

Section 9. Mitigation Plans

Section 6 of this MSWMP addresses the design and performance standards for stormwater management measures applicable to major development projects. In some instances, however, site specific conditions may prevent strict compliance with these standards. In accordance with N.J.A.C. 7:8-4.2(c)11, such projects may be granted a variance or exemption from these standards by the Municipal Zoning Board or Planning Board, if a mitigation plan is approved by the Board and mitigation plan implementation is a condition of the major development project approval.

To the extent possible, a mitigation plan should offset the impacts on groundwater recharge, stormwater quantity control, and/or stormwater quality control that would be created by granting the variance or exemption to the development project. In addition, to the extent possible, the proposed mitigation project(s) should be located within the same HUC14 sub-drainage basin(s) as the major development project, and if not, within the same Watershed Management Area.

A mitigation plan may include more than one mitigation project, in order to achieve the objectives of location and/or impact offsets. The Municipal Stormwater Coordinator Public Works Director (if different), and Engineer (if different) will develop and maintain a list of mitigation projects that can be implemented in order to comply with the mitigation plan provisions of this MSWMP. Included as part of the list of projects will be quantitative estimates of the offsets to groundwater recharge, stormwater quantity control, and/or stormwater quality control for each of the mitigation projects.

The mitigation plan must include a detailed plan and schedule for implementation of the mitigation project(s). Implementation may be accomplished as a part of the major development project, or the Municipality may accept funding for the project(s), at the discretion of the Municipality. If the Municipality chooses to accept funding in lieu of implementation, such funding shall include any costs that must be incurred by the Municipality in implementing the mitigation project(s), including design, permitting, land and/or easement acquisition, construction, and provisions for the long-term operation and maintenance of the mitigation project(s).

A mitigation plan must clearly demonstrate that strict compliance with the design and performance standards for stormwater management measures cannot be achieved. Before submitting a mitigation plan that does not meet the objectives of the MSWMP with regard to mitigation project location and/or impact offsets, the developer shall request that the Municipality determine whether it can identify other projects, consistent with those objectives, that the Municipality can add to its list.

A mitigation plan that includes a mitigation project or projects not taken from the Municipality's list may be submitted for review by the Municipality. Such projects must be reviewed and accepted by the Municipality, before a mitigation plan including such projects can be submitted to the Zoning Board or Planning Board for review. A mitigation plan including projects not already listed by the Municipality must include quantitative estimates of the offsets to groundwater recharge, stormwater quantity control, and/or stormwater quality control for each of those unlisted mitigation projects.

The mitigation plan must include provisions for ensuring the long-term operation and maintenance of the mitigation project(s), by clearly identifying the party responsible for the operation and maintenance of each mitigation project. If the Municipality accepts a mitigation plan that designates the Municipality as the responsible party for mitigation project operation and maintenance, provisions for funding the associated costs by the developer shall be included in the mitigation plan.

If implementation of a mitigation plan is a condition of approval for a major development project by the Municipal Zoning Board or Planning Board, such approval shall also include the requirement that the developer execute a funding agreement with the Municipality for mitigation plan implementation, as a further condition of approval. The funding agreement, in form acceptable to the Municipality, shall provide for funding by the developer of all costs to implement the plan that will be incurred by the Municipality, including the cost of long-term operation and maintenance of any mitigation projects.

Section 10. Gloucester County Stormwater Management Program

The Gloucester County Board of Freeholders, in an effort to help municipalities address non-point source pollution and stormwater management, has established a Gloucester County Stormwater Management Program that provides assistance with many of the NJPDES permit requirements. The Gloucester County Stormwater website at <http://www.gcstormwater.com> provides a web link to learn more about the new NJDEP stormwater management rules, the NJPDES stormwater management permit requirements and the ongoing Gloucester County Stormwater Management Program.

The purpose of the program is to help municipalities meet the NJDEP's permit requirements through a regional effort in a fiscally responsible manner.

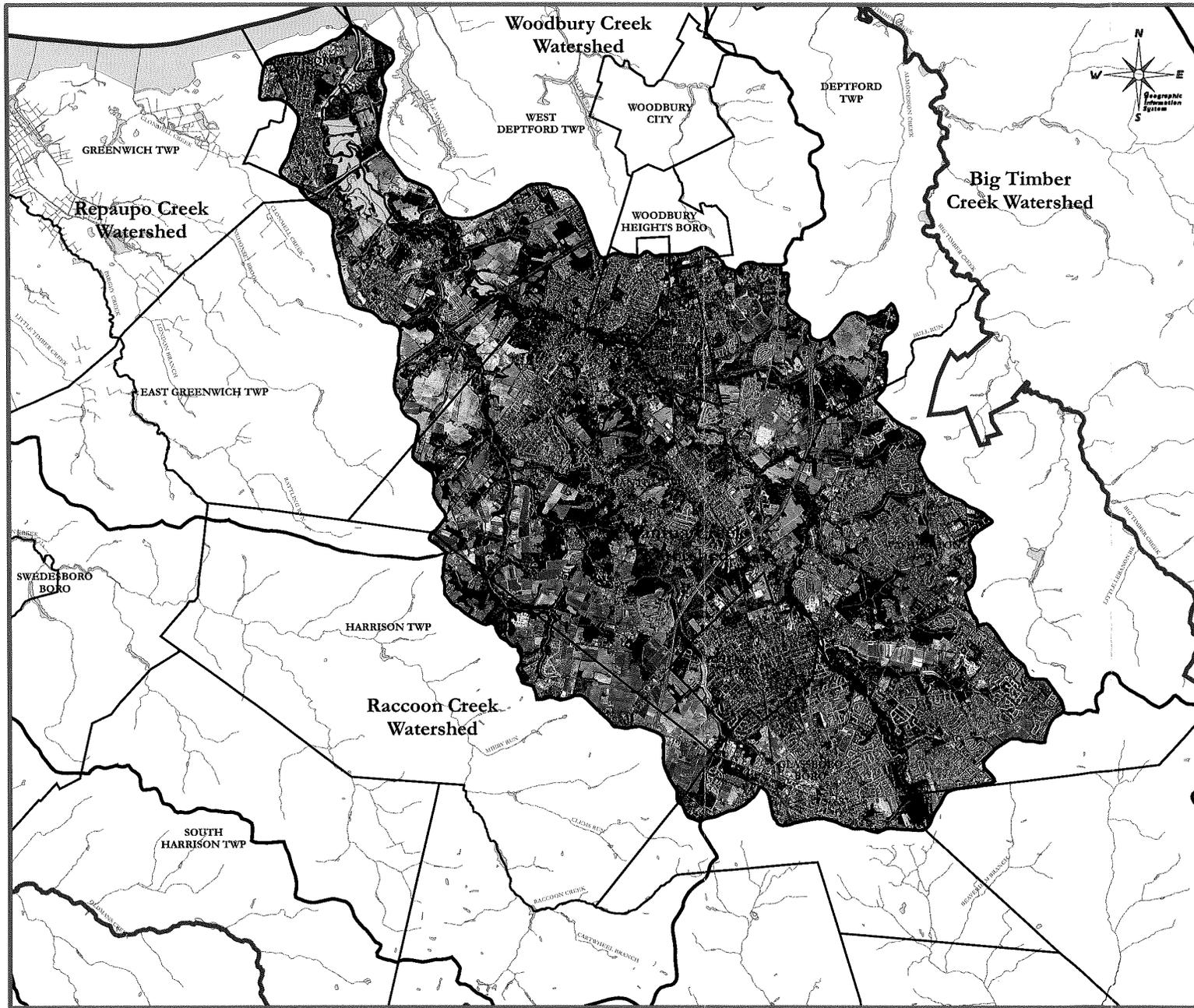
The County is addressing a number of each town's permit requirements to help alleviate the financial burden, while providing coordinated efforts that will better manage our environment. By utilizing a countywide watershed based approach, the end product will be a plan for each municipality tailored to the specific needs of the watershed.

The Gloucester County Freeholder Board's watershed-based approach to stormwater management is unique in the state of New Jersey. Through economies of scale and the use of technology, not necessarily available at the local level, the regional plan saves local taxpayers more, by coordinating preparation of the NJDEP required MSWMP for each of the 24 municipalities. The County not only saves time and money, but is better prepared to control non-point source pollution and to encourage improvements in water quality throughout Gloucester County.

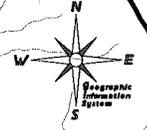
The overall long term goal of stormwater management is to have all waters in New Jersey meet water quality standards for their designated uses. That is, ensure that our rivers, lakes and coastal waters are fishable, swimmable, and support healthy ecosystems. The *New Jersey Nonpoint Source and Stormwater Management Program Plan*, (NJDEP, December, 2000) indicates that "Nonpoint sources of pollution from stormwater runoff have long been thought to be major contributors to the degradation of water quality in New Jersey." It further states:

The task ahead will not be easy. Controlling point sources of pollution took many years, many new governmental and private partners and billions of federal and private dollars. Successfully managing nonpoint sources of pollution and stormwater runoff can be expected to require a similar if not greater commitment.

APPENDIX A. WATERSHED FIGURES



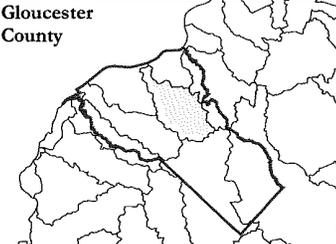
**Gloucester County
Stormwater
Management Plan
Figure No. MC-1
2002 DIGITAL
ORTHOPHOTOGRAPHY**



Legend

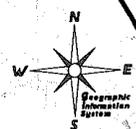
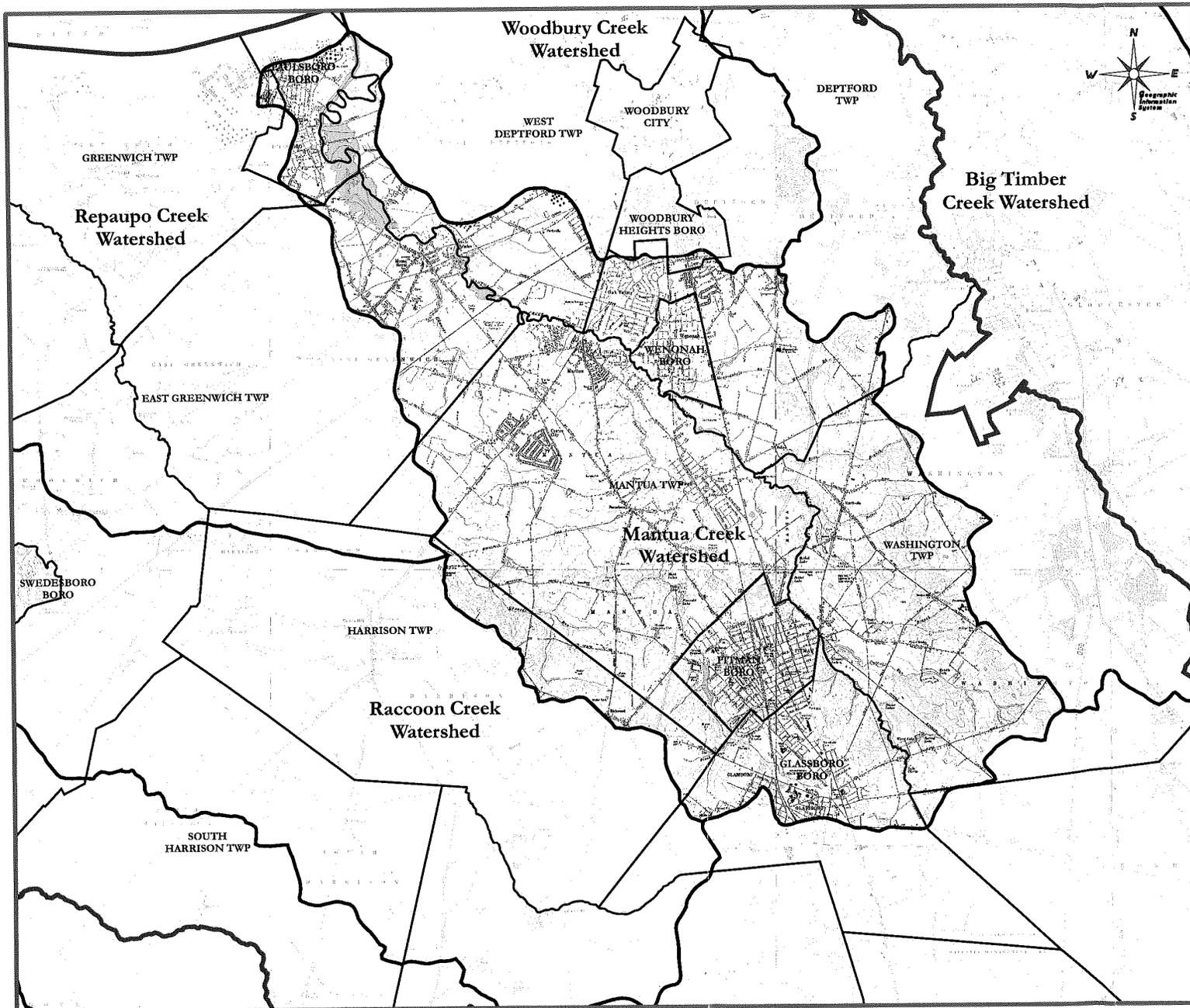
	County Boundary		3,000 Feet
	Municipal Boundary		
	Watershed Boundary		
	Streams (as mapped by NJDEP)		
	Lakes (as mapped by NJDEP)		

Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



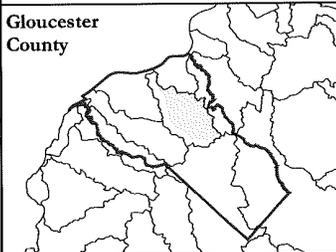
**Gloucester County
Stormwater
Management Plan
Figure No. MC-2
TOPOGRAPHY**

Legend

	County Boundary
	Municipal Boundary
	Watershed Boundary
	Streams (as mapped by NJDEP)
	Lakes (as mapped by NJDEP)

3,000 1,500 0 1,500 3,000
Feet

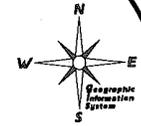

 Gloucester County
 Improvement Authority
 Freeholder Director
 Stephen M. Sweeney, Liaison



**Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB**

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

**Gloucester County
Stormwater
Management Plan
Figure No. MC-3
WATERWAYS**



Legend

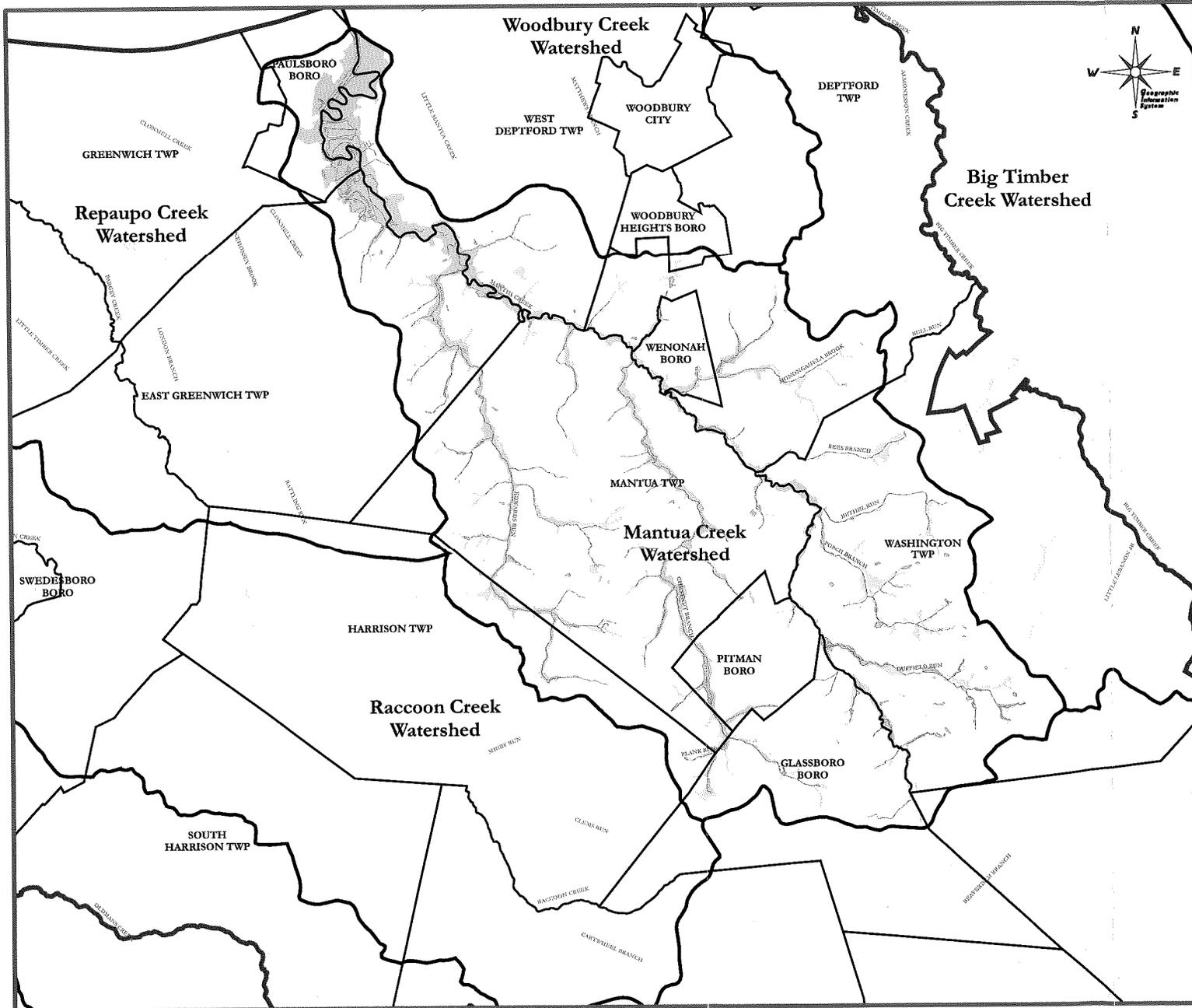
3,000 500 0 3,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary
- Total Maximum Daily Loads for Streams
- Total Maximum Daily Loads for Lakes
- Category One Stream Segment
- Category One Buffer Area
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)

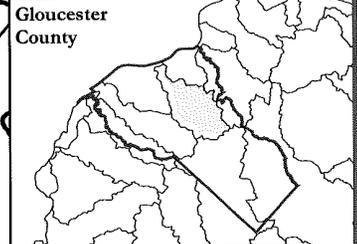
Floodprone Areas

FLOODPRONE

- Documented Floodprone Area
- Undocumented Floodprone Area
- Water

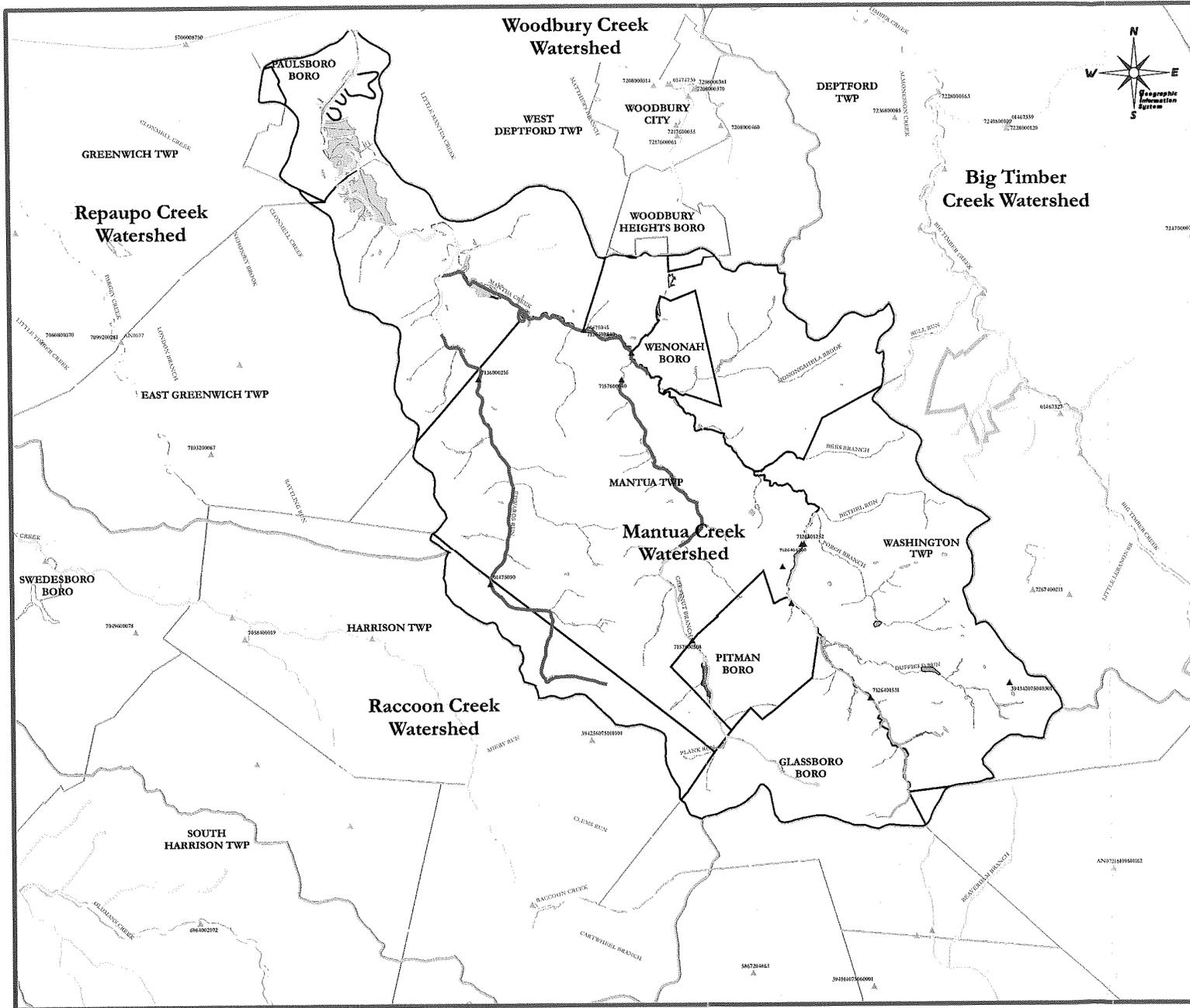


Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

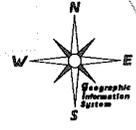
Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



Gloucester County Stormwater Management Plan

Figure No. MC-4 WATER QUALITY



Legend

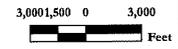
- County Boundary
- Municipal Boundary
- Watershed Boundary
- STORET Sites
- Ambient Monitoring Network Sites
- Existing Water Quality Stations
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)
- TMDL Streams (as mapped by NJDEP)
- TMDL Lakes (as mapped by NJDEP)

NJDEP 2004 Integrated Report Results for Lakes OVERALL

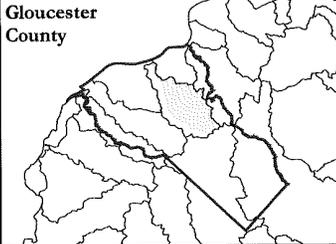
- Full Attain
- Insufficient
- Fish Advisory Only
- List 4
- Non Attain

NJDEP 2004 Integrated Report Results for Conventinals in Non-Tidal Rivers OVERALL

- Full Attain
- Insufficient
- Fish Advisory Only
- List 4
- Non Attain



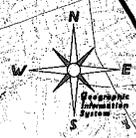
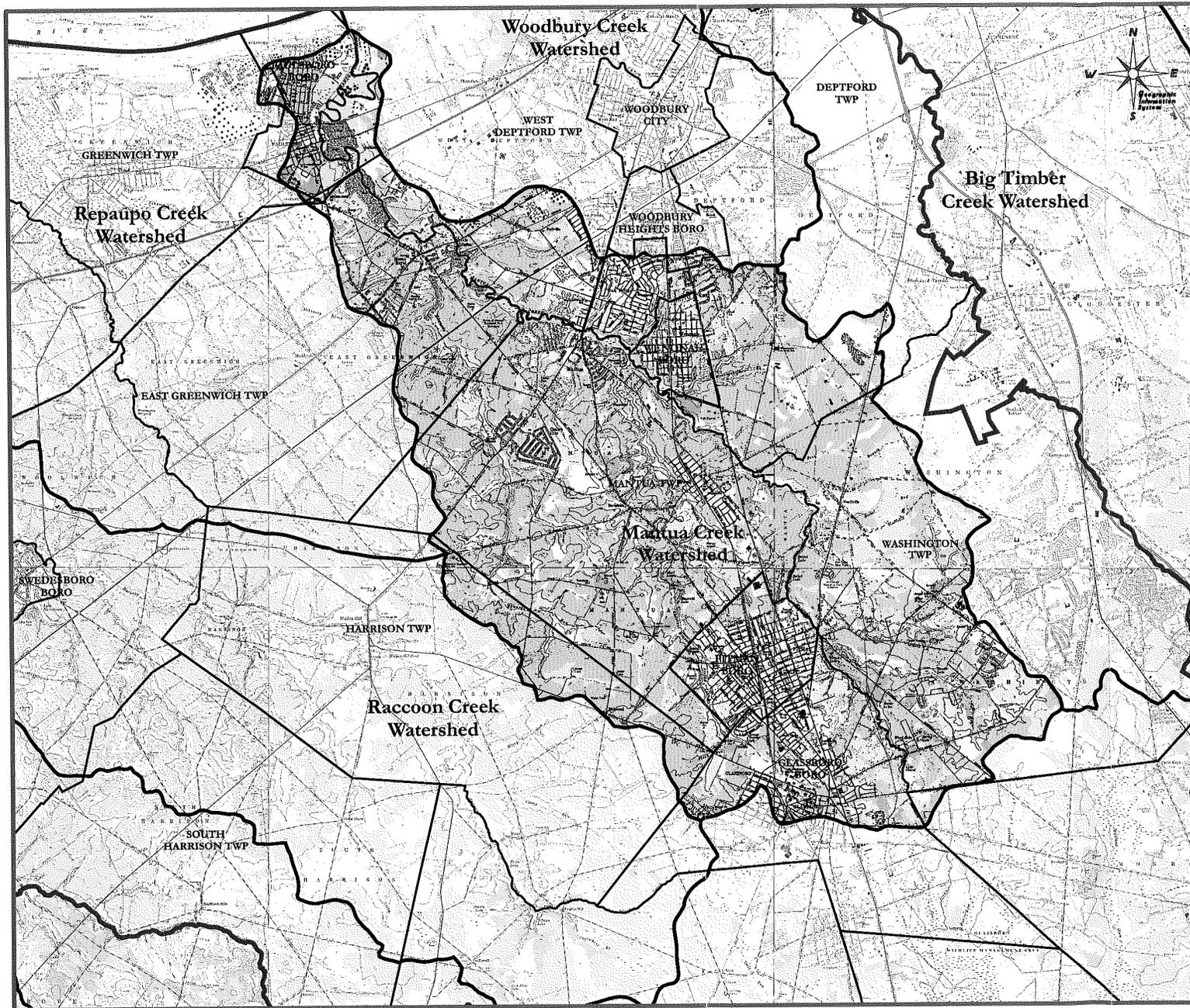

 Gloucester County
 Improvement Authority
 Freeholder Director
 Stephen M. Sweeney, Liaison



