

## **MUNICIPAL STORMWATER MANAGEMENT PLAN**

**Township of Plumsted  
Ocean County, New Jersey**

Prepared by:

**Dewberry Engineers, Inc.**  
1015 Briggs Rd Road, Suite 210  
Mount Laurel, NJ 08054

**June 2021**



---

Lisa M. Peterson, PE, PLS, CME  
New Jersey Professional Engineer  
And Land Surveyor  
License Number 24GB04258400

## **TABLE OF CONTENTS**

| <b><u>Section</u></b>                               | <b><u>Page</u></b> |
|-----------------------------------------------------|--------------------|
| Introduction.....                                   | 3                  |
| Goals .....                                         | 4                  |
| Stormwater Discussion .....                         | 5                  |
| Background .....                                    | 7                  |
| Design and Performance Standards.....               | 12                 |
| Plan Consistency.....                               | 13                 |
| Nonstructural Stormwater Management Strategies..... | 14                 |
| Land Use/Build-Out Analysis.....                    | 16                 |
| Mitigation Plans.....                               | 17                 |

| <b><u>List of Tables</u></b>                                               | <b><u>Page</u></b> |
|----------------------------------------------------------------------------|--------------------|
| Table C-1: Sample Build-Out Calculations for Two HUCI4s .....              | 27                 |
| Table C-2: Pollutant Loads by Land Cover .....                             | 30                 |
| Table C-3: Nonpoint Source Loads at Build-Out for Two Example HUCI4s ..... | 31                 |

| <b><u>List of Figures</u></b>                                                       | <b><u>Page</u></b> |
|-------------------------------------------------------------------------------------|--------------------|
| Figure C-1: Groundwater Recharge in the Hydrologic Cycle.....                       | 6                  |
| Figure C-2: Township and Its Waterways .....                                        | 10                 |
| Figure C-3: Township Boundary on USGS Quadrangles.....                              | 11                 |
| Figure C-4: Groundwater Recharge Areas in the Township.....                         | 20                 |
| Figure C-5: Wellhead Protection Areas in the Township .....                         | 21                 |
| Figure C-6: Township's Existing Land Use .....                                      | 22                 |
| Figure C-7: Hydrologic Units (HUCI4s Within the Township .....                      | 23                 |
| Figure C-8: Zoning Districts Within the Township .....                              | 24                 |
| Figure C-9: Wetlands and Water Land Use Within the Township – Constrained Land..... | 25                 |
| Figure C-10: Municipal Water Bodies with Quad Map .....                             | 26                 |

## Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Plumsted (“the Township”) to address stormwater related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains and adopts all the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan endorses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, as defined in N.J.A.C. 7:8 Stormwater Management Rules. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan describes long-term operation and maintenance measures for existing and future stormwater facilities.

The “build-out” analysis included in this plan is based upon existing zoning and land available for development. The plan addresses the review and update of existing Ordinances, the Township Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a Variance or exemption of the design and performance standards is sought. As part of the mitigation section of the Stormwater Plan, specific stormwater management measures are identified to lessen the impact of existing development.

## Goals

The goals of this MSWMP are to:

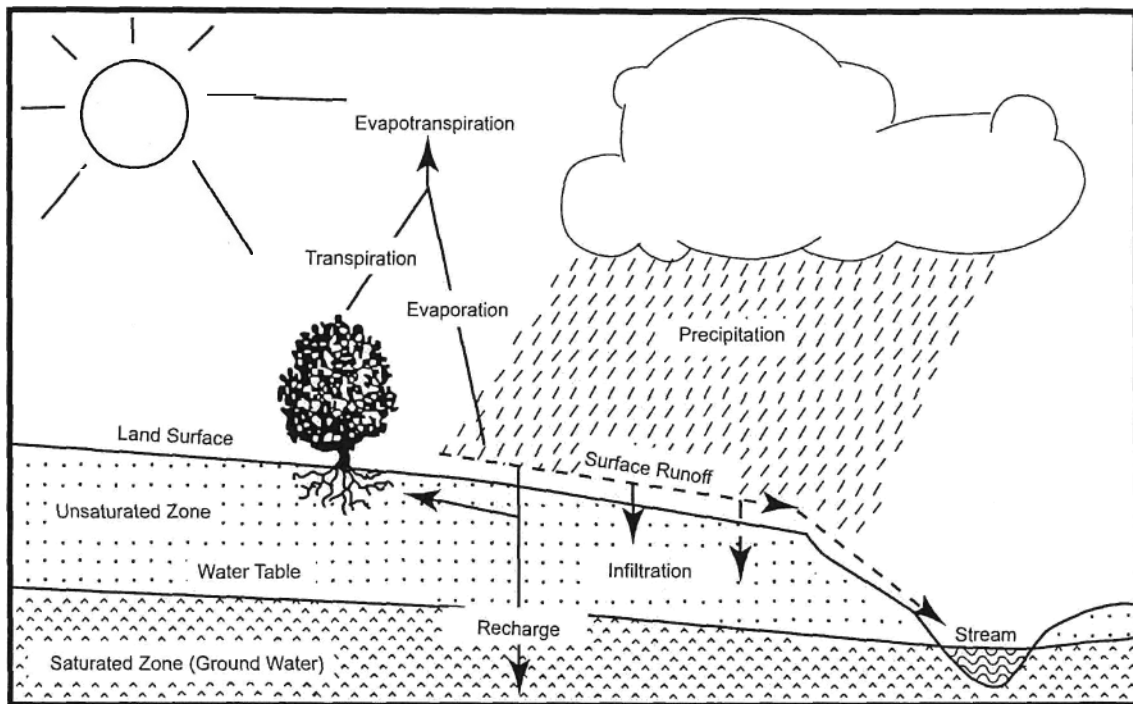
- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in non-point pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the State, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, Municipal, recreational, industrial and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins, including safety standards for stormwater infrastructure.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities.

## Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure C-1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration, which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

**Figure C-1: Groundwater Recharge in the Hydrologic Cycle**



Source: New Jersey Geologic Survey GSR-32

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

## Background

The Township of Plumsted was incorporated in 1845 and encompasses a 40.08 square mile area in northwestern Ocean County, New Jersey. The Township is bounded on the north by Monmouth County community of Upper Freehold Township, on the east by the Township of Jackson, on the south by the Township of Manchester, and on the west by the Burlington County communities of North Hanover Township, New Hanover Township and Pemberton Township. Joint Base McGuire-Dix-Lakehurst (JBMDL) is located in the southern half of the Township and encompasses 11,693 acres, approximately 45 percent of the Township's land area.

The southern half of the Township, coincident with JBMDL, along with the northern two-thirds of the eastern quarter sector is within the jurisdiction of the New Jersey Pinelands Commission. The Pinelands area is approximately 13,745 acres, 54 percent, of the Township.

In recent years, the Township has been under significant development pressure. The population of the Township has continually increased from 4,674 in 1980 to 6,005 in 1990 to 7,275 in 2000 and 8,571 in 2019. This population increase has resulted in considerable demand for new development; changes in the landscape have most likely increased stormwater runoff volumes and pollutant loads to the waterways of the Municipality. Figure C-2 illustrates the waterways in the Township. Figure C-3 depicts the Township boundary on the USGS quadrangle maps.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the State's waterways. There are over 800 AMNET sites throughout the State of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics.

There are no rivers flowing through the Township, however, the Township contains waterways that are the headwaters to three watershed management areas; the Barnegat Bay (WMA 13), Rancocas (WMA 19), and the Assiscunk, Crosswicks and Doctors (WMA 20). The Township has twelve tributaries feeding these areas. The Union/Ridgeway Branch of Toms River is fed by the Ridgeway Branch and Shannae Brook. The Rancocas is fed by Goodwater Run, Hartshorne Mill Stream, Gaunts Creek and the North Branch Rancocas Creek.

Assiscunk, Crosswicks and Doctors Creeks watershed is fed by Jumping Brook, Beaverdam Brook, Crosswicks Creek, Lahaway Creek and Prospertown Brook. The New Jersey Integrated Water Quality Monitoring and Assessment Report lists Crosswicks Creek at CR 537 as impaired on the benthic macroinvertebrates. All these watersheds contain some water bodies that are impaired to some extent.

Since the Township contains the headwaters for streams in all three management areas, providing improved storm water management techniques in the Township will aid in the improvement of a significant number of waterways within the state. Since these waterways are impaired waterways the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway.

A TMDL is the amount of a pollutant that can be accepted by a water body without exceeding water quality standards of interfering with the ability to use a water body for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES Permit to discharge, and non-point source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved wastewater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303(d)) (Integrated List) is required by the Federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards and identifies waters that are impaired. Sub-list 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

### **Watershed Management Area 13- Barnegat Bay**

The NJDEP data shows that the dissolved oxygen levels of the Atlantic Ocean and the total coliform levels of the Barnegat Bay frequently exceed the state's criteria. This means that this body of water is an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway. The NJDEP has developed a proposed Total Coliform TMDL per September 27, 2006 Report, entitled *"Fourteen Total Maximum Daily Loads for Total Coliform to address Shellfish impaired waters in Watershed Management Area 13, Atlantic Coastal Water Region"*.

### **Watershed Management Area 19- Rancocas Creek**

The NJDEP data shows that Rancocas Creek and associated tributaries are impaired for fecal coliform, according to sub-list 5 of the Integrated List. The NJDEP has developed an approved Total Coliform TMDL per September 29, 2003 Report, entitled *"Total Maximum Daily Loads for Fecal Coliform to Address 27 Streams in the Lower Delaware Water Region"*. According to this report, the impaired areas that need reductions implemented are listed as areas within the town of Mount Holly and Medford Township. Therefore, there are no reductions required within the Township of Plumsted. Also, please note that the entire waterway within the Township is located within JBMDL.

## **Watershed Management Area 20- Assiscunk, Crosswicks and Doctors**

The NJDEP data shows that Crosswicks Creek, Lahaway Creek and Doctor's Creek and associated tributaries are impaired for fecal coliform and Doctor's Creek is also impaired for Total Phosphorus, according to sub-list 5 of the Integrated List. The NJDEP has developed an approved Total Coliform TMDL per September 29, 2003 Report, entitled "*Total Maximum Daily Loads for Fecal Coliform to Address 27 Streams in the Lower Delaware Water Region*". In order to comply with the TMDL, the amount of total coliform in the waterways must be reduced. For the waterways within the Township and those affected by the Township, the following reductions are necessary; Crosswicks Creek, a 86% reduction is proposed, Doctor's Creek, a 86% reduction is proposed. Although addressed within the above TMDL Report, Lahaway Creek has no proposed reduction.

