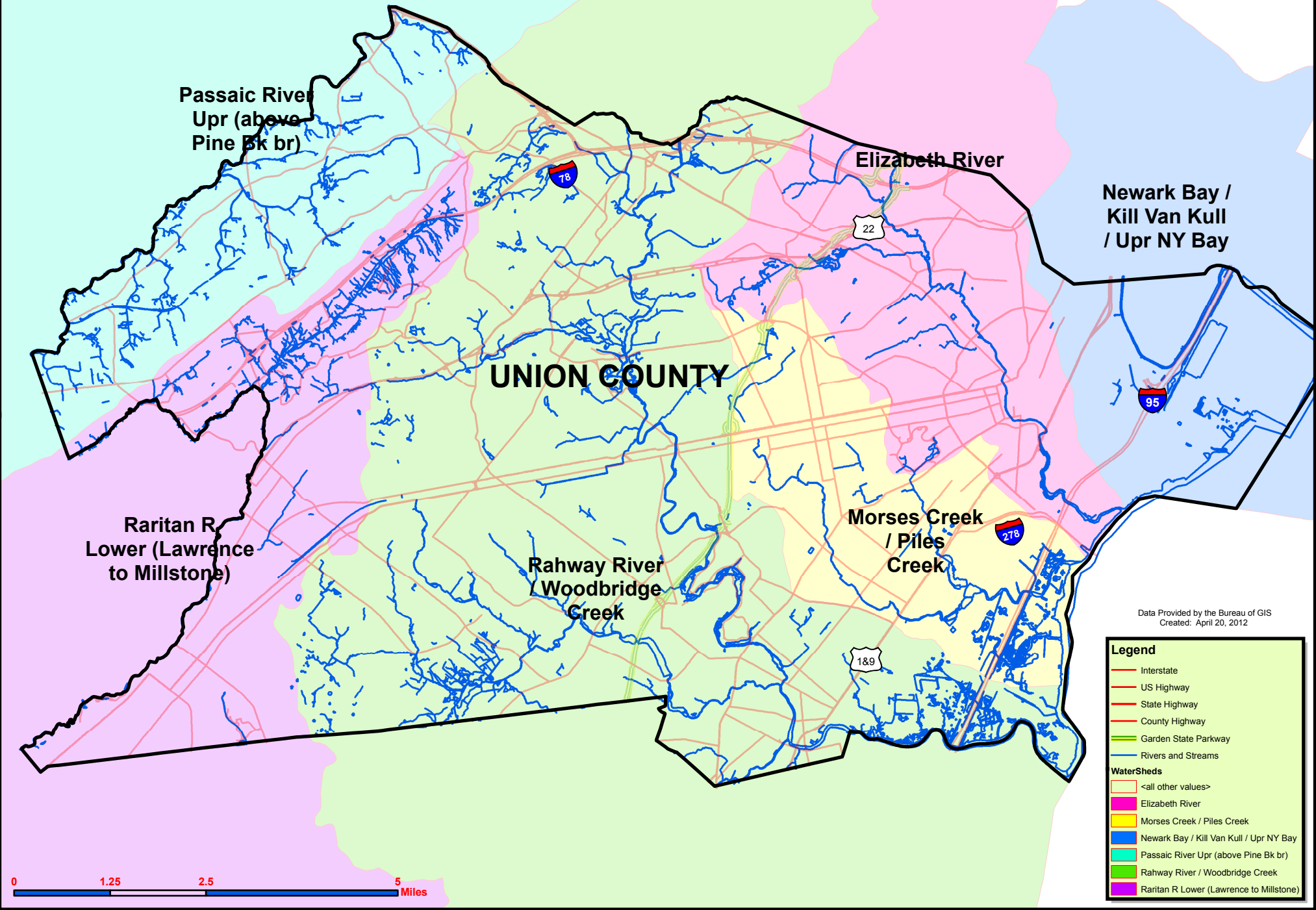


APPENDIX P  
WATERSHED



# UNION COUNTY WATERSHEDS



Data Provided by the Bureau of GIS  
Created: April 20, 2012

**Legend**

- Interstate
- US Highway
- State Highway
- County Highway
- Garden State Parkway
- Rivers and Streams

**WaterSheds**

- <all other values>
- Elizabeth River
- Morses Creek / Piles Creek
- Newark Bay / Kill Van Kull / Upr NY Bay
- Passaic River Upr (above Pine Bk br)
- Rahway River / Woodbridge Creek
- Raritan R Lower (Lawrence to Millstone)



