

Illicit Discharge Detection and Elimination Program

Prepared for:

Doylestown Township and Citizens

Doylestown Township, Pennsylvania

March 2, 2010



Introduction



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& ASSOCIATES**

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REGISTERED COMPANY
ISO 9001
ENGINEERING DESIGN

- **Richard Burns, P.G.**
- **Russell Mehalick**

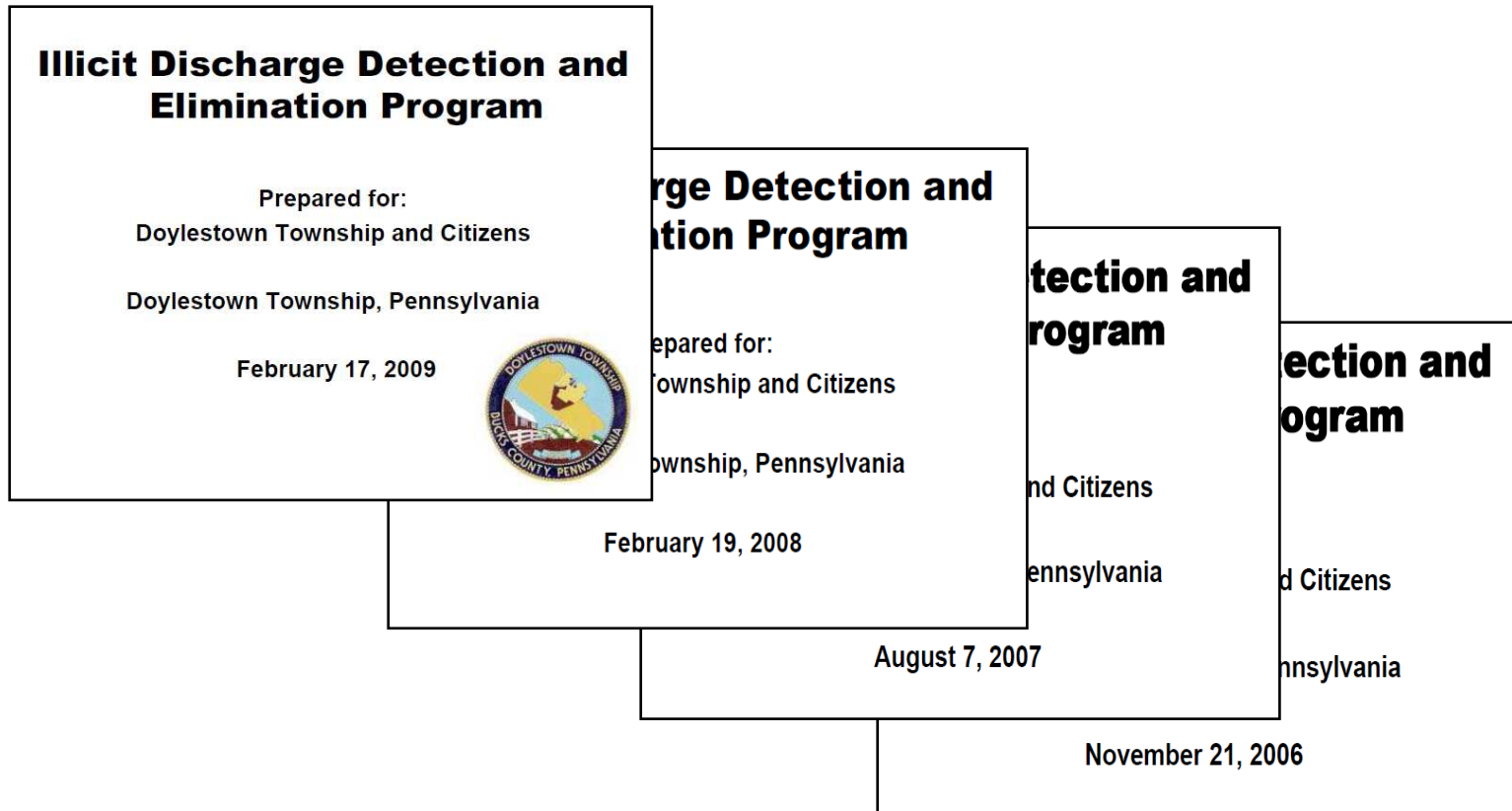


Agenda

- **What is the Illicit Discharge Detection and Elimination (IDD&E) program?**
- **Overview of Program Implementation at Doylestown**
- **Findings**
- **Going Forward**
- **Takeaways**
- **Q&A**



Previous Presentations



2009 presentation available @ Township Website

<http://www.doylestownpa.org/>



Public Information

Local



- <http://www.doylestownpa.org/Stormwater.htm>

State



- <http://www.depweb.state.pa/us> Keyword-Stormwater

Federal



- <http://cfpub.epa.gov/npdes/stormwatermonth.cfm>



What is the IDD&E Program?

- EPA program to monitor non-point source pollution
 - Reduce adverse impacts to water quality
- Doylestown Township
 - Urban Area
 - Small Municipal separate storm sewer systems (MS4s)
- Requirements include:
 - Public education and outreach
 - Public participation and involvement
 - **Monitoring**
 - Construction site runoff control
 - Post-construction runoff control
 - Pollution prevention and good house keeping
 - Best Management Practices (BMPs)



What is an Illicit Discharge?

