



Innovative Facility and Infrastructure Design™

INNOVATIVE JOB STATUS MONITORING TECHNIQUES USING GIS

ODOT MS4 OUTFALL INVENTORY

PRESENTED BY NICOLE CLUNE, P.E. | LJB INC. | JUNE 23, 2007

The Ohio Department of Transportation (ODOT)



- Founded in 1905
- Headquarters: Columbus, Ohio
- Director: James Beasley
- Industry: Public transportation construction and maintenance
- Operating Income: \$2.898 billion (2007)
- Employees: 6,031 (2006)
- Website: <http://www.dot.state.oh.us/>

- ODOT and Ohio highway information
- 7th largest highway system in the nation.
- 5th greatest volume of traffic
- 4th largest interstate system
- 3rd greatest value of truck freight
- 2nd largest inventory of bridges.
- **Maintains**
- Approximately 49,000 lane miles
- Over 44,000 Bridges and Culverts
- Over 5,000 stop signs
- Over 3,400 intersections
- Over 6,200 on and off ramps
- Over 3,100 miles of guardrail

TODAY'S AGENDA



- Stormwater regulatory overview
- Purpose of the project
- How GIS is woven into the three-step inventory process
 - > Step 1: Office research and data collection
 - > Step 2: Field data collection
 - > Step 3: Database population
- Conclusion
 - > Job status monitoring using GIS
 - > Other GIS applications

STORMWATER REGULATORY OVERVIEW



- Clean Water Act (CWA)
 - > Began as the Federal Water Pollution Control Amendments of 1972.
 - > Known as the Clean Water Act following amendments in 1977.
 - > The Act is the primary federal law in the United States governing water pollution.
 - > All discharges into the nation's waters are unlawful, unless specifically authorized by a permit.
 - > EPA grants and manages these permits through the NPDES program.

STORMWATER REGULATORY OVERVIEW



- ◉ National Pollutant Discharge Elimination System (NPDES)
 - > System for granting and regulating discharge permits.
 - > Regulates both point and non-point sources that discharge pollutants into waters of the United States.
 - > More than 65,000 industrial and municipal dischargers must obtain permits from EPA.
 - > Permits are issued for 5-year periods and must be renewed thereafter to allow continued discharge.

STORMWATER REGULATORY OVERVIEW

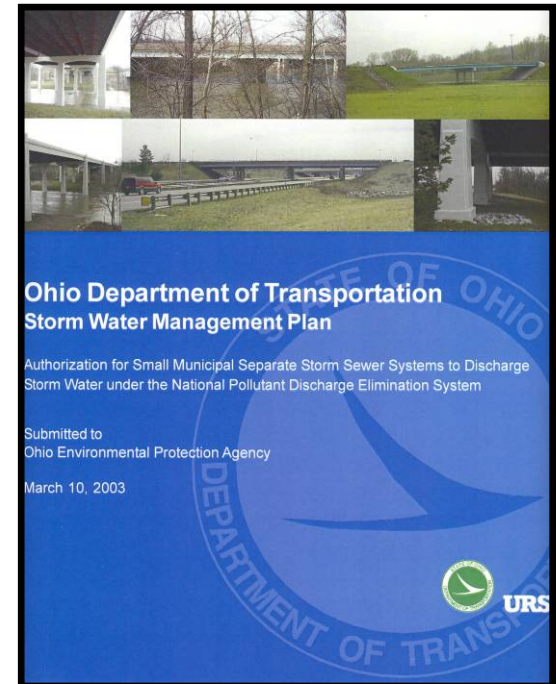


- Types of NPDES Stormwater Permits
 - > Industrial
 - > Construction (statewide)
 - > Municipal Separate Stormwater Sewer System (MS4)
 - Urbanized areas only
 - Traditional MS4 (~300 in Ohio) = municipalities
 - Non-traditional MS4 (11 in Ohio) = colleges, **ODOT**
 - Stormwater Management Plan (SWMP) required

STORMWATER MANAGEMENT PLAN



- ODOT was granted permit coverage by OEPA in 2003.
- Permit required ODOT to incorporate six elements into SWMP
 - > Public education outreach
 - > Public involvement and participation
 - > **Illicit discharge detection and elimination (MS4 Outfall Inventory)**
 - > Construction site run-off controls
 - > Post-construction run-off controls
 - > Pollution prevention and good housekeeping



WHAT IS ODOT'S MS4 REGULATED AREA?



- ODOT's responsibility and includes:
 - > ODOT normalized urban areas in Appendix 6 cities:
 - All Interstate highways
 - U.S. and state highways within villages and unincorporated areas
 - All ODOT facilities
 - > For Appendix 7 cities:
 - All Interstate highways
 - All ODOT facilities

A TOTAL OF 1,930 MILES AND 92 FACILITIES

WHAT IS INVENTORIED?



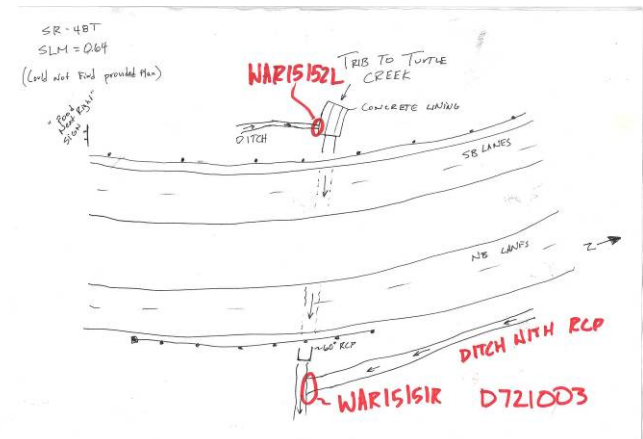
- Outfall definition: the point at which any *discernible, confined and discrete conveyance* of ODOT's storm sewer system discharges to surface waters of the state.



