

# Improved MS4 Permit Data Management, Field Inspections, and Annual Reporting

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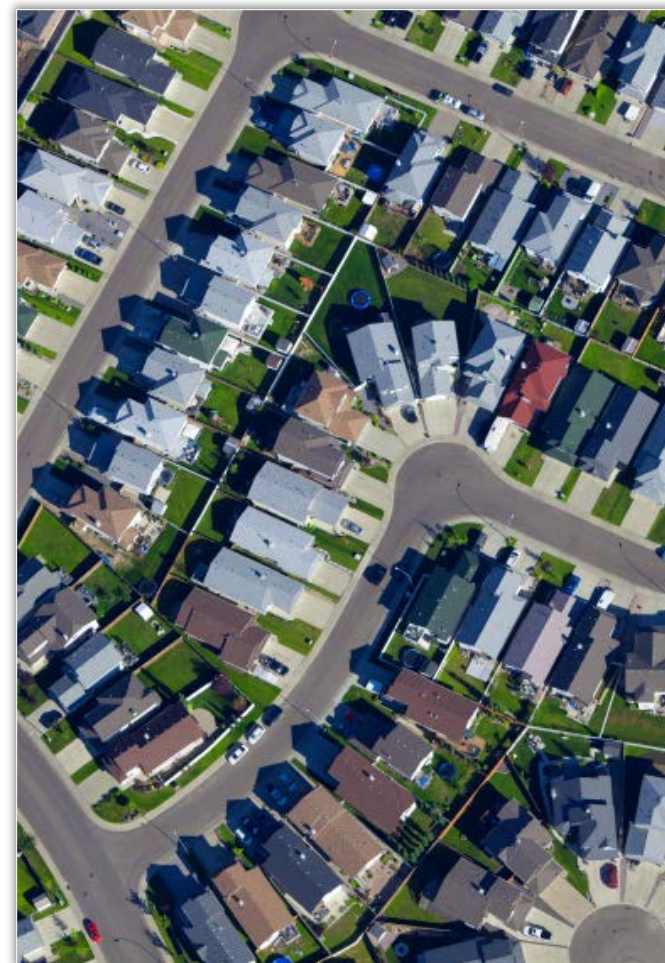
# About Houston Engineering, Inc. (HEI)

- Engineering consulting firm
- Provide GIS and web services and solutions nationally
- In-house application development
- Water resources
- Stormwater regulations



# What is an MS4?

- Municipal Separate Storm Sewer System (MS4)
- An MS4 is a conveyance or system of conveyances that is:
  - Owned by a state, city, town, village, or other public entity that discharges to US waters.
  - Designed or used to collect or convey stormwater (including storm drains, pipes, ditches, etc.).
  - Not a combined sewer.
  - Not part of a publicly-owned treatment works (sewage treatment plant).



# MS4 Permit Background

- National Pollutant Discharge Elimination System (NPDES) authorized by the Clean Water Act in 1972
- 3 Categories of NPDES Stormwater Program
  - Construction
  - Industrial
  - Municipal (MS4)
- Approximately 750 Phase I MS4s (1990)
- Approximately 6,700 Phase II MS4s (1999)



# MS4 Permit Background

- **Goal:** Prevent stormwater runoff from washing harmful pollutants into local surface waters such as streams, rivers, lakes, or coastal waters
- Regulatory authority is delegated to most states from the EPA



# EPA MS4 Permit Framework

## Minimum Control Measures

1. Public Education & Outreach
2. Public Participation
3. Illicit Discharge Detection & Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management
6. Pollution Prevention/Good Housekeeping



# Why is Mapping an MS4 Important?

## Example Permit Provision

3.2.1 The permittee must maintain an up-to-date and accurate storm sewer system map.

- a. The storm sewer system map must show the following, at a minimum:
  1. The location of all MS4 outfalls and drainage areas contributing to those outfalls that are operated by the permittee, and that discharge within the permittee's jurisdiction to a receiving water
  2. The location (and name, where known to the permittee) of all waters receiving discharges from those outfall pipes. Each mapped outfall must be given an individual alphanumeric identifier, which must be noted on the map. When possible, the outfalls must be located using a geographic position system (GPS) and photographs should be taken to provide baseline information and track operation & maintenance needs over time.<sup>4</sup>
  3. Priority areas identified under Part 3.3
  4. Field screening stations identified under Part 3.4.2.a
- b. A copy of the storm sewer system map must be available onsite for review by the permitting authority.

