Baltimore City
Department of Public Works

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BALTIMORE CITY
DPW
DEPARTMENT OF PUBLIC WORKS

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Chasing Compliance: Baltimore's Use of IDDE Methods for Bacteria Reduction

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Department of Public Works
City of Baltimore

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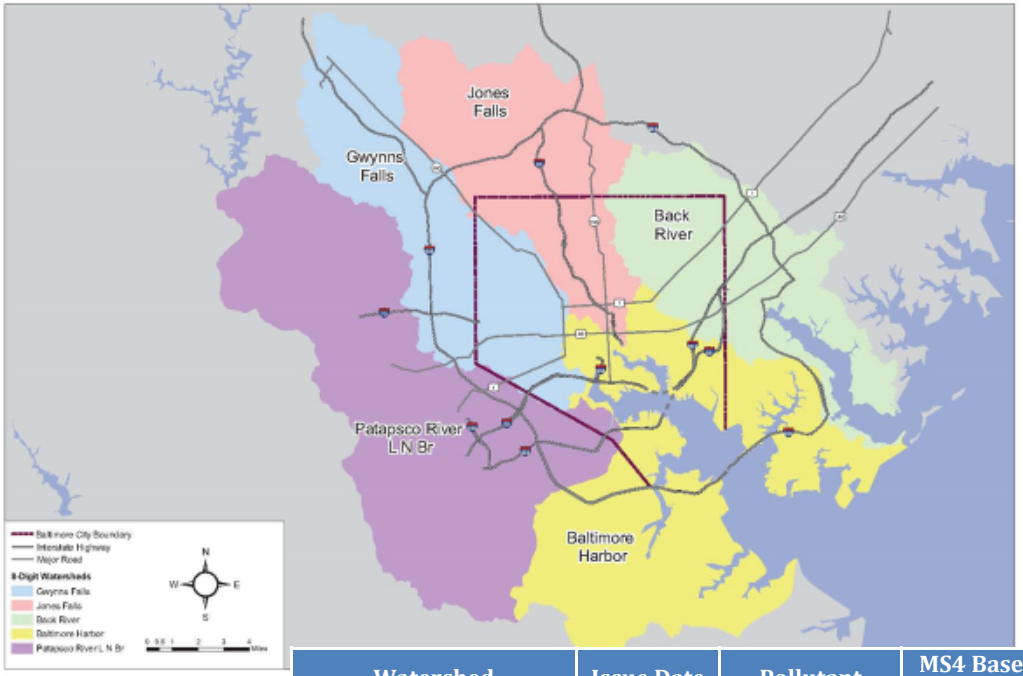
Bacteria TMDLs for Baltimore



- Capital infrastructure improvements
- Traditional, ESD, and Alternative BMPs
- Septic system improvements
- Preventive maintenance
- Education
- IDDE

Watershed	Issue Date	Pollutant	MS4 Baseline Load	WLA	Units	Description	% Reduction
Back River (Herring Run)	2007	E.coli	5,860,942	214,920	Billion MPN/year	Annual Avg.	96.3%
Gwynns Falls	2007	E.coli	98,157	322	Billion MPN/day	Daily	99.7%
Jones Falls	2008	E.coli	8,608	314	Billion MPN/day	Daily	96.4%
Lower N. Branch Patapsco	2009	E.coli	5,393	3,902	Billion MPN/year	Annual Avg.	27.6%