Definition - Any discharge that is not stormwater runoff

Examples:

- Broken sanitary sewer lines - Fecal Coliform
- Poorly maintained or installed septic systems - Fecal Coliform
- Improper oil, paint, and solvent disposal - chemicals
- Radiator flushing - chemicals
- Spills from roadway accidents - chemicals
- Improper disposal of household toxics - chemicals
- Car washing waste waters – phosphates

How to distinguish between stormwater runoff

- Dry weather flow - No rainfall for previous 72 hours



Dry Weather Inspection – Flow / No Flow



Dry Weather Inspection Indicators of Illicit Discharge



Solids



Suds



Overview of IDD&E Monitoring

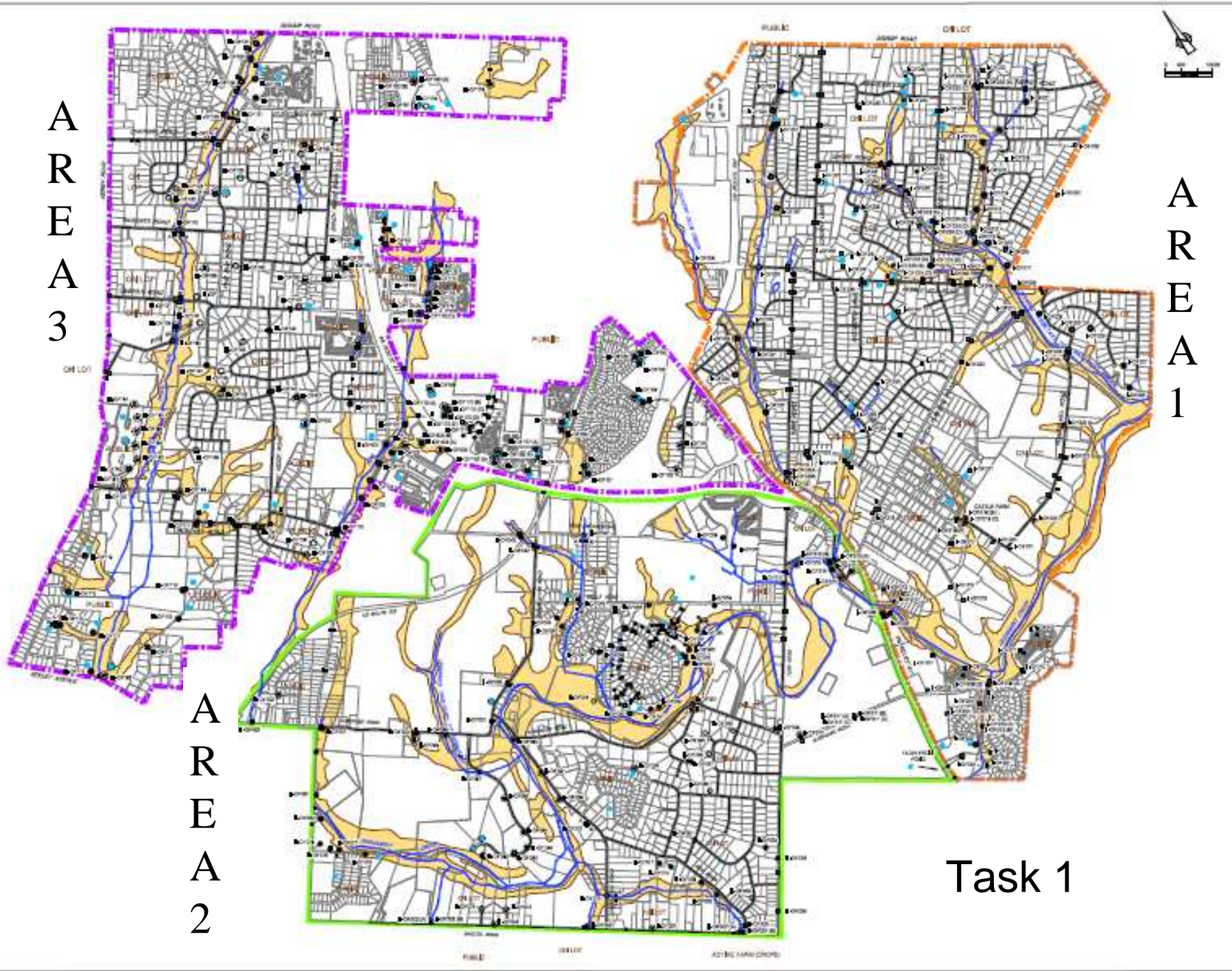
- Task 1 – Mapping - Township divided into 3 areas
- Task 2 - Locate outfalls through inspections
- Task 3 - Inspect outfalls during “dry weather” and sample those with flow
- Task 4 - Review lab data / submit annual report to PADEP
- **Task 5 - Attempt to locate sources of illicit discharge**



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Task 1

IDD&E Monitoring Efforts

- **2005 – 2007 (Tasks 2 - 4)**
 - Areas 1, 2, & 3 - Outfall Inspections, Sampling, Source Tracing
 - Sample Analysis and Review
 - Reports submitted to PADEP
- **2008 (Tasks 3 - 5)**
 - Focused inspections/sampling in identified problem areas
 - Sample Analysis (includes Fecal Coliform and Fecal Strep)
 - Review of Data / Report to PADEP
 - TV inspections of storm lines upstream of identified problem outfalls



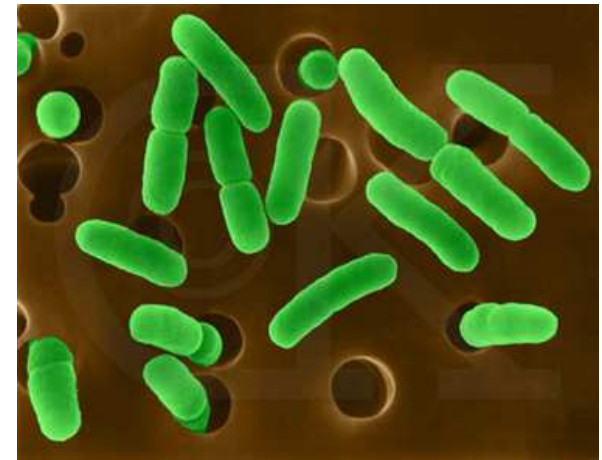
IDD&E Monitoring Efforts

- **2009 (Task 5)**
 - Focused inspections/sampling further
 - Sample Analysis (Fecal Coliform)
 - Review of Data
 - TV inspections of storm lines upstream of identified problem outfalls
 - Dye Tracing of Residential Septic Systems
 - Report to PADEP



What are Fecal Coliform Bacteria?

