

Isolating and Fixing Illicit Discharges

Finding: Illicit Discharge Investigations



- ▶ Storm Drain Network Investigations
- ▶ Drainage Area Investigations
- ▶ On-Site Investigations
- ▶ How to Work with the Local Government

Finding: Storm Drain Network Investigations



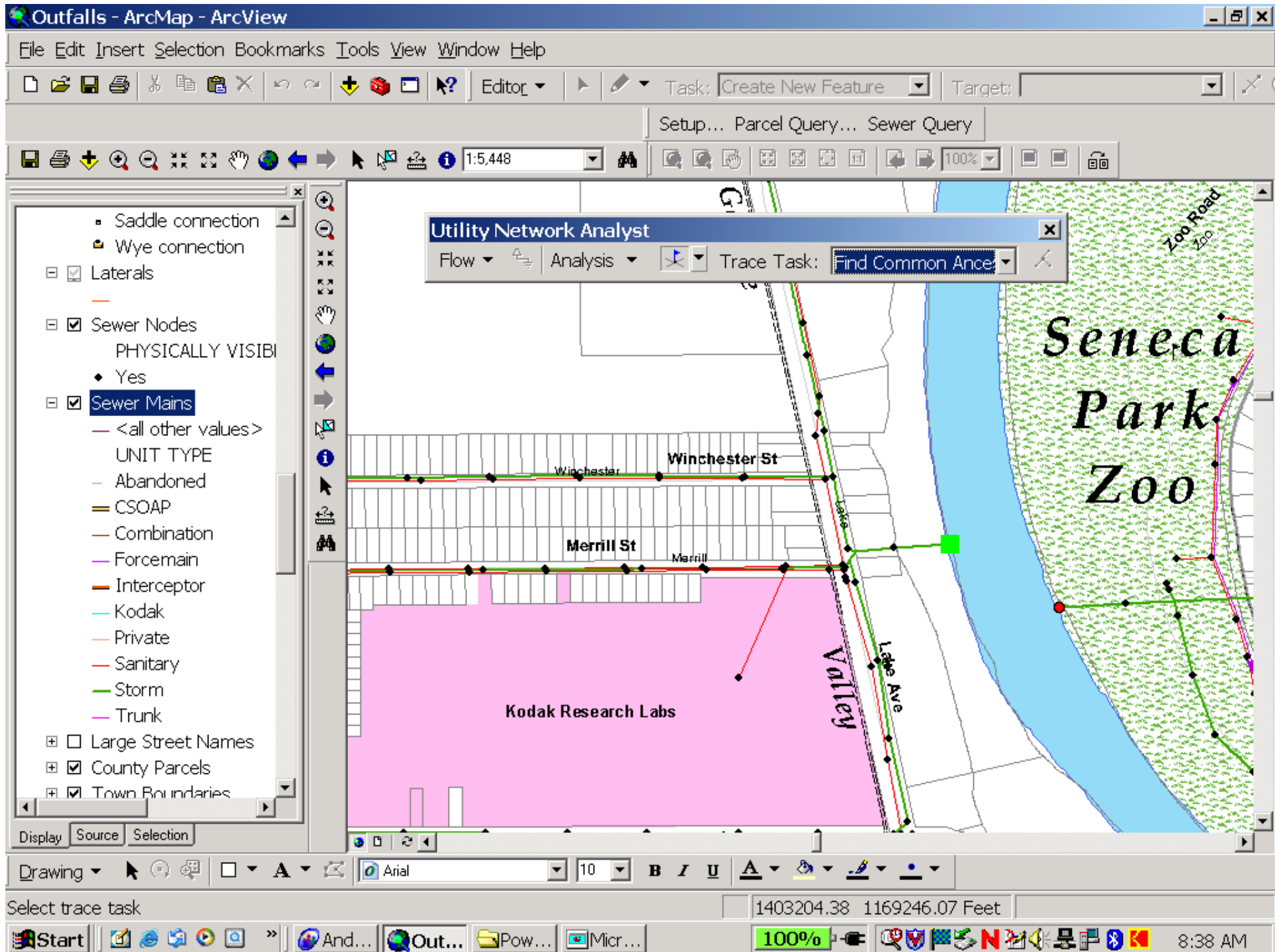
Trunk Investigations –
narrows source to a single
segment of a storm sewer

