# WESTAMPTON TOWNSHIP

# MUNICIPAL STORMWATER MANAGEMENT PLAN

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# WESTAMPTON TOWNSHIP
# Municipal Stormwater Management Plan

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# Municipal Stormwater Management Plan

## Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Westampton Township to address Stormwater-related impacts as required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations.

The plan addresses groundwater recharge, stormwater quantity, and Stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one, or more, acre of land. The intent of these standards is to minimize the adverse impact of stormwater runoff on water quality and quantity, and on the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan includes long-term operation and maintenance measures for existing and future stormwater facilities.

The model stormwater control ordinance has been adopted by the Township. A review of existing ordinances has determined that only Section 215-19.A.(15) of the Ordinance is inconsistent with the Regulations and shall be deleted from the Ordinance.

The plan is intended to be consistent with the Rancocas Creek Watershed Management Plan and anticipates future revisions that may be necessary to comply with the TMDL for total phosphorus that is under development in the Rancocas Creek.

## Goals

The goals of the 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 nonpoint 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 domestic, municipal, recreational, industrial, and other uses of water; and
- Protect public safety through the proper design and operation of stormwater basins.

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. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

## Stormwater Discussion

Land development can dramatically alter the hydrologic cycle 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, as shown in Figure F-1. 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, erosions sedimentation can destroy habitat from which some species cannot adapt.

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. 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.

# GROUNDWATER RECHARGE IN THE HYDROLOGIC CYCLE

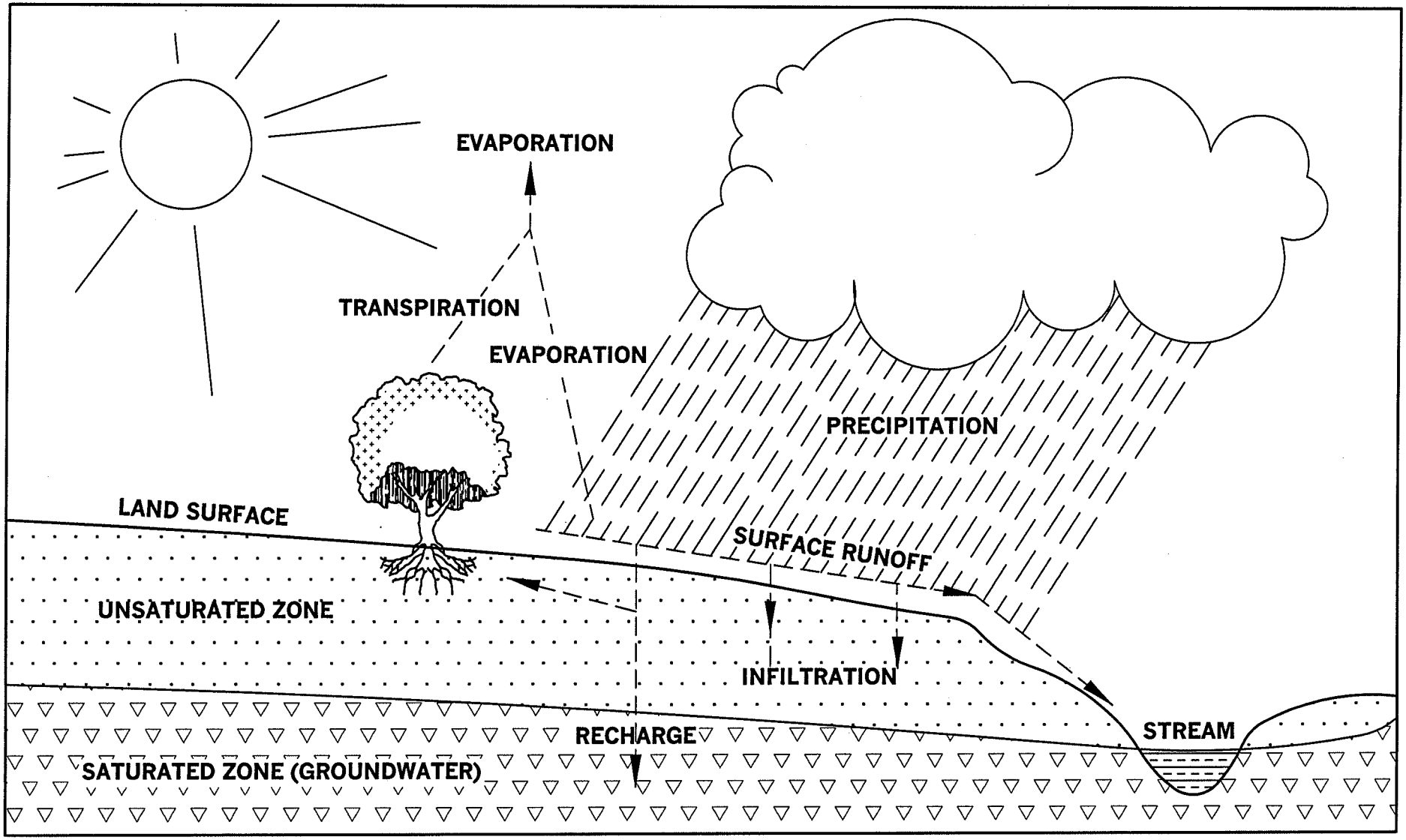


Figure F-1

## Background

The Township encompasses approximately 10.5 square miles of Burlington County bordered primarily on the South by the Rancocas Creek. The westerly portion of the Township is bordered on the north by Mill Creek, and the northwesterly sector bordering Mount Holly, Eastampton and Springfield Townships drains northwardly into Springfield Township and ultimately to the Assiscunk Creek. Waterways in the Township are illustrated in Figure F-2, and Figure F-3, which shows major streams, watershed areas and ridgelines. Figure F-4 depicts the Township boundary on the USGS quadrangle mapping.