Baltimore's Stormwater System

Collect

- 53,716 inlets
- Clear water connections

Convey

- 1,208 miles pipe
- 116 miles stream

Discharge

- 285 Harbor outfalls
- 1,424 other outfalls

DPW Operations for IDDE

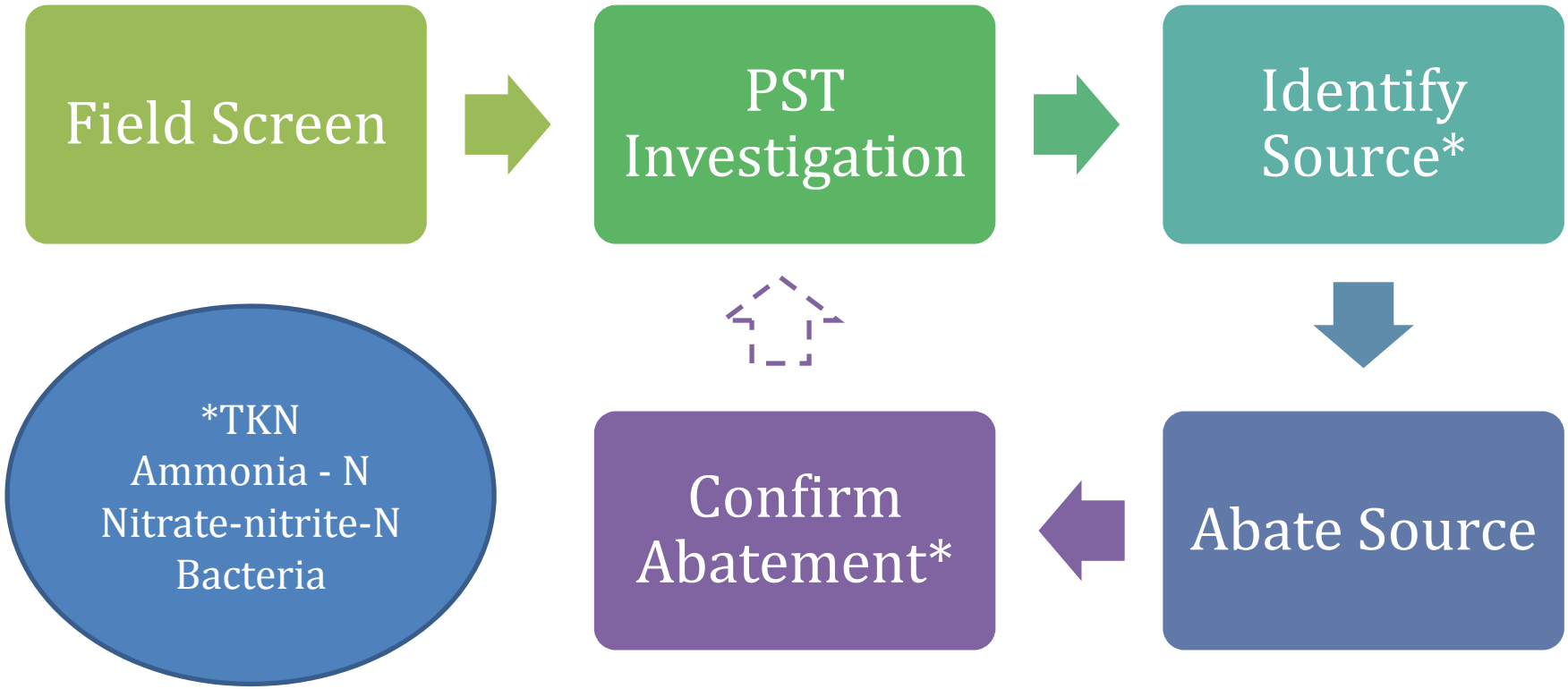
- 14 positions
  - 1 supervisor
  - 8 field
  - 1 data mgt.
  - 4 vacant
- Scientists and engineers, min. bachelors degree

- $2.0 M / year budget
- 3 funding sources
- Some private partnerships and volunteer programs

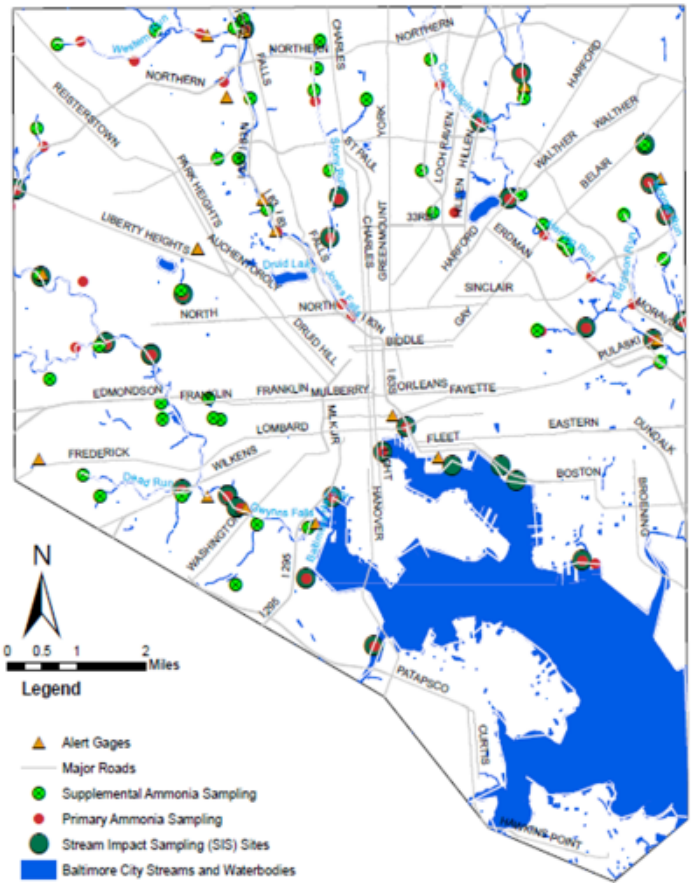
- Weekly field screening at over 80 locations
- FY 2015: 244 pollution source tracking (PST) investigations

