

STORMWATER MANAGEMENT PLAN
MASTER PLAN ELEMENT

BOROUGH OF RUMSON
MONMOUTH COUNTY, NEW JERSEY

PREPARED FOR
RUMSON BOROUGH PLANNING BOARD

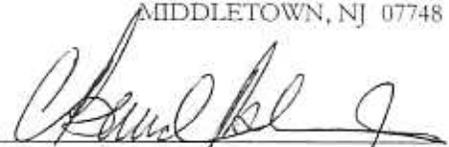
February 7, 2005
Amended August 7, 2006

PREPARED BY
C. BERNARD BLUM, JR., P.E., P.P.
RUMSON BOROUGH ENGINEER

OF THE FIRM OF



11 TINDALL ROAD
MIDDLETOWN, NJ 07748



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The original of this document has been signed and sealed in accordance with New Jersey Law

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FREDERICK ANDRE, SECRETARY

BOROUGH OF RUMSON PLANNING BOARD

**RESOLUTION ADOPTING STORMWATER MANAGEMENT PLAN
MASTER PLAN ELEMENT**

WHEREAS, the Planning Board is a duly constituted approving Authority created pursuant to the Provisions of N.J.S.A. 40:55D-23 of the Municipal Land Use Law; and

WHEREAS, pursuant to N.J.S.A. 40:55D-28, the Planning Board may prepare and after public hearing may amend a Master Plan or component parts thereof to guide the use of lands within the Municipality in a manner which protects public health, safety and promotes the general welfare; and

WHEREAS, pursuant to N.J.A.C. 7:8-4.3(a), a Municipality shall adopt a Municipal Stormwater Management Plan as an integral part of its Master Plan; and

WHEREAS, pursuant to N.J.A.C. 7:8-1.1 et. seq., the Planning Board has prepared a Stormwater Management Plan Master Plan Element in order to comply with the requirements set forth in the New Jersey Administrative Code for Municipal Stormwater Management Planning; and

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Michael B. Steib P. R.

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WHEREAS, pursuant to the requirements of the Municipal Land Use Law N.J.S.A. 40:55D-1 et. seq. and specifically N.J.S.A. 40:55D-28 and N.J.S.A. 40:55D-13, the Planning Board conducted a public hearing on the 7th day of August, 2006, due Notice of said meeting having been given in accordance with New Jersey Statutes, the Open Public Meetings Act and the Municipal Land Use Law and a quorum of the Planning Board being present, the Planning Board reviewed and considered the proposed Stormwater Management Plan Master Plan Element along with any public comment thereon and the Planning Board having determined that the Stormwater Management Plan Master Plan Element is in compliance with the requirements of the Municipal Land Use Law and the requirements for stormwater management pursuant to the applicable Sections of the New Jersey Administrative Code.

NOW, THEREFORE, BE IT RESOLVED, by the Planning Board of the Borough of Rumson on this 11th day of September, 2006 that the Stormwater Management Plan Master Plan Element prepared by C. Bernard Blum, Jr., P.E., P.P., Rumson Borough Engineer dated February 7, 2005, amended August 7, 2006, be and is hereby adopted.

OFFERED BY: *COUNCILMAN RUBIN*

SECONDED BY: MR. ANDERSON

ROLL CALL:

YES: PARTON, RUBIN, EMERY, ANDERSON, SHANLEY, HEWITT, CASAZZA,
VAUGHAN

NO: NONE

ABSTAIN: WHITE

ABSENT: EKORHL, LOSPINUSO

Gertie B Parton
Chairperson, Planning
Board - Borough of Rumson

I CERTIFY, that the above is a true and exact copy of
the Resolution adopted by the Borough of Rumson at its
meeting held on September 11, 2006.

Laura J. Piro
Secretary, Planning
Board - Borough of Rumson

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INTRODUCTION

A Stormwater Management Plan provides a strategy for municipalities to plan for and manage increased runoff associated with future development and land use changes. This municipal Stormwater Management Plan is designed to provide a municipal-wide approach to stormwater management planning. This Plan makes recommendations to better regulate stormwater management. This Plan is not designed to resolve existing flooding or runoff problems, but to identify them for future correction. This Plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by including stormwater design and performance standards for new development and redevelopment. This Plan also addresses the Borough's suggested policy regarding the long-term operation and maintenance of existing and future stormwater management facilities.

This Stormwater Management Plan complies with N.J.A.C. 7:14A-25 Municipal Stormwater Regulations, which requires each community in New Jersey to prepare and adopt a stormwater management plan.

GOALS AND OBJECTIVES

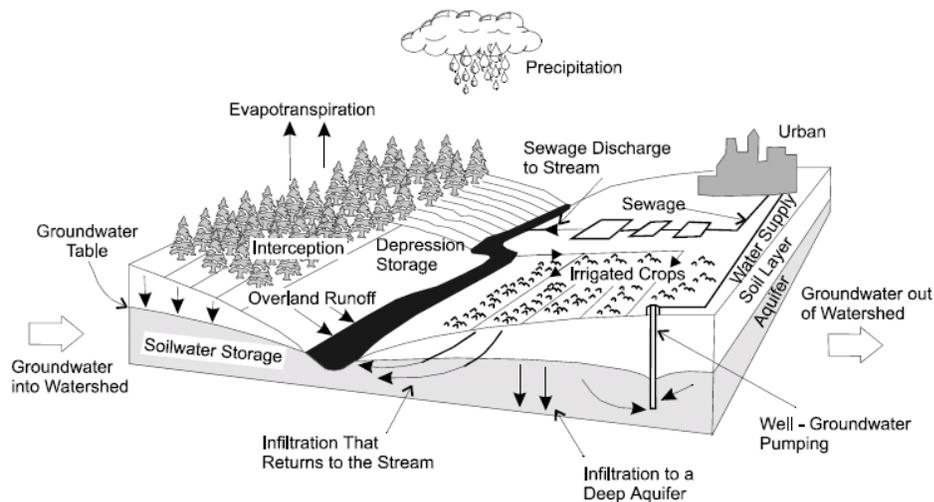
The goals of this Stormwater Management Plan are:

1. Reduce flood damage, including damage to life, property and the environment;
2. Minimize, to the extent practical, any increase in stormwater runoff from any new development;
3. Reduce soil erosion from development, redevelopment and construction projects;
4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
5. Maintain groundwater recharge;
6. Prevent, to the greatest extent feasible, an increase in non-point pollution;
7. Maintain the integrity of stream channels for their biological function, as well as for drainage;
8. 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 the public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, commercial, and other uses of water;
9. Protect public safety through the proper design and operation of stormwater basins;
10. Properly manage and maintain existing natural ponds and waterways on private property