Gloucester County, New Jersey, USA
 Dated: 02/18/06 Drawn By: SEB

Note:
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

**Gloucester County
Stormwater
Management Plan
Figure No. MC-5
GROUND WATER
RECHARGE**



Legend

3,000 1,500 0 3,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary

Ground Water Recharge Areas

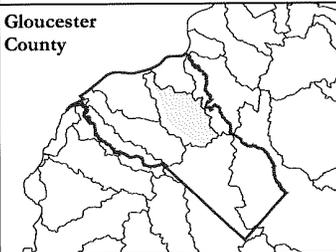
County Ranking

- 15 to 16 in/yr
- 10 to 14 in/yr
- 8 to 9 in/yr
- 1 to 7 in/yr
- 0 in/yr

Hydric Soils

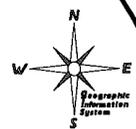
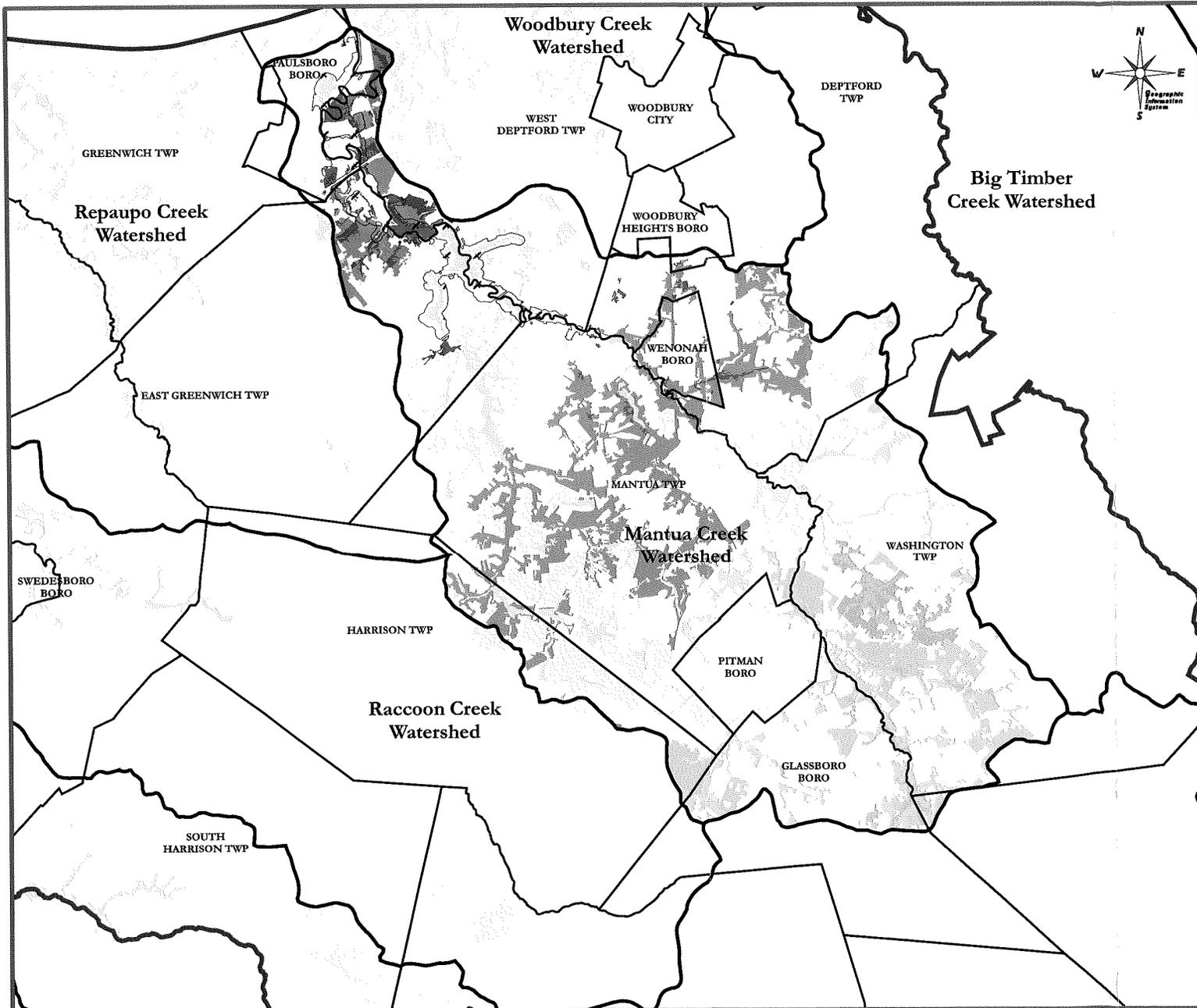
- Wetlands and Open Water
- No Recharge Calculated

Gloucester County
Improvement Authority
Freholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



**Gloucester County
Stormwater
Management Plan
Figure No. MC-6
CRITICAL HABITAT**

Legend

County Boundary	Bald Eagle Foraging Area
Municipal Boundary	Urban Peregrine Falcon Nest
Watershed Boundary	Wood Turtle

Beach RANK	Grassland RANK
Suitable Habitat (1)	Suitable (1)
Priority Species (2)	Priority Species (2)
State Threatened (3)	State Threatened (3)
State Endangered (4)	State Endangered (4)
Federal T and E (5)	Federal T and E (5)

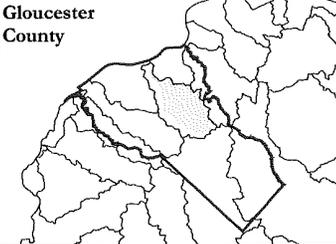
Forest RANK	Forested Wetland RANK
Suitable (1)	Suitable (1)
Priority Species (2)	Priority Species (2)
State Threatened (3)	State Threatened (3)
State Endangered (4)	State Endangered (4)
Federal T and E (5)	Federal T and E (5)

Emergent Wetland RANK

Suitable Habitat (1)	
Priority Species (2)	
State Threatened (3)	
State Endangered (4)	
Federal T and F (5)	

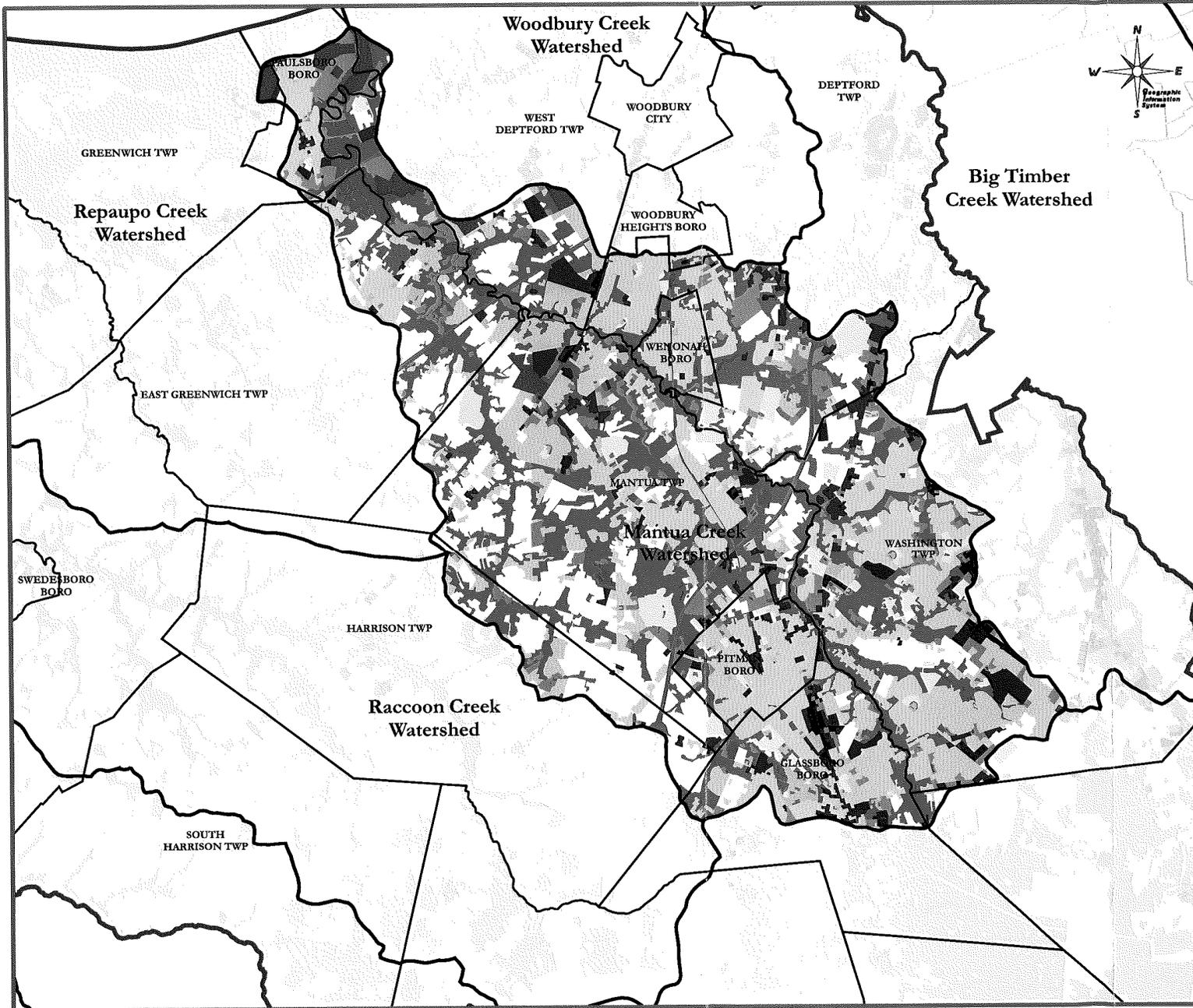
3,000 1,500 0 3,000 Feet

Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

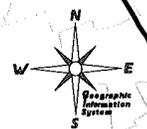



Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.



Gloucester County Stormwater Management Plan Figure No. MC-7 LAND USE



Legend 3,000 1,500 0 3,000 Feet

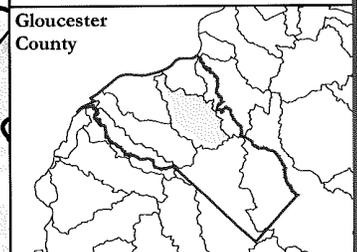
County Boundary
 Municipal Boundary
 Watershed Boundary

Gloucester County Land Use (as mapped by DVRPC)

DESCRIPTION

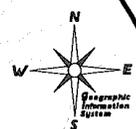
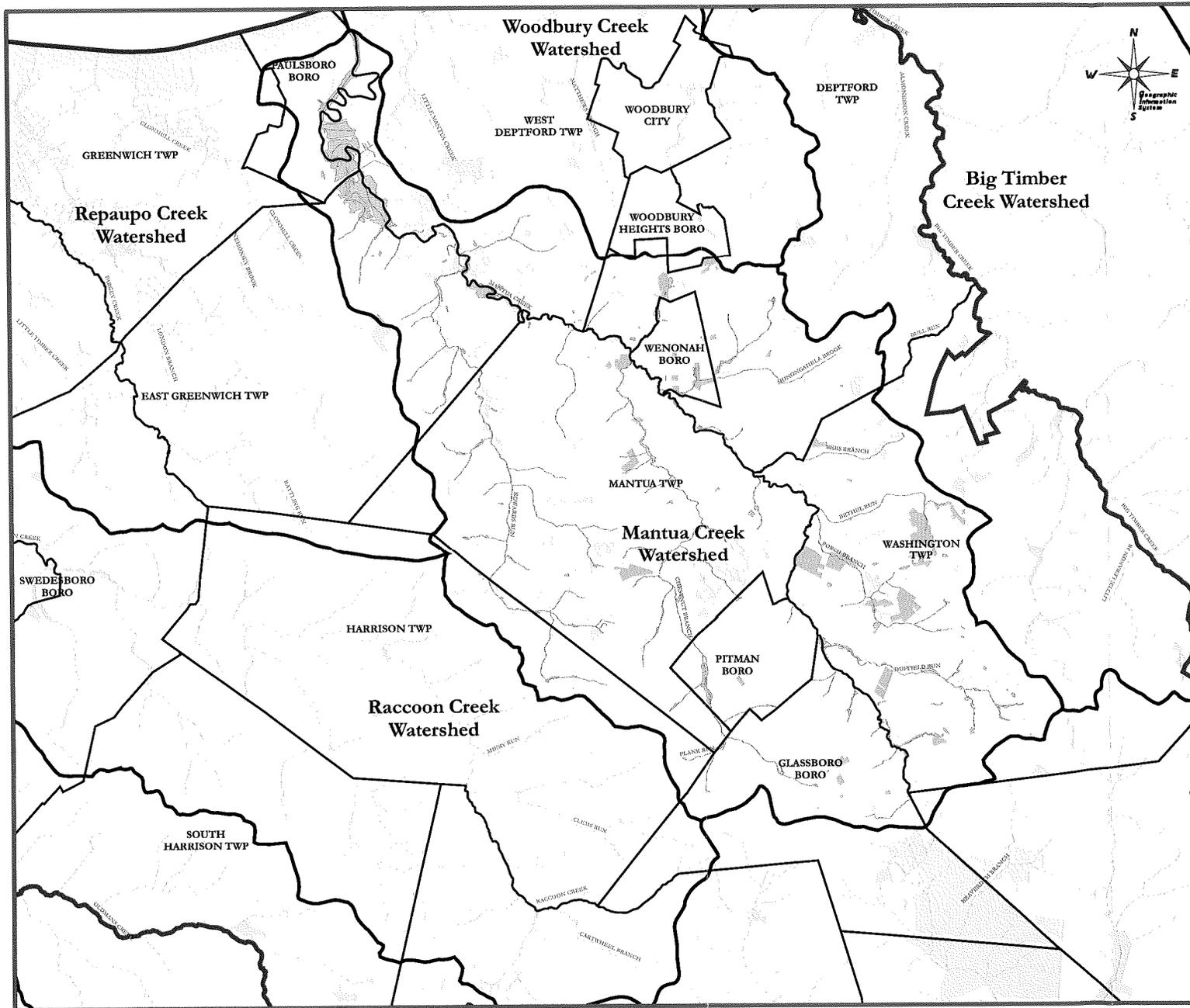
Agriculture	Recreation
Agriculture/Agricultural Bog	Parking/Recreation
Community Services	Residential/Single-Family Detached
Parking/Community Services	Residential/Row Home
Commercial	Residential/Mobile Home
Parking/Commercial	Residential/Multi-Family
Manufacturing/Light Industrial	Parking/Multi-Family
Parking/Light Manufacturing	Utility
Manufacturing/Heavy Industrial	Parking/Utility
Parking/Heavy Manufacturing	Transportation
Military	Parking/Transportation
Parking/Military	Vacant
Mining	Water
Parking/Mining	Wooded

Gloucester County
 Improvement Authority
 Freeholder Director
 Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
 Dated: 02/18/06 Drawn By: SEB

Note:
 This map was developed using New Jersey Department of
 Environmental Protection Geographic Information System
 digital data, but this secondary product has not been verified
 by NJDEP and is not state-authorized.