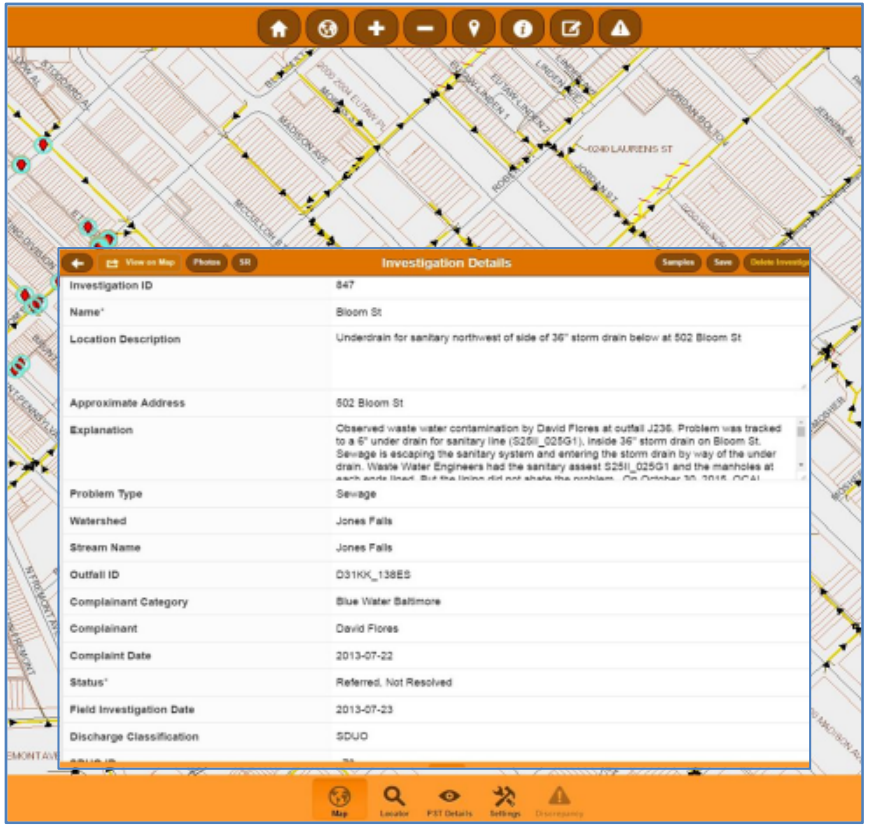
Stream Impact Sampling ● Chemical & Biological Assessment ● 311 Response
SSO Abatement Confirmation ● ERP SSO Sampling ● Flood ALERT Management ● Education

