

An aerial photograph of a person standing in a river, surrounded by dense green foliage and trees. The person is wearing a bright green safety vest and a yellow hard hat. The river is a light grey color, and the surrounding area is a mix of green grass and trees.

# Technology Applications for Environmental Fieldwork

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*SAVE TIME IN THE FIELD AND THE OFFICE*

Caitlin Burke, CWS, DECI  
GHA, Inc.

# Overview

## Fieldwork

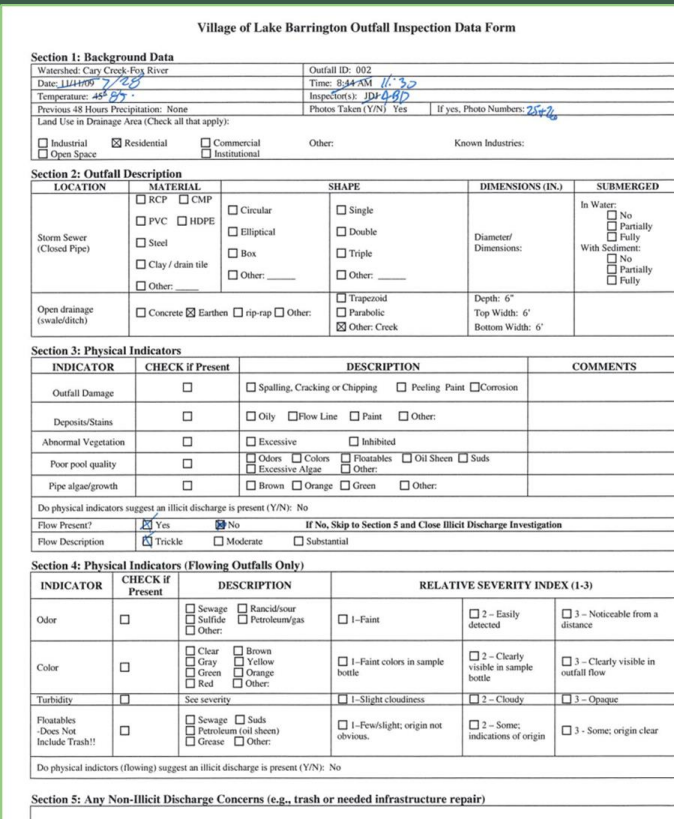
- Outfall Inspections
- Erosion Control Inspections
- Wetland Delineations

## Technology

- Workforce
- Survey 123
- Fluix / Fillable PDFs
- Collector
- Drones



**Moving outfall inspections from analog to digital has cut the operational time by approximately 50%**



# MS4 Outfall Inspections - Workforce

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## Why use Workforce?

- ▶ Turn by turn navigation & interactive maps for efficient outfall location
- ▶ Data is collected and updated on the server in real time
- ▶ No need to transfer paper data – reduced error
- ▶ Automated reports
- ▶ Data can be accessed from client database
- ▶ Integrates with Survey123, Collector & Navigator

## Creating an outfall assignment – dispatcher view

The screenshot displays the Workforce application interface for creating an outfall assignment. The browser address bar shows the URL: `workforce.arcgis.com/projects/8354b0da334423997ef8cb015bf850e/dispatch/assignments`. The user is logged in as Greg.

**Left Panel: Assignments List**

- Assign
- Filter by type, location or ID
- + Assignments
- Status ▾ Due ▾ Priority ▾ Assignee ▾ Sort ▾
- 191 assignments Showing 1-50
- Outfall Inspection VT0036 Medium
- Outfall Inspection VT0035 Medium
- Outfall Inspection VT013 Medium
- Outfall Inspection VT033 Medium
- Outfall Inspection VT032 Medium
- Outfall Inspection VT009 Medium
- Outfall Inspection VT010 Medium
- Outfall Inspection VT011 Medium
- Outfall Inspection VT001 Medium
- Outfall Inspection VT002 Medium

**Map View**

The map shows a residential area with streets like Forest Edge Ln, Durbin Ct, and Royal Melbourne Dr. Two red circular markers are visible on the map, labeled '1' and '2', indicating specific locations for outfall assignments. The map also shows parks like Promontory Park and Longview Meadows Park, and a pond labeled Oak Hills Pond.