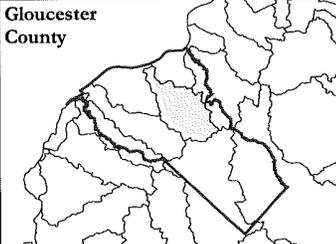
**Gloucester County
Stormwater
Management Plan
Figure No. MC-8
CONSTRAINED AREAS**

Legend

3,000 1,500 0 3,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)
- Open Space (as mapped by NJDEP)
- County Open Space
- Wetlands (as mapped by NJDEP)

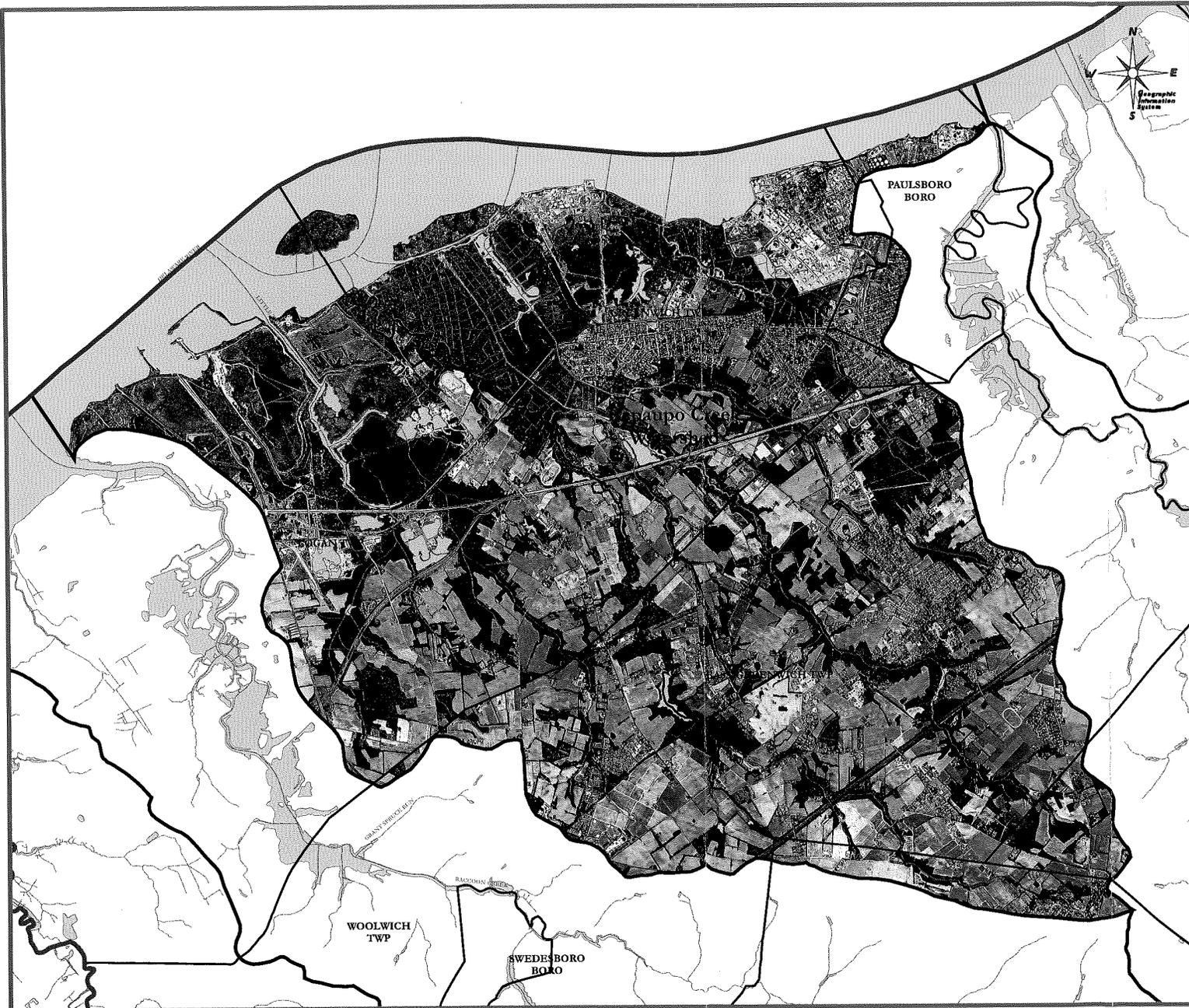
Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

**Gloucester County
Stormwater
Management Plan
Figure No. RE-1
AERIAL
PHOTOGRAPHY (2002)**

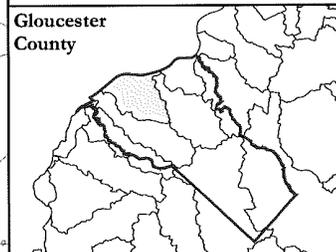


Legend

2,000 1,000 0 1,000 2,000 Feet

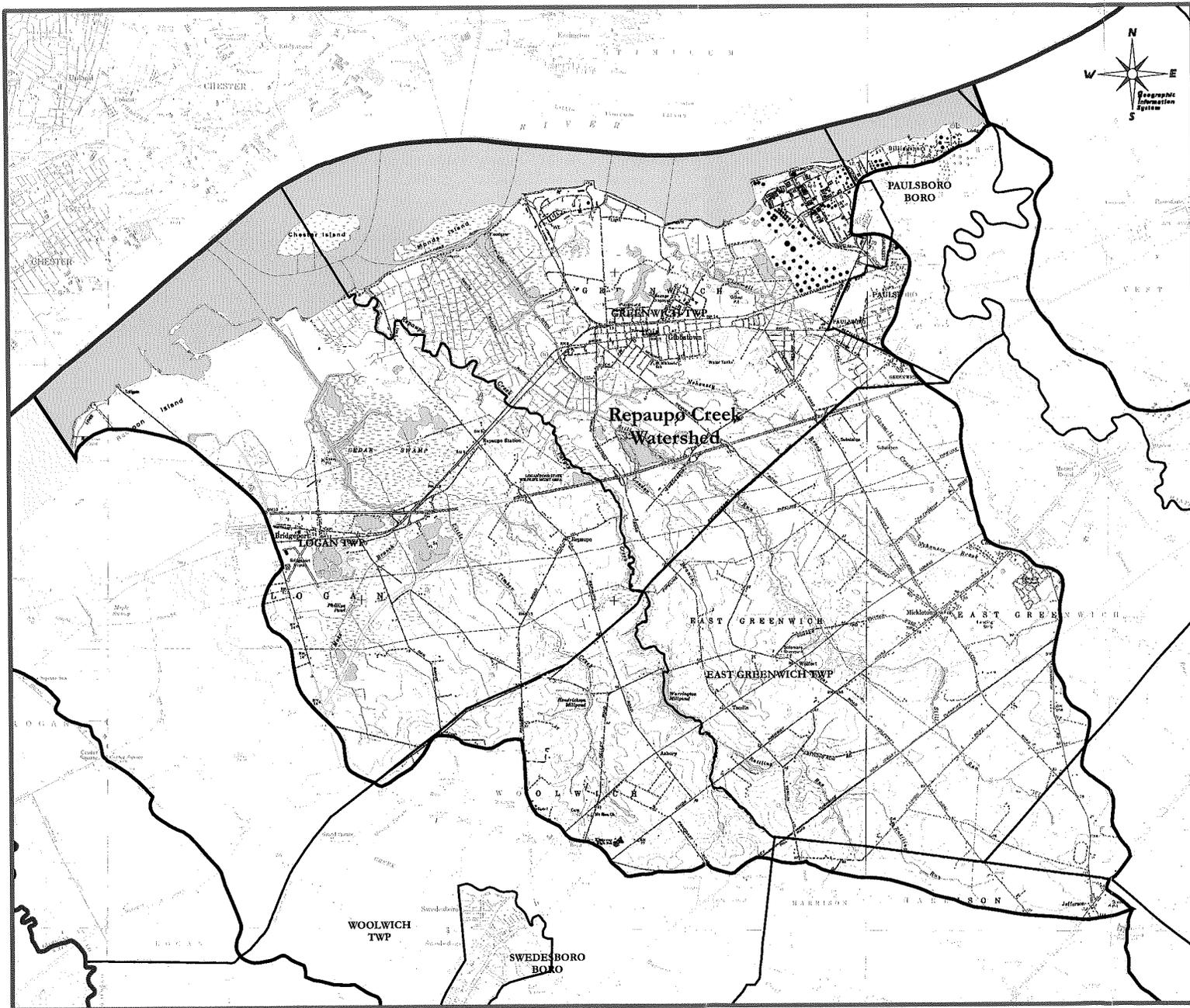
- County Boundary
- Municipal Boundary
- Watershed Boundary
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)

Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

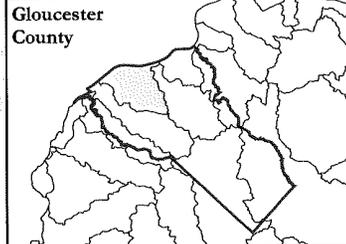


**Gloucester County
Stormwater
Management Plan
Figure No. RE-2
TOPOGRAPHY**

Legend 2,000 1,000 0 1,000 2,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)

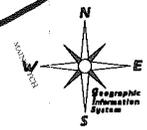
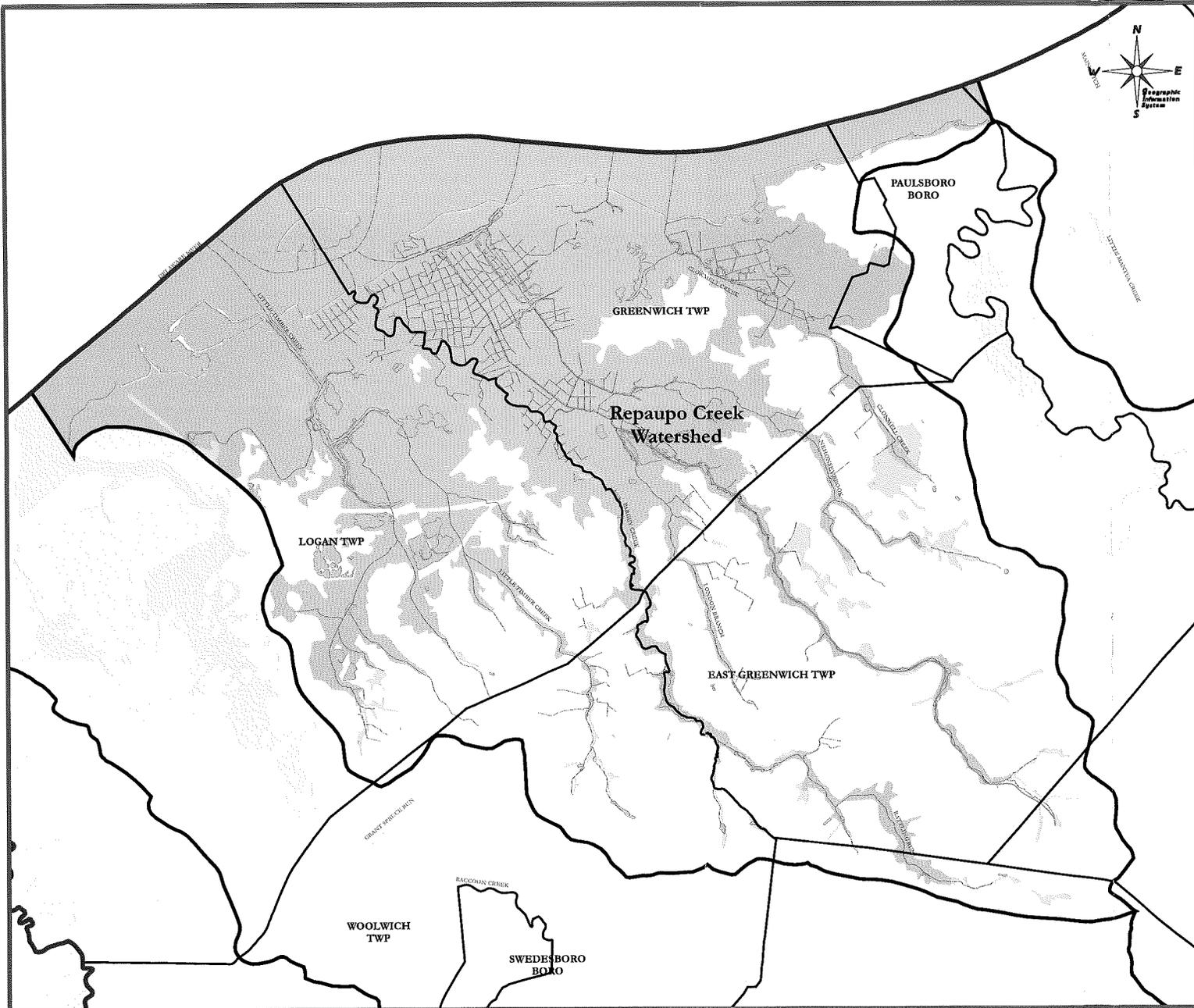

 Gloucester County
 Improvement Authority
 Freeholder Director
 Stephen M. Sweeney, Liaison



Gloucester County, New Jersey, USA
 Dated: 02/18/06 Drawn By: SEB

Note:
 This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

**Gloucester County
Stormwater
Management Plan
Figure No. RE-3
WATERWAYS**



Legend

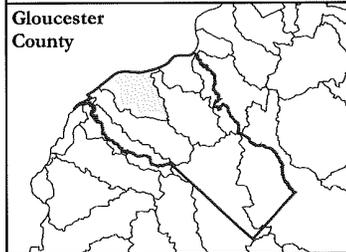
2,000 1,000 0 1,000 2,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)
- Total Maximum Daily Loads for Streams
- Total Maximum Daily Loads for Lakes
- Category One Stream Segment
- Category One Buffer Area

Floodprone Areas
FLOODPRONE

- Documented Floodprone Area
- Undocumented Floodprone Area
- Water

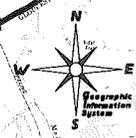
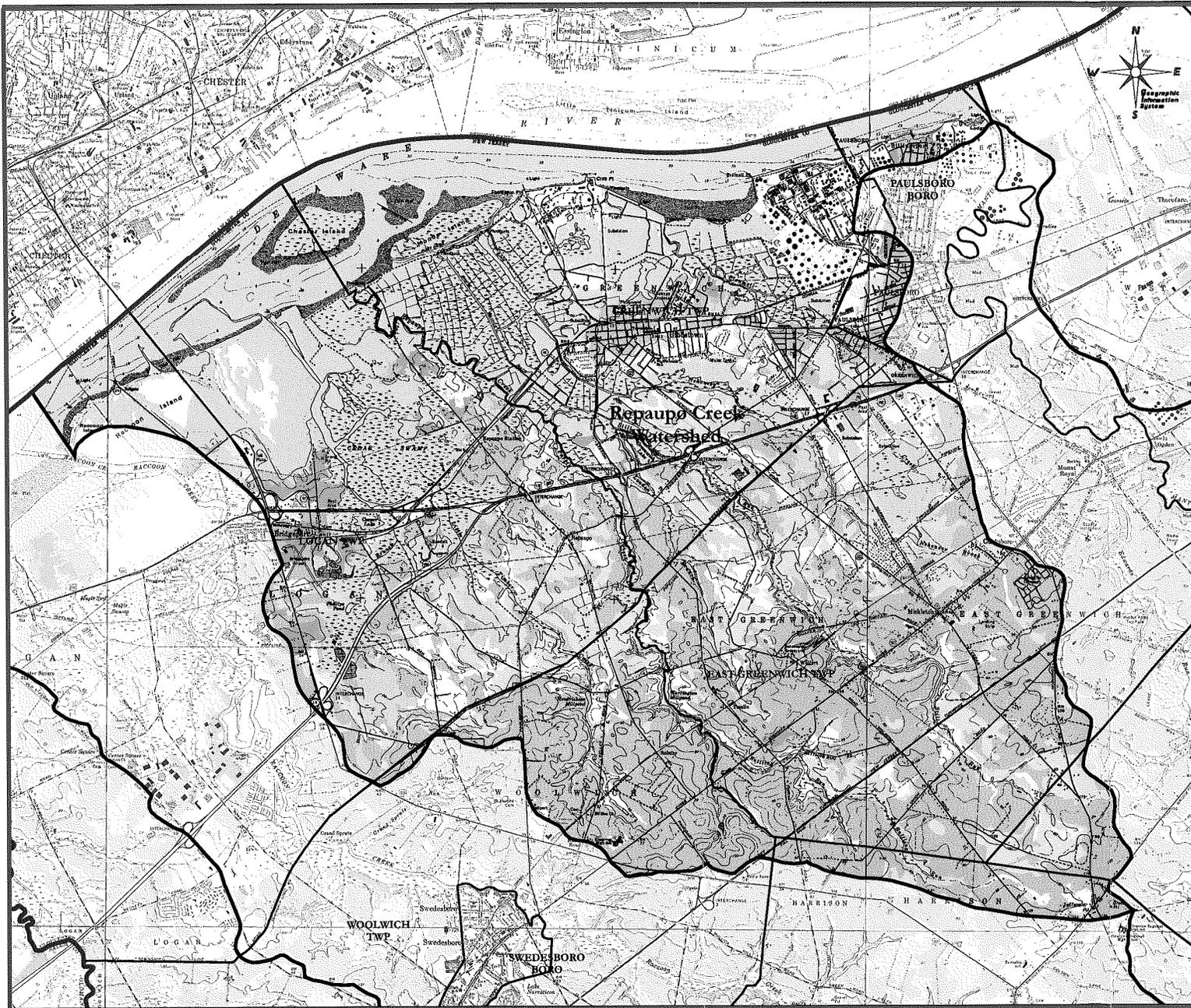
Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Gloucester County Stormwater Management Plan Figure No. RE-5 GROUND WATER RECHARGE