To address the phosphorus problem the NJDEP has proposed a TMDL on February 5, 2007 entitled, "*Total Maximum Daily Loads for Phosphorus to Address 4 Stream Segments Annaricken Brook, Barkers Brook North Branch and Doctors Creek Drainage Area* Identifications: HUC02040201100010-01, 02040201100020-01, 02040201060030-01, 02040201060020-01, 02040201060010-01 Lower Delaware Water Region WMA 20". In order to comply with the TMDL, the amount of total Phosphorus in the waterways must be reduced. For the waterways within the Township and those affected by the Township, the following reductions are necessary; Doctor's Creek, a 79.8% reduction is proposed.

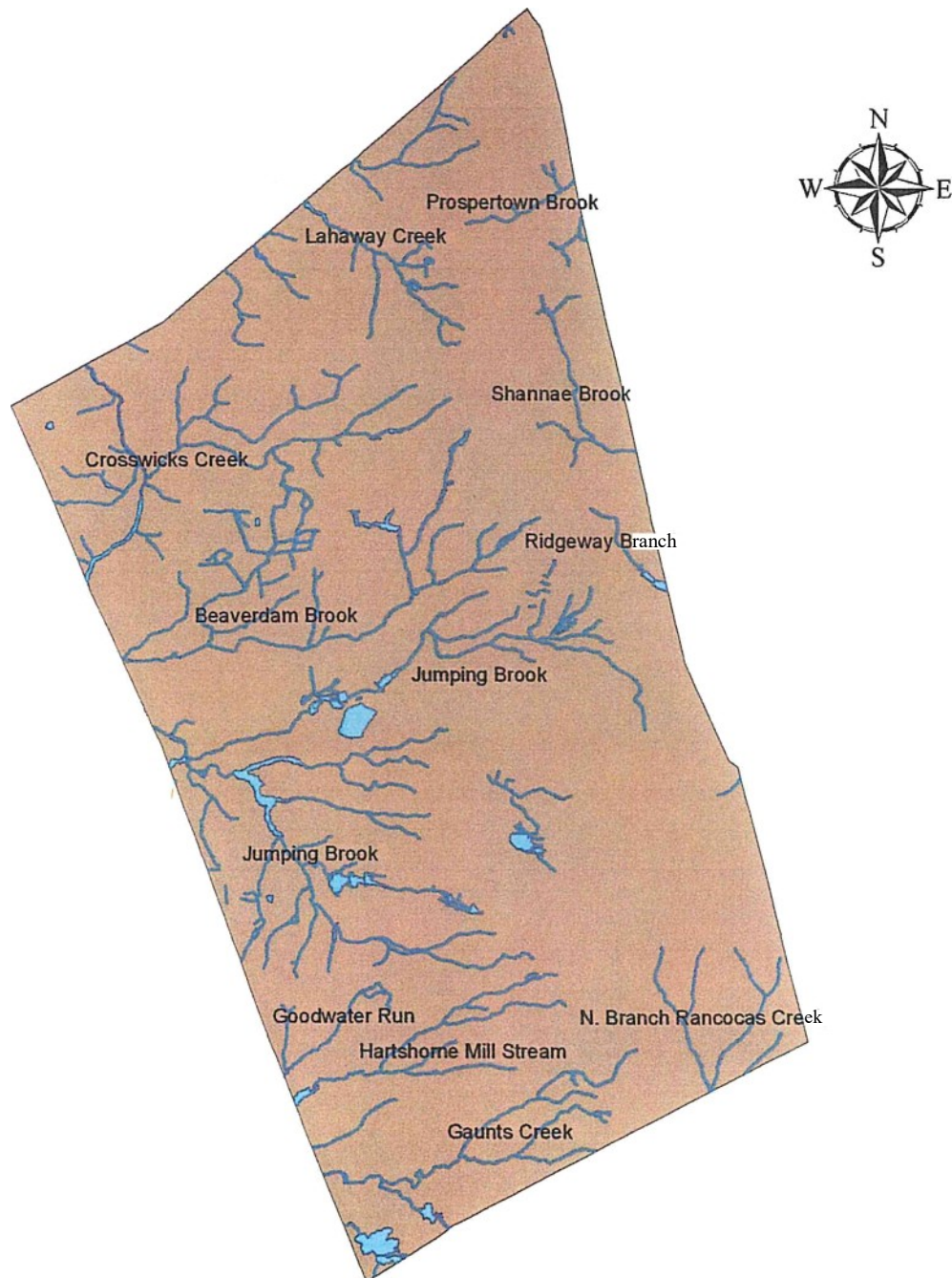
The purpose of the plan is to comply with these recommended reductions.

The rural nature of the Township means the sources of fecal coliform and phosphorus are likely to be from the agricultural and natural sources. The Township has been encouraging and educating farmers in the proper use and disposal of the major sources, including fertilizer and animal waste. The coliform can also come from geese and pet waste in the more suburban downtown area. The Township is actively educating the population on pet waste disposal. The Township is also constructing a new sanitary sewer collection system and wastewater treatment plant, which is expected to positively affect the aged septic and cesspools in the downtown area.

All future development will be constructed in accordance with this plan and all related township ordinances. Any development that is built within mapped flood plains areas will also be permitted and constructed in accordance with NJDEP Flood Hazard Area standards. It is anticipated that no future flooding problems should occur.

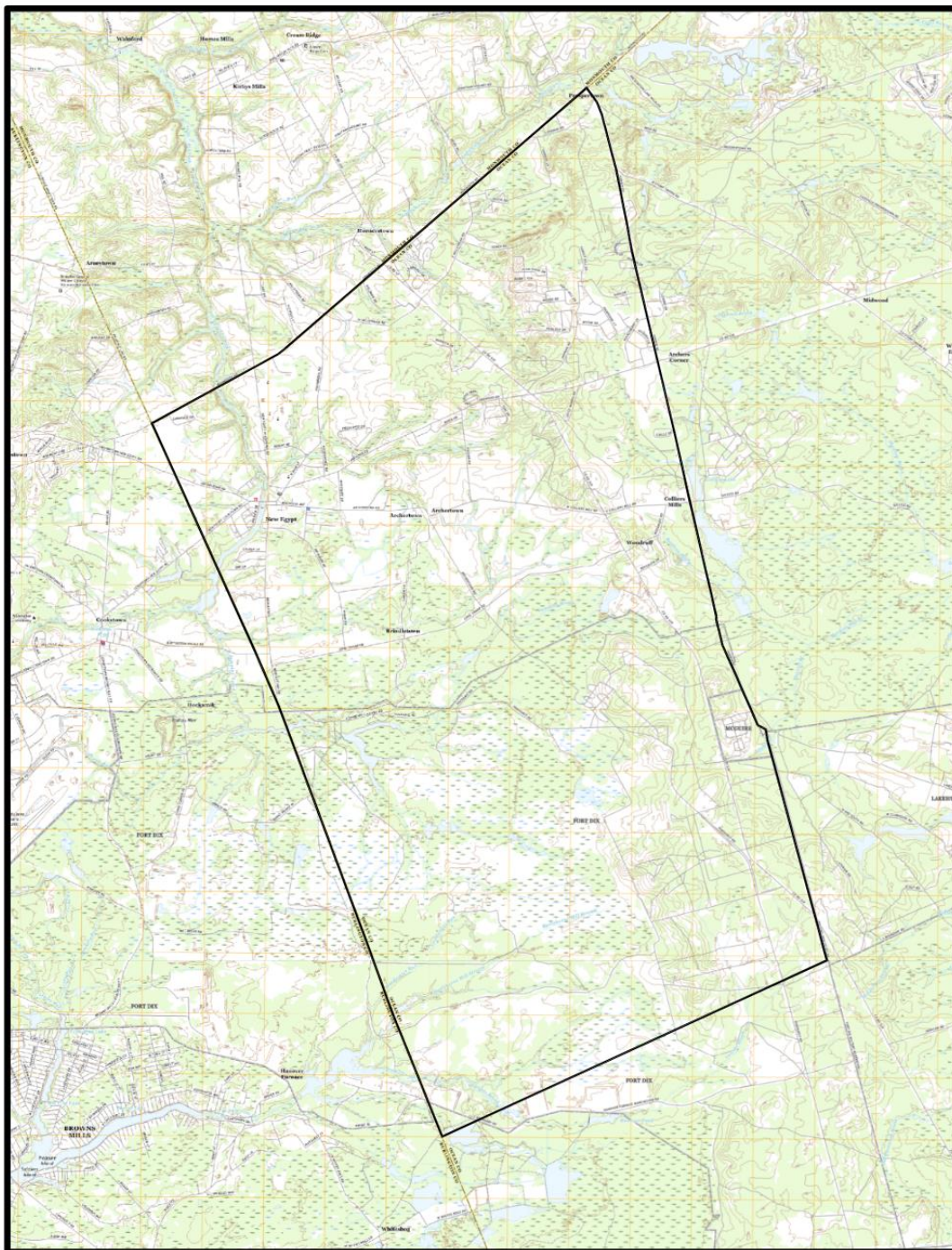
The Township looks for any opportunity to effectively improve the environment and as in the past will look to implement those activities that create a healthier community.

**Figure C-2: Township and Its Waterways**



Source: NJDEP NJ-Geoweb Mapping

### Figure C-3: Township Boundary on USGS Quadrangles



## **Design and Performance Standards**

The Township has adopted the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the Stormwater Management Rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.

During construction, Township inspectors will observe the construction of projects to ensure that the stormwater management measures are constructed and function to comply with the Stormwater Ordinance including design standards and safety requirements. The Township will enforce all corrective measures and penalties for non-compliance, as contained in the Township Stormwater Ordinance.

## Plan Consistency

The Township is not within a Regional Stormwater Management Planning Area; therefore, this plan does not need to be consistent with any Regional Stormwater Management Plans (RSWMPs). If any RSWMPs are developed in the future, the Municipal Stormwater Management Plan will be updated to be consistent.

This plan is consistent with the TMDL for Total Coliform currently enacted for the waterways within and affected by the Township. If any future TMDLs are proposed, the Township shall comply with those as well as updating this plan for consistency.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The Municipality will utilize the most current update of the RSIS in the stormwater management review of residential areas. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates to the RSIS.

