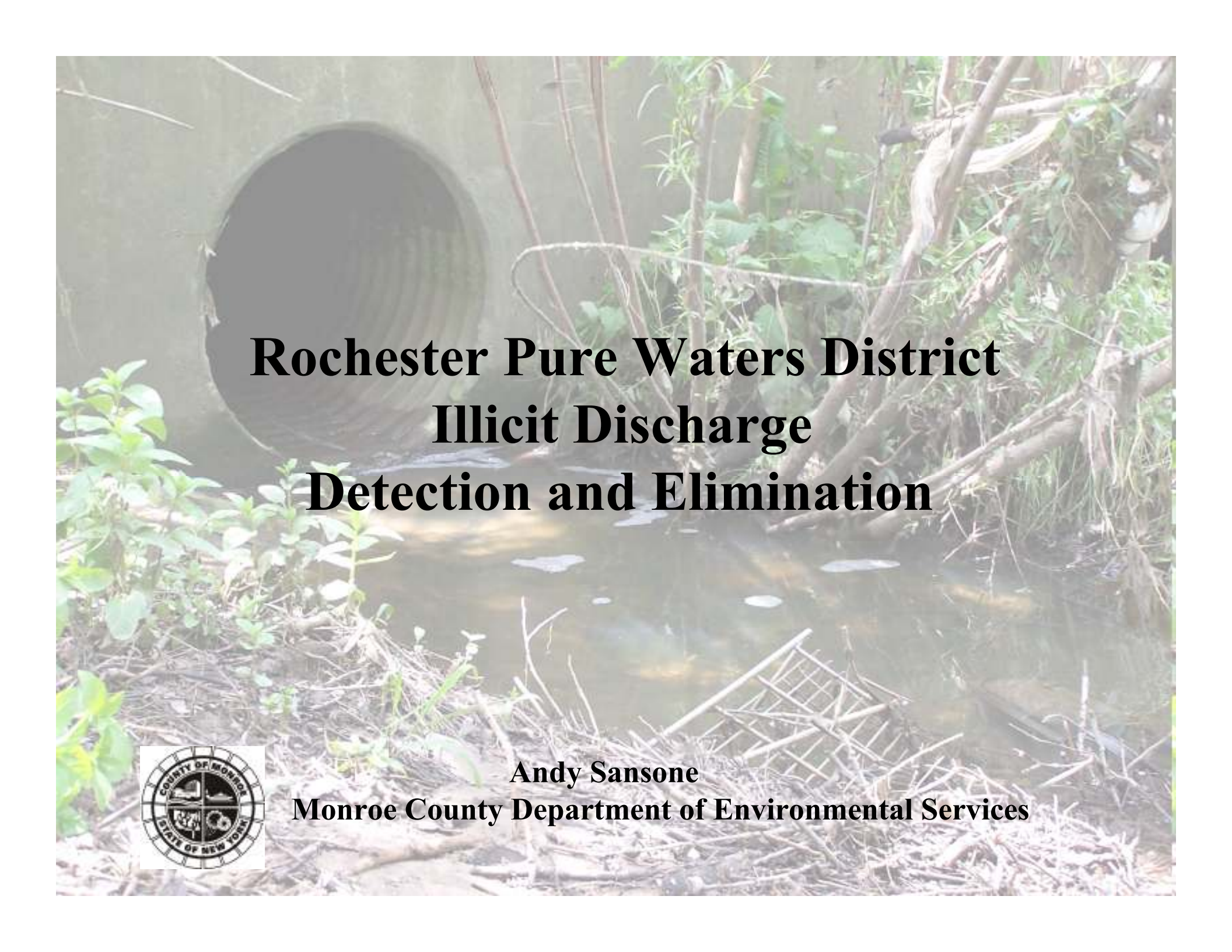




Rochester Pure Waters District Illicit Discharge Detection and Elimination



Andy Sansone
Monroe County Department of Environmental Services

Presentation Outline

- **IDDE Program Requirements**
- **Measurable Goals**
- **GIS Mapping**
- **Inspection Techniques**
- **Data Management**
- **Current Progress, “Case Studies”**
- **Eliminating the Discharge**

Illicit Discharge Detection & Elimination

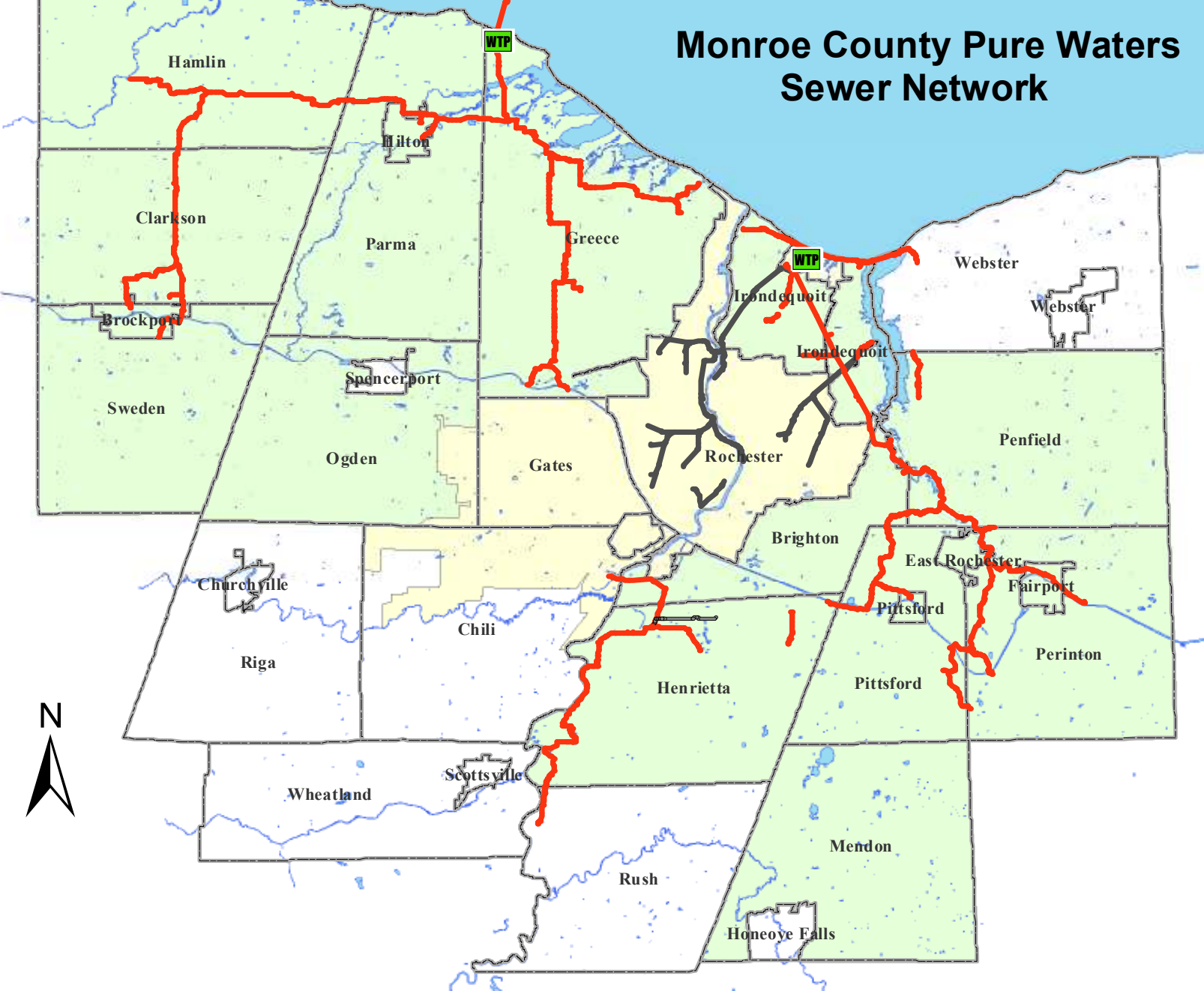
Minimum Requirement as per SPDES:

- Develop, implement and enforce a program**
- Develop and maintain an outfall map**
- Illicit discharge prohibition...ordinance**
- Inform public employees, businesses & public**
- Develop measurable goals, BMP's**