Legend

2,000 1,000 0 2,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary

Ground Water Recharge Areas

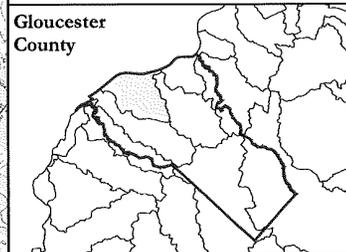
County Ranking

- 15 to 16 in/yr
- 10 to 14 in/yr
- 8 to 9 in/yr
- 1 to 7 in/yr
- 0 in/yr

Hydric Soils

- Wetlands and Open Water
- No Recharge Calculated

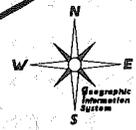
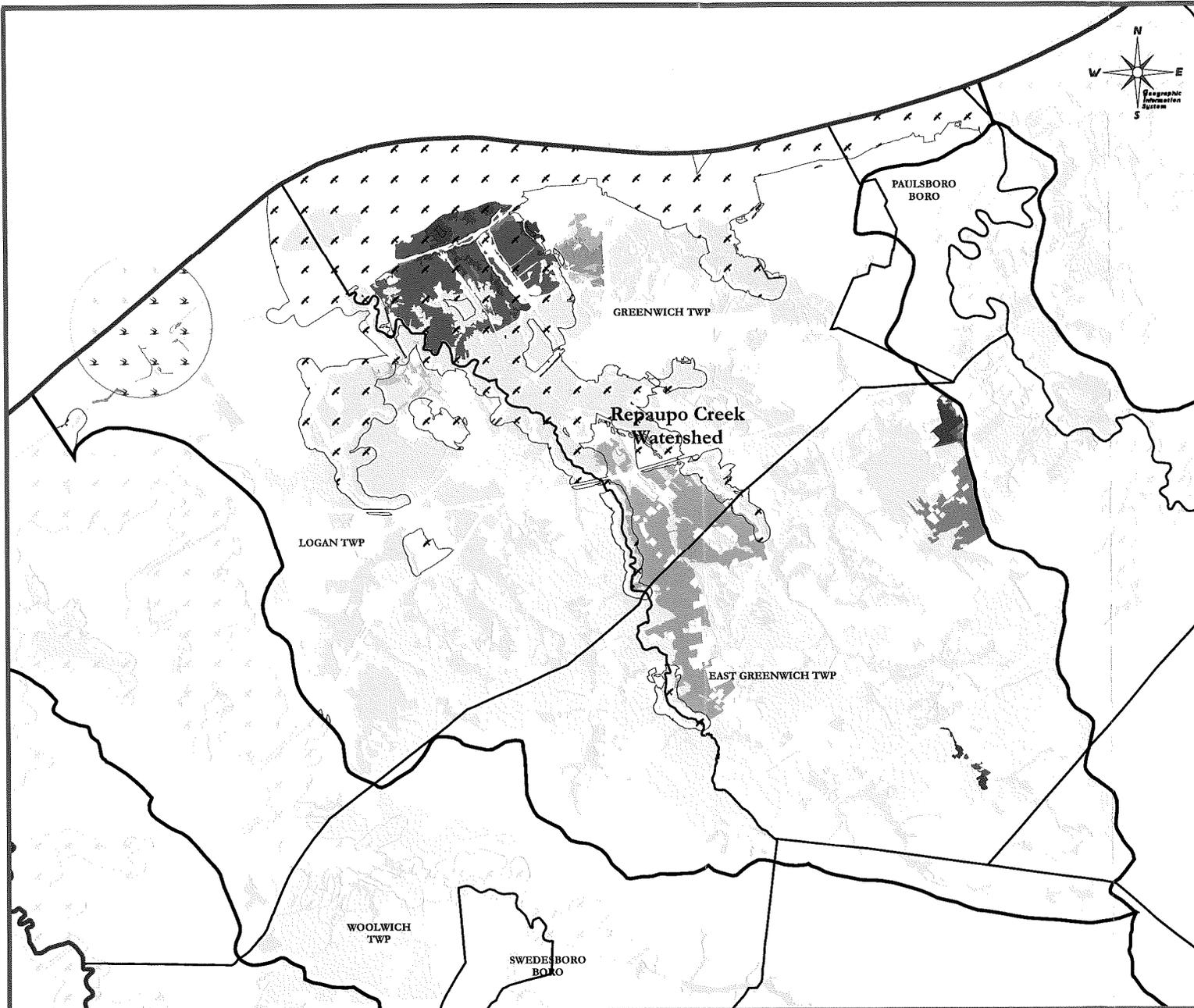
Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Gloucester County Stormwater Management Plan Figure No. RE-6 CRITICAL HABITAT



Legend

County Boundary	Bald Eagle Foraging Area
Municipal Boundary	Urban Peregrine Falcon Nest
Watershed Boundary	Wood Turtle

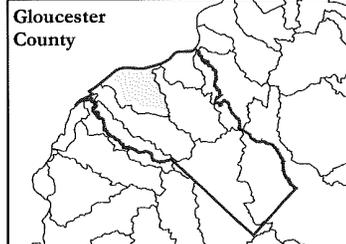
Beach RANK	Grassland RANK
Suitable Habitat (1)	Suitable (1)
Priority Species (2)	Priority Species (2)
State Threatened (3)	State Threatened (3)
State Endangered (4)	State Endangered (4)
Federal T and E (5)	Federal T and E (5)

Forest RANK	Forested Wetland RANK
Suitable (1)	Suitable (1)
Priority Species (2)	Priority Species (2)
State Threatened (3)	State Threatened (3)
State Endangered (4)	State Endangered (4)
Federal T and E (5)	Federal T and E (5)

Emergent Wetland RANK	
Suitable Habitat (1)	
Priority Species (2)	
State Threatened (3)	
State Endangered (4)	
Federal T and E (5)	

2,000 1,000 0 2,000 Feet

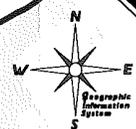
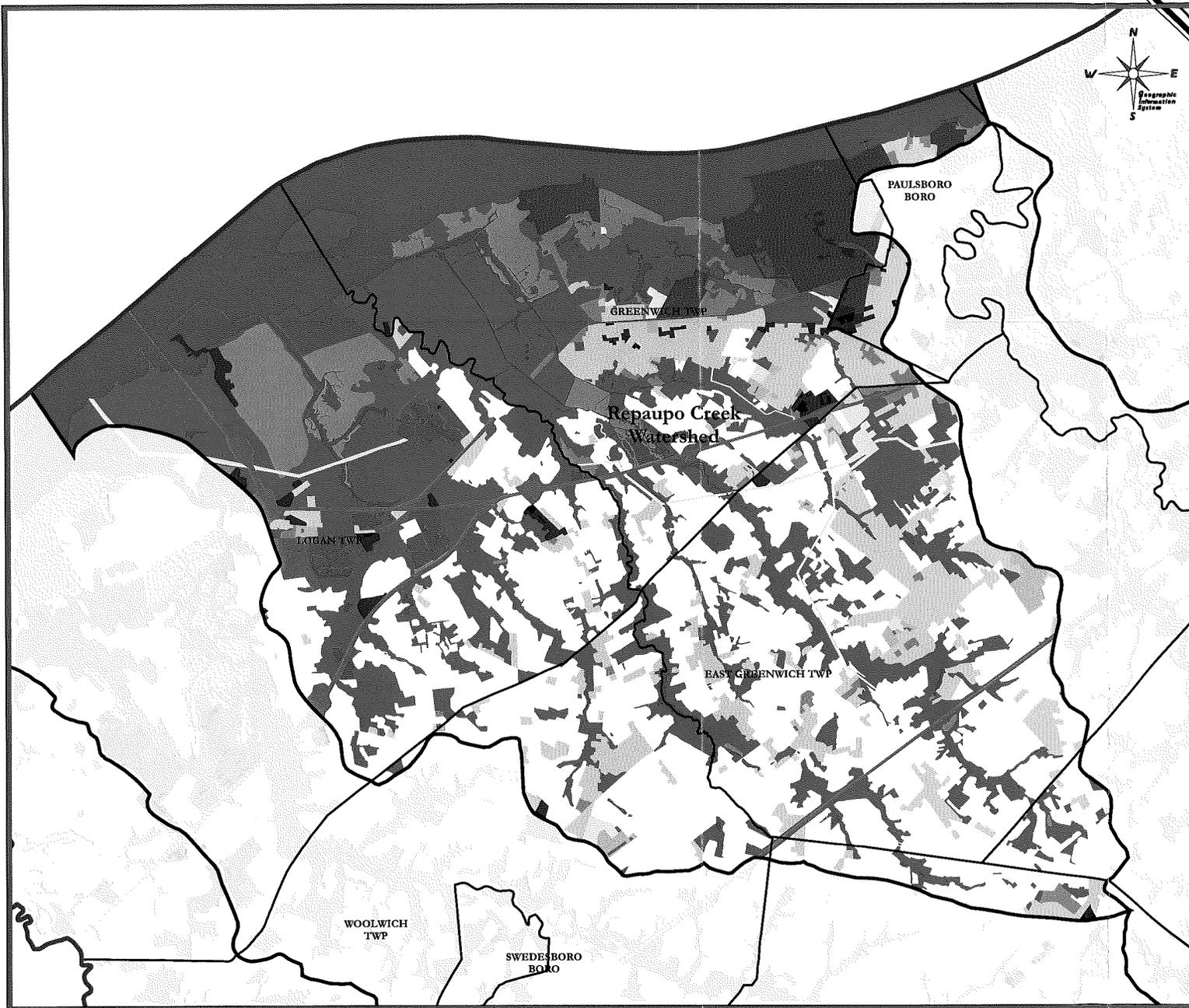
Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/22/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Gloucester County Stormwater Management Plan Figure No. RE-7 LAND USE



2,000

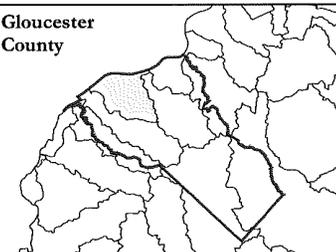
Legend

- County Boundary
- Municipal Boundary
- Watershed Boundary

Gloucester County Land Use (as mapped by DVRPC)

DESCRIPTION	
Agriculture	Recreation
Agriculture/Agricultural Bog	Parking/Recreation
Community Services	Residential/Single-Family Detached
Parking/Community Services	Residential/Row Home
Commercial	Residential/Mobile Home
Parking/Commercial	Residential/Multi-Family
Manufacturing/Light Industrial	Parking/Multi-Family
Parking/Light Manufacturing	Utility
Manufacturing/Heavy Industrial	Parking/Utility
Parking/Heavy Manufacturing	Transportation
Military	Parking/Transportation
Parking/Military	Vacant
Mining	Water
Parking/Mining	Wooded

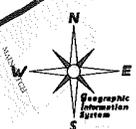
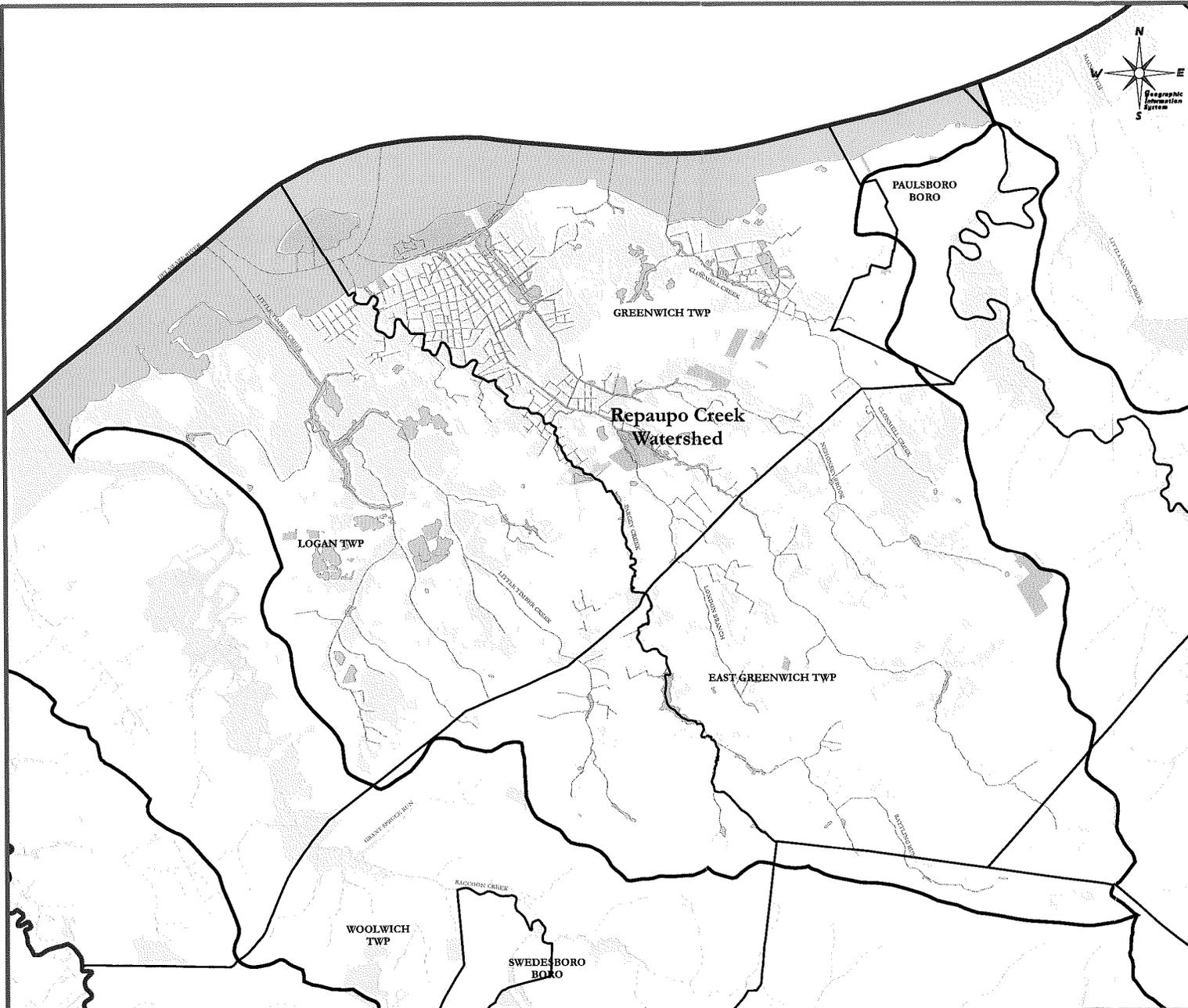
Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

**Gloucester County
Stormwater
Management Plan
Figure No. RE-8
CONSTRAINED AREAS**

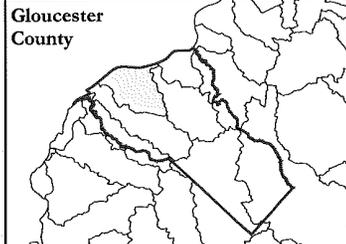


Legend

2,000 1,000 0 1,000 2,000 Feet

- County Boundary
- Municipal Boundary
- Watershed Boundary
- Streams (as mapped by NJDEP)
- Lakes (as mapped by NJDEP)
- Open Space (as mapped by NJDEP)
- County Open Space
- Wetlands (as mapped by NJDEP)

Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Sweeney, Liaison

Gloucester County, New Jersey, USA
Dated: 02/18/06 Drawn By: SEB

Note:
This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not state-authorized.