- Microscopic organisms that live in the digestive tract of humans and other warm-blooded animals
- They also live in the waste material excreted from the intestinal tract
- Fecal coliform bacteria *may* indicate the presence of disease-carrying organisms
- Common Sources
 - Humans
 - Pets
 - Livestock and agricultural practices
 - Birds



Is Fecal Coliform a Good Measurement?

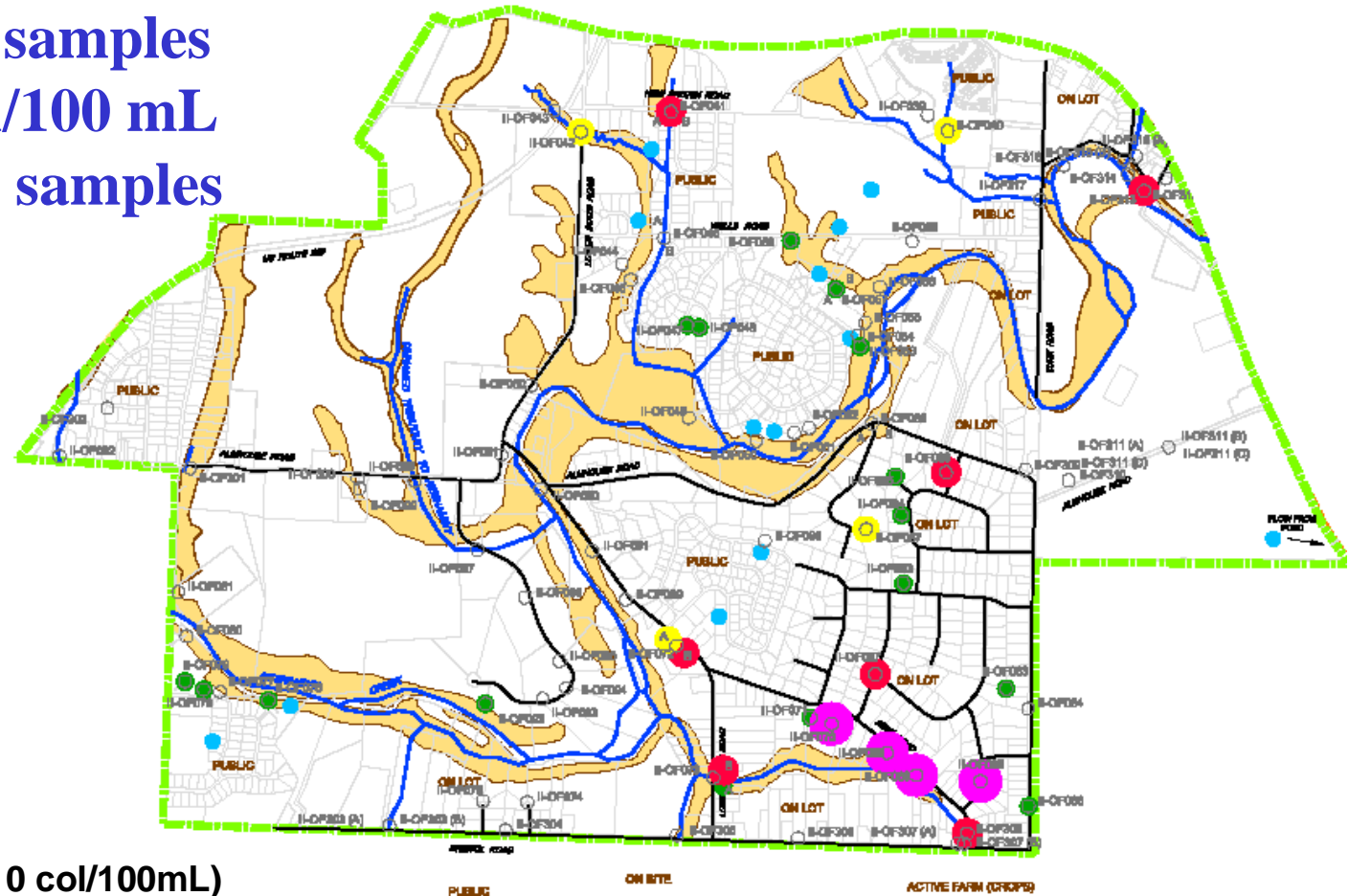
- Fecal Coliform multiply quickly
- Fecal Coliform do not live long
- Dry Weather sampling increases the chance that the Fecal Coliform measured is from sewage
- **Sampling for Fecal Coliform is the single best measurement available at this time.**
- Sampling for Fecal Streptococci provides additional supporting evidence.



