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Municipal Stormwater Management Plan

For the Town of Hackettstown
Warren County, New Jersey
February 2005
Adopted March 22, 2005

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MC Project No. HKT-074

The original of this report was signed and sealed in accordance with N.J.S.A. 45:14a-12

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Town of Hackettstown ("the Town") to address stormwater-related impacts. The creation of this plan is required by NJAC 7:14A-25 Municipal Stormwater Regulations. This plan contains all of the required elements described in NJAC 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 or increases impervious coverage by one – quarter acre or more. 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 Town 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;

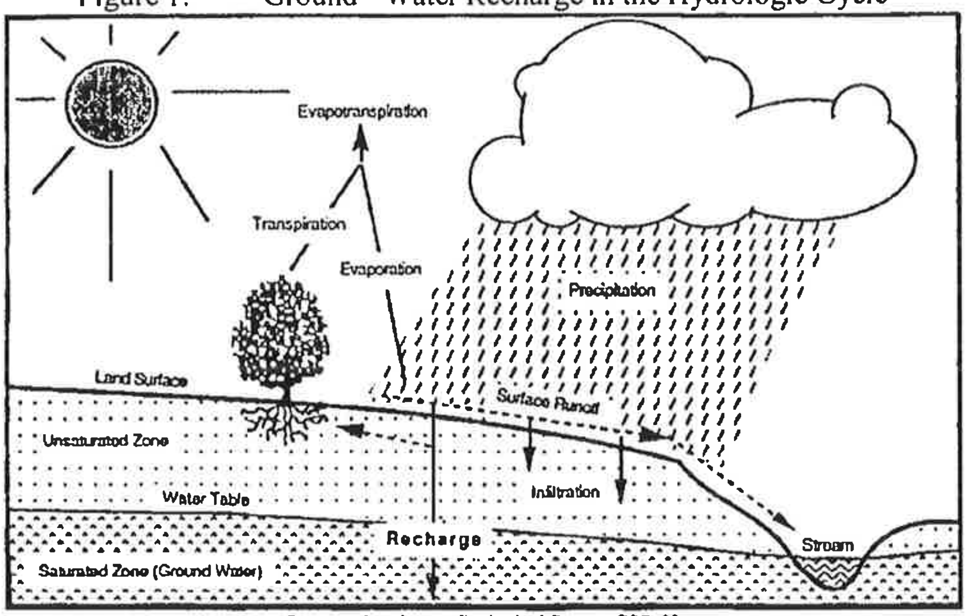
- prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, 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.

In addition to the above goals, the Town's Master Plan Reexamination (adopted July 24, 2001) noted that municipal stormwater management design standards underwent a comprehensive revision in the early 1990s. To achieve stormwater management objectives, 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 this 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 1) of a site and, ultimately, the entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw from 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, 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 fluctuation between normal and storm flow rates, which 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 1: Ground - Water Recharge in the Hydrologic Cycle



Source: New Jersey Geological Survey GSR-32

In addition to increase 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 Town encompasses 3.5 square miles in Warren County, New Jersey. The population of the Town decreased slightly from 8,850 in 1980, to 8,120 in 1990, and then increased to 9,129 in 2000. This population increase has been the result of new single-family and multi-family residential development, which entailed changes in the landscape that have most likely increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure 2 illustrates the waterways in the Town. The Musconetcong River is a major waterway with Trout Brook and Hackettstown Brook as tributaries. The Musconetcong River flows along the eastern boundary of the Town and serves as the boundary between Warren County and Morris County. Figure 3 depicts the Town boundary on the USGS quadrangle map.

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 the benthic macroinvertebrate community dynamics. The *New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report* ("the 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

