

Municipal Stormwater Management Plan

For

Pequannock Township

Morris County New Jersey

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February 25, 2005

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September 15, 2022

Ref: NJPDES #NJG0148342
PI ID #207742
Effective Date of Authorization 4/1/04

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Introduction

This Stormwater Management Plan represents an update from the initial 2005 document prepared by the Township of Pequannock. This update reflects the Township's continued implementation of the stormwater management standards that are mandatory for new major development published in the March 2021 NJDEP Best Management Practices Manual. The Township's Stormwater Control ordinance includes all of the required performance requirements for all new major developments, as well as expanding the stormwater management measures of smaller development applications.

This updated Municipal Stormwater Management Plan (MSWMP) provides readers with an outline of the ongoing strategy of the Township of Pequannock ("the Township") to address stormwater-related impacts. The initial creation of this plan was 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 stormwater-related water quality, groundwater recharge, stormwater quantity, and stormwater quality impacts for new major development by incorporating stormwater design and performance standards, which is currently defined as:

A. An individual development as well as multiple developments that individually or collectively result in:

- (1) The disturbance of one or more acres of land since February 2, 2004;*
- (2) The creation of 1/4 acre or more of regulated impervious surface since February 2, 2004;*
- (3) The creation of 1/4 acre or more of regulated motor vehicle surface since March 2, or*
- (4) A combination of Subsection A(2) and (3) above that totals an area of 1/4 acre or more. The same surface shall not be counted twice when determining if the combination area equals 1/4 acre or more.*
- (5) Any construction of one or more of the following uses:*
 - (a) Feeding and holding areas that provide for more than 100 head of cattle or 15,000 hens, 500 swine, 4,000 turkeys, or 10,000 ducks; this subsection shall also apply to all other equivalent numbers of animal units as determined by the Natural Resources Conservation Service (NRCS) Agricultural Waste Management Field Manual for measuring BOD (biochemical oxygen demand) producing potential.*
 - (b) Storage, distribution or treatment facilities (excluding individual on-site sewage disposal systems) for liquid waste.*
 - (c) Solid waste storage, disposition, incineration or landfill.*
 - (d) Quarries, mines or borrow pits.*
 - (e) Land application of sludge or effluents.*
 - (f) Storage, distribution or treatment facilities for radioactive waste.*

B. "Major development" includes all developments that are part of a common plan of development or sale (for example, phased residential development) that collectively or individually meet any one or more of Subsection A(1), (2), (3) or (4) above. Projects undertaken by any government agency that otherwise meet the definition of "major development" but which do not require approval under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq., are also considered major development.

As it relates to the stormwater related water quality, water quantity and groundwater recharge impacts from existing developments, this updated MSWP will address the Township's efforts to improve existing conditions. The design standards in the Township Stormwater Ordinance 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 Stormwater Ordinance also incorporates the long-term operation and maintenance requirements for existing and future stormwater facilities. A copy of the adopted ordinance is attached at the end of this Plan.