2007 Results Area 2 - Round 2



42% of all 2007 samples had FC >100 col/100 mL
28 of 66 total samples

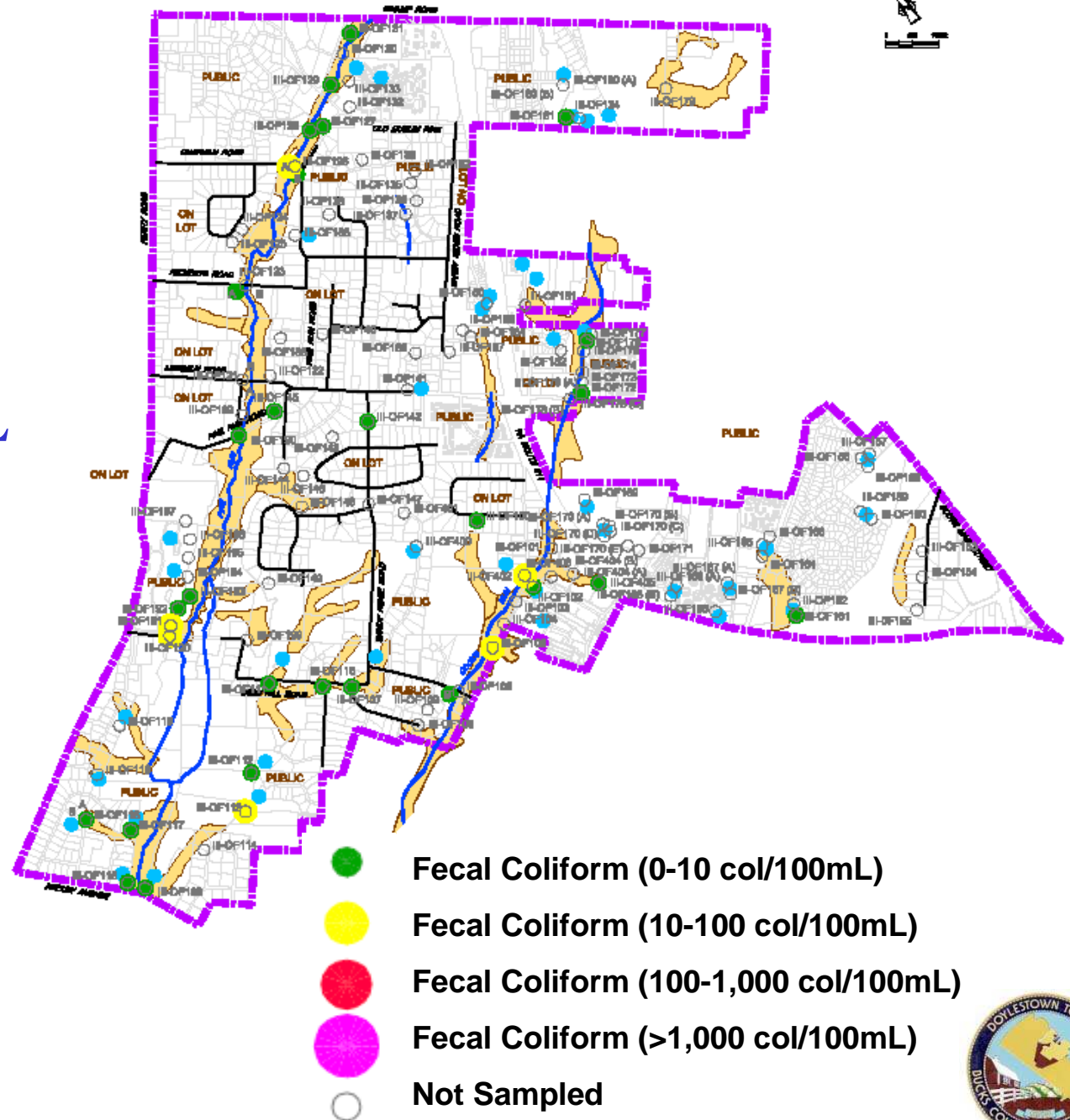


- Fecal Coliform (0-10 col/100mL)
- Fecal Coliform (10-100 col/100mL)
- Fecal Coliform (100-1,000 col/100mL)
- Fecal Coliform (>1,000 col/100mL)
- Not Sampled



2007 Results Area 3 - Round 2

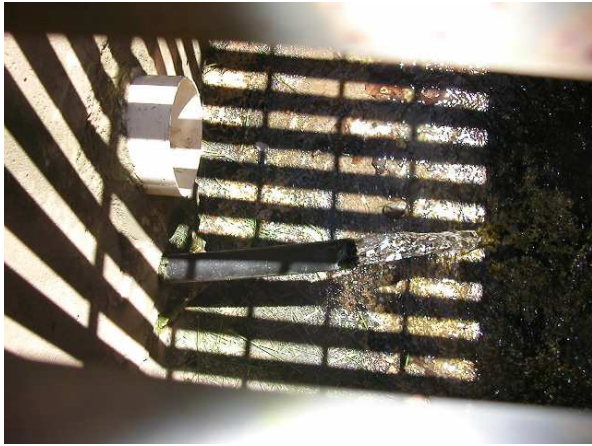
No samples had
FC >100 col/100 mL



2007-08 Source Investigations

- Sampling (Areas 1 & 2)
 - Samples were collected at outfalls previously exhibiting elevated Fecal Coliform concentrations
- Source investigations involved visual tracing of dry weather flow back to a potential source and, if found, a sample was collected





Example of tracing a discharge back to a source



2008 Sampling Results

Area 1

- 6 confirmatory samples at 5 problem outfalls
- 17% (1 of 6 samples) = >200 col/100 ml
- Maximum FC = 900 col/100ml