Gloucester County Stormwater Management Plan

Figure No. 9

DATA INFORMATION

Note: All listed data has been displayed "as-is", with no alterations, with the exception of the Category One Stream Segment and subsequent Category One Buffer Areas which were derived from the Surface Water Quality Standards.

<p>NJDEP Streams of Atlantic, Camden, Cumberland, Gloucester, and Salem Counties, New Jersey, 1986</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA)</p> <p>Publication Date: November 1st, 1998</p> <p>Abstract: This data represents the streams of Atlantic County, New Jersey. The hydrographic system network for this county was generated as a line ArcInfo coverage from USGS 1:24,000 Digital Line Graph (DLG) files, with subsequent editing and updating.</p>	<p>NJDEP Wetlands of Atlantic, Camden, Cumberland, Gloucester, and Salem Counties, New Jersey, 1986</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA)</p> <p>Publication Date: November 1st, 1999</p> <p>Abstract: This is a graphical representation of this county's wetlands data and contains all the tidal and non-tidal wetlands as of 1986. It was created by reclassifying wetlands on this county's 1986 LULUC (land use/land cover) data. This was done so that this new data would contain both tidal and non-tidal wetlands.</p>	<p>NJDEP Existing Water Quality Stations in New Jersey</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Land Use Management (LUM), Water Monitoring & Standards, Bureau of Freshwater Biological Monitoring (BFBM)</p> <p>Publication Date: May 12th, 2003</p> <p>Abstract: This data represents sampling points for the EWQ (Existing Water Quality) project at NJDEP. The EWQ Network was designed to provide supplemental data for water quality for the entire state.</p>	<p>NJDEP 2004 Integrated Report Results for Lakes</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Water Assessment Team (WAT)</p> <p>Publication Date: June, 2004</p> <p>Abstract: This data represents the 2004 Integrated Report final assessment results for aquatic life and recreation designated uses as well as fish advices and eutrophication assessment of lakes. The assessments are based on data from the NJDEP Waters of Freshwater Fisheries, local and county health departments, and NJDEP Clean Lakes Program.</p>	<p>NJDEP 2004 Integrated Report Results for Conventional in Non-Tidal Rivers</p> <p>Originator: New Jersey Department of Environmental Protection, Water Assessment Team</p> <p>Publication Date: March, 2003</p> <p>Abstract: This data represents the 2004 Integrated Report final assessment results for conventional, aquatic life, metals, toxics, fish advices, and shellfish harvesting for rivers in New Jersey. Also included are the location of the river, monitoring station where data came from, and parameters listed on the 1998 303(d) list (for conventional, metals, and toxics only).</p>	<p>Gloucester County Open Space</p> <p>Originator: Civil Solutions; Adams, Rahaman, and Heggan, Assoc. Inc.</p> <p>Publication Date: Currently Unpublished</p> <p>Abstract: This data contains all the open space areas for Gloucester County, NJ, as defined by the MODIV tax data created by Civil Solutions. Property Class Codes were evaluated to show public properties.</p>
<p>NJDEP Open Water Areas of Atlantic, Camden, Cumberland, Gloucester, and Salem Counties, New Jersey 1986 (1:24000)</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA)</p> <p>Publication Date: November 1st, 1998</p> <p>Abstract: This data contains all the open water areas for this county as of 1986. Open water areas such as lakes, ponds, tidal waters, reservoirs, bays, etc. are included. This file was created by reclassifying the water series out of its LULUC (land use/land cover) data. The following reclass was performed on ArcGIS 8.0 software to create this data. Lakes were greater than 5000 and land use less than 6000 (the aquatic code refer to the Anderson classification system), and represent all codes that refer to bodies of water). Non-open water wetlands polygons can be found in the county's 'Wetlands' data and the streams in its 'Streams' data.</p>	<p>Category One Stream Segments and Buffer Areas Derived from NJDEP Surface Water Quality Standards of New Jersey (Surface Water Quality Standards - C1), Buffer = 300</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Division of Land Use Management, Bureau of Freshwater & Biological Monitoring</p> <p>Publication Date: August 4th, 2003</p> <p>Abstract: This data is a digital representation of New Jersey's Surface Water Quality Standards in accordance with "Surface Water Quality Standards for New Jersey Waters" as designated in N.J.A.C. 7:9. The Surface Water Quality Standards (SWQS) establish the designated uses to be achieved and specify the water quality criteria necessary to protect the State's waters. Designated uses include public water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and irrigation. These are reflected in the classification assigned to specific waters. The network has been broken/filtered to reflect the location within the standards set. When intersecting the surface water quality standards, the Surface Water Quality Standards regulations at N.J.A.C. 7:9B always take precedence. The GIS layer is supplemental only and is not legally binding.</p>	<p>NJDEP Flood-Prone Areas of Atlantic, Camden, Cumberland, Gloucester, and Salem Counties, NJ</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Office of Information Resources Management (OIRM), Bureau of Geographic Information and Analysis (BGIA)</p> <p>Publication Date: February 1st, 1996</p> <p>Abstract: The flood-prone areas have been delineated through the use of readily available information on past floods rather than from detailed surveys and inspections. In general, the delineated areas are for natural conditions and do not take into consideration the possible effects of existing or proposed flood control structures except where those effects could be evaluated. Flood areas were identified for: (1) urban areas where the upstream drainage basin exceeds 23 square miles; (2) rural areas in humid regions where the upstream drainage basin exceeds 100 square miles; (3) rural areas where in semiarid regions where the upstream drainage basin exceeds 250 square miles; and (4) smaller drainage basins, depending on topography and potential use of the flood plain.</p>	<p>NJDEP Total Maximum Daily Loads (TMDLs) for Fecal Streptom</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Bureau of Environmental Analysis and Restoration (BEAR)</p> <p>Publication Date: September 29th, 2003</p> <p>Abstract: The potential of concern for these Stream TMDLs is phosphorus, the presence of which is indicated by elevated concentrations of fecal coliform bacteria. Fecal coliform concentrations were found to exceed New Jersey's Surface Water Quality Standards (SWQS), published as N.J.A.C. 7:9B et seq., for the segments identified in the Reports. In accordance with Section 305(d) of the Clean Water Act (CWA), the State of New Jersey developed the 2002 Integrated List of Waterbodies, addressing the overall water quality of the State's waters and identifying impaired waterbodies for which Total Maximum Daily Loads (TMDLs) may be necessary. As reported in the 2002 Integrated List of Waterbodies, also identified in the river miles and management response associated with each listed segment. All of these waterbodies have a high priority ranking, as described in the 2002 Integrated List of Waterbodies.</p>	<p>NJDEP Total Maximum Daily Loads (TMDLs) for Bioturbation Lakes</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Bureau of Environmental Analysis and Restoration (BEAR)</p> <p>Publication Date: September 29th, 2003</p> <p>Abstract: The potential of concern for the Eutrophic Lake TMDLs is phosphorus. Phosphorus is an essential nutrient for plants and algae, but is considered a pollutant when it stimulates excessive plant and algae growth. Overgrown vegetation and algae blooms in lakes can prevent recreational lake use for fishing and swimming. In severe cases, plant and algae die-off can lead to hypoxia in the lake raising the potential for killing fish in the lake. Potential sources of phosphorus include discharge from sewage treatment plants, combined sewer overflows and stormwater runoff. As stormwater flows over the land, it may pick up phosphorus. Phosphorus contribution to stormwater runoff is calculated based on land uses within the lake's watershed.</p>	<p>NJDEP State Owned, Protected Open Space and Recreation Areas in New Jersey</p> <p>Originator: NJ Department of Environmental Protection (NJDEP), Green Acres</p> <p>Publication Date: 1993</p> <p>Abstract: This data set contains protected open space and recreation areas owned in fee simple interest by the State of New Jersey Department of Environmental Protection (NJDEP). Types of property in this data layer include parcels such as parks, forests, historic sites, natural areas and wildlife management areas. The data was derived from a variety of source maps including state maps, surveys and even hand-drawn boundary lines on USGS topographic maps. These source materials vary in scale and level of accuracy. Due to the varied mapping sources and methods of data capture, this data set is limited in its ability to portray all open space lands accurately, particularly the parcels purchased prior to 1991.</p>
<p>DVRPC Land Use for 2000 Gloucester County, New Jersey</p> <p>Originator: Delaware Valley Regional Planning Commission</p> <p>Publication Date: March, 2004</p> <p>Abstract: Every five years, since 1990, the Delaware Valley Regional Planning Commission has produced a GIS Land Use for its 5 county region. In 2000, digital orthophotography was flown by DVRPC. Utilizing this orthophotography, the Land Use annotation and digitizing was performed on screen, or "heads-up", first at DVRPC. Digitizing was done using ESRI ArcGIS 8.0 software at 1 inch = 200 feet scale. The Personal Geodatabase was created for each county in the DVRPC region. These Personal Geodatabases were then exported to ESRI shapefiles for distribution to the public.</p>	<p>STORET Water Quality Monitoring Stations</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), NJDEP Bureau of Freshwater Biological Monitoring</p> <p>Publication Date: February 26th, 2000</p> <p>Abstract: The STORET data maintains the locations of water quality monitoring stations from the ANNET project at NJDEP. The NJDEP ANNET database supplied the list of site (elevation) data. The locations were selected because they were easily accessed, and sampling data for 4 seasons, and provided a good point of comparison for other sites.</p>	<p>NJDEP ANNET Reference Sites with Ecoregion Sections for New Jersey</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Watershed Management, Water Monitoring Management, Bureau of Freshwater Biological Monitoring</p> <p>Publication Date: February 26th, 2000</p> <p>Abstract: This data represents reference sites for the ANNET project at NJDEP. The NJDEP ANNET database supplied the list of site (elevation) data. The locations were selected because they were easily accessed, and sampling data for 4 seasons, and provided a good point of comparison for other sites.</p>	<p>New Jersey Geologic Survey - DGS02-3 Ground-Water Recharge for New Jersey</p> <p>Originator: Mark Pincak, NJGS/BGWRB</p> <p>Publication Date: Currently Unpublished Material</p> <p>Abstract: An estimation of ground-water recharge for Atlantic County. Ground-water recharge is estimated using the NIGS methodology from NJ Geologic Survey Report GSR-32. Methods for cross-validation of recharge estimates in New Jersey Land-use/land-cover, soil and nonpoint-source-based climatic data were combined and used to produce an estimate of ground-water recharge in inches/year. Recharge was then ranked by volume (billions of gallons/year) using natural breaks in the percentage of total volume.</p>	<p>New Jersey 2002 High-Resolution Orthophotography (MRSID format)</p> <p>Originator: State of New Jersey Office of Information Technology, Office of Geographic Information Systems</p> <p>Publication Date: July 31st, 2003</p> <p>Abstract: Digital color infrared (CIR) orthophotography of New Jersey in State Plane NAD83 Coordinates, US Survey Feet. The digital orthophotography was produced at a scale of 1:2400 (1"=200') with a 1 foot pixel resolution. Digital orthophotography combines the image characteristics of a photograph with the geometric qualities of a map. Digital orthophotography is a process which corrects aerial photography for non-geometric distortions such as camera lens distortion, vertical displacement and variations in aerial altitude and orientation. Aerial photography of the entire State of New Jersey was captured during February-April, 2002. The ortho-rectification process achieved a +/- 4.0 foot, horizontal accuracy at a 99% confidence level. The data was produced for the State of New Jersey (NSR) at a 1:2400 compression ratio. The files were produced utilizing MRSID Geopatial Edition 1.4 and are approximately 5 MB in size.</p>	
<p>NJDEP Forest</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2004</p> <p>Abstract: The Forest data depicts critical area maps for forest-dependent species which are generated by selecting specific land-use classes from the NJDEP's LULUC data set. This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. Version 1 was created by intersecting imperiled and priority species data with 1995 cover data derived from TM satellite imagery. This version (version 2) was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land use/Land cover Update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Forested Wetland</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2004</p> <p>Abstract: The Forested Wetland data depicts critical area maps for dependent species which are generated by selecting specific land-use classes from the NJDEP's LULUC data set. This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. Version 1 was created by intersecting imperiled and priority species data with 1995 cover data derived from TM satellite imagery. This version (version 2) was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land use/Land cover Update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Emergent Wetland</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2004</p> <p>Abstract: The Emergent Wetland data depicts critical area maps for dependent species which are generated by selecting specific land-use classes from the NJDEP's LULUC data set. This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. Version 1 was created by intersecting imperiled and priority species data with 1995 cover data derived from TM satellite imagery. This version (version 2) was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land use/Land cover Update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Beach</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2004</p> <p>Abstract: The Beach data depicts critical area maps for beach-dependent species which are generated by selecting specific land-use classes from the NJDEP's LULUC data set. This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. Version 1 was created by intersecting imperiled and priority species data with 1995 cover data derived from TM satellite imagery. This version (version 2) was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land use/Land cover Update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Grassland</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2004</p> <p>Abstract: The Grassland data depicts critical area maps for grassland-dependent species which are generated by selecting specific land-use classes from the NJDEP's LULUC data set. This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. Version 1 was created by intersecting imperiled and priority species data with 1995 cover data derived from TM satellite imagery. This version (version 2) was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land use/Land cover Update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Urban Peregrine</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. Version 1 was created by intersecting imperiled and priority species data with 1995 cover data derived from TM satellite imagery. This version (version 2) was created by intersecting imperiled and priority species data with NJDEP 1995/97 Land use/Land cover Update. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>
<p>NJDEP Bald Eagle Foraging</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. All habitat data were generated using GIS techniques. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Bald Eagle Foraging</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. All habitat data were generated using GIS techniques. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Wood Turtle</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. A 32 meter (102 meter) buffer is applied to all streams (NJDEP Streams of Basin County) within a one mile radius of each wood turtle sighting location. The buffer is applied to that all areas being delineated as critical wood turtle habitat are within one mile of a wood turtle sighting. The NJDEP LULUC layer is overlaid on the buffered areas. All areas classified as urban, with the exception of parks, reservoirs, are deleted from the buffered areas. A 90-meter buffer is applied to the identified foraging habitat to create a 90-meter buffer. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Wood Turtle</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. A 32 meter (102 meter) buffer is applied to all streams (NJDEP Streams of Basin County) within a one mile radius of each wood turtle sighting location. The buffer is applied to that all areas being delineated as critical wood turtle habitat are within one mile of a wood turtle sighting. The NJDEP LULUC layer is overlaid on the buffered areas. All areas classified as urban, with the exception of parks, reservoirs, are deleted from the buffered areas. A 90-meter buffer is applied to the identified foraging habitat to create a 90-meter buffer. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Wood Turtle</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. A 32 meter (102 meter) buffer is applied to all streams (NJDEP Streams of Basin County) within a one mile radius of each wood turtle sighting location. The buffer is applied to that all areas being delineated as critical wood turtle habitat are within one mile of a wood turtle sighting. The NJDEP LULUC layer is overlaid on the buffered areas. All areas classified as urban, with the exception of parks, reservoirs, are deleted from the buffered areas. A 90-meter buffer is applied to the identified foraging habitat to create a 90-meter buffer. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>	<p>NJDEP Wood Turtle</p> <p>Originator: New Jersey Department of Environmental Protection (NJDEP), Division of Fish Wildlife, Endangered Nongame Species Program (ENSP)</p> <p>Publication Date: October 23rd, 2001</p> <p>Abstract: This data set is a product of the Landscape Project, a pro-active, ecosystem-level approach to the long-term protection of imperiled and priority species and their important habitats in New Jersey. A 32 meter (102 meter) buffer is applied to all streams (NJDEP Streams of Basin County) within a one mile radius of each wood turtle sighting location. The buffer is applied to that all areas being delineated as critical wood turtle habitat are within one mile of a wood turtle sighting. The NJDEP LULUC layer is overlaid on the buffered areas. All areas classified as urban, with the exception of parks, reservoirs, are deleted from the buffered areas. A 90-meter buffer is applied to the identified foraging habitat to create a 90-meter buffer. The resulting data layer identifies, delineates and ranks (based on the conservation status of species present) habitat sensitive areas. Each patch is coded for the number of sightings of priority, state threatened, state endangered and federally listed species present. The data is designed to be used for state and local planning, open space acquisition and land-use regulation.</p>