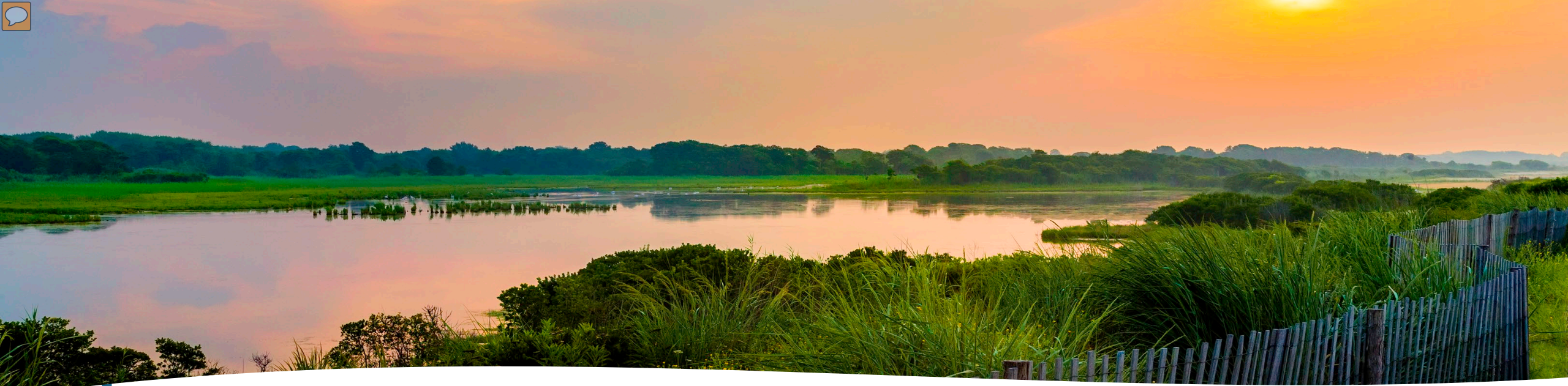


# NJSME Member Meeting

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September 12, 2025



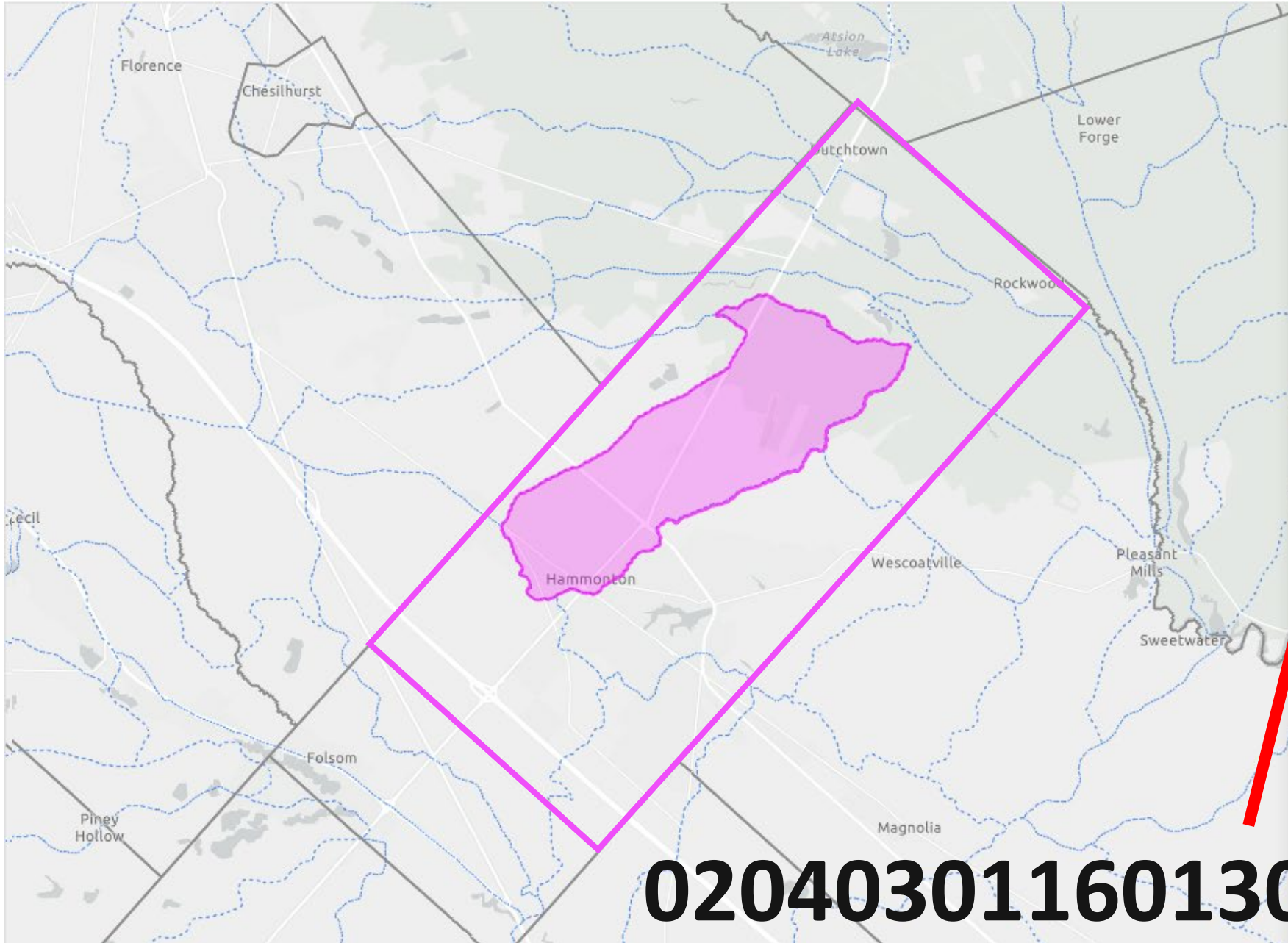


# Watershed Improvement Plan

## Purpose:

- ✓ Identify opportunities to improve water quality
- ✓ Reduce MS4 contribution of pollutants to waterbodies with impairments & TMDLs
- ✓ Address stormwater flooding to protect human health and safety, and the environment

# Hydrologic Unit Code (HUC 14)



**HUC14: Great Swamp Branch (below Rt 206)** ×

🔍 Zoom to 📏 Pan

Hydrologic Unit Code (HUC14)	02040301160130
Subwatershed Name	Great Swamp Branch (below Rt 206)
Watershed Management Area Number	14
Watershed Management Area Name	Mullica
Water Region Number	3
Water Region Name	Atlantic Coast
Watershed Name	Mullica River (above Basto River)
HUC12	020403010604
ACRES	5,561.03