END PRODUCT OF MS4 OUTFALL INVENTORY

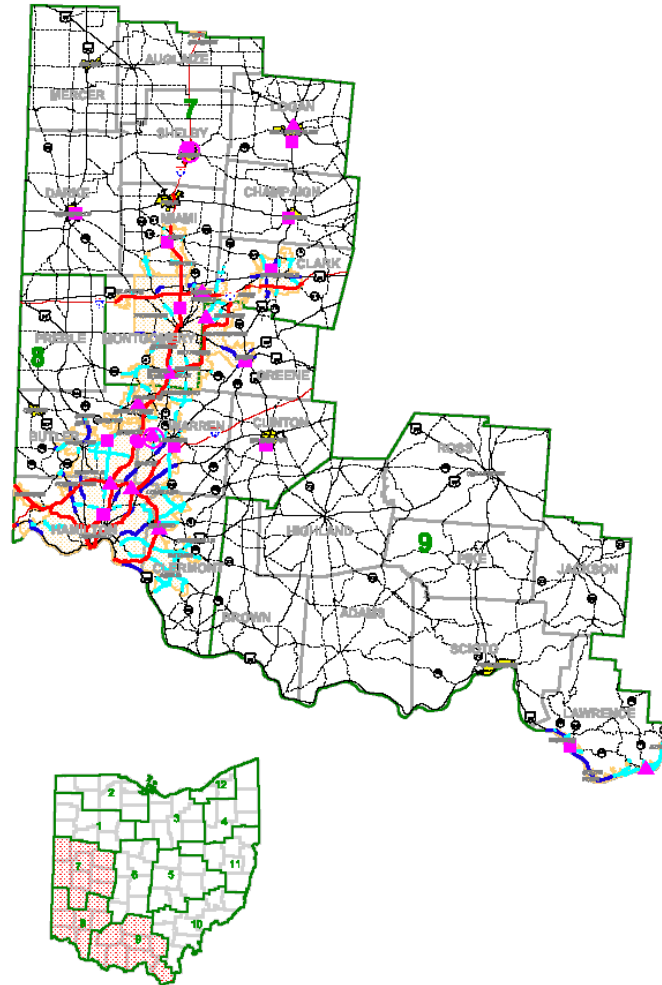


- Complete database for all outfalls in the ODOT MS4 regulated area.
 - > GIS information of outfall locations
 - > Construction plan or drawing of each outfall location
 - > Photo(s) of each outfall
 - > Illicit discharge information
- Inventory will serve as the foundation for ODOT's illicit discharge detection and elimination efforts

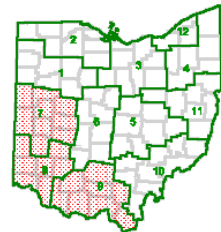




ODOT MS4 Outfall Inventory Regulated Area District 7, 8 & 9



- Highways**
 - INTERSTATES
 - U.S. HIGHWAYS
 - STATE ROUTES
- District Boundary
- County Boundaries
- City Boundary
- ODOT MS4 Regulated Area
- Appendix 7 Cities
- Regulated State Route
- Regulated Interstates
- Regulated US Highways
- Regulated Rest Areas
- Regulated Outposts
- Regulated Garages
- Regulated District Office



20 0 20 40 Miles



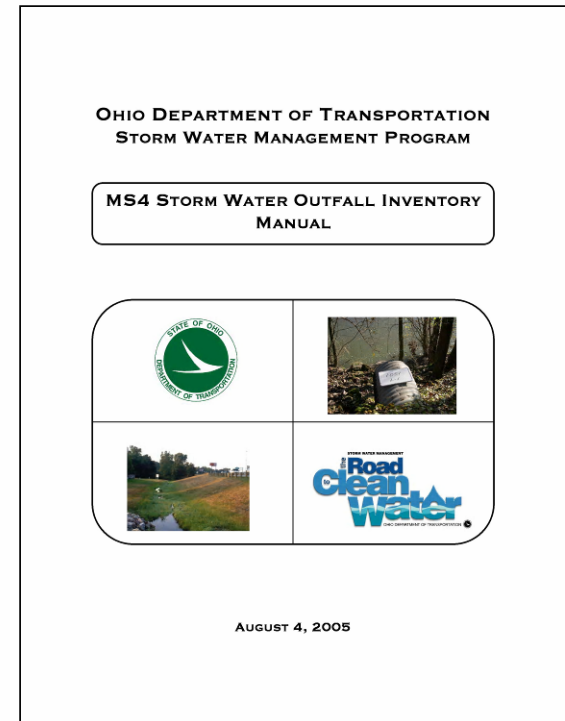
THREE STEP PROCESS



- Three primary steps will lead to a complete database:
 - > Step 1: Office research and data collection
 - > Step 2: Field data collection
 - > Step 3: Database population



Contractor after completing an outfall inventory





ODOT DATA FORM



OHIO DEPARTMENT OF TRANSPORTATION
MS4 STORM WATER OUTFALL INVENTORY



OFFICE DATA

Staff: Benes

Name of Receiving Stream: Brady Creek

11-Digit HUC: 5060001220 County: FRA

Municipality: Prairie Township NLFID: SFRA00040**C

Facility Address: N/A

FIELD DATA

Staff: Newman, Kramer

Date of Field Survey: 9/4/2004 Rock Channel Protection? Yes No

Outfall Identifier: FRA00123L Litter Present? Yes No

OH St Plane Northing: 744000.00 Latitude: 39.950729 N

OH St Plane Easting: 1815000.00 Longitude (-): 83.170876 W

Ditch Outfalls Only

Back Slope (00:00): _____

Fore Slope (00:00): _____

Bottom Width (in.): _____

The diagram shows a cross-section of a ditch. On the left, a 'Roadway' is shown above a 'Fore Slope' which has a 'Run:Rise' ratio. The ditch itself has a 'Bottom Width' and a 'Rise' on its left side. On the right, there is a 'Back Slope' with a 'Run:Rise' ratio.

Pipe Outfalls Only

Pipe Shape: Circular - Rectangular -
(choose one) Elliptical - Egg - Other

Pipe Height (in.): 30

Pipe Width (in.): 30

Pipe Material: RCP - VCP - CMP - PVC -
(choose one) CPP - Other

Comments. (Provide explanation why "Other" was selected.)
Photos #8 and #9. Cobble, gravel, and sand present inside pipe (stream substrate).

DRY WEATHER VISUAL FIELD SCREENING

Staff: Newman, Kramer

Date of Dry Weather Visual Field Screening: 9/4/2004

Make only one choice for each:

Odor Present at Outfall: <input checked="" type="checkbox"/> None - Musty - Sewage - Solvent - Sulfur - Oil - Gasoline - Other	Floatables Present at Outfall: <input checked="" type="checkbox"/> None - Oil Sheen - Sewage - Foam/Bubbles - Algae
--	---

Color of Water at Outfall: <input checked="" type="checkbox"/> None - Yellow - Green - Brown - Gray - Other	Turbidity of Water at Outfall: <input checked="" type="checkbox"/> Clear - Cloudy - Opaque
---	--

Status of Potential Illicit Discharge: <input checked="" type="checkbox"/> No flow - Low priority - Medium priority - High priority	Source of Potential Illicit Discharge: <input checked="" type="checkbox"/> None - HSTS - Industrial - Commercial - Other
---	--

Comments regarding dry weather visual field screening and potential illicit discharges. Provide explanation why "Other" was selected.
Source of potential illicit discharge may be Bob's Car Repair located adjacent to stream along US 40. Very little flow (< 1 gallon every 6 seconds) at outfall.

WHAT WOULD YOU DO?