The Township's Stormwater Management Ordinance requires all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Township inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Ocean County Soil Conservation District.

In addition to the above requirements, all developments within the Pinelands jurisdiction are subject to the Township's Stormwater Management Ordinance for Pinelands developments as well as the Pinelands Master Plan.

The Township is partially located within the Pinelands jurisdiction, and as such, the Municipal Stormwater ordinance references the Pinelands Municipal Stormwater Control Ordinance. Therefore, any revisions to the Pinelands regulations will be reflected in the updated Municipal ordinances regrading Stormwater Management.

## **Nonstructural Stormwater Management Strategies**

The Township has enacted various ordinances written to encourage nonstructural Stormwater strategies and comply with the new Stormwater and buffering regulations.

The ordinances listed below have been revised or may undergo revision to comply with the new regulations. The zoning ordinances and Master Plan support the Stormwater Management Plan.

The municipal master plan was evaluated to determine how to implement green infrastructure and the principles expressed in the nonstructural stormwater management strategies.

The official map was evaluated to determine how to incorporate nonstructural stormwater management strategies.

The development regulations were evaluated to determine how to incorporate nonstructural stormwater management strategies.

### **Chapter 4: ANIMAL CONTROL**

This chapter includes language requiring all animal waste to be properly disposed of.

### **Chapter 14: LAND SUBDIVISION**

#### **Section 14-3A: Woodland Protection**

This section encourages and regulates the preservation of natural landscaping which helps reduce impervious coverage and water quality.

#### **Section 14-7.7: Preservation of Natural Resources**

This section provides for the preservation of trees and natural watercourses, which naturally control flooding and other Stormwater management issues, as well as provide for disconnection of impervious surfaces. This section also defines buffers and screening for differing uses that enhance the separation between impervious surfaces.

### **Chapter 15: ZONING**

#### **Section 15-5.10: Off-street Parking Requirements**

This section defines the type of materials as well as the method of construction for pavements and landscaping. These specifications may be reviewed and amended to allow for the use of permeable materials to reduce impervious coverage.

#### **Section 15-14.21: Supplemental Design Standards and Management Programs**

This section defines the type of materials as well as the method of construction for all developments within the Pinelands. These specifications may be reviewed and amended to allow for the use of permeable materials to reduce impervious coverage, as well as utilizing buffer areas and other areas of natural preservation for drainage of the development.

#### Chapter 19: FLOOD DAMAGE PREVENTION

This chapter regulates construction and usage of flood plains in an effort to minimize loss of life and property and to protect the flood plain areas for their natural water quality and Stormwater management properties.

#### Chapter 29: LITTER

This chapter describes the proper disposal techniques of waste material within the Township.

#### Chapter 43: PARKS AND RECREATIONAL AREAS

This chapter provides restrictions to the disposal of material within the Township's Recreational Facilities. This reinforces and enhances the littering ordinance, which helps improve the Stormwater quality within the Township.

#### Chapter 54: SOIL REMOVAL, EXCAVATION AND MINING

This chapter provides for the remediation of mining locations to prevent undue water quality impairments during and after operations.

#### Chapter 55: SOLID WASTE COLLECTION

This chapter provides restrictions to the disposal of solid waste material within the Township. This reinforces and enhances the littering ordinance, which helps improve the Stormwater quality within the Township.

#### Chapter 61: VEHICLES, ABANDONED OR JUNKED

This chapter prohibits the disposition of the above-mentioned vehicles within the Township. These vehicles can be sources of pollution and as such, this section protects the water quality of the Township.

## LAND USE/BUILD-OUT ANALYSIS

A detailed land use analysis for the Township was conducted. Figure C-6 illustrates the existing land use in the Township based on 2015 GIS information from NJDEP. Figure C-7 illustrates the HUC14s within the Township. The Township Zoning Map is shown in Figure C-8. Figure C-9 illustrates the constrained lands within the Township. (Note: For this sample plan, every constrained land was not mapped.) The build-out calculations for impervious cover are shown in Table C-1. As expected, when developing agricultural and forest lands, the build-out of the HUC14s will result in a significant increase in impervious surfaces.

Table C-2 presents the pollutant loading coefficients by land cover. The pollutant loads at full build-out are presented in Table C-3.

It is important to note that, although the pollutant loads for agricultural lands are higher than those for low density residential for the parameters in Table C-2, converting agricultural lands to residential typically results in an increase in pollutant loads for metals and petroleum hydrocarbons. Also, total suspended solids loads due to stormwater runoff may decrease due to the conversion of agricultural lands to low density residential, but the percentage of impervious surfaces increases dramatically. If, due to the increase of impervious surfaces, increases in stormwater runoff flows are not managed properly, these high flows will increase streambank erosion, thereby increasing sediment loads to the receiving waters.

## Mitigation Plans

This Mitigation Plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards. An issuance of a waiver from these or other related mitigation requirements by the NJDEP or other agency, does not relieve the developer from the requirements imposed through municipal review. The applicant must obtain all required permits for the mitigation project prior to municipal approval.

### MITIGATION PROJECT REQUIREMENTS

All mitigation projects shall comply with the NJDEP's "Guidance for the Development of Municipal Mitigation Plans" last published in February 2006. At a minimum the mitigation project must be implemented in the same drainage area as the proposed development. The mitigation effects must be in the same category as the waiver and must benefit the same receptor water body. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

### MITIGATION PROJECT SELECTION

The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. Listed below are general projects that can be used to address the mitigation requirement, in various categories, the applicant must select a project that is in the same category in which the relief is being sought and the project.

Selection of an appropriate mitigation project for a requested waiver/exemption must adhere to the following requirements:

1. The project must be within the same area that would contribute to the receptor impacted by the project. *Note that depending on the specific performance standard waived, the sensitive receptor and/or the contributory area to that receptor may be different.* If there are no specific sensitive receptors that would be impacted as the result of the grant of the waiver/exemption, then the location of the mitigation project can be located anywhere within the municipality, and should be selected to provide the most benefit relative to an existing Stormwater problem in the same category (quality, quantity or recharge).
2. Legal authorization must be obtained to construct the project at the

location selected. This includes the maintenance and any access needs for the project in the future

3. The project should be close to the location of the original project, and if possible, be located upstream at a similar distance from the identified sensitive receptor. This distance should not be based on actual location, but *on a* similar hydraulic distance to the sensitive receptor. For example, if the project for which a waiver is obtained discharges to a tributary, but the closest location discharges to the main branch, it may be more beneficial to identify a location discharging to the same tributary.
4. For ease of administration, if sensitive receptors are addressed, it is preferable to have one location that addresses any and all of the performance standards waived, rather than one location for each performance standard. Although, multiple sites may be selected if the impact to water quality will be significantly greater. All requests for multiple sites must be approved by the Township Engineer.
5. It must be demonstrated that implementation of the mitigation project will result in no adverse impacts to other properties.
6. Mitigation projects that address stormwater runoff quantity can provide storage for proposed increases in runoff volume, as opposed to a direct peak flow reduction.
7. If the project that requests mitigation is within the Pinelands region, the proposed mitigation project must also be within the Pinelands region.

The Projects below represents the Township's initial survey of possible projects which could be used if the above requirements are met and waivers are required. This is by no means a final and/ or complete list but possible initial projects. If none of the below recommendations are appropriate, the developer is free to suggest his own project pending all necessary approvals.

#### Water Quantity

- No proposed projects, funding for a study of appropriate projects is necessary first

#### Groundwater Recharge

- No proposed projects, funding for a study of appropriate projects is necessary first

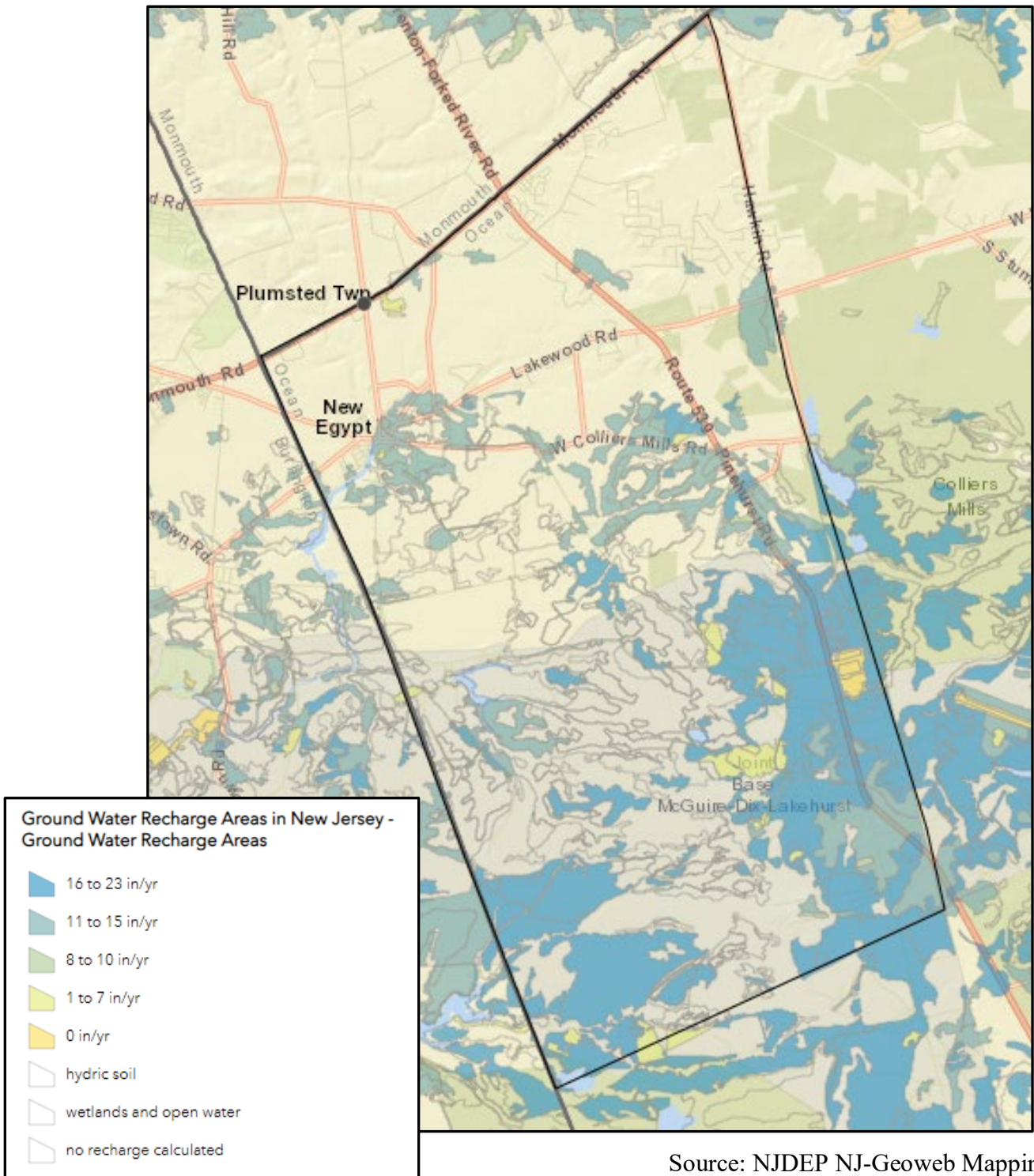
### Water Quality

- Establish vegetation areas along Oakford Lake shoreline to “minimize goose traffic”
- Provide education on goose management at the parks, ballfields, and recreation areas.