Area 2

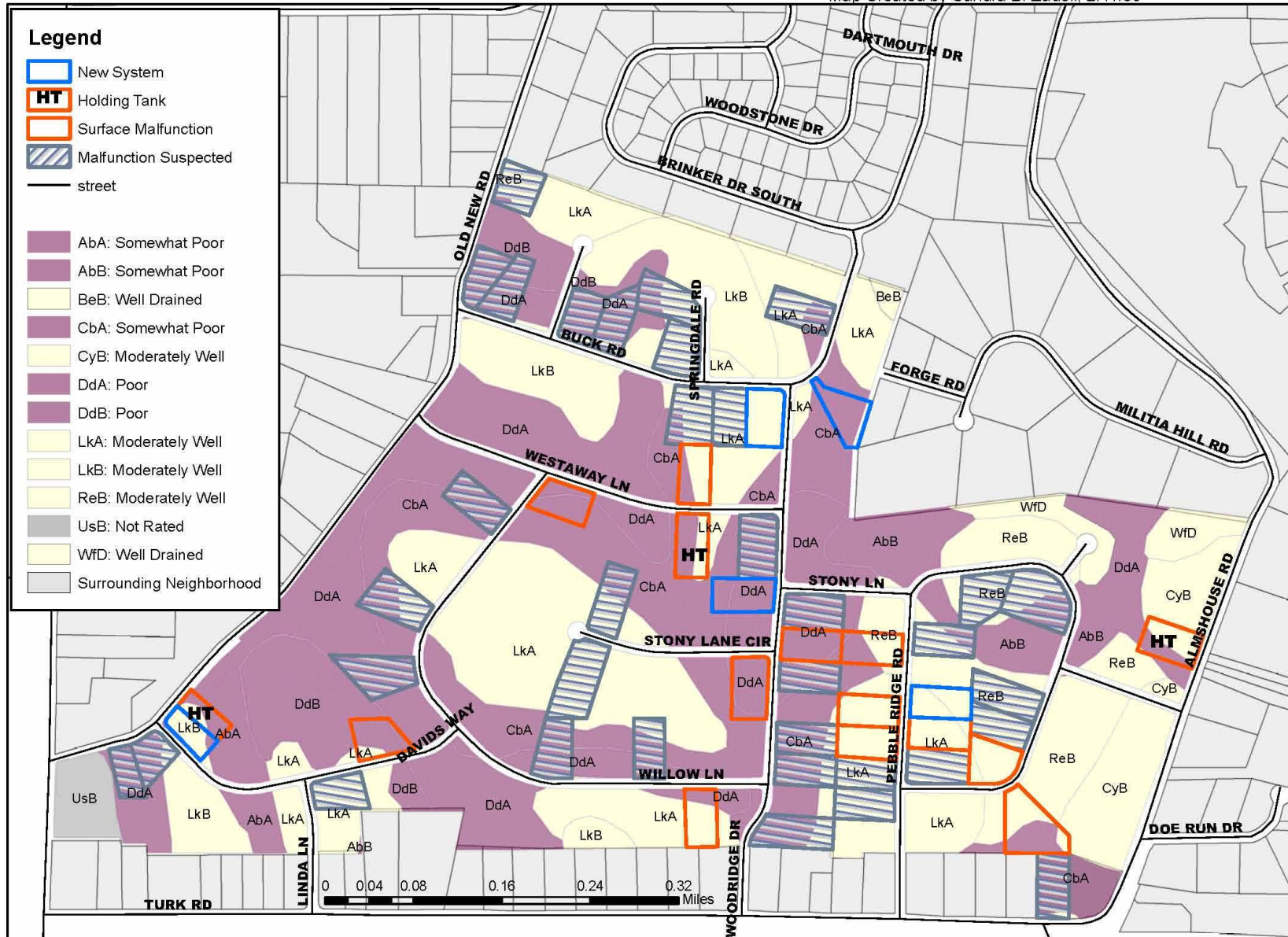
- 22 confirmatory samples at 15 problem outfalls
- 68% (15 of 22 samples) = FC >200 col/100ml
- One outfall (OF313) = FC & FS $>600,000$ col/100ml



Soil Survey - 2008

Boucher and James Study Findings with Soils

Map Created by Sandra B. Zadell, 2.11.09



2009 Sampling Results

Area 2

- 5 samples
- 100% samples = FC >600 col/100ml
- One outfall (OF068) = FC & FS >6,000 col/100ml