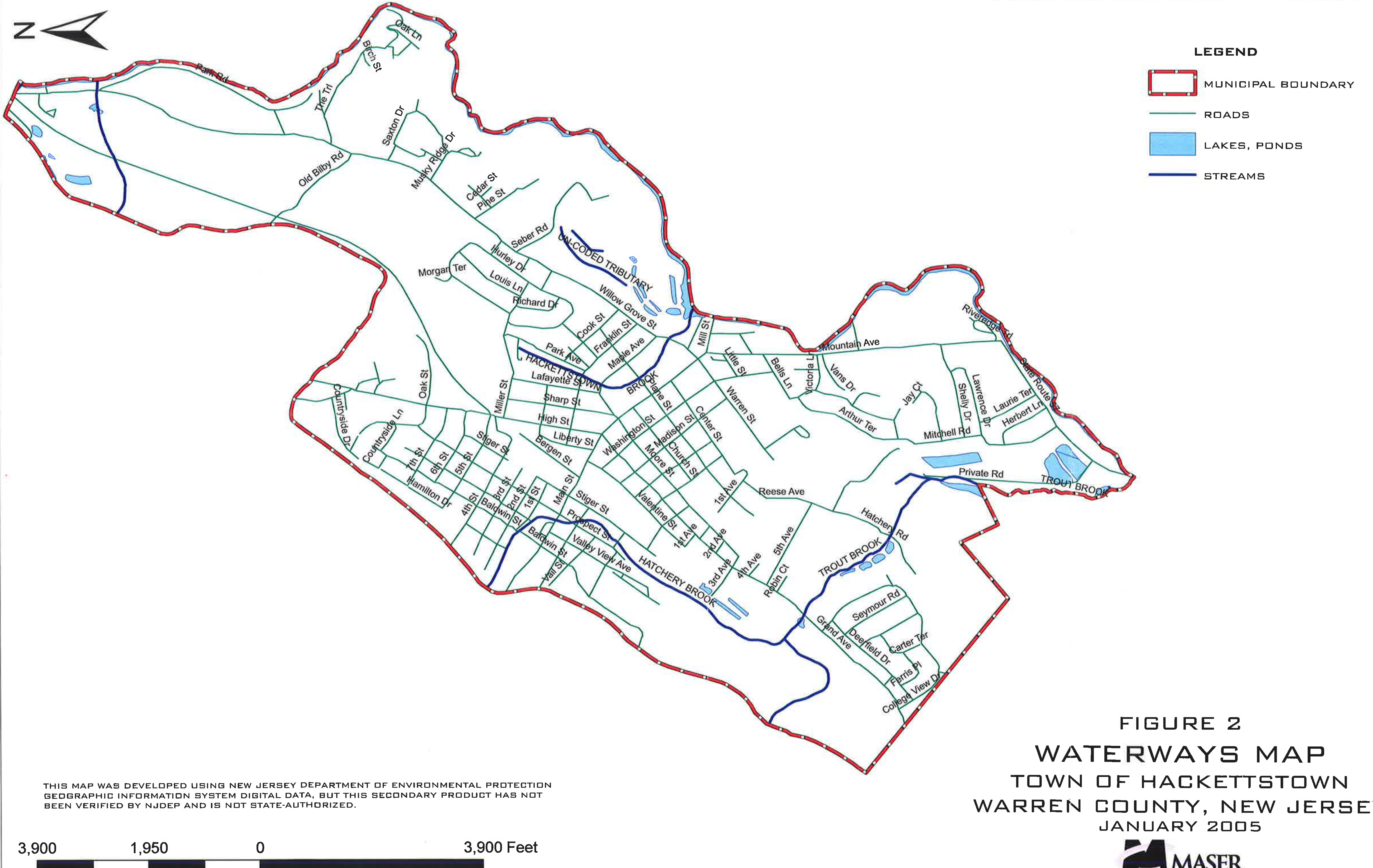


FIGURE 2

WATERWAYS MAP

TOWN OF HACKETTSTOWN

WARREN COUNTY, NEW JERSEY

JANUARY 2005

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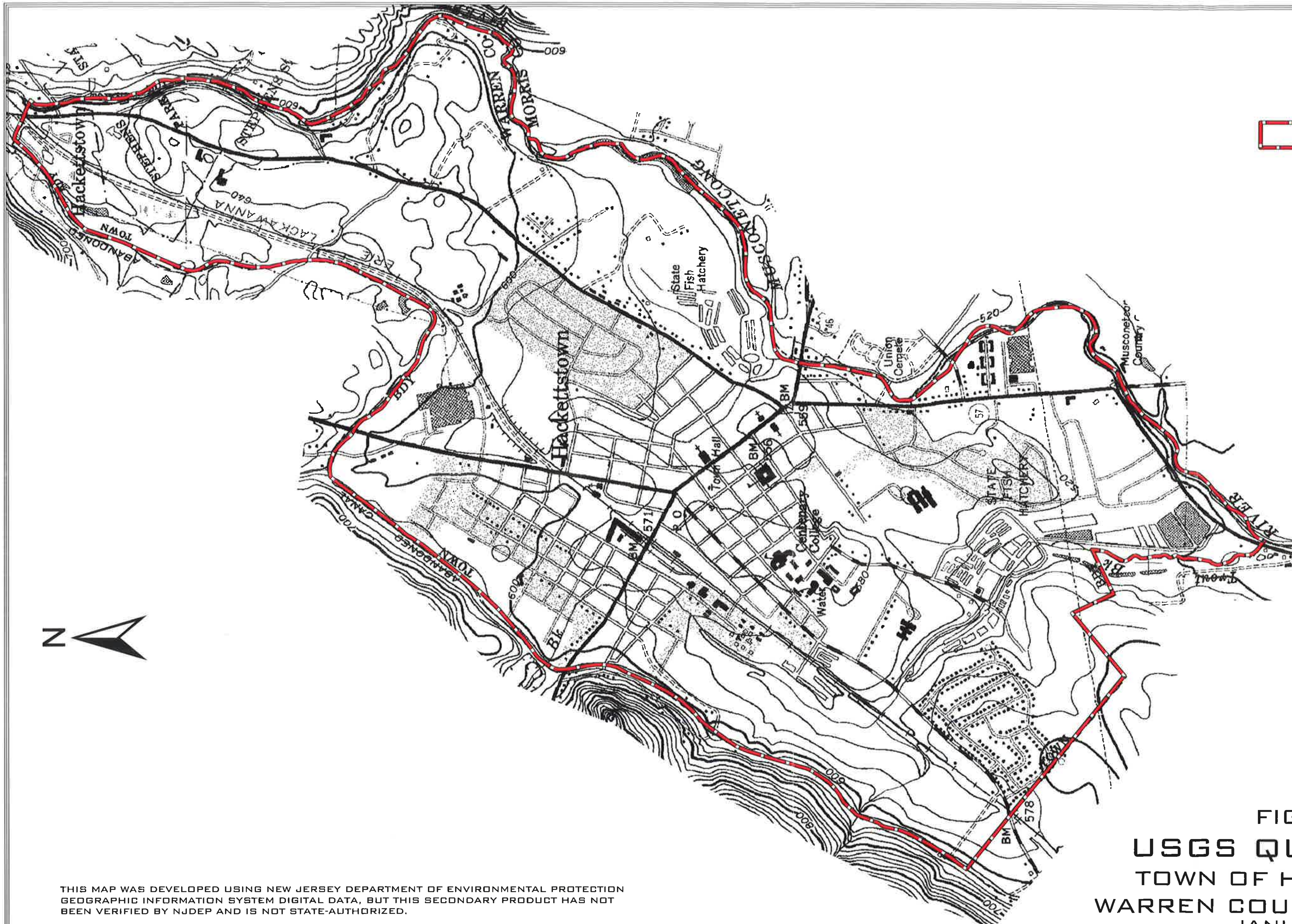
NJNCAD/HKT-074/FIG-2 WATERWAYS



LEGEND

MUNICIPAL BOUNDARY

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FIGURE 3

USGS QUADRANGLE

TOWN OF HACKETTSTOWN

WARREN COUNTY, NEW JERSEY

JANUARY 2005

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NJNCAD/HKT-074/FIG-3 USGS

pollutants, for which one or more Total Maximum Daily Load (TMDL) are needed. Table 1 shows the AMNET data for Sublist 5 items within the Town.

Table 1
Sublist 5 Items for the Town of Hackettstown

Station Name / Waterbody	Site ID	Parameters	Data Source
Musconetcong River at Beattystown	01456200, 1-MUS-3	Temperature, Arsenic	NJDEP/USGS Data, EWQ, Metal Recon
Trout Brook at Rt 57 in Hackettstown	AN0068	Benthic Macroinvertebrates	NJDEP AMNET

Source: *New Jersey 2004 Integrated Water Quality Monitoring and Assessment Report* prepared by NJDEP http://www.state.nj.us/dep/wmm/sgwqt/wat/integratedlist/docs/Appendix%201A%20Sublists%201-5.xls

The AMNET data show that the Musconetcong River and their tributaries may have an abnormal temperature, and unacceptable arsenic and benthic macroinvertebrates concentrations. Appendix 1B: Sublist 5 with Priority Ranking of the Report shows the development of a TMDL for arsenic is of high urgency, medium urgency for temperature and low urgency for benthic macroinvertebrates.