### Other Alternatives

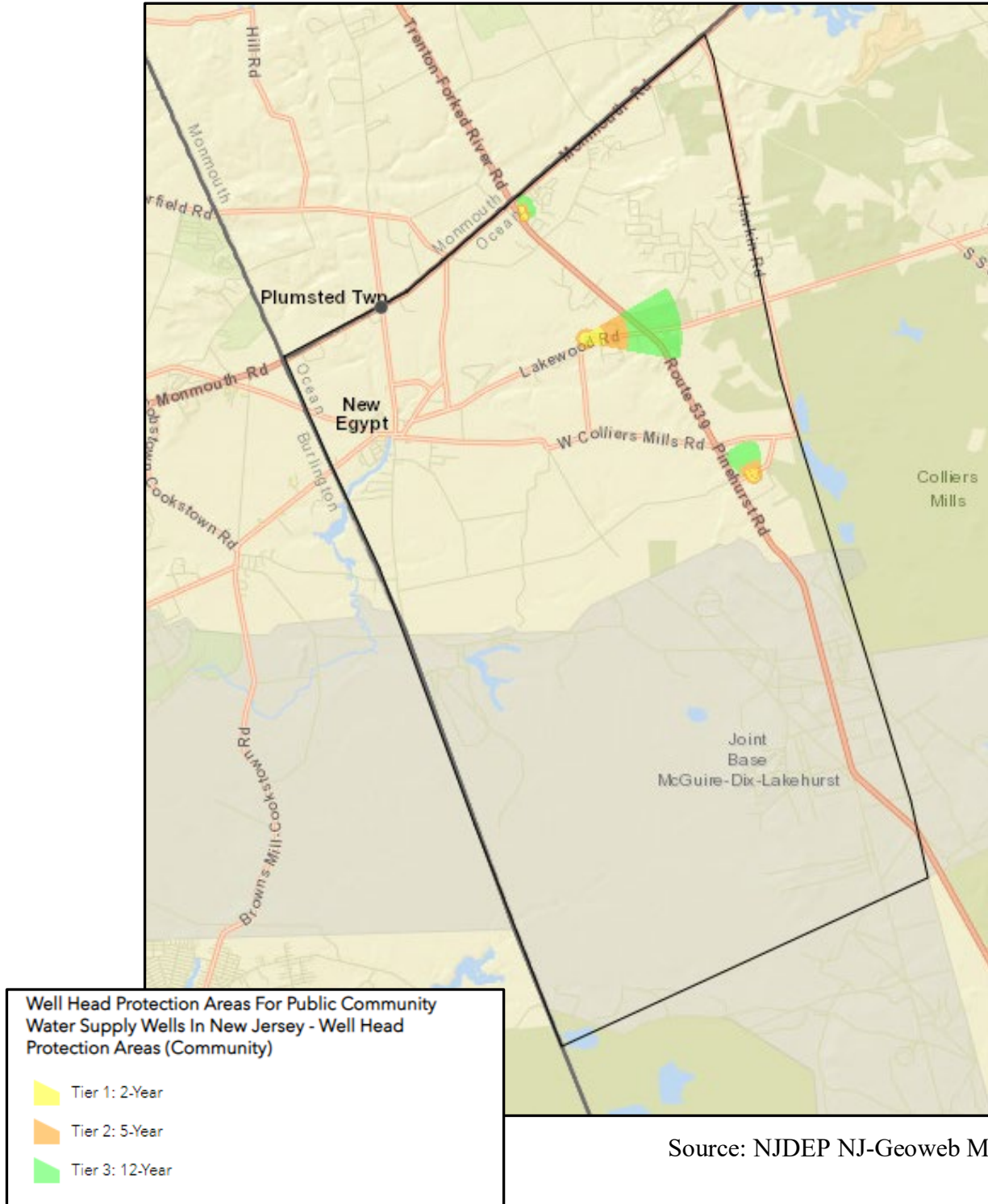
- If a suitable site cannot be located within the Township and the development will have no measurable impact to flooding, erosion, water quality degradation, etc., the Township may elect to allow the developer to contribute to a fund. From this fund the Township may conduct future analysis to identify future mitigation projects, allow for the funding of larger mitigation projects than that of the developer or undertake municipality wide projects as necessary. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure. In addition, the Township shall utilize the contribution within 5 years.
- If a suitable site cannot be located in the same drainage area as the proposed development, as discussed above, the mitigation project may provide mitigation that is not equivalent to the impacts for which the Variance or waiver is sought, but that addresses the same issue. For example, if a Variance is given because the 80 percent TSS requirement is not met, the selected project may address water quality impacts due to a fecal impairment and such addresses issues within the water quality category.