Goals

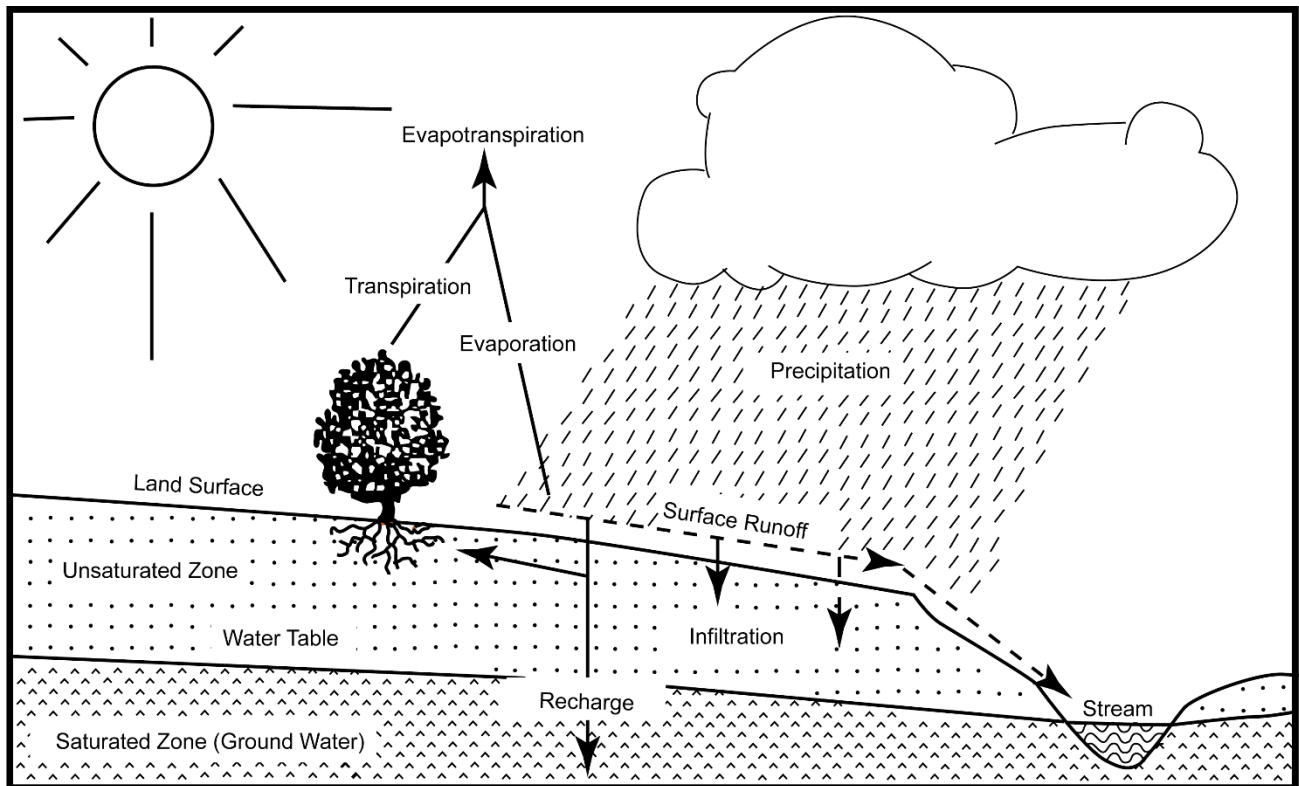
The goals of this MSWMP are those identified in the Municipal Land Use Law at NJSA 40:55D-95 and N.J.A.C. 7:8-2.2 as follows:

- to reduce flood damage, including damage to life and property;
- to minimize, to the extent practical, any increase in stormwater runoff from any new development or construction project;
- to reduce soil erosion from any development or construction project;
- to assure the adequacy of existing and proposed culverts and bridges,
- to induce water recharge into the ground where practical;
- to prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- to maintain the integrity of stream channels for their biological functions, as well as for drainage;
- To minimize public safety hazards at any storm water management facilities constructed as part of a subdivision or pursuant to a site plan; and
- minimize pollutants in stormwater runoff from new and existing development in order 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.

The Township has been advancing these goals through the adoption and enforcement of our Stormwater Management Ordinance (Chapter 308). The most recently adopted Stormwater Management Ordinance outlines specific stormwater design and performance standards for new development and redevelopment activities. In 2003, the Master Plan Re-Examination established a number of goals and objectives that were somewhat consistent with the goals of the stormwater measures discussed in this document. That re-examination did not specifically address stormwater management and water quality, but the benefits attained from each interest are very closely aligned. The December 2019 Master Plan likewise did not specifically address Stormwater Management, focusing more on Floodplain Management issues that resulted from the FEMA Preliminary Flood Insurance Rate Mapping impacting a substantial area the Township.

Stormwater Discussion

Uncontrolled land development can drastically alter the hydrologic cycle of a site and, ultimately, an entire watershed. In a pre-developed condition, existing native vegetation acts to intercept precipitation and runoff on the site and draws that portion of this precipitation into the ground towards the root zone. A portion of this intercepted rainfall is then returned back to the atmosphere through plant evapotranspiration. Natural micro-topography of the land's surface creates depressions and gullies where accumulated rainfall temporarily collects as the infiltrative properties of the undisturbed soils allows this collected water to infiltrate back into the ground where it is stored as base flow for adjacent streams and ponds. In a developed condition, this beneficial vegetation and the natural makeup of the topography and soil composition is usually removed. The mature growth vegetation is replaced with lawns or impervious cover, the natural imperfection of the landscape is graded to remove the natural depressions and the undisturbed soil properties allowing infiltration are removed through construction disturbance and compaction. All of these processes experienced during typical construction operations can and do have a negative effect on the normal hydrologic cycle and affects runoff quantity, runoff quality and the recharge potential of lands within a watershed.



Source: New Jersey Geological Survey Report GSR-32.

Figure C-1: Groundwater Recharge in the Hydrologic Cycle

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, uncontrolled 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, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, and nutrients.

Uncontrolled land development activities can also adversely impact 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.

Background

Pequannock Township encompasses approximately 7 square miles (4,500 acres) generally located in the northeastern corner in Morris County, New Jersey. The Township has a population that has fluctuated between 14,500 and 15,500 from the 1970's to 2020. The municipal limits are reflected on a USGS Quadrangle Map incorporated as Figure C-3 in this report. The Township is predominantly developed in a residential suburban character, with commercial corridors along Route 23, the northern end of West Parkway and Newark-Pompton Turnpike. It is bordered by the Borough of Riverdale to the north, the Borough of Kinnelon to the west, the Borough of Lincoln Park to the South, and the Borough of Pompton Lakes and Township of Wayne in Passaic County to the east.