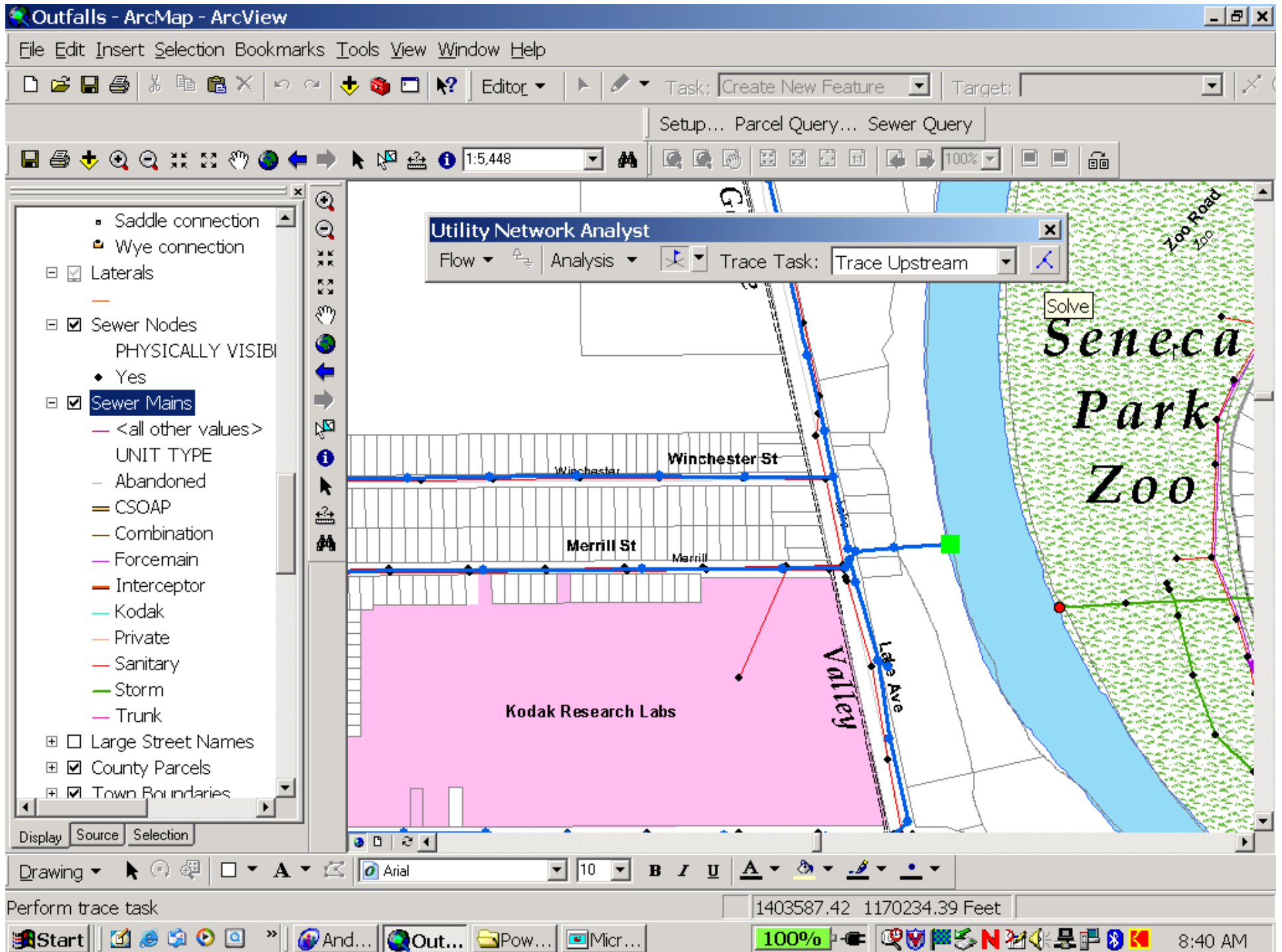
3 Methods for how to Explore
Network:

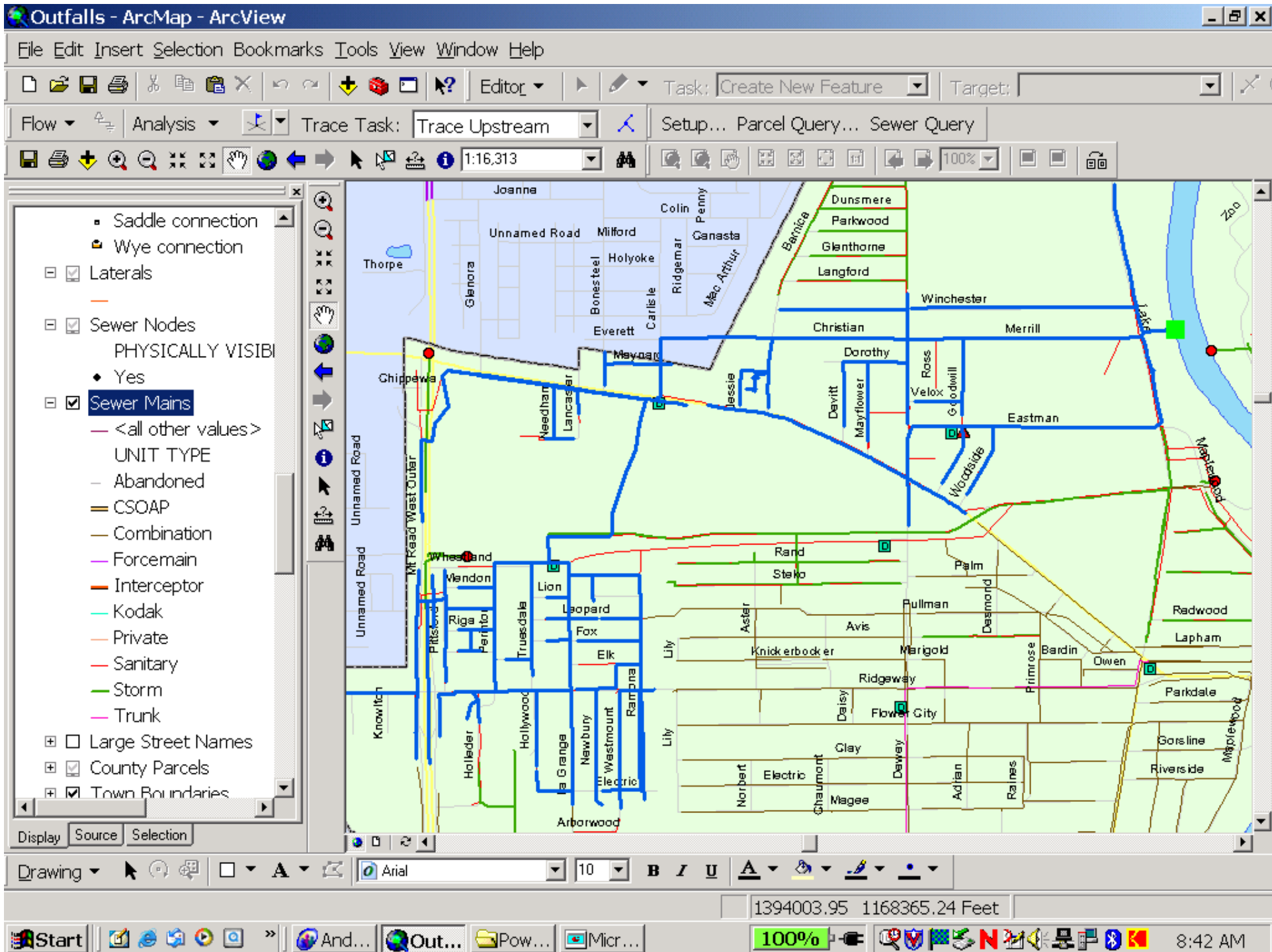
- Move up the trunk
- Split the Storm Drain Network
- Move down the Storm Drain
Network

Example: Use Mapping to Isolate Andy Sansone, Rochester, NY

- ▶ Very large drainage network.
- ▶ Use GIS to isolate discharges to a segment of the storm drain network.
- ▶ Later, follow up with detailed investigations.