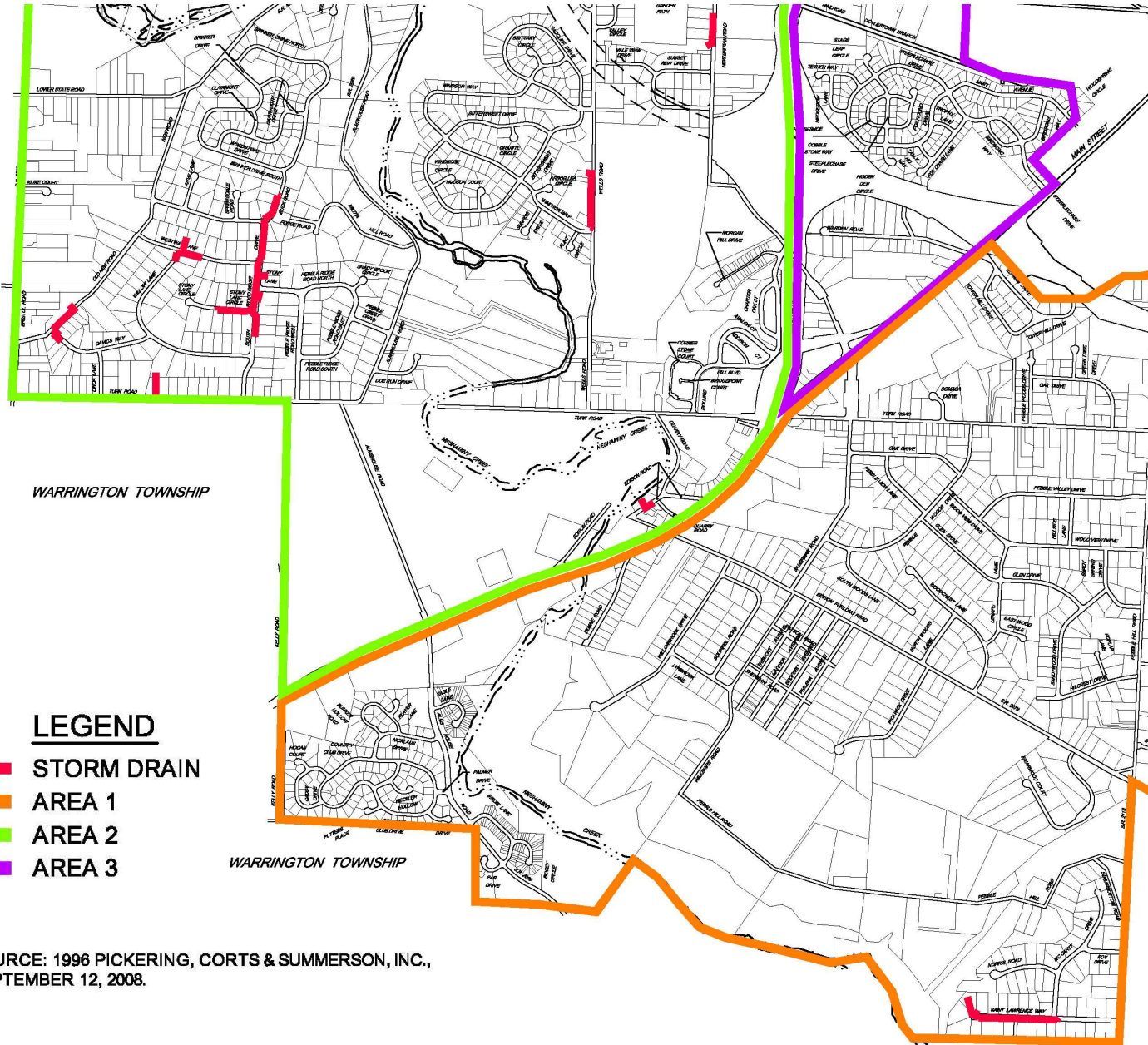


Television Studies

- To further identify the ultimate source, television studies of select storm sewer pipes were conducted
- Storm sewer lines for 9 outfalls were televised based on elevated sampling data (e.g. Fecal Coliform) or visual observations (e.g. soap suds):
 - Area 1 – 1 outfall
 - Area 2 – 8 outfalls



Storm Drain Inspection Map



SOURCE: 1996 PICKERING, CORTS & SUMMERSON, INC.,
SEPTEMBER 12, 2008.