# Why is Mapping an MS4 Important?

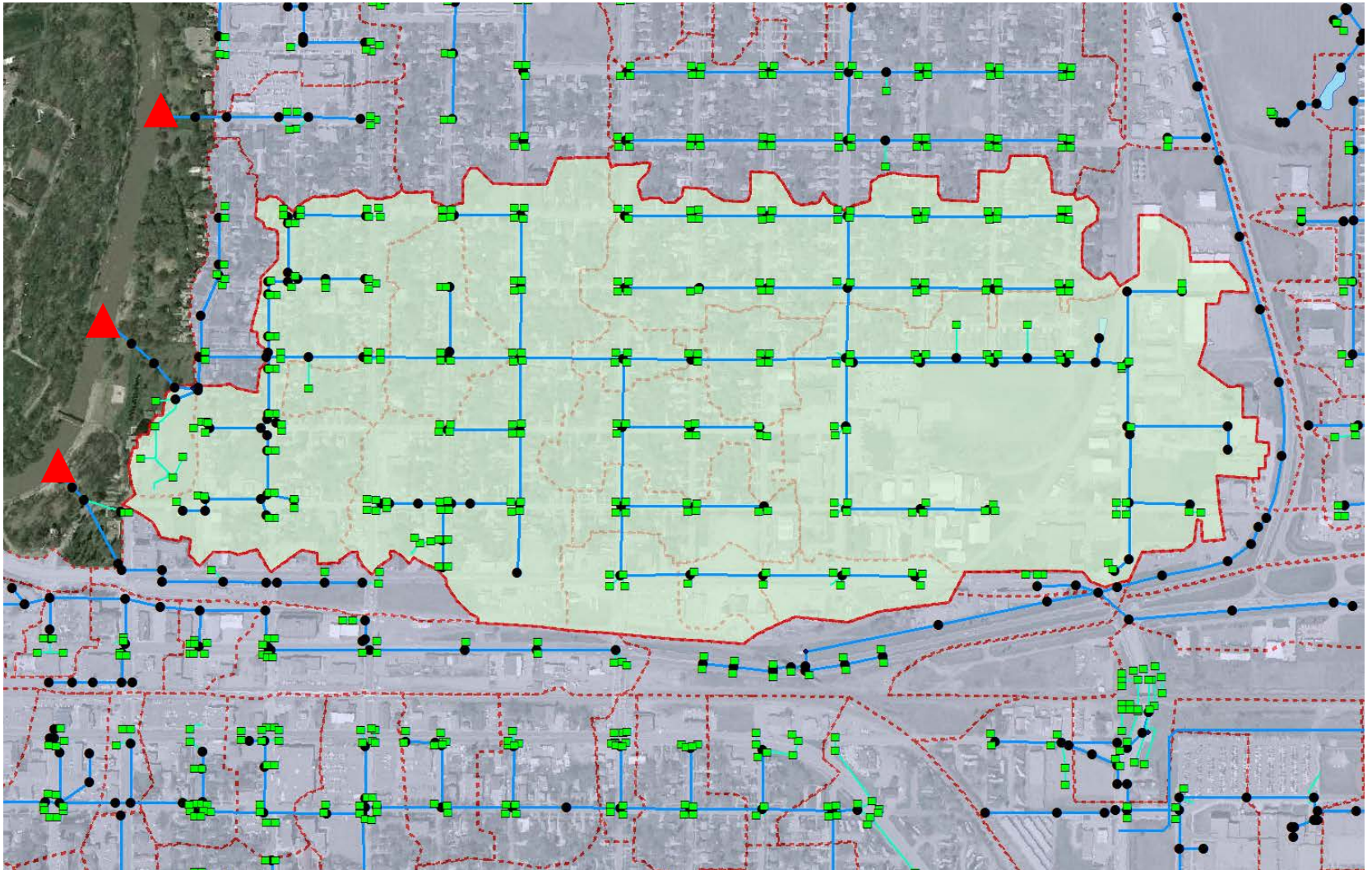
## Illicit Discharge Detection & Elimination

- Outfall Screenings
- Stormwater network to trace and isolate the source
- Assess potential from within drainage area





# Why is Mapping an MS4 Important?



# MS4 Mapping Requirements

- Construction Stormwater

“ . . . . maintain an inventory of all public and private active construction sites. . . . .required to conduct inspections . . . ”

- Post-construction Stormwater

“ . . . . maintain an inventory of all post-construction stormwater control measures . . . .document the findings of inspection reports . . . . ”

- Municipal Operations (PP/GH)

“ . . . . maintain an inventory of municipally owned or operated facilities and stormwater controls . . . . ”



# How is MS4 Permit Data Managed?

- Paper
- Spreadsheets
- Access databases
- ArcGIS
- Asset Management Systems (AMS)
- Permitting & Licensing Systems
- Commercial Off-the-Shelf (COTS) Applications
- All of the above

The screenshot shows a web application window titled "Property Info". It features several input fields for "Water Body ID", "Date", "Inlet ID", and "Outlet ID". A "Maintenance Comment" text area is also present. On the right side, there are sections for "Inlet Information", "Outlet Information", and "Information", which includes a dropdown menu for "Wetland - Stormwater wetland" and radio buttons for "Yes" and "No". At the bottom, there are navigation buttons like "Next Record", "Previous Record", "Find Record", "Add Record", "Print Record", and "Undo Record". A status bar at the very bottom indicates "Record: 1 of 1000" and "No Filter".



