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Stormwater Management Plan

For

Borough of Englishtown
Monmouth County, New Jersey

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Borough Engineer

February 2005
Revised thru February 2007

ELT-117

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Englishtown ("the Borough") 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 impacts 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.

This plan also addresses the review and update of existing ordinances, and other planning documents to allow for project designs that include low impact development techniques. The plan is also consistent with the following Policies and Objectives of the Borough's Master Plan:

Policies:

- Land development should be designed to protect freshwater wetlands and floodplains as well as enhance the environmental policies of the Borough.
- The reasonable use of all land consistent with its location and relationship to other land uses will be promoted.
- A development pattern which will protect and enhance the long term economic, social and welfare interests of present and future residents will be encouraged.

Objectives:

- Promote the conservation of open space through protection of freshwater wetlands, floodplains and valuable natural resources and prevent degradation of the environment through improper uses and development densities.

Municipal Stormwater Management Plan (MSWMP) Goals

The goals of this MSWMP are to:

- Reduce flood damage, including damage to life and property;
- Protect drinking water supply;
- 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 source pollution;
- Maintain the integrity of stream channels for their biological functions, as well as for drainage;
- Minimize pollutants in stormwater 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.

The Borough Master Plan was reviewed and the goal/objective applicable to the MSWMP is as follows:

2. Promote the conservation of open space through protection of freshwater wetlands, floodplains and valuable natural resources and prevent degradation of the environment through improper uses and development densities

This Master Plan goal/objective is met.

In addition, both the Borough's Site Plan Review and Subdivision of Land Ordinances, Sections 2.109 and 2.115 respectively, were reviewed. Both refer to the Stormwater Control Ordinance and RSIS Standards for design and compliance, to meet the said Master Plan goal/objective.

To achieve MSWMP goals, this plan outlines specific stormwater design and performance standards for new development. The Borough realizes that with the limited area within municipal boundary, that the above goals can only be achieved by one or more of the following: reduce flood damage with adequately designed storm sewer and management systems, culverts and bridges; protect drinking water with well-head protection; minimize increase in stormwater runoff with properly designed stormwater management basins and properly designed stormwater recharge basins; reduce soil erosion by following the guidelines set by the Soil Conservation District; assure adequacy of all culverts and bridges with an on-going review; minimize impervious coverage and encourage groundwater recharge where possible; prevent non-point source pollution, i.e., pet waste, wildlife feeding, yard wastes, illicit connections, etc.; maintain integrity of stream channels by requiring top-of-bank buffers and requiring and enforcing NJDEP Letters of Interpretation and transition zones for Freshwater Wetlands; minimize pollutants with enforcement of stormwater ordinances, and requiring Environmental Impact Statements for projects; and, protect public safety with proper design and operation of stormwater basins.

Safety Standards for Stormwater Management Basins, as per N.J.A.C. 7:8-6, are incorporated in the Borough's Stormwater Management Ordinance in Section 2.54.08. In addition, Sections 2.109.18.A&B, and 2.115.20.E.1&2, reference the Stormwater Management Ordinance and Residential Site Improvement Standards (RSIS), which outline requirements to protect public safety.

Long term operation, maintenance as per N.J.A.C. 7:8-5.8, and enforcement of stormwater management measures are addressed in adopted Stormwater Control Ordinances, as well as, the implementation of the Residential Site Improvement Standards (RSIS) standards via development review. The Borough's Stormwater Control Ordinance, Section 2.54.10 reviews in detail, the maintenance and repair for stormwater management measures; and, Section 2.54.11 reviews the enforcement (Police Department and/or Code Enforcement Department) and penalties (Five Hundred ($500) dollars or imprisonment in the County Jail for a period not exceeding ninety (90) days) for entities found to be in violation of the ordinances. In addition, Sections 2.55, 2.57, and 2.89 of the Borough Code, address enforcement and penalties regarding Wildlife Feeding, Pet Waste, Yard Waste, Littering, and Illicit Connections.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (see Figure 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 under 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 the habitat of some species.

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 flood for the aquatic community.

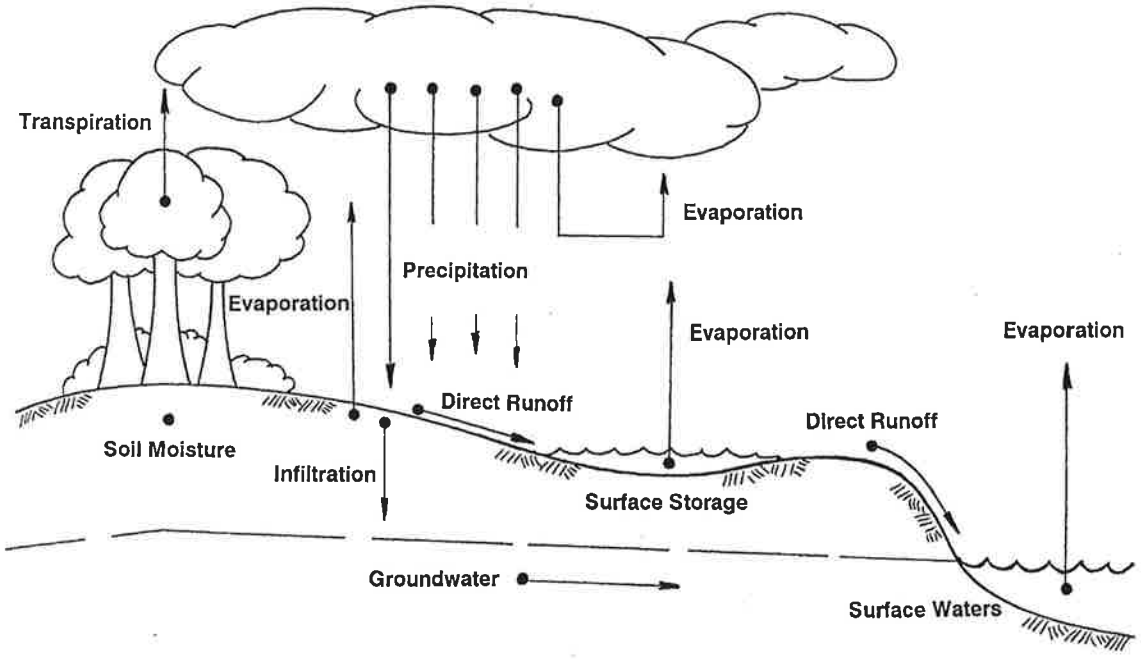


Figure 1 – Hydrologic Cycle

Background

The Borough of Englishtown encompasses 0.57 square miles in western Monmouth County, New Jersey. It is generally a rural residential community with the ambiance of a small town main street setting. The Borough is an older community with few large areas of undeveloped land remaining.