**Figure C-4: Groundwater Recharge Areas in the Township**



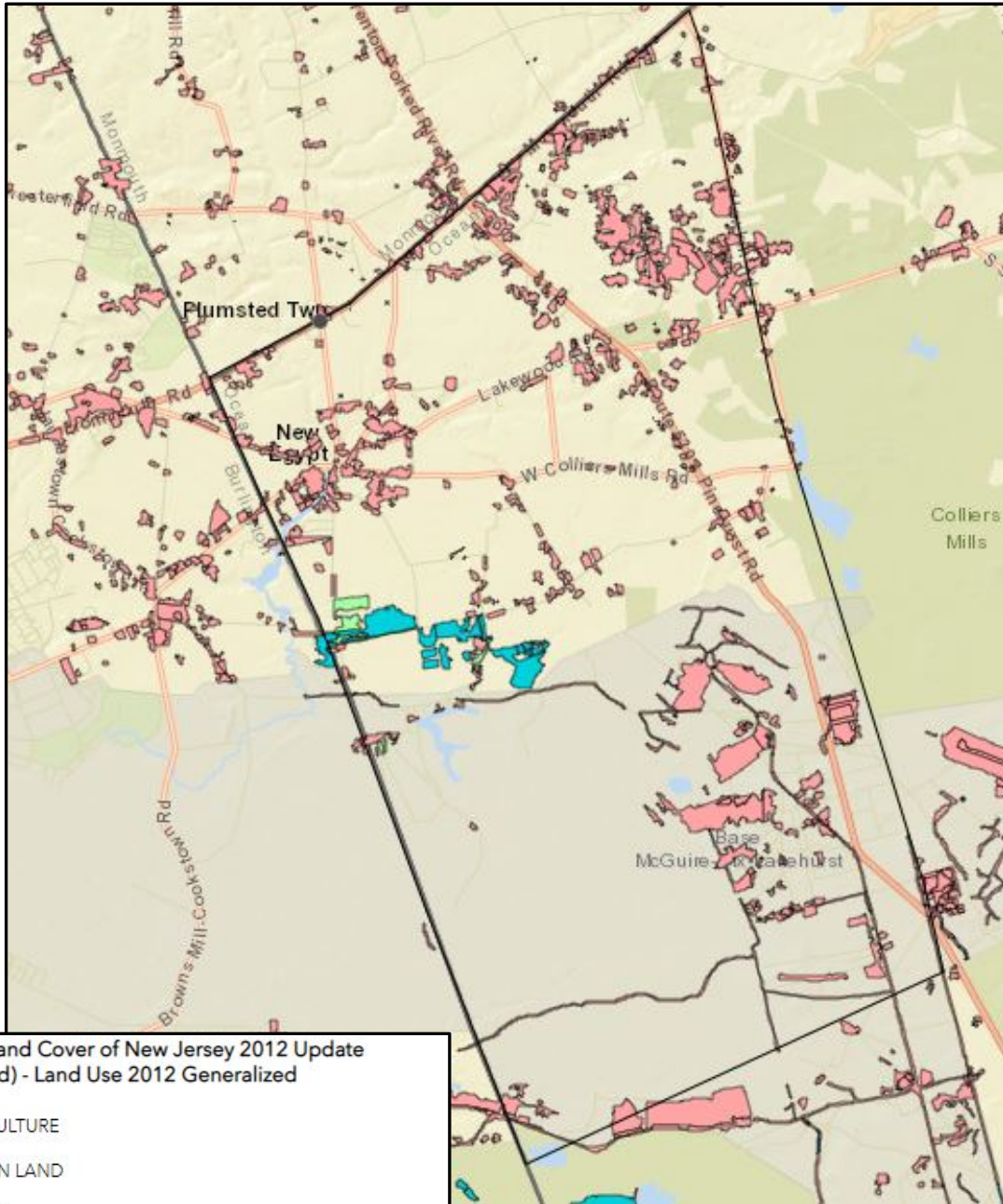
Source: NJDEP NJ-Geoweb Mapping

**Figure C-5: Wellhead Protection Areas in the Township**



Source: NJDEP NJ-Geoweb Mapping

Figure C-6: Township's Existing land Use

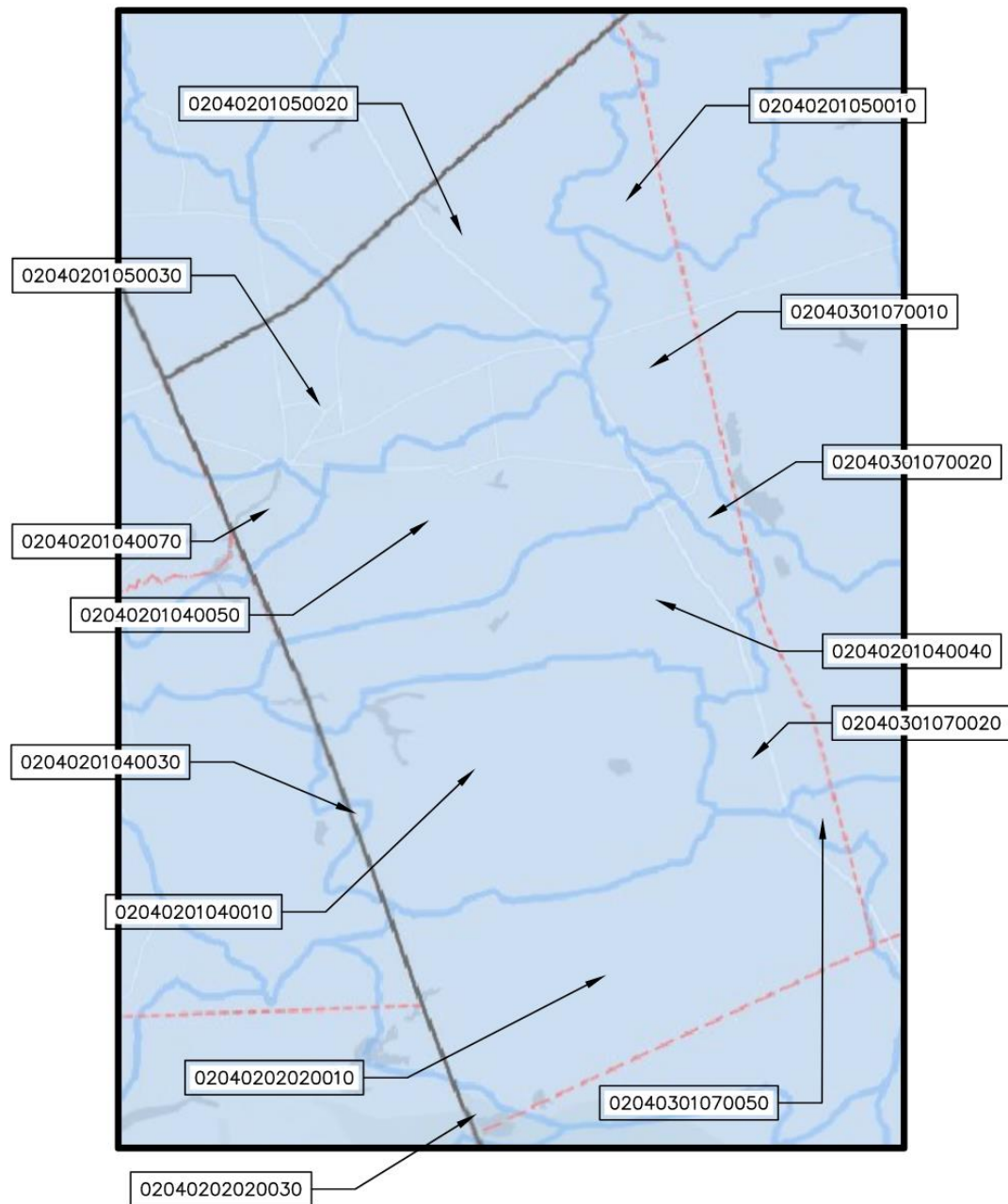


Land Use/Land Cover of New Jersey 2012 Update  
(Generalized) - Land Use 2012 Generalized