- 560 miles of roadway
- 840 stream crossings
- 1,440 field crew hours
- 21,000 miles of driving
- 4,050 outfall points
 - > GIS data
 - > Plan sheet
 - > Photos

GIS: WHY IT'S THE BETTER APPROACH



- Fully integrate GIS into each step
 - > Reduce duplication of effort
 - > Minimize data inconsistencies
 - Clean data
 - > Time savings during field data collection
 - Derive as much as possible in the office
 - GPS unit programmed to prompt questions and provide choices for answers.
 - Safety: less time spent alongside the road
 - > Project management
 - Track progress of field crew & overall project
 - Flush out errors

STEP 1: OFFICE RESEARCH AND DATA COLLECTION

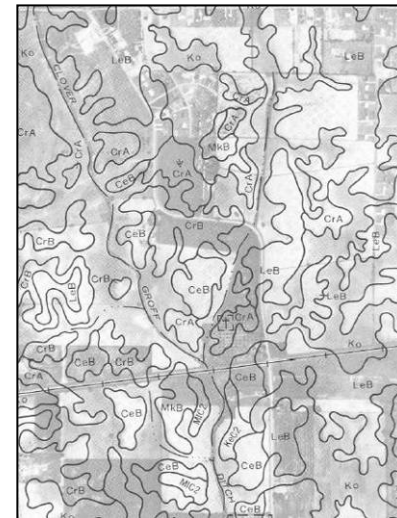
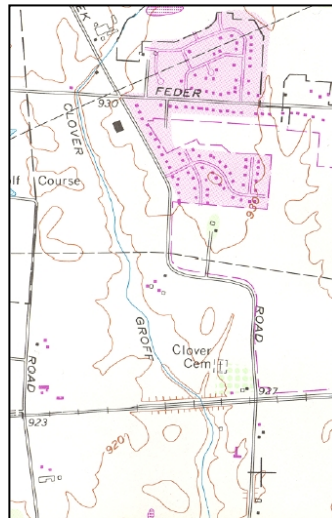
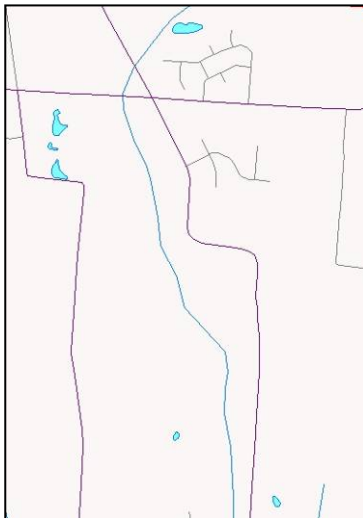


- Water Resource Mapping Review
 - > Identify stream locations on roadways and facilities
- Review of Construction Plans
 - > Research roadway construction drawings

WATER RESOURCE MAPPING REVIEW



- Identify Stream Locations on Roadways and Facilities
 - > MS4 area base map – some streams, bridges that may span surface waters of the State
 - > USGS topographic maps – do not display the smallest headwater streams
 - > NRCS soil surveys – will show most small streams

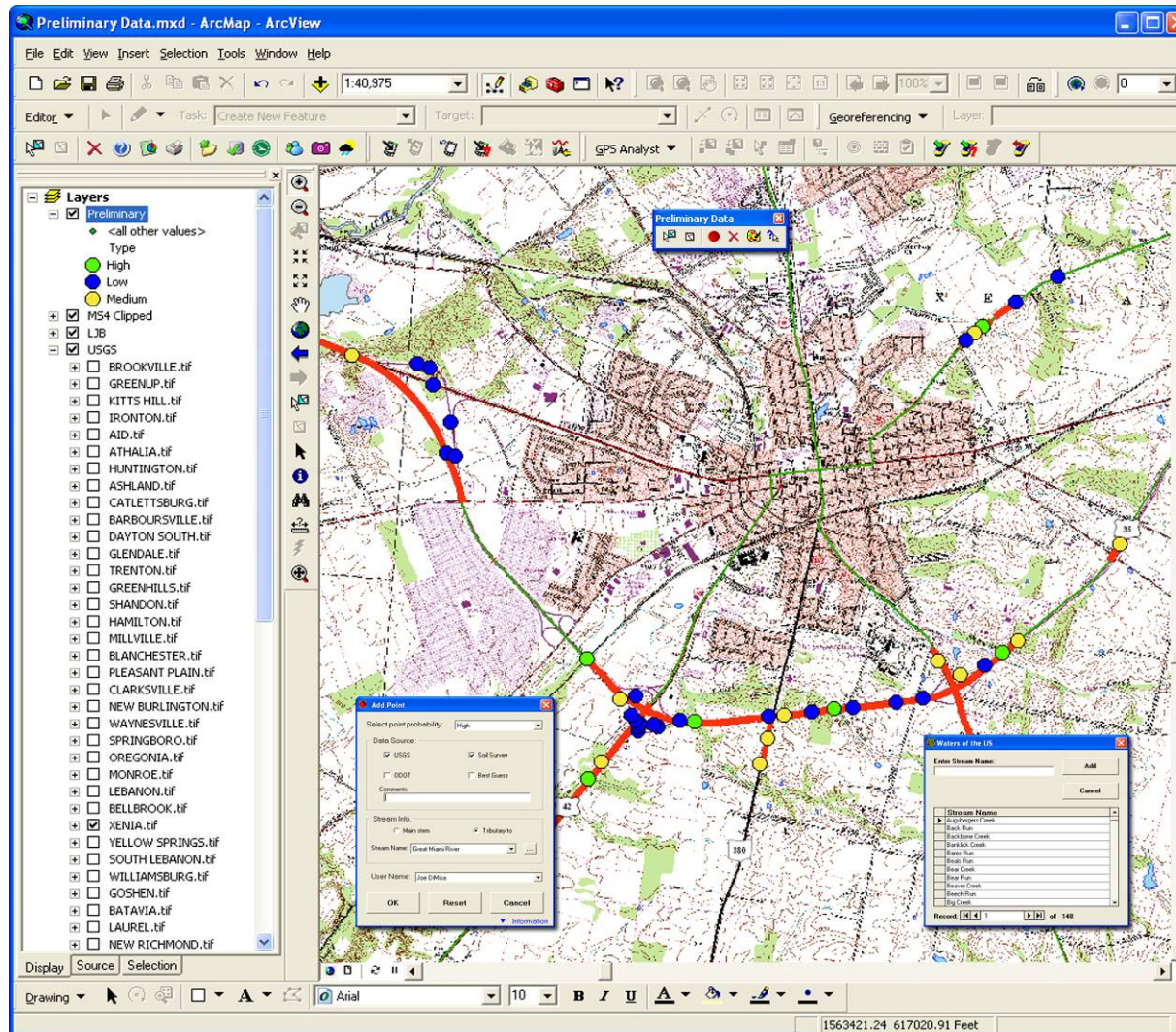


WATER RESOURCE MAPPING REVIEW



- GIS: Identify Preliminary Point
 - > Locate stream crossings
 - Develop base map by adding USGS mapping
 - Reference NRCS soil survey maps
 - Place point on database
 - > Information added with each point
 - Stream name
 - Probability of stream at this location (high, med, low)
 - Name of person entering information

WATER RESOURCE MAPPING REVIEW



WATER RESOURCE MAPPING REVIEW



GIS: Office Process

- Preliminary Point is processed with ODOT-supplied base information
- Result – intelligent points
 - > SLM log point
 - > County, municipality, ODOT district
 - > HUC code (hydrologic unit code)
 - > NFLID (network linear feature identification)