**Bottom Panel**

- Assignments
- Workers
- Clustering

## *Performing an outfall inspection – mobile worker view*

4:26 PM Wed Oct 16

Outfall Inspections 2019

To Do ▾

MEDIUM PRIORITY

● Outfall Inspection  
Lg142  
Medium Priority | Due Today at 9:45 AM 3 mi

Sort

1 Assignment  
Updated just now



**Section 1: Background Data**

Subwatershed: Antakasic Creek		Outfall ID: VT0035	
Date: Jun 11, 2019		Time: 11:15	
Temperature: 80°		Inspector(s): CB, LA	
Previous 72 hours Precipitation: No		Photos Taken (Y/N) Y	If yes, Photo Numbers: See attached
Land Use in Drainage Area (Check all that apply):			
<input type="checkbox"/> Industrial	<input checked="" type="checkbox"/> Residential	<input type="checkbox"/> Commercial	Other: _____ Known Industries: _____
<input type="checkbox"/> Open Space	<input type="checkbox"/> Institutional		

**Section 2: Outfall Description**

LOCATION	MATERIAL	SHAPE		DIMENSIONS (in.)	SUBMERGED
Storm Sewer (Closed Pipe)	RCP	Circular	Single	36"	In Water: Partially With Sediment: Partially
Open drainage (swale/ditch)				Depth: Top Width: Bottom Width:	

**Section 3: Physical Indicators**

INDICATOR	DESCRIPTION	COMMENTS
Outfall Damage	Spalling, Cracking or Chipping	FES is separated from pipe
Deposits/Stains	Flow Line	
Abnormal Vegetation	None	
Poor pool quality	Comments	
Pipe algae/growth	None	
Do physical indicators suggest an illicit discharge is present (Y/N): No		
Flow Present?	No	If No, Skip to Section 5 and Close Illicit Discharge Investigation
Flow Description	N/A	

**Section 4: Physical Indicators (Flowing Outfalls Only)**

INDICATOR	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)
Odor		
Color		
Turbidity		
Floatables - Does Not Include Trash!!		
Do physical indicators (flowing) suggest an illicit discharge is present (Y/N): No		

**Section 5: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repair)**

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Image 1



Comments: View of Outfall 035

Image 2



Comments: View of Outfall 035

# Erosion Control Inspections – Fluix

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- ▶ Customizable, fillable PDF form & document management
- ▶ Formatted for use on mobile or tablet
- ▶ Eliminates office data entry & duplication
- ▶ Automated reporting
- ▶ Email reports from the field
- ▶ All reports are stored in the program





## NPDES Site Observation Report for ILR10



General Information		
GHA Project Name and Number: Mundelein Public Works Facility	Today's Date: 3/6/20	Last Visit: 2/28/20
Preparer's Name & Title: Caitlin Burke, DECI Environmental Consultant	Client:	
Stage of Construction Storm Sewer:	Current Weather: 45, Sunny	
Reason for Visit: Weekly	NPDES Permit No.	
	On-site Contact Name & Title:	
Site Observations – Describe Location and Recommend Corrective Measures on Next Page		

No.	BMP/Activity	Implemented & Maintained
1	Are discharge points and receiving waters free of sediment deposits and other pollutants?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
2	Have BMPs specified in the SWPPP been installed and maintained?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
3	Has the SWPPP been updated to reflect the current conditions on site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
4	Are outlets protected/stabilized?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
5	Have stormwater management systems been constructed, stabilized, and verified to be functioning appropriately?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Action Item <input type="checkbox"/> N/A
6	Are Special Management Areas (e.g., creeks, wetlands, buffers, etc.) adequately protected?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
7	Are storm drain inlets adequately protected?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
8	Have all idle, disturbed areas been stabilized within 7 days of cessation of construction activities in that area (or more restrictive time period per local ordinance requirement)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
9	Are erodible stockpiles (e.g., topsoil) properly located and adequately protected?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
10	Are washout facilities (e.g., concrete washouts, etc.) available and maintained?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
11	Is waste, including building materials and construction debris, collected and placed in approved receptacles?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
12	Are non-stormwater discharges (e.g., dewatering) properly controlled?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
13	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other potential pollutants?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
14	Are portable toilets, material storage areas, and materials that are potential stormwater contaminants managed appropriately?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
15	Are stabilized entrances installed and are adjacent roads clear of sediment?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A
16	Other, based on site conditions:	<input type="checkbox"/> Yes <input type="checkbox"/> Action Item <input type="checkbox"/> N/A

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## NPDES Site Observation Report for ILR10



No.	Location and Recommended Corrective Measure	Completed/Initial*
5	Please remove temp. riser to allow the basin water level to normalize	<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>

## General Notes and Comments:

The site is temporarily stabilized with no sediment leaving the site at the time of the visit.