- AGRICULTURE
- BARREN LAND
- FOREST
- URBAN
- WATER
- WETLANDS

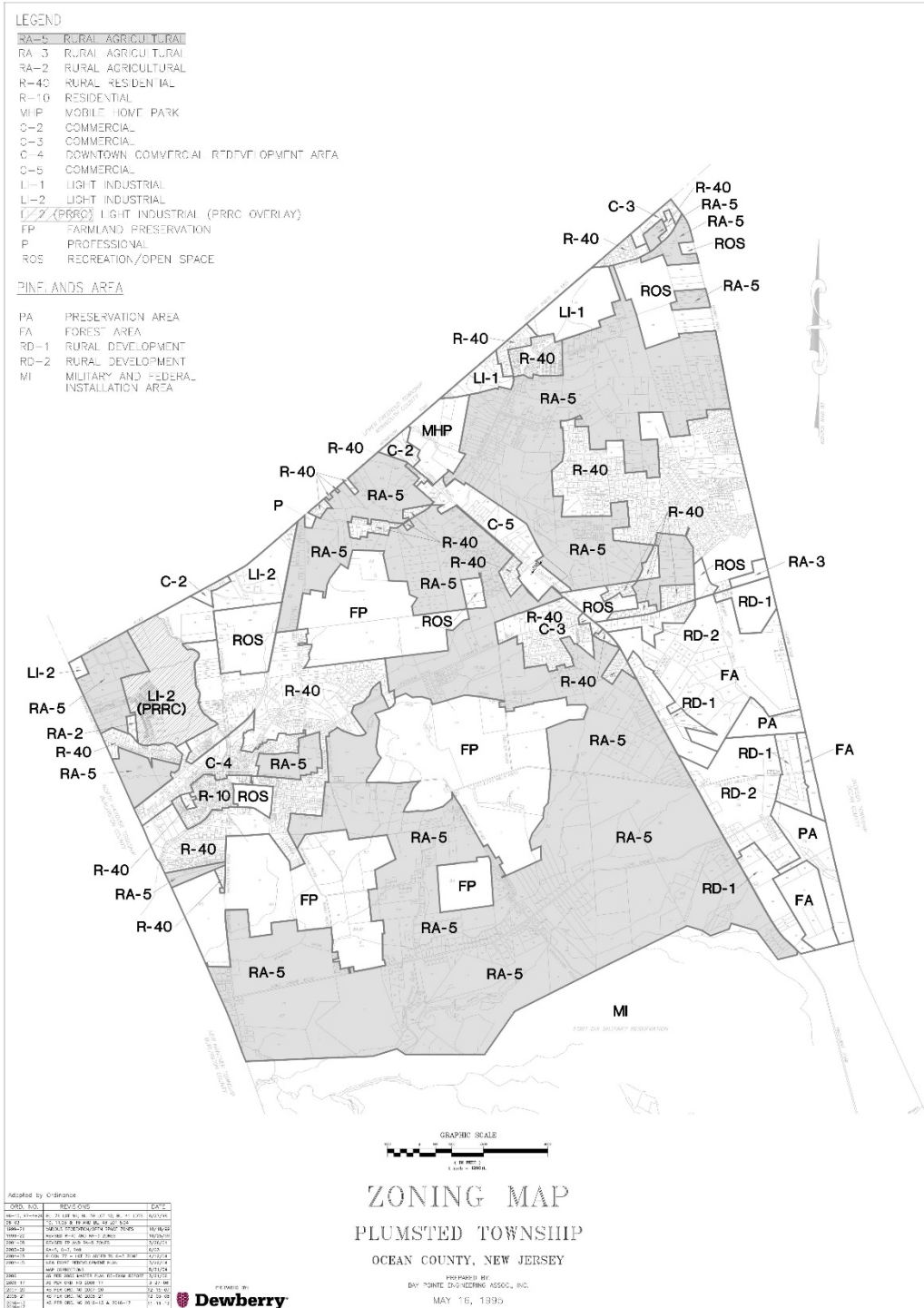
Source: NJDEP NJ-Geoweb Mapping

**Figure C-7: Hydrologic Units (HUC14s) Within the Township**

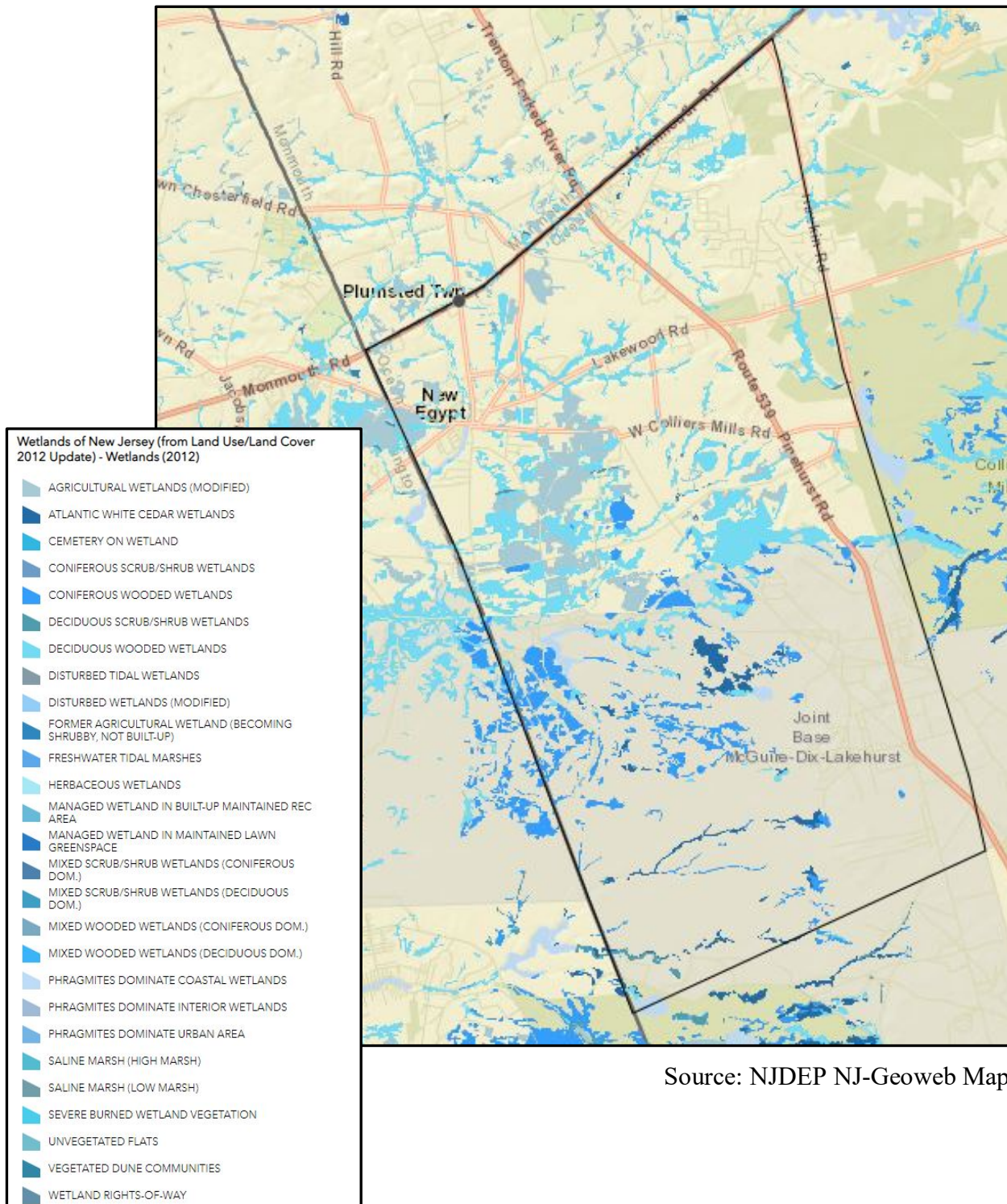


Source: NJDEP NJ-Geoweb Mapping

**Figure C-8: Zoning Districts Within the Township**



**Figure C-9: Wetlands and Water Land Uses Within the Township-Constrained Land**



Source: NJDEP NJ-Geoweb Mapping

**Figure C-10: Municipal Water Bodies with Quad Map**



**Table C-1: Sample Build-Out Calculations for Two HUC14's**

| HUC14 and Zone                               | Total Area<br>(acres) | Existing<br>Impervious<br>(acres) | Existing<br>Impervious<br>(%) | Wetlands/<br>Water<br>Area<br>(acres) | Additional<br>Preserved<br>Lands<br>(acres) | Developable<br>Area<br>(acres) | Allowable<br>Impervious<br>(%) | Build-Out<br>Impervious<br>(acres) |
|----------------------------------------------|-----------------------|-----------------------------------|-------------------------------|---------------------------------------|---------------------------------------------|--------------------------------|--------------------------------|------------------------------------|
| <b>2040201050010</b>                         |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| RA-5 (Rural Agricultural)                    | 317.2                 | 21.1                              | 6.7%                          | 16.2                                  | 0.0                                         | 279.9                          | 25%                            | 70.0                               |
| R-40 (Rural Residential)                     | 253.2                 | 44.4                              | 17.5%                         | 17.1                                  | 45.3                                        | 146.5                          | 40%                            | 58.6                               |
| ROS (Recreation/Open Space)                  | 59.4                  | 1.2                               | 2.0%                          | 0.0                                   | 0.0                                         | 58.2                           | 40%                            | 23.3                               |
| Total                                        | 629.8                 | 66.7                              | 10.6%                         | 33.3                                  | 45.3                                        | 596.5                          | 35%                            | 208.8                              |
| <b>2040201050020</b>                         |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| RA-5 (Rural Agricultural)                    | 1632.9                | 110.1                             | 6.7%                          | 445.0                                 | 131.1                                       | 946.7                          | 25%                            | 236.7                              |
| R-40 (Rural Residential)                     | 354.7                 | 134.9                             | 38.0%                         | 75.3                                  | 17.3                                        | 127.2                          | 40%                            | 50.9                               |
| ROS (Recreation/Open Space)                  | 188.8                 | 3.7                               | 2.0%                          | 5.2                                   | 0.0                                         | 179.9                          | 40%                            | 72.0                               |
| MHP (Mobile Home Park)                       | 122.8                 | 39.8                              | 32.4%                         | 9.2                                   | 0.0                                         | 73.8                           | 40%                            | 29.5                               |
| LI-1 (Light Industrial)                      | 180.0                 | 8.0                               | 4.4%                          | 58.1                                  | 0.0                                         | 113.9                          | 30%                            | 34.2                               |
| LI-2 (Light Industrial)                      | 4.9                   | 0.5                               | 11.0%                         | 0.0                                   | 0.0                                         | 4.4                            | 50%                            | 2.2                                |
| P (Professional)                             | 4.4                   | 0.4                               | 8.9%                          | 0.0                                   | 0.0                                         | 4.0                            | 40%                            | 1.6                                |
| C-2 (Commercial)                             | 26.3                  | 11.5                              | 43.7%                         | 1.8                                   | 0.0                                         | 13.0                           | 40%                            | 5.2                                |
| C-3 (Commercial)                             | 23.5                  | 2.5                               | 10.6%                         | 4.2                                   | 16.8                                        | 0.0                            | 40%                            | 0.0                                |
| C-5 (Commercial)                             | 165.1                 | 23.5                              | 14.2%                         | 11.3                                  | 0.0                                         | 130.3                          | 40%                            | 52.1                               |
| FP (Farmland Preservation)                   | 123.8                 | 3.2                               | 2.6%                          | 24.8                                  | 0.0                                         | 95.8                           | 0%                             | 0.0                                |
| Total                                        | 2827.2                | 338.1                             | 12.0%                         | 634.9                                 | 165.1                                       | 2192.3                         | 35%                            | 767.3                              |
| <b>2040201050030</b>                         |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| RA-5 (Rural Agricultural)                    | 787.1                 | 62.4                              | 7.9%                          | 137.4                                 | 80.0                                        | 507.3                          | 25%                            | 126.8                              |
| RA-2 (Rural Agricultural)                    | 6.8                   | 0.0                               | 0.3%                          | 0.0                                   | 0.0                                         | 6.8                            | 40%                            | 2.7                                |
| RD-2 (Rural Development)                     | 13.0                  | 2.8                               | 21.5%                         | 0.0                                   | 0.0                                         | 10.2                           | 40%                            | 4.1                                |
| R-10 (Residential)                           | 8.9                   | 4.5                               | 50.6%                         | 0.0                                   | 0.0                                         | 4.4                            | 40%                            | 1.8                                |
| R-40 (Rural Residential)                     | 770.1                 | 152.7                             | 19.8%                         | 117.6                                 | 166.1                                       | 333.7                          | 40%                            | 133.5                              |
| ROS (Recreation/Open Space)                  | 163.8                 | 27.1                              | 16.5%                         | 32.1                                  | 0.0                                         | 104.6                          | 40%                            | 41.8                               |
| LI-2 (Light Industrial)                      | 447.4                 | 45.7                              | 10.2%                         | 44.8                                  | 5.3                                         | 351.6                          | 50%                            | 175.8                              |
| C-2 (Commercial)                             | 12.9                  | 5.2                               | 40.3%                         | 1.4                                   | 5.8                                         | 0.5                            | 40%                            | 0.2                                |
| C-3 (Commercial)                             | 7.2                   | 5.5                               | 76.1%                         | 0.0                                   | 1.7                                         | 0.0                            | 40%                            | 0.0                                |
| C-4 (Downtown Commercial Redevelopment Area) | 121.7                 | 48.7                              | 40.0%                         | 17.3                                  | 55.7                                        | 0.0                            | 40%                            | 0.0                                |
| FP (Farmland Preservation)                   | 458.0                 | 10.5                              | 2.3%                          | 93.3                                  | 0.0                                         | 354.2                          | 0%                             | 0.0                                |
| FA (Forest Area)                             | 8.7                   | 0.8                               | 8.9%                          | 0.0                                   | 0.0                                         | 7.9                            | 0%                             | 0.0                                |
| Total                                        | 2805.6                | 365.89                            | 13.0%                         | 443.9                                 | 314.5                                       | 2361.7                         | 33%                            | 777.4                              |

Table C-1 (Continued)

| HUC14 and Zone                              | Total Area<br>(acres) | Existing<br>Impervious<br>(acres) | Existing<br>Impervious<br>(%) | Wetlands/<br>Water<br>Area<br>(acres) | Additional<br>Preserved<br>Lands<br>(acres) | Developable<br>Area<br>(acres) | Allowable<br>Impervious<br>(%) | Build-Out<br>Impervious<br>(acres) |
|---------------------------------------------|-----------------------|-----------------------------------|-------------------------------|---------------------------------------|---------------------------------------------|--------------------------------|--------------------------------|------------------------------------|
| <b>2040202020010</b>                        |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| MI (Military and Federal Installation Area) | 4986.4                | 92.0                              | 1.8%                          | 1533.3                                | N/A                                         | N/A                            | N/A                            | N/A                                |
| Total                                       | 4986.4                | 92.0                              | 1.8%                          | 1533.3                                | N/A                                         | 0.0                            | N/A                            | N/A                                |
| <b>2040202020030</b>                        |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| MI (Military and Federal Installation Area) | 161.8                 | 6.0                               | 3.7%                          | 55.3                                  | N/A                                         | N/A                            | N/A                            | N/A                                |
| Total                                       | 161.8                 | 6.0                               | 3.7%                          | 55.3                                  | N/A                                         | 0.0                            | N/A                            | N/A                                |
| <b>2040301070010</b>                        |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| RA-5 (Rural Agricultural)                   | 121.6                 | 4.1                               | 3.4%                          | 1.0                                   | 0.0                                         | 116.5                          | 25%                            | 29.1                               |
| RA-3 (Rural Agricultural)                   | 17.3                  | 2.7                               | 15.6%                         | 0.0                                   | 2.5                                         | 12.1                           | 40%                            | 4.9                                |
| RD-1 (Rural Development)                    | 169.5                 | 11.1                              | 6.5%                          | 1.4                                   | 12.2                                        | 144.8                          | 40%                            | 57.9                               |
| RD-2 (Rural Development)                    | 74.0                  | 8.0                               | 10.8%                         | 0.0                                   | 6.5                                         | 59.6                           | 40%                            | 23.8                               |
| R-40 (Rural Residential)                    | 334.1                 | 68.6                              | 20.5%                         | 8.4                                   | 14.6                                        | 242.5                          | 40%                            | 97.0                               |
| ROS (Recreation/Open Space)                 | 20.0                  | 0.4                               | 2.0%                          | 7.9                                   | 0.0                                         | 11.7                           | 40%                            | 4.7                                |
| FA (Forest Area)                            | 530.1                 | 12.0                              | 2.3%                          | 75.7                                  | 0.0                                         | 442.4                          | 0%                             | 0.0                                |
| PA (Preservation Area)                      | 70.1                  | 1.3                               | 1.9%                          | 13.4                                  | 0.0                                         | 55.4                           | 0%                             | 0.0                                |
| Total                                       | 1336.7                | 108.1                             | 8.1%                          | 107.8                                 | 35.7                                        | 1228.9                         | 28%                            | 345.6                              |
| <b>2040301070020</b>                        |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| MI (Military and Federal Installation Area) | 907.2                 | 65.6                              | 7.2%                          | 6.7                                   | N/A                                         | N/A                            | N/A                            | N/A                                |
| FA (Forest Area)                            | 12.5                  | 0.0                               | 0.2%                          | 0.0                                   | 0.0                                         | 12.5                           | 0%                             | 0.0                                |
| PA (Preservation Area)                      | 89.8                  | 1.2                               | 1.3%                          | 18.9                                  | 0.0                                         | 69.7                           | 0%                             | 0.0                                |
| RD-1 (Rural Development)                    | 36.0                  | 7.0                               | 19.4%                         | 3.5                                   | 0.0                                         | 25.5                           | 40%                            | 10.2                               |
| RD-2 (Rural Development)                    | 179.9                 | 15.6                              | 8.7%                          | 11.1                                  | 0.0                                         | 153.2                          | 40%                            | 61.3                               |
| Total                                       | 0.0                   | 89.4                              | #DIV/0!                       | 40.2                                  | 0.0                                         | -40.2                          | 20%                            | -8.0                               |
| <b>2040301070050</b>                        |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| MI (Military and Federal Installation Area) | 127.7                 | 2.2                               | 1.7%                          | 0.0                                   | N/A                                         | N/A                            | N/A                            | N/A                                |
| Total                                       | 127.7                 | 2.2                               | 1.7%                          | 0.0                                   | N/A                                         | 0.0                            | N/A                            | N/A                                |
| <b>2040201040010</b>                        |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| MI (Military and Federal Installation Area) | 4720.3                | 82.8                              | 1.8%                          | 3595.3                                | N/A                                         | N/A                            | N/A                            | N/A                                |
| Total                                       | 4720.3                | 82.8                              | 1.8%                          | 3595.3                                | N/A                                         | 0.0                            | N/A                            | N/A                                |