Tracking Approach: Manhole Inspections



Source: Ft. Worth DEM

Methods:

- ▶ Visual Observations
- ▶ Indicator Sampling

Considerations:

- ▶ Need crew of 2
- ▶ Dry weather conditions
- ▶ Traffic diversion
- ▶ Proper lifting

Lucky IDDE (Tom Lawrence, City of Memphis, TN)



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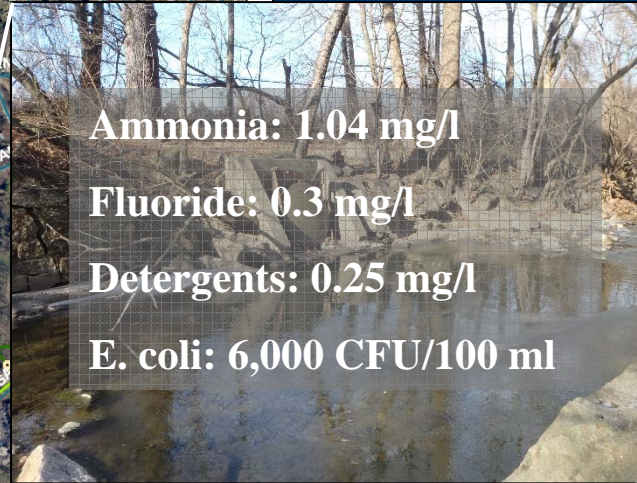
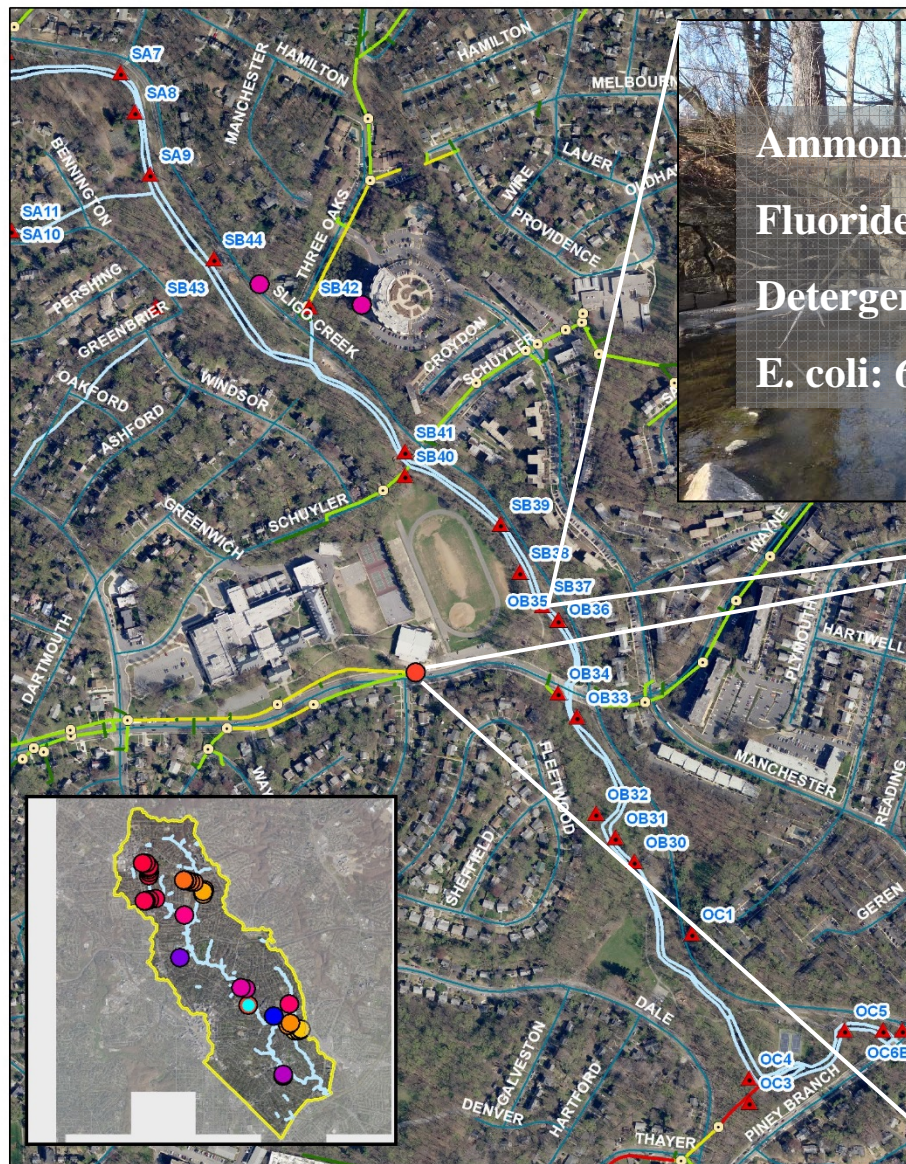