The topography of Pequannock can best be described as predominantly 'flat'. The only substantial increases in elevation occur proximate to the Rt. 287 corridor and along the northwestern corner of the Township. The Township generally slopes towards the Pequannock and Pompton Rivers to the southeast, as well as the East Ditch to the west. The lack of vertical change in town and the existing State Open

Waters noted above has resulted in significant numbers of properties being located within Special Flood Hazard Areas. A Preliminary Flood Insurance Rate Map, generated by FEMA in 2017, has resulted in the depiction of an extensive expansion of the Floodways of both of these waterways, severely impacting the potential development and redevelopment potential of those areas of town.

Aside from the boundary Pompton River and Pequannock Rivers, there are eleven (11) locally named waterways in Pequannock, as follows, and as shown in Figure C-2:

1. Beaver Brook (East Ditch tributary)
2. East Ditch
3. Harrison Ditch (Pequannock River tributary)
4. Henderson Ditch (Pompton River tributary)
5. Jefferson Ditch (Henderson Ditch tributary)
6. Lucy Ditch (East Ditch tributary)
7. De Mott's Brook (Madison Ditch)
8. Mountain Ditch (East Ditch tributary)
9. River Road Ditch (Pompton River tributary)
10. Town Hall Ditch (Twin Brooks tributary)
11. Meyer's Brook & Spring Brook (Twin Brooks)
12. West Ditch

None of the waterways are classified as Category 1 waters or tributaries to same. None of the Township's waterways are classified as FW-2-Non-trout Category 1, the classification for which special resources protection areas have to be provided.

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.

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. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

A Total Maximum Daily Load (TMDL) is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody 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 nonpoint 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 stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

All of the waterways on the east side of the Township are present in the Pompton River Watershed and are identified as "Watershed: 19 Pompton River WMA 3(M)" in New Jersey's 1998 List of Water Quality Limited Waterbodies and Their Corresponding Ranking for TMDL Determinations". The Pompton River,

which forms the easterly border of the Township, is moderately impaired. The data show that the instream total phosphorus concentrations and fecal coliform concentrations of the Pompton River frequently exceed the state's criteria. This means that this river is an impaired waterway and the NJDEP is required to develop a (TMDL) for these pollutants for this waterway.

At the time of the initial MSWP, there was one (1) property (Plains Plaza) with an NJPDES permit for the discharge of treated effluent to the Pompton River. That property has since constructed a pump station that now sends sanitary sewage to the Wayne Township sanitary system. That construction has eliminated the only point discharge of sanitary sewage from the Township of Pequannock. The remaining NJPDES permits in the Township are for the sanitary subsurface disposal at commercial properties, for the on-site wastewater treatment systems of the various dental facilities in town and various stormwater discharge permits. The Township is currently pursuing the installation of sanitary sewers along the Route 23 commercial corridor. Once completed, the properties within the affected area will be required to abandon their existing septic systems and connect to the new public utility. These actions should result in a potential reduction in fecal coliforms as well as a reduction in a modest reduction of base flows to the Pompton River. Accordingly, the Township is in conformance with our requirements as it relates to phosphorus and fecal coliform discharges.

As noted earlier, the Township has a generally 'flat' topography, which, when coupled with the adjacent waterways, results in the establishment of Special Flood Hazard Areas and Floodways. The impact of the various major storms occurring in the last sixty five (65) years is such that the drainage courses tributary to these major waterways back up from the floodwaters rising is the same. When these waters eventually recede, it is gradual with relatively little damage to the drainage courses and stormwater management system itself.

Despite the relatively high imperviousness of the Township, the base flows in streams do not appear to be significantly impacted, due in part to the prevalence of septic systems in town. Lower base flows can have a negative impact on instream habitat during the summer months. A map of the wellhead protection areas, also required as part of the MSWMP, are shown in Figure C-5.

As discussed in the initial MSWMP, the amount developable land area in the Township was fairly limited, with the bulk of the available, unconstrained land already developed. A vacant land analysis has now been prepared, with the result of there being 0.18 square miles of vacant land available for development (see attached Figure C-6). Accordingly, a "build-out" analysis is not required. The plan also addresses the recent adoption of the updated NJDEP Model Stormwater ordinance, the Township Master Plan, and other planning documents to allow for project designs that include low impact development techniques and 'green infrastructure'. As the Township of Pequannock has never issued any variances or exceptions to the stormwater design and performance standards of the Township Stormwater Ordinance, a mitigation plan is not required or included. All major developments are required to address their stormwater management obligations on their site.



