

MUNICIPAL STORMWATER MANAGEMENT PLAN

for

**TOWNSHIP OF SPRINGFIELD
BURLINGTON COUNTY, NEW JERSEY**

March 2005

Prepared by:



LWR File No. 2005-35-15-05

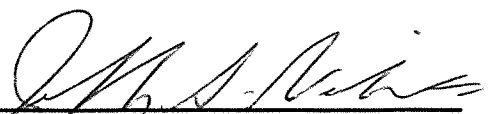

Jeffrey S. Richter, PE
N.J. License No. 32520

TABLE OF CONTENTS

	<u>Page No.</u>
Introduction	1
Goals	1
Stormwater Discussion Background	2
Design and Performance Standards	9
Plan Consistency	9
Nonstructural Stormwater Management Strategies.....	10
Land Use/Build-Out Analysis	10
Mitigation Plans	18

List of Tables

- Table C-1: Sample Build-Out Calculations for Two HUC14s
- Table C-2: Pollutant Loads by Land Cover
- Table C-3: Nonpoint Source Loads at Build-Out for Two Example HUC14s

List of Figures

- Figure C-1: Groundwater Recharge in the Hydrologic Cycle
- Figure C-2: Township and Its Waterways
- Figure C-3: Township Boundary on USGS Quadrangles
- Figure C-4: Groundwater Recharge Areas in the Township
- Figure C-5: Township's Existing Land Use
- Figure C-6: Hydrologic Units (HUC14s) Within the Township
- Figure C-7: Zoning Districts Within the Township
- Figure C-8: Wetlands and Water Land Uses within the Township – Constrained Land
- Figure C-9: Mitigation Location Plan

Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Township of Springfield 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 all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. 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. 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. A “build-out” analysis has been included in this plan based upon existing zoning and land available for development. The plan also 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 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 the domestic, municipal, recreational, industrial, and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins.

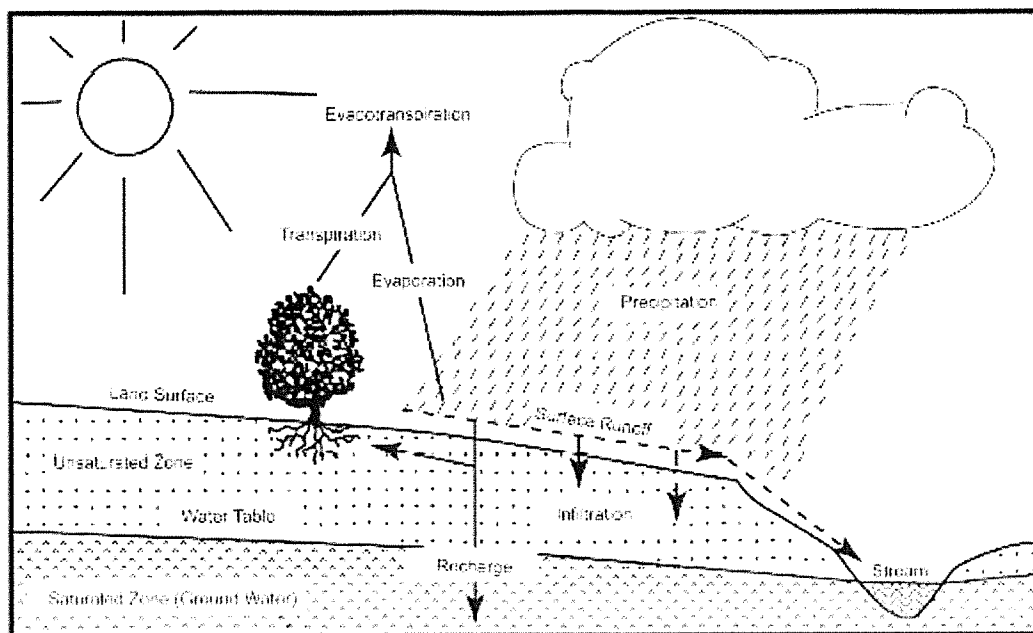
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan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

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.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey Report 65R-32

Background

Springfield Township is located in Burlington County, NJ. The Township covers approximately thirty (30) square miles most of which is land. Only 0.03% of the Township is composed of water. The location of the Township on the USGS Quadrangle is illustrated in Figure C-3.

Over the past 30 years, the population of the Township has been increasing. However, the rate of increase over the past decade has slowed in comparison to the two preceding decades. The Township's population has grown from 2,244 people in 1970, to 2,691 in 1980, to 3,227 in 2000. That is an overall increase of 43%. Between 1970 and 1979, the population grew by 7.2%, but from 1990-2000, the population only grew by 6.2%. The population of the Township from 1970-2000 is detailed in the following table. The current population density is 107.4 people per square mile, and the average density of housing units is 37.9 per square mile.