According to the 2000 census, the Borough has 1,764 residents. The population rose approximately 39 percent since the 1990 census. This population increase is significantly more than the overall state and county increases of approximately 9 and 11 percent respectively over the same period.

The undeveloped areas that do exist are sporadically located throughout the municipality. A large portion of the Borough running down the center is constrained by wetlands. Streams and rivers within the Borough are shown in Figure 2 and the topography of the Borough generally falling eastward, as shown in Figure 3.

The Borough is situated along the southern portion of the Matchaponix Brook in the Raritan Basin. It is located in Watershed Management Area (WMA) 9 Lower Raritan, South River, and Lawrence Brook. The Borough contains portions of four (4) Hydrologic Unit Code (HUC) areas. These HUC14 areas are shown in Figure 4.

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 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.

Based on the AMNET data, there area a number of water bodies within the Borough that are moderately impaired. The closest AMNET site is located on McGellairds Brook at Rt. 527. There is also an AMNET site on the Weamaconk Creek at Rt. 522. The Monmouth County Board of Health also monitors McGellairds Brook and Weamaconk Creek for phosphorus and benthic macroinvertebrates.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the state. These data show that the instream total phosphorus, total suspended solids, arsenic and benzene concentrations of the Raritan River frequently exceed the state's criteria. This means that the river is an impaired waterway and the NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants.

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 pollution, 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 BMP's.

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 TMDL's are needed.

The following waters are listed on Sublist 5 (August 9, 2004):

- Barclay Brook near Englishtown, pH (01405285 - NJDEP/USGS Data) Medium Priority for TMDL.
- McGellairds Brook at Rt. 527 in Englishtown, Benthic Macroinvertebrates (AN0447 - NJDEP AMNET) Low Priority for TMDL.
- McGellairds Brook at Main St in Englishtown, Phosphorus (22 - Monmouth Co HD) Medium Priority for TMDL with action to be taken by 2006.
- Weamaconk Creek at Rt. 522 in Englishtown, Benthic Macroinvertebrates (AN0443, MB-81 - NJDEP AMNET, Monmouth Co HD) Low Priority for TMDL.

In addition to water quality problems, the Borough has occasional flooding problems. Flooding on the Weamaconk Creek affects the properties along the center of the Borough from north to south. While flooding along McGellairds Brook affects properties along the northern side of the Borough. The 100-year floodplain, shown in Figure 5, depicts the Weamaconk Creek and McGellairds Brook floodplains.

The Borough is almost fully developed. The Borough land use, based on 1995/1997 aerial photography, is shown in Figure 6.

The Borough currently contains nine (9) zoning districts: Residential Low Density (R-LD), Residential Medium Density (R-MD); Residential, Planned Development (R-PD), Commercial, Central (C-1); Commercial, General (C-2); Industrial (I); Conservation (CON), Residential, High Density/Affordable Housing Overlay Zone (R-HD/AH); and Residential, Affordable Planned Development Overlay Zone (R-APD), as shown in Figure 7. A large area along the entire length of the Matchaponix Brook and McGellars Brook has been preserved in the Conservation Zone.

There is only one (1) undeveloped parcel within the Borough, Block 5 Lot 6, three and eight tenths (3.8) acres located behind the properties at the intersection of Main Street and West Dey Street. Said parcel is landlocked, and inundated by floodplain and wetlands. Therefore, at this time, it appears that the only method of future development within the Borough will be by acquiring several contiguous parcels, combining them by reverse subdivision, demolishing the existing dwellings and structures, and then proceed.

A current aerial photo with parcel lot lines overlain on it is shown in Figure 8. The majority of municipality is developed suburban land with little chance for groundwater recharge. However, groundwater recharge rates for native soils in this area are generally between 1 and 19 inches annually. The average annual groundwater recharge rates are shown graphically in Figure 9.

The Borough is entirely within the State Plan Designation PA2 Suburban Planning Area and was designated as a Village Center in 2002. The State Plan identifies specific types of Centers: Urban Centers, Regional Centers, Towns, Villages and Hamlets. Centers, in the State Plan, are defined as compact forms of development that, compared to sprawl development, consume less land, deplete fewer natural resources and are more efficient in the delivery of public services. Factors such as area, population, gross population density, number of housing units, gross housing density, employment and jobs to housing ratio determine how a Center is classified. Within Centers are the Core and the Neighborhoods. The Core is defined as the commercial, cultural and civic heart of the Center, while Neighborhoods are defined by walking distances and contain a balanced mix of uses and activities or contribute towards such a balance within the overall Center.

According to the 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-, five-, and twelve-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

A Well Head Protection Area (WHPA) consists of three tiers, each based on the time of travel to the well. The outer boundaries of these tiers will have the following times of travel:

Tier 1 - 2 Years (720 days)
Tier 2 - 5 Years (1,826 days)
Tier 3 - 12 Years (4,383 days)

The portion of the zone of contribution designated as the WHPA is based upon the TOT of the ground water to a pumping well. The TOT for the outer boundary of a Tier 1 WHPA is based on the average of findings that bacteria have polluted wells as far as 170 days TOT. The 2-year TOT provides a reasonable margin of safety and municipalities should make efforts to protect theses areas. As shown in Figure 10, the Borough has one Tier 1 protection area and is not within a Tier 2 or 3 areas.

In addition to the rivers and streams that run through and along the Borough, there are a number of wetland areas. These wetland areas, shown in Figure 11, provide flood storage, nonpoint pollutant removal and habitat for flora and fauna.

Design and Performance Standards

The Borough 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 12 month of the adoption date of the Stormwater Management Rules.

Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area and no TMDL's have been developed for waters within the Borough; therefore this plan does neither need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDL's. 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 N.J.A.C. 5:21. The Borough will utilize the most current update of the RSIS in the stormwater review of residential development. This Municipal Stormwater Management Plan will be updated to be consistent with any future updates of the RSIS. The Borough will also use the RSIS stormwater management standards for the design of inlet and drainage systems; quantity and quality of storm runoff; promote recharge where possible; and, design of detention basins and other drainage facilities and or alternatives i.e., bio retention systems, pervious pavement, vegetative filters, etc.

The Borough'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, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District. All pertinent design calculations for stormwater management facilities should adhere to the new design rainfall depths for Monmouth County as revised by the Natural Resources Conservation Service as of September 2004 accordingly:

NRCS 24 Hour Design Storm Rainfall Depths

as Revised September 2004

Storm Period	1 Year		2 Year		5 Year		10 Year		25 Year		50 Year		100 Year	
	Old	New	Old	New	Old	New	Old	New	Old	New	Old	New	Old	New
Monmouth County	2.8	**2.9**	3.4	**3.4**	4.4	**4.4**	5.3	**5.2**	6.0	**6.6**	6.5	**7.7**	7.5	**8.9**

The MSWMP has been reviewed and is consistent with and requires all new development and redevelopment plans to comply with, the Monmouth County Growth Management Guide's objective to Water Resources, and the State Plan, as follows:

1. Encourage the protection and conservation of all water resources.
2. Encourage the protection of potable water resources.
3. Encourage the preservation and improvement of coastal water resources.
4. Promote preservation and improvement of surface water quality.
5. Encourage the preservation and improvement of groundwater quality and quantity.
6. Promote and protection of water-oriented wildlife habitat.
7. Promote the preservation, restoration and enhancement of wetlands and stream corridors in order to protect the adjacent water bodies, such as streams, rivers, lakes, bays and oceans.
8. The Borough is designated a Village Center by State Plan implementation, and encourages development which protects and preserves water resources and environmentally sensitive areas

By utilizing the Borough's Zoning Ordinance, Section 2.130; and, Land Development Ordinances, Sections 2.109 and 2.115, development can only proceed with an extension of the existing water, sanitary and storm infrastructure, and maintaining the CON (Conservation) Zone

The Borough's Stormwater Management Ordinance, and Land Development Ordinance, are consistent with, and require all new development and redevelopment plans to comply with, the applicable objectives of the Borough's Master Plan, which is as follows:

2. Promote the conservation of open space through protection of freshwater wetlands, floodplains and valuable natural resources and prevent degradation of the environment through improper uses and development densities

Nonstructural Stormwater Management Strategies

The Borough has reviewed the current master plan and land use ordinances. The appropriate sections of each document will reference the Municipal Stormwater Management Plan. Each development application will be reviewed on a case-by-case basis for the implementation of, and consistency with, the Non-Structural Stormwater Management Strategies regulations. The applicant's engineer and the Joint Zoning/Planning Board will implement Nonstructural Stormwater Management Strategies that are conducive to the type and intensity of the proposed development. Said Nonstructural Stormwater Management Strategies will include, but are not limited to the following:

- The protection of areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.

- Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.
- Maximize the protection of natural drainage features and vegetation.
- Minimize the increase in the post-construction "time of concentration."
- Minimize or limit the increase in the post-construction "runoff."
- Minimize or limit the increase in the post-construction "rate of stormwater."
- Minimize the increase in the post-construction "quality of stormwater runoff."
- Minimize land disturbance including clearing and grading.
- Minimize soil compaction.
- Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.
- Provide vegetated open-channel conveyance systems that discharge into and through stable vegetated areas.
- Provide preventative source controls.

Land Use/Build-Out Analysis

Since the Borough of Englishtown is less than one square mile in size it does not have more than one square mile of vacant land. Therefore the Borough is not required to do a build-out analysis.

Mitigation Plans

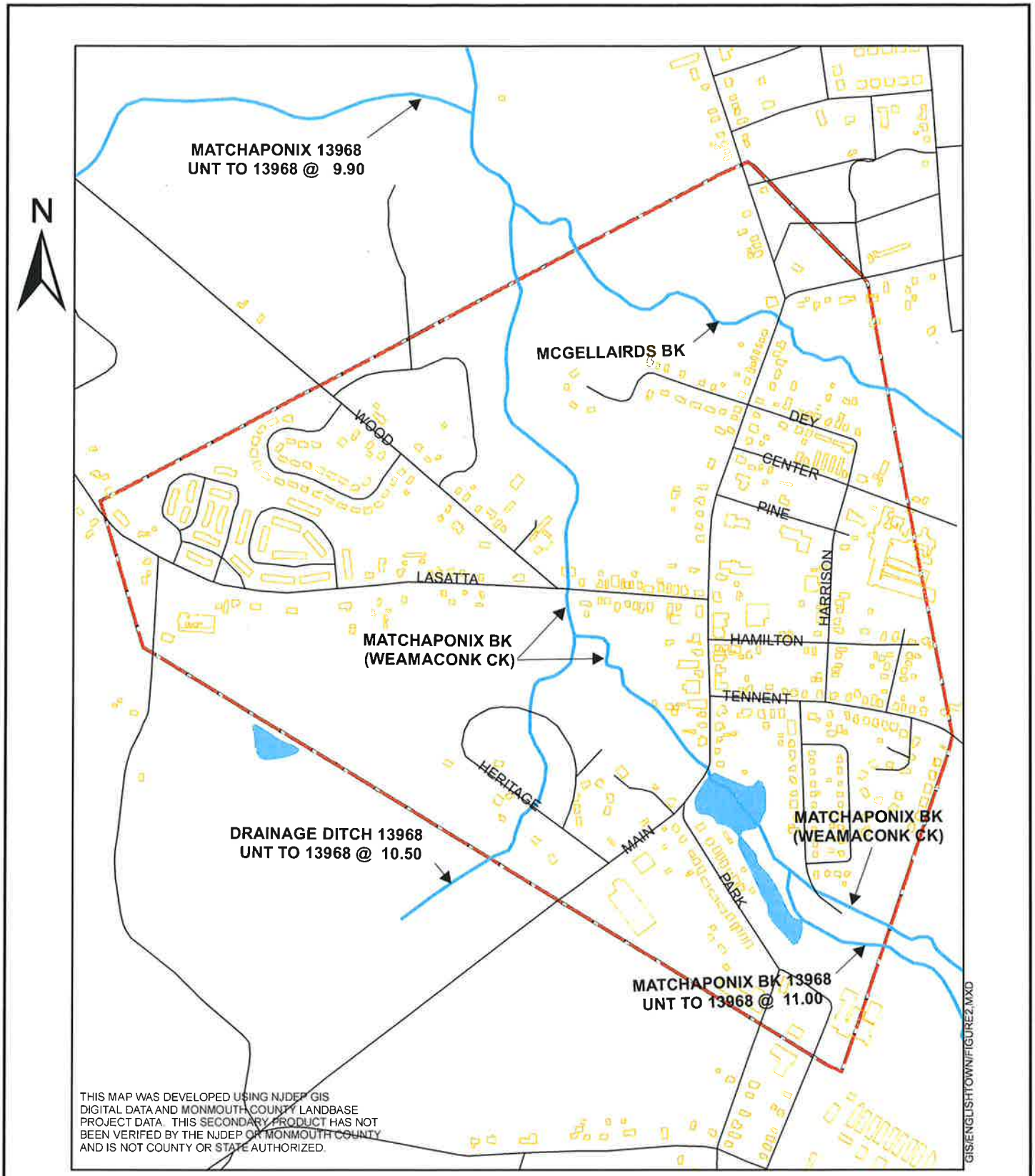
Applicants for development will be expected to mitigate the impacts of development of stormwater at their site only. No variances and exemptions from the standards shall be granted.