“Lucky IDDE” (Tom Lawrence, City of Memphis, TN)



Some Examples from Maryland

- ▶ Field work by CWP
- ▶ Examples tracking down a couple of discharges
- ▶ Often, initial investigation requires follow-up



Ammonia: 1.04 mg/l
 Fluoride: 0.3 mg/l
 Detergents: 0.25 mg/l
 E. coli: 6,000 CFU/100 ml

- Team walked grounds of International school looking for flow
- No indicators of flow were found in any manholes on school grounds or along Wayne Ave
- Flow likely a cross connection within school
- County will need to access pipe schematics for school and perform dye testing



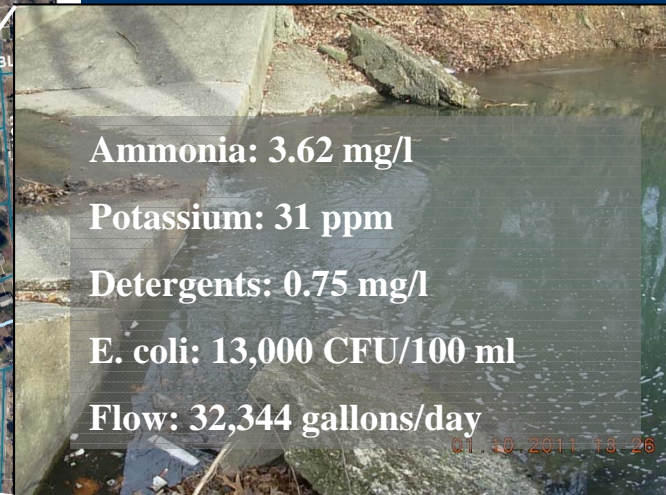
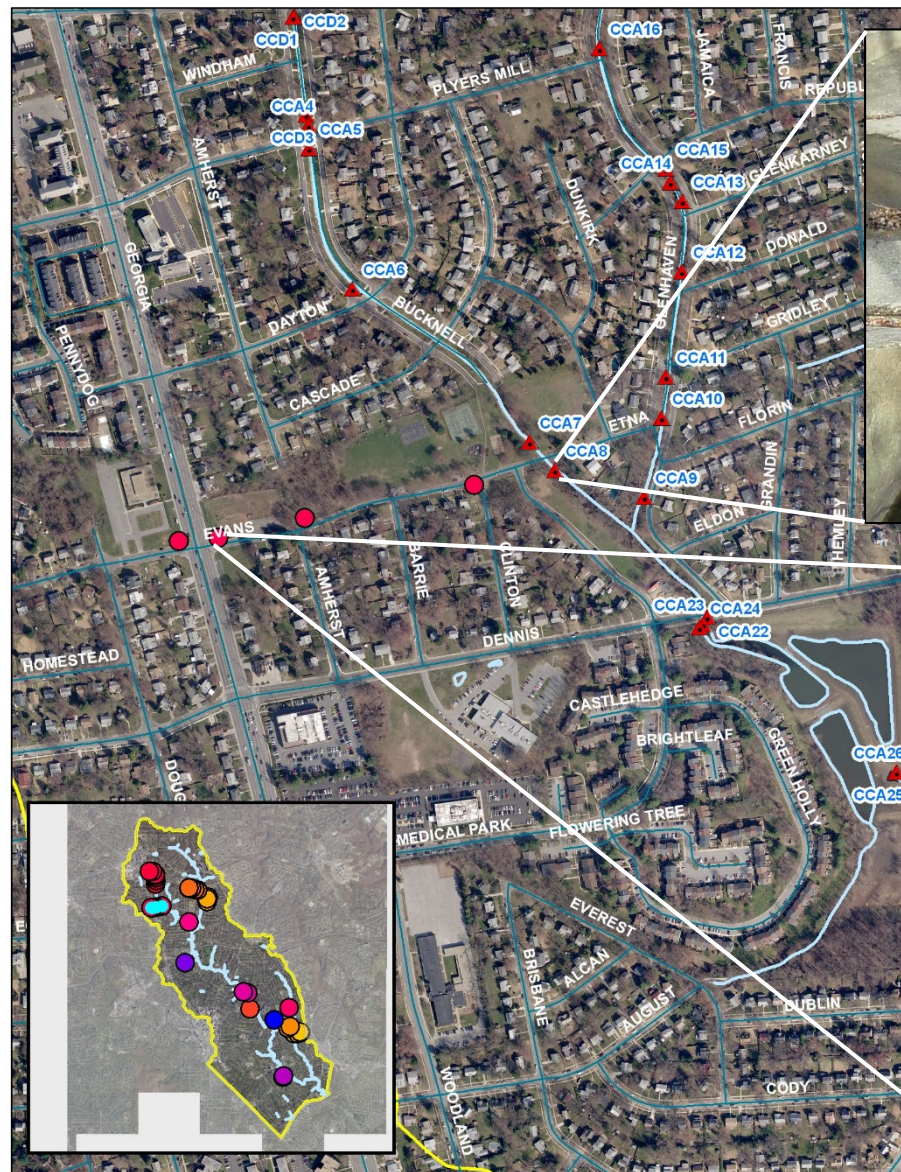
Ammonia: 0.35 mg/l