A 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.

The Town is almost fully developed. The existing land use, based on current GIS information from NJDEP, is shown in Figure 4. The existing zoning districts are shown in Figure 5. The groundwater recharge rates for native soils in the Town are generally between 16 and 22 inches annually. The average annual groundwater recharge rates are shown graphically in Figure 6.

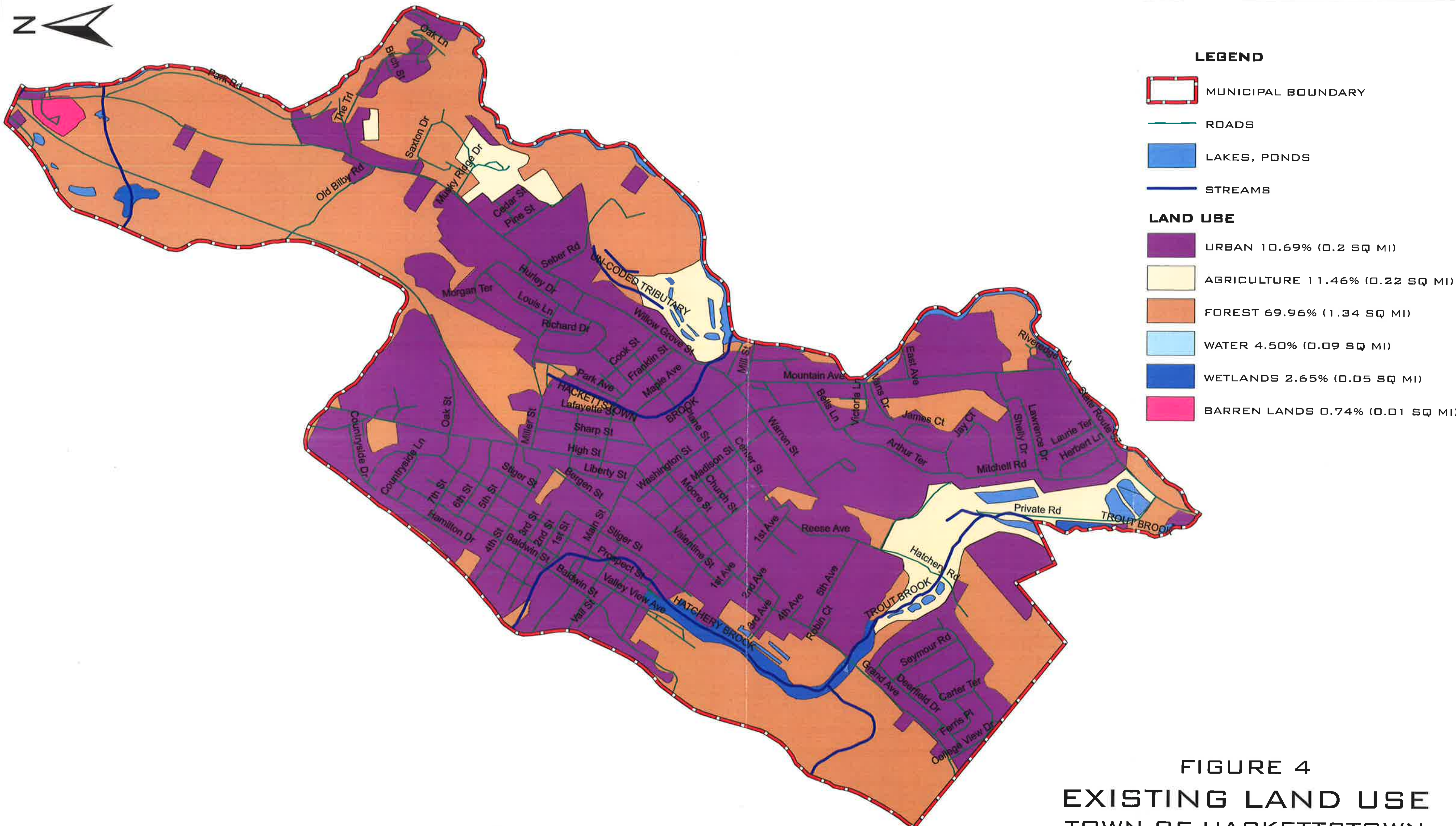

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FIGURE 4
EXISTING LAND USE
TOWN OF HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
JANUARY 2005

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NJNCAD/HKT-074/FIG-4 EXISTING LAND USE

