

MS4 Data Collection with Collector and iForms



The Challenge

- Identify, inspect, monitor, and modify their stormwater systems and work to improve stormwater quality in order to obtain a permit authorized by Section 22a-430b of the Connecticut General Statutes
- The permitting process includes several mapped elements, including:
 - Locate stormwater discharges (**outfalls**), to include type, material, size, latitude and longitude
 - Outfall (**inspection** and maintenance)
 - **Interconnections** with other MS4s
 - Receiving water bodies and **watersheds**
 - Impervious area to calculate **DCIA** (Directly Connected Impervious Area)
 - Areas with DCIA > 11%
 - **Detention/Retention pond** locations
 - **Catch basin** (inspection and maintenance)
 - **IDDE** (Illicit Discharge and Elimination) identification
 - **SSOs** (Sanitary Sewer Overflows) identification and monitoring
 - Additional Stormwater system features (**pipes, open channel conveyances, and manholes**)
 - **Sanitary** Sewer features (Required where available)
 - Additional recommended features (**Topography, Imagery, Septic**)
- Unfunded

The Questions

There are options for mapping your stormwater data. Questions to ask include:

- Who will **collect** the data?
- Who will **use** the data, once collected?
- What **features** do I need to collect?
- Is there **capital budget** available, or can this be done as a line item fiscal year task?
- What is the plan to maintain and **update** the data?
- What is the **time frame** for completion?
- What **method** should be used for collecting the data?
- Is there any **existing** data?

The Options

Digitize
from Imagery

Import
from DWG
(CADD)

Digitize
from As-Builts

Field Collect
Can be Consultant, Staff, or
Intern

Cost: \$\$
Accuracy: ++++/+
Time: ^^
*Can only capture
catch basins and
manholes*

**Digitize
from Imagery**

Cost: \$\$\$
Accuracy: ++++
Time: ^^^
*Digital scans are
necessary, high
accuracy but may
not be available for
all features*

**Digitize
from As-Builts**

Field Collect
**Can be Consultant, Staff, or
Intern**

**Import
from DWG
(CADD)**

Cost: \$
Accuracy: ?
Time: ^
*May not be
available/accurate,
generally does not
have attribution*

Cost: \$\$\$\$
Accuracy: ++++/+
Time: ^^^
*High cost (consultant),
lower cost (staff/intern),
accurate for surface
features, poor accuracy
for subsurface features*

A Solution

NEGEO has developed an **integrated** solution for collecting GIS Stormwater features required by the permit.

This solution can be utilized by Town staff and/or subconsultants to **collect features** and **conduct inspections** for Municipal stormwater systems.



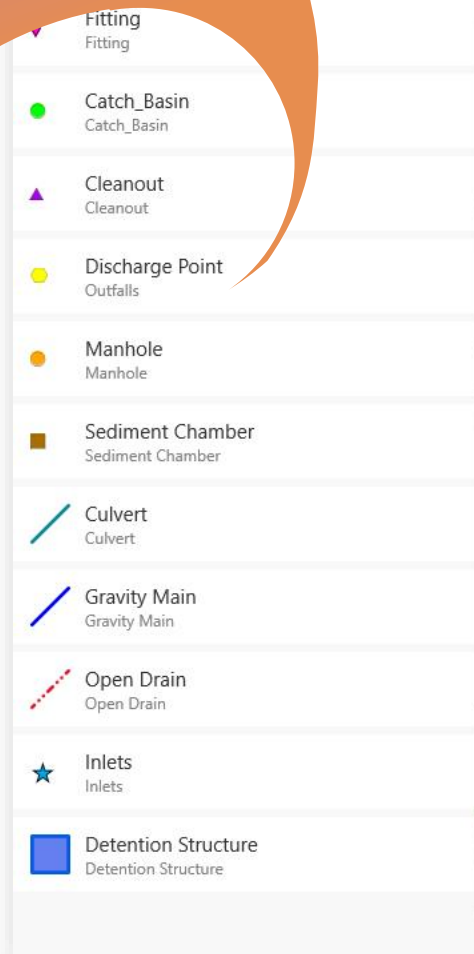


Using a mobile device – a tablet, laptop, or even a phone- collect stormwater features such as outfalls, catch basins, and pipes.

An ArcGIS Online map is **set up** with the features and attribution you'd like to collect.

Staff, interns, or consultants can **capture data** in the field using a mobile device with Collector for ArcGIS.