Table C-1 (Continued)

| HUC14 and Zone                               | Total Area<br>(acres) | Existing<br>Impervious<br>(acres) | Existing<br>Impervious<br>(%) | Wetlands/<br>Water<br>Area<br>(acres) | Additional<br>Preserved<br>Lands<br>(acres) | Developable<br>Area<br>(acres) | Allowable<br>Impervious<br>(%) | Build-Out<br>Impervious<br>(acres) |
|----------------------------------------------|-----------------------|-----------------------------------|-------------------------------|---------------------------------------|---------------------------------------------|--------------------------------|--------------------------------|------------------------------------|
| <b>2040201040040</b>                         |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| MI (Military and Federal Installation Area)  | 1236.1                | 52.7                              | 4.3%                          | 690.5                                 | N/A                                         | N/A                            | N/A                            | N/A                                |
| RA-5 (Rural Agricultural)                    | 1503.5                | 44.1                              | 2.9%                          | 961.5                                 | 489.5                                       | 8.4                            | 25%                            | 2.1                                |
| RD-1 (Rural Development)                     | 93.0                  | 8.5                               | 9.1%                          | 2.8                                   | 0.5                                         | 81.3                           | 40%                            | 32.5                               |
| RD-2 (Rural Development)                     | 45.2                  | 6.6                               | 14.5%                         | 0.0                                   | 0.0                                         | 38.6                           | 40%                            | 15.5                               |
| FA (Forest Area)                             | 93.2                  | 0.0                               | 0.0%                          | 8.4                                   | 0.0                                         | 84.8                           | 0%                             | 0.0                                |
| PA (Preservation Area)                       | 33.0                  | 0.9                               | 2.7%                          | 1.9                                   | 0.0                                         | 30.2                           | 0%                             | 0.0                                |
| Total                                        | 3004.0                | 112.8                             | 3.8%                          | 1665.1                                | 490.0                                       | 1338.9                         | 21%                            | 281.2                              |
| <b>2040201040050</b>                         |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| RA-5 (Rural Agricultural)                    | 1957.4                | 112.9                             | 5.8%                          | 413.1                                 | 258.72                                      | 1172.7                         | 25%                            | 293.2                              |
| R-40 (Rural Residential)                     | 97.3                  | 22.3                              | 22.9%                         | 8.2                                   | 15.75                                       | 51.0                           | 40%                            | 20.4                               |
| RD-1 (Rural Development)                     | 8.4                   | 7.2                               | 85.8%                         | 0.0                                   | 0.0                                         | 1.2                            | 40%                            | 0.5                                |
| RD-2 (Rural Development)                     | 30.6                  | 3.1                               | 10.0%                         | 0.0                                   | 0.0                                         | 27.5                           | 40%                            | 11.0                               |
| FP (Farmland Preservation)                   | 1227.5                | 49.7                              | 4.0%                          | 481.3                                 | 0.0                                         | 696.5                          | 0%                             | 0.0                                |
| Total                                        | 3321.2                | 195.2                             | 5.9%                          | 902.6                                 | 274.47                                      | 2418.6                         | 29%                            | 701.4                              |
| <b>2040201040070</b>                         |                       |                                   |                               |                                       |                                             |                                |                                |                                    |
| RA-5 (Rural Agricultural)                    | 28.7                  | 1.9                               | 6.5%                          | 16.3                                  | 0.0                                         | 10.5                           | 25%                            | 2.6                                |
| R-10 (Residential)                           | 60.6                  | 18.9                              | 31.2%                         | 41.7                                  | 0.0                                         | 0.0                            | 40%                            | 0.0                                |
| R-40 (Rural Residential)                     | 187.7                 | 31.3                              | 16.7%                         | 60.5                                  | 15.8                                        | 80.2                           | 40%                            | 32.1                               |
| ROS (Recreation/Open Space)                  | 17.40                 | 4.1                               | 23.5%                         | 0.0                                   | 0.0                                         | 13.3                           | 40%                            | 5.3                                |
| C-4 (Downtown Commercial Redevelopment Area) | 32.80                 | 8.6                               | 26.1%                         | 3.5                                   | 0.0                                         | 20.7                           | 40%                            | 8.3                                |
| FP (Farmland Preservation)                   | 69.70                 | 3.7                               | 5.3%                          | 17.0                                  | 0.0                                         | 49.0                           | 0%                             | 0.0                                |
| Total                                        | 396.9                 | 68.4                              | 17.2%                         | 139.0                                 | 15.8                                        | 257.9                          | 31%                            | 79.5                               |

**Table C-2: Pollutant Loads by Land Cover**

| <b>Land Cover</b>                | <b>Total Phosphorus Load<br/>(lbs/acre/year)</b> | <b>Total Nitrogen Load<br/>(lbs/acre/year)</b> | <b>Total Suspended Solids Load (lbs/acre/year)</b> |
|----------------------------------|--------------------------------------------------|------------------------------------------------|----------------------------------------------------|
| High, Medium Density Residential | 1.4                                              | 15                                             | 140                                                |
| Low Density, Rural Residential   | 0.6                                              | 5                                              | 100                                                |
| Commercial                       | 2.1                                              | 22                                             | 200                                                |
| Industrial                       | 1.5                                              | 12                                             | 200                                                |
| Urban, Mixed Urban, Other Urban  | 1                                                | 10                                             | 120                                                |
| Agricultural                     | 1.3                                              | 10                                             | 300                                                |
| Forest, Water, Wetlands          | 0.1                                              | 3                                              | 40                                                 |
| Barren Land / Transitional Area  | 0.5                                              | 5                                              | 60                                                 |

**Table C-3: Nonpoint Source Loads at Build-Out for Two Example HUC14's**

| HUC14 and Zone                               | Build-Out Zoning                 | Developable Area (acres) | TP (lbs/acre/year) | TP (lbs/year) | TN (lbs/acre/year) | TN (lbs/year)  | TSS (lbs/acre/year) | TSS (lbs/year)  |
|----------------------------------------------|----------------------------------|--------------------------|--------------------|---------------|--------------------|----------------|---------------------|-----------------|
| <b>2040201050010</b>                         |                                  |                          |                    |               |                    |                |                     |                 |
| RA-5 (Rural Agricultural)                    | Agricultural                     | 279.9                    | 1.3                | 363.9         | 10                 | 2799.0         | 300                 | 83970.0         |
| R-40 (Rural Residential)                     | Low Density, Rural Residential   | 146.5                    | 0.6                | 87.9          | 5                  | 439.4          | 100                 | 43935.0         |
| ROS (Recreation/Open Space)                  | Barren Land/Transitional Area    | 58.2                     | 0.5                | 29.1          | 5                  | 145.5          | 60                  | 8730.0          |
| <b>Total</b>                                 |                                  | <b>596.5</b>             |                    | <b>480.8</b>  |                    | <b>3383.9</b>  |                     | <b>136635.0</b> |
| <b>2040201050020</b>                         |                                  |                          |                    |               |                    |                |                     |                 |
| RA-5 (Rural Agricultural)                    | Agricultural                     | 946.7                    | 1.3                | 1230.8        | 10                 | 9467.4         | 300                 | 284022.0        |
| R-40 (Rural Residential)                     | Low Density, Rural Residential   | 127.2                    | 0.6                | 76.3          | 5                  | 636.1          | 100                 | 12722.0         |
| ROS (Recreation/Open Space)                  | Barren Land/Transitional Area    | 179.9                    | 0.5                | 90.0          | 5                  | 899.5          | 60                  | 10794.0         |
| MHP (Mobile Home Park)                       | Low Density, Rural Residential   | 73.8                     | 0.6                | 44.3          | 5                  | 369.0          | 100                 | 7380.0          |
| LI-1 (Light Industrial)                      | Industrial                       | 113.9                    | 1.5                | 170.9         | 12                 | 1366.8         | 200                 | 22780.0         |
| LI-2 (Light Industrial)                      | Industrial                       | 4.4                      | 1.5                | 6.5           | 12                 | 52.3           | 200                 | 872.0           |
| P (Professional)                             | Commercial                       | 4.0                      | 2.1                | 8.4           | 22                 | 88.2           | 200                 | 802.0           |
| C-2 (Commercial)                             | Commercial                       | 13.0                     | 2.1                | 27.3          | 22                 | 286.0          | 200                 | 2600.0          |
| C-3 (Commercial)                             | Commercial                       | 0.0                      | 2.1                | 0.0           | 22                 | 0.0            | 200                 | 0.0             |
| C-5 (Commercial)                             | Commercial                       | 130.3                    | 2.1                | 273.6         | 22                 | 2666.6         | 200                 | 26660.0         |
| FP (Farmland Preservation)                   | Agricultural                     | 95.8                     | 1.3                | 124.5         | 10                 | 958.0          | 300                 | 28740.0         |
| <b>Total</b>                                 |                                  | <b>2192.3</b>            |                    | <b>2052.6</b> |                    | <b>16989.9</b> |                     | <b>396772.0</b> |
| <b>2040201050030</b>                         |                                  |                          |                    |               |                    |                |                     |                 |
| RA-5 (Rural Agricultural)                    | Agricultural                     | 507.3                    | 1.3                | 659.5         | 10                 | 5073.4         | 300                 | 152202.0        |
| RA-2 (Rural Agricultural)                    | Agricultural                     | 6.8                      | 1.3                | 8.8           | 10                 | 67.8           | 300                 | 2034.0          |
| RD-2 (Rural Development)                     | Low Density, Rural Residential   | 10.2                     | 0.6                | 6.1           | 5                  | 51.0           | 100                 | 1020.0          |
| R-10 (Residential)                           | High, Medium Density Residential | 4.4                      | 1.4                | 6.2           | 15                 | 66.0           | 140                 | 616.0           |
| R-40 (Rural Residential)                     | Low Density, Rural Residential   | 333.7                    | 0.6                | 200.2         | 5                  | 1668.4         | 100                 | 33368.0         |
| ROS (Recreation/Open Space)                  | Barren Land/Transitional Area    | 104.6                    | 0.5                | 52.3          | 5                  | 523.0          | 60                  | 6276.0          |
| LI-2 (Light Industrial)                      | Industrial                       | 351.6                    | 1.5                | 527.4         | 12                 | 4219.6         | 200                 | 70326.0         |
| C-2 (Commercial)                             | Commercial                       | 0.5                      | 2.1                | 1.1           | 22                 | 11.7           | 200                 | 106.0           |
| C-3 (Commercial)                             | Commercial                       | 0.0                      | 2.1                | 0.1           | 22                 | 0.7            | 200                 | 6.0             |
| C-4 (Downtown Commercial Redevelopment Area) | Commercial                       | 0.0                      | 2.1                | 0.0           | 22                 | 0.0            | 200                 | 0.0             |
| FP (Farmland Preservation)                   | Agricultural                     | 354.2                    | 1.3                | 460.5         | 10                 | 3542.0         | 300                 | 106260.0        |
| FA (Forest Area)                             | Forest, Water, Wetlands          | 7.9                      | 0.1                | 0.8           | 3                  | 23.8           | 40                  | 317.2           |
| <b>Total</b>                                 |                                  | <b>2361.7</b>            |                    | <b>1923.0</b> |                    | <b>15247.3</b> |                     | <b>372531.2</b> |