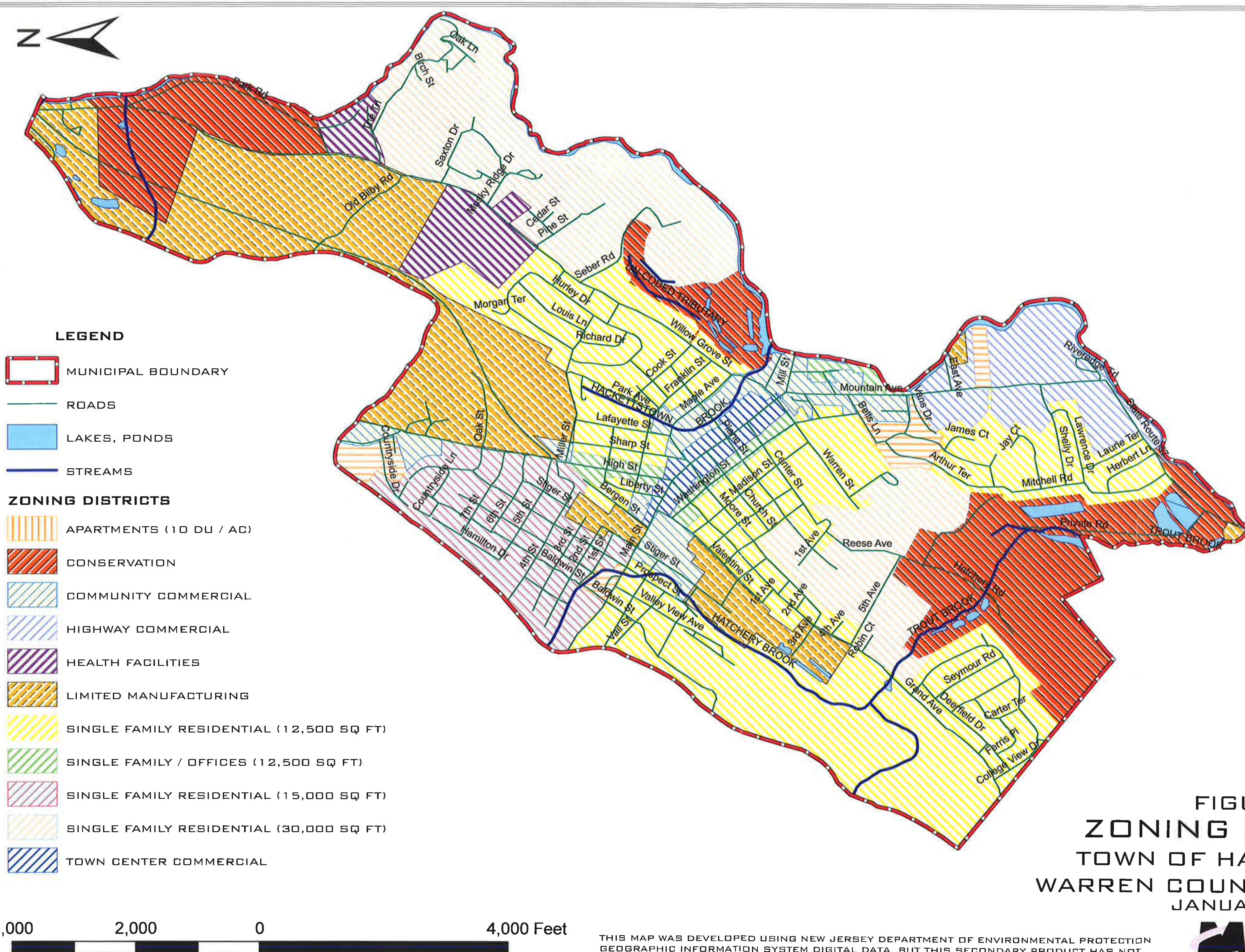

FIGURE 5
ZONING DISTRICTS
TOWN OF HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
JANUARY 2005

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NJNCAD/HKT-074/FIG-5 ZONING DISTRICTS