Collect GIS Features



Collector for ArcGIS

VIEW EXISTING FEATURES

Collect GIS
Features

Verizon 8:59 AM

Cancel Submit

Location
No valid Location

Outfall:

UniqueID >

Creator
Required >

Creation Date
Required >

Edit Date
Required >

Editor
2018 >

Outfall Type >

Outfall Condition >

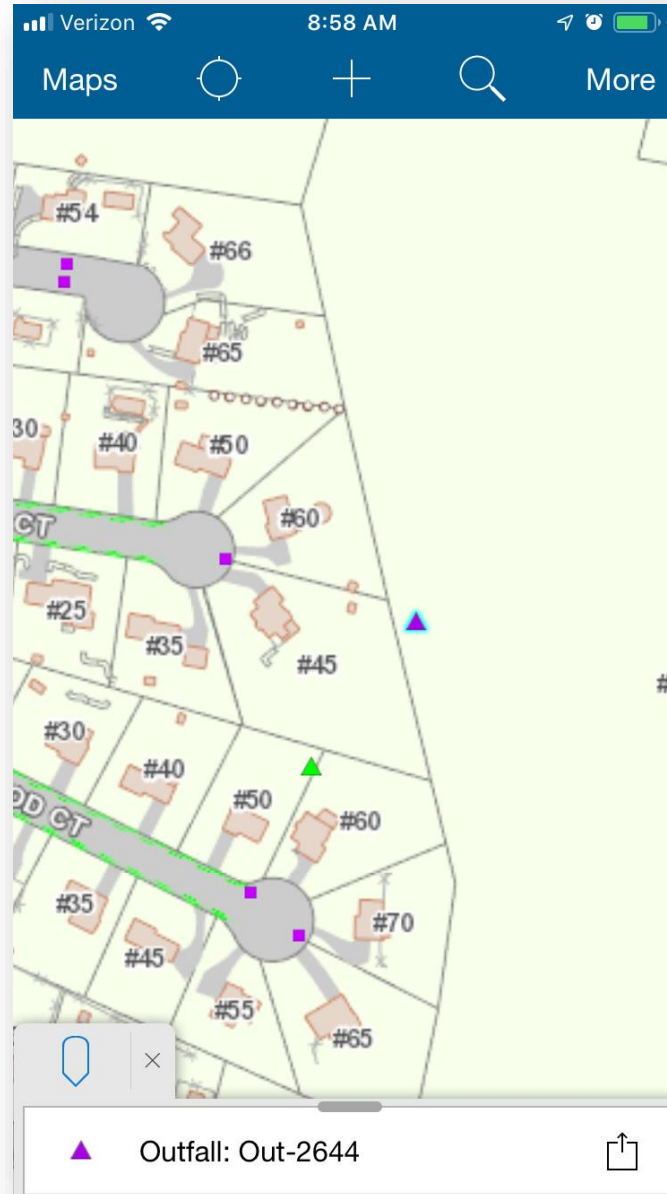
Stable Slopes
Required >

Stable Channel
Required >

Additional Action Required
Required >

Notes >

Type



Verizon 8:59 AM

Map Details

Location
Lat: 41.50326226° Long: -72.91798395°

Outfall: Out-2644

Outfall ID: Out-2644
Location: 91 WILLOW ST
Type: UNK
Basin Subregion: Willow Brook
Ancillary Role: None
[Outfall Field Inspection Form](#)



ADD A NEW FEATURE

Verizon 9:52 AM

Cancel Collect a new feature

Filter

- Fitting
- Catch_Basin**
- Cleanout
- Discharge Point
- Manhole
- Sediment Chamber
- Culvert
- Gravity Main
- Open Drain
- Inlets



Verizon 9:52 AM

Cancel Submit

Location
No valid Location

Catch Basin:

SOURCE

SOURCEDATE

PlanID

INLETTYPE

Top_

RIMELEV

INVERT_OUT

INVERT_OUT_DIR

INVERT1

INVERT1DIR

INVERT2

INVERT2DIR



Verizon 9:53 AM

Cancel Done

INLETTYPE

Filter

<No value>

Rear Yard

Roof

Open Lid Manhole

Closed Lid Manhole

Standard

Other

Unknown


Curb Inlet

Drop Inlet Yard

Catch Basin

Double Catch Basin

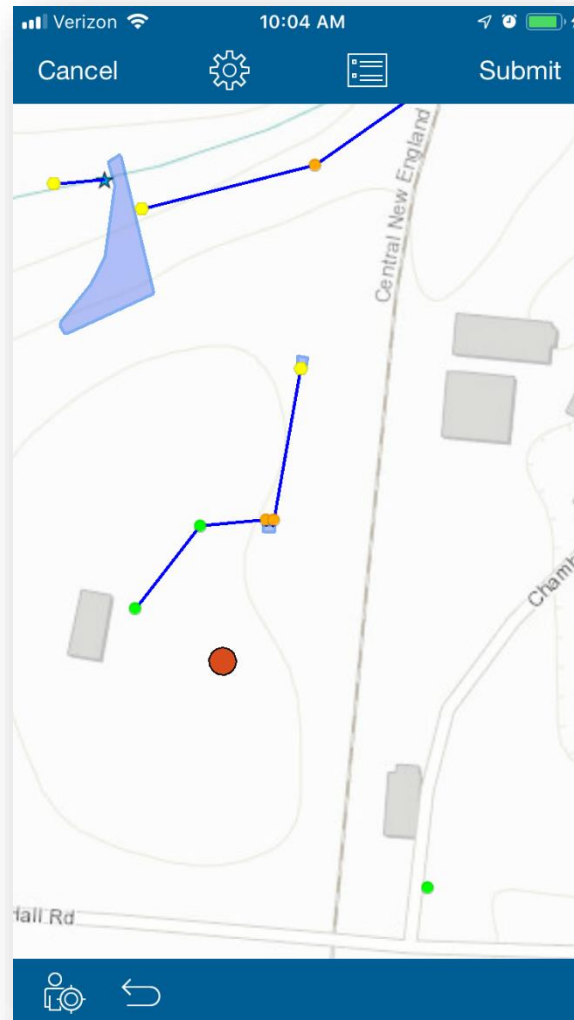


Click  once you've got your attribution to return to the map

ADD A NEW FEATURE



Tap on the screen
to add point



Click 'Submit' to
save, or  to
return to the
attributes

Once the stormwater features are collected in the field you can use an integrated custom inspection form for outfall testing, inspection, and monitoring, and catch basin cleaning.



iForm Builder by Zerion can be **integrated** with Collector to inspect Outfalls and Catch Basins. These forms are **linked** to a specific feature and can be pre-populated with information (type, size, etc.) from Collector. New information is collected within the form and **maintained** in a database.



Verizon 8:59 AM

Map Details

Location
Lat: 41.50326226° Long: -72.91798395°

Outfall: Out-2644

Outfall ID: Out-2644
Location: 91 WILLOW ST
Type: UNK
Basin Subregion: Willow Brook
Ancillary Role: None
[Outfall Field Inspection Form](#)



T-Mobile 2:10 PM 66%


Engineering: Manhole Inspection Save

Name of Inspector *
Ryan

Inspection ID
34-678

Manhole(s)

Date of Signature *
Jul 7, 2016

Inspector Signature *


Date of Next Inspection
Jul 7, 2017



Sync and view new data, access forms, and generate reports for submission for MS4 requirements

With a MapXpress internal viewer from NEGEO, data collection and forms are integrated to view the data in **real-time**, and generate custom views and reports. These **custom reports** can be formatted for internal use, or to meet MS4 requirements.

The Collector and iForms workflow can still be used in GIS



**View Data and
Generate Maps and
Reports**



Town of Cheshire, CT

Outfall



I want to...

#775

Description

Invert:

Watershed: 5202-00-2-L4

Location: LEXINGTON CT

[Download Source Document](#)

Details

OBJECTID
3282

Type
FES

SourceName
FILE000635.pdf

INVERT_1
N/A

BASIN_NO
5202-00-2-L4

Location

190.83






Search Outfalls
Search Catch Basin
iForms
Sync Inspection Data



View Data and
Generate Maps and
Reports

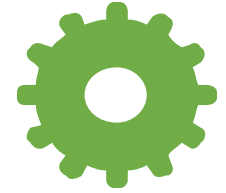
mapXpress

What are the benefits of this approach?

- **Easy** to use 
- iForms can be **customized** to resemble the paper form staff are accustomed to
- Introduces **digital** workflows 
- Field collection done by staff or interns can **mitigate costs**
- Can be used **offline** 
- **Add** features and forms at any time
- Workflow is **expandable** to other departments
- Collected data can have **other uses** (CBYD, Highway projects, etc.)
- **Real-time** review and management  

What are the limitations of this approach?

- Implementation requires **familiarity** with GIS
- Field collection takes **time** and **money**
- Requires an annual **hosting fee** and an Esri organizational account.



Beyond MS4

Whichever option you choose, a solid GIS database of your stormwater features will offer benefits far beyond that of fulfilling your MS4 requirements:

- **Track, Schedule** and **Monitor** your catch basin cleaning
- **Provide data** to consultants and staff for outfall sampling and maintenance
- Inform Call Before You Dig (**CBYD**) and Road Construction projects
- Track Illicit Discharge (**IDDE**) up- and down-stream
- **Educate** residents about the impact of stormwater discharge



Thank you!

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