Storm Sewer Television



Storm Sewer Television



Rotating Camera



Storm Sewer Television

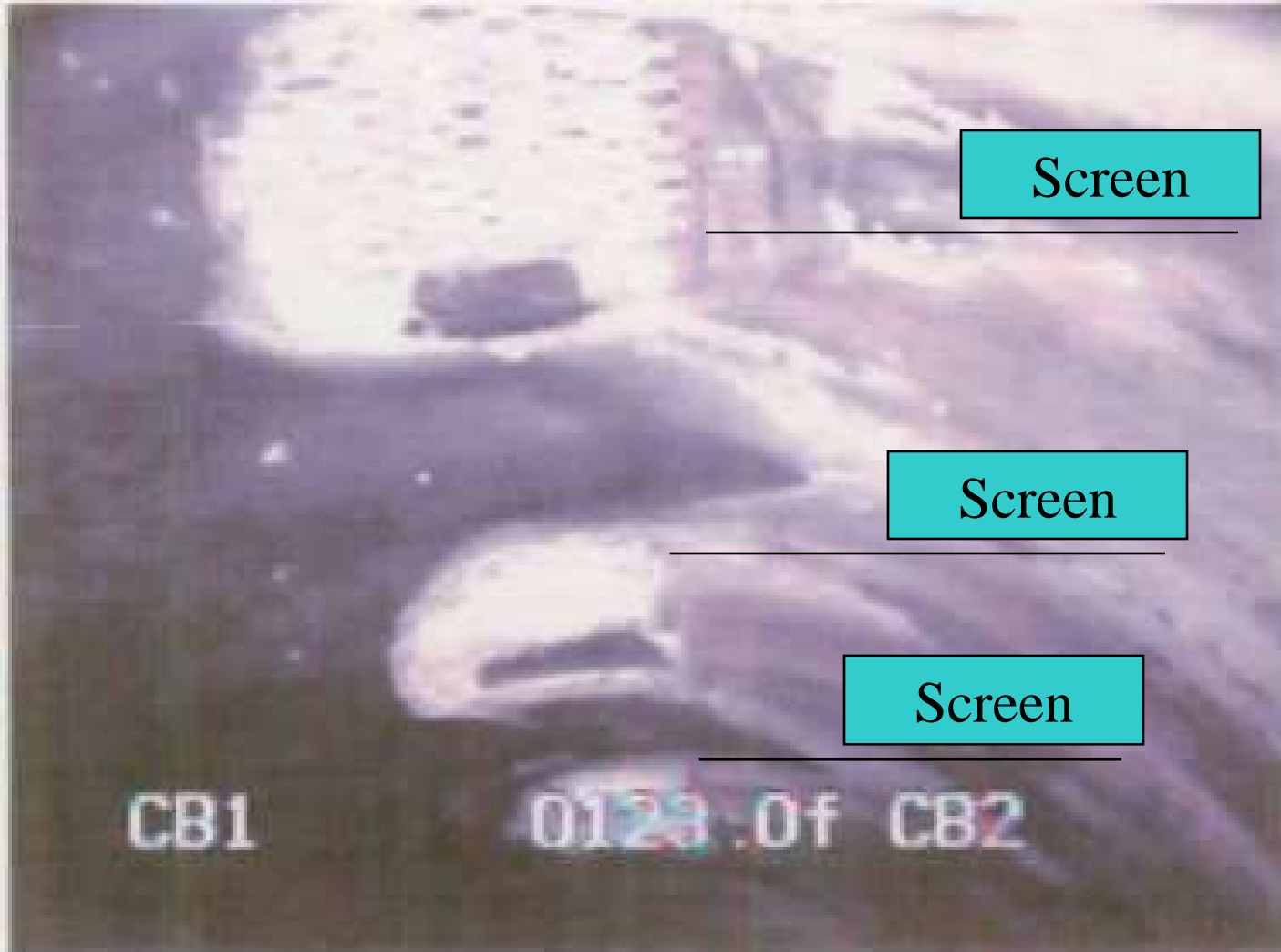
Inserting Camera into
Catch Basin



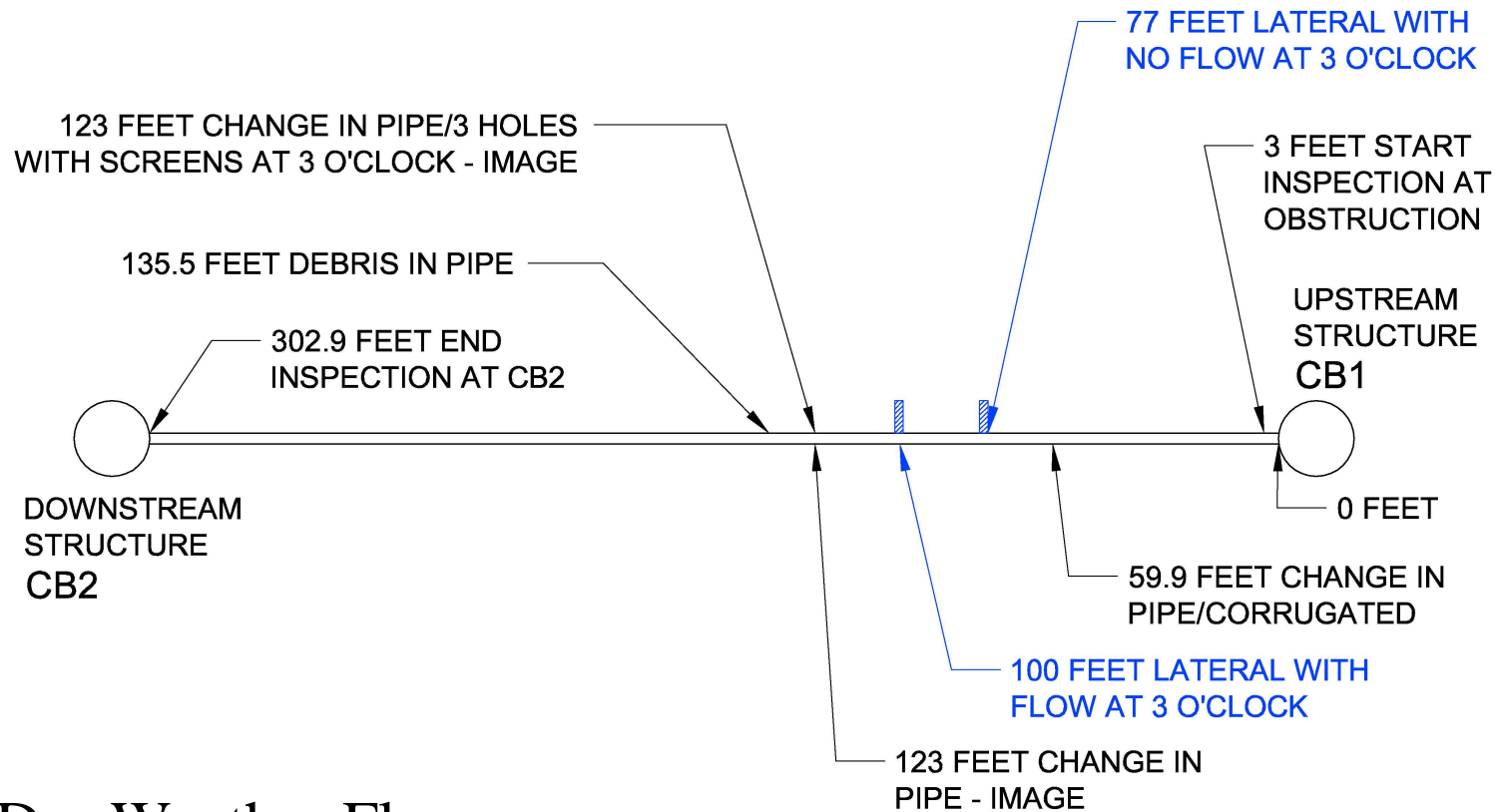
Storm Sewer Television



Storm Sewer Television



Storm Sewer Television Field Report



Dry Weather Flow



Summary of TV Findings

- Identified potential IDD&E sources at 7 of 9 outfalls
- Identified flow in several storm drain laterals
- This information used to focus sampling and dye tracing activities



Dye Tracing

- Township submitted questionnaires to select residents in identified problem areas
- Narrow investigation of potential problem laterals through sampling and/or dye tracing
- Dye tracing of individual properties (with owner's consent)
- Sampling/analysis of select dry weather outfalls and source areas with historical impact
- Additional source investigations, if necessary
- Source Mitigation