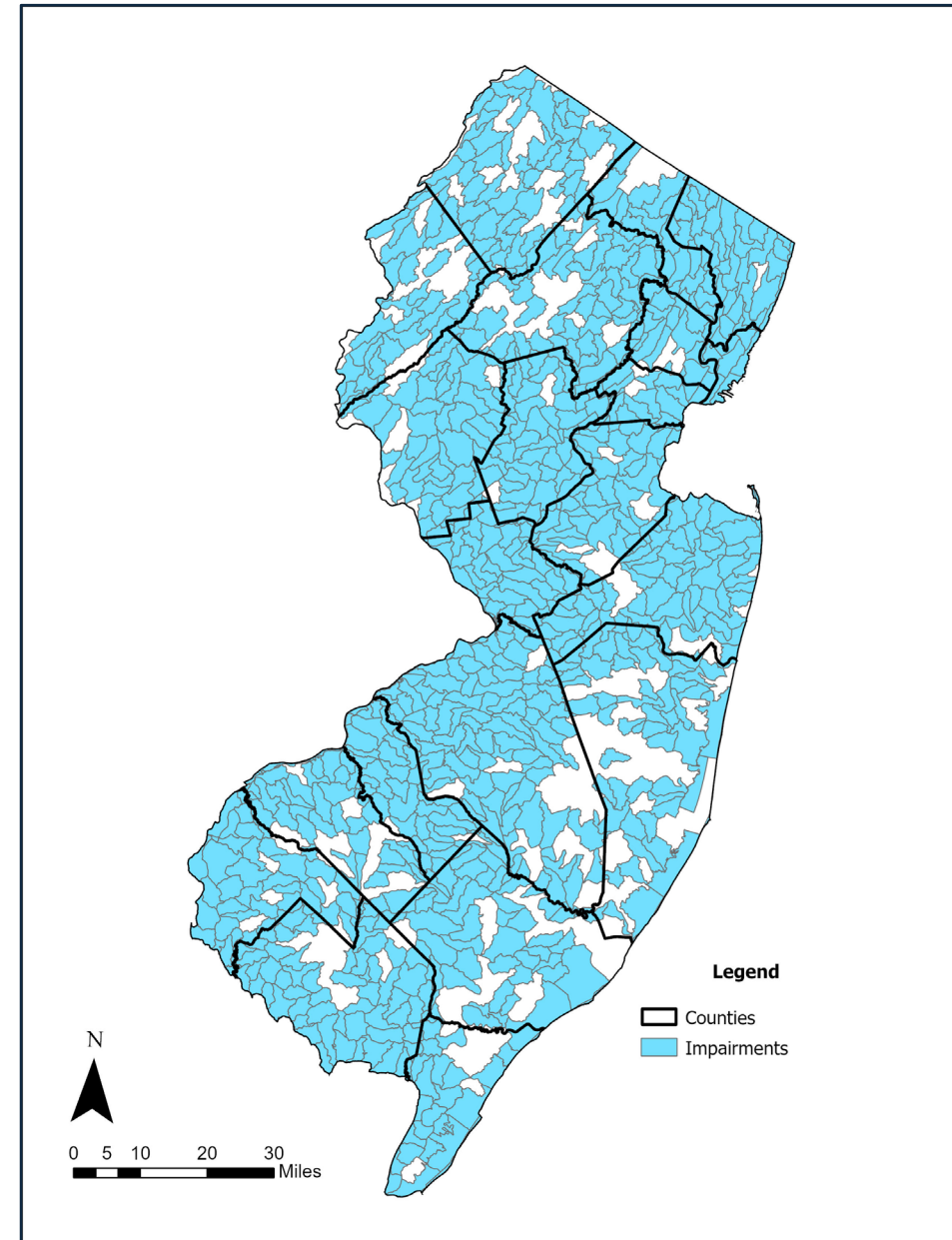
**02040301160130**

# Surface Water Quality in New Jersey

## Water Quality Impairments

---

- ✓ Benzo(a) pyrene (PAHs)
- ✓ Cadmium
- ✓ Chromium
- ✓ Copper
- ✓ Dissolved Oxygen (DO)
- ✓ Enterococcus
- ✓ E. Coli
- ✓ Lead
- ✓ PCBs in Fish Tissue
- ✓ pH
- ✓ Total Phosphorus
- ✓ Temperature
- ✓ Total Dissolved Solids (TDS)
- ✓ Total Suspended Solids (TSS)
- ✓ Turbidity

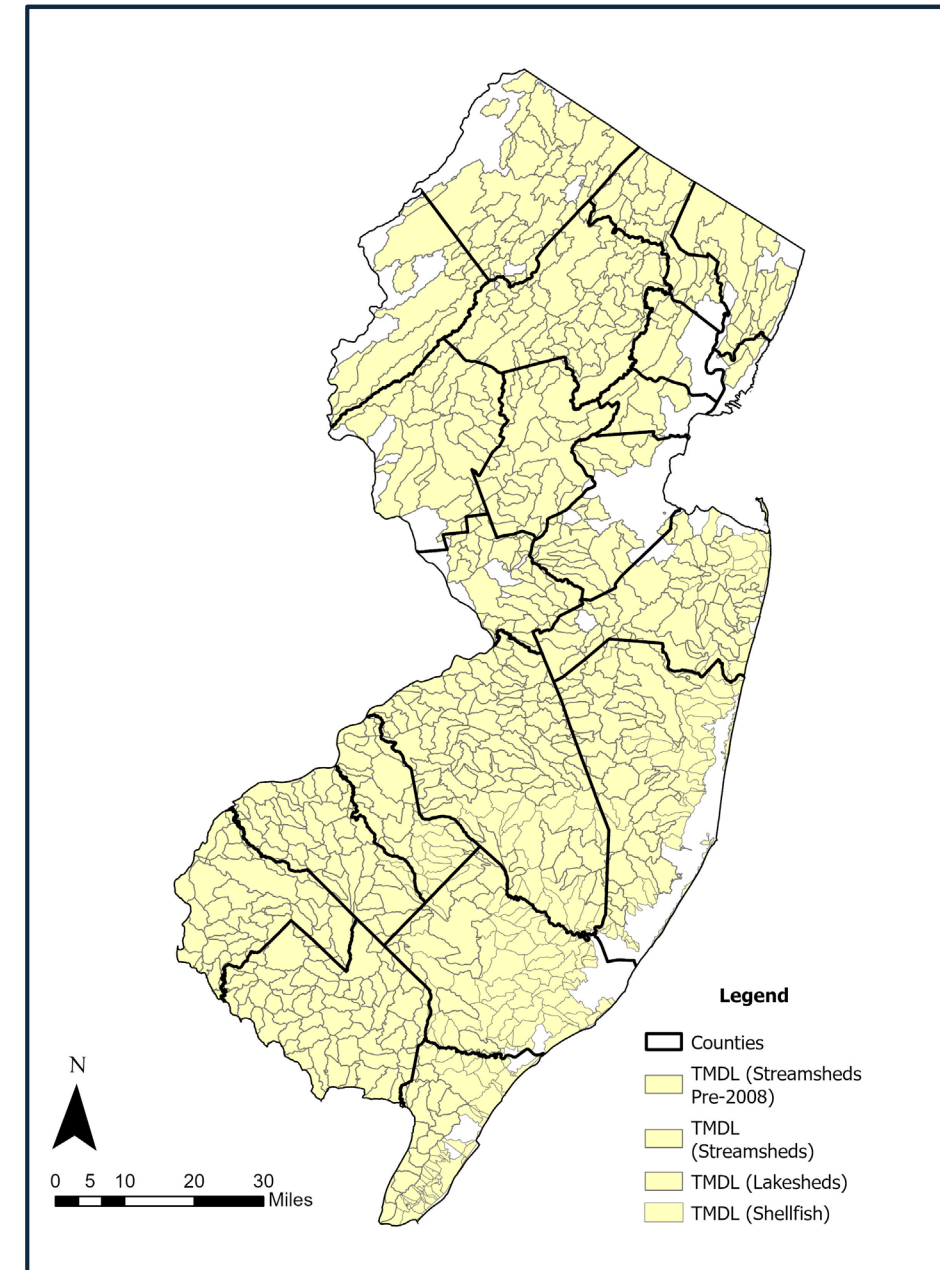


# Surface Water Quality in New Jersey

## Total Maximum Daily Load (TMDLs)

---

- ✓ Fecal Coliform
- ✓ Nickel
- ✓ Polychlorinated Biphenyls (PCBs)
- ✓ Temperature
- ✓ Total Coliform
- ✓ Total Phosphorus
- ✓ Total Suspended Solids (TSS)
- ✓ Volatile Organic Compounds (VOCs)