It should also be noted that the Borough has little or no land area available at strategic downstream locations suitable for a flood control or water quality enhancement project, even if mitigation were to be allowed in this plan. The lack of available lands for such purposes can be seen from the Aerial photo Map provided in Figure 8. It is more practical for any new development to provide on-site stormwater facilities rather than implementing a municipal system that would disrupt the existing built environment.

Recommended Implementing Stormwater Control Ordinances

The Borough has adopted the following ordinances:

- Illicit Connection Ordinance
- Improper Waste Disposal Ordinance
- Litter Ordinance
- Pet Waste Ordinance
- Wildlife Feeding Ordinance
- Yard Waste Ordinance
- The Stormwater Control Ordinance will be implemented in accordance with NJAC 7:8-4.



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ENGLISHTOWN BORO

WATERWAYS MAP

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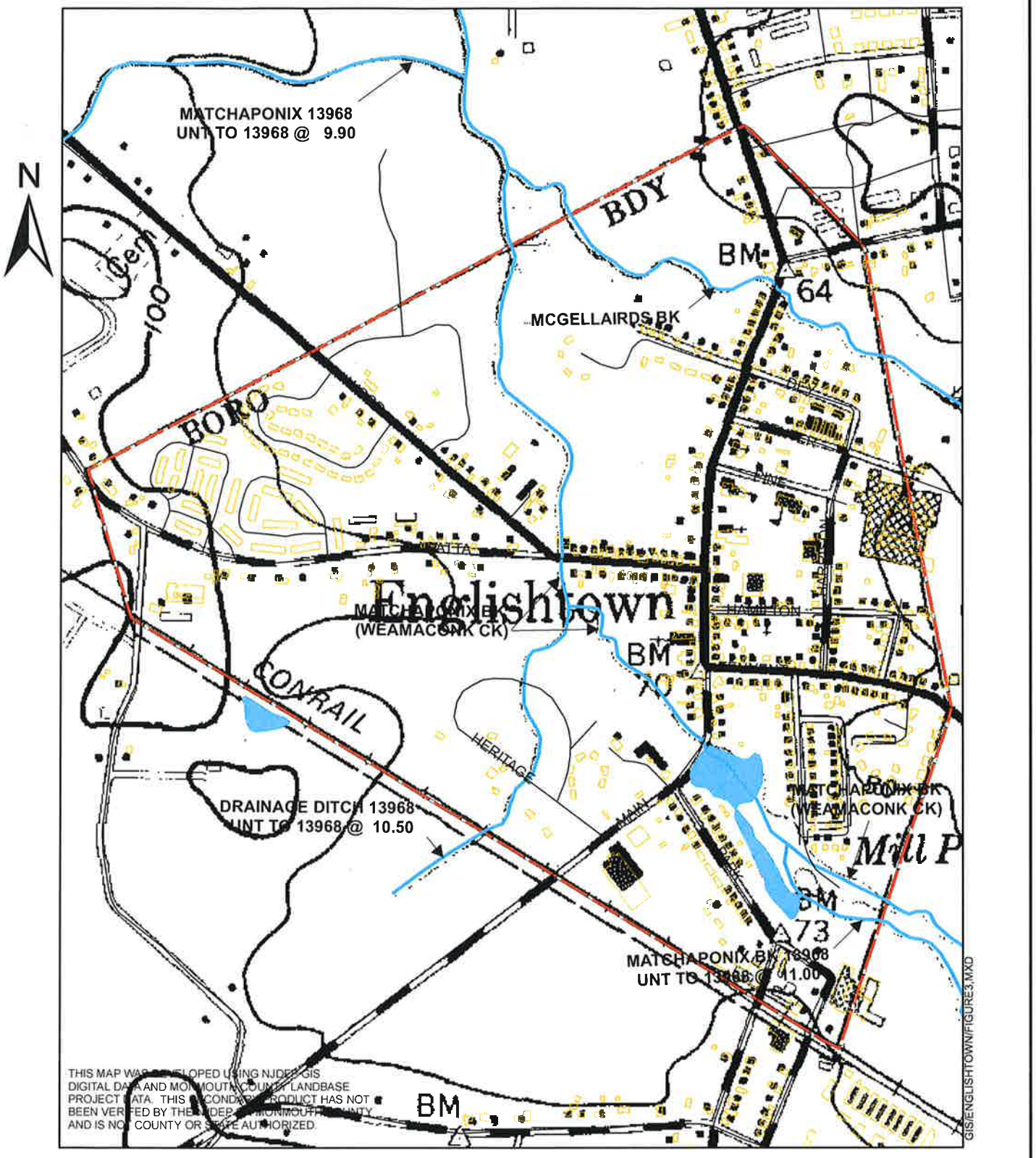
FIGURE 2