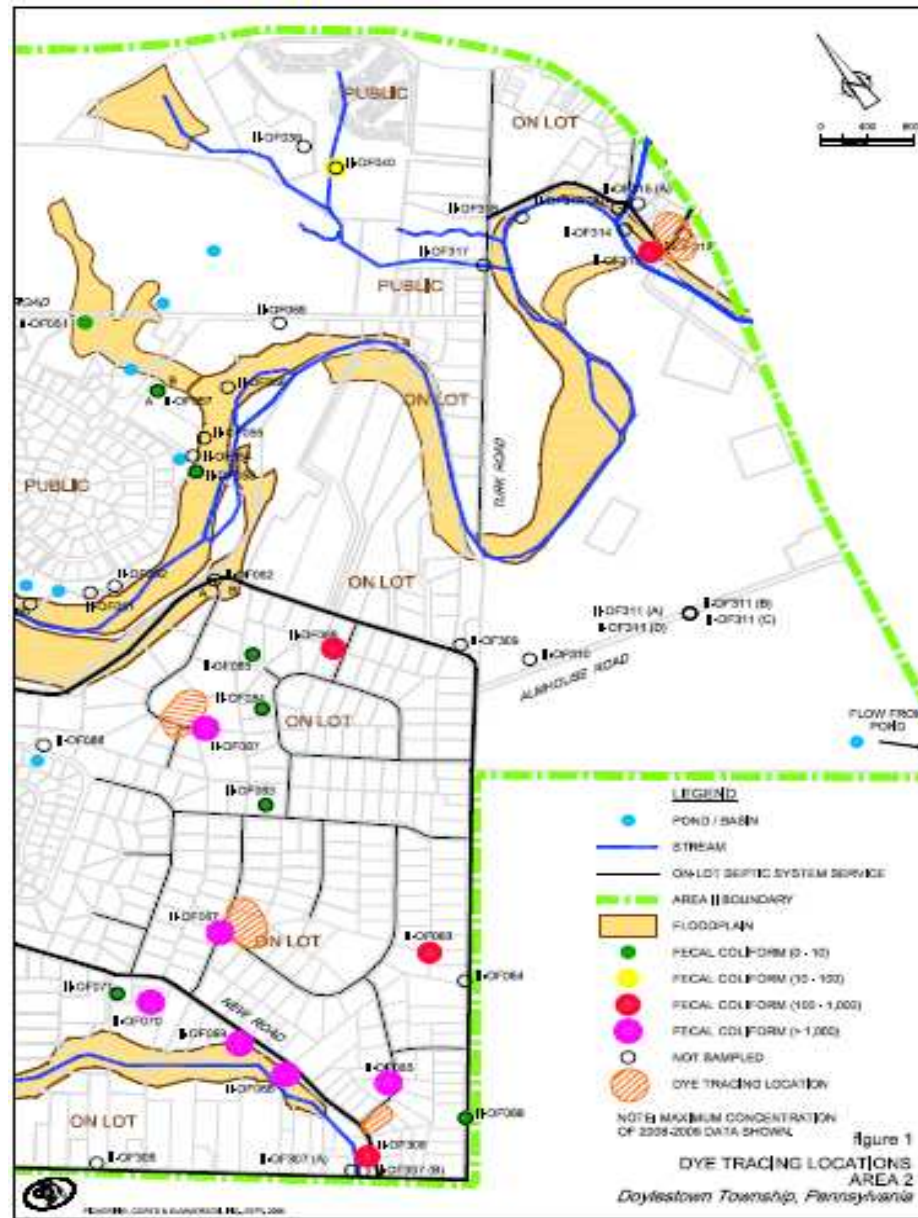


Dye Tracing

- **Purpose** – Evaluate if septic system is leaking (or directly connected) to the Township storm water system
- **Method** - Flush dye through septic system via toilet or sink. Observe yard and storm water basins in street
- **Dye** - Non-toxic. Material Safety Data Sheets (MSDS) will be provided to homeowners. Authorities will be notified
- EPA-recommended method to determine sources in IDD&E Program

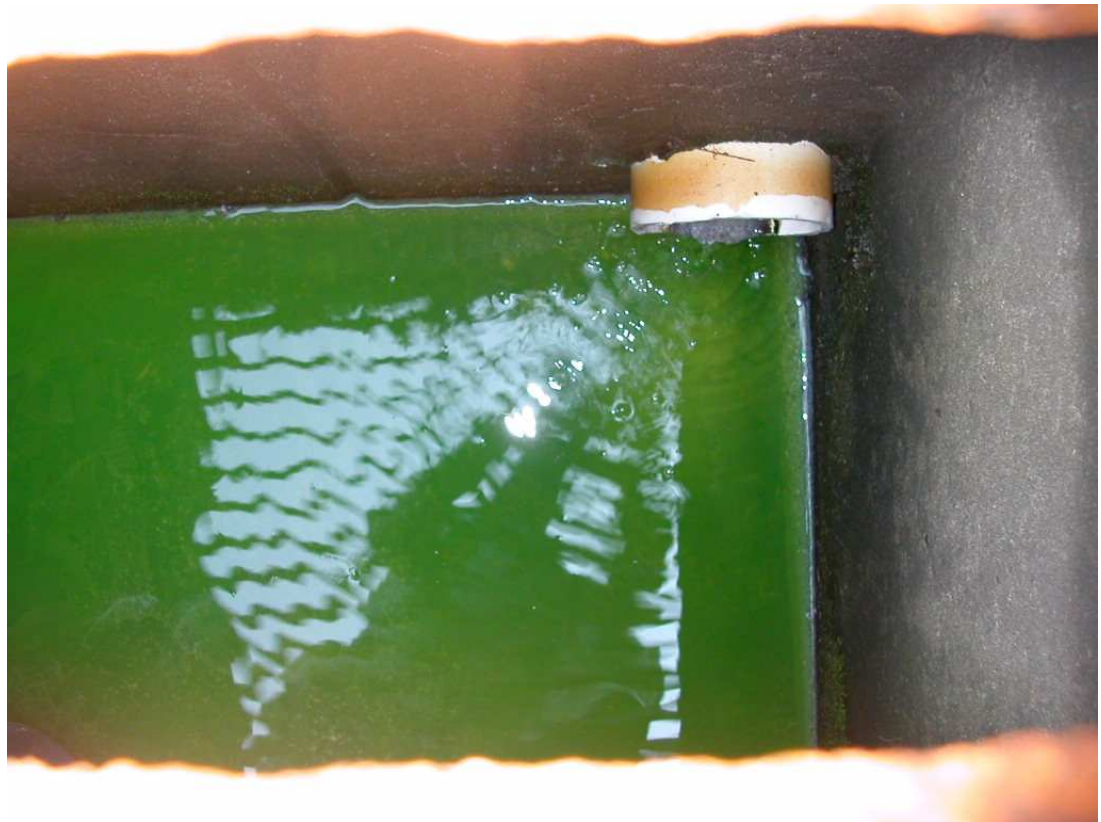


Dye Tracing Locations



Dye Testing Results

- 8 Dye Tests
- 1 test indicated failing septic system or direct connection to storm sewer (photo)
- Results provided to Township



Going Forward

- Township submitted additional questionnaires
- Conduct additional dye tracing 2010
- Sampling/analysis of select dry weather outfalls and source areas with historical impact
- Additional source investigations, if necessary
- Source Mitigation



Takeaways

- PADEP-required monitoring / reporting
- Sample Analysis (Fecal Coliform)
- **Locate sources of illicit discharge**
 - TV inspections of storm lines
 - Dye Tracing of Residential Septic Systems
- Public participation
- Pollution prevention & good housekeeping
- Septic system maintenance
- Township is in Compliance
- **Goal is to Improve Water Quality!!!**

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