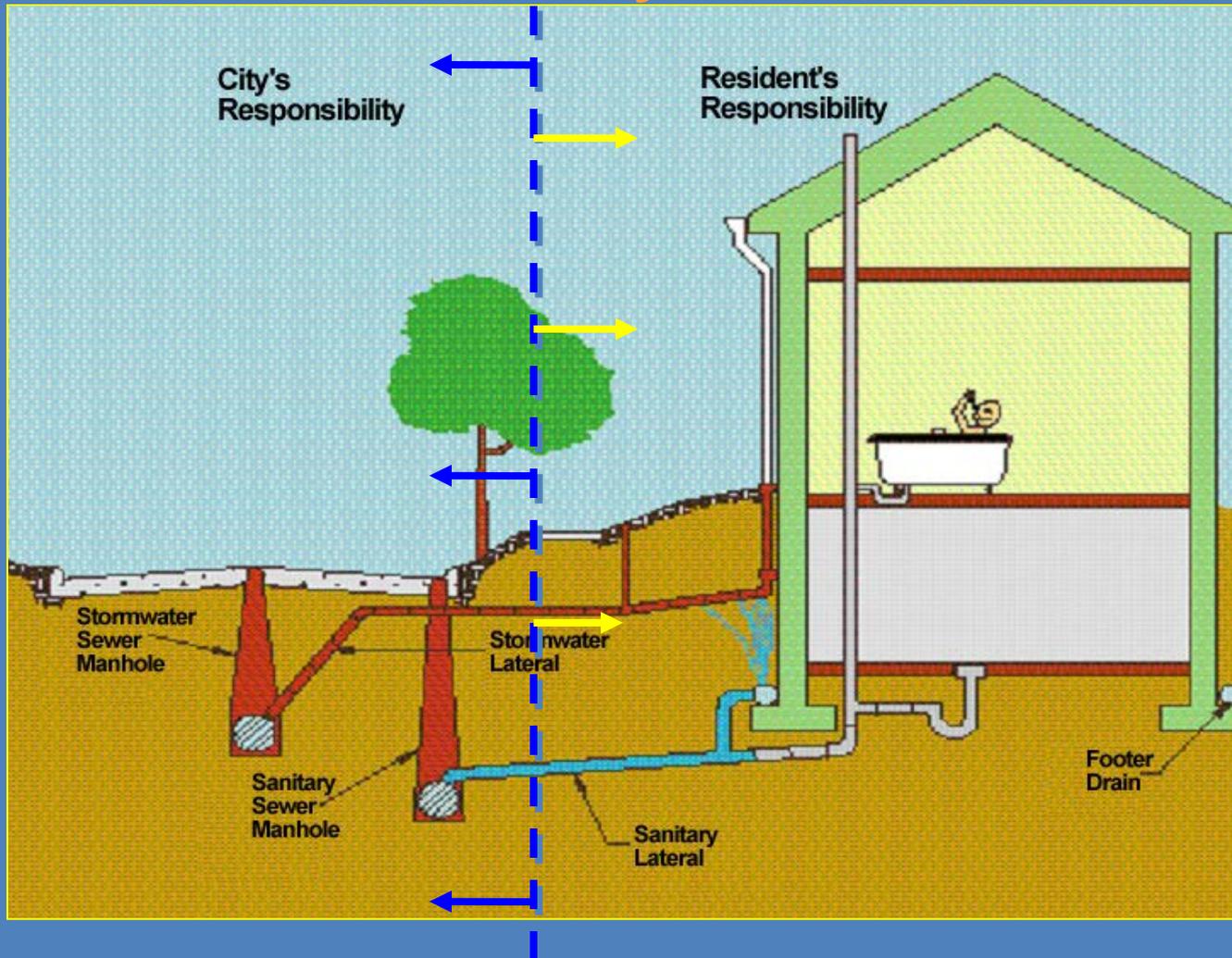
- Project Began in September 2011
- Field Work will Begin in October 2011 and will continue through 2011 and into 2012 if necessary