WATER RESOURCE MAPPING REVIEW



ODOT DISTRICT 8

4/18/2006 10:59:15AM



State Routes

NLF ID	Name	County	Stream Name	Type	SLM	Verified
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	9.32	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	10.09	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	10.62	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	10.79	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	11.02	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	11.08	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	11.61	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	11.86	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	12.24	
SBUTSR00004**C	SR-4	BUTLER	Pond	Low	12.50	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	12.57	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	12.70	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	12.85	
SBUTSR00004**C	SR-4	BUTLER	Pond	Medium	13.11	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	13.37	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	13.63	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	Medium	14.02	
SBUTSR00004**C	SR-4	BUTLER	Coldwater Creek	High	14.81	
SBUTSR00004**C	SR-4	BUTLER	Coldwater Creek	High	14.89	
SBUTSR00004**C	SR-4	BUTLER	Dicks Creek	High	18.21	
SBUTSR00004**C	SR-4	BUTLER	Dicks Creek	Low	18.81	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	23.24	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	24.52	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	24.75	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	24.90	
SBUTSR00004**C	SR-4	BUTLER	Great Miami River	High	25.09	
SBUTSR00004*BC	SR-4	BUTLER	Unknown	Low	3.04	
SBUTSR00004*BC	SR-4	BUTLER	Unknown	High	3.15	
SBUTSR00004*BC	SR-4	BUTLER	Unknown	High	3.25	
SBUTSR00004*BC	SR-4	BUTLER	Great Miami River	High	5.07	
SBUTSR00004*BC	SR-4	BUTLER	Great Miami River	Medium	5.50	
SBUTSR00004*BC	SR-4	BUTLER	Great Miami River	Medium	5.95	
SBUTSR00063**C	SR-63	BUTLER	Dicks Creek	High	1.91	
SBUTSR00063**C	SR-63	BUTLER	Dicks Creek	High	2.24	
SBUTSR00073**C	SR-73	BUTLER	Great Miami River	High	16.87	
SBUTSR00122**C	SR-122	BUTLER	Great Miami River	High	6.11	
SBUTSR00128**C	SR-128	BUTLER	Great Miami River	High	7.61	
SBUTSR00128**C	SR-128	BUTLER	Great Miami River	High	8.11	
SBUTSR00129**C	SR-129	BUTLER	Indian Creek	Medium	8.41	
SBUTSR00129**C	SR-129	BUTLER	Beals Run	High	9.08	
SBUTSR00129**C	SR-129	BUTLER	Indian Creek	High	9.21	

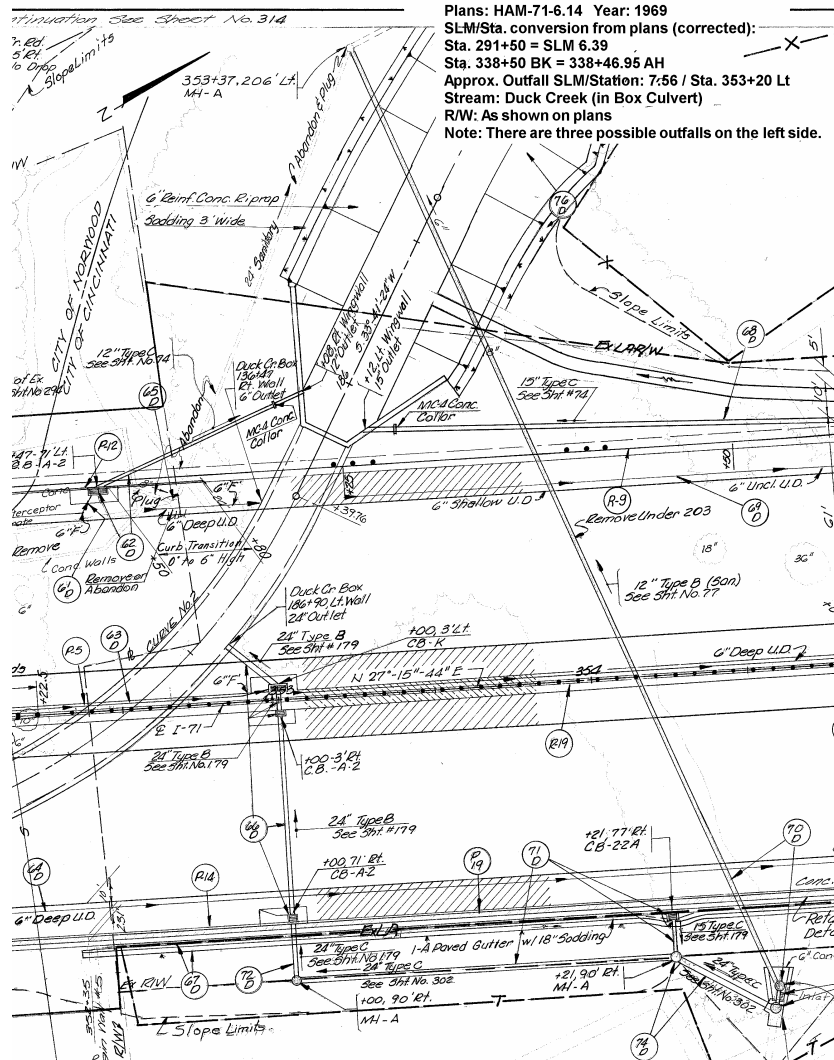


REVIEW OF CONSTRUCTION PLANS

- ◉ Research Roadway Construction Drawings
 - > Further identify stream crossings
 - > Identify storm water outfall points
 - Pipes
 - Ditches
 - Catch basins
 - > Base diagram for the drawing of each outfall location

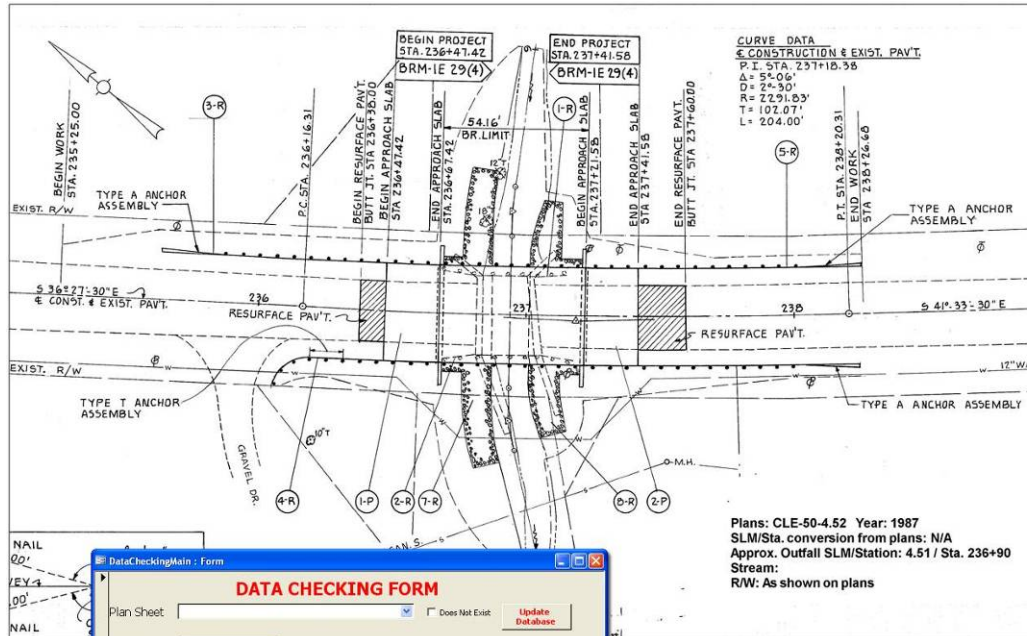


REVIEW OF CONSTRUCTION PLANS





REVIEW OF CONSTRUCTION PLANS



Plans: CLE-50-4.52 Year: 1987
SLM/Sta. conversion from plans: N/A
Approx. Outfall SLM/Station: 4.51 / Sta. 236+90
Stream:
R/W: As shown on plans

