

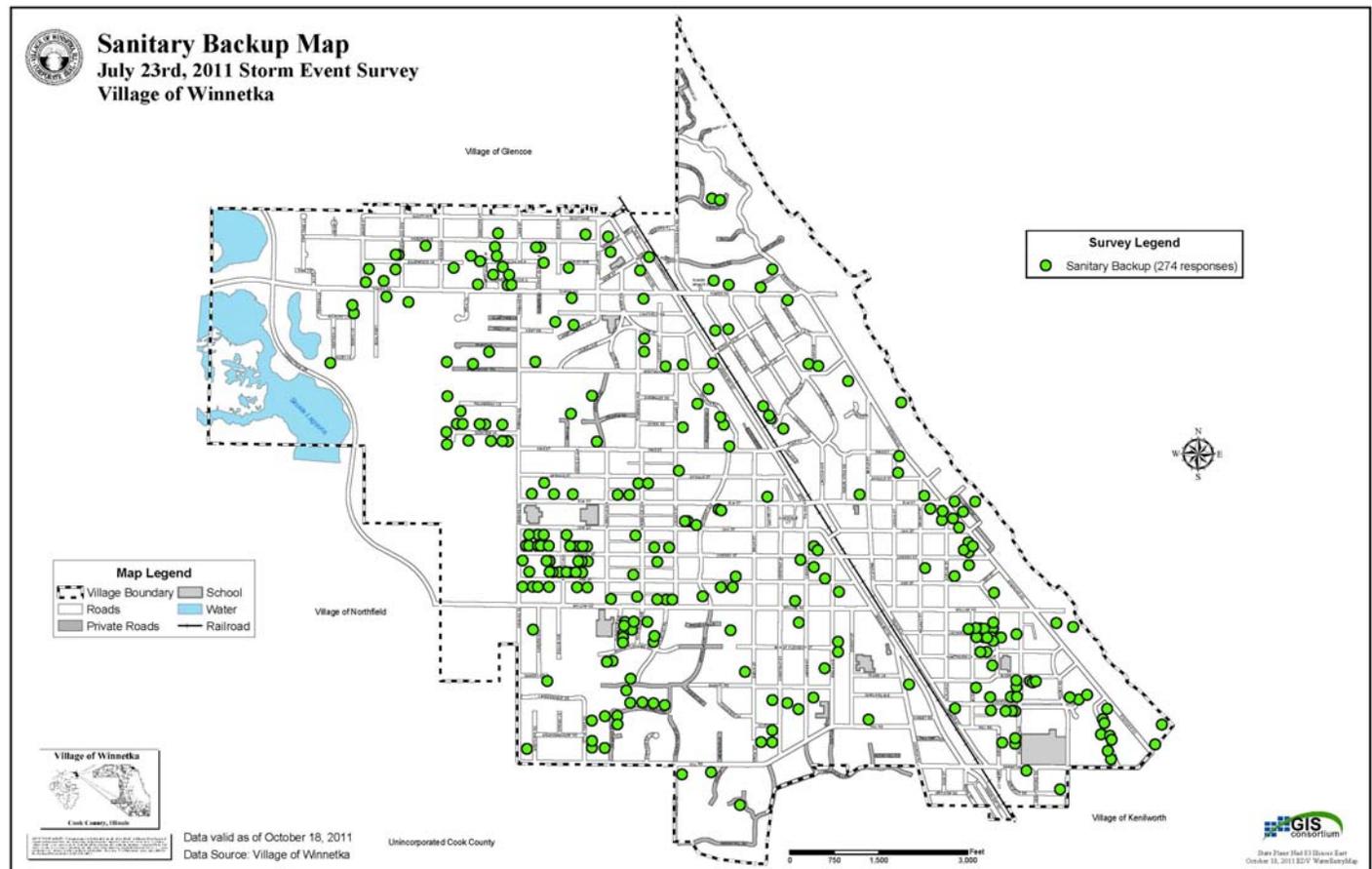
Proposed Sanitary Sewer Evaluation Survey Plan