MAY 2005



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ENGLISHTOWN BORO

USGS QUADRANGLE MAP

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FIGURE 3
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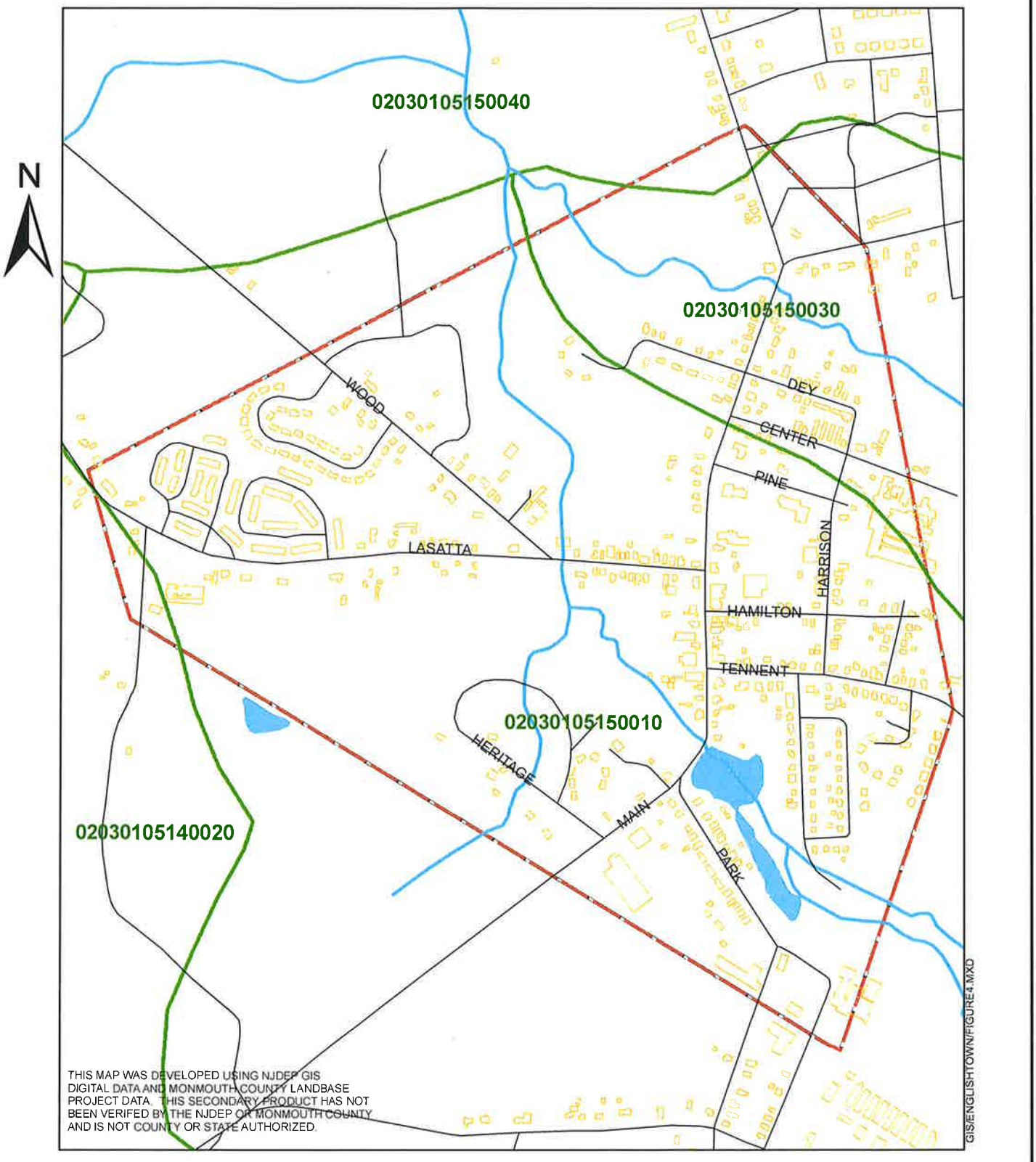