Pure Waters Measurable Goals

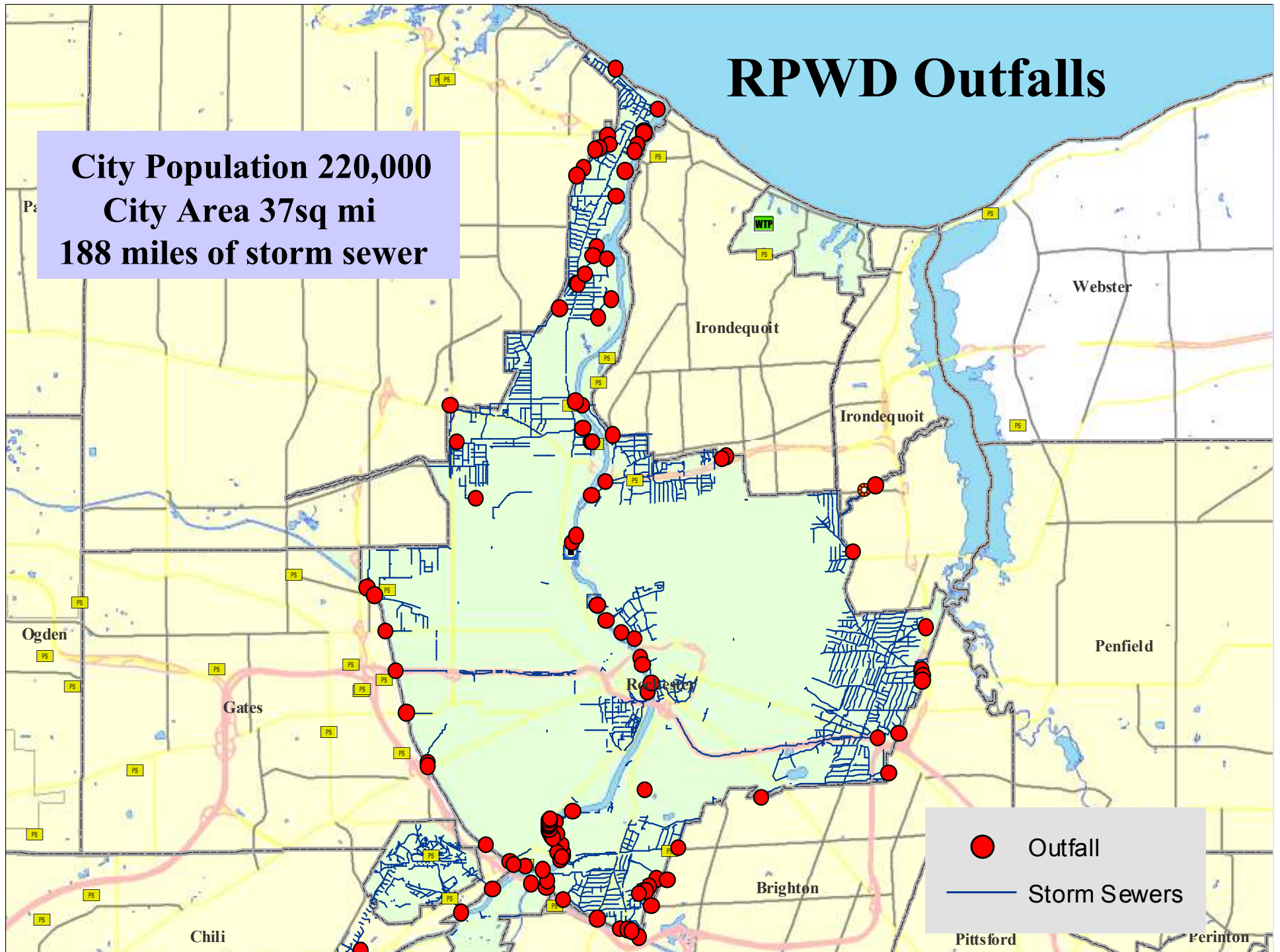
- Construct Outfall Map**
- Inspect 20% of Outfalls Annually**
- Complete Inspections by 2008**
- Develop Illicit Discharge Ordinance**
- Small Business Pollution Prevention
BMP's and Education**

Monroe County Pure Waters Sewer Network



RPWD Outfalls

City Population 220,000
City Area 37sq mi
188 miles of storm sewer



Outfall Inspection Status

RPWD 120 Stormwater Outfalls

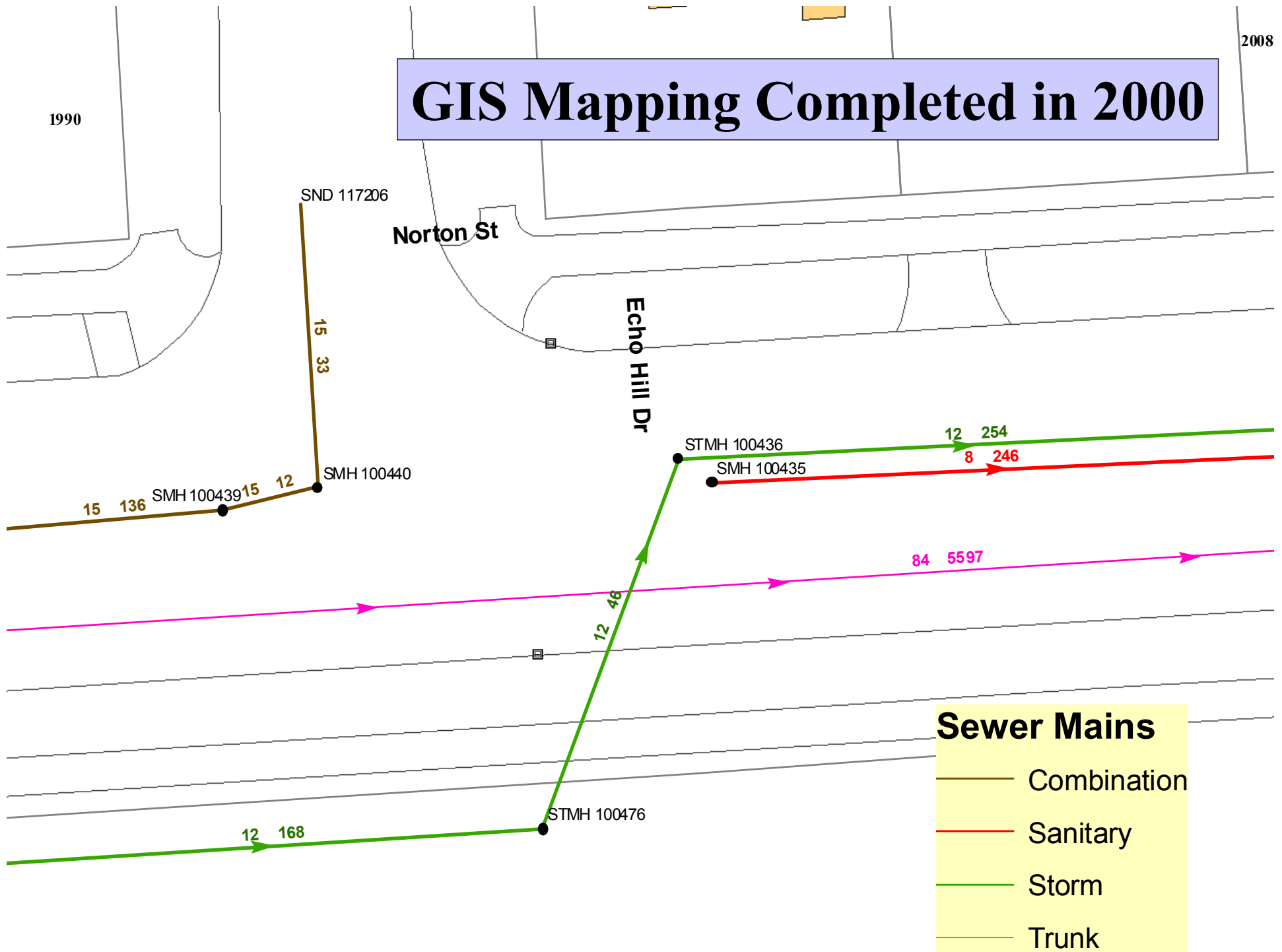
	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>Total</u>
Outfalls Inspected	20	27	21	32	100
Illicit Discharges Detected*	0	11	14	12	37
Illicit Discharges Eliminated		2	8	4	14