The New Jersey Department of Environmental Protection 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 macroinvertibrates 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. The two major waterways that border the Township are the Rancocas Creek on the south and Mill Creek on the north. No AMNET Biomonitoring sites are located within the Township's jurisdiction. However, data collected from a monitoring site on the opposite side of Rancocas Creek near the Turnpike Bridge classified the creek as being moderately impaired.

The Township has experienced significant residential development in recent years, with the population increasing from approximately 3,400 in 1980 to approximately 7,200 in 2000. Industrial and commercial development has also occurred in dramatic fashion. The Highland Drive, Rancocas Park and Rancocas Park East industrial subdivisions alone have accounted for over 250 acres of completed industrial development to date.

During this time of growth, stormwater management consistent with good engineering practice has been incorporated into the various developments with increased emphasis, in more recent years, on the need for retention and recharge, particularly in areas where downstream increases in the volume of water would have been problematic. The potential adverse impacts of stormwater runoff as a result of development have, therefore, been mitigated as a result of cooperation and agreement of developers and their engineers during the review process. Since such cooperation cannot always be assured, it is important to implement a stormwater management plan and associated stormwater control ordinances consistent with the requirement of N.J.A.C. 7:14-25 to assure the proper regulation of future development.

# WESTAMPTON TOWNSHIP
# WATERWAYS

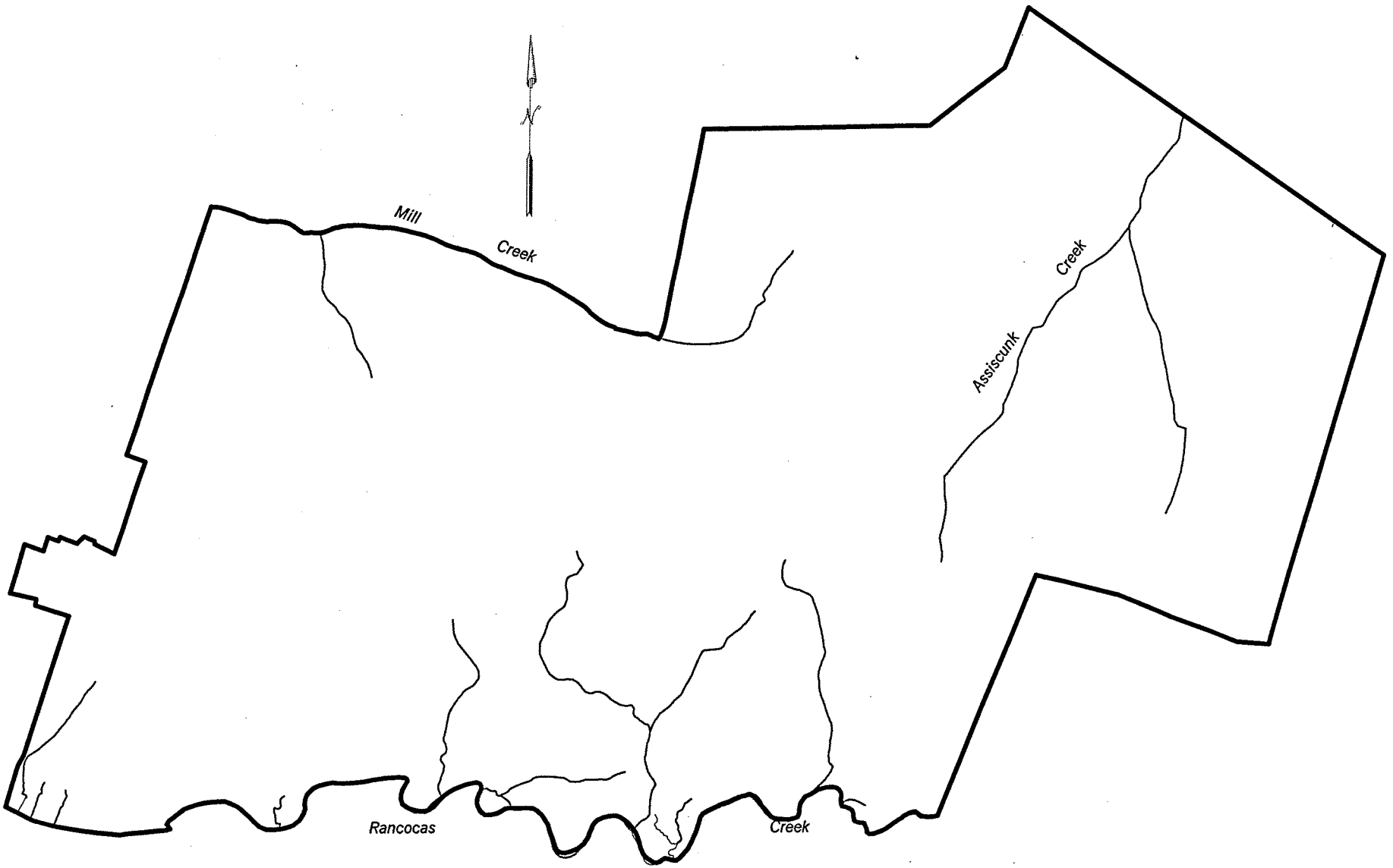


Figure F-2

# WESTAMPTON TOWNSHIP
# HYDROLOGIC UNITS (HUC 14s) WITHIN THE TOWNSHIP

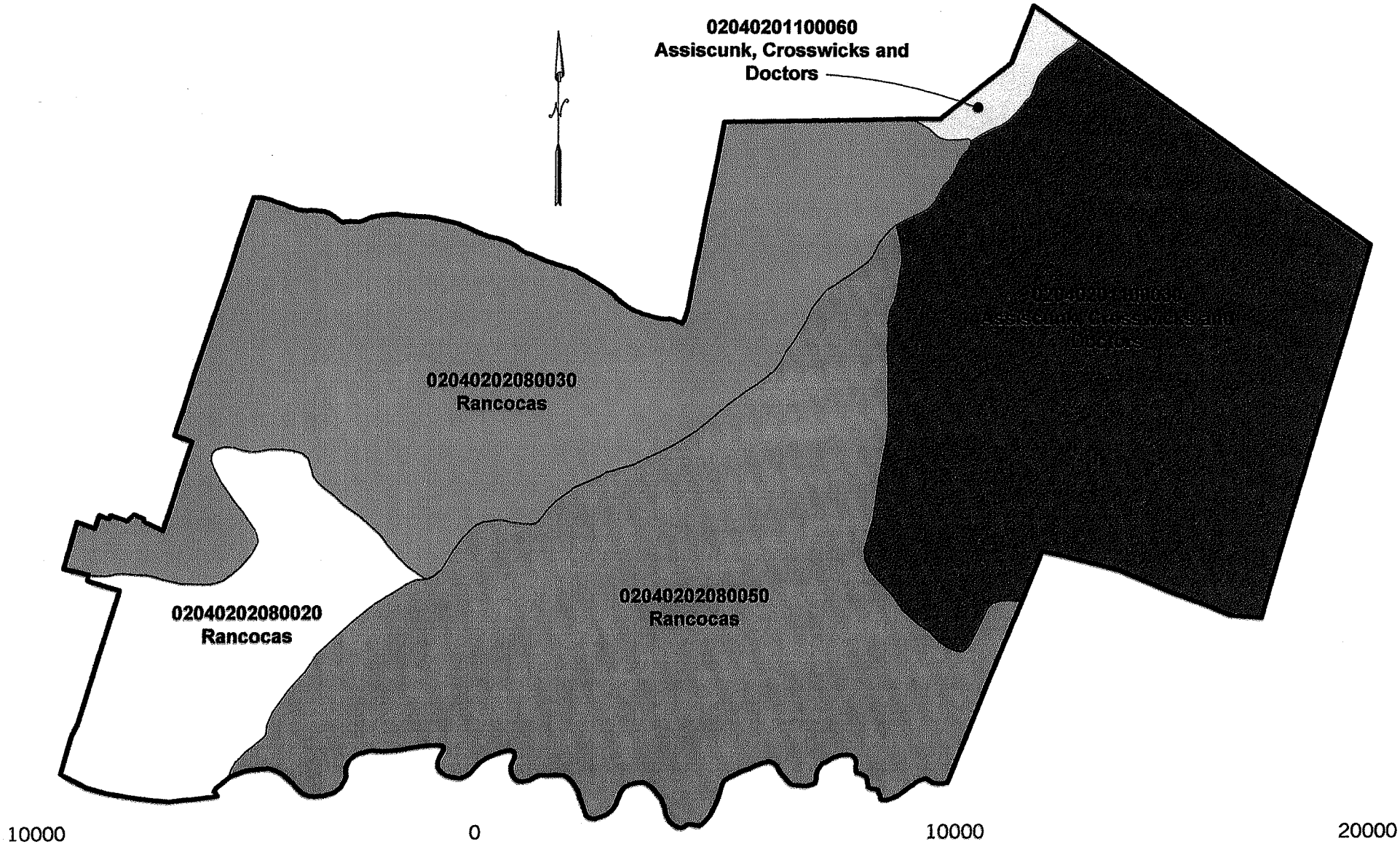


Figure F-3

# WESTAMPTON TOWNSHIP
# ON USGS QUADRANGLE MAPS

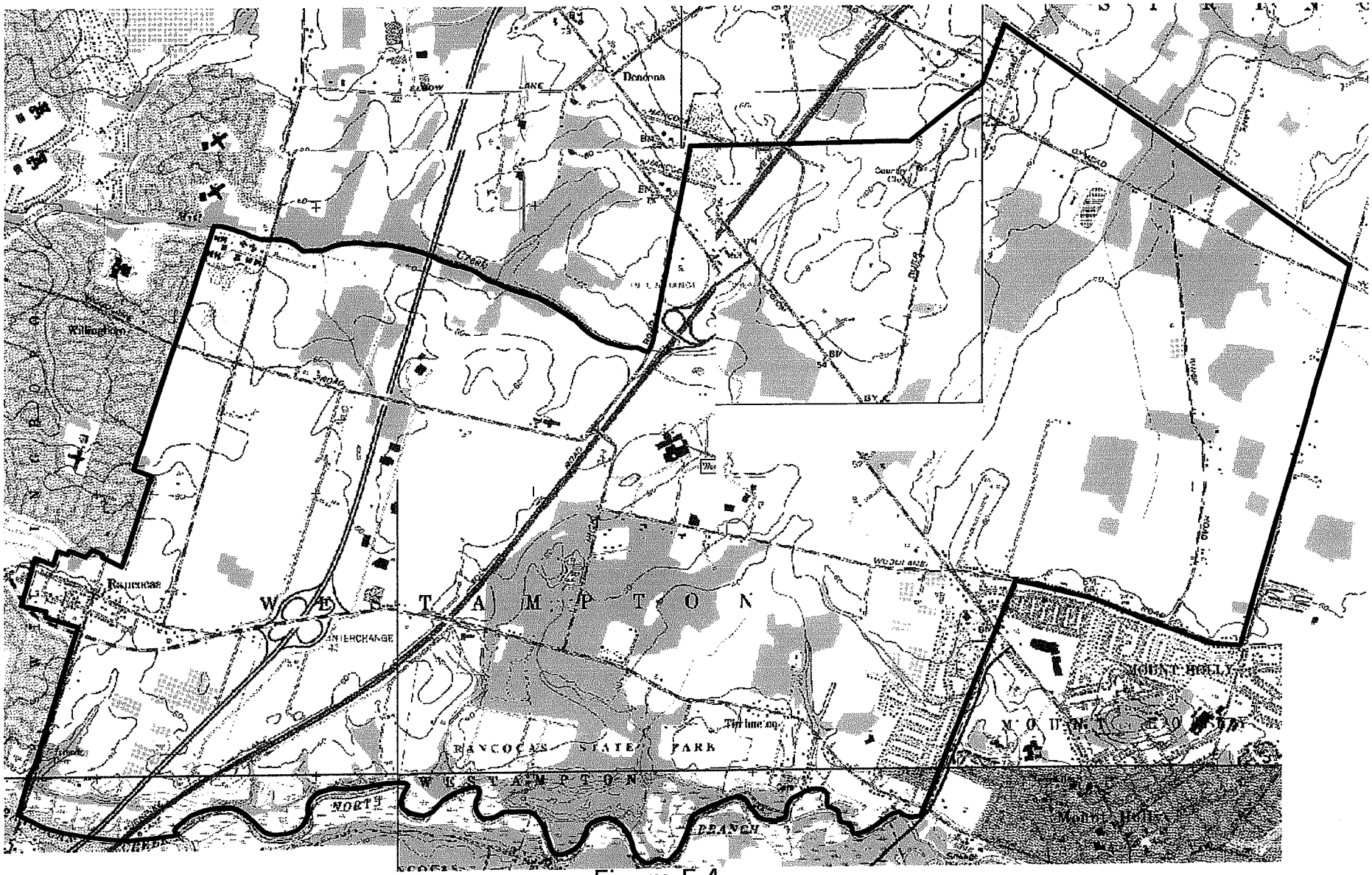


Figure F-4

ESRI ArcExplorer 2.0

# Westampton Primary Groundwater Recharge Map


Friday, Sep 8 2006

Figure F-5

## Design and Performance Standards

The Township will adopt 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. 4:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. The ordinances will be submitted to the County for review and approval within [24 months of the effective date of the Stormwater Management Rules.]

There is one section of the existing ordinances that may be contrary to NJAC 7:8-5 regulations, that is, Section 215-19.A.(15), which refers to drainage and drainage improvements using structural devices. The Township intends to delete this ordinance to avoid any confusion with future applicants for land development.

During construction, Township inspectors will observe the construction of each project to ensure that the stormwater management measures are constructed and function as designed.

## Plan Consistency

At this time, the Township is not within a Regional Stormwater Management Planning Area and no Total Maximum Daily Load of wasteload allocations (TMDLs) have been developed thus far for waters within the Township. However, a TMDL is currently under development for phosphorous in the Rancocas Creek. Should this TMDL be adopted, the Township may need to revise the MSWMP to include any specific ordinances or measures in order to comply with such a TMDL. Additionally, if any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) under 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 local Soil Conservation District.

## Nonstructural Stormwater Management Strategies

As defined by the N.J.D.E.P. Stormwater Design Regulations [N.J.A.C.-5.3(b)], nonstructural stormwater strategies for the design of new developments or redevelopment include the following objectives:

1) To protect areas which provide water quality benefits, or areas particularly susceptible to erosion or sediment loss.

2) To minimize impervious surfaces and to break up or disconnect the flow of runoff over impervious surfaces.

3) To maximize protection of natural drainage features and vegetation.

4) To minimize the decrease in the "time of concentration" from preconstruction conditions to post-construction conditions.

5) To minimize the land disturbance required for clearing and grading and other construction activities.

6) To minimize soil compaction.

7) To provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides.

8) To provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas.