Project Completed by:

CHURCHILL Consulting Engineers  

for:

Gloucester County
Improvement Authority
Freeholder Director
Stephen M. Swensky, Liaison



APPENDIX B. WATER QUALITY DATA

Repaupo Creek Watershed
AMNET Scores

Watershed	Site Name	Site Number	Location	Municipality	Impairment Score 1985/1996	Impairment Score 2000/2001	Habitat Score 2000/2001	Impairment Rating 1995/1996	Impairment Rating 2000/2001	Chironomid Larvae Abnormalities	Site Activity
Repaupo Creek	L1 Timber Ck	AN0675	Paulsboro Rd	Logan	15	15	157	Moderate	Moderate	True	False
Repaupo Creek	Pargy Ck	AN0677	Sweedsboro Ave	East Greenwich	12	21	157	Moderate	Moderate	False	True
Repaupo Creek	Rattling Run	AN0676	Tomlin Rd	East Greenwich	9	12	142	Moderate	Moderate	True	True
Repaupo Creek	Still Run	AN0675	Quaker Rd	East Greenwich	15	9	123	Moderate	Moderate	True	True

Impairment Score

24 - 30

Non-impaird

9 - 21

Moderately Impaired

0 - 6

Severely Impaired

Impairment Rating

Repaupo Creek Watershed
Mercury Data

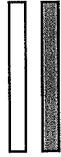
Watershed	Site Name	Species	Date	N	Total Weight (g)	Total Length (cm)		Age (years)		Sex	Hg Concentration (mg/kg wet weight)
						Avg.	Range	Avg.	Range		
Repaupo Creek	Little Timber Creek	Brown Bullhead	1992	1	484.2	33.5		5		U	0.040
Repaupo Creek	Little Timber Creek	Brown Bullhead	1992	1	382.2	29.5		4		U	0.037

Women of reproductive age and children:
< 0.08 ppm

0.08 - 0.18 ppm

0.19 - 0.54 ppm

> 0.54 ppm



Others:
< 0.35 ppm
0.35 - 0.93 ppm
0.947 - 2.81 ppm
> 2.81 ppm

Women of reproductive age and children:
No Advisories
Limited Consumption (Less than one meal per week)
Limited Consumption (Less than one meal per month)
No consumption advised

Others:
No Advisories
Limited Consumption (Less than one meal per week)
Limited Consumption (Less than one meal per month)
No consumption advised

Non-Impaired
Impaired

Repaupo Creek Watershed
Fecal Coliform Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Result Value (CFU/100mL)	Standard (CFU/100mL)
Repaupo Creek	Still Run near Mickelton	01476600	02040202	NJDEP	1999 Avg.	249	200

Non-Impaired

Impaired

Mantua Creek Watershed
AMNET Scores

Watershed	Site Name	Site Number	Location	Municipality	Impairment Score 1985/1996	Impairment Score 2000/2001	Habitat Score 2000/2001	Impairment Rating 1992/1996	Impairment Rating 2000/2001	Chironomid Larvae Abnormalities	Site Activity
Mantua Creek	Chestnut Br	AN0671	Mantua Blvd	Mantua Twp	12	18	135	Moderate	Moderate	True	True
Mantua Creek	Chestnut Br	AN0670	Lamb Rd	Mantua Twp	18	21	191	Moderate	Moderate	False	True
Mantua Creek	Edwards Run	AN0674	Jessups Mill Rd	Mantua Twp	15	12	116	Moderate	Moderate	False	True
Mantua Creek	Edwards Run	AN0673	Pitman - Jefferson Rd	Harrison Twp	3	12	128	Severe	Moderate	False	True
Mantua Creek	Mantua Ck	AN0672	Mantua Ave	Wenonah Boro	12	19	139	Moderate	Moderate	False	True
Mantua Creek	Mantua Ck	AN0669	Lamb Rd	Mantua Twp	9	18	174	Moderate	Moderate	False	True
Mantua Creek	Mantua Ck	AN0668	Greentree Rd	Gasstono Boro	15	24	176	Moderate	None	False	True

Impairment Score Impairment Rating
 24 - 30 Non-Impaired
 9 - 21 Moderately Impaired
 0 - 6 Severely Impaired

Chironomid Larvae Abnormalities
 Non-Impaired
 Sublist 5

Mantua Creek Watershed
Mercury Data

Watershed	Site Name	Species	Date	N	Total Weight (g)	Total Length (cm)		Age (years)		Sex	Hg Concentration (mg/kg wet weight)
						Avg.	Range	Avg.	Range		
Mantua Creek	Alcyon Lake	Esox niger	1992	1		44.9	44.9			U	0.40
Mantua Creek	Alcyon Lake	Micropterus salmoides	1992	4		29.53	27.8 - 33.7	4.3	4 - 5	U	0.48
Mantua Creek	Alcyon Lake	Pomoxis nigromaculatus	1992	2		17	16.9 - 17.1	4.5	4 - 5	U	0.24
Mantua Creek	Alcyon Lake	Black Crappie	11/9/1992		66.9	17.1				IM	0.28
Mantua Creek	Alcyon Lake	Black Crappie	11/9/1992		63.7	16.9				IM	0.19
Mantua Creek	Alcyon Lake	Chain Pickerel	11/9/1992		547.6	44.9				M	0.40
Mantua Creek	Alcyon Lake	Largemouth Bass	11/9/1992		559.2	33.7				U	0.41
Mantua Creek	Alcyon Lake	Largemouth Bass	11/10/1992		270.2	28.6				U	0.67
Mantua Creek	Alcyon Lake	Largemouth Bass	11/11/1992		308.5	28				U	0.33
Mantua Creek	Alcyon Lake	Largemouth Bass	11/12/1992		294.3	27.8				U	0.51

Women of reproductive age and children:
< 0.08 ppm
No Advisories

0.08 - 0.18 ppm
Limited Consumption (Less than one meal per week)

0.18 - 0.54 ppm
Limited Consumption (Less than one meal per month)

> 0.54 ppm
No consumption advised



Non-Impaired

Impaired

Others:
< 0.35 ppm

0.35 - 0.93 ppm

0.947 - 2.81 ppm

> 2.81 ppm

No Advisories

Limited Consumption (Less than one meal per week)

Limited Consumption (Less than one meal per month)

No consumption advised

Mantua Creek Watershed
Phosphorous Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Sample Type	Result Value (mg/l)	Standard (mg/l)
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/28/00	Unfiltered	0.152	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/28/00	Filtered	0.06	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/22/01	Unfiltered	0.104	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/22/01	Filtered	0.025	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	05/23/01	Unfiltered	0.33	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	05/23/01	Filtered	0.13	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/23/01	Unfiltered	0.145	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/23/01	Filtered	0.056	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/27/01	Unfiltered	0.088	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	11/27/01	Filtered	0.026	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/20/02	Unfiltered	0.065	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	02/20/02	Filtered	0.023	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	06/20/02	Unfiltered	0.44	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	06/20/02	Filtered	0.25	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/27/02	Unfiltered	0.19	0.1
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	08/27/02	Filtered	0.08	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	01/24/01	Total Actual	0.12	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	04/28/01	Total Actual	*Non-detect	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	07/19/01	Total Actual	0.17	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	10/03/01	Total Actual	0.07	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	01/02/02	Total Actual	0.07	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	04/11/02	Total Actual	*Non-detect	0.1
Mantua Creek	Mantua Creek at Rt. 45 in W. Deptford	01475046	02040202	NJDEP	07/24/02	Total Actual	0.246	0.1

Non-Impaired

Impaired

Mantua Creek Watershed
Fecal Coliform Data

Watershed	Site Name	Site ID	HUC	Sampling Agency	Sample Date	Result Value (CFU/100mL)	Standard (CFU/100mL)
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/10/2001	940	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/17/2001	1,100	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/24/2001	15,000	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	7/31/2001	940	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	8/7/2001	24,000	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	2001 Avg	8,596	200
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	5/29/2002	1,100	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	6/5/2002	500	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	6/12/2002	5,000	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	6/26/2002	230	400
Mantua Creek	Edwards Run at Jefferson	01475090	02040202	USGS	2002 Avg	1,703	200

Non-Impaired

Impaired

APPENDIX C. MUNICIPAL REGULATION CHECKLIST

New Jersey Stormwater Best Management Practices Manual

February 2004

<http://www.state.nj.us/dep/watershedmgt/bmpmanualfeb2004.htm>

A P P E N D I X B

Municipal Regulations Checklist

A checklist for incorporating nonstructural stormwater management strategies into local regulations

As part of the requirements for municipal stormwater management plans in the Stormwater Management Rules at N.J.A.C. 7:8-4, municipalities are required to evaluate the municipal master plan, and land use and zoning ordinances to determine what adjustments need to be made to allow the implementation of nonstructural stormwater management techniques, also called low impact development techniques, which are presented in *Chapter 2: Low Impact Development Techniques*. *Chapter 3: Regional and Municipal Stormwater Management Plans* provides information on the development of municipal stormwater management plans, including the evaluation of the master plan, and land use and zoning ordinances. This checklist was prepared to assist municipalities in identifying the specific ordinances that should be evaluated, and the types of changes to be incorporated to address the requirements of the Stormwater Management Rules.

Part 1: Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharge and stormwater runoff quality and quantity.

A. Preservation of Natural Areas

Municipal regulations should include requirements to preserve existing vegetated areas, minimize turf grass lawn areas, and use native vegetation.

- Yes No Are applicants required to provide a layout of the existing vegetated areas, and a description of the conditions in those areas?
- Yes No Does the municipality have maximum as well as minimum yard sizing ordinances?
- Yes No Are residents restricted from enlarging existing turf lawn areas?
- Yes No Do the ordinances provide incentives for the use of vegetation as filters for stormwater runoff?
- Yes No Do the ordinances require a specific percentage of permanently preserved open space as part of the evaluation of cluster development?

B. Tree Protection Ordinances

Municipalities often have a tree ordinance to minimize the removal of trees and to replace trees that are removed. However, while tree ordinances protect the number of trees, they do not typically address the associated leaf litter or smaller vegetation that provides additional water quality and quantity benefits. Municipalities should consider enhancing tree ordinances to a forest ordinance that would also maintain the benefits of a forested area.

- Yes No Does the municipality have a tree protection ordinance?
- Yes No Can the municipality include a forest protection ordinance?
- Yes No If forested areas are present at development sites, is there a required percentage of the stand to be preserved?

C. Landscaping Island and Screening Ordinances

Municipalities often have ordinances that require landscaping islands for parking areas. The landscaping islands can provide ideal opportunities for the filtration and disconnection of runoff, or the placement of small LID-BMPs. Screening ordinances limit the view of adjoining properties, parking areas, or loading areas. Low maintenance vegetation can be required in islands and areas used for screening to provide stormwater quality, groundwater recharge, or stormwater quantity benefits.

- Yes No Do the ordinances require landscaping islands in parking lots, or between the roadway and the sidewalk? Can the ordinance be adjusted to require vegetation that is more beneficial for stormwater quality, groundwater recharge, or stormwater quantity, but that does not interfere with driver vision at the intersections?
- Yes No Is the use of bioretention islands and other stormwater practices within landscaped areas or setbacks allowed?
- Yes No Do the ordinances require screening from adjoining properties? Can the screening criteria require the use of vegetation to the maximum extent practicable before the use of walls or berms?

D. Riparian Buffers

Municipalities may have existing buffer and/or floodplain ordinances that require the protection of vegetation adjacent to streams. Municipalities should consult existing regulations adopted by the Department to ensure that riparian buffer or floodplain ordinances reflect the requirements of the Department within these areas. The municipality should consider conservation restrictions and allowable maintenance to ensure the preservation of these areas.