# Pollutant Parameters Related to Stormwater

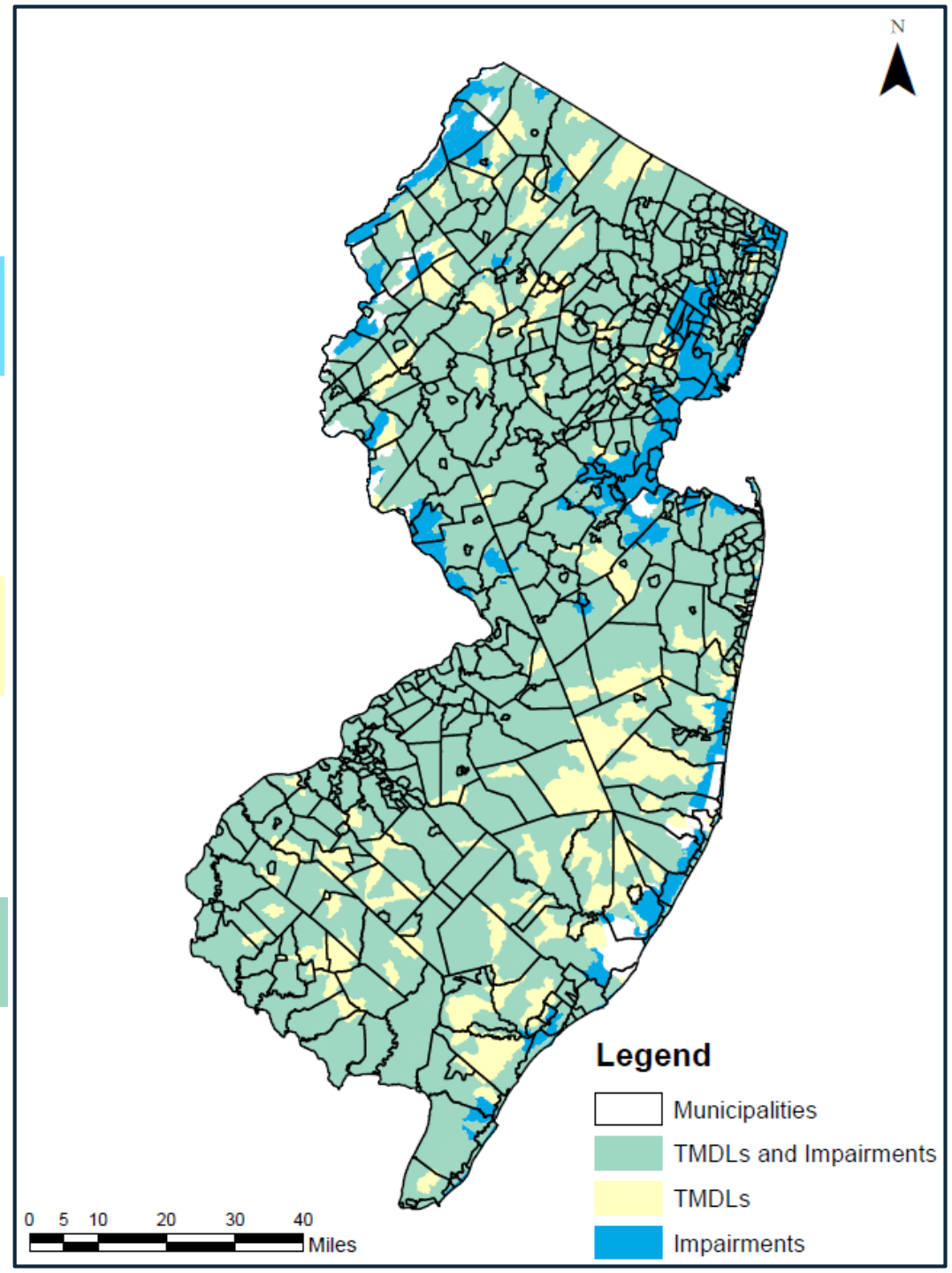
- ✓ Fecal Coliform, Total Coliform, Enterococcus, & E. coli – wildlife/pet waste, sewer leaks
- ✓ Nickel, Cadmium, Chromium, & Benzo(a) pyrene (PAHs) – vehicle exhaust, asphalt
- ✓ Total Phosphorus, Dissolved Oxygen (DO), Nitrate, & pH – fertilizers, leaf litter and other vegetative waste
- ✓ Polychlorinated biphenyls (PCBs) – vehicles, building materials
- ✓ Temperature, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), & Turbidity – runoff from impervious surfaces, roadside erosion, road salt, leaf litter and other vegetative waste
- ✓ Volatile Organic Compounds (VOCs) – gasoline, paint, solvents
- ✓ Lead & Copper – old deteriorating pipes