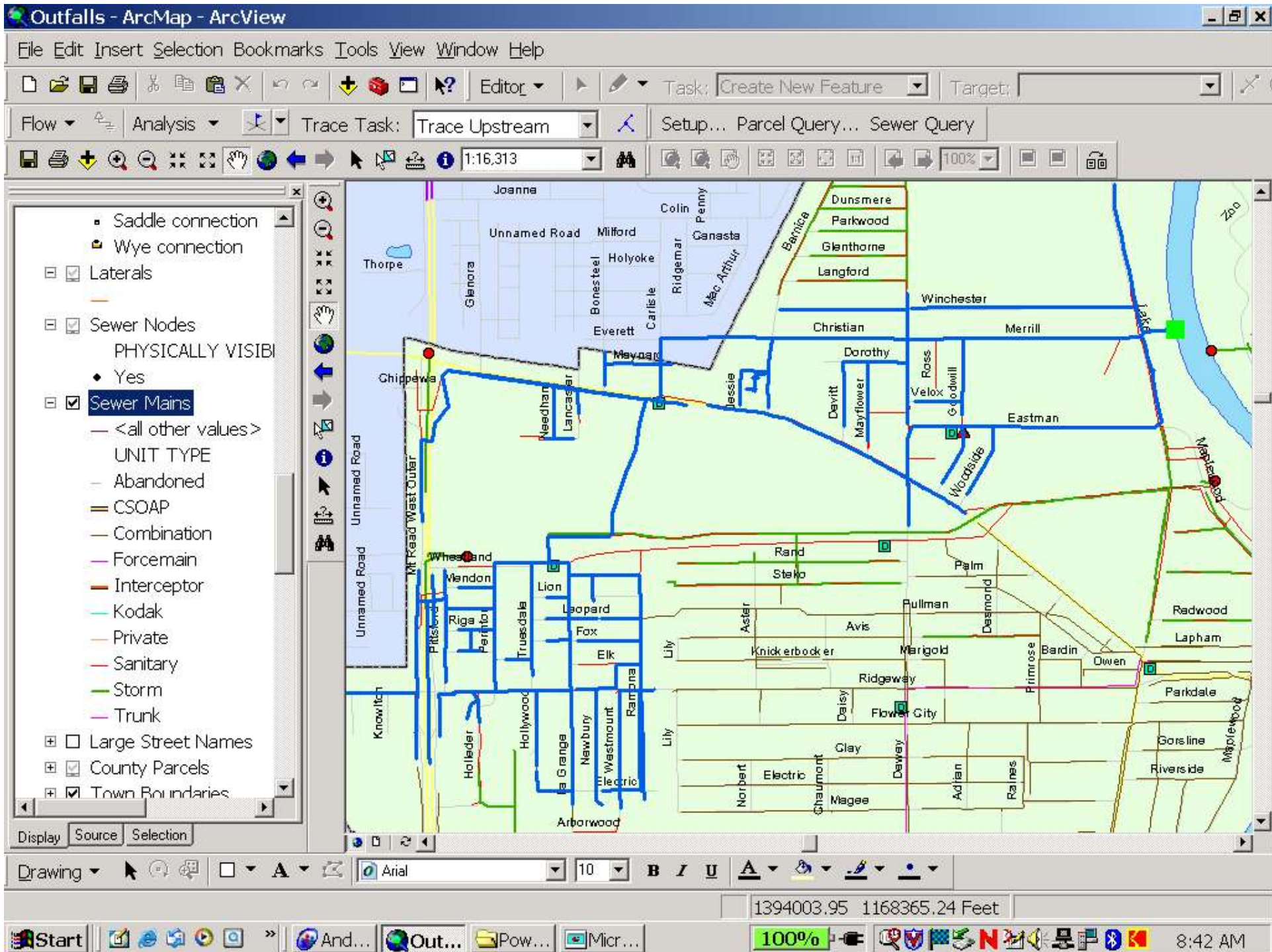
* Estimated >20,000 gallons/day of sanitary waste
discharged to local waterways

Sources of Illicit Discharges

- Sanitary wastewater
- Effluent from septic tanks
- Car wash wastewater's
- Improper oil disposal
- Radiator flushing disposal
- Laundry wastewater's
- Spills from roadway accidents
- Improper disposal of auto and household toxics
- Swimming Pools

GIS Mapping Completed in 2000







Outfall Inspection Techniques

- **Visual Inspection**
- **Sampling**

Outfall Inspections

- Odors
- Stains
- Color
- Foam
- Oily Sheen
- Floatables
- Impacted Vegetation
- Dry Weather Flows

Follow the Water !!!

**Visual inspection can
be an efficient method**





Sampling

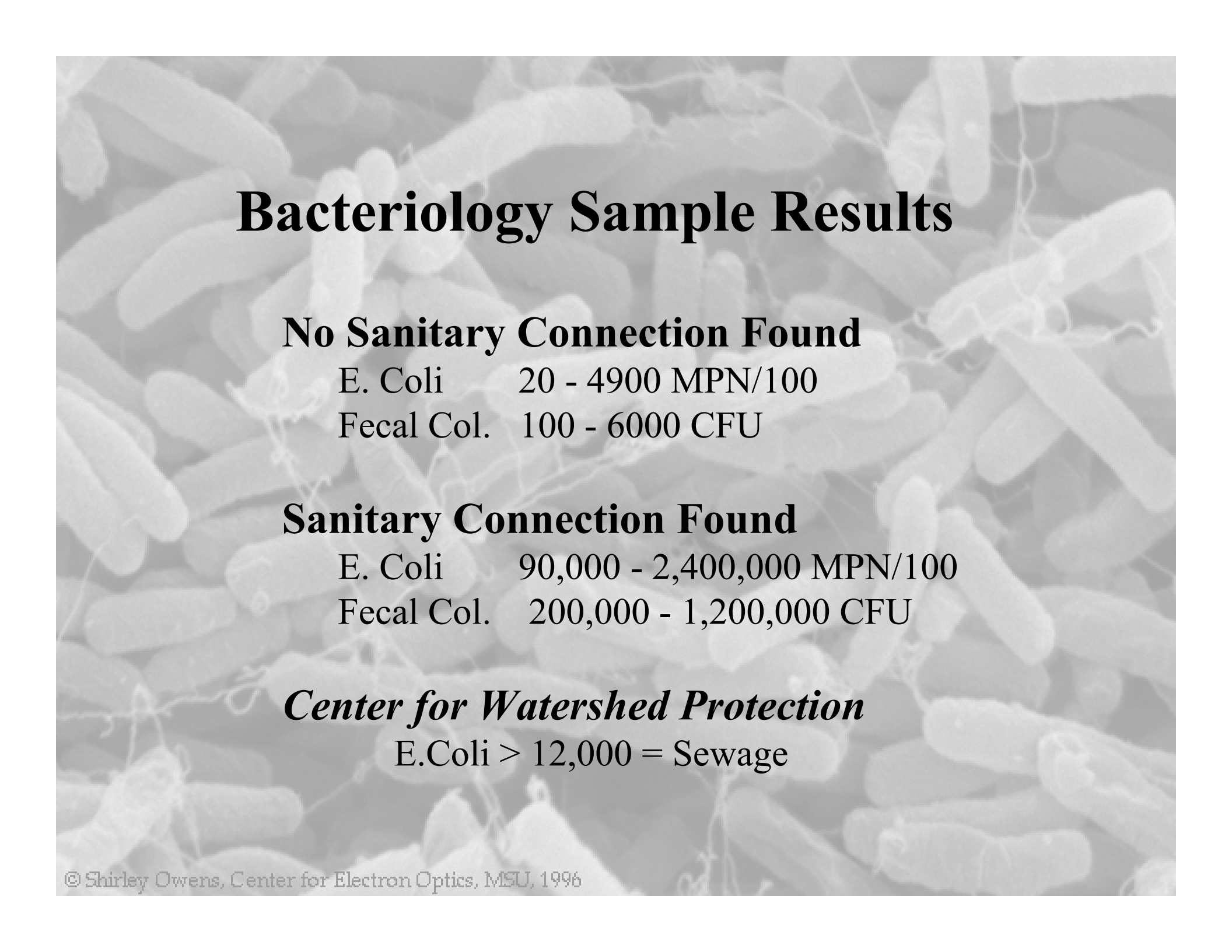
Once an outfall is identified as having a high priority through visual inspection there are a few easy chemical tests that may help find the source of the problem.