Assessing Pollutant Reductions

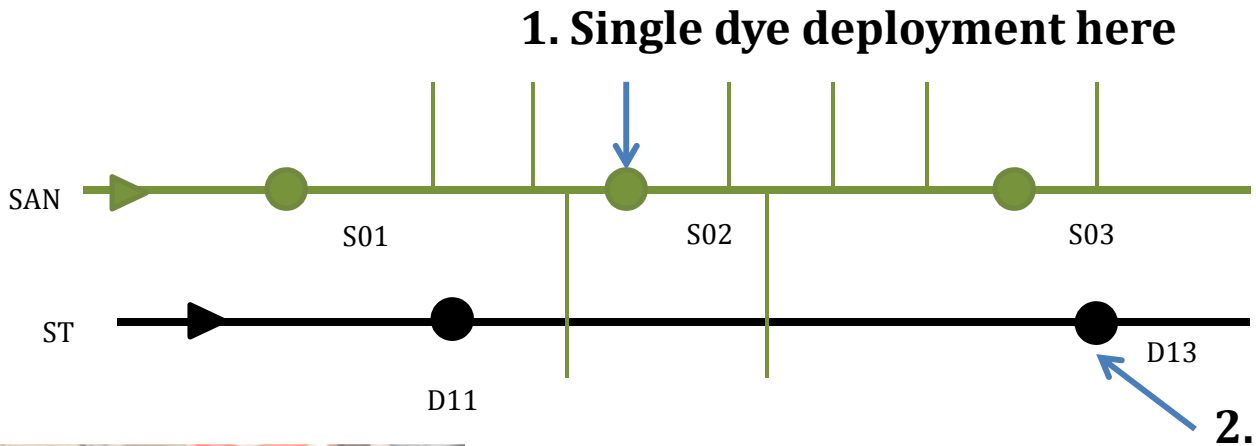


Field Screening & PST





Traditional Dye Testing



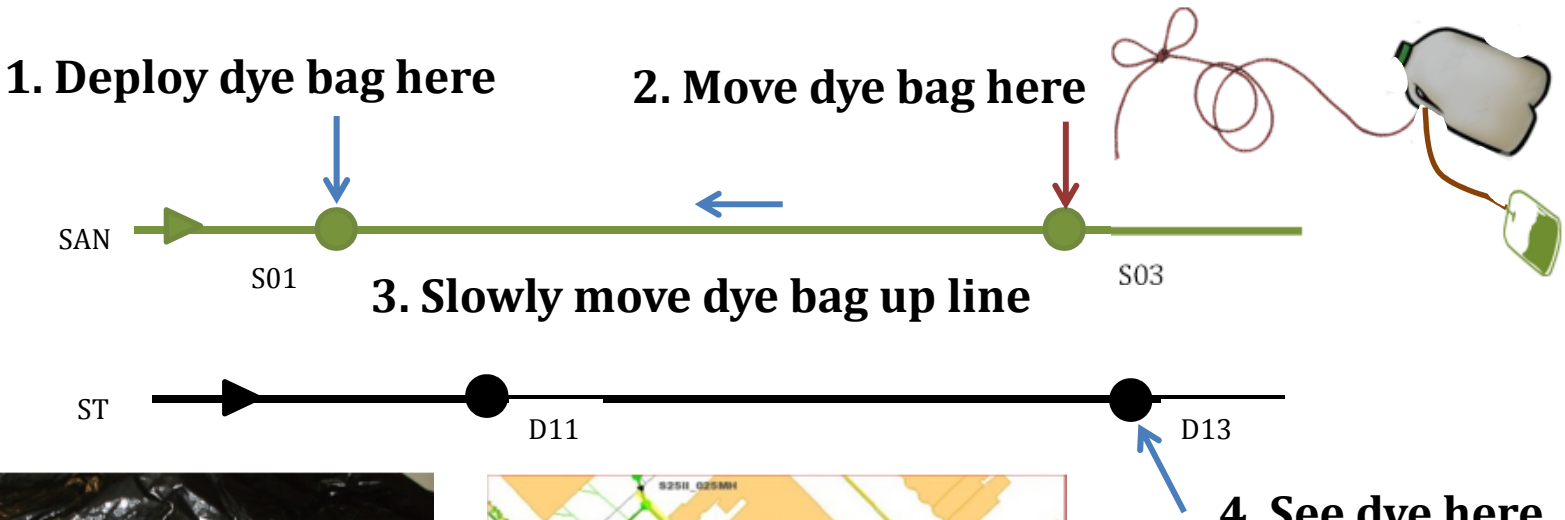
Method	Cost
One-point-repair	$7,800
Lining *	$18,000
Pipe Bursting*	$60,000

* Assumes 400 LF pipe segment.

Alternate 1: Mass Dye

<u>Example:</u>
Small leak with a 130-acre drainage area. Discharge in stream, not storm sewer system.