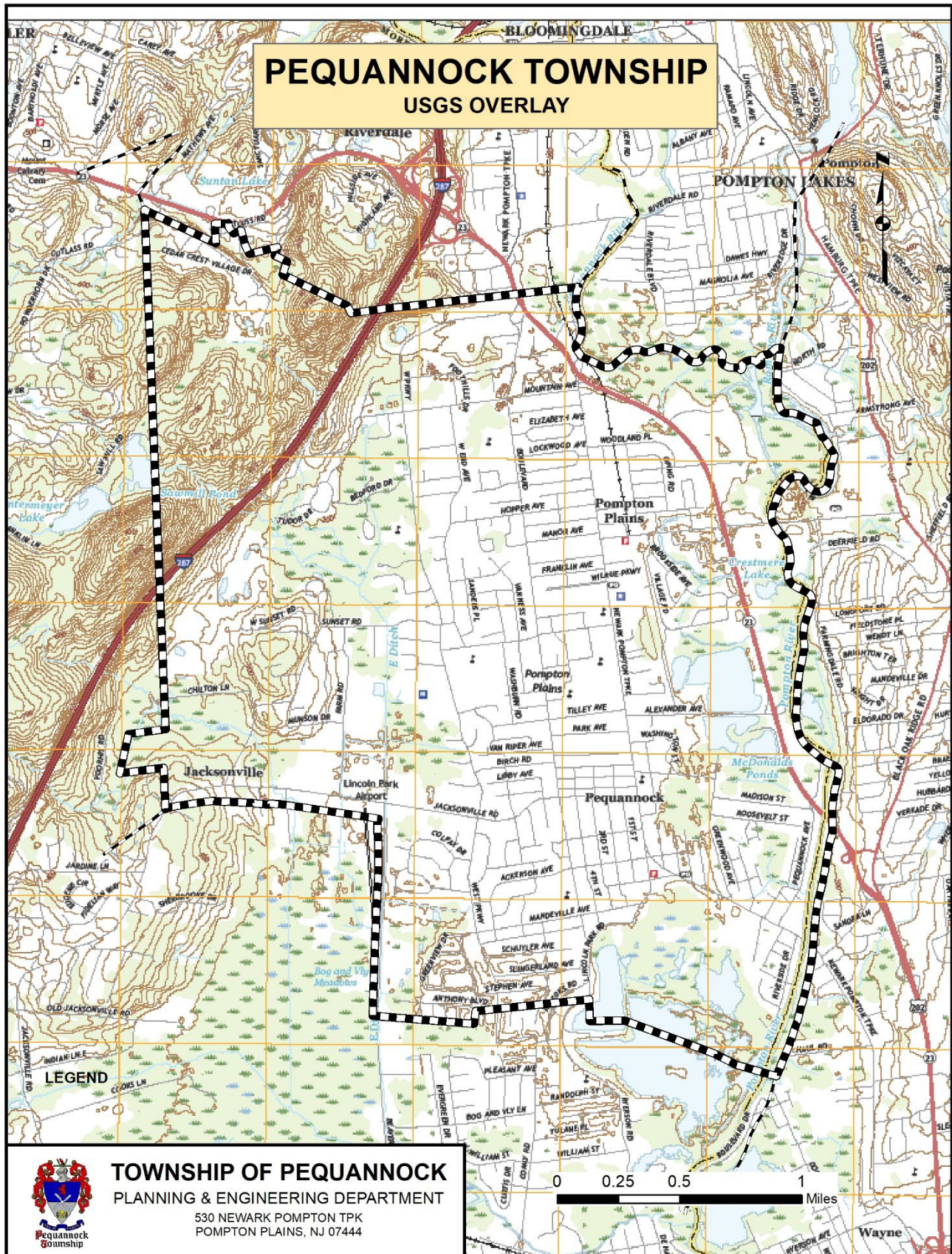


Figure C-3: Township Boundary on USGS Quadrangles

PEQUANNOCK TOWNSHIP

WELLHEAD PROTECTION MAP

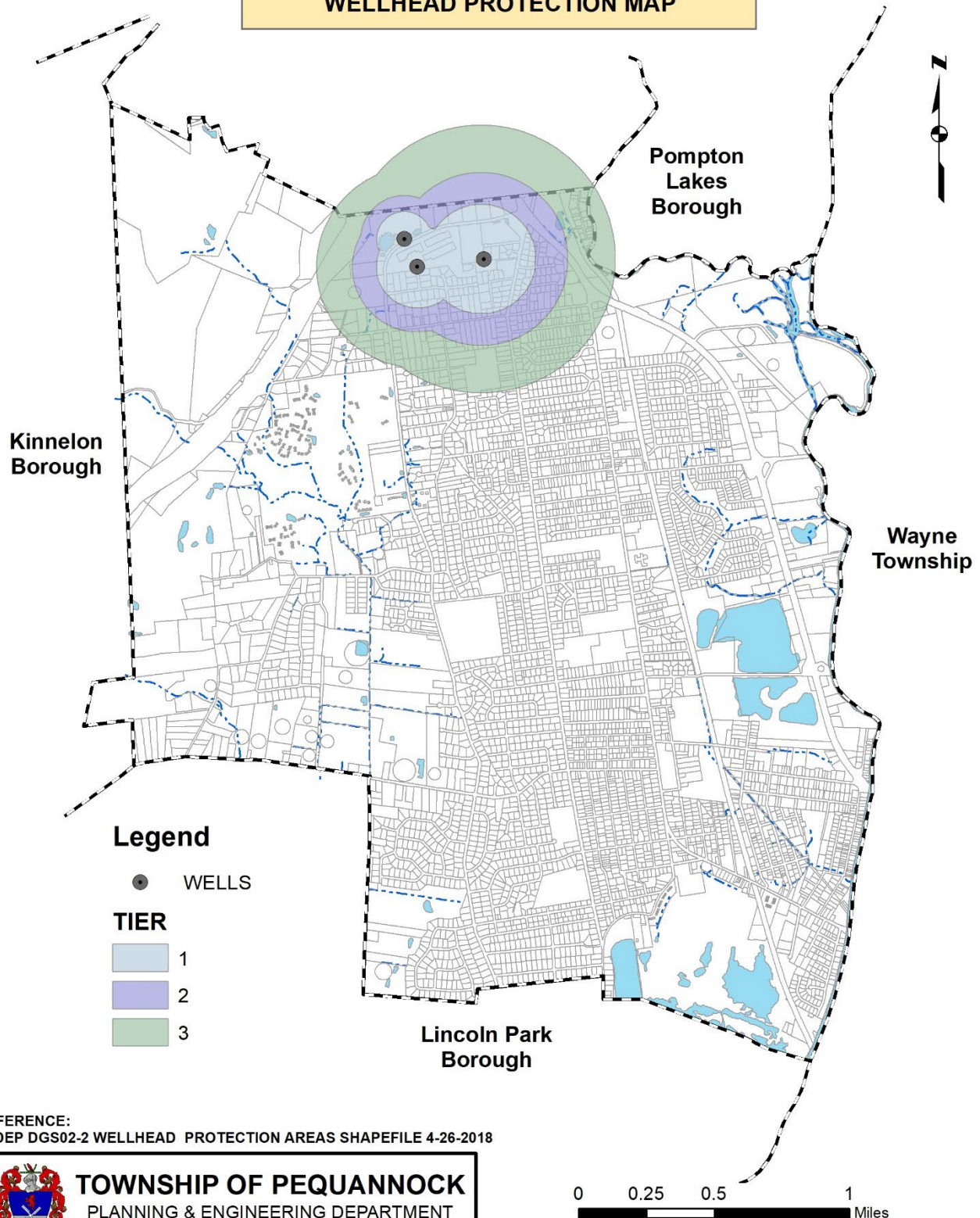


Figure C-4: Wellhead Protection Areas in the Township

Design and Performance Standards

The Township has adopted the most recent 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 Township has also adopted a more stringent requirement for stormwater associated with residential additions that would not be subject to the State standards. All new roof areas of 400 square feet or more now require the installation of subsurface recharge facilities.

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 and no TMDLs have been developed for waters within the Township; accordingly, this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent. There are TMDL's associated with both the Pompton and Pequannock Rivers, which form the easterly municipal boundary of Pequannock. Those waterways have been identified as being impacted by both fecal coliforms and phosphorus.

In order to remedy the indicated impairments, sources of increased levels of fecal-coliform and phosphorus must be assessed. The contributing sources include point discharges from sanitary sewer treatment facilities, which are absent in Pequannock. Animal wastes, such as from domestic animals and resident Canadian geese also contribute to stormwater driven loadings. The Township has enacted and enforces its Pet Waste ordinances to address the domestic animal wastes and a Wildlife Feeding ordinance for geese and other wildlife. None of the agricultural uses in town include livestock, so there are no farmland associated fecal coliform issues.

In response to unacceptably high fecal coliform counts at the Township's Public swimming area (Woodland Lake/PV Park) that resulted in lake closures, beginning in 2015, the Township has pursued both lethal and non-lethal goose management programs to control the resident Canadian goose population. The results of the management programs have drastically reduced the water quality induced lake closures. The required NJDEP permitting is applied for and maintained along with all required report submittals in the DPW offices.