DataCheckingMain : Form

DATA CHECKING FORM

Plan Sheet: Does Not Exist

County:

Route #:

SLM:

County	RouteNumber	MEAS	Checked	PlanSheet
Allen	75	118.83678322	Not Verified	Blank
Allen	75	119.37707801	Not Verified	Blank
Allen	75	122.07713608	Not Verified	Blank
Allen	75	122.46261513	Not Verified	Blank
Auglaize	75	117.87949891	Not Verified	Blank
Auglaize	75	117.95822029	Not Verified	Blank
Auglaize	75	118.07639094	Not Verified	Blank
Butler	747	5.1954499603	Not Verified	Blank
Clark	4	0.1704542811	Not Verified	Blank
Clark	70	41.370835536	Not Verified	Blank
Clark	70	41.658280299	Not Verified	Blank
Clark	70	42.158639380	Not Verified	Blank
Clermont	125	0.17	Not Verified	Blank
Clermont	125	0.2621655635	Not Verified	Blank
Clermont	125	0.5675530384	Not Verified	Blank
Clermont	125	0.6936810095	Not Verified	Blank

Records: 14 of 1435

STEP 2: FIELD DATA COLLECTION



- Field crew training
- GIS: Field data prep
- GIS: Data collection

FIELD CREW TRAINING CLASS



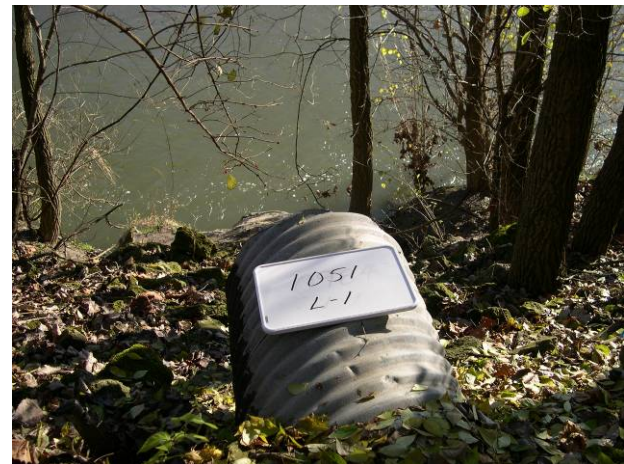
- Recognizing “Surface Waters of the State”
 - > For the purposes of this inventory, a surface watercourse shall be considered to be a stream and surface waters of the State if all of the following characteristics are present:
 - A *defined “channel”* which carries water for at least a minimal period of time and has an “*ordinary high water mark*” (OHWM).



FIELD CREW TRAINING CLASS



- What to Inventory: Outfalls
 - > Two outfall types:
 - Ditch outfalls: an outfall located at the end point of an *open drainage feature*, which is most commonly a ditch, but can also be a trench, trough, channel or other similar feature.
 - Pipe outfalls: an outfall located at the end point of a *closed drainage feature*, such as a pipe, culvert or similar manufactured structure.



FIELD CREW TRAINING CLASS



FIELD DATA PREP



- Checking data out from database (ArcView) to the GPS unit (ArcMap) provides smart data for the field crew
 - > MS4 boundaries
 - > Stream crossings (Low/Med/High Priority)
 - > Locations where construction drawings have been linked into database
 - > Previously inventoried points
 - Points needing dry weather visual field screening
 - Locations skipped due to roadway construction
 - > Weather Data

DAILY WEATHER DATA UPDATES



The screenshot displays the ArcMap interface with a map of a region containing various weather data points. The map shows a network of roads and several yellow circular markers representing weather stations. A 3D terrain model is visible in the lower-left portion of the map. The left-hand side of the interface features a 'Table of Contents' with a list of layers and their visibility status. The 'Weather' layer is checked, and its sub-layers 'Station Locations', 'US Locations', 'JR Locations', and 'SR Locations' are also checked. Other layers include 'Rain', 'NewPoint', 'Construction', 'DeletePoint', 'Locations', 'Preliminary', 'Streets', 'MS4', 'Dist_Office', 'Rest_Areas', 'County', 'DLG_Major_Streams', 'City', 'Boundary_Area', 'USGS', 'XENIA.Nf', and 'Dist789'. The bottom of the screen shows a 'Traffic Weather Checker' window with a weather icon, the text 'TRAFFIC WEATHER CHECKER', the date and time '7/24/2006 10:21:37 AM', and an 'Information' link.

delete.mxd - ArcMap - ArcView

File Edit View Insert Selection Tools Window Help

1:697,351

100%

Georeferencing Layer:

Task: Create New Feature Target:

GPS Analyst

- Review Data
- Field Data
 - <all other values>
 - Completed
 - Completed
 - Not Found
- Rain
- NewPoint
- Construction
- DeletePoint
- Weather
 - Station Locations
 - Weather
 - Locations
 - US Locations
 - JR Locations
 - SR Locations
 - Preliminary
 - Streets
 - MS4
 - Dist_Office
- Rest_Areas
- County
- DLG_Major_Streams
- City
- Boundary_Area
- USGS
 - XENIA.Nf
 - Dist789

Display Source Selection

Drawing

Arial 10

Traffic Weather Checker

TRAFFIC WEATHER CHECKER

7/24/2006 10:21:37 AM

Information

FIELD DATA COLLECTION



- Field Crew Inputs
 - > Remainder of Outfall ID
 - > Rock Channel Protection
 - > Litter Present
 - > Comments
 - > Ditch or Pipe data

OHIO DEPARTMENT OF TRANSPORTATION
MS4 STORM WATER OUTFALL INVENTORY

OFFICE DATA

Staff: Benes
Name of Receiving Stream: Brody Creek
11-Digit HUC: 5060001220 County: FRA
Municipality: Prairie Township NLFID: SFRA000
Facility Address: N/A

FIELD DATA

Staff: Newman, Kramer
Date of Field Survey: 9/4/2004 Rock Channel Protection
Outfall Identifier: FRA00123L Litter Present?
OH St Plane Northing: 744000.00 Latitude: 39.95072
OH St Plane Easting: 1815000.00 Longitude (-): 83.17087