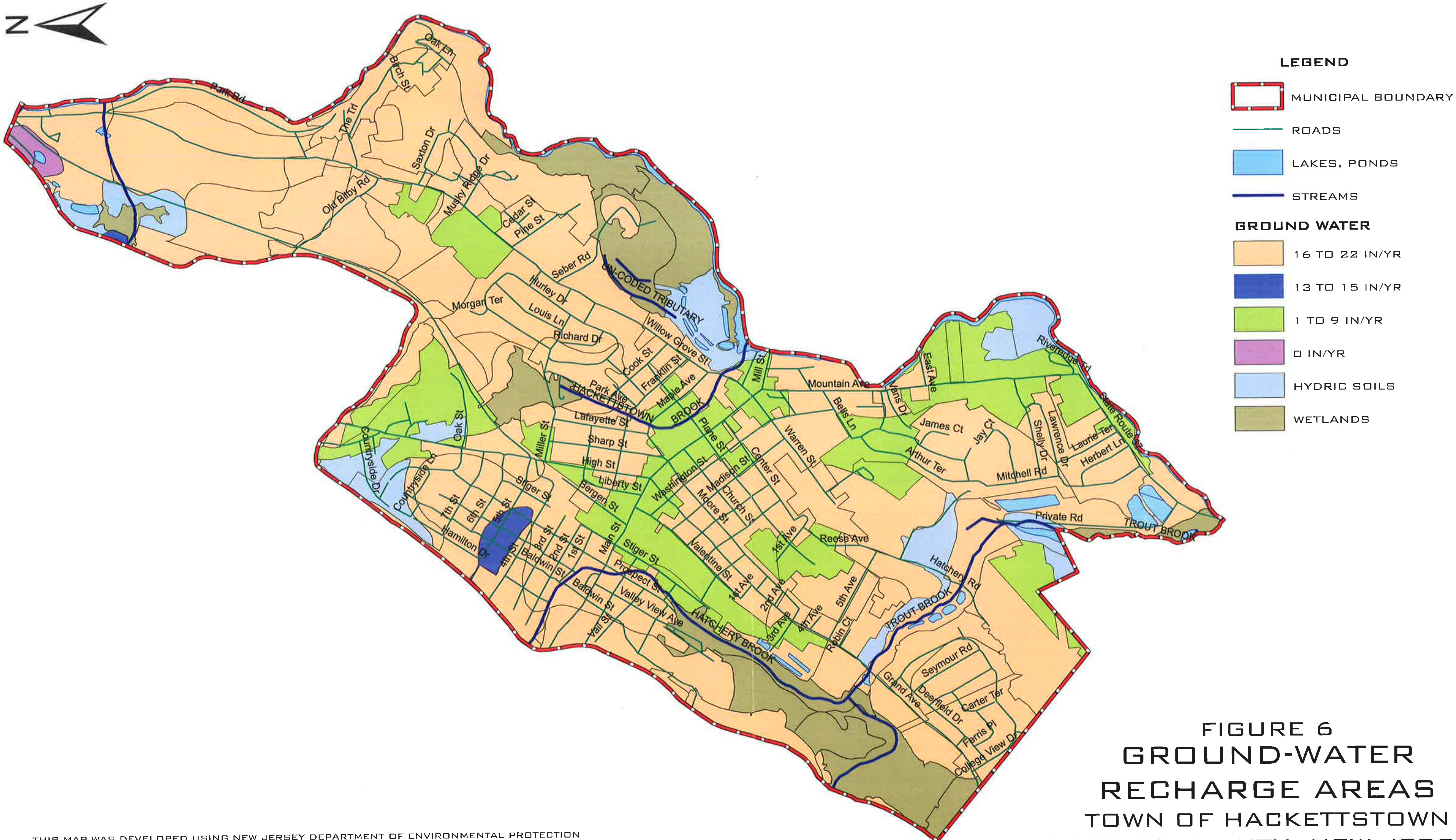

FIGURE 6
GROUND-WATER RECHARGE AREAS
TOWN OF HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
JANUARY 2005

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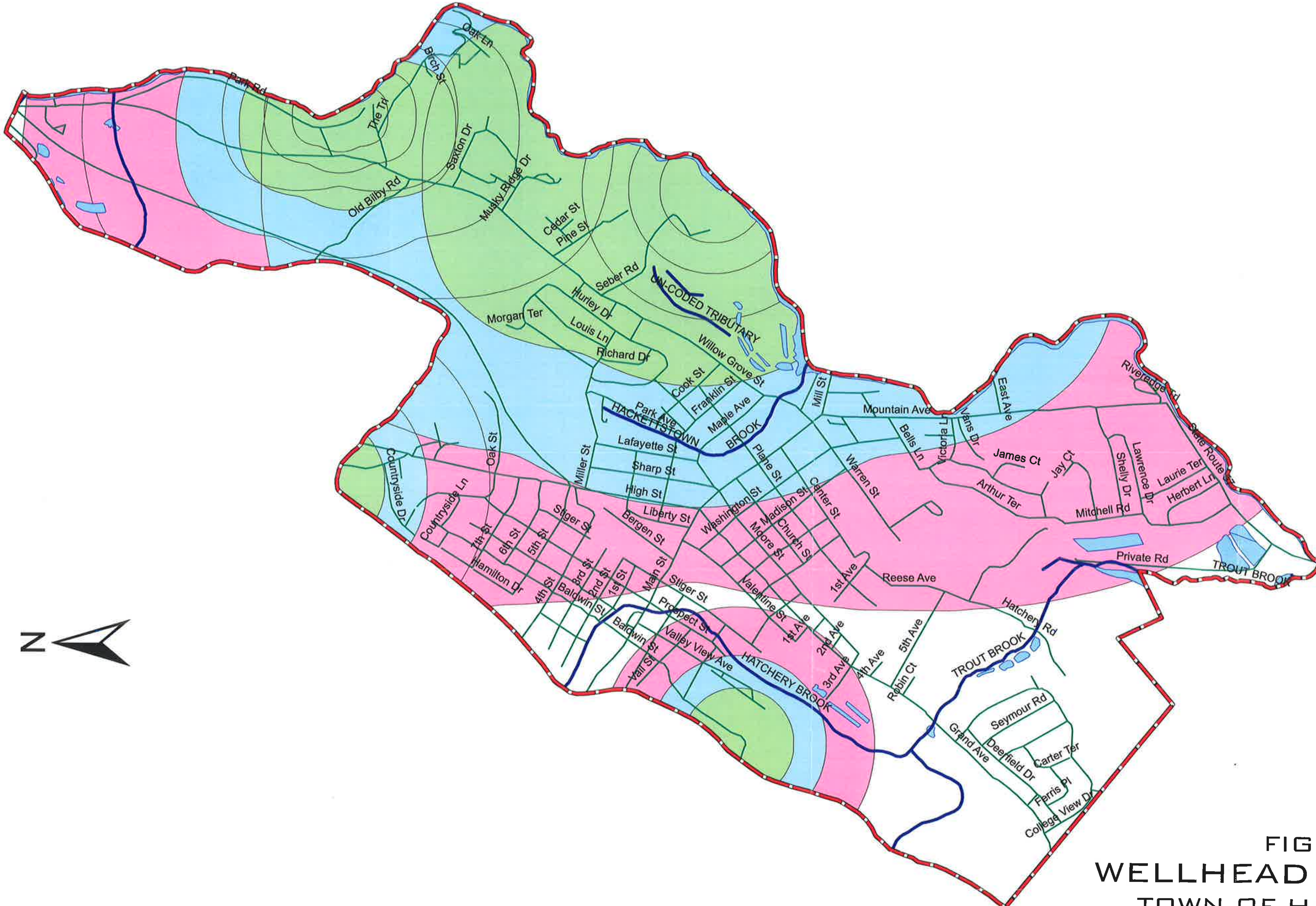
NJNCAD/HKT-074/FIG-6 GROUNDWATER RECHARGE

According to NJDEP, "A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) well in New Jersey that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two- (Tier 1), five- (Tier 2), and twelve- (Tier 3) year period of time for unconfined wells. The confined wells have a fifty foot radius delineated around each well serving as the well head protection area to be controlled by the water purveyor in accordance with Safe Drinking Water Regulations (see NJAC 7:10 – 11.7 (b)1)."

WHPA delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Area Protection Program (SWAP). The delineations are the first step in defining the sources of water to a public supply well. Within these areas, potential contamination will be assessed and appropriate monitoring will be undertaken as subsequent phases of the NJDEP SWAP. As shown in Figure 7, the Town is either in a Tier 1, Tier 2 or Tier 3 – wellhead protection area. This is due to the presence of HMUA (Hackettstown Municipal Utility Authority) wells in several locations in the Town.



LEGEND

- MUNICIPAL BOUNDARY
- ROADS
- LAKES, PONDS
- STREAMS

TIER

- TIER 1 (2 YEARS)
- TIER 2 (5 YEARS)
- TIER 3 (12 YEARS)

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FIGURE 7
WELLHEAD PROTECTION
TOWN OF HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
JANUARY 2005

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NJNCAD/HKT-074/FIG-7 WELLHEAD PROTECTION

Design and Performance Standards

The Town will adopt the design and performance standards for stormwater management measures as presented in NJAC 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 NJAC 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with NJAC 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, Town inspectors will observe the construction of site improvements, including drainage to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

The Town is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Town; therefore 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.

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

The Town'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, Town 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

The Town has reviewed the master plan and ordinances, and has provided a list of the sections in the Town land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. These are the ordinances identified for revisions. Once the ordinance texts are completed, they will be submitted to the county review agency 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 submissions.

Section 500 of the Town Land Development Ordinance, entitled General Provisions and Design Standards, was reviewed with regard to incorporating nonstructural storm water management strategies. The following standards are in place in this section:

Section 502 "Drainage" is a comprehensive listing of design standards intended to reduce peak rates of stormwater runoff, control erosion, and enhance water quality. The drainage standards cover 16 pages and were prepared in the early 1990s. The standards included sizing of culverts and piping, preservation of vegetation along drainage courses, and the design of detention and retention basins, swales, and other features.

These standards are to be replaced by the design and performance standards for stormwater management as per NJAC 7:8-5, the safety standards for stormwater management basins in NJAC 7:8-6 and the drainage design criteria in the RSIS (NJAC 5:21-7.1).

Section 505 "Lot Configuration" states that all lots shall be suitable for their intended use, giving particular attention to the suitability of a lot due to factors such as poor drainage conditions or flood conditions.

Section 506 "Natural Features" requires that all site plans and subdivisions be designed so as to minimize changes in existing grades and to preserve natural features such as soil fertility and existing vegetation, which aid in stormwater management. In addition, "critical areas" shall be preserved as undeveloped open space. Critical areas include NJDEP defined wetlands, significant trees, lands in the floodplain, steep slopes in excess of 25% as measured over a 10-foot vertical contour interval, habitats of rare and endangered vegetation and wildlife, and historically significant structures. In addition, in areas where existing vegetation is deemed insufficient, 12 trees per acre are required on single-family residential lots and gross tract areas, not including trees provided to meet buffer and street tree requirements.