Table C-3 (Continued)

| HUC14 and Zone                              | Build-Out Zoning               | Developable Area (acres) | TP (lbs/acre/year) | TP (lbs/year) | TN (lbs/acre/year) | TN (lbs/year) | TSS (lbs/acre/year) | TSS (lbs/year) |
|---------------------------------------------|--------------------------------|--------------------------|--------------------|---------------|--------------------|---------------|---------------------|----------------|
| <b>2040202020010</b>                        |                                |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area) | -                              | N/A                      |                    |               |                    |               |                     |                |
| Total                                       |                                | N/A                      |                    |               |                    |               |                     |                |
| <b>2040202020030</b>                        |                                |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area) | -                              | N/A                      |                    |               |                    |               |                     |                |
| Total                                       |                                | N/A                      |                    |               |                    |               |                     |                |
| <b>2040301070010</b>                        |                                |                          |                    |               |                    |               |                     |                |
| BA-5 (Rural Agricultural)                   | Agricultural                   | 116.5                    | 1.3                | 151.5         | 10                 | 1165.1        | 300                 | 34953.0        |
| BA-3 (Rural Agricultural)                   | Agricultural                   | 12.1                     | 1.3                | 15.8          | 10                 | 121.4         | 300                 | 3642.0         |
| RD-1 (Rural Development)                    | Low Density, Rural Residential | 144.8                    | 0.6                | 86.9          | 5                  | 724.1         | 100                 | 14482.0        |
| RD-2 (Rural Development)                    | Low Density, Rural Residential | 59.6                     | 0.6                | 35.7          | 5                  | 297.9         | 100                 | 5958.0         |
| R-40 (Rural Residential)                    | Low Density, Rural Residential | 242.5                    | 0.6                | 145.5         | 5                  | 1212.6        | 100                 | 24252.0        |
| ROS (Recreation/Open Space)                 | Barren Land/Transitional Area  | 11.7                     | 0.5                | 5.9           | 5                  | 58.6          | 60                  | 702.6          |
| FA (Forest Area)                            | Forest, Water, Wetlands        | 442.4                    | 0.1                | 44.2          | 3                  | 1327.2        | 40                  | 17696.0        |
| PA (Preservation Area)                      | Forest, Water, Wetlands        | 55.4                     | 0.1                | 5.5           | 3                  | 166.2         | 40                  | 2215.6         |
| Total                                       |                                | 1228.9                   |                    | 491.0         |                    | 5073.0        |                     | 103901.2       |
| <b>2040301070020</b>                        |                                |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area) | -                              | N/A                      |                    |               |                    |               |                     |                |
| FA (Forest Area)                            | Forest, Water, Wetlands        | 12.5                     | 0.1                | 1.2           | 3                  | 37.4          | 40                  | 498.8          |
| PA (Preservation Area)                      | Forest, Water, Wetlands        | 69.7                     | 0.1                | 7.0           | 3                  | 209.2         | 40                  | 2789.2         |
| RD-1 (Rural Development)                    | Low Density, Rural Residential | 25.5                     | 0.6                | 15.3          | 5                  | 127.7         | 100                 | 2553.0         |
| RD-2 (Rural Development)                    | Low Density, Rural Residential | 153.2                    | 0.6                | 91.9          | 5                  | 765.8         | 100                 | 15316.0        |
| Total                                       |                                | 1185.2                   |                    | 115.4         |                    | 1140.1        |                     | 21157.0        |
| <b>2040301070050</b>                        |                                |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area) | -                              | N/A                      |                    |               |                    |               |                     |                |
| Total                                       |                                | N/A                      |                    |               |                    |               |                     |                |
| <b>2040201040010</b>                        |                                |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area) | -                              | N/A                      |                    |               |                    |               |                     |                |
| Total                                       |                                | N/A                      |                    |               |                    |               |                     |                |
| <b>2040201040030</b>                        |                                |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area) | -                              | N/A                      |                    |               |                    |               |                     |                |
| Total                                       |                                | N/A                      |                    |               |                    |               |                     |                |

Table C-3 (Continued)

| HUC14 and Zone                               | Build-Out Zoning                 | Developable Area (acres) | TP (lbs/acre/year) | TP (lbs/year) | TN (lbs/acre/year) | TN (lbs/year) | TSS (lbs/acre/year) | TSS (lbs/year) |
|----------------------------------------------|----------------------------------|--------------------------|--------------------|---------------|--------------------|---------------|---------------------|----------------|
| <b>2040201040040</b>                         |                                  |                          |                    |               |                    |               |                     |                |
| MI (Military and Federal Installation Area)  | -                                | N/A                      |                    |               |                    |               |                     |                |
| RA-5 (Rural Agricultural)                    | Agricultural                     | 8.4                      | 1.3                | 10.9          | 10                 | 83.9          | 300                 | 2517.0         |
| RD-1 (Rural Development)                     | Low Density, Rural Residential   | 81.3                     | 0.6                | 48.8          | 5                  | 406.3         | 100                 | 8126.0         |
| RD-2 (Rural Development)                     | Low Density, Rural Residential   | 38.6                     | 0.6                | 23.2          | 5                  | 193.2         | 100                 | 3864.0         |
| FA (Forest Area)                             | Forest, Water, Wetlands          | 84.8                     | 0.1                | 8.5           | 3                  | 254.4         | 40                  | 3391.7         |
| PA (Preservation Area)                       | Forest, Water, Wetlands          | 30.2                     | 0.1                | 3.0           | 3                  | 90.7          | 40                  | 1208.9         |
| Total                                        |                                  | 1338.9                   |                    | 94.3          |                    | 1028.4        |                     | 19107.6        |
| <b>2040201040050</b>                         |                                  |                          |                    |               |                    |               |                     |                |
| RA-5 (Rural Agricultural)                    | Agricultural                     | 1172.7                   | 1.3                | 1524.5        | 10                 | 11727.2       | 300                 | 351816.0       |
| R-40 (Rural Residential)                     | Low Density, Rural Residential   | 51.0                     | 0.6                | 30.6          | 5                  | 255.1         | 100                 | 5102.0         |
| RD-1 (Rural Development)                     | Low Density, Rural Residential   | 1.2                      | 0.6                | 0.7           | 5                  | 6.0           | 100                 | 119.0          |
| RD-2 (Rural Development)                     | Low Density, Rural Residential   | 27.5                     | 0.6                | 16.5          | 5                  | 137.7         | 100                 | 2754.6         |
| FP (Farmland Preservation)                   | Agricultural                     | 696.5                    | 1.3                | 905.4         | 10                 | 8964.9        | 300                 | 208947.0       |
| Total                                        |                                  | 2418.6                   |                    | 2477.8        |                    | 19090.9       |                     | 568738.6       |
| <b>2040201040070</b>                         |                                  |                          |                    |               |                    |               |                     |                |
| RA-5 (Rural Agricultural)                    | Agricultural                     | 10.5                     | 1.3                | 13.7          | 10                 | 105.5         | 300                 | 3163.8         |
| R-10 (Residential)                           | High, Medium Density Residential | 0.0                      | 1.4                | 0.0           | 15                 | 0.0           | 140                 | 0.0            |
| R-40 (Rural Residential)                     | Low Density, Rural Residential   | 80.2                     | 0.6                | 48.1          | 5                  | 400.8         | 100                 | 8016.0         |
| ROS (Recreation/Open Space)                  | Barren Land/Transitional Area    | 13.3                     | 0.5                | 6.7           | 5                  | 66.6          | 60                  | 799.1          |
| C-4 (Downtown Commercial Redevelopment Area) | Commercial                       | 20.7                     | 2.1                | 43.5          | 22                 | 456.1         | 200                 | 4146.0         |
| FP (Farmland Preservation)                   | Agricultural                     | 49.0                     | 1.3                | 63.7          | 10                 | 489.9         | 300                 | 14695.5        |
| Total                                        |                                  | 257.9                    |                    | 175.7         |                    | 1518.8        |                     | 30820.4        |