Presented to Winnetka Village Council

December 13, 2011

Sanitary Sewer Backups

■ July 2011 Storm - Survey Results

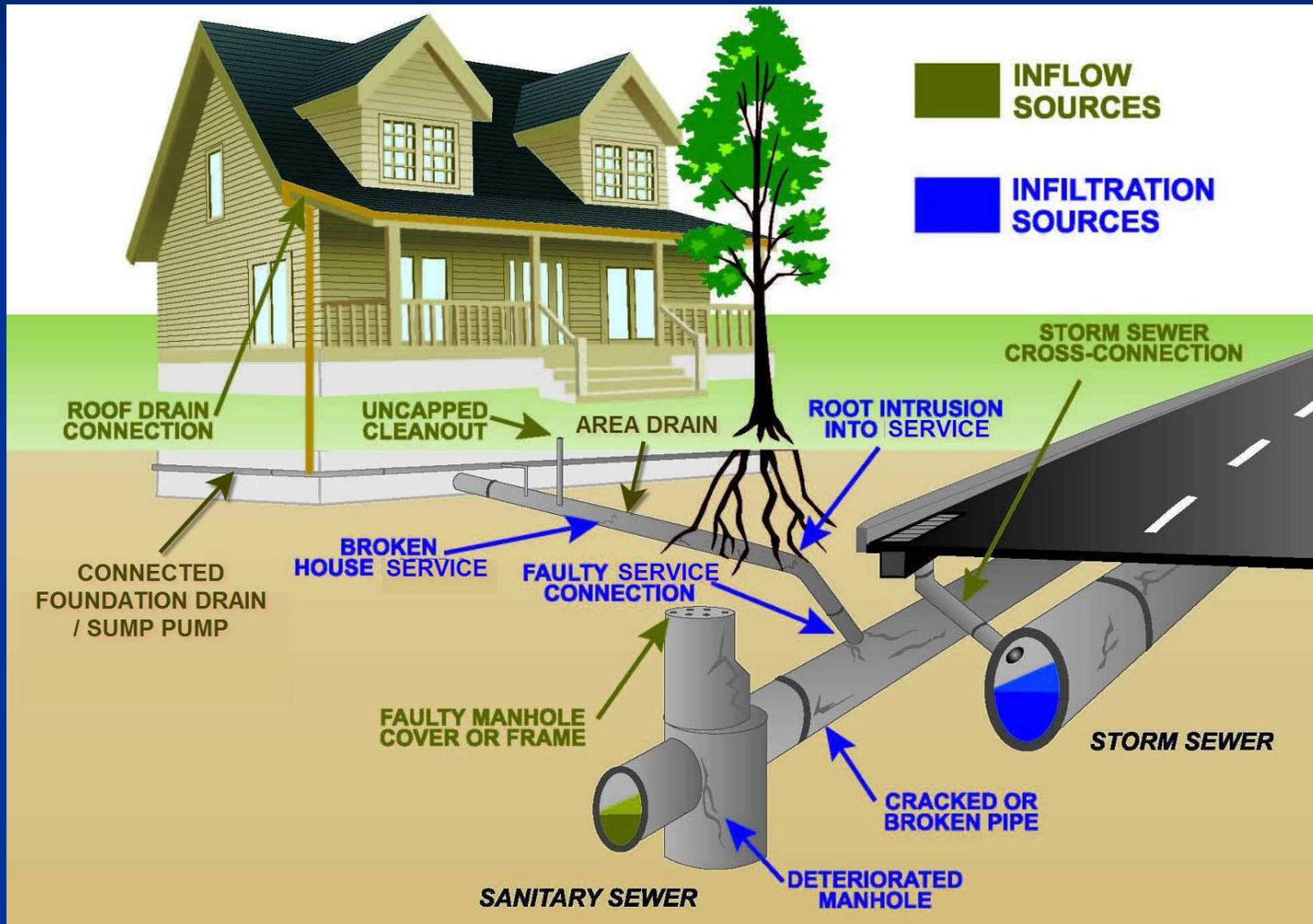


What Is Inflow and Infiltration?