Section 508 "Off-Street Parking, Loading Areas, and Driveways" requires parking lots to be buffered and landscaped. Buffers may include pervious landscape features like berms or screen plantings. Within the parking lot, at least 5% of the interior parking spaces must be landscaped with plantings, including one tree for every ten parking spaces. Plantings must be within protected areas. Furthermore, all parking areas must be provided with curbing or curb stops so that each parking and loading area has controlled entrances, exits, and drainage control. The Town would like curb cuts minimized.

This section will be amended to allow for flush curb with curb stops, or curbing with curb cuts to encourage developers to allow for the discharge of runoff from impervious areas into landscaped areas to reduce total suspended solids, lessen runoff rates, and encourage recharge. In addition, pervious paving materials will be permitted to minimize stormwater runoff and promote groundwater recharge.

Section 509 "Performance Standards For All Uses" prohibits the deposition of materials or waste on a lot where they may be transferred off the lot by natural causes or forces or where they can contaminate an underground aquifer.

Section 514 "Streets, Curbs, and Sidewalks" describes the requirements for streets within Town developments. It requires that all developments be served with paved streets. The Town has three street classification, "local," which has a minimum right-of-way of 50 feet (30 paved), "collector," which has a minimum right-of-way of 66 feet (40 paved), and "arterial," which has a minimum right-of-way of 80 feet (50 paved). Belgian block, granite, or concrete curbing is required along all streets.

Language will be added to this section to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces, or use permeable paving materials where appropriate. In addition, the street design criteria in the RSIS will be referenced since more flexibility in the cross-section of a street is offered. For example, curbs are not always required and can be replaced by roadside swales, which will help treat runoff and promote recharge.

Section 519 "Grading of Lots" requires that sites be graded to ensure proper drainage away from building foundations. When the terrain requires that stormwater be directed towards a building foundation, appropriate drainage measures such a swales and storm sewers shall be provided. The grade of land located within the dripline of a tree shall not be raised or lowered, or else tree wells and retaining walls must be provided.

This section will be amended to include language that requires land disturbance and clearing to be minimized and soil compaction to be limited.

Section 520 "Easements" requires that where a subdivision is traversed by a watercourse, drainageway, or channel, there must be provided a stormwater easement or drainage right-of-way, conforming substantially with the lines of such watercourse, and of width or construction, or both, as will be adequate for the purpose. Drainage easements around open ditches shall be a minimum of fifty feet wide in accordance with section 502. The Town currently prohibits improvements, including landscaping other than grass, within all drainage easement areas.

The section will be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species.

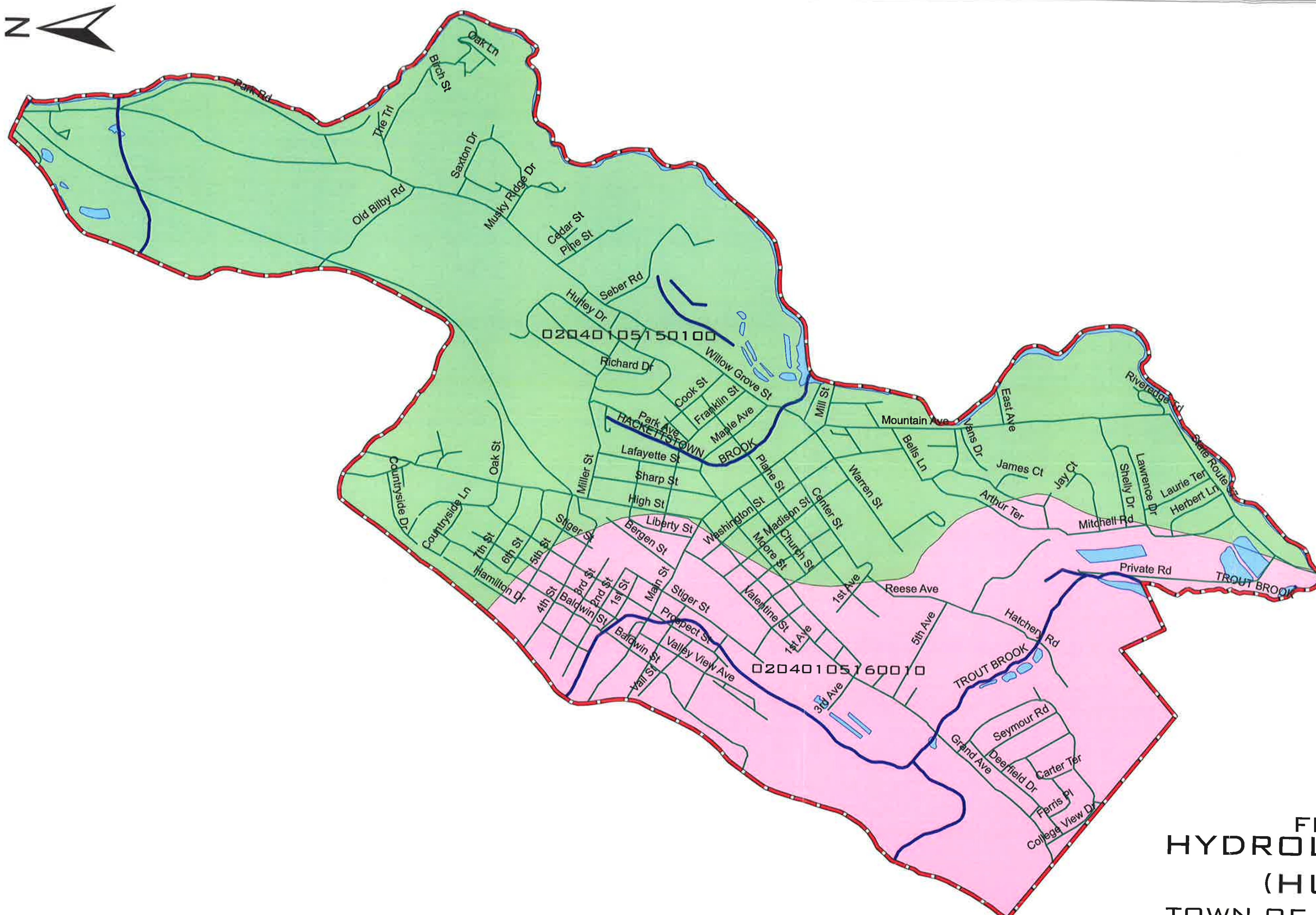
Section 523 "Landscaping Standards" states that in the area of all cuts and fills or terraces, landscaping shall be sufficient to prevent erosion, and that all roadway side slopes steeper than one foot vertically to three feet horizontally shall be planted with appropriate ground cover.