1970	2,244	1980	2,691	1990	3,015
1971	2,304	1981	2,724	1991	3,065
1972	2,343	1982	2,742	1992	3,095
1973	2,342	1983	2,759	1993	3,132
1974	2,291	1984	2,779	1994	3,148
1975	2,335	1985	2,798	1995	3,161
1976	2,373	1986	2,794	1996	3,170
1977	2,331	1987	2,834	1997	3,177
1978	2,385	1988	2,862	1998	3,177
1979	2,406	1989	2,943	1999	3,202
				2000	3,222

The Township consists mostly of Agricultural Land as illustrated in Figure C-5. A considerable portion (5,015.37 acres) of this farmland has been purchased by the Burlington County Farmland Preservation Program. Furthermore, the County has preserved 1,654.34 acres of Open Space. These preserved areas are detailed in Figure C-5. In addition to the preserved spaces, the Township contains 6,548 acres of wetlands which are protected from major development.

The waterways in the township are Assiscunk Creek, Barkers Brook, Annaricken Brook, Powells Run and North Run (Figure C-2). Many of these waterways are listed on Sublist 5 of the New Jersey Integrated Water Quality Monitoring and Assessment Report. This combined report presents the extent to which New Jersey waters are attaining water quality standards. Sublist 5 of the Report lists the waters that are impaired or threatened by pollutants and require one or more Total Maximum Daily Loads (TMDL).

A TMDL is the amount of a pollutant that can be accepted by a water body without exceeding water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. New Jersey Department of Environmental Protection (NJDEP) develops implementation plans to identify how the various pollutant sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other Best Management Practices (BMP).

The following table details the waterways in the Township that require TMDLs. The table includes the waterway, its impairment and the priority designated by NJDEP. A TMDL has already been approved by the United States Environmental Protection Agency (EPA) for Fecal Coliform in Barkers Brook.

<u>Waterway</u>	<u>Impairment</u>	<u>Priority</u>
Annaricken Brook	Phosphorous	Medium
Assiscunk Creek	Arsenic	High
Assiscunk Creek	Cadmium	High
Assiscunk Creek	Chromium	High
Assiscunk Creek	Lead	High
Assiscunk Creek	Mercury	High
	Benthic	
Barkers Brook	Macroinvertebrates	Low
Barkers Brook	pH	Medium
Barkers Brook	Phosphorous	Medium