## Certification Statement:

(To be signed by a responsible corporate officer of the property owner or a duly authorized representative of the property owner in accordance with NPDES Permit ILR10 Part VI.G)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature:

Name and Title: Caitlin Burke, Environmental Consultant / DECI

Date: 3/9/20

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## NPDES Site Observation Report for ILR10



Silt fence is in good condition



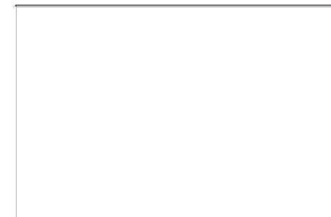
Silt fence is in good condition



Please remove temporary riser



Erosion control blanket in good condition



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# Erosion Control Inspections – Drones

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Significantly reduces inspection time on large sites.

- ▶ Monitor changes on site over time; construction observation
  - ▶ Weekly / Rain Event Inspection Supplementation
  - ▶ In progress: programmed flight paths, inspection guidelines
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- ▶ Case Studies:







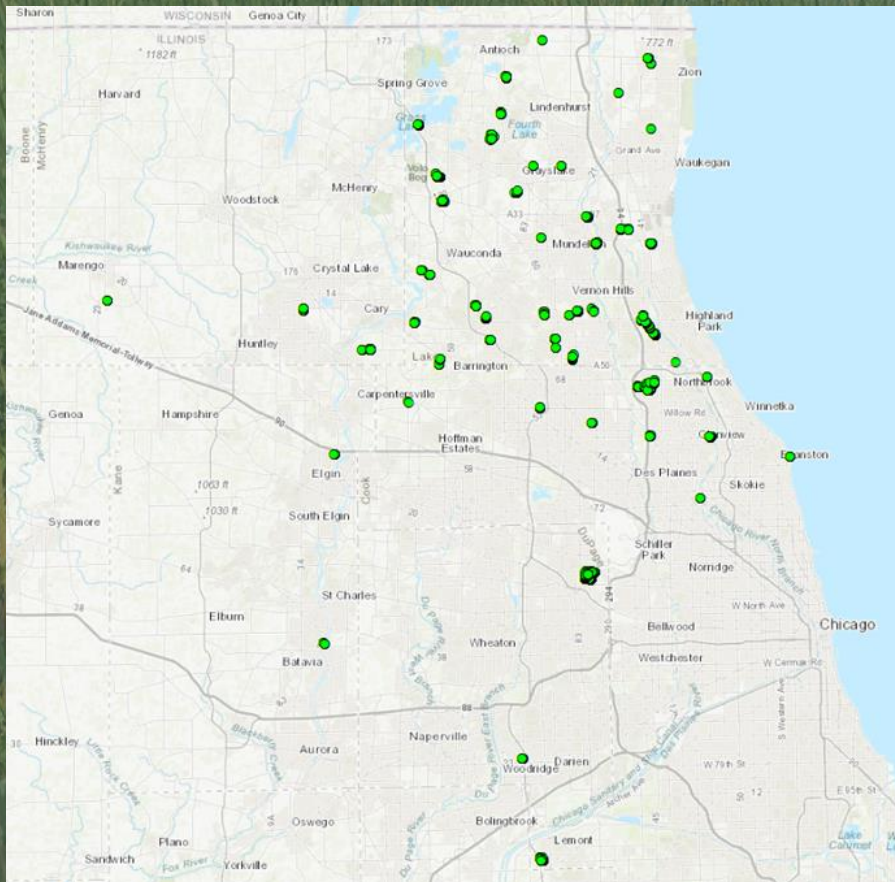








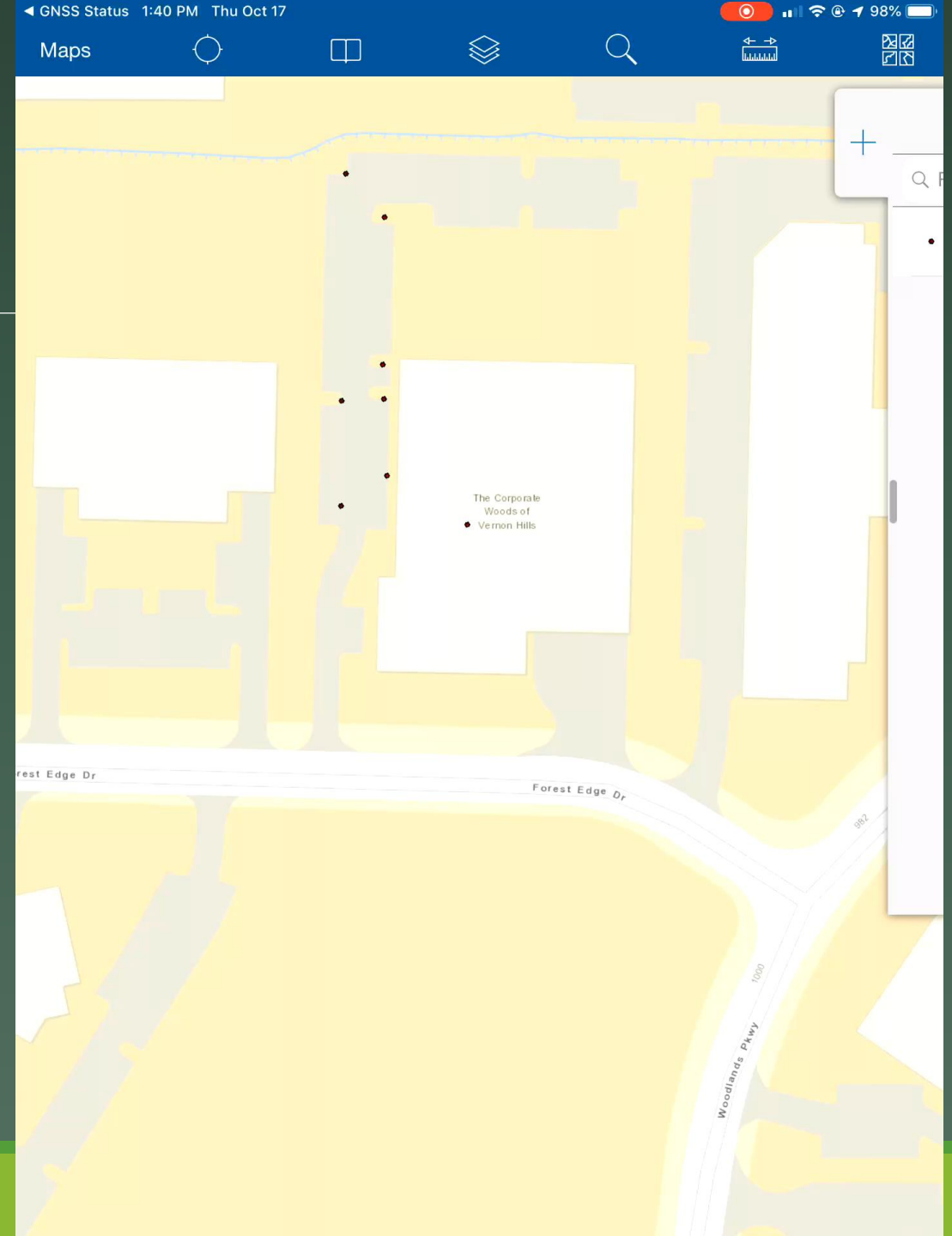
# Wetland Delineations - Collector



- ▶ Sub-meter horizontal precision when paired with a receiver
- ▶ Minimal equipment required: formatted for mobile or tablet, combined with small receiver
- ▶ Integrates with ArcGIS Pro & stored in ArcGIS online account



## *Using Collector for wetlands*









# Wetland Delineations - Drones

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"A field of tall grass"