9) To provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff. Such source controls include, but are not limited to:

    i) Site design features that help to prevent accumulation of trash and debris in drainage systems;

    ii) Site design features that help to prevent discharge of trash and debris from drainage systems;

    iii) Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants and industrial or commercial developments; and

iv) When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.

The Township shall adopt a Stormwater Control Ordinance based upon the N.J.D.E.P. Model Ordinance which shall include provisions for incorporating the foregoing nonstructural stormwater objections into the design of future developments. Selection of management strategies for each given situation shall be the most appropriate as reviewed and approved by the Township Engineer.

## Land Use/ Build-Out Analysis

In accordance with requirements a detailed land use/build-out analysis has been prepared based upon the information illustrated in Figure F-3 (Page 7), Figure F-6 (Page 17), Figure F-7 (Page 18), and Figure F-8 (Page 19).

The build-out calculations are summarized in the tables below. It should be noted that the HUC14 designated, "020240202080020" and adjacent "020240202080030" are incorrectly shown on the mappings provided by the NJDEP. The areas used in the calculations for these HUC14s reflect actual conditions based upon geodetic mapping and available topographical surveys.

In accordance with our current zoning, we see no particular areas of concern with regard to future high loads in any specific area. However, should a TMDL be approved with regard to any watersheds within the Township, and should that TMDL indicate the necessity of mitigating potential sources of pollution within the Township, the Township will revise and update its ordinances and regulations appropriately in order to be consistent.

**TABLE T-1**
**HUC 14 BUILD-OUT CALCULATIONS**

| HUC14 & ZONING | TOTAL AREA | CONSTRAINED LANDS AREA | DEVELOPABLE AREA | ALLOWABLE IMPERVIOUS | BUILD-OUT IMPERVIOUS |
|---|---|---|---|---|---|
| **02040202040050 (Rancocas)** | | | | | |
| Low Density Residential | 1,669 Ac. | 807 Ac. | 862 Ac. | 25% | 215.50 Ac. |
| Low/Med. Residential | 183 | 86 | 97 | 30% | 29.10 |
| Office Research | 124 | 23 | 101 | 55% | 55.55 |
| Commercial | 101 | 24 | 77 | 60% | 46.20 |
| Industrial | 416 | 0 | 416 | 80% | 332.80 |
| **TOTALS** | **2,493 Ac.** | **940 Ac.** | **1,553 Ac.** | **44%** | **679.15 Ac.** |
| **02040202080020 (Rancocas)** | | | | | |
| Low Density Residential | 109 Ac. | 9 Ac. | 100 Ac. | 25% | 25.00 Ac. |
| Office Research | 47 | 27 | 20 | 55% | 11.00 |
| Commercial | 7 | 0 | 7 | 60% | 4.20 |
| Industrial | 138 | 20 | 118 | 80% | 94.40 |
| **TOTALS** | **301 Ac.** | **56 Ac.** | **245 Ac.** | **55%** | 134.60 Ac. |
| **02040202080030 (Rancocas)** | | | | | |
| Low Density Residential | 274 Ac. | 46 Ac. | 228 Ac. | 25% | 57.00 Ac. |
| Low/Med Residential | 294 | 61 | 233 | 80% | 186.40 |

## TABLE T-1 (Cont'd)

| HUC14 & ZONING | TOTAL AREA | CONSTRAINED LANDS AREA | DEVELOPABLE AREA | ALLOWABLE IMPERVIOUS | BUILD-OUT IMPERVIOUS |
|---|---|---|---|---|---|
| Office Research | 219 | 25 | 194 | 55% | 106.70 |
| Commercial | 270 | 22 | 248 | 60% | 148.80 |
| Industrial | 761 | 112 | 649 | 80% | 519.20 |
| **TOTALS** | **1,818 Ac.** | **266 Ac.** | **1,552 Ac.** | **65%** | 1,081.10 Ac. |
| **02040201100060 (Assiscunk, Crosswicks & Doctors)** | | | | | |
| Low Density Residential | 52 Ac. | 0 Ac. | 52 Ac. | 25% | 13.00 Ac. |
| **TOTALS** | **52 Ac.** | **0 Ac.** | **52 Ac.** | **25%** | **13.00 Ac.** |
| **0204020201100030 (Assiscunk, Crosswicks & Doctors)** | | | | | |
| Low Density Residential | 1,124 Ac. | 443 Ac. | 681 Ac. | 35% | 170.25 Ac. |
| Low/Med Residential | 654 | 404 | 250 | 80% | 200.00 |
| Office Research | 348 | 80 | 268 | 55% | 147.40 |
| Commercial | 85 | 0 | 85 | 60% | 51.00 |
| **TOTALS** | **2,211 Ac.** | **927 Ac.** | **1,284 Ac.** | **44%** | **568.65 Ac.** |

## TABLE T-2, POLLUTANT LOADS BY LAND COVER

| Land Cover | Total Phosporus Land (lbs/acre/year) | Total Nitrogen Load (lbs/acre/year) | Total Suspended Solids Load (lbs/acre/yr) |
|---|---|---|---|
| High, Medium Density Residential | 1.4 | 15 | 140 |
| Low Density, Rural Residential | .06 | 5 | 100 |
| Commercial | 2.1 | 22 | 200 |
| Industrial | 1.5 | 16 | 200 |
| Urban, Mixed Urban, Other Urban | 1.0 | 10 | 120 |
| Agricultural | 1.3 | 10 | 300 |
| Forest, Water, Wetlands | 0.1 | 3 | 40 |
| Barrenland/ Transitional Area | 0.3 | 5 | 60 |