- **Chlorine Residual**
- **E. Coli**
- **Optical Brightener Trap**
- **Ammonia**

- **Fluoride ?**

Sampling a Manhole



The background of the slide is a grayscale electron micrograph showing numerous E. coli bacteria. These are rod-shaped organisms, some appearing individually and others in small clusters. Some bacteria have thin, hair-like flagella extending from their ends. The overall texture is granular and detailed, typical of a high-magnification micrograph.

Bacteriology Sample Results

No Sanitary Connection Found

E. Coli 20 - 4900 MPN/100

Fecal Col. 100 - 6000 CFU

Sanitary Connection Found

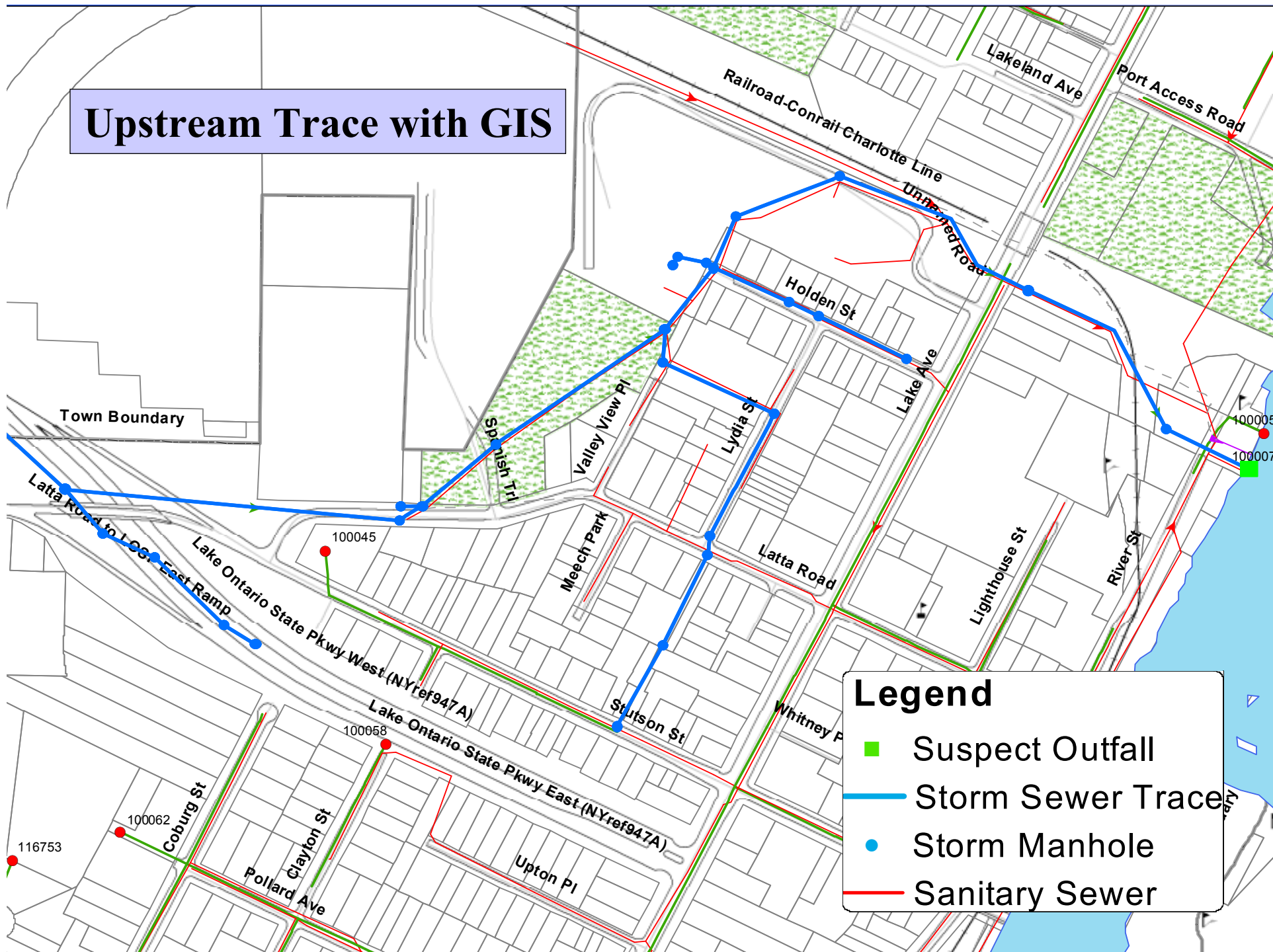
E. Coli 90,000 - 2,400,000 MPN/100

Fecal Col. 200,000 - 1,200,000 CFU

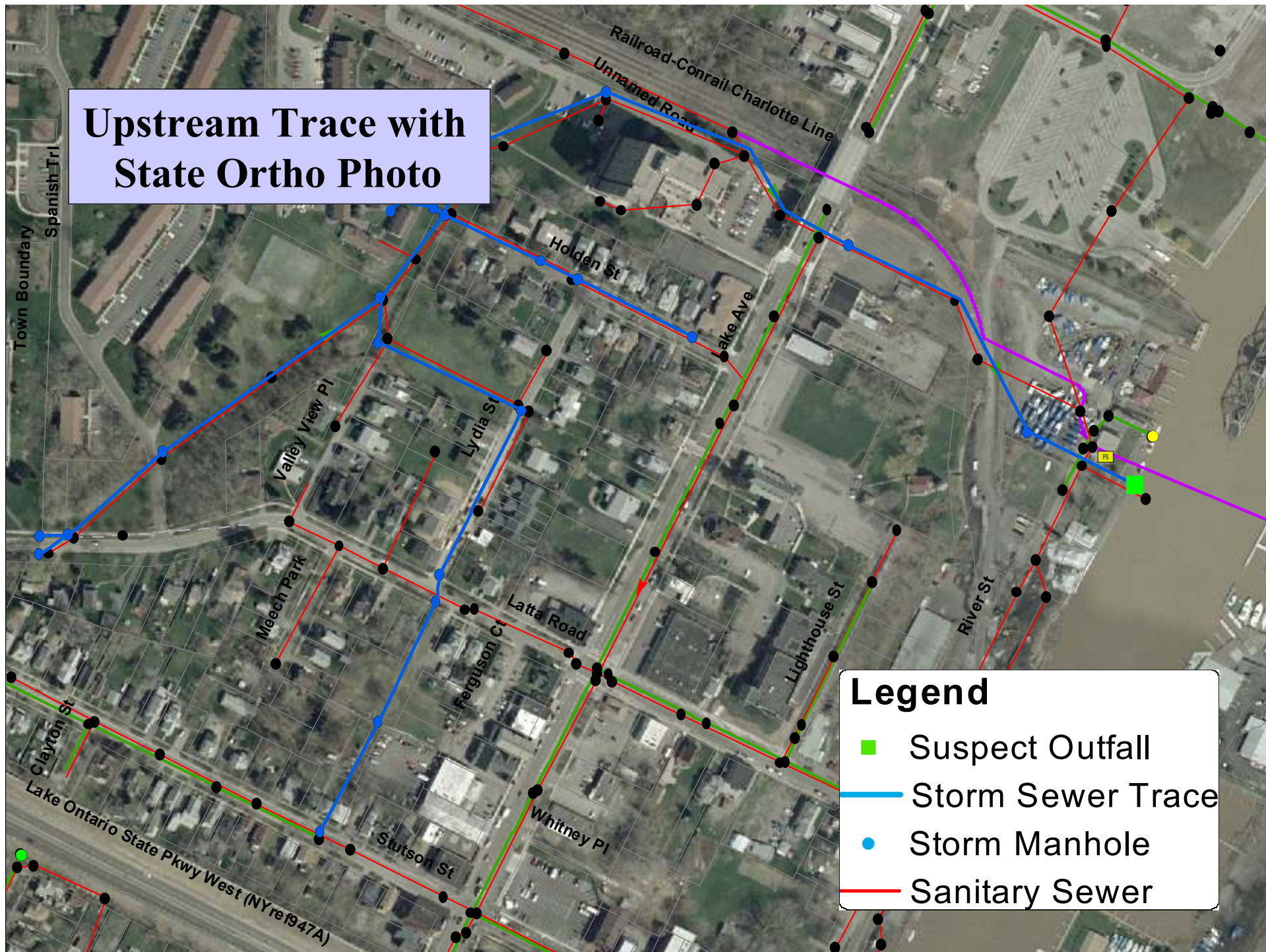
Center for Watershed Protection

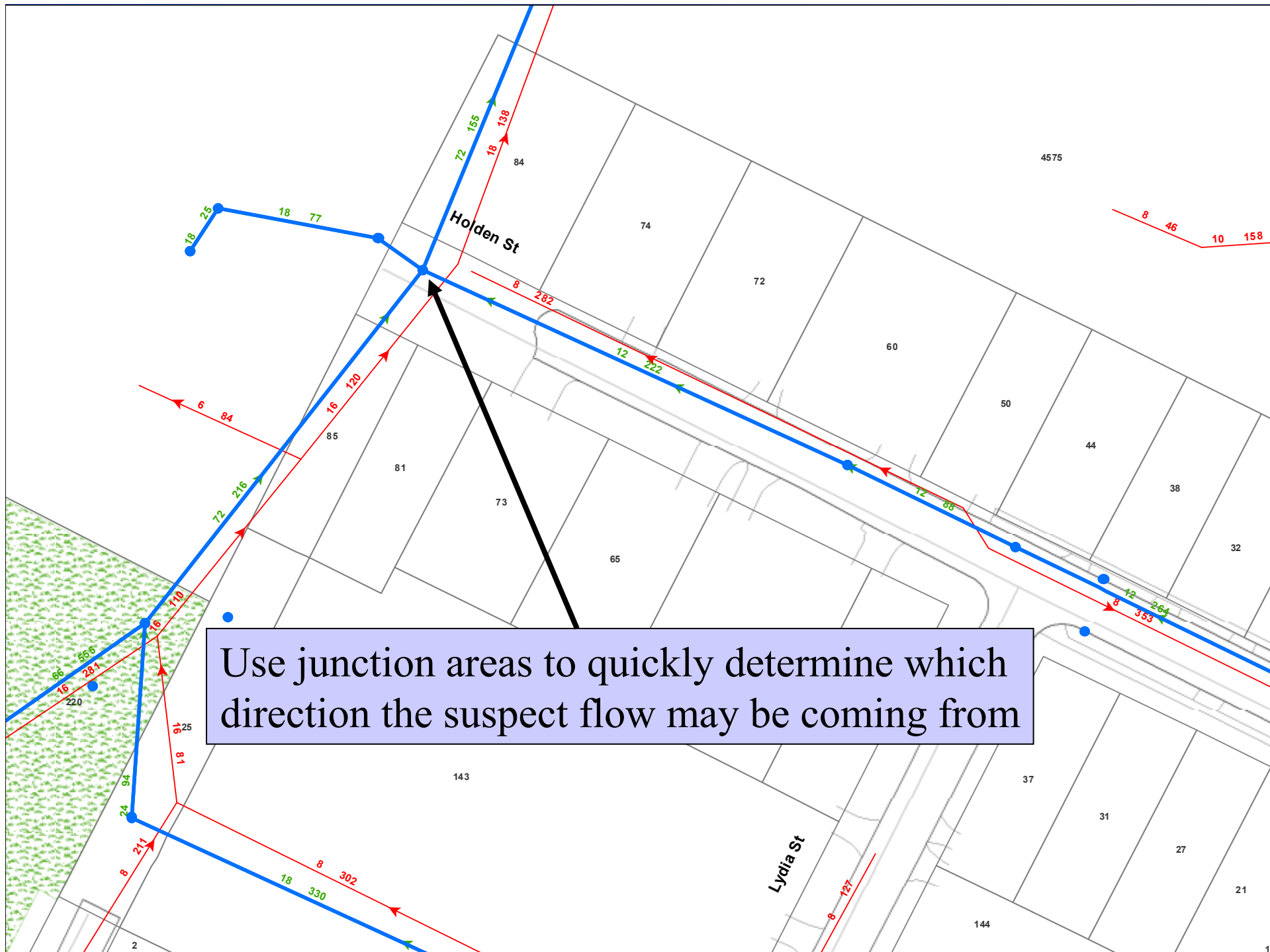
E.Coli > 12,000 = Sewage

Upstream Trace with GIS

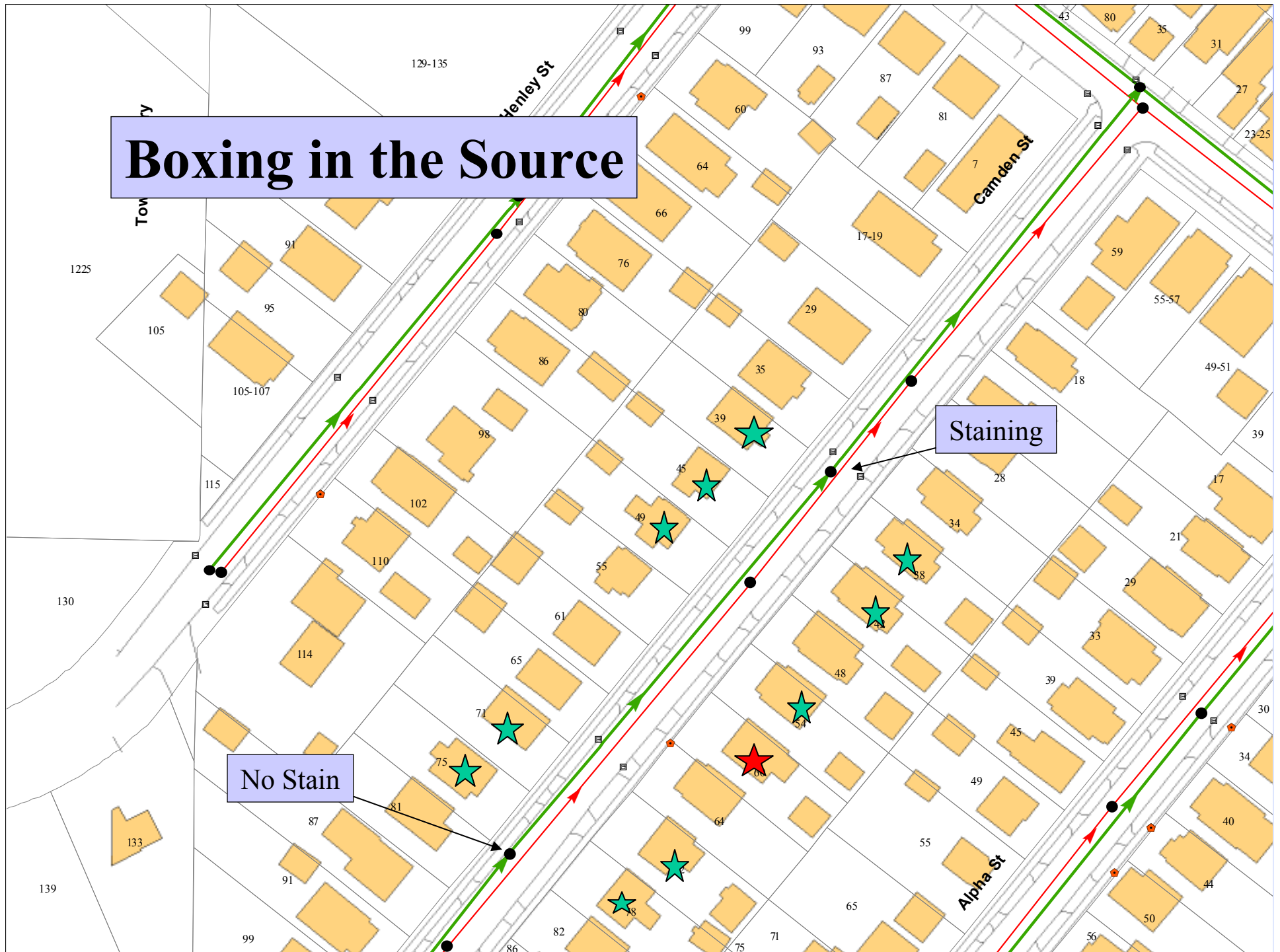


Upstream Trace with State Ortho Photo





Boxing in the Source



Dye Testing



Televising



Smoke Testing



Better Data Management

Microsoft Access - [Outfall Form : Form]