FIGURE C-2: SPRINGFIELD TOWNSHIP AND ITS WATERWAYS

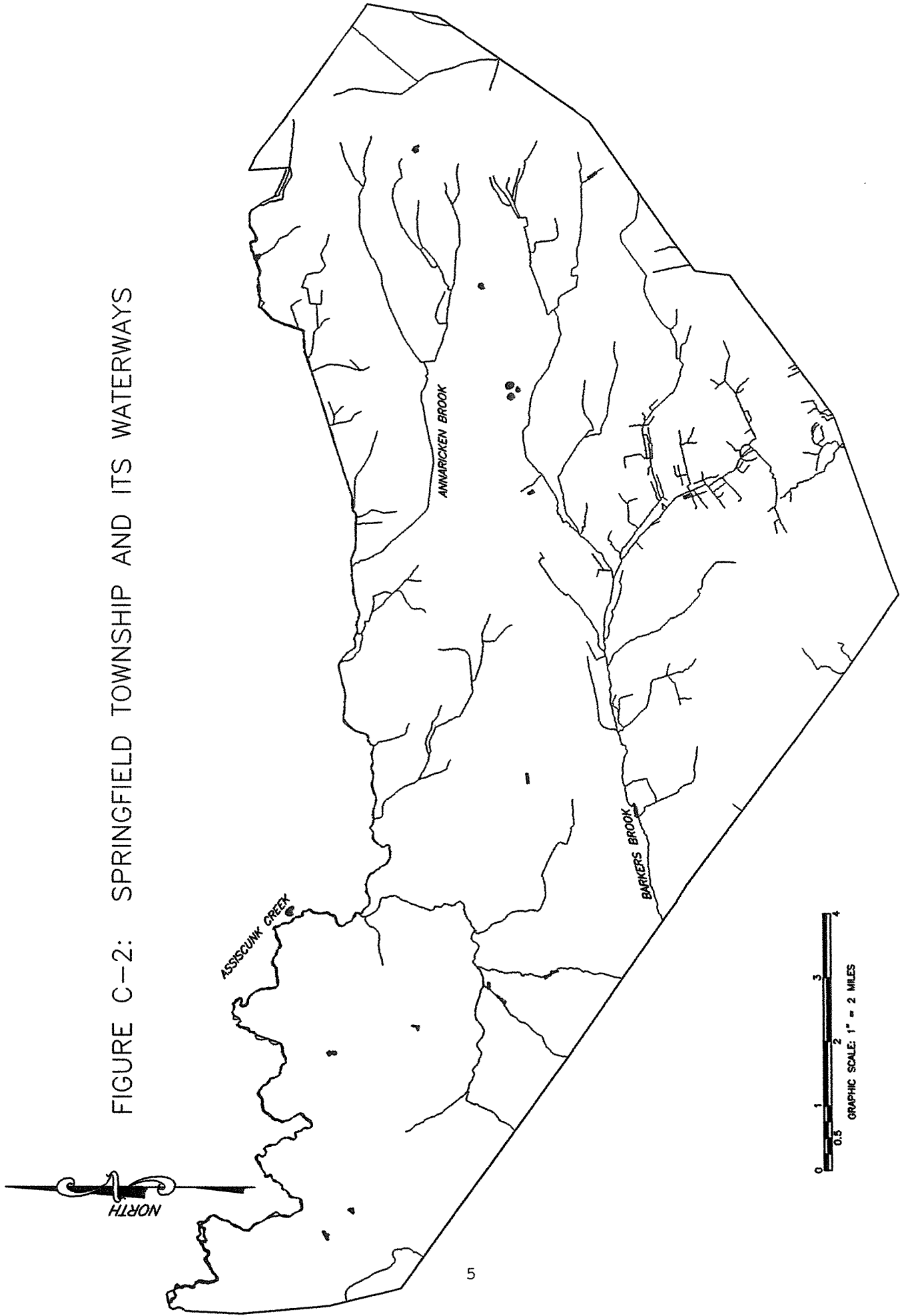
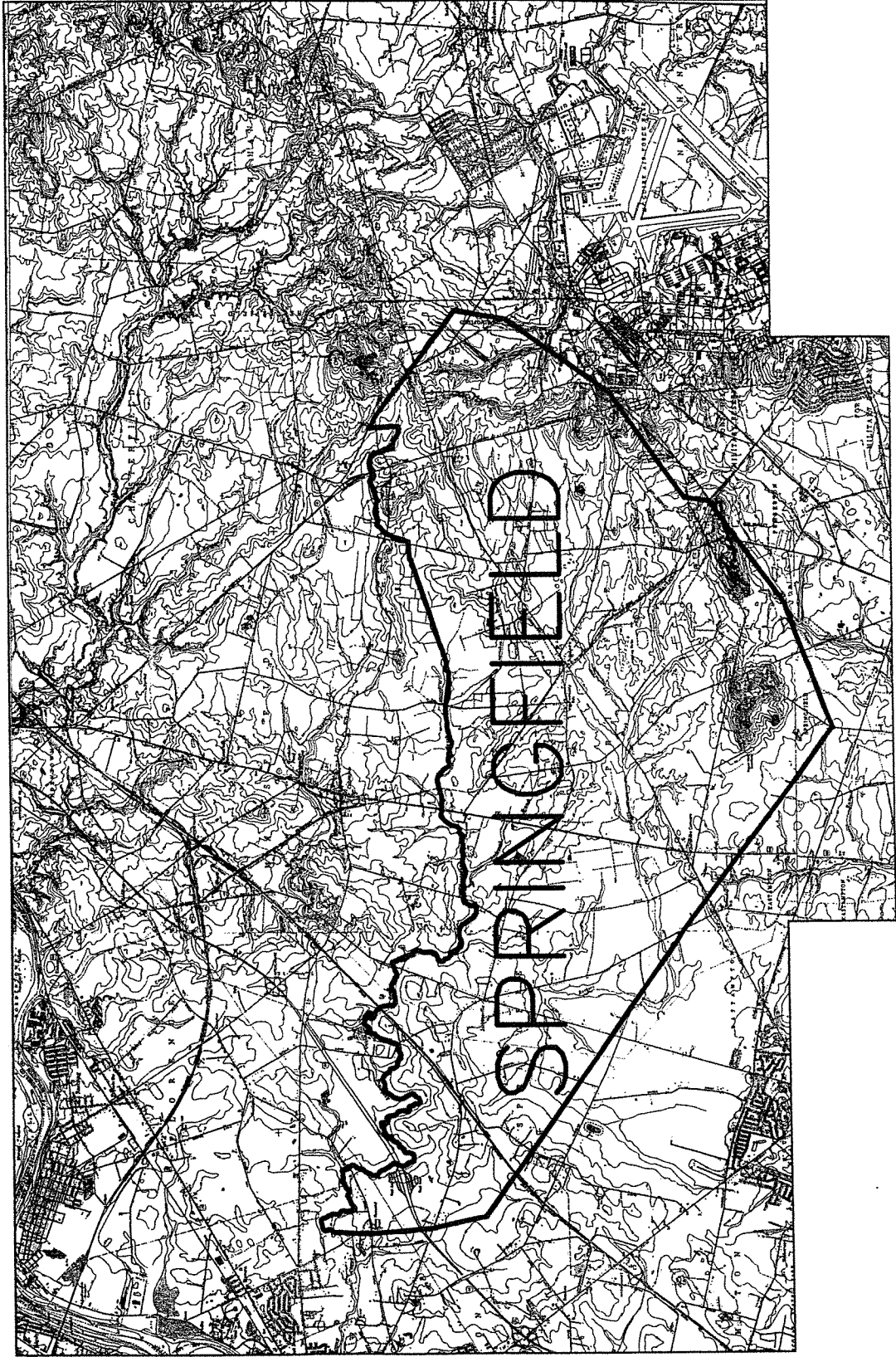


FIGURE C-3: TOWNSHIP BOUNDARY ON USGS QUADRANGLE



In addition to water quality problems, the Township has minor water quantity problems including isolated areas of flooding and stream bank erosion. Some of the culverts associated with road crossings in the Township are undersized. During severe storm events, these undersized culverts do not have adequate capacity, thereby causing a backwater effect and flooding upstream.