The section will be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species. Language will also be added that requires land disturbance, clearing and soil compaction to be minimized.

Section 524 "Morris Canal" indicates the Morris Canal has environmental importance as a drainageway, a water retention basin, and as a portion of valuable natural area watersheds, and prevents any activities which may damage the canal or interfere with its function.

Land Use / Build – Out Analysis

A detailed land use analysis for the Town was conducted. Figure 4 illustrates the existing land use in the Town based on current GIS information from NJDEP. Figure 8 illustrates the HUC14s within the Town. The Town zoning map is shown in Figure 5. Figure 9 illustrates the wetlands within the Town. The build-out calculations for impervious coverage are shown in Table 2. The Total Acres, Existing Impervious (%), Existing Impervious (Acres), Critical Areas (Acres), and Existing Developed Areas (Acres) were provided by the Warren County Planning Department. It is important to note that this Build – Out Calculation provides only an estimate for potential additional impervious coverage. A portion of the critical areas has been developed, thus the remaining developable areas may also be somewhat underestimated and the total of Critical Areas (Acres) and Existing Developed Areas (Acres) may exceed the Total Acres of a given zone within a HUC14 location. Under this circumstance, a negative number appears in the Remaining Developable Areas (Acres) column, which leads to the assumption of no additional impervious coverage will result. A more accurate build – out analysis would require consideration of the amount of developed lands within critical areas. In any case, when developing agricultural and forestlands, the build-out of these HUC14s will result in a significant increase in impervious surfaces.



LEGEND

- MUNICIPAL BOUNDARY
- ROADS
- LAKES, PONDS
- STREAMS

HUC 14s

- 02040105150100
- 02040105160010

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FIGURE 8
HYDROLOGIC UNITS (HUC 14s)
TOWN OF HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
JANUARY 2005

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NJNCAD/HKT-074/FIG-8 HUC14

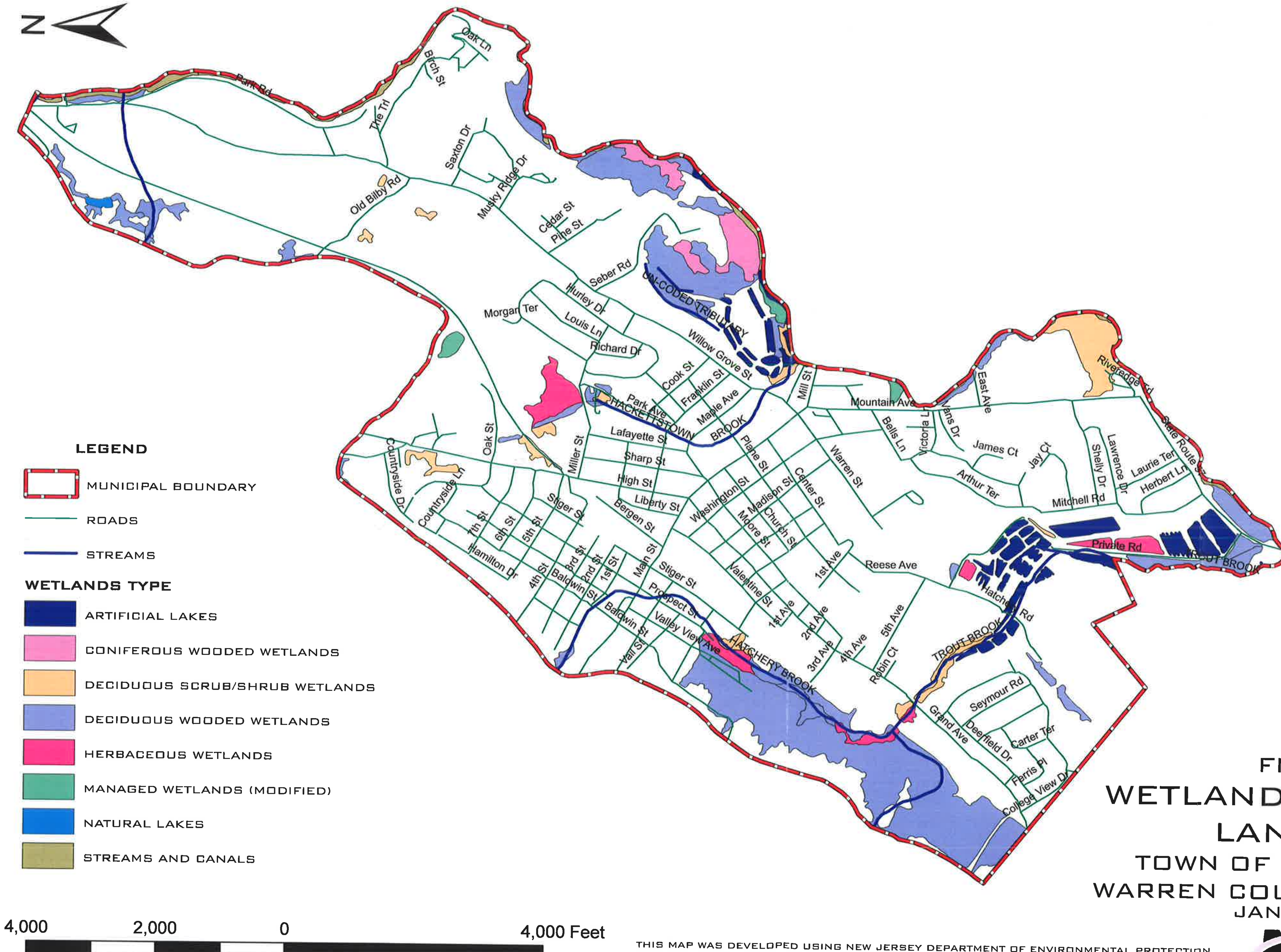

FIGURE 9
WETLANDS AND WATER LAND USES

TOWN OF HACKETTSTOWN
WARREN COUNTY, NEW JERSEY
JANUARY 2005

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NJNCAD/HKT-074/FIG-9 WETLANDS AND WATER LAND USES

Table 3 presents the pollutant loading coefficients by land cover. The pollutant loads at full build-out are presented in Table 4.