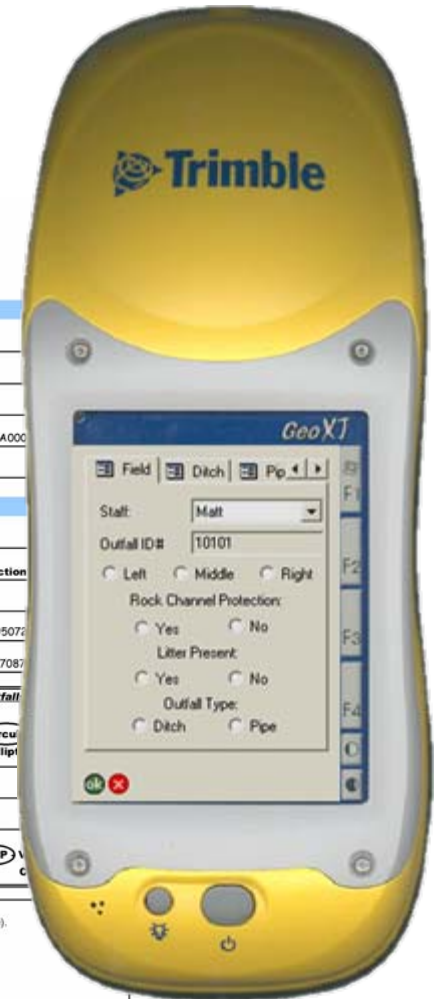
Ditch Outfalls Only

Back Slope (00:00):
Fore Slope (00:00):
Bottom Width (in.):

Pipe Outfall

Pipe Shape: (choose one) Circular Elliptical
Pipe Height (in.):
Pipe Width (in.):
Pipe Material: (choose one) RCP V C

Comments. (Provide explanation why "Other" was selected.)
Photos #8 and #9. Cobble, gravel, and sand present inside pipe (stream substrate).



FIELD DATA COLLECTION



- Ditch Data
 - > Back Slope
 - > Fore Slope
 - > Bottom ditch width



OHIO DEPARTMENT OF TRANSPORTATION
MS4 STORM WATER OUTFALL INSPECTION

OFFICE DATA

Staff: Benes
Name of Receiving Stream: Brady Creek
11-Digit HUC: 5060001220
Municipality: Prairie Township
Facility Address: N/A

FIELD DATA

Staff: Newman, Kramer
Date of Field Survey: 9/4/2004
Outfall Identifier: FRA00123L
OH St Plane Northing: 744000.00
OH St Plane Easting: 1815000.00

Ditch Outfalls Only

Back Slope (00:00):
Fore Slope (00:00):
Bottom Width (in.):

Diagram illustrating the relationship between Run Rise, Bottom Width, Fore Slope, Ditch, and Back Slope.

Comments. (Provide explanation why "Other" was selected. Photos #8 and #9. Cobble, gravel, and sand present inside pipe.)



FIELD DATA COLLECTION



- Pipe Data
 - > Shape
 - > Height
 - > Width
 - > Material



DEPARTMENT OF TRANSPORTATION
STORM WATER OUTFALL INVENTORY

Road Clean Water

Locations

Name: Brady Creek

County: FRA

NLFID: SFRA00040**C

Man, Kramer

9/4/2004 **Rock Channel Protection?** Yes No

FRA00123L **Litter Present?** Yes No

744000.00 **Latitude:** 39.950729 N

1815000.00 **Longitude (-):** 83.170876 W

Pipe Outfalls Only

Pipe Shape: Circular - Rectangular -
(choose one) Elliptical - Egg - Other

Pipe Height (in.): 30

Pipe Width (in.): 30

Pipe Material: RCP - VCP - CMP - PVC -
(choose one) CPP - Other

Explanation why "Other" was selected.
level, and sand present inside pipe (stream substrate).

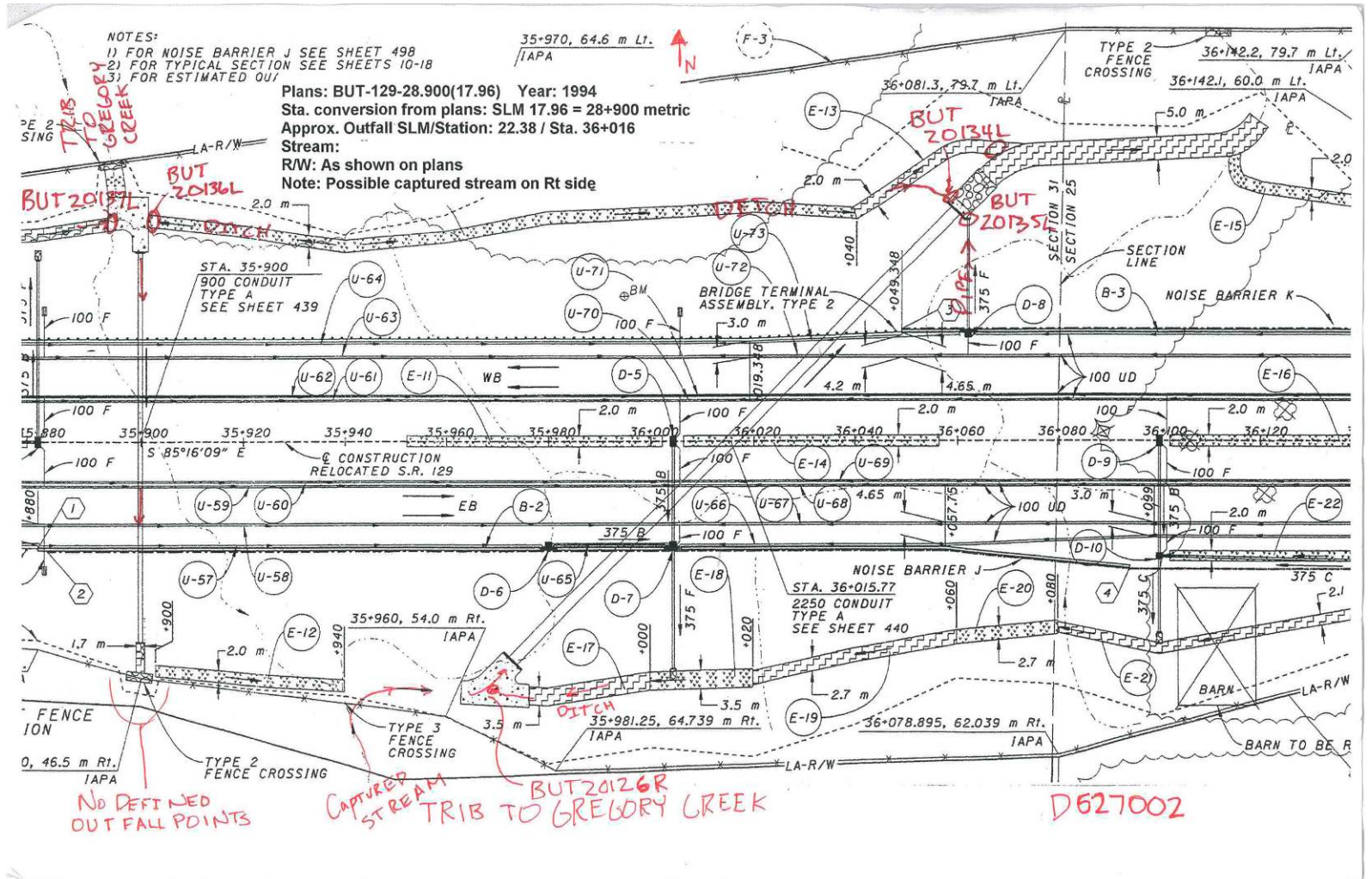


FIELD DATA COLLECTION

- Dry Weather Visual Field Screening
 - > Odor Present
 - > Color of Water
 - > Status of Potential Illicit Discharge
 - > Floatables Present
 - > Turbidity of Water
 - > Source of Potential Illicit Discharge
 - > Comments