- Extraneous Flow that Enters From Two Different Sources
- **Inflow** Is Rain or Surface Water that Finds Direct Entrance by Way of Downspouts, Sump Pumps, Manholes, and Catch Basins
- **Infiltration** Is Groundwater that Enters through Defective Pipes, Manholes, or Building Connections

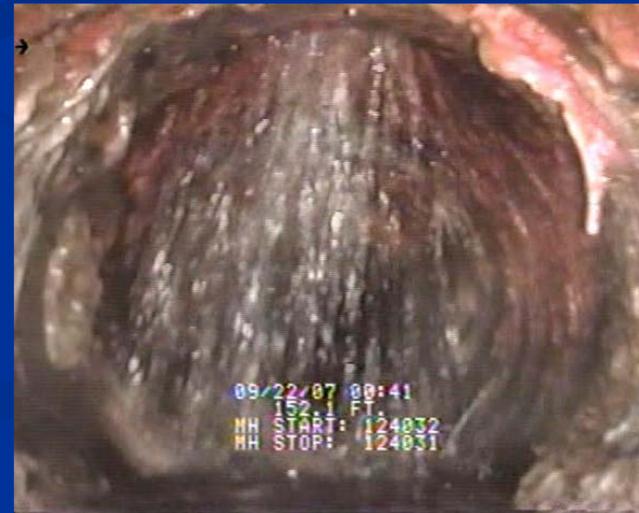
Industry Insiders Call It: I/I

Inflow and Infiltration (I/I) Source Review



Inflow

- Direct Connections – Immediate Response
- Minimally Addressed by Lining
- Found by Field Investigation
- Public and Private Sources



Sanitary System Evaluation Program Components

- Flow Monitoring
- System Modeling
- Prioritize Basins for Sanitary Sewer Evaluation Survey (SSES)
- SSES
 - Smoke Testing
 - Manhole Inspections
 - Building Inspections
 - Dye Testing
 - Television Inspection

Sanitary System Evaluation Program Components (cont.)

- Rehabilitation Design
- Rehabilitation
- Post-Rehabilitation Flow Monitoring
- Long-term Sewer System O & M