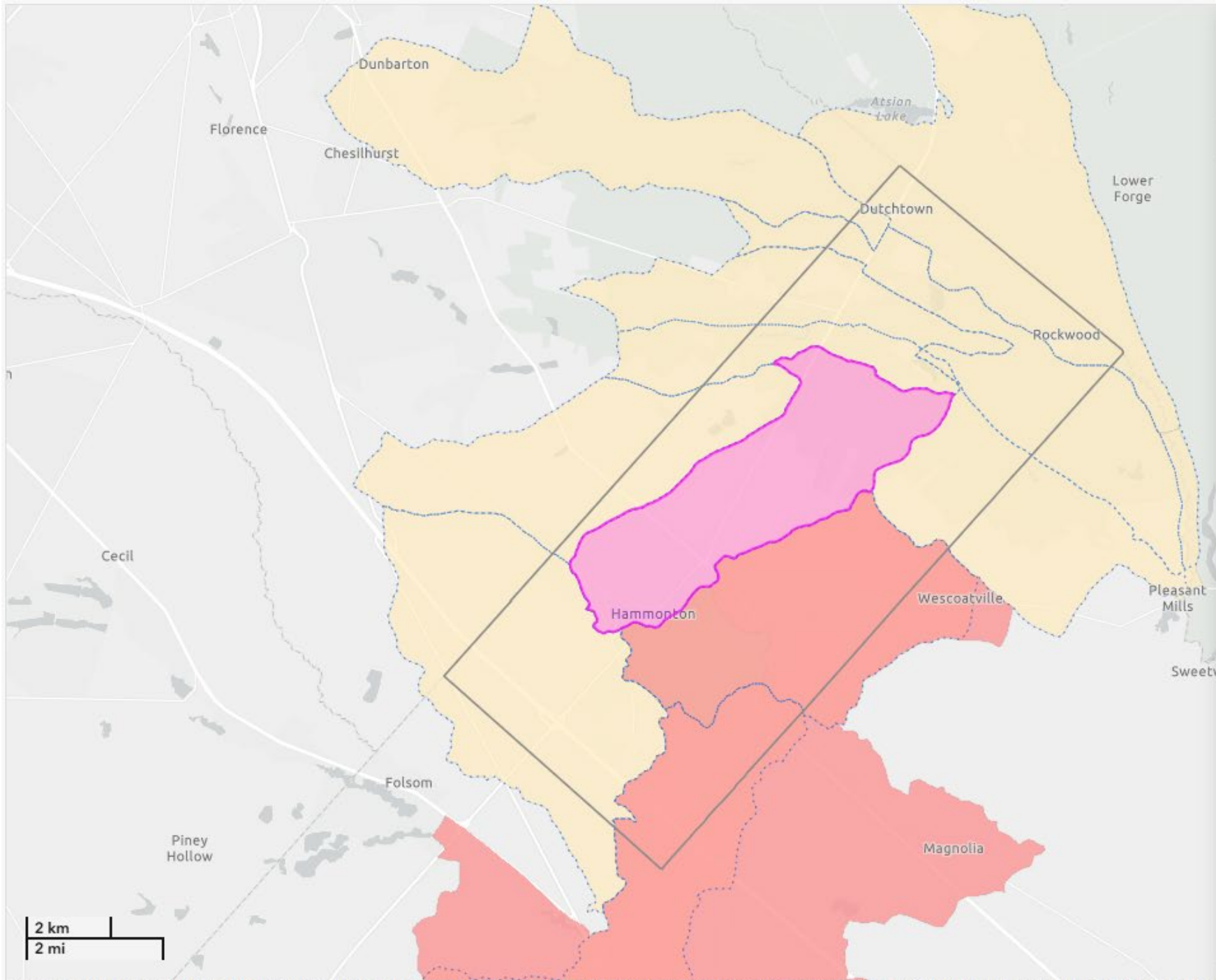


# Water Quality Impairments

## Total Maximum Daily Load (TMDLs)

### TMDLs and Impairments





**Water Quality Impairment(s) Related to Stormwater for Great Swamp Branch (below Rt 206)** ×

🔍 Zoom to    📏 Pan

**Water Quality Impairment(s) Related to Stormwater**

- Great Swamp Branch (below Rt 206)  
NITRATE >

---

- Great Swamp Branch (below Rt 206)  
PH >



# Presentation Symbols



**Tier A**



**Highway Agency**



# Watershed Improvement Plan Overview

## Phase 1

### Watershed Inventory Report

- Inventory of ALL stormwater facilities and other relevant information

## Phase 2

### Watershed Assessment Report

- Evaluate stormwater inventory and assess improvement BMP's
- Evaluate potential BMP's for future improvement projects

## Phase 3

### Watershed Improvement Plan Report

- Select BMP locations
- Select and begin implementation of improvement BMP's

# Watershed Inventory Report – Phase 1



- ✓ Outfall drainage area
- ✓ Interconnection drainage area
- 🚧 MS4 related flooding areas
- 🏠 The location/ownership of all stormwater outfalls and basins/infrastructure not owned/operated by the permittee

- ✓ Receiving waterbodies
- ✓ Water quality classifications
- ✓ TMDL & Impairment areas
- ✓ Impervious areas
- ✓ Overburdened Communities

# NJDEP Open Data

## Receiving Waterbodies



National Hydrography Dataset (NHD) Streams and Waterbodies 2015 for New Jersey (Download)

☑ Authoritative



NJ Dept. of Environmental Protection Bureau of GIS  
NJDEP Bureau of GIS

Open Document

## Impervious Areas



Land Use/Land Cover of New Jersey 2020

☑ Authoritative



NJ Dept. of Environmental Protection Bureau of GIS  
NJDEP Bureau of GIS

View Map

Download

More ▾

## Water Quality Classifications



Surface Water Quality Classification of New Jersey

☑ Authoritative



NJ Dept. of Environmental Protection Bureau of GIS  
NJDEP Bureau of GIS

View Map

Download

More ▾

## TMDL & Impairments

Document ...

[Essex County Impervious Surface...](#)

Applied Geographics, Inc.

This data set was generated to provide a statewide vector...

Document ...

[Cumberland County Impervious Surface...](#)

Applied Geographics, Inc.

This data set was generated to provide a statewide vector...

Document ...

[Warren County Impervious Surface...](#)

Applied Geographics, Inc.

This data set was generated to provide a statewide vector...

Document ...

[Ocean County Impervious Surface...](#)

Applied Geographics, Inc.

This data set was generated to provide a statewide vector...

Document ...

[Middlesex County Impervious Surface...](#)

Applied Geographics, Inc.

This data set was generated to provide a statewide vector...

Document ...

[Hunterdon County Impervious Surface...](#)

Applied Geographics, Inc.

This data set was generated to provide a statewide vector...