# What is Best?

## It Depends:

- What existing software packages are in use? (AMS, Permitting & Licensing)
- MS4 size
- Staff capabilities and preferences
- Specific MS4 permit requirements
- Uniqueness of workflows
- Set up and maintenance costs



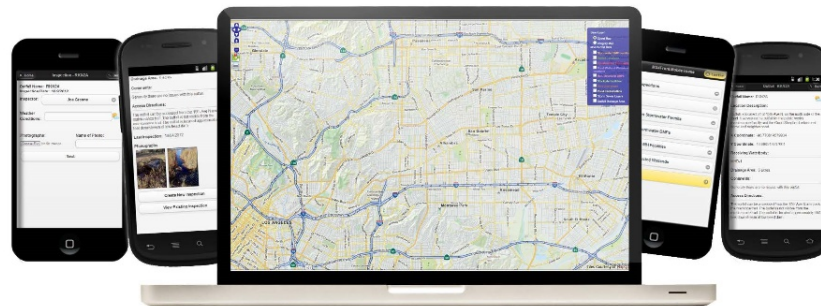
# MS4Front – COTS Example

Goal: Utilize Technology to Increase Efficiency and Effectiveness

- Flexible & Configurable
- Annual Reporting & Documentation
- Audit Preparedness



*Manage MS4 Permits with Efficiency*



Developed by Houston Engineering, Inc.



# Workflow Examples

## Case Study: Plymouth, MN

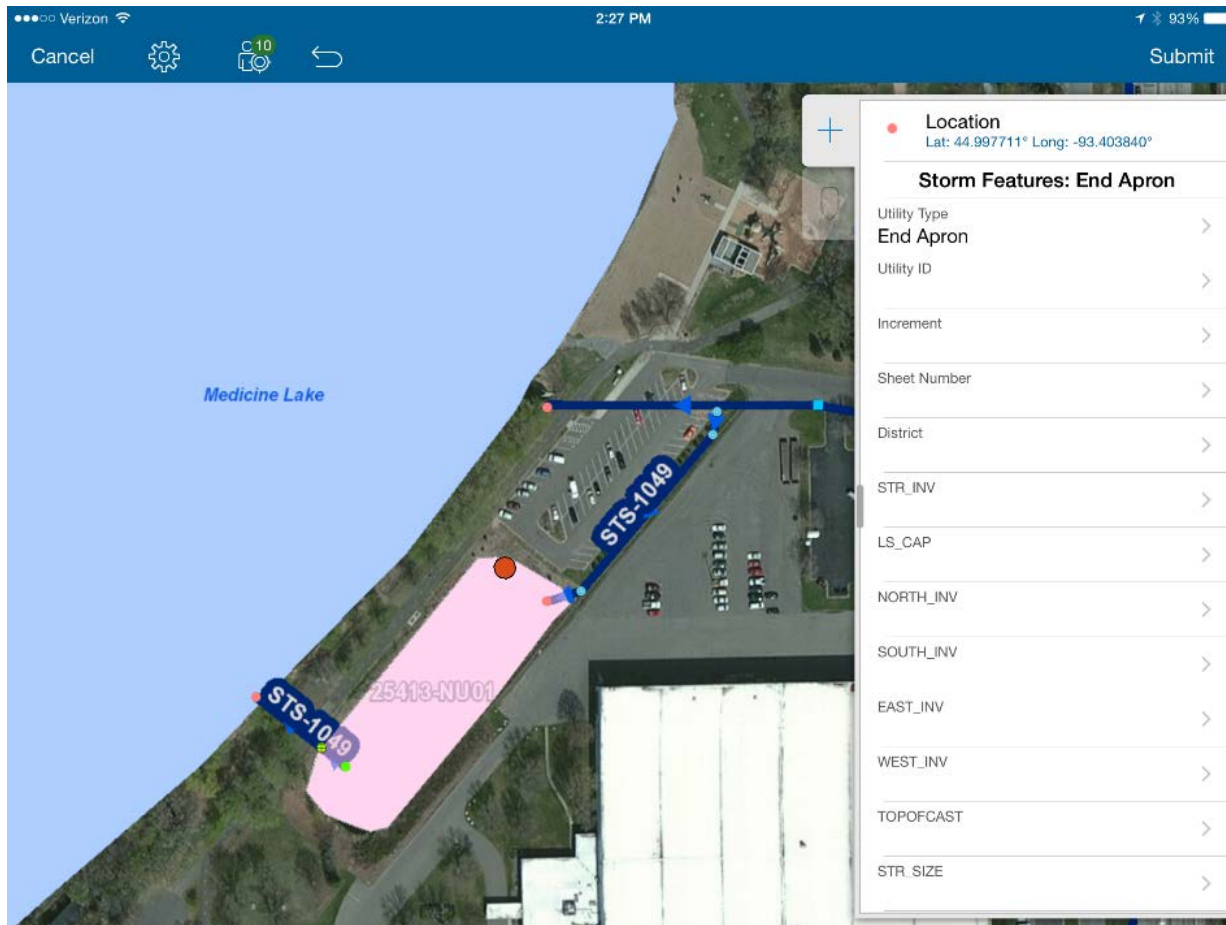
- Physical Asset Inventory
- Field Inspections
- IDDE Enforcement