Flow Monitoring

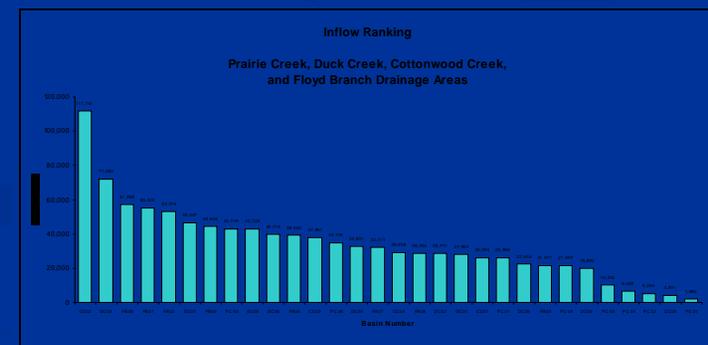
■ Purpose

- Prioritize SSES
- Address specific problem area
- Model calibration

■ Full System or Individual Basin

Duration

- Generally 60-90 days

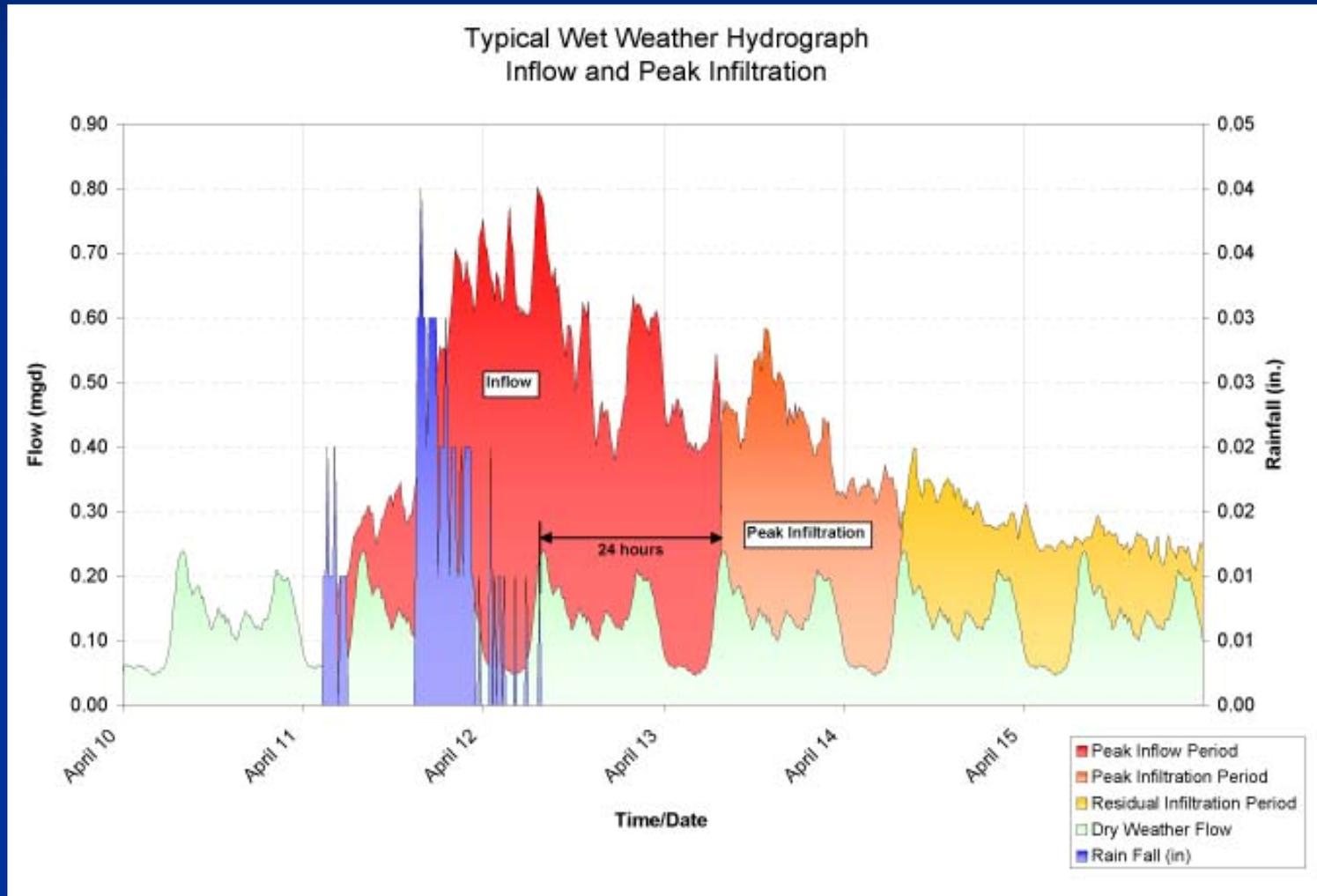


Flow Monitoring Components

- Site Selection / Investigation
- Equipment
- Installation
- Hydraulic Calibration
- Service and Maintenance
- Telemetry
- Rain Data
- Data Analysis



Flow Quantification



Flow Monitoring Results

- Dry-Weather Flow (DWF)
- Wet-Weather Flow (WWF)
- Peaking Factor = WWF/DWF
- Rank Areas by Peaking Factor
- Start with Highest Peaking Factor



Hydraulic Modeling

- System Capacity
- Impact of I/I Reduction
- Hydraulic Bottlenecks
- Master Planning
 - Facility improvements
 - Growth



Smoke Testing

- Direct Connections
- Cross-Connections
- Main Line Defects
- Private Property Defects



Manhole / Visual Pipe Inspection

- Basic Inspection
Unchanged
- Electronic Data
Collection
- Update GIS with GPS
Locates
- Many Rehabilitation
Options