Springfield Township has experienced a minimal amount of development. Most of the Township is composed of Agricultural Land with a few zones of low density residential development. Therefore, the Township has not had a significant increase in impervious surfaces. Furthermore, given that a considerable amount of land in the Township is preserved, there will not likely be a large increase in impervious surface in the future. Nonetheless, the Township has minor areas of stream bank erosion and isolated areas of flooding. For example, the stream banks along Annaricken Brook exhibit signs of stream bank erosion. Flooding occurs near a few of the bridges in the Township which may require larger culverts to accommodate the volume of water in the streams during severe storm events. Areas of flooding include the bridge on Warner Road, Smithville-Jacksonville Road near Oxmead, Springfield Meeting House and Juliustown-Georgetown Road, and Tower Drive and Juliustown Road. Additionally, some of the Township's roads have flooding problems in areas that need improved drainage ditches.

Since the Township does not have a high percentage of impervious surfaces (Table C-1), there has not been a significant decrease in groundwater recharge. A map of groundwater recharge areas are shown in Figure C-4. The township does not contain any wellhead protection areas.

Figure C-4. Groundwater Recharge in the Township.



Design and Performance Standards

The Township of Springfield 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. 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. The ordinances will be submitted to the county for review and approval within [24 months of the effective date of the Stormwater Management Rules.] During construction, Township inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

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, 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) 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 local Soil Conservation District.

There are 8.49 miles of TMDL (Total Maximum Daily Load) Fecal Coliform Streams in the Township. The following Changes have been made to the Township Ordinance:

Section 48-ARTICLE II: Proper Disposal of Pet Waste Article to establish requirements for the proper disposal of pet solid waste in the township, as to protect public health, safety and welfare, and to prescribe penalties for failure to comply.

Section 48-ARTICLE III: Feeding of Unconfined Wildlife Article to prohibit the feeding of unconfined wildlife in any public park or on any other property owned and operated by the Township, so as to protect public health, safety and welfare, and to prescribe penalties for failure to comply.

Section 160-ARTICLE I: Disposal of Materials into Storm Sewer Systems Article to prohibit the spilling, dumping or disposal of materials other than stormwater to the municipal separate storm sewer system (MS4) operated by the Township, so as to protect public health, safety and welfare, and to prescribe penalties for failure to comply.

Section 160-ARTICLE I: Illicit Connections to Storm Sewer System Article to prohibit illicit connections to the municipal separate storm sewer systems operated by the Township, so as to protect public health, safety and welfare, and to prescribe penalties for failure to comply.

Nonstructural Stormwater Management Strategies

The Township of Springfield has reviewed the master plan and ordinances, and has provided a list of the sections in the Township land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within [24 months of the effective date of the Stormwater Management Rules]. A copy will be sent to the Department of Environmental Protection at the time of submission. Chapter 178 of the Township Code, entitled development Regulations, was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes were made to Article VI of this Chapter, entitled “Design and Performance Standards” to incorporate these strategies.

Section 215-73: Open Space Regulation In order to protect and preserve the open space of the Township, and to further the public health, safety, morals and general welfare.

Section 215-85: Buffers A planted landscape buffer shall be provided and maintained by the owner or lessee of a nonresidential property contiguous to a residentially used or zoned property, except where natural or physical barriers exist. Buffer areas are required along lot and street lines of all nonresidential lots where such property lines or the center line of adjacent streets abut residential used or residential zoning districts lines and where a farm use abuts a major subdivision of five acres or more or a major site plan. Each permitted use shall provide and maintain attractively landscaped grounds and suitable screening in order to safeguard the character of adjacent districts.

Land Use/Build-Out Analysis

A detailed land use analysis has been conducted for the Township. Figure C-6 illustrates the existing land use in the Township based on 1995/97 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. 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 these two 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.