Alternate 2: Segmental Dye



Example: 370 LF previously lined 14-inch sanitary pipe, where CCTV showed no defects

Other Dye Deployment Methods

Dye tea bag

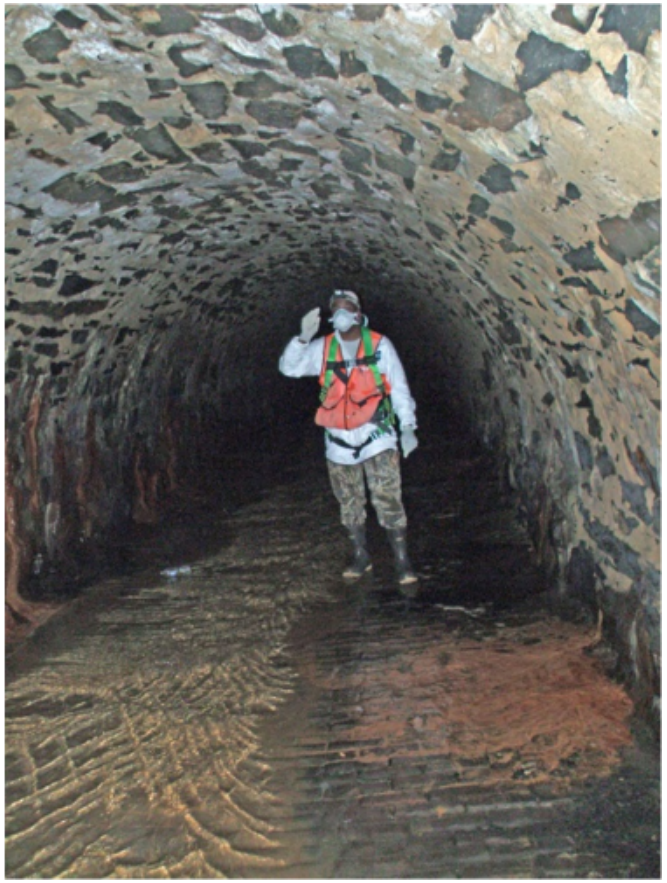
Dye diffuser

Alternate 3: Long Term Dye

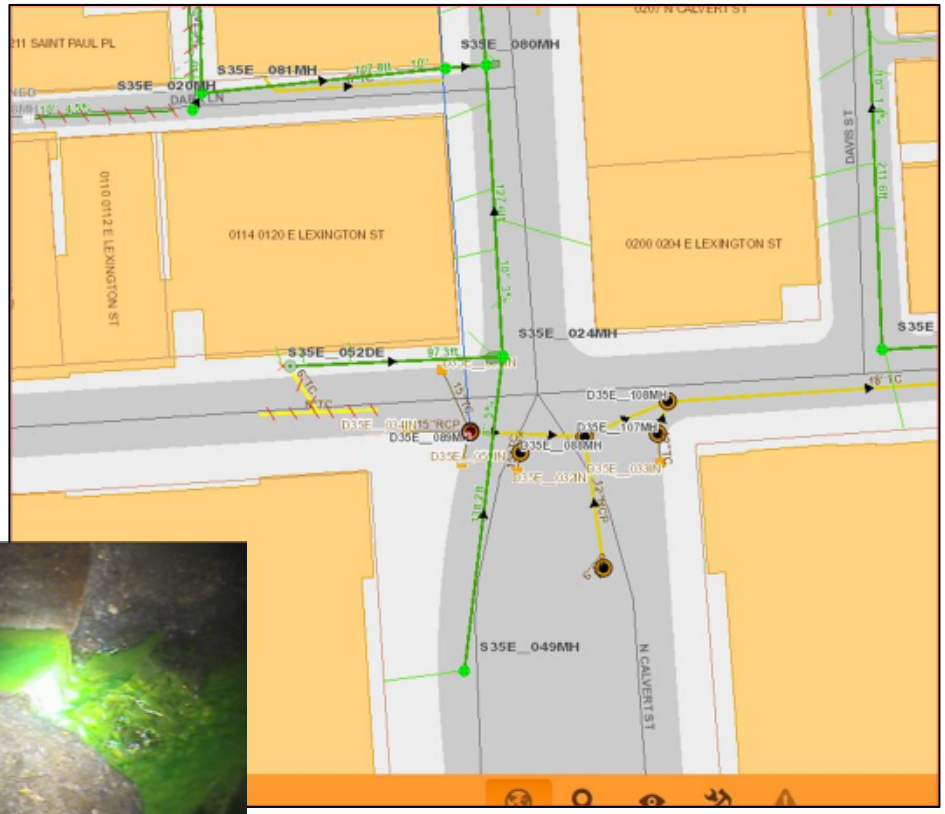
Example:
Closest sanitary asset was not the source.