# Public Outreach

- Conduct Public Meetings to discuss the testing procedures, what the residents will see during the testing and the findings
- Make recommendations following the completion of the study



# Public Property - Private Property Sewer Systems



# Mainline Dye Testing (Public Property)

- Mainline Dye Testing uses water from fire hydrants to simulate rainfall conditions
- Dye is added to the water which helps to determine where leaks occur
- Close Captioned Television (CCTV) equipment is used to locate and quantify the found leaks



# Mainline Dye Testing Results

- The CCTV camera captures the location, severity and type of leak
- Data is presented in a report format with specific recommendations and costs for sewer repairs also known as Pre-Design



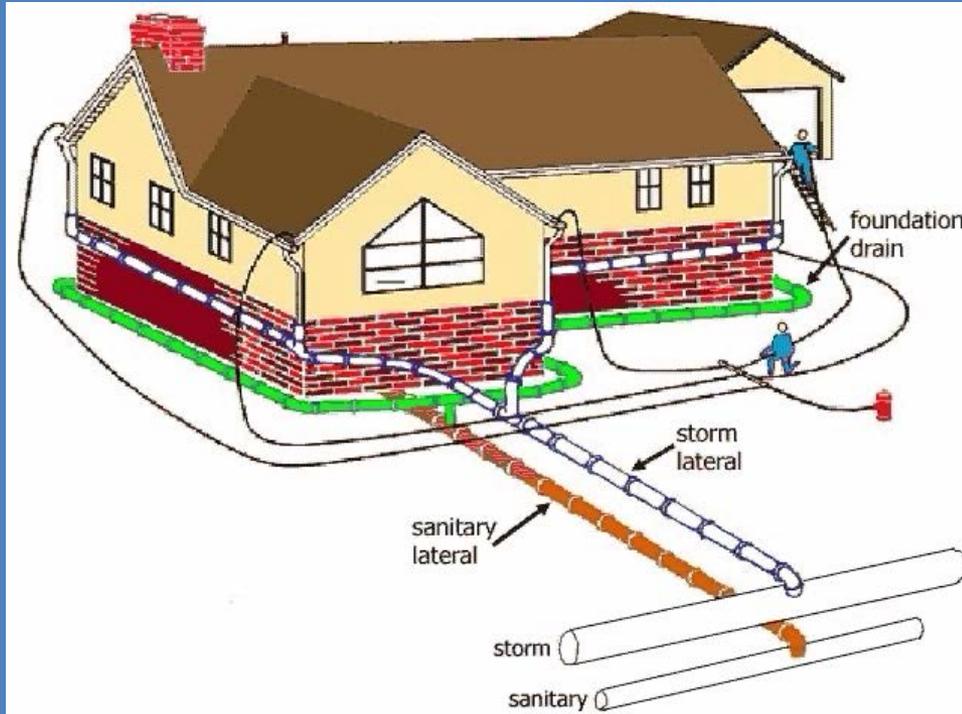


# Residential Dye Testing (Private Property)

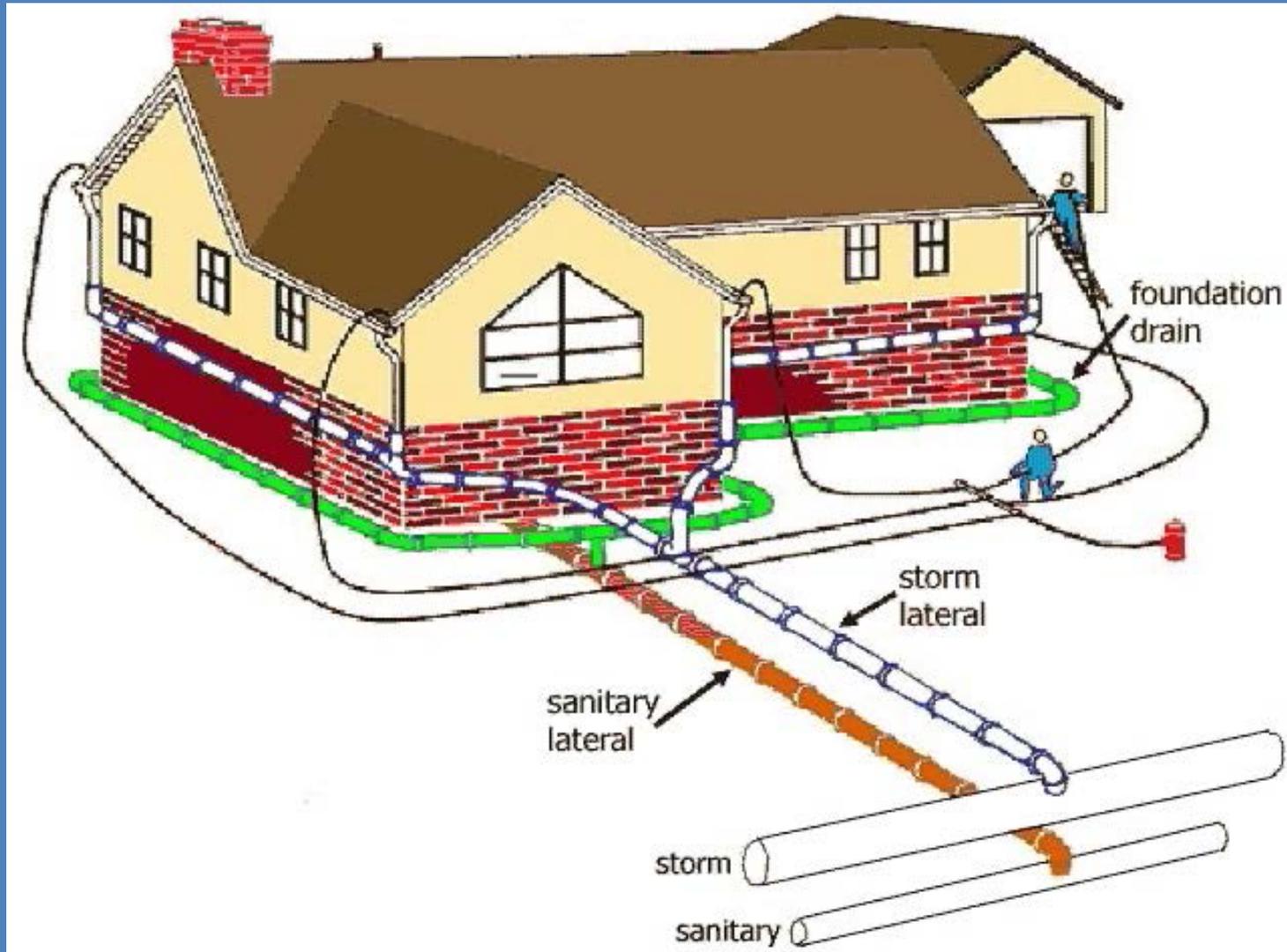
- Residential Dye Testing adds water to downspouts to simulate rainfall conditions
- All testing is done outside the house
- Close Captioned Television (CCTV) equipment is used to locate and quantify the found leaks