# NJ-WET (New Jersey Watershed Evaluation Tool)



## New Jersey Watershed Evaluation Tool (NJ-WET)



TMDLs & Impairments

MS4 Infrastructure

OBC & Impervious Surfaces

Search: hammonton

**Hammonton**

ATLANTIC

**Hammonton**

Zoom to Pan

**Hammonton Town**  
ATLANTIC COUNTY  
Area (Square Miles): 41.31  
2020 Population: 14,711

**Intersecting HUC14s:**

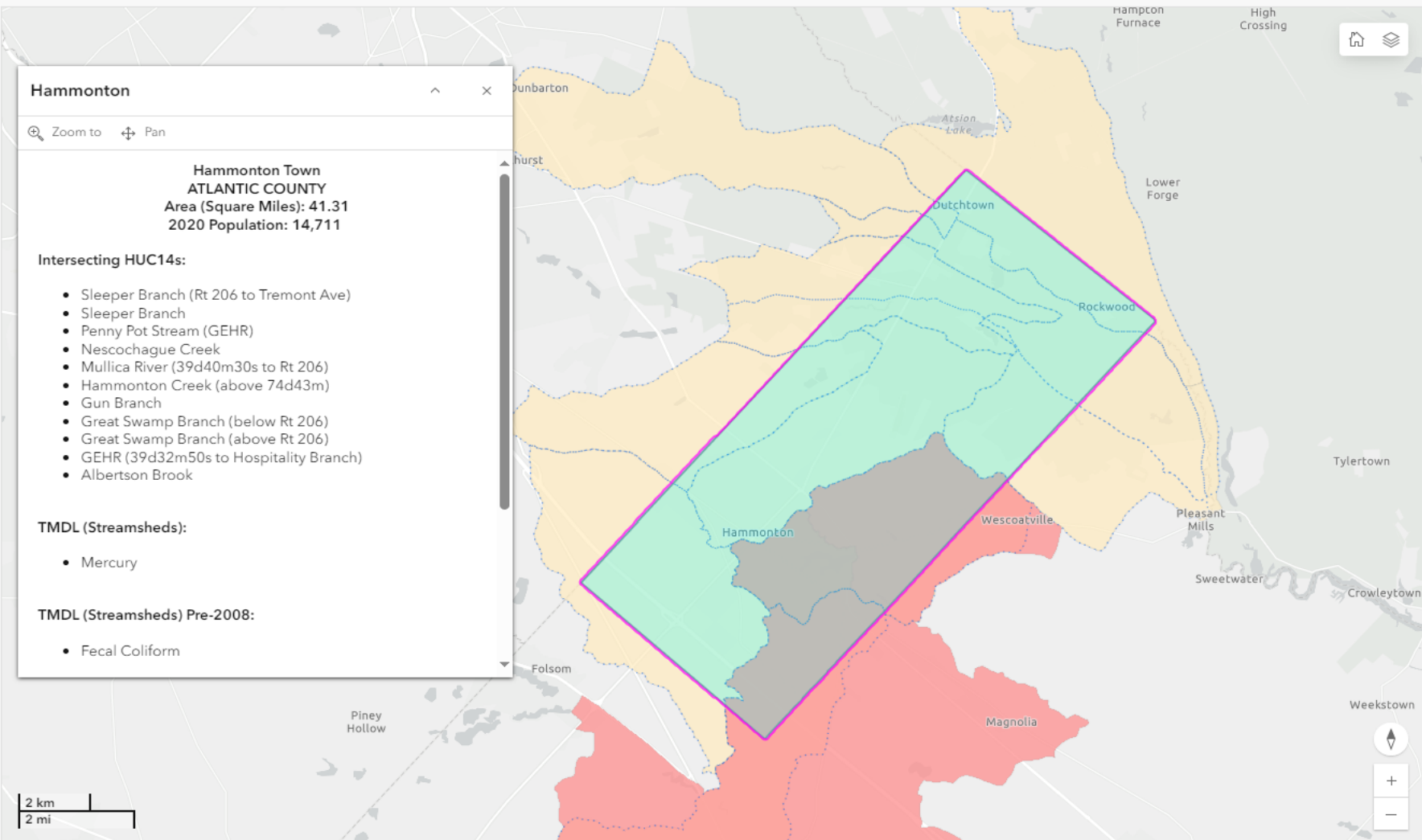
- Sleeper Branch (Rt 206 to Tremont Ave)
- Sleeper Branch
- Penny Pot Stream (GEHR)
- Nescochague Creek
- Mullica River (39d40m30s to Rt 206)
- Hammonton Creek (above 74d43m)
- Gun Branch
- Great Swamp Branch (below Rt 206)
- Great Swamp Branch (above Rt 206)
- GEHR (39d32m50s to Hospitality Branch)
- Albertson Brook

**TMDL (Streamsheds):**

- Mercury

**TMDL (Streamsheds) Pre-2008:**

- Fecal Coliform



**Municipality**

**Watersheds (DEPHUC14)**

**TMDLs**

**TMDL (Streamsheds)**

- Polychlorinated Biphenyls (PCBs)
- Total Phosphorus
- Volatile Organic Compounds (VOCs)
- Total Suspended Solids

**TMDL (Streamsheds) Pre-2008**

- Fecal Coliform
- Total Phosphorus

**TMDL (Lakesheds)**

- Fecal Coliform
- Total Phosphorus

**TMDL (Shellfish)**

- Total coliform

New Jersey Office of GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS | NJDEP | New Jersey Office of Information Technology (NJGIT), Office of Geographic Informa... Powered by Esri



Required Data	Data Source
1. All stormwater outfalls owned/operated by the permittee	MS4 Infrastructure Map
2. Drainage area for each permittee owned/operated outfall	Topography ArcGIS Solutions/ArcHydro
3. Receiving waterbodies of those outfalls	NJ-WET NJDEP Open Data
4. Water quality classification of all receiving waterbody segments	NJ-WET NJDEP Open Data
5. All stormwater interconnections from the permittee’s MS4 system into another entities’ storm or sanitary sewer system	MS4 to MS4 interconnections required in MS4 Infrastructure Map, private interconnection(s) needed
6. The drainage area for each interconnection into another entities’ storm or sanitary sewer system	Topography ArcGIS Solutions/ArcHydro
7. All stormwater interconnections into the permittee’s system from another entities’ storm sewer system	MS4 to MS4 interconnections required in MS4 Infrastructure Map, private interconnection(s) needed

*\*The highlighted rows indicate that electronic data is required to be submitted to the Department via the Stormwater Document Submittal Service using NJDEP Online. Acceptable electronic data submittal formats are as follows:*

- Georeferenced shapefile(s),*
- Geodatabase(s), or*
- AutoCAD file(s) (with all other non-applicable data stripped out).*



Required Data

Data Source

8. All storm drain inlets owned/operated by the permittee	MS4 Infrastructure Map
9. Area associated with each TMDL for waters that lie within or bordering the permittee’s property(s)/jurisdiction	NJ-WET NJDEP Open Data
10. Area associated with each water quality impairment for waters that lie within or bordering the permittee’s property(s)/jurisdiction	NJ-WET NJDEP Open Data
11. Overburdened communities	NJ-WET NJDEP Open Data EJMAP
12. Impervious areas	NJ-WET NJDEP Open Data
13. Location and ownership of all stormwater infrastructure not owned or operated by the permittee	H&H Database

*\*The highlighted rows indicate that electronic data is required to be submitted to the Department via the Stormwater Document Submittal Service using NJDEP Online. Acceptable electronic data submittal formats are as follows:*

- *Georeferenced shapefile(s),*
- *Geodatabase(s), or*
- *AutoCAD file(s) (with all other non-applicable data stripped out).*

# Watershed Inventory Report Template



## Phase 1 of the WIP Template for Tier A and Public Complex Permittees

### List of Figures

The table below is an example detailing how this section should appear. Each line in the table should be updated and replaced by the permittee to reflect the corresponding figure titles.