File Edit View Insert Format Records Tools Window Help

Tahoma 8 B I U

Outfall Monitoring Observation Sheet

Outfall Number Date
City-Town Time
Observers name Refresh Quit

Outfall Address

Add New Outfall

Weather Conditions		Inspection Date
Date last rainfall or significant snow melt (if known)	Pipe Diam	☐ 10/10/2005
Or, Select the one that applies No Rain/Snow Melt in past 72 hrs	Receiving Stream Name	☐ 12/12/2005
Adjaent Land Use		☐ 9/10/2005
☒ Residential	☒ Industrial	☐ 11/11/2005
☒ Commerical	☒ Agricultural	☐ 1/1/2005
☒ Parkland	☒ Open Space	☐ 9/9/2005
		Add NEW

At the time of observation, is the outfall pipe:	
Discharging	☐ YES ☒ NO
Visable	☐ YES ☒ Submerged

ODOR	COLOR	FLOATABLES	VEGETATION	Structural Damage	DEPOSITS / STAINS
☒ Chemical ☒ Chlorine ☒ Musty ☐ Harsh ☐ Sewage ☐ Rotten Eggs ☒ None	☒ Muddy ☒ Cloudy ☐ Grey ☐ Green ☐ Brown ☐ Blue ☐ Red ☐ Clear ☐ Other	☐ Oily ☐ Rainbow ☒ Trash ☐ Foam ☐ Toilet Paper ☒ None ☒ Other	☒ Excessive Growth ☒ Inhibited Growth ☐ Dead Plants ☐ Looks Normal	☒ Cracks ☒ Deterioration ☒ Peeling Paint ☐ Other	☒ Dark Staining ☒ White Staining ☒ Orange Staining ☒ Other

Estimate the depth of flow in the outfall pipe (inches)