DRY WEATHER VISUAL FIELD SCREENING			
Staff:		Newman, Kramer	
Date of Dry Weather Visual Field Screening:		9/4/2004	
Make only <u>one</u> choice for each:			
Odor Present at Outfall:	None - Musty - <u>Sewage</u> - Solvent - Sulfur - Oil - Gasoline - Other	Floatables Present at Outfall:	None - <u>Oil Sheen</u> - Sewage - Foam/Bubbles - Algae
Color of Water at Outfall:	None - Yellow - Green - Brown - <u>Gray</u> - Other	Turbidity of Water at Outfall:	Clear - <u>Cloudy</u> - Opaque
Status of Potential Illicit Discharge:	No flow - Low priority - <u>Medium priority</u> - High priority	Source of Potential Illicit Discharge:	None - HSTS - Industrial - <u>Commercial</u> - Other
Comments regarding dry weather visual field screening and potential illicit discharges. Provide explanation why "Other" was selected. Source of potential illicit discharge may be Bob's Car Repair located adjacent to stream along US 40. Very little flow (< 1 gallon every 6 seconds) at outfall.			

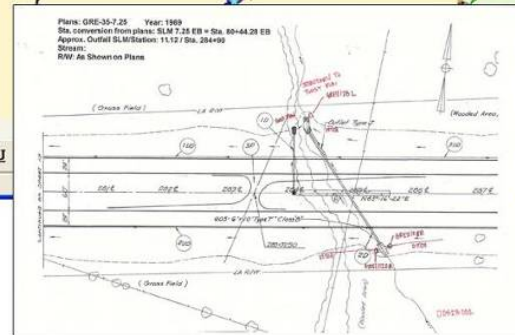
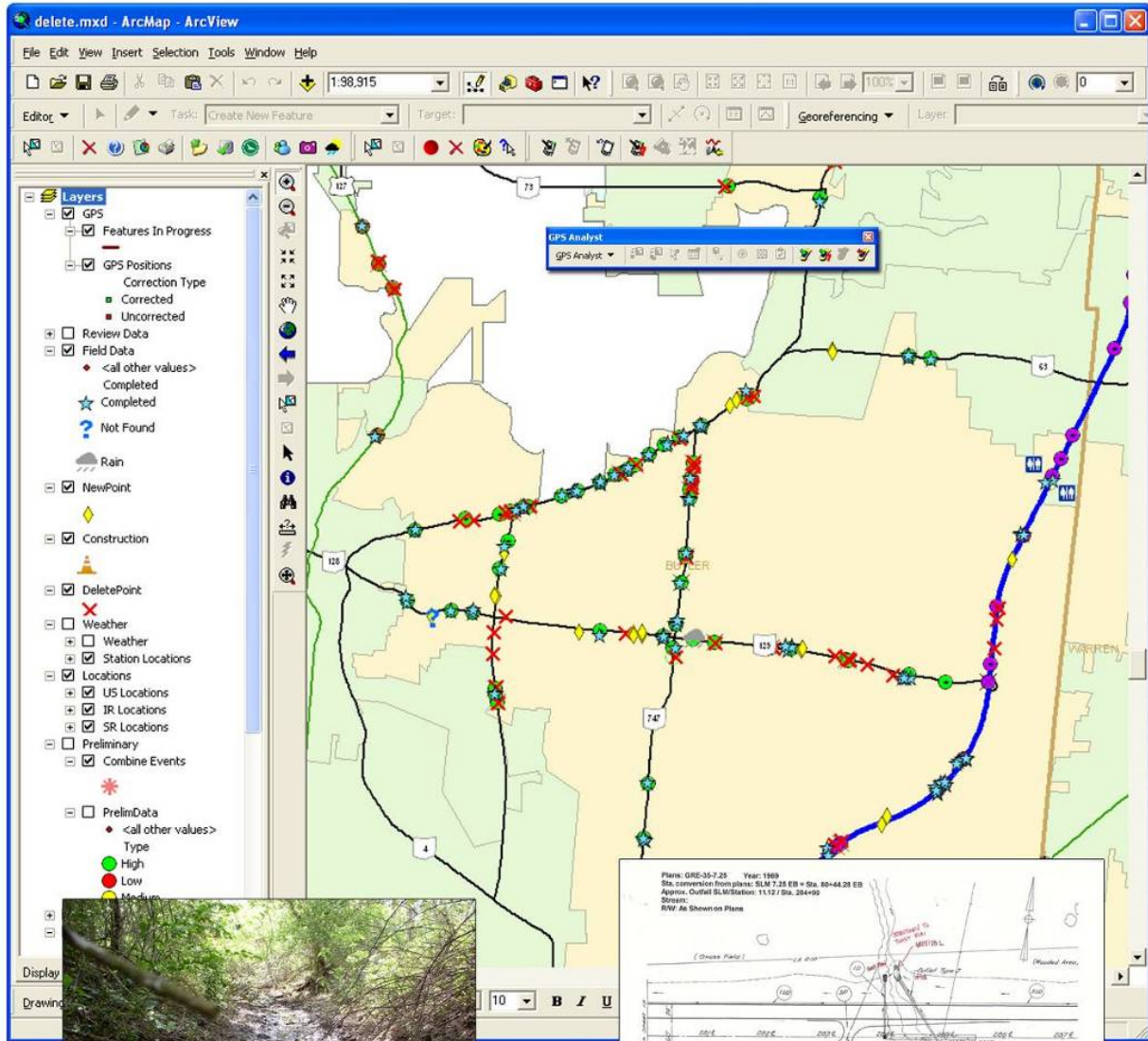
FIELD DATA COLLECTION



STEP 3: DATABASE POPULATION



- Process Field Collected Data in the Office
 - > Data is checked from GPS unit into the database
 - > Error correction of outfall points by locating the nearest base station
 - > Error checking in the field data
 - > Photos and plans linked to outfall point





OHIO DEPARTMENT OF TRANSPORTATION MS4 STORM WATER OUTFALL INVENTORY



OFFICE DATA

Office Staff:	<input type="text" value="Joe DiMisa"/>	NLFD:	<input type="text" value="5GREU500035**C"/>
Stream Type:	<input type="text" value="Tributary to"/>	Route No.:	<input type="text" value="35"/>
Stream Name:	<input type="text" value="Little Miami River"/>	Log Point No.:	<input type="text" value="6.537869262"/>
County:	<input type="text" value="Greene"/>	11-Digit HUC:	<input type="text" value="05090202020"/>
Zip Code:	<input type="text" value="45385"/>	Facility Address:	<input type="text" value="non-linked"/>

OUTFALL PHOTOGRAPH



Photo Name:

FIELD DATA

Field Staff:	<input type="text" value="Matt Weaver"/>	Date of Field Survey:	<input type="text" value="5/22/06"/>
Outfall ID#:	<input type="text" value="11103"/>	Rock Channel Protect:	<input type="text" value="N"/>
OH State Plane North:	<input type="text" value="1409185.32982516"/>	Litter Present:	<input type="text" value="Y"/>
OH State Plane South:	<input type="text"/>		