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ENGLISHTOWN BORO

HUC 14 DRAINAGE AREA MAP

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FIGURE 4
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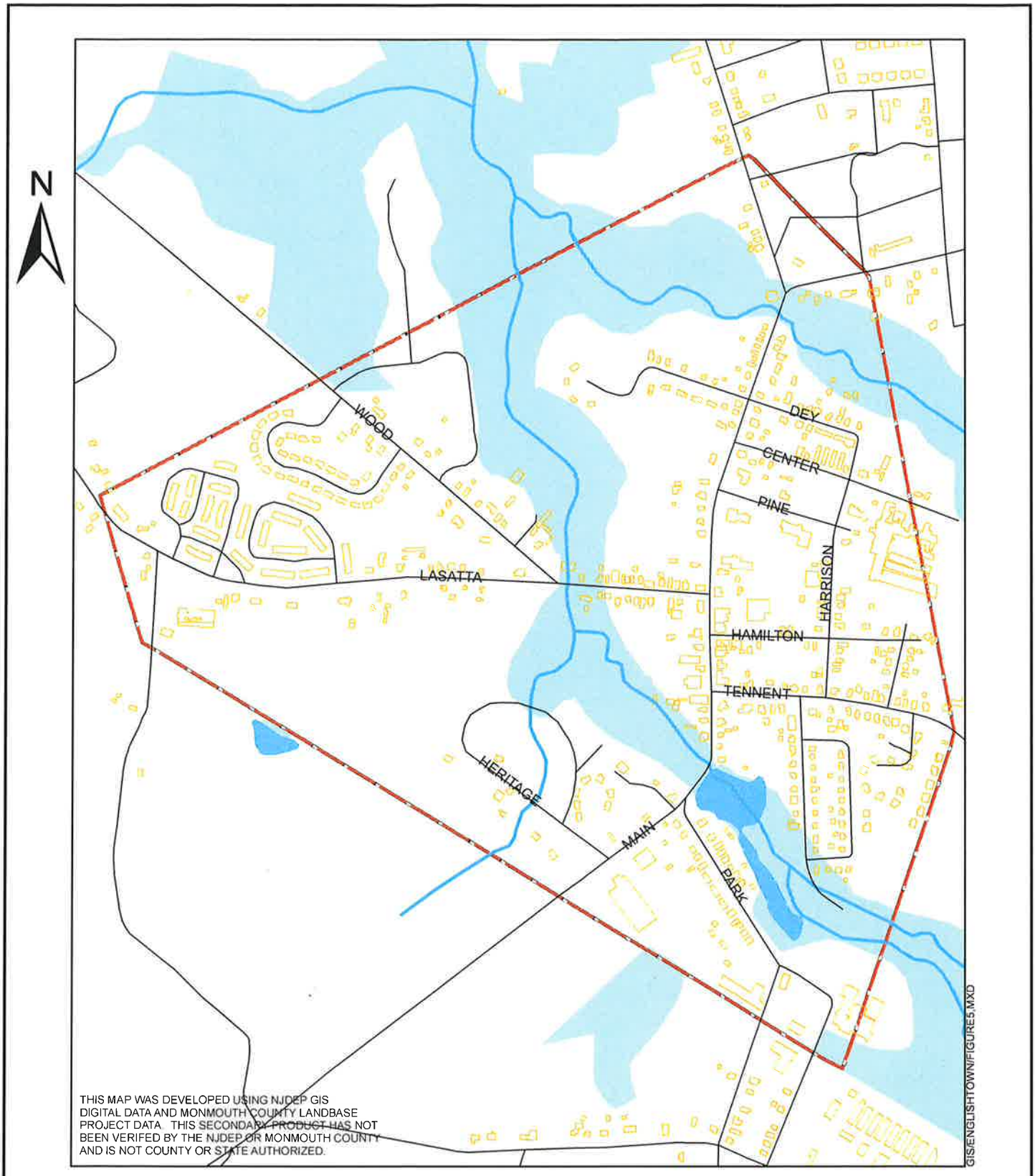

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ENGLISHTOWN BORO

100 YEAR FREQUENCY FLOOD PLAIN MAP

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FIGURE 5

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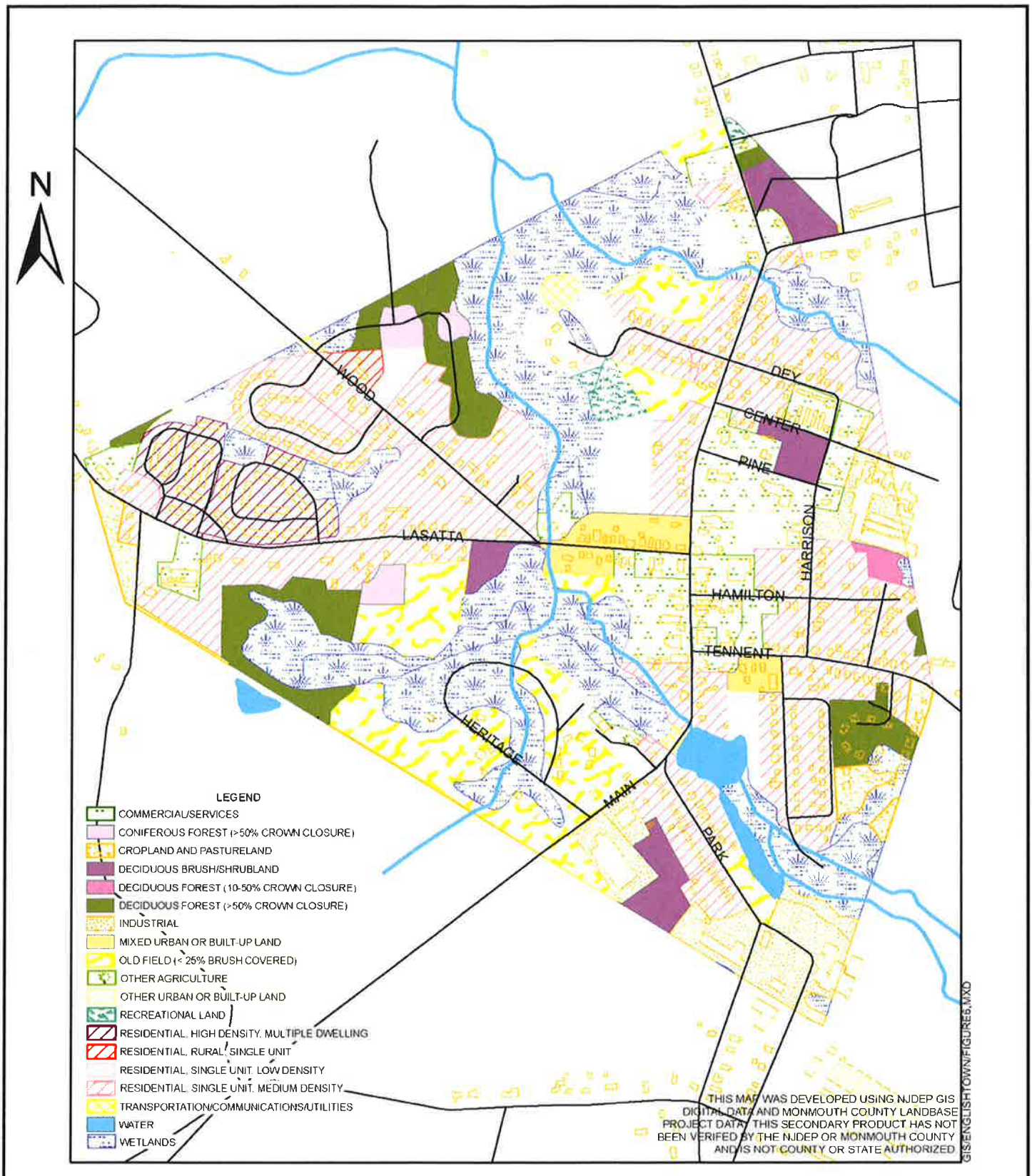