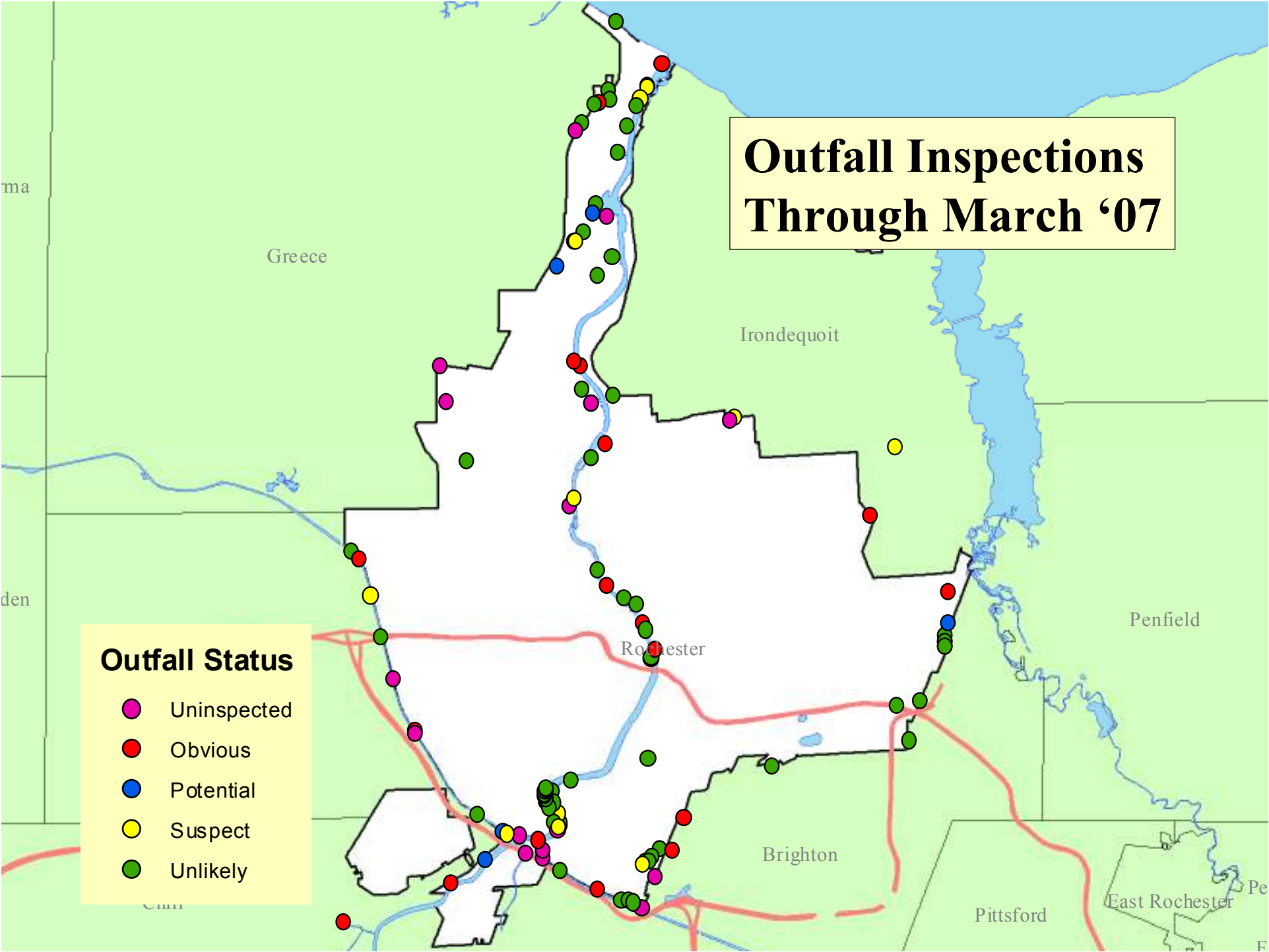
Form View

start An... 7... 2 W ES... Se... 2 M 99% 8:37 AM

Outfall Inspections Through March '07

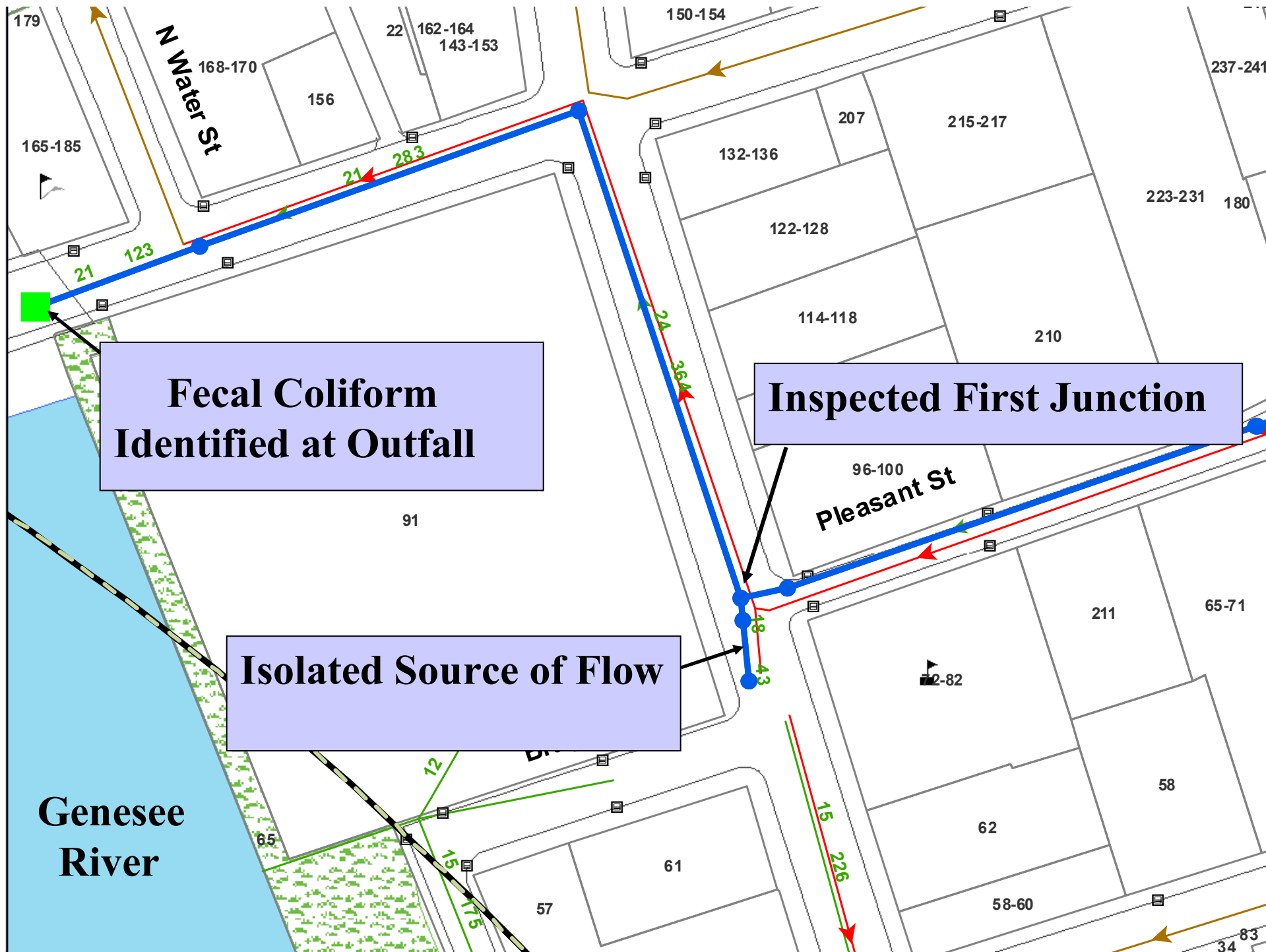
Outfall Status

- Uninspected
- Obvious
- Potential
- Suspect
- Unlikely



Illicit Discharges Detected









**Plumbing Changes
are the Cause**



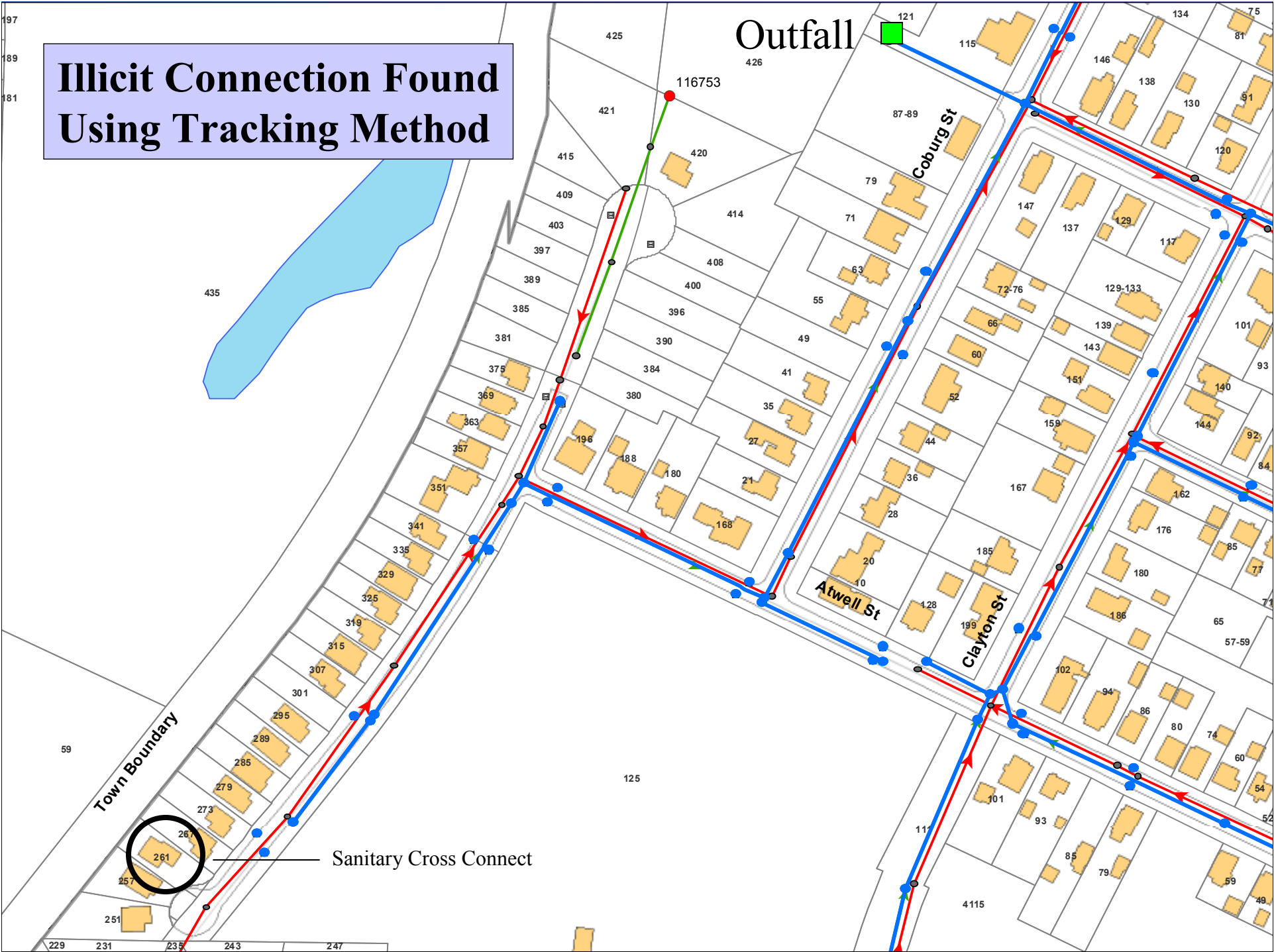
An Illicit Discharge



Example of Staining



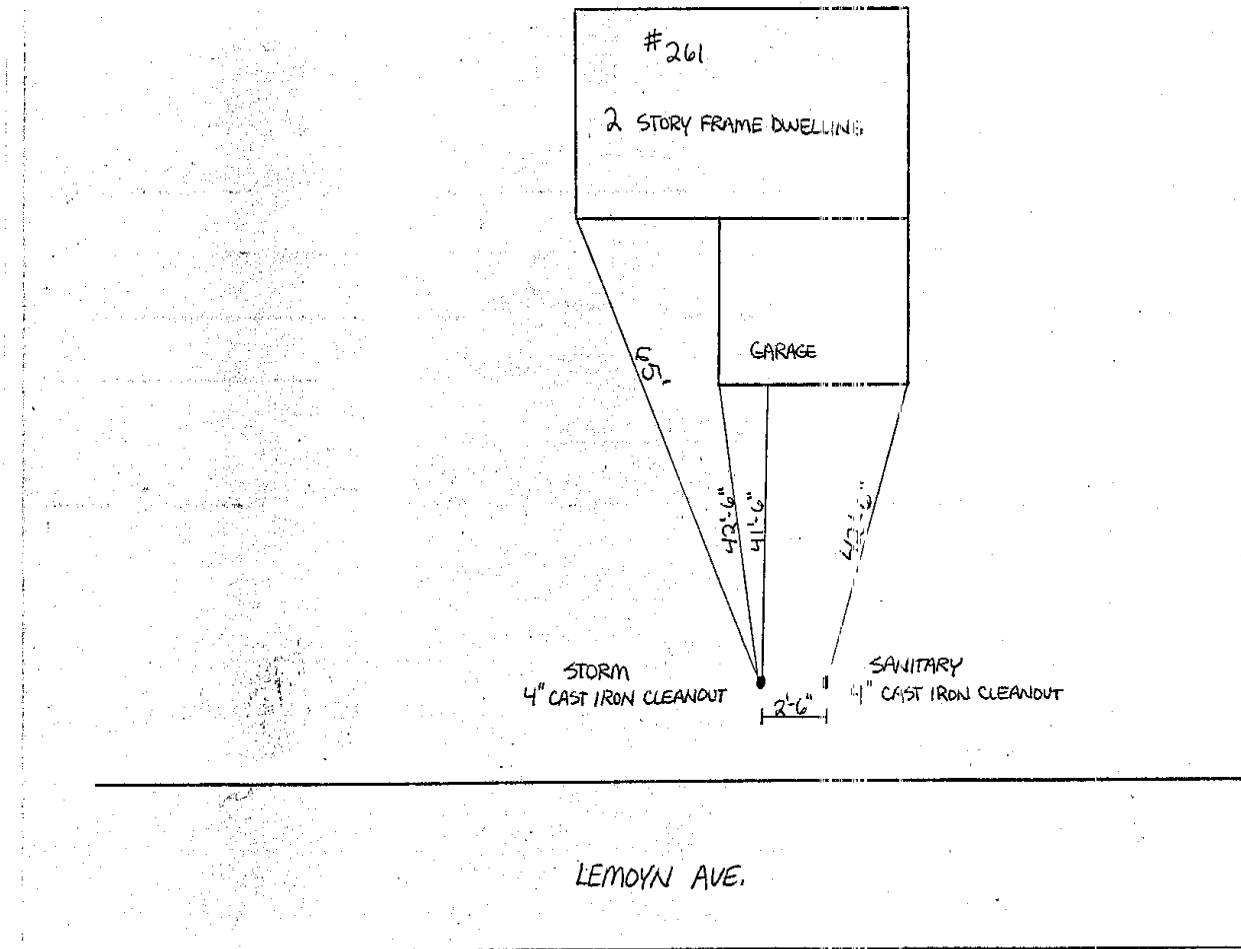
Illicit Connection Found Using Tracking Method