Source: NJDEP BMP Manual, Appendix C

## TABLE T-3
## NON-POINT SOURCE LOAD AT BUILD-OUT

| HUC14 & ZONING | DEVELOPABLE AREA (Ac.) | TP (lbs/ac/yr) | TP (lb/yr) | TN (lbs/ac/yr) | TN (lb/yr) | TSS (lbs/ac/yr) | TSS (lb/yr) |
|---|---|---|---|---|---|---|---|
| **02040202040050 (Rancocas)** | | | | | | | |
| Low Density Residential | 862 | 0.6 | 517 | 5 | 4,310 | 100 | 86,200 |
| Low/Med. Residential | 97 | 1.4 | 136 | 15 | 1,455 | 140 | 13,580 |
| OR/Commercial | 178 | 2.1 | 374 | 22 | 3,916 | 200 | 35,600 |
| Industrial | 416 | 1.56 | 624 | 16 | 6,656 | 200 | 83,200 |
| **TOTALS** | **1,553** | | **1,651** | | **16,337** | | **218,580** |
| **02040202080020 (Rancocas)** | | | | | | | |
| Low Density Residential | 100 | 0.6 | 60 | 5 | 500 | 100 | 10,000 |
| OR/Commercial | 27 | 2.1 | 57 | 22 | 594 | 200 | 5,400 |
| Industrial | 118 | 1.5 | 177 | 16 | 1,888 | 200 | 23,600 |
| **TOTALS** | **245** | | **294** | | **2,982** | | **39,000** |
| **02040202080030 (Rancocas)** | | | | | | | |
| Low Density Residential | 228 | 0.6 | 137 | 5 | 1,140 | 100 | 22,800 |
| Medium Residential | 233 | 1.4 | 326 | 15 | 3,495 | 140 | 32,620 |
| OR/Commercial | 442 | 2.1 | 928 | 22 | 9,724 | 200 | 88,400 |
| Industrial | 649 | 1.5 | 974 | 16 | 10,384 | 200 | 129,800 |
| **TOTALS** | **1,552** | | **2,364** | | **24,743** | | **273,620** |
| **02040201100060 (Assiscunk, Crosswicks & Doctors)** | | | | | | | |
| Low Density Residential | 52 | 0.6 | 31 | 5 | 260 | 100 | 5,200 |
| **TOTALS** | **52** | | **31** | | **260** | | **5,200** |
| **02040201100030 (Assiscunk, Crosswicks & Doctors)** | | | | | | | |
| Low Density Residential | 681 | 0.6 | 409 | 5 | 3,405 | 100 | 68,100 |
| Low/Med. Residential | 250 | 1.4 | 350 | 15 | 3,750 | 140 | 35,000 |
| OR/Commercial | 353 | 2.1 | 741 | 22 | 7,766 | 200 | 70,600 |
| **TOTALS** | **1,284** | | **1,500** | | **14,921** | | **173,700** |