Visual Assessment

- Storm System
  - Pipe walk with Go Pro
  - Pole camera
  - Push camera
  - Pipeline camera (crawler)
  - Camera locator
- Sanitary System
  - CCTV truck



Case Study: Downtown Investigation



Communication as a Tool

Detection

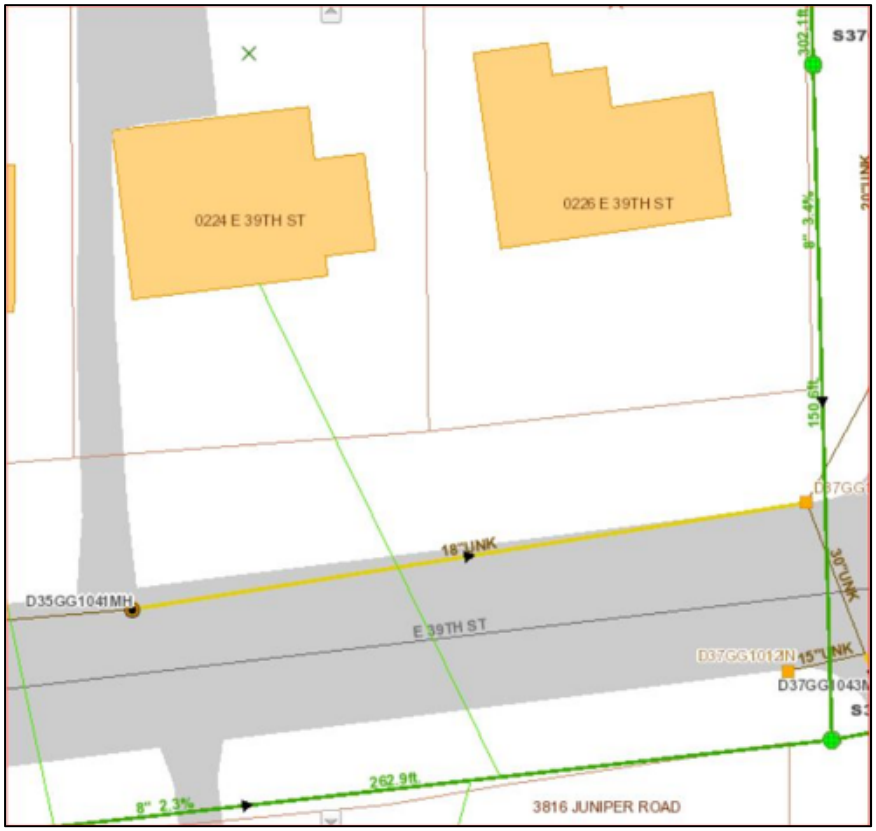
Notification

Education

Enforcement

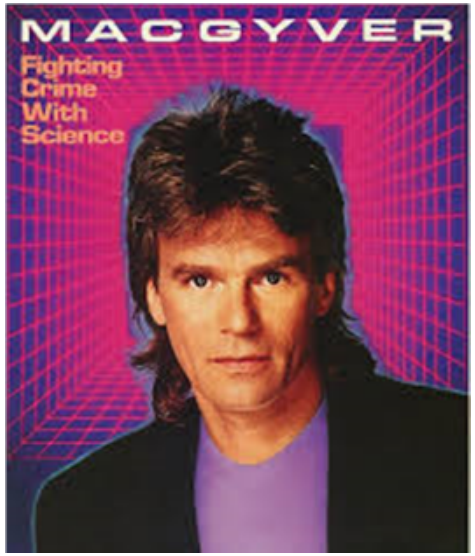
Abatement

Case Study: Small but Complex



Final Thoughts

- An ounce of detection is worth a pound of elimination.
- Double check your work.
- Think outside the pipe.
- Practice patience.
- Communication is key!
- Find your inner McGyver.



Thank You for Your Time.

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