# Asset Inventory: Structural Stormwater BMP




ESRI Collector App



# Asset Inventory: Structural Stormwater BMP

## Permit Compliance Requirements

- Routine inspections
- Maintenance
- TMDL/pollutant removal
- Annual reporting

 City of Plymouth  
Adding Quality to Life

### City of Plymouth

Stormwater Pond/Constructed Wetland Maintenance Activity Report

Maintenance Activity Details

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Pond-Wetland Name: 26244-NU01


Date: 1/8/2015

Completed By: Ben Scharenbroich

Estimated Material Removed:

Description: EAP pipe from W Medicine Lake Drive and parking lot has been cleaned and more rip rap was added.

Cattails removed from around pond where it was blocking the flow.

Attachments:  Attachment

01-09-2015, 12:01, 44-9889, -93-4121



# Field Inspections: Construction Stormwater

- Inventory of active construction sites
- Routine field inspections
- Violations reports and enforcement actions



## City of Plymouth

### Construction Program Inspection Report

#### Inspection Details

Permit Number:	2014004
Permit Name:	Enclave on The Greenway
Date:	10/27/2014
Time:	T15:47:34
Inspector:	Ben Scharenbroich
Date of last rainfall > 1":	10/3/2014
Weather Conditions:	Sunny; 70° F; Winds NW 8 MPH

A screenshot of a mobile application interface for conducting inspections. The form is titled 'Inspection - 26244-NU01' and includes fields for 'Pond/Wetland Name', 'Date', 'Inspector', 'City of Plymouth', 'Is this inspection a inlet or outlet?', 'Last Rainfall Date', 'Last Rainfall Amount (In.)', 'BMP Condition', 'Maintenance Deadline', 'Is maintenance required?', and 'Evidence of Illicit Discharge(s)?'. There are also sections for 'Caption' and 'Photographs' with a 'Delete' button.

# IDDE Enforcement

- Discovered during either:
  - Outfall screenings
  - MS4 staff
  - Citizen reports
- Investigate and report Illicit Discharges discovered in the field
- Follow up with enforcement actions



# IDDE Enforcement

HOME ▾ MS4Map

Details Add ▾ Edit Basemap

NEW MAP Joe ▾

marks Find address or place 🔍

### Add Features

**Illicit Discharge Discovery**

High Risk Moderate Risk Low Risk

**Structural BMP**

Bioretention Swale Stormwater Rain Garden Pond

UNDO REDO

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**City of Plymouth**  
Adding Quality to Life

October 15, 2012

Mark & Tami Applebinder  
18245 46th Avenue North  
Plymouth, MN 55488

**SUBJECT: PLYMOUTH CITY CODE SECTION 725 - STORM DRAINAGE SYSTEMS**

Mark & Tami Applebinder

An illicit discharge from your property to the storm drainage system was discovered on October 12, 2012. Unless specifically exempted, discharges to the storm drainage system other than rain water, including carpet and upholstery chemicals, are prohibited per Plymouth City Code Section 725.

Actions must be taken to stop the illicit discharge immediately. The illicit discharge may be re-inspected daily. If there is an issue regarding your ability to resolve the violations, please contact me immediately. **Additional violation(s) may be referred to the City Attorney for elevated enforcement action.**

If you have any questions, please call me at 763-509-5526. Thank you for your prompt attention to this matter.

Sincerely,  
*Derek Asche*  
Derek Asche  
Water Resources Manager

Cc: Scott Newberger, Utilities Manager

3400 Plymouth Blvd • Plymouth, Minnesota 55447-1482 • Tel: 763-509-5000 • www.plymouthmn.gov

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# Summary

- MS4 permit background
- Mapping requirements
- Data management
- COTS example
- Workflows



# Thank You

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