FIGURE C-5: TOWNSHIP'S EXISTING LAND USE

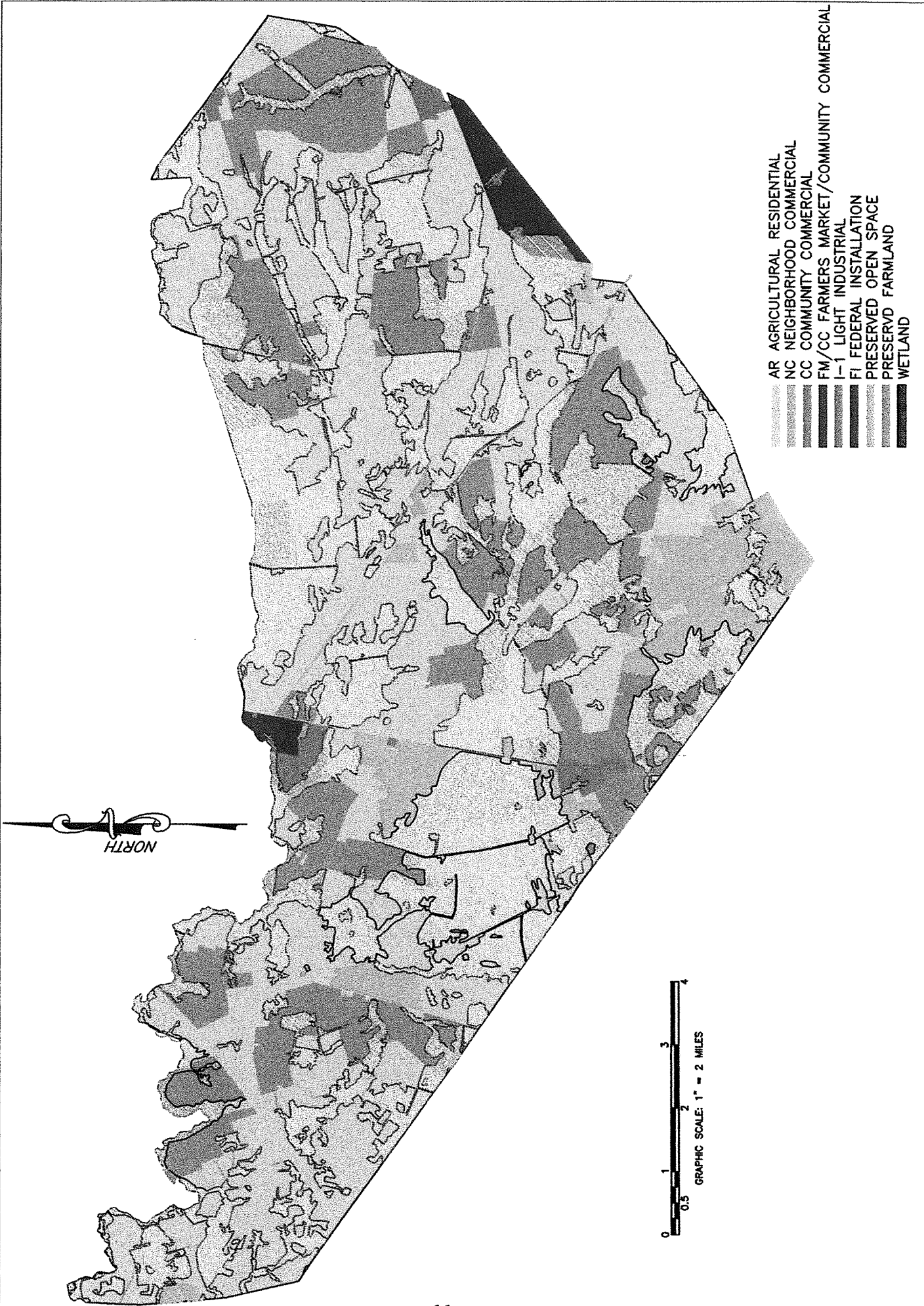


FIGURE C-6: HYDROLOGIC UNITS (HUC14'S) WITHIN THE TOWNSHIP

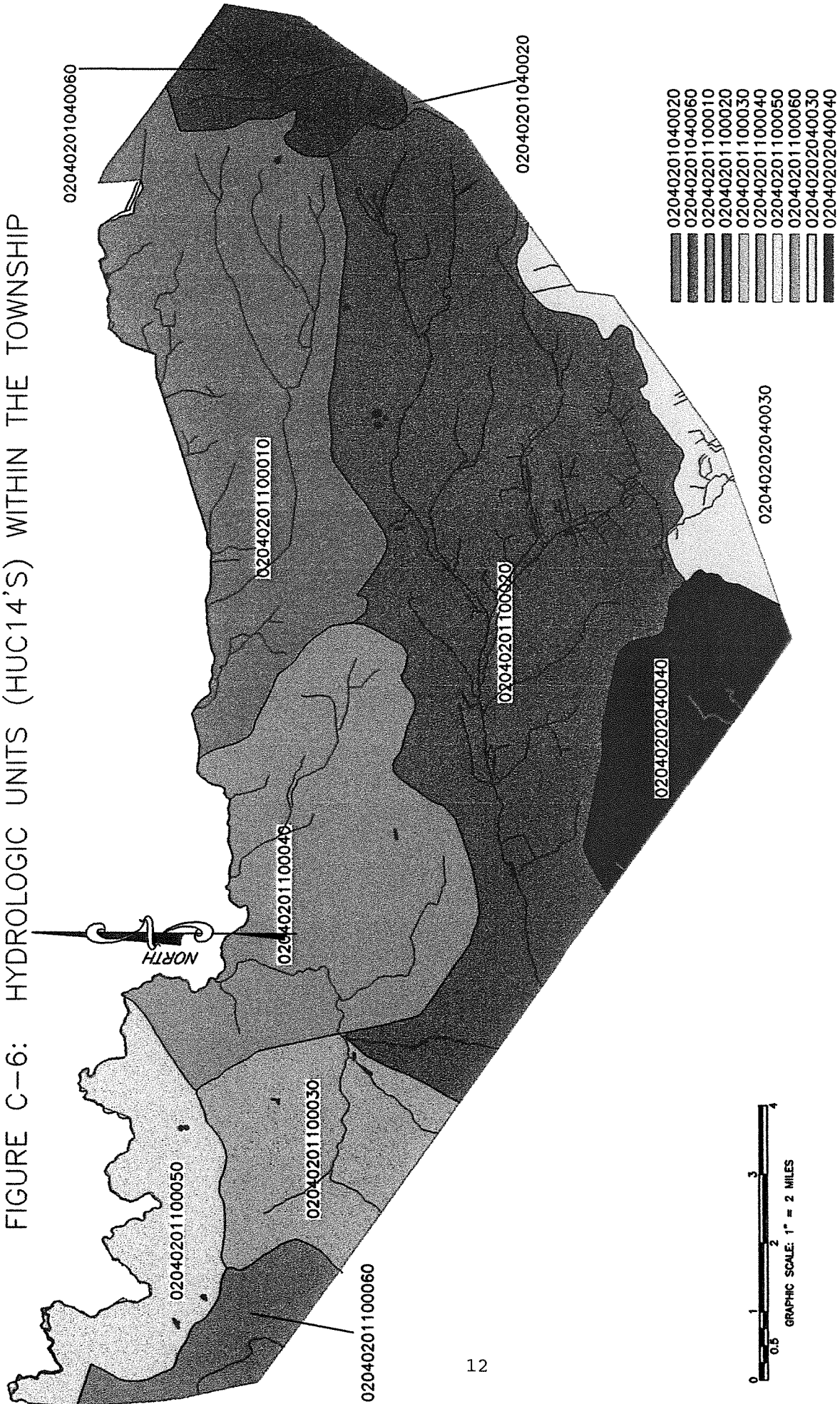


FIGURE C-7: ZONING DISTRICTS WITHIN THE TOWNSHIP

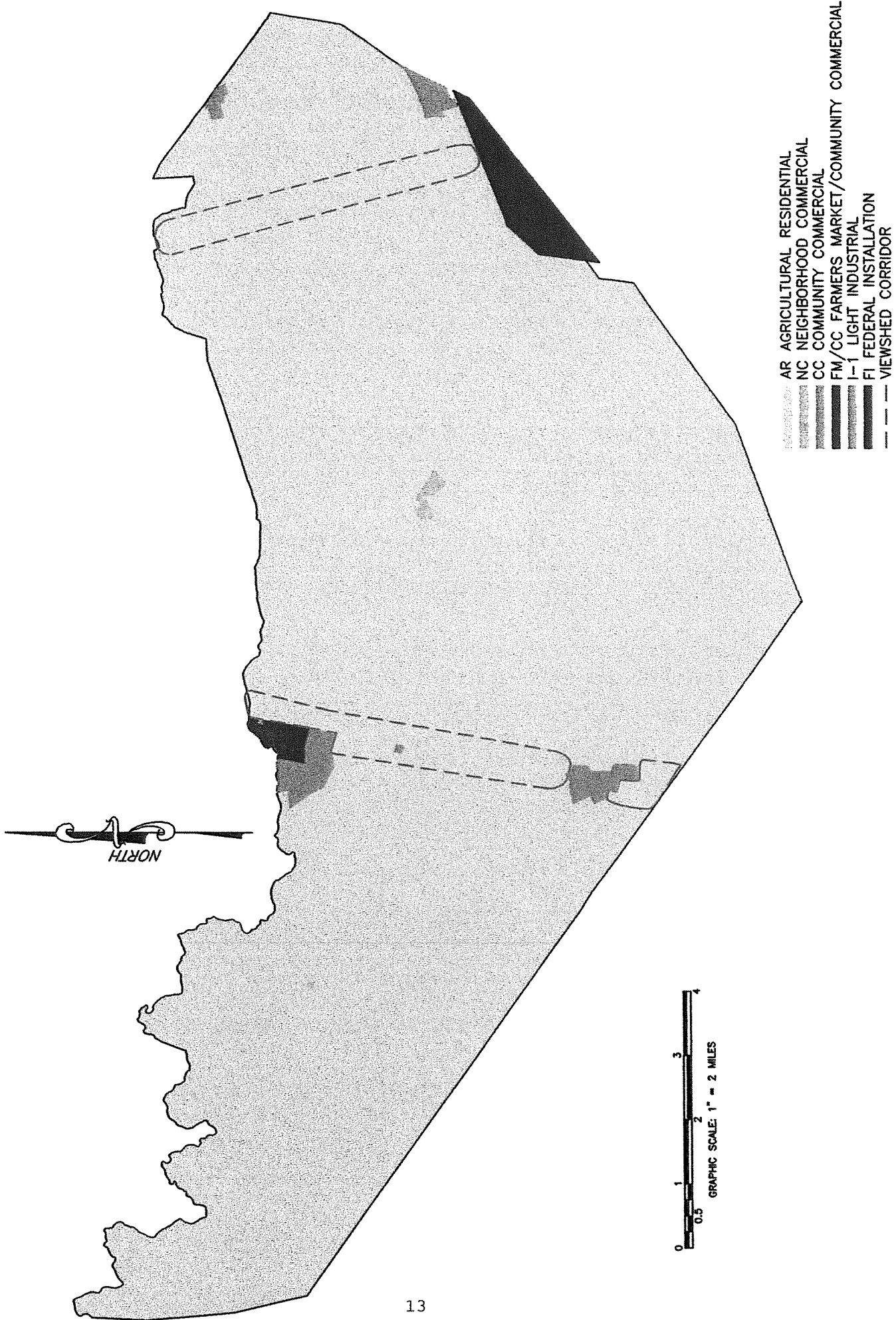


FIGURE C-8: WETLANDS AND WATER LAND USE WITHIN THE TOWNSHIP—CONSTRAINED LAND

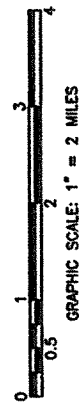


Table C-1: Sample Build-Out Calculations for Ten HUC14s

HUC14 and Zone	Total Area (acres)	Existing Impervious (%)	Existing Impervious (acres)	Wetlands/ Water Area (acres)	Preserved Farm/Open Space (acres)	Developable Area (acres)	Allowable Impervious (%)	Build-Out Impervious (acres)
2040202040040								
Agricultural Residential (AR)	1061.68	1.03	10.95	354.57	620.07	76.09	25	19.0225
Community Commercial (CC)	18.23	13.06	2.38	0	0	15.85	60	9.51
2040201100060								
Agricultural Residential (AR)	554.33	3.05	16.91	152.7	23.61	361.11	25	90.2775