Sewer Connection Records

Cleanouts
with
4 inch Laterals

SEWER CONNECTION DETAILS									
DISTRICT OWNED					PRIVATE OWNED				
Comb.	☐	Mat	Size	Depth @	Comb.	☐	Mat	Size	Depth @
San.	☐	Mat	Size	Depth @	San.	☐	Mat	Size	Depth @
Storm	☐	Mat	Size	Depth @	Storm	☐	Mat	Size	Depth @
C.O. INSTALLED					SAN. 3/9/88 DATE STORM 3/9/88 MAT. CAST IRON SIZE 4" DEPTH 4' ±				





New Subdivision Built in 2004

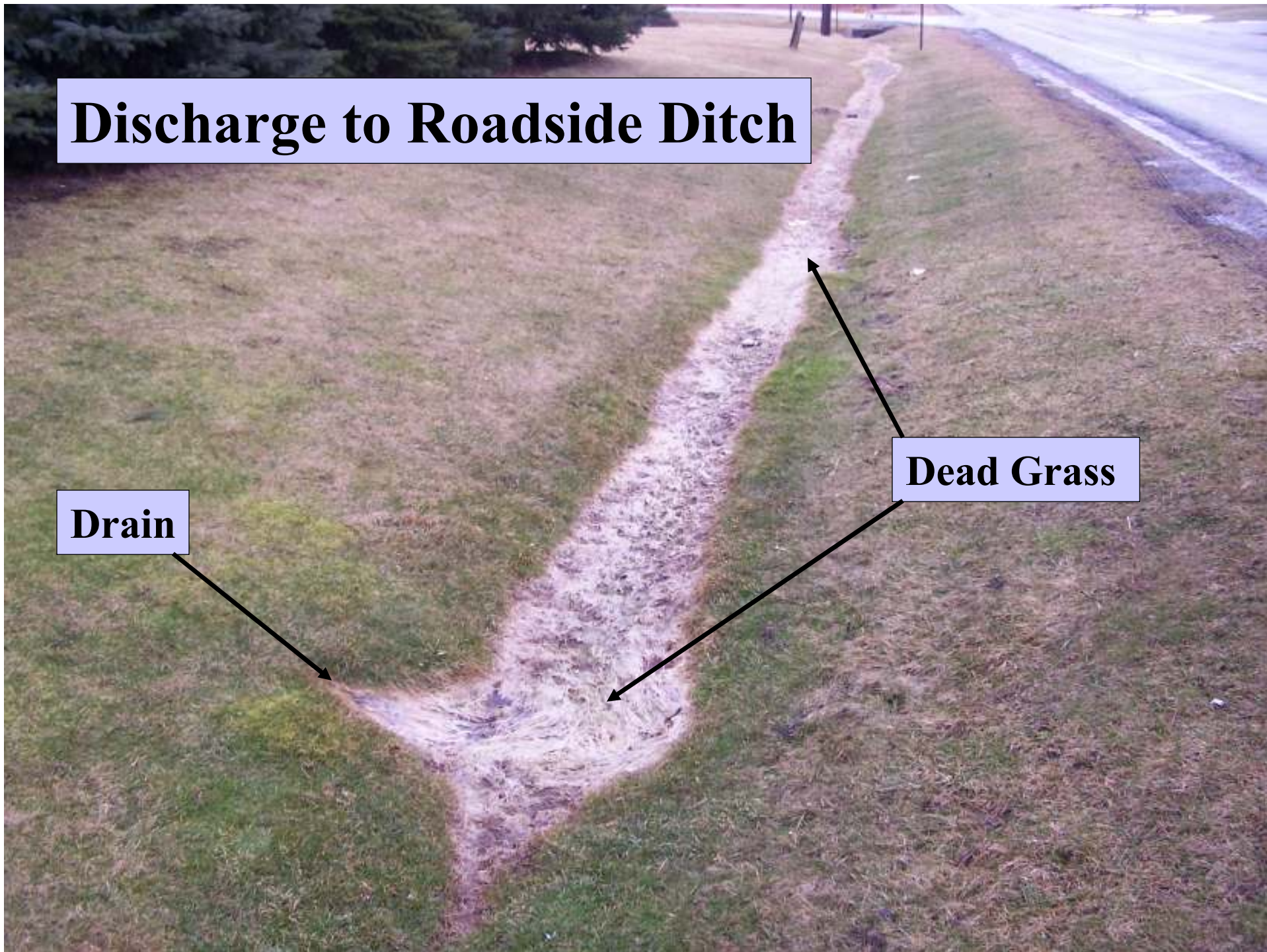
**2 of 7 Homes
Cross-Connected**



Discharge to Roadside Ditch

Drain

Dead Grass



Ex-filtration:

Sanitary Waste Leaking into Storm

- **High Ecoli levels, no floatables/solids**
- **May or may not have staining, odor**
- **Sanitary pipe above the storm**
- **Broken main or lateral**
- **Use Optical Brightener Traps**

**Broken Pipe Leading
to Exfiltration**

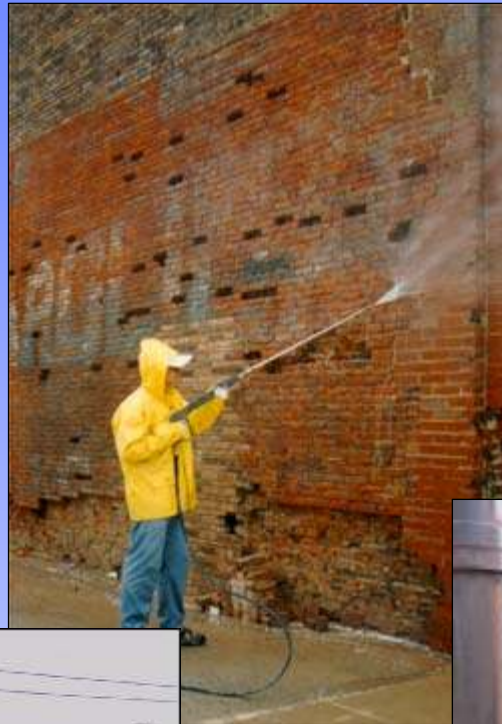




Eliminating the Discharge

- **Identify the source**
- **Notify property owner**
- **Investigation crew determine exact cause**
- **Notice of Violation**
- **Pursue contractor/builder if possible**
- **DES perform residential repair**

Urban Hotspots...Source Control



Implications of an Illicit Discharge Ordinance

- **Enforcement by MS4**
- **Specific language prohibiting illicit connections and illegal discharges**
- **Ensures access to private property**
- **BMP's**
- **May require septic system inspections?**
- **Possible penalties for non-compliance**





Illicit Discharge Task Group

- **Coalition members..... meet monthly**
- **Target Priority Pollutants**
- **Develop Strategies, BMP's**
- **Small Business Pollution Prevention**

Illicit Discharges.....

.....They're Out There

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