Title	Page #
Figure 1: <i>Permittee Owned/Operated Stormwater Outfalls</i>	Page #
Figure 2:	Page #
Figure 3:	Page #
Figure 4:	Page #
Figure 5:	Page #
Etc.	Page #

### List of Tables

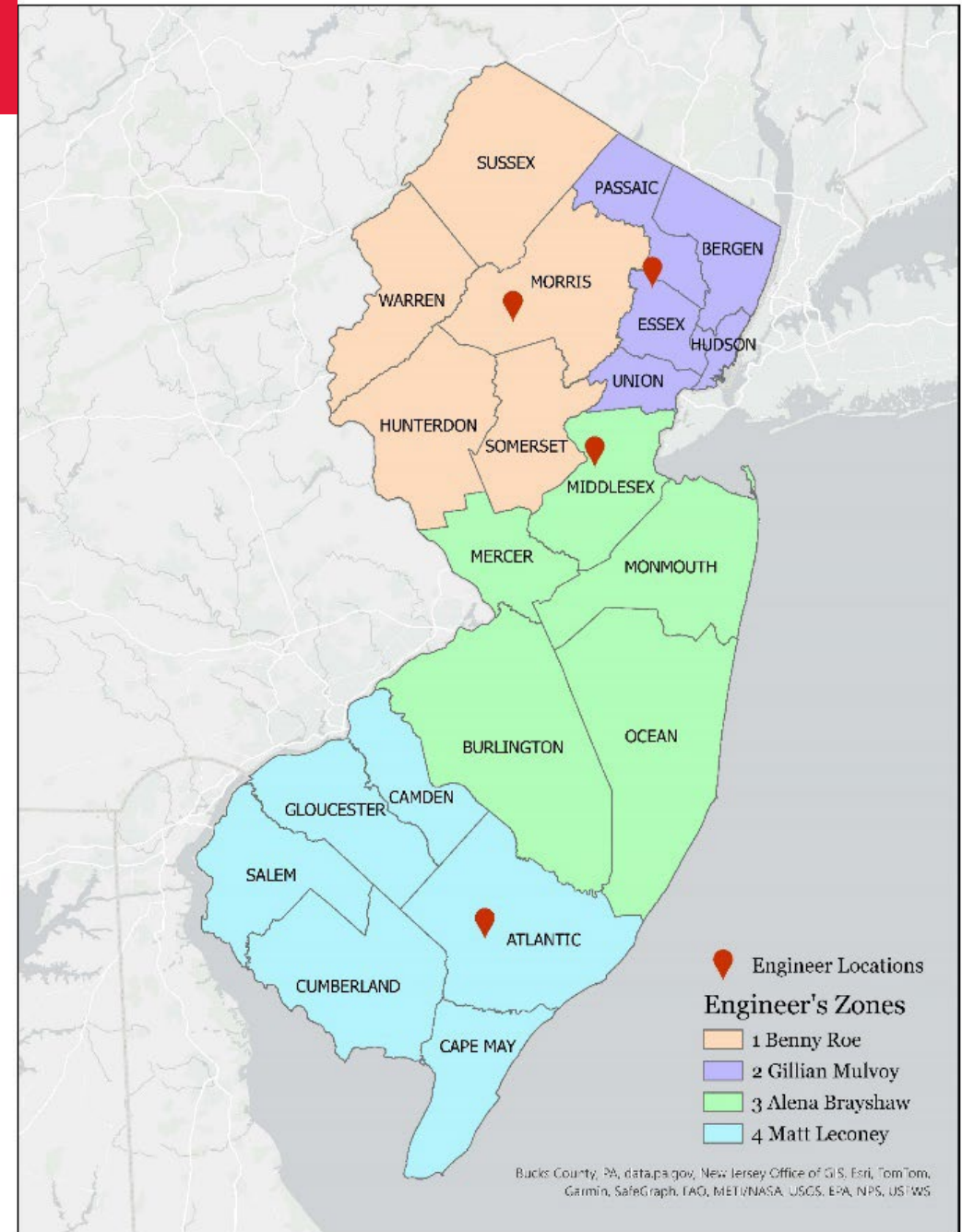
The table below is an example detailing how this section should appear. Each line in the table should be updated and replaced by the permittee to reflect the corresponding table titles.

Title	Page #
Table 1: <i>Receiving Surface Water Bodies &amp; Water Quality Classifications</i>	Page #
Table 2:	Page #
Table 3:	Page #
Table 4:	Page #
Table 5:	Page #
Etc.	Page #



1. Build or enhance stormwater asset inventory or mapping
2. Stormwater system vulnerability, condition/functional assessment
3. Water quality and flood stressor identification
4. Watershed implementation planning and project identification and design
5. Zoning and impervious surface build out analysis
6. Ordinance evaluation and amendment

Region	Name	Email
Northwest	Benny Roe	<a href="mailto:benny.roe@rutgers.edu">benny.roe@rutgers.edu</a>
Northeast	Gillian Mulvoy	<a href="mailto:gillian.mulvoy@rutgers.edu">gillian.mulvoy@rutgers.edu</a>
Central	Alena Brayshaw	<a href="mailto:alena.brayshaw@rutgers.edu">alena.brayshaw@rutgers.edu</a>
South	Matthew Leconey	<a href="mailto:matthew.leconey@rutgers.edu">matthew.leconey@rutgers.edu</a>





# WIP Resources



[Home](#) / [Municipal Stormwater Regulation Program](#) / **Watershed Improvement Plan**

## Watershed Improvement Plan

### Templates

[Phase 1 – Watershed Inventory Report Template](#)

[Watershed Assessment Report – Phase 2 – \*Coming Soon\*](#)

[Watershed Improvement Plan – Phase 3 – \*Coming Soon\*](#)

### New Jersey Watershed Evaluation Tool (NJ-WET)

[NJ-WET](#)

[NJ-WET FAQ](#)