# Identifying Leaks on Private Property



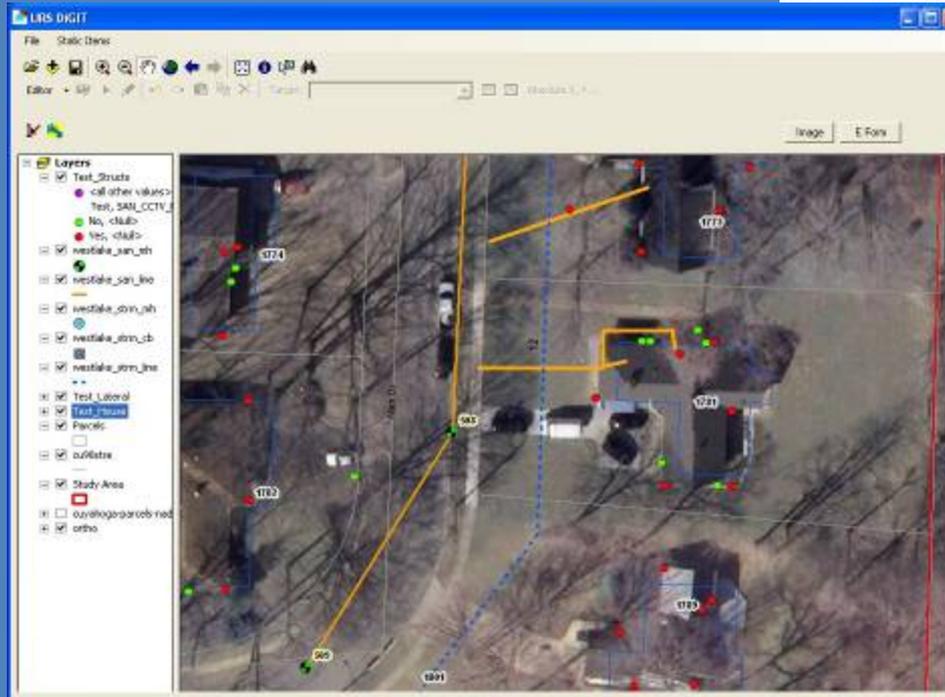
# Identifying Leaks on Private Property



# Private Property Testing Results

Address 1248 E. Melrose      Comments

TestID	Structure	Location	Description	Test	Dye Color	Sanitary CCTV Results	Sanitary Est. Flow (GPM)	Storm CCTV Results	Storm Est. Flow (GPM)	Comments
126	Swamp pump	In House	Contacted	No						
126	Downspout	Midle Right	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
175	Downspout	Rear Right	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
174	Downspout	Rear Middle	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
173	Downspout	Rear Middle	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
172	Downspout	Rear Middle	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
171	Downspout	Front Left	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
170	Downspout	Front Left	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
169	Downspout	Rear Middle	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
168	Downspout	Front Middle	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	
167	Downspout	Front Right	Contacted	Yes	Green	Positive	Non-avg	Positive	Decking	



# Electronic Data Collection

- Paperless Forms for all tests using pen-tablet field computer
- All data can be linked to City mapping system



# Basement Elevation Survey

- Verify Basement Elevations for Approximately 30 Homes Tributary to Pump Station to Check Lateral Elevations in Relation to Pump Station Alarms



# Report

- Report of Findings Submitted to City
- City to share Findings with Public
- Report Will Include a Cost Benefit Analysis
- Recommendations May Include:
  - Sewer Rehabilitation
  - Sewer Reconstruction
  - Relief Sewers
  - Private Property Rehabilitation



# Project Issues

- Work in Right-of-Way Where Manholes are Located
- Fire Hydrant Usage and Potential for 'Dirty Water' in the Area Similar to Hydrant Flushing
- Work Vehicles (Trucks) in Streets
- Minor Traffic Disruption
- Field Crews Working on Both Public and Private Property
- Communication
- Addressing Found Sewer Problems

# Field Staff and Work Area Identification

- Field Staff will have Project Identification Cards
- Field Staff will use Proper Traffic/Safety Devices
- Field Staff will wear Florescent Safety Green Vests/Shirts at All Times



# Project Contacts

- Berea Service Department- Jim Brown
  - Phone Number is 440-826-5816
- Berea Engineering Department- Tony Armagno
  - Phone Number is 440-826-5814
- URS Field Manager- Scott Belz
  - Phone Number is 216-622-2345

# Questions and Answers ?

Thank You for Coming and  
Participating in this Important  
City of Berea  
Sewer Improvement Project!