# WESTAMPTON TOWNSHIP
# LAND USES

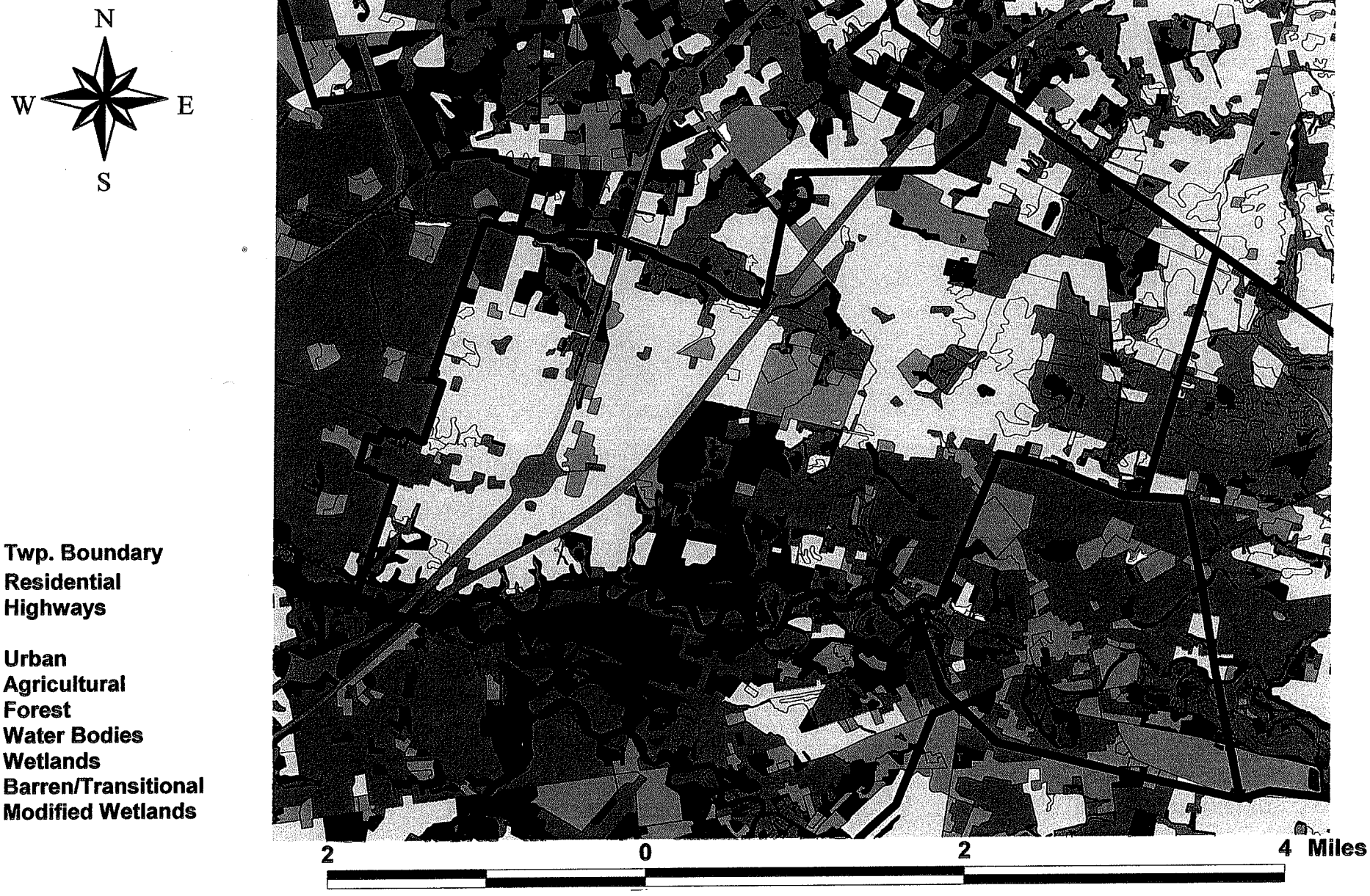


Figure F-6

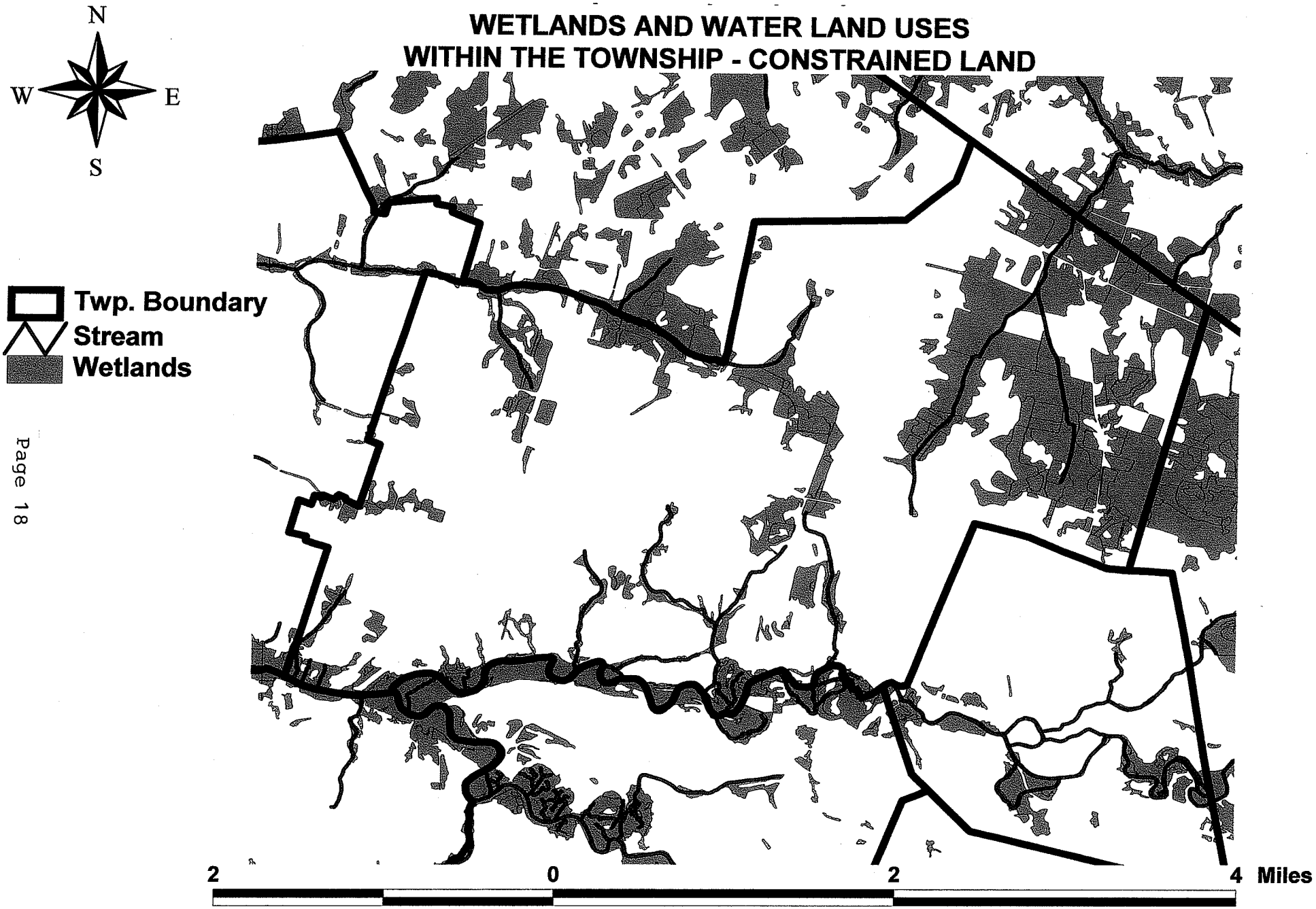
WETLANDS AND WATER LAND USES
WITHIN THE TOWNSHIP - CONSTRAINED LAND
N
W
E
S
Twp. Boundary
Stream
Wetlands
2
0
2
4 Miles