Table 2: Build – Out Calculations for HUC14s

HUC14 and Zone*	Total Acres*	Existing Impervious (%)*	Existing Impervious (Acres)*	Critical Areas (Acres)*	Existing Developed Areas (Acres)*	Remaining Developable Areas (Acres) [1]	Allowable Impervious (%) [2]	Build-Out Impervious (Acres) [3]
2040105150 - Musconetcong R (Trout Bk to SaxtonFalls)								
APT	39.652	0.619	24.535	15.326	38.278	(13.952)	0.750	0.000
C	169.019	0.014	2.344	72.861	5.484	90.674	0.100	9.067
CC	67.333	0.501	33.703	12.895	61.066	(6.628)	0.700	0.000
HC	111.959	0.555	62.083	69.081	87.964	(45.086)	0.700	0.000
HF	65.961	0.296	19.544	12.031	35.707	18.223	0.750	13.667
LM	328.286	0.183	59.969	40.347	100.366	187.573	0.750	140.680
R-12.5	325.968	0.298	97.220	3.720	311.386	10.862	0.300	3.259
R-12.5/OFF	31.524	0.418	13.186	6.648	29.669	(4.793)	0.550	0.000
R-15	82.290	0.294	24.154	0.648	80.637	1.005	0.300	0.302
R-30	284.936	0.083	23.582	96.477	91.289	97.170	0.150	14.576
TCC	27.905	0.763	21.304	0.000	27.904	0.001	1.000	0.001
Totals	1,534.833		381.624	330.034	869.750	405.507		181.551
2040105160 - Musconetcong R (Hances Bk thru Trout Bk)								
APT	5.105	0.653	3.335	0.000	5.106	(0.001)	0.750	0.000
C	201.372	0.090	18.191	114.045	44.833	42.494	0.100	4.249
CC	22.107	0.689	15.221	0.000	22.107	0.000	0.700	0.000
LM	58.446	0.410	23.961	9.560	41.776	7.110	0.750	5.332
R-12.5	394.569	0.182	71.905	158.522	231.384	4.663	0.300	1.399
R-12.5/OFF	5.060	0.676	3.419	0.000	5.038	0.022	0.550	0.012
R-15	78.265	0.286	22.392	1.079	74.592	2.594	0.300	0.778
R-30	99.935	0.252	25.159	9.282	94.273	(3.620)	0.150	0.000
TCC	5.286	0.896	4.735	0.000	5.286	0.000	1.000	0.000
Totals	870.145		188.318	292.488	524.395	56.883		11.771
Total Existing Impervious Coverage			**569.942**	**Potential Additional Impervious Coverage**				**193.322**

* Information Provided by Warren County Planning Department

1 Remaining Developable Areas (Acres) = Total Acres - Critical Areas (Acres) - Existing Developed Areas (Acres)

2 Allowable Impervious (%) is the Maximum Impervious Coverage permitted by the Zoning Ordinance

3 Build - Out Impervious (Acres) = Remaining Developable Areas (Acres) x Allowable Impervious (%)

Table 3: Pollutant Loads by Land Cover

Land Cover	Total Phosphorous 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	1.0	10	120
Agricultural	1.3	10	300
Forest, Water, Wetlands	0.1	3	40
Barrenland / Transitional Area	0.5	5	60

Source: NJDEP Stormwater BMP Manual 2004

Table 4: Nonpoint Source Loads at Build – Out for HUC14s

HUC14 and Zone	Build - Out Zoning	Remaining Developable Areas (Acres)	Total Phosphorous lbs/acre/year	Total Phosphorous lbs/year	Total Nitrogen lbs/acre/year	Total Nitrogen lbs/year	Total Suspended Solids lbs/acre/year	Total Suspended Solids lbs/year
2040105150 - Musconetcong R (Trout Bk to SaxtonFalls)								
APT *	High, Medium Density Residential	(13.952)	1.4	0	15	0	140	0
C	Low Density, Rural Residential	90.674	0.6	54	5	453	100	9,067
CC *	Commercial	(6.628)	2.1	0	22	0	200	0
HC *	Commercial	(45.086)	2.1	0	22	0	200	0
HF	Other Urban	18.223	1.0	18	10	182	120	2,187
LM	Industrial	187.573	1.5	281	16	3,001	200	37,515
R-12.5	High, Medium Density Residential	10.862	1.4	15	15	163	140	1,521
R-12.5 / OFF *	High, Medium Density Residential	(4.793)	1.4	0	15	0	140	0
R-15	High, Medium Density Residential	1.005	1.4	1	15	15	140	141

R-30	Low Density, Rural Residential	97.170	0.6	58	5	486	100	9,717
TCC	Commercial	0.001	2.1	0	22	0	200	0
Totals				429		4,301		60,147
2040105160 - Musconetcong R (Hances Bk thru Trout Bk)								
APT *	High, Medium Density Residential	(0.001)	1.4	0	15	0	140	0
C	Low Density, Rural Residential	42.494	0.6	114	5	212	100	21,247
CC	Commercial	0.000	2.1	0	22	0	200	0
LM	Industrial	7.110	1.5	10	16	114	200	22,752
R-12.5	High, Medium Density Residential	4.663	1.4	159	15	70	140	9,792
R-12.5 / OFF	High, Medium Density Residential	0.022	1.4	0	15	0	140	46
R-15	High, Medium Density Residential	2.594	1.4	1	15	39	140	5,447
R-30 *	Low Density, Rural Residential	(3.620)	0.6	0	5	0	100	0
TCC	Commercial	0.000	2.1	0	22	0	200	0
Totals				283		435		59,285
Totals				712		4,736		119,432
* No additional non-point source loads will be attributed to the Remaining Developable Areas (Acres) when a negative acreage appears								

Mitigation Plans

Due to the significance of the Musconetcong River and its tributaries to the Town from recreation and aesthetic perspectives, its water quality must be safeguarded from development activities. The safeguarding of the Musconetcong River was included as a goal and objective in the 1988 Comprehensive Revision of the Master Plan. Subsequent reexamination reports have reiterated this goal and objective.

Because of the language in the Master Plan, the Town does not believe it is in their interest to vary the design and performance standards in the stormwater rules. Thus, no variances and exemptions from the standards shall be granted. Applicants for development will be expected to mitigate the impacts of development on stormwater at their own site or other sites within the subject watershed that it controls.

It should also be noted that there is little or no land area within the Town at strategic locations and owned by the municipality or other governmental agencies that would even allow for a flood control or water quality enhancement project if mitigation were to be allowed in the plan by the municipality. The lack of available lands for such purposes was noted in the Stormwater Management Plan Element of the 1988 Master Plan.