2040201100050								
Agricultural Residential (AR)	1238.05	4.05	50.15	350.33	291.24	546.33	25	136.5825
2040201100040								
Agricultural Residential (AR)	2755.42	2.32	63.9	1136.26	524.62	1030.64	25	257.66
Community Commercial (CC)	105.49	2.33	2.46	22.25	0	80.78	60	48.468
Farmers Market (FM/CC)	62.42	61.52	38.4	6.43	0	17.59	75	13.1925
2040201100030								
Agricultural Residential (AR)	1309.28	2.42	31.73	360.49	402.52	514.54	25	128.635
2040201100010								
Agricultural Residential (AR)	3492.55	1.52	53.11	1056.36	368.81	2014.27	25	503.5675
Community Commercial (CC)	10.9	18.81	2.05	0	0	8.85	60	5.31
Neighborhood Commercial(NC)	1.68	15.48	0.26	0	0	1.42	60	0.852
2040201040020								
Agricultural Residential (AR)	4.44	28.60	1.27	0	0	3.17	25	0.7925
Light Industrial (I1)	9.34	27.09	2.53	0	0	6.81	50	3.405
2040201040060								
Agricultural Residential (AR)	711.1	1.86	13.21	101.83	408.82	187.24	25	46.81
Community Commercial (CC)	5.45	36.88	2.01	0	0	3.44	60	2.064
Light Industrial (I1)	41.76	0.00	0	3.02	0	38.74	50	19.37
2040201100020								
Agricultural Residential (AR)	6665.49	1.47	98	2766.83	1507.81	2292.85	25	573.2125
Community Commercial (CC)	47.51	11.45	5.44	5.57	0	36.5	60	21.9
Neighborhood Commercial(NC)	20.68	5.66	1.17	3.46	0	16.05	60	9.63
Light Industrial (I1)	0.3	0.00	0	0	0	0.3	50	0.15
2040202040030								
Agricultural Residential (AR)	609.71	1.43	8.71	227.9	90.22	282.88	25	70.72
Totals	18725.81		404.64	6548	4237.72	7535.45		1961.1315

Table C-2: Pollutant Loads by Land Cover

Land Cover	Total Phosphorus Load (lbs\acre\year)	Total Nitrogen Load (lbs\acre\year)	Total Suspended Solids Load (lbs\acre\year)
High, Medium Density Residential	1.4	15	140
Low Density, Rural Residential	0.6	5	100
Commercial	2.1	22	200
Industrial	1.5	16	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