Ditch Outfalls Only

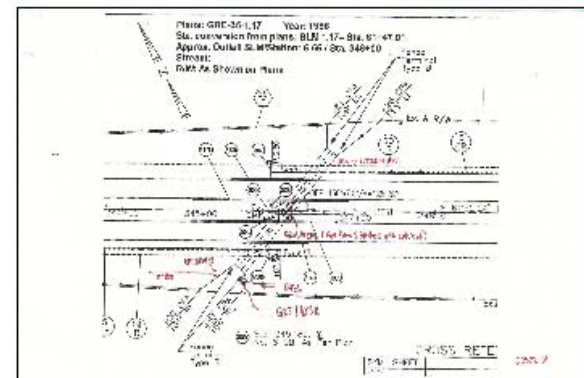
Back Slope (00:00):	<input type="text" value="0301"/>
Fore Slope (00:00):	<input type="text" value="0301"/>
Bottom Width (in):	<input type="text" value="48"/>

Pipe Outfalls Only

Pipe Shape:	<input type="text" value="None"/>
Pipe Height (in.):	<input type="text" value="0"/>
Pipe Width (in.):	<input type="text" value="0"/>
Pipe Material:	<input type="text" value="RCP"/>

Comments:

OUTFALL PLAN SHEET



Plan Name:

DRY WEATHER VISUAL FIELD SCREENING

Dry Staff:	<input type="text" value="Matt Weaver"/>	Date of Dry Weather:	<input type="text" value="5/22/06"/>
Odor Present:	<input type="text" value="None"/>	Floatables Present:	<input type="text" value="None"/>
Color of Water:	<input type="text" value="None"/>	Turbidity of Water:	<input type="text" value="Clear"/>
Status of Discharge:	<input type="text" value="No Flow"/>	Source of Discharge:	<input type="text" value="None"/>
Dry Comments:	<input type="text"/>		

Status of Point:



DATABASE POPULATION



- Data is imported into ODOT's MS4 Outfall Inventory Database via the Internet
 - > Tabular outfall data (CSV) file.
 - > Digital photos and sketches as JPEG image files.
- The complete and verified imported data is reviewed before it is considered to be final
- Final data is then submitted to ODOT

ODOT DATABASE



- Standardized Queries and Searches

The screenshot shows a web browser window titled "ODOT MS-4 Inventory - Advanced Query - Mozilla Firefox". The address bar displays the URL "http://www.corp.dlzc.com/ODOTMS4/outfall_adv_query_new.asp". The page header is "ODOT MS-4 Outfall Inventory - Advanced Query" with navigation links for "Basic Query", "Import Data", and "Log Out".

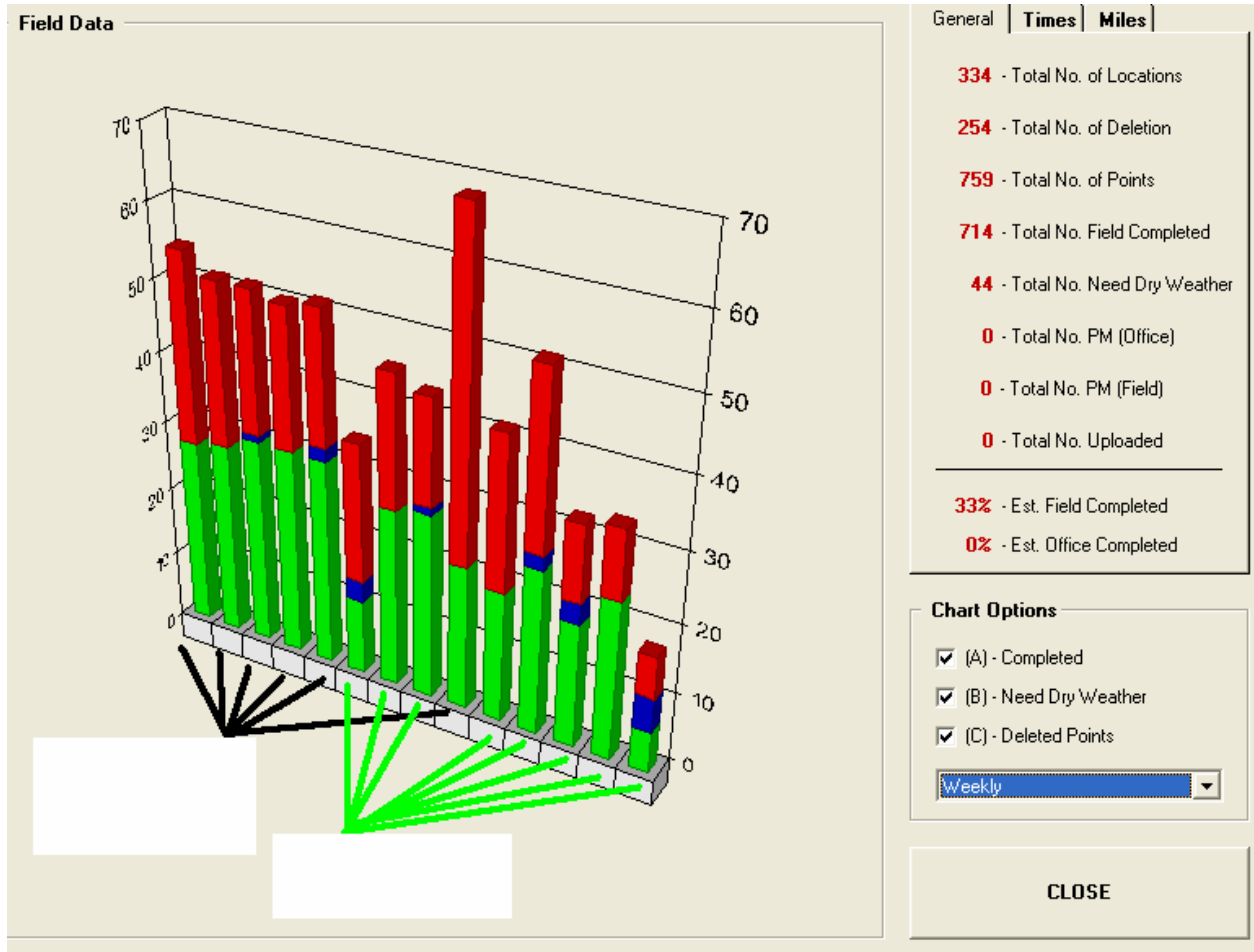
The main content area is a green box with the following text: "Please select criteria below to query the database. You can select as many items as you want or leave any of them blank."

The form contains the following fields:

- Receiving Stream:
- Watershed Code:
- District:
- County:
- Facility Address:
- Municipality:
- NLF ID:
- Site Designation #:
- Outfall Type:
- Rock Channel Protection:
- Litter Present:

The status bar at the bottom of the browser window shows "Done".

GIS: JOB STATUS MONITORING



GIS: OTHER APPLICATIONS



- GIS can be tailored toward various infrastructure inventory needs.

- > Traffic Sign Inventories
- > Environmental
 - Indiana Bat Tree Locations
 - Wetland Delineations
- > Dam Inventory





Innovative Facility and Infrastructure Design™

INNOVATIVE JOB STATUS MONITORING TECHNIQUES USING GIS

ODOT MS4 OUTFALL INVENTORY

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