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ENGLISHTOWN BORO

1995/1997 LAND USE MAP

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FIGURE 6

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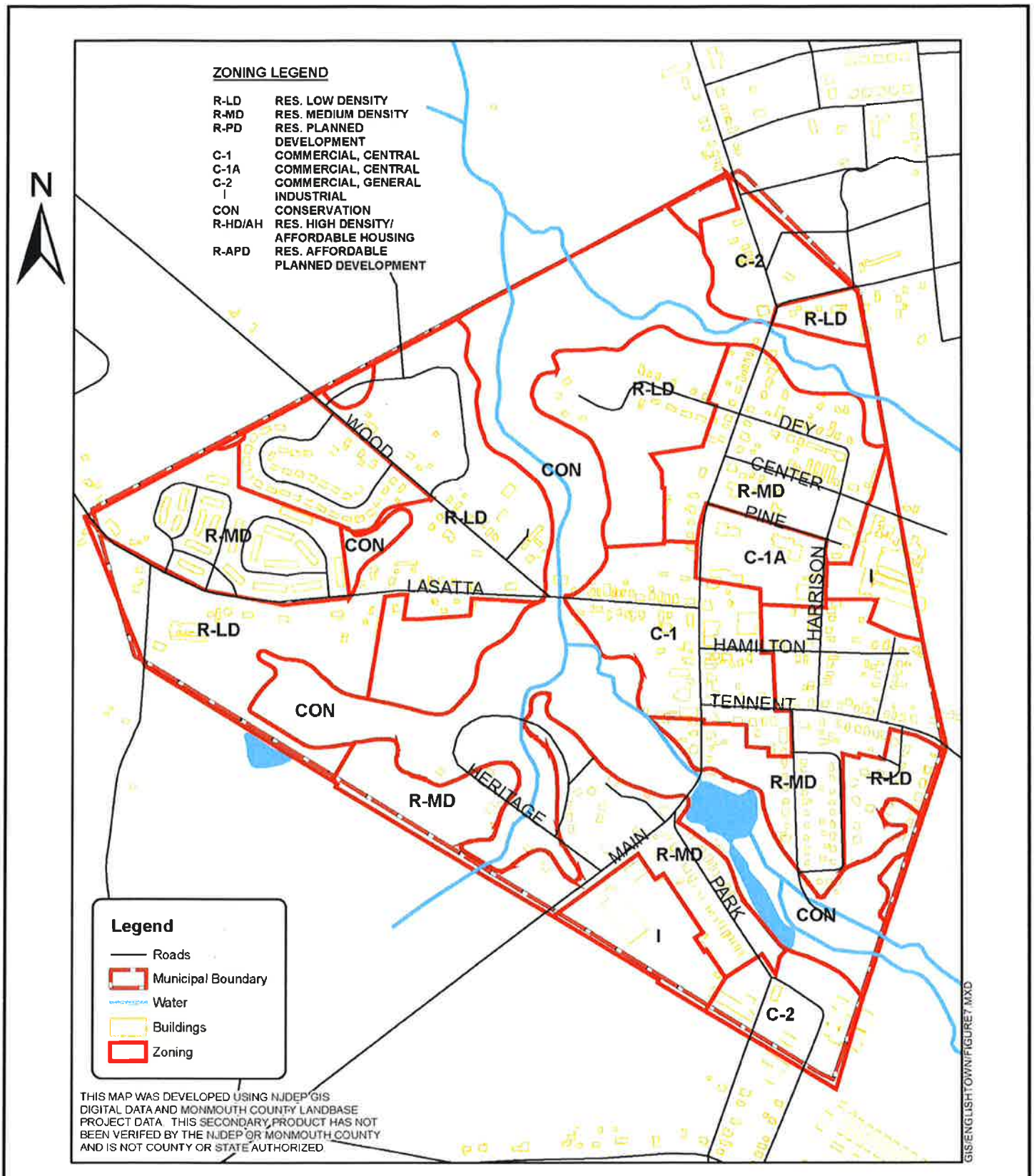

1 INCH EQUALS 800 FEET

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ENGLISHTOWN BORO

ZONING

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FIGURE 7

MAY 2005

1 INCH EQUALS 800 FEET

0 400 800 1,600 Feet

ENGLISHTOWN BORO

AERIAL PHOTO

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FIGURE 8

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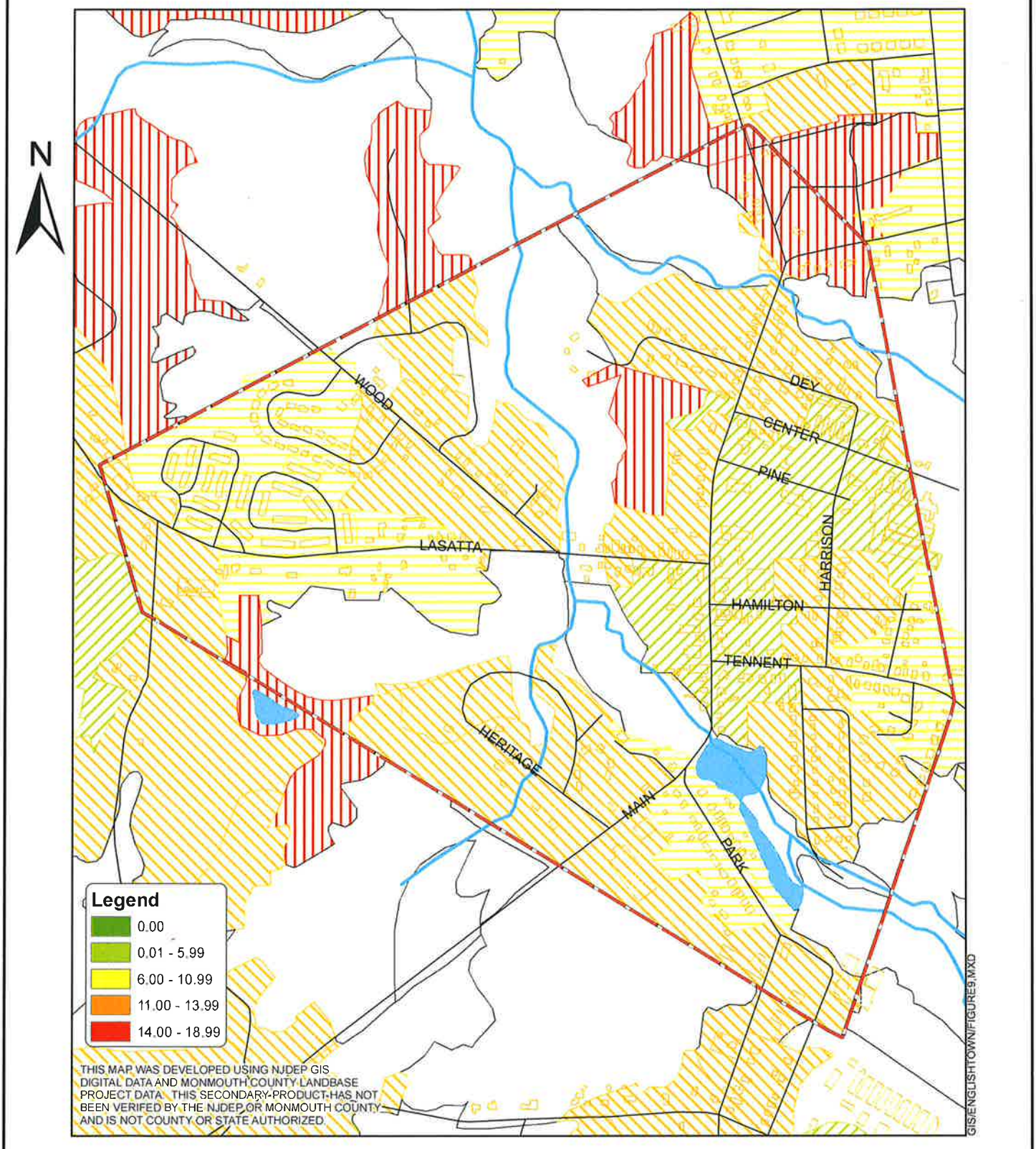