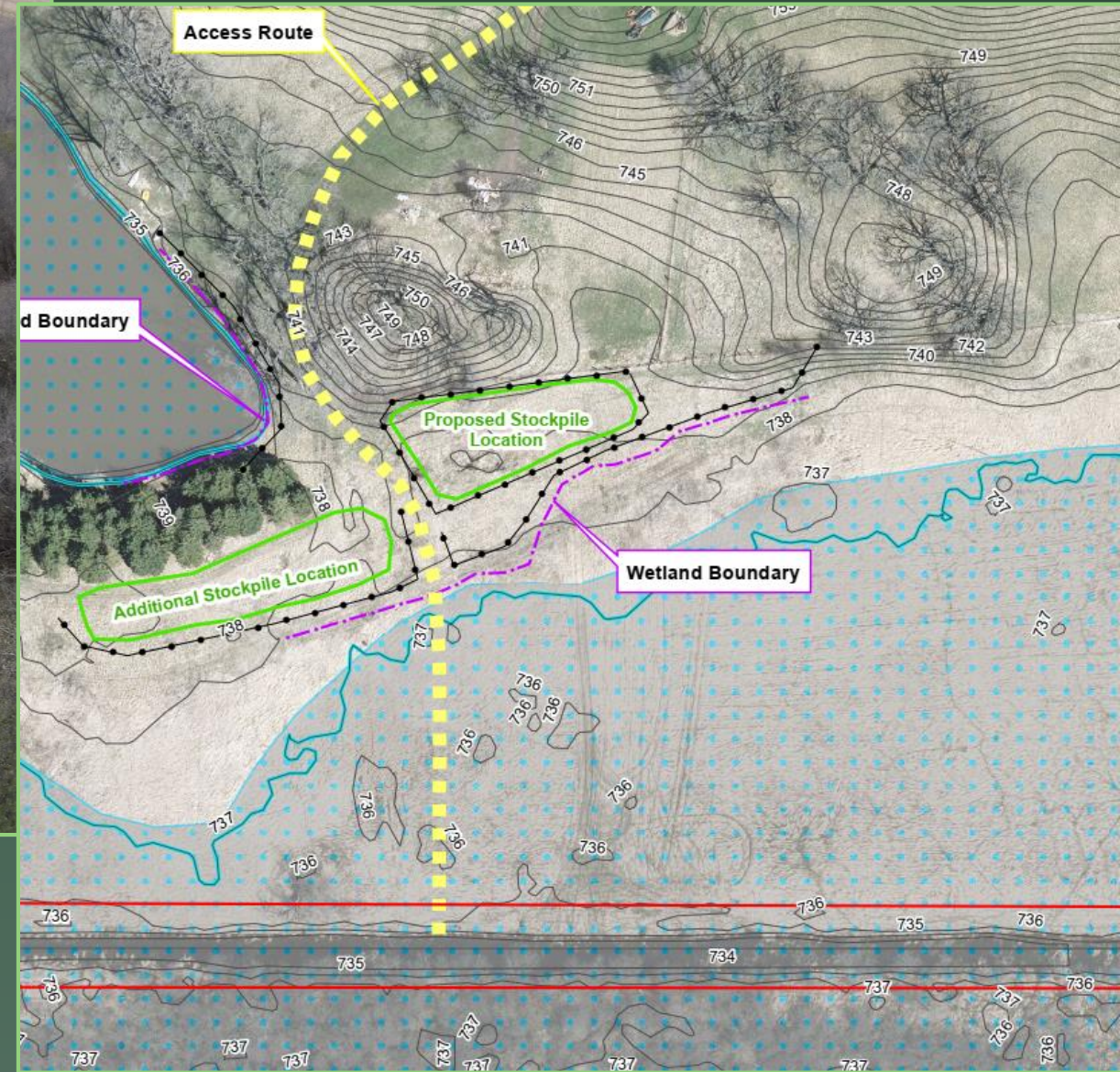
## Why use drones?

- ▶ Gather supplemental data
- ▶ Distinguish between different vegetative zones, open water, etc.
- ▶ Visualize the site topography
- ▶ Access difficult locations
- ▶ Cover expansive sites











# Takeaways

- Improved data collection, storage, and access
- Improved system of record
- Cost-saving for clients
- Time-saving for staff



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