Fluoride: 0.11 mg/l

Total coliforms: 500 CFU/100 ml

Flow: ~3,381 gallons/day

- Team walked Windham St. and found flow in all manholes
- A fire hydrant up pipe from last flowing outfall may have a leak
- Neighbors report of seeing sump discharges from houses, sometimes with suds
- Discharges from sumps also a potential

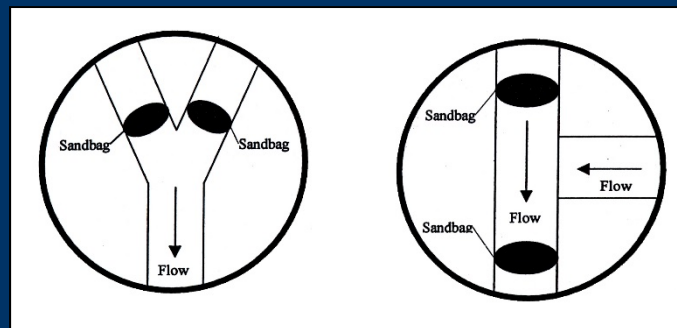


- Team walked Evans Ave, surveying manholes
- Manholes off Evans were dry
- Mapping problematic up-pipe of problem area
- East of Georgia: Ammonia-0.7 mg/l and detergents-0.75 mg/l
- West of Georgia: Ammonia-0.1 mg/l and detergents-0.25 mg/l
- Source likely between the two (still a problem up-pipe?)

Tracking Approach: Isolating Intermittent Discharges



- ▶ Sandbags
- ▶ Optical Brightener Monitoring (OBM) Traps
- ▶ Automatic Samplers
- ▶ Observation of Deposits/Stains



Finding:

Drainage Area Investigations

Survey of drainage area with problem outfall:

- Rapid Windshield Survey
- Detailed Investigation
- Effective if illicit discharge has unique characteristics allowing crews to quickly ascertain probable cause.

Finding: Drainage Area Investigations



Source: R. Frymire

Finding: Drainage Area Investigations



Source: R. Frymire

Finding: On-Site Investigations

Used to pinpoint the exact source or connection producing a discharge within a storm drain network.

3 Basic Approaches:

- ▶ Dye
- ▶ Video
- ▶ Smoke

Dye Testing

Introduce non-toxic dye into plumbing fixtures – if it appears in storm drain then an illicit connection exists.

Useful when:

- Very small drainage area (<10 properties)
- Source from an individual property
- Commercial or industrial land use



Source: NIWPC, 2003

Dye Testing



Source: A. Sansone

Video Testing

Guide a mobile video camera to locate connections producing illicit discharge.



Useful when:

- Continuous discharge
- Discharge limited to single pipe segment
- Communities own equipment for other investigations

Smoke Testing

Introduce smoke into storm drain system and observe where smoke surfaces.

Useful when:

- Cross-connection with sanitary sewer exists
- Identifying other underground sources caused by storm drain damage
- Discharge confined to upper reaches of storm drain network

How can a watershed group work with the local government?

- ▶ Call in findings to hotline (if available)
- ▶ Develop a relationship and report data periodically
- ▶ Local government is in a direct partnership as a part of its program.
- ▶ Specific ideas?

Questions?