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ENGLISHTOWN BORO

GROUNDWATER RECHARGE MAP

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FIGURE 9

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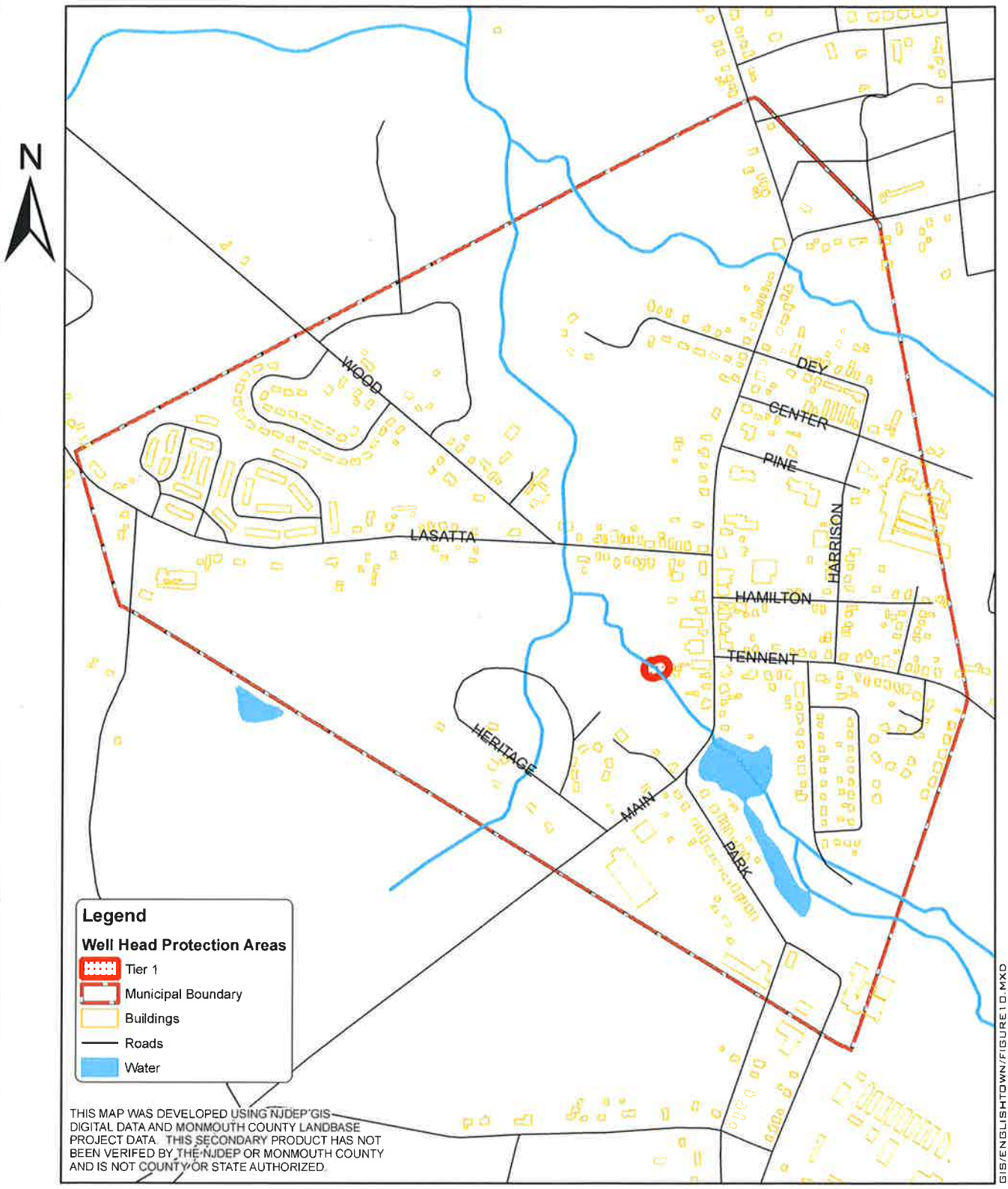

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ENGLISHTOWN BORO

WELL HEAD PROTECTION AREAS

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FIGURE 10

MAY 2005

1 INCH EQUALS 800 FEET

0 400 800 1,600 Feet

ENGLISHTOWN BORO

WETLANDS AND WATER

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FIGURE 11

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