Figure F-7

# WESTAMPTON TOWNSHIP
# ZONING MAP

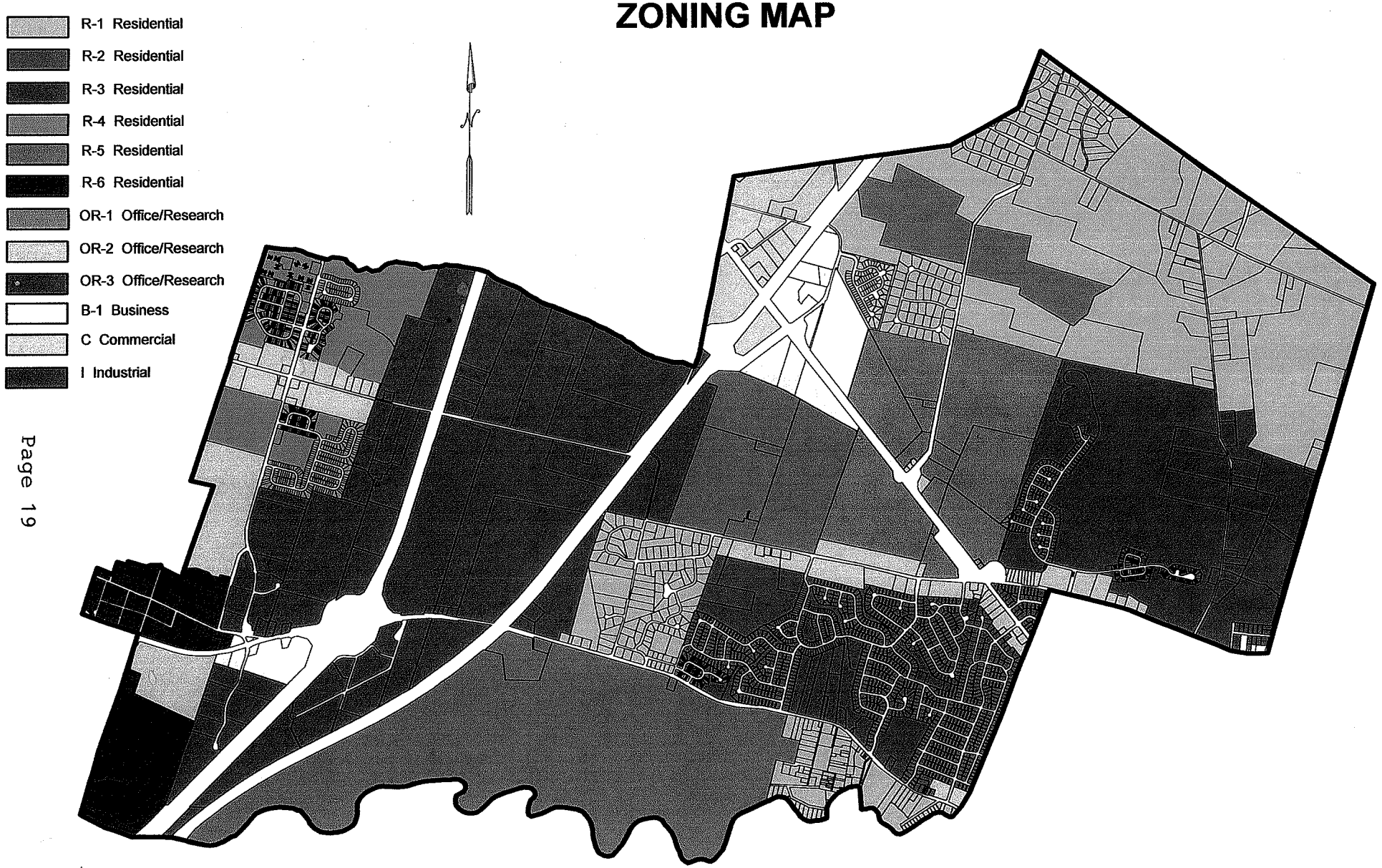


Figure F-8

## Stream Corridor Protection Plan

There are no special Water Resource protection areas, designated as Category 1 (N.J.A.C. 7.9B) or any upstream perennial or intermittent streams of any Category 1 waters within Westampton Township.

It shall, therefore, not be required that any stream corridor protection plans requiring 300 foot buffering be established within the Township.

If any bodies of water within the Township become designated as "C-1" in the future, any major development within 300 feet of such water shall be regulated in accordance with N.J.A.C. 7:8-5.5(h).