Other means of indirectly addressing this TMDL include the distribution of the annual Pet Waste notices, public education associated with septic system operation and maintenance, and adherence to the recently adopted stormwater management ordinance in regards to water quality.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) at N.J.A.C. 5:21. The municipality utilizes 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, Morris County Soil Conservation District employees and municipal inspectors observe on-site soil erosion and sediment control measures and any inconsistencies are addressed by the Morris County Soil Conservation District.

Nonstructural Stormwater Management Strategies

With the adoption of the most current NJDEP Model Stormwater Ordinance, the Township is effectively implementing the principles of nonstructural stormwater management techniques. At this time, the Township is in compliance with the State requirements.

Land Use/Build-Out Analysis

A detailed land use analysis for the Township has been conducted. The result of this analysis is that there is less than one (1) square mile of barren, unencumbered land available for development. Accordingly, a build-out analysis is not required. 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.

It should be noted that while the Township does have active agricultural parcels, the bulk of that land area is covered with greenhouses, warehousing and other impervious coverage. The current uses within the AG zones contrast with the typical vision of rolling fields of planted cropland. The Township zoning ordinance has recently been amended to reflect the existing impervious coverages of these lots as a means of encouraging their continued agricultural utilization.

PEQUANNOCK TOWNSHIP BUILD OUT ANALYSIS

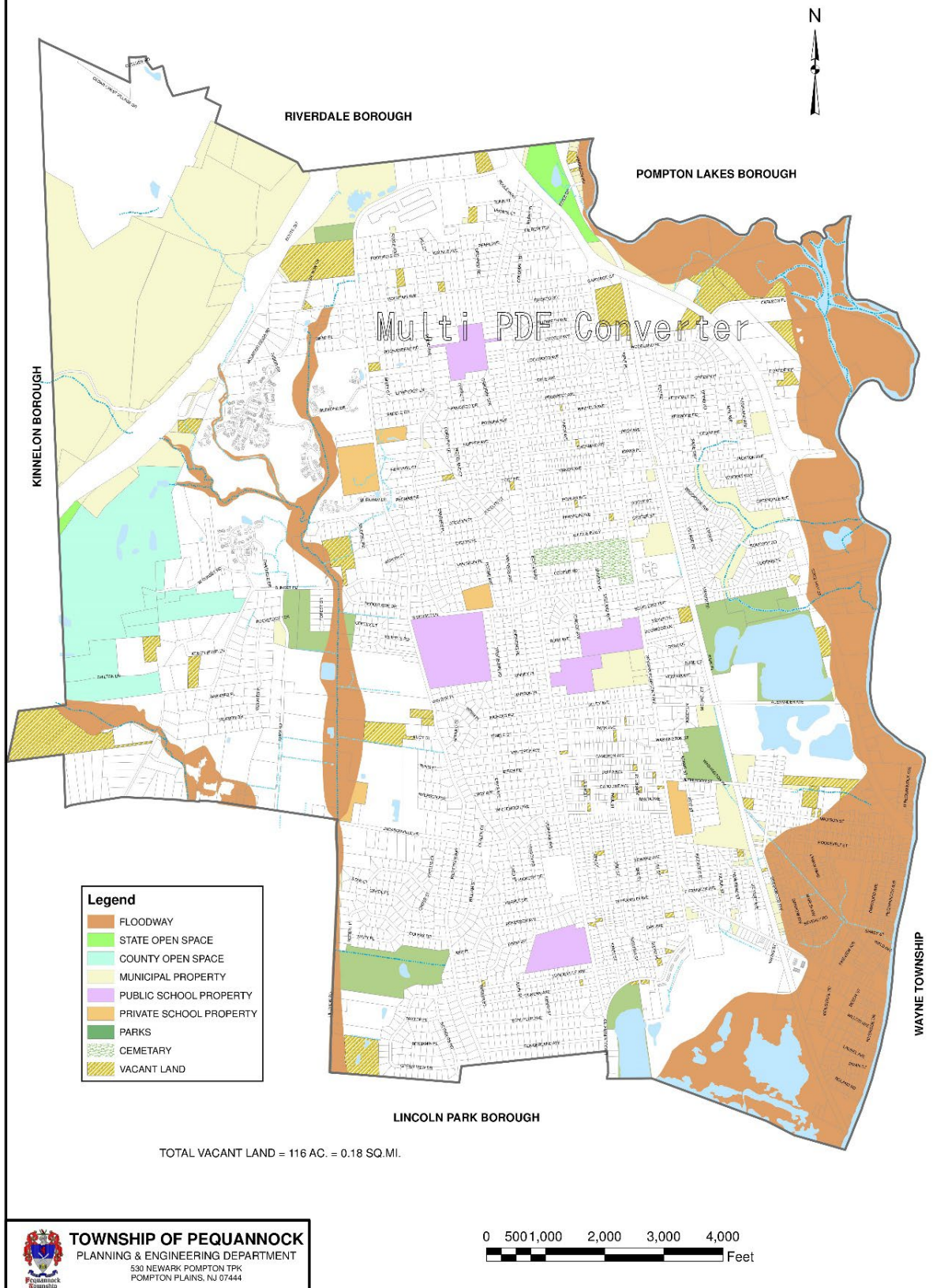


Figure C-5: Township's Existing Land Use/Build Out Analysis

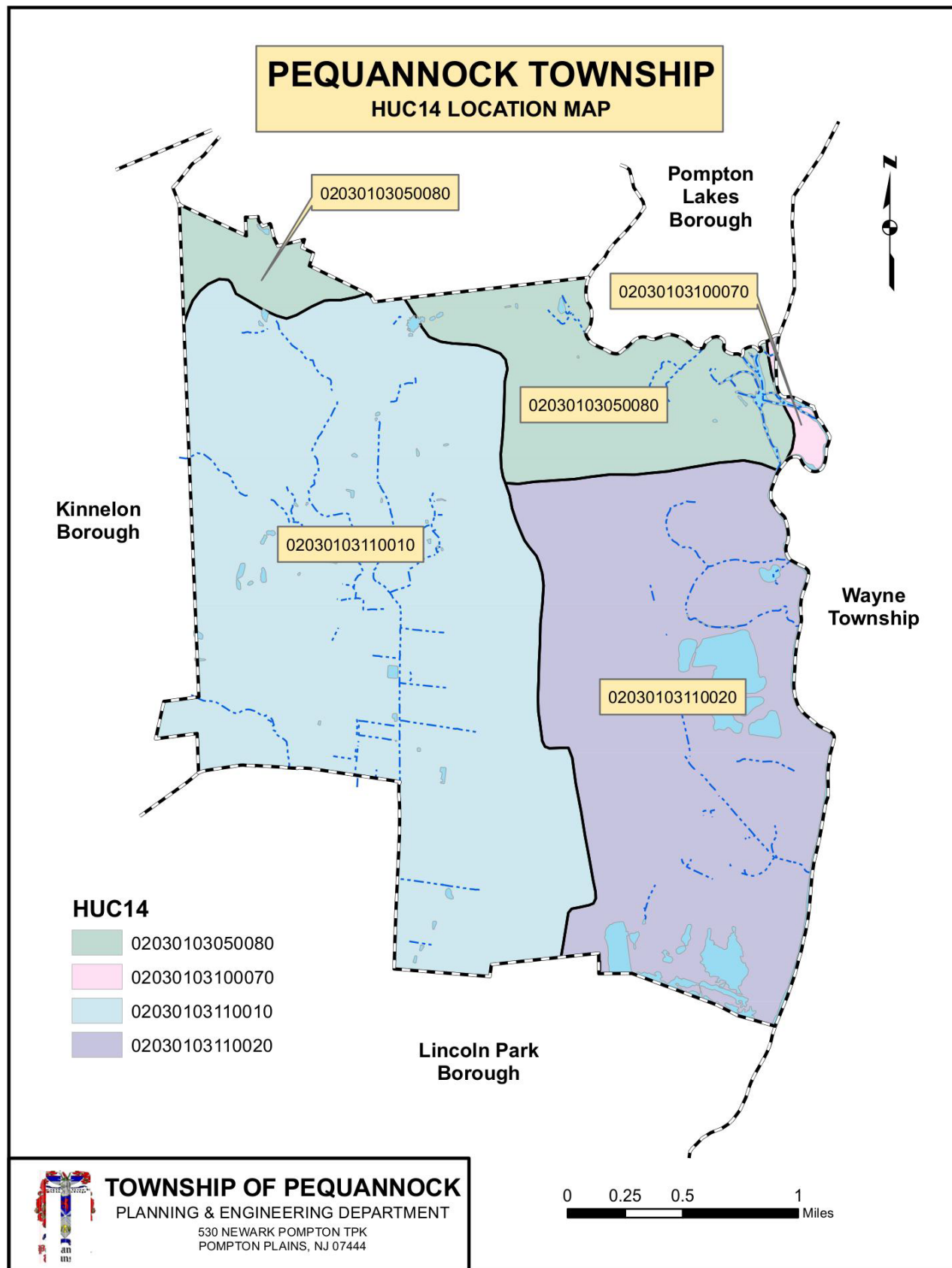
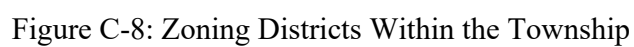
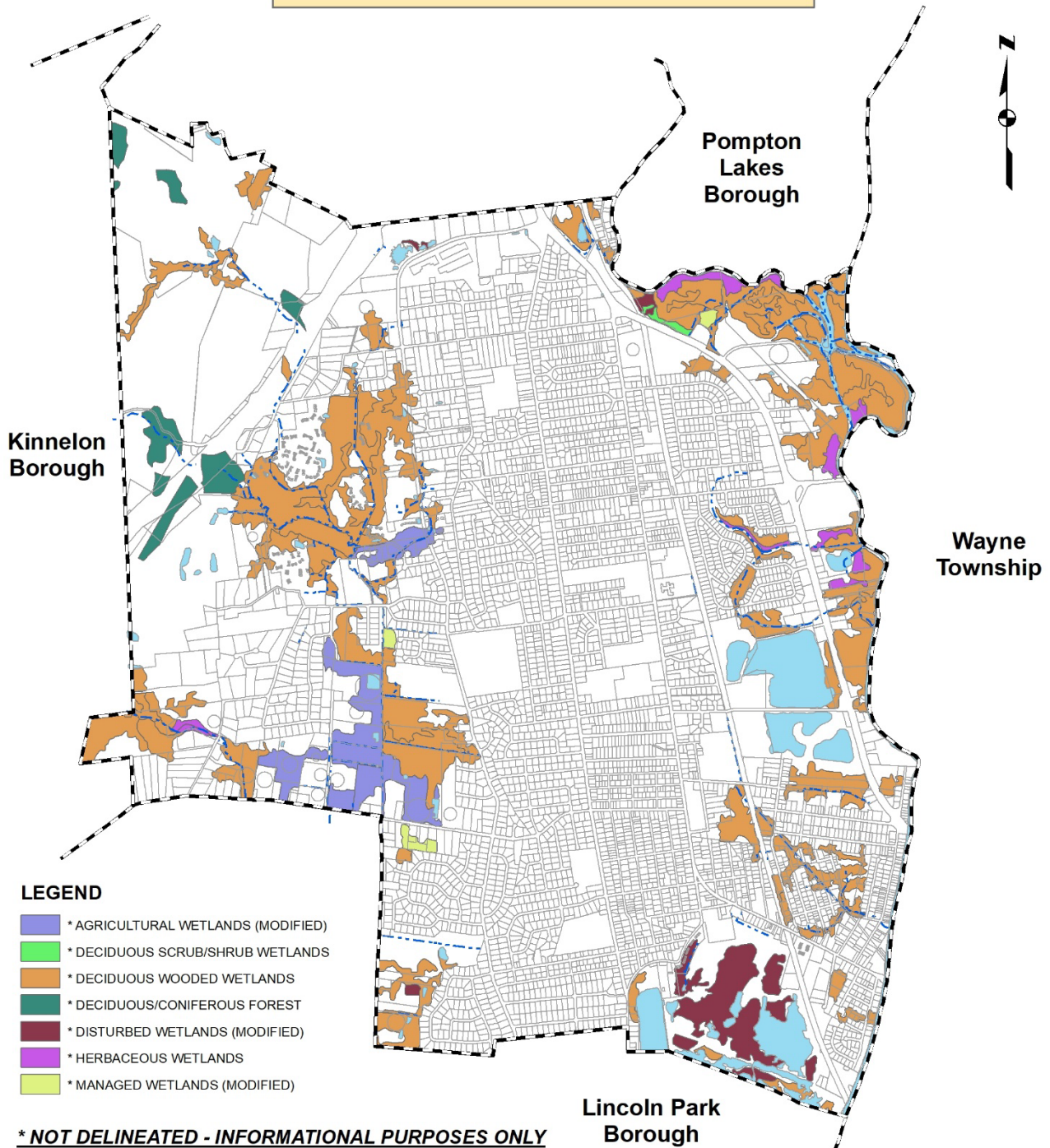


Figure C-7: Hydrologic Units (HUC14s) Within the Township



PEQUANNOCK TOWNSHIP

WETLANDS MAP *



TOWNSHIP OF PEQUANNOCK
 PLANNING & ENGINEERING DEPARTMENT
 530 NEWARK POMPTON TPK
 POMPTON PLAINS, NJ 07444

0 0.25 0.5 1 Miles

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

Land Cover	Total Phosphorus Load (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	0.6	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
Barren land/Transitional Area	0.5	5	60

Source: NJDEP Stormwater BMP Manual 2004.

Table C-2: Pollutant Loads by Land Cover

Mitigation Plans

As noted early in this Plan, the Township of Pequannock has never granted a variance or exception to any major development that required stormwater management. All developments have met or exceeded the stormwater management design and performance standards on site.

Based on the prevalence of suitable soils throughout the Township, there does not appear to be a need for any specific mitigation area or projects for the foreseeable future.