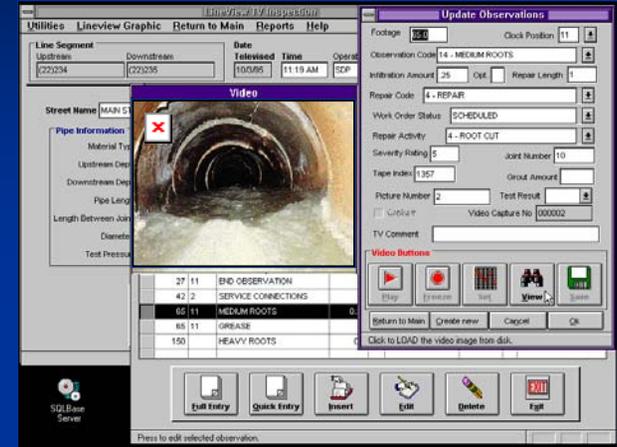
Typical Public Sector “Recurring” Sources

- Manholes
 - Frame Seals
 - Pipe Seals



Television Inspection

- Objectives:
 - Structural integrity
 - Location of laterals
- Technology
 - Pan and tilt digital camera
- Deliverables
 - Digital video with PACP codes
 - X/Y Coordinates for defects / laterals
 - Viewable through GIS



Building Inspection

- Sump Pumps
- Downspouts
- Combination Sumps
- Diverter Valves
- Area Drains
- Footing Tiles



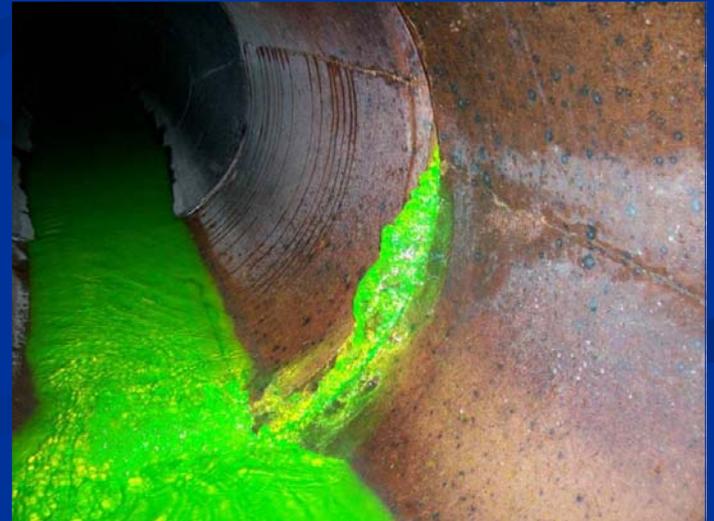
Remaining Private Property Sources

- Combination Sump Pumps (Washroom in Basement)
- Unsealed Sanitary Sumps
- Stairwell Drains / Window Well Drains / Driveway Drains
- Directly Connected Foundation Drains



Dye Water Testing

- Confirm Suspect Private Sector Sources (Area Drains, Downspouts, Sump Pump Discharge, Etc.)
- Confirm System Flow Patterns (Inlets, Flow Directions, Etc.)



Proposed Plan for Winnetka

- Consultant Contract
 - Draft Request For Proposals (RFP)
 - Council to Award Contract
- Flow Monitoring (March - early June)
- Evaluate Data and Prioritize Basins for I/I Elimination (June-July)
- Present Plan to Council (August)
- Authorize SSES Program (August)

Proposed Plan for Winnetka (Cont.)

- SSES (September - November)
 - Smoke Testing
 - Manhole & Pipe Inspections
 - Building Inspections
- Develop I/I Removal & Rehabilitation Plan (December - January)

Summary and Recommendation

- Understand the Process
 - Gather Relevant Data
 - Existing Data Review
 - Survey Results
 - Flow Monitoring
 - Boil It Down
 - Evaluate Flow Monitoring and Survey Data
 - Prioritize Basins for Detailed SSES
 - Act
 - Authorize Detailed SSES for Highest Priority Basins
- Authorize Staff to Obtain Engineering Proposals

QUESTIONS?