- Yes No Is there a stream buffer or floodplain ordinance in the community?
- Yes No Is the ordinance consistent with existing state regulatory requirements?
- Yes No Does the ordinance require a conservation easement, or other permanent restrictions on buffer areas?
- Yes No Does the ordinance identify or limit when stormwater outfall structures can cross the buffer?
- Yes No Does the ordinance give detailed information on the type of maintenance and/or activities that is allowed in the buffer?

Part 2: Minimizing Land Disturbance

The minimization of disturbance can be used at different phases of a development project. The goal is to limit clearing, grading, and other disturbance associated with development to protect existing features that provide stormwater benefits. Zoning ordinances typically limit the amount of impervious surfaces on building lots, but do not limit the amount of area that can be disturbed during construction. This strategy helps preserve the site's existing hydrologic character, as well as limiting the occurrence of soil compaction.

A. Limits of Disturbance

Designing with the terrain, or site fingerprinting, requires an assessment of the characteristics of the site and the selection of areas for development that would minimize the impact. This can be incorporated into the requirements for existing site conditions and the environmental impact statement. Limits of disturbance should be incorporated into construction plans reviewed and approved by the municipality. Setbacks should be evaluated to determine whether they can be reduced. The following maximum setbacks are recommended for low impact development designs:

- front yard – 20 feet;
- rear yard – 25 feet; and
- side yard – 8 feet.

- Yes No As part of the depiction of existing conditions, are environmentally critical and environmentally constrained areas identified? (Environmentally critical areas are areas or features with significant environmental value, such as steep slopes, stream corridors, natural heritage priority sites, and habitats of threatened and endangered species. Environmentally constrained areas are those with development restrictions, such as wetlands, floodplains, and sites of endangered species.)
- Yes No Can any of the existing setbacks be reduced?
- Yes No Are there maximum turf grass or impervious cover limits in any of the setbacks?
- Yes No Do the ordinances inhibit or prohibit the clearcutting of the project site as part of the construction?
- Yes No Is the traffic of heavy construction vehicles limited to specific areas, such as areas of proposed roadway? Are these areas required to be identified on the plans and marked in the field?
- Yes No Do the ordinances require the identification of specific areas that provide significant hydrologic functions, such as existing surface storage areas, forested areas, riparian corridors, and areas with high groundwater recharge capabilities?
- Yes No Does the municipality require an as-built inspection before issuing a certificate of occupancy? If so, does the inspection include identification of compacted areas, if they exist within the site?
- Yes No Does the municipality require the restoration to compacted areas in accordance with the Soil Erosion and Sediment Control Standards?

B. Open Space and Cluster Development

Open space areas are restricted land that may be set aside for conservation, recreation, or agricultural use, and are often associated with cluster development requirements. Since open space can have a variety of uses, the municipality should evaluate its open space ordinances to determine whether amendments are necessary to provide improved stormwater benefits.

- Yes No Are open space or cluster development designs allowed in the municipality?
- Yes No Are flexible site design incentives available for developers that utilize open space or cluster design options?
- Yes No Are there limitations on the allowable disturbance of existing vegetated areas in open space?
- Yes No Are the requirements to re-establish vegetation in disturbed areas dedicated for open space?
- Yes No Is there a maximum allowable impervious cover in open space areas?

Part 3: Impervious Area Management

The amount of impervious area, and its relationship to adjacent vegetated areas, can significantly change the amount of runoff that needs to be addressed by BMPs. Most of a site's impervious surfaces are typically located in the streets, sidewalks, driveway, and parking areas. These areas are further hampered by requirements for continuous curbing that prevent discharge from impervious surfaces into adjacent vegetated areas.

A. Streets and Driveways

Street widths of 18 to 22 feet are recommended for low impact development designs in low density residential developments. Minimum driveway widths of 9 and 18 feet for one lane and two lanes, respectively, are also recommended. The minimum widths of all streets and driveways should be evaluated to demonstrate that the proposed width is the narrowest possible consistent with safety and traffic concerns and requirements. Municipalities should evaluate which traffic calming features, such as circles, rotaries, medians, and islands, can be vegetated or landscaped. Cul-de-sacs can also be evaluated to reduce the radius area, or to provide a landscape island in the center.

- Yes No Are the street widths the minimum necessary for traffic density, emergency vehicle movement, and roadside parking?
- Yes No Are street features, such as circles, rotaries, or landscaped islands allowed to or required to receive runoff?
- Yes No Are curb cuts or flush curbs with curb stops an allowable alternative to raised curbs?
- Yes No Can the minimum cul-de-sac radius be reduced or is a landscaped island required in the center of the cul-de-sac?
- Yes No Are alternative turn-arounds such as "hammerheads" allowed on short streets in low density residential developments?
- Yes No Can the minimum driveway width be reduced?
- Yes No Are shared driveways permitted in residential developments?

B. Parking Areas and Sidewalks

A mix of uses at a development site can allow for shared parking areas, reducing the total parking area. Municipalities require minimum parking areas, but seldom limit the total number of parking spaces. Table 1 shows recommendations for minimum parking space ratios for low impact design:

Table 1: Low Impact Development Parking Space Ratios

Use	Parking Ratio per 1000 sq. ft. of Gross Floor Area
Professional office building	Less than 3.0
Shopping centers	Less than 4.5

- Yes No Can the parking ratios be reduced?
- Yes No Are the parking requirements set as maximum or median rather than minimum requirements?
- Yes No Is the use of shared parking arrangements allowed to reduce the parking area?
- Yes No Are model shared parking agreements provided?
- Yes No Does the presence of mass transit allow for reduced parking ratios?
- Yes No Is a minimum stall width of 9 feet allowed?
- Yes No Is a minimum stall length of 18 feet allowed?
- Yes No Can the stall lengths be reduced to allow vehicle overhang into a vegetated area?
- Yes No Do ordinances allow for permeable material to be used in overflow parking areas?
- Yes No Do ordinances allow for multi-level parking?
- Yes No Are there incentives to provide parking that reduces impervious cover, rather than providing only surface parking lots?

Sidewalks can be made of pervious material or disconnected from the drainage system to allow runoff to re-infiltrate into the adjacent pervious areas.

- Yes No Do ordinances allow for sidewalks constructed with pervious material?
- Yes No Can alternate pedestrian networks be substituted for sidewalks (e.g., trails through common areas)?

C. Unconnected Impervious Areas

Disconnection of impervious areas can occur in both low density development and high density commercial development, provided sufficient vegetated area is available to accept dispersed stormwater flows. Areas for disconnection include parking lot or cul-de-sac islands, lawn areas, and other vegetated areas.

- Yes No Are developers required to disconnect impervious surfaces to promote pollutant removal and groundwater recharge?
- Yes No Do ordinances allow the reduction of the runoff volume when runoff from impervious areas are re-infiltrated into vegetated areas?
- Yes No Do ordinances allow flush curb and/or curb cuts to allow for runoff to discharge into adjacent vegetated areas as sheet flow?

Part 4: Vegetated Open Channels

The use of vegetated channels, rather than the standard concrete curb and gutter configuration, can decrease flow velocity, and allow for stormwater filtration and re-infiltration. One design option is for vegetated channels that convey smaller storm events, such as the water quality design storm, and provide an overflow into a storm sewer system for larger storm events.

- Yes No Do ordinances allow or require vegetated open channel conveyance instead of the standard curb and gutter designs?
- Yes No Are there established design criteria for vegetated channels?

APPENDIX D. LOW IMPACT DEVELOPEMNT CHECKLIST

New Jersey Stormwater Best Management Practices Manual

February 2004

<http://www.state.nj.us/dep/watershedmgt/bmpmanualfeb2004.htm>

A P P E N D I X A

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

According to the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, the groundwater recharge, stormwater quality, and stormwater quantity standards established by the Rules for major land development projects must be met by incorporating nine specific nonstructural stormwater management strategies into the project's design to the maximum extent practicable.

To accomplish this, the Rules require an applicant seeking land development approval from a regulatory board or agency to identify those nonstructural strategies that have been incorporated into the project's design. In addition, if an applicant contends that it is not feasible to incorporate any of the specific strategies into the project's design, particularly for engineering, environmental, or safety reasons, the Rules further require that the applicant provide a basis for that contention.

This checklist has been prepared to assist applicants, site designers, and regulatory boards and agencies in ensuring that the nonstructural stormwater management requirements of the Rules are met. It provides an applicant with a means to identify both the nonstructural strategies incorporated into the development's design and the specific low impact development BMPs (LID-BMPs) that have been used to do so. It can also help an applicant explain the engineering, environmental, and/or safety reasons that a specific nonstructural strategy could not be incorporated into the development's design.

The checklist can also assist municipalities and other land development review agencies in the development of specific requirements for both nonstructural strategies and LID-BMPs in zoning and/or land use ordinances and regulations. As such, where requirements consistent with the Rules have been adopted, they may supersede this checklist.

Finally, the checklist can be used during a pre-design meeting between an applicant and pertinent review personnel to discuss local nonstructural strategies and LID-BMPs requirements in order to optimize the development's nonstructural stormwater management design.

Since this checklist is intended to promote the use of nonstructural stormwater management strategies and provide guidance in their incorporation in land development projects, municipalities are permitted to revise it as necessary to meet the goals and objectives of their specific stormwater management program and plan within the limits of N.J.A.C. 7:8.

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

Municipality: _____

County: _____ Date: _____

Review board or agency: _____

Proposed land development name: _____

Lot(s): _____ Block(s): _____

Project or application number: _____

Applicant's name: _____

Applicant's address: _____

Telephone: _____ Fax: _____

Email address: _____

Designer's name: _____

Designer's address: _____

Telephone: _____ Fax: _____

Email address: _____

Part 2: Review of Local Stormwater Management Regulations

Title and date of stormwater management regulations used in development design:

Do regulations include nonstructural requirements? Yes: _____ No: _____

If yes, briefly describe: _____

List LID-BMPs prohibited by local regulations: _____

Pre-design meeting held? Yes: _____ Date: _____ No: _____

Meeting held with: _____

Pre-design site walk held? Yes: _____ Date: _____ No: _____

Site walk held with: _____

Other agencies with stormwater review jurisdiction:

Name: _____

Required approval: _____

Name: _____

Required approval: _____

Name: _____

Required approval: _____

Part 3: Nonstructural Strategies and LID-BMPs in Design

3.1 Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharges and runoff quality and quantity. This section of the checklist helps identify the vegetation and landscaping strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to help maintain existing recharge rates and/or minimize or prevent increases in runoff quantity and pollutant loading.

A. Has an inventory of existing site vegetation been performed? Yes: _____ No: _____

If yes, was this inventory a factor in the site's layout and design? Yes: _____ No: _____

B. Does the site design utilize any of the following nonstructural LID-BMPs?

Preservation of natural areas? Yes: _____ No: _____ If yes, specify % of site: _____

Native ground cover? Yes: _____ No: _____ If yes, specify % of site: _____

Vegetated buffers? Yes: _____ No: _____ If yes, specify % of site: _____

C. Do the land development regulations require these nonstructural LID-BMPs?

Preservation of natural areas? Yes: _____ No: _____ If yes, specify % of site: _____

Native ground cover? Yes: _____ No: _____ If yes, specify % of site: _____

Vegetated buffers? Yes: _____ No: _____ If yes, specify % of site: _____

D. If vegetated filter strips or buffers are utilized, specify their functions:

Reduce runoff volume increases through lower runoff coefficient: Yes: _____ No: _____

Reduce runoff pollutant loads through runoff treatment: Yes: _____ No: _____

Maintain groundwater recharge by preserving natural areas: Yes: _____ No: _____

3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

A. Have inventories of existing site soils and slopes been performed? Yes: _____ No: _____

If yes, were these inventories factors in the site's layout and design? Yes: _____ No: _____

B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners? Yes: _____ No: _____

If yes, how: _____

Restrict temporary site disturbance during construction? Yes: _____ No: _____

If yes, how: _____

Consider soils and slopes in selecting disturbance limits? Yes: _____ No: _____

If yes, how: _____

C. Specify percentage of site to be cleared: _____ Regraded: _____

D. Specify percentage of cleared areas done so for buildings: _____

For driveways and parking: _____ For roadways: _____

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above?

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: _____ HSG B: _____ HSG C: _____ HSG D: _____

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A: _____ HSG B: _____ HSG C: _____ HSG D: _____

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

I. Does the site include Karst topography? Yes: _____ No: _____

If yes, discuss measures taken to limit Karst impacts:

3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

A. Specify impervious cover at site: Existing: _____ Proposed: _____

B. Specify maximum site impervious coverage allowed by regulations: _____

C. Compare proposed street cartway widths with those required by regulations:

Type of Street	Proposed Cartway Width (feet)	Required Cartway Width (feet)
Residential access – low intensity		
Residential access – medium intensity		
Residential access – high intensity with parking		
Residential access – high intensity without parking		
Neighborhood		
Minor collector – low intensity without parking		
Minor collector – with one parking lane		
Minor collector – with two parking lanes		
Minor collector – without parking		
Major collector		

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: _____ Regulations: _____

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: _____ Regulations: _____

F. Specify percentage of total site impervious cover created by buildings:

By driveways and parking: _____ By roadways: _____

G. What design criteria and/or site changes would be required to reduce the percentages in F above?

H. Specify percentage of total impervious area that will be unconnected:

Total site: _____ Buildings: _____ Driveways and parking: _____ Roads: _____

I. Specify percentage of total impervious area that will be porous:

Total site: _____ Buildings: _____ Driveways and parking: _____ Roads: _____

J. Specify percentage of total building roof area that will be vegetated: _____

K. Specify percentage of total parking area located beneath buildings: _____

L. Specify percentage of total parking located within multi-level parking deck: _____

3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: _____ Vegetated swale: _____ Natural channel: _____

Stormwater management facility: _____ Other: _____

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: _____

Increase overland flow roughness: _____

3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

A. Trash Receptacles

Specify the number of trash receptacles provided: _____

Specify the spacing between the trash receptacles: _____

Compare trash receptacles proposed with those required by regulations:

Proposed: _____ Regulations: _____

B. Pet Waste Stations

Specify the number of pet waste stations provided: _____

Specify the spacing between the pet waste stations: _____

Compare pet waste stations proposed with those required by regulations:

Proposed: _____ Regulations: _____

C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: _____

D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: _____ Regulations: _____

Litter collection: Proposed: _____ Regulations: _____

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

E. Prevention and Containment of Spills

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: _____ Location: _____

**Part 4: Compliance with Nonstructural Requirements
of NJDEP Stormwater Management Rules**

1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

No.	Nonstructural Strategy	Yes	No
1.	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.		
2.	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.		
3.	Maximize the protection of natural drainage features and vegetation.		
4.	Minimize the decrease in the pre-construction time of concentration.		
5.	Minimize land disturbance including clearing and grading.		
6.	Minimize soil compaction.		
7.	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.		
8.	Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.		
9.	Provide preventative source controls.		

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.

APPENDIX E. EAST GREENWICH TOWNSHIP MITIGATION PROJECTS