### Resources

[\\*WIP Project Matrix \(See \\* below\)](#)

[WIP Project Descriptions – \*Coming Soon\*](#)

[Pollutants of Concern](#)

[TMDL Lookup Tool](#)

[NJDEP Open Data](#)

[H&H Database](#)

[\\*\\*MS4 Technical Assistance Program for Municipalities – Rutgers Cooperative Extension \(See \\*\\* below\)](#)

# Watershed Assessment Report – Phase 2

## Phase 2 Report

- ✓ Identify potential projects, estimate reduction of pollutants, summarize feedback from public sessions, establish funding needs, and tentative implementation schedule
- ✓ Stakeholder by soliciting input from residents, businesses, neighboring towns, and other potential dischargers
- ✓ Post on designated website & announce public comment period

- ✓ Summarize feedback from public information sessions
- ✓ Open a 60-day comment period and posted on a dedicated webpage
- ✓ [WIP Matrix Tool](#)

## Maintenance Yards, Ancillary Operations, Rest Areas



- ✓ Identify potential water quality and quantity improvement BMPS
- ✓ Estimate reduction of pollutants
- ✓ Establish funding needs
- ✓ Tentative implementation schedule



## Roadways, Access Roads, Ramps

- ✓ Assess potential water quality and quantity improvements BMPs as part of all future capital improvement projects

# Watershed Improvement Plan Report – Phase 3

## Phase 3 Report

- ✓ Summary of public comments received, how projects will be coordinated with other regulatory requirements/MS4 permittees, and any problems identified.
- ✓ Open a 60-day comment period and posted on a dedicated webpage

## Review/Updates

- Biennial review of revisions to the impairments of the permittee's waterbodies based on the Department's Integrated Report
- Newly adopted TMDLs
- Overburdened Communities layer, and any other layer updates.

## Maintenance Yards, Ancillary Operations, Rest Areas



- ✓ Summarize proposed locations of water quality and quantity improvement BMPs & the estimate of load reductions
- ✓ Proposed implementation schedule
- ✓ Cost, broken down by project and year

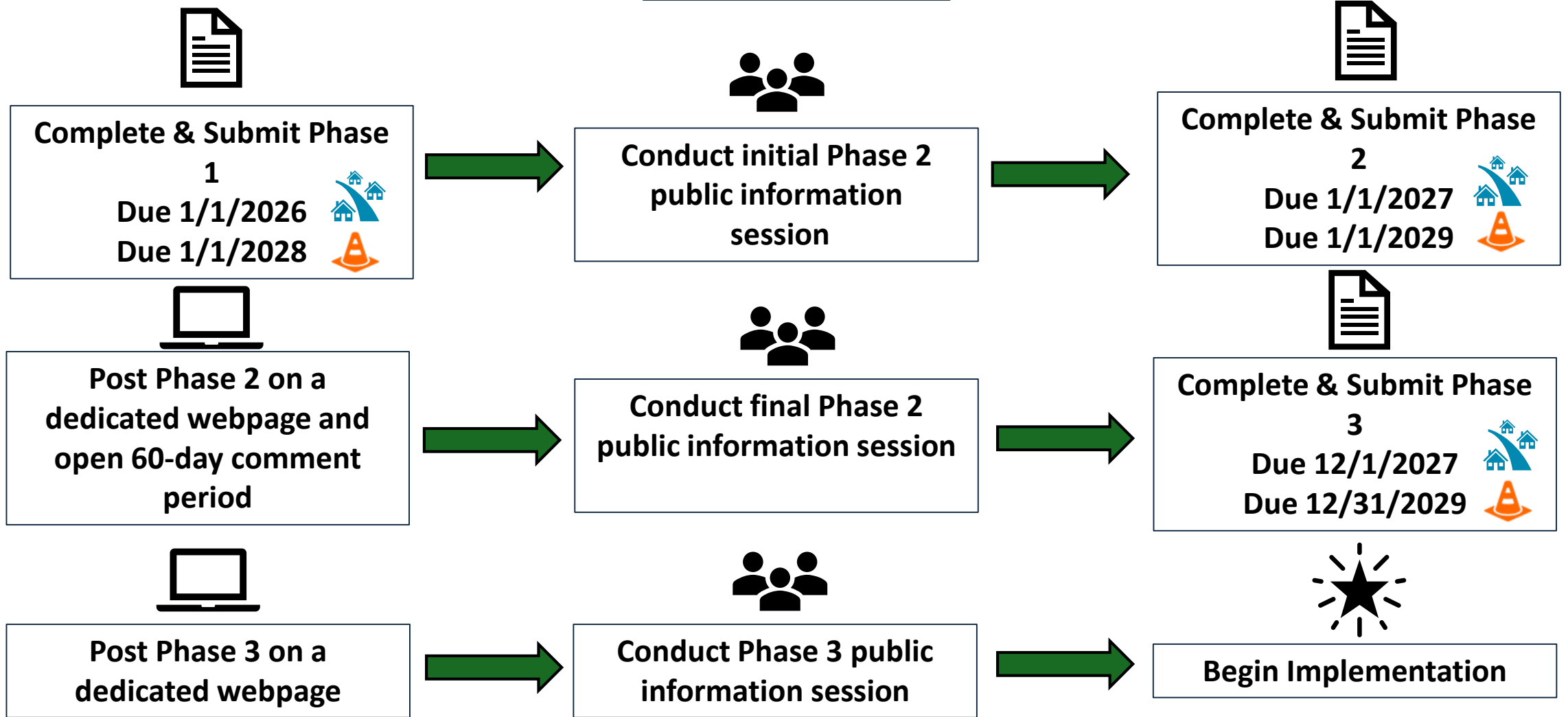


## Roadways, Access Ways, Ramps

- ✓ Summarize proposed locations of water quality and quantity improvement BMPs to be implemented as part of all future capital improvement projects



# WIP Timeline





# Regional Collaboration

- ✓ The Department fully supports MS4 permittees collaborating regionally to prepare their WIPs
- ✓ Some potential partnership ideas:
  - ✓ 2 or more MS4s that discharge to the same or adjacent waterbodies or HUC 14s that share a TMDL or impairment
  - ✓ Managed by a watershed group or similar organization
  - ✓ Managed by an existing regional authority

# CONTACT US

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Bureau of NJPDES  
Stormwater Permitting



[stormwatermanager@dep.nj.gov](mailto:stormwatermanager@dep.nj.gov)



<https://dep.nj.gov/njpdes-stormwater/>



[County Case Manager List](#)