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)
2040202040040								
Low Density Residential	AR	87.04	0.6	52.224	5	435.2	100	8704
Commercial	CC	18.23	2.1	38.283	22	401.06	200	3646
Agricultural		271.17	1.3	352.521	10	2711.7	300	81351
Forest, Water, Wetlands		354.57	0.1	35.457	3	1063.71	40	14182.8
Barrenland/Transition Area		348.9	0.5	174.45	5	1744.5	60	20934
2040202040030								
Low Density Residential	AR	291.59	0.6	174.954	5	1457.95	100	29159
Forest, Water, Wetlands		227.9	0.1	22.79	3	683.7	40	9116
Barrenland/Transition Area		90.22	0.5	45.11	5	451.1	60	5413.2
2040201100060								
Low Density Residential	AR	378.02	0.6	226.812	5	1890.1	100	37802
Forest, Water, Wetlands		152.7	0.1	15.27	3	458.1	40	6108
Barrenland/Transition Area		23.61	0.5	11.805	5	118.05	60	1416.6
2040201100050								
Low Density Residential	AR	596.48	0.6	357.888	5	2982.4	100	59648
Agricultural		291.24	1.3	378.612	10	2912.4	300	87372
Forest, Water, Wetlands		350.33	0.1	35.033	3	1050.99	40	14013.2
2040201100040								
Low Density Residential	AR	1065.86	0.6	639.516	5	5329.3	100	106586
Commercial	FM/CC	167.91	2.1	352.611	22	3694.02	200	33582
Agricultural		321.54	1.3	418.002	10	3215.4	300	96462
Forest, Water, Wetlands		1164.94	0.1	116.494	3	3494.82	40	46597.6
Barrenland/Transition Area		203.08	0.5	101.54	5	1015.4	60	12184.8

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)
2040201100030								
Low Density Residential	AR	546.27	0.6	327.762	5	2731.35	100	54627
Agricultural		318.25	1.3	413.725	10	3182.5	300	95475
Forest, Water, Wetlands		360.49	0.1	36.049	3	1081.47	40	14419.6
Barrenland/ Transition Area		84.27	0.5	42.135	5	421.35	60	5056.2
2040201100020								
Low Density Residential	AR	2390.85	0.6	1434.51	5	11954.25	100	239085
Commercial	CC NC	59.16	2.1	124.236	22	1301.52	200	11832
Industrial	I-1	0.3	1.5	0.45	16	4.8	200	60
Agricultural		1341.65	1.3	1744.145	10	13416.5	300	402495
Forest, Water, Wetlands		2775.86	0.1	277.586	3	8327.58	40	111034.4
Barrenland/ Transition Area		166.16	0.5	83.08	5	830.8	60	9969.6
2040201100010								
Low Density Residential	AR	1617.38	0.6	970.428	5	8086.9	100	161738
Commercial	CC NC	10.9	2.1	22.89	22	239.8	200	2180
Agricultural		368.41	1.3	478.933	10	3684.1	300	110523
Forest, Water, Wetlands		1506.36	0.1	150.636	3	4519.08	40	60254.4
Barrenland/ Transition Area		0.4	0.5	0.2	5	2	60	24
2040201040020								
Low Density Residential	AR	4.44	0.6	2.664	5	22.2	100	444
Industrial	I-1	9.34	1.5	14.01	16	149.44	200	1868
2040201040060								
Low Density Residential	AR	197.43	0.6	118.458	5	987.15	100	19743
Commercial	CC	5.45	2.1	11.445	22	119.9	200	1090
Industrial	I-1	41.76	1.5	62.64	16	668.16	200	8352
Agricultural		408.82	1.3	531.466	10	4088.2	300	122646
Forest, Water, Wetlands		104.85	0.1	10.485	3	314.55	40	4194
Totals				9672.811		95065.54		1955363

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. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. 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.

- a. The applicant can select one of the following projects listed to compensate for the deficit from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Township Engineer. Listed below are specific projects that can be used to address the mitigation requirement.

Groundwater Recharge

- Retrofit an existing basin with measures for groundwater recharge as described in The New Jersey Stormwater Management Practices Manual.
- Clean debris from roadside ditches and remove silt that has accumulated to help promote groundwater recharge.

Water Quality

- Replace existing inlet covers and install trashracks and bar screens on outlet control structures and headwalls to address solids and floatable control.

Water Quantity

- Replace existing culverts and clean existing storm sewer systems in areas of flooding throughout the Township. Regrading flood areas will also promote more storage volume to alleviate some flooding issues.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption 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. Listed below are specific projects that can be used to address the mitigation option.

Groundwater Recharge

- Clean and enlarge, where possible, the Ditches along Folwell Station road to extend retention time and promote groundwater recharge (Mitigation Location Plan #4).

Water Quality

- Stabilize the stream banks along the Annaricken Brook along Juliustown-Georgetown Road to prevent erosion siltation of the stream (Mitigation Location Plan #6).

Water Quantity

- Perform a hydraulic analysis of the bridge at Warner Road and improve the area and bridge to prevent future flooding (Mitigation Location Plan #1).
- Install water management measures to alleviate the flooding problems along Smithville-Jacksonville Road near Oxmead Road (Mitigation Location Plan #2).
- Install water management measures to alleviate the flooding problems along Springfield Meetinghouse Road near Juliustown-Georgetown Road (Mitigation Location Plan #3).
- Install water management measures to alleviate the flooding problems along Tower Drive and Juliustown Road (Mitigation Location Plan #5).

The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Management Plan. 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.

FIGURE C-9: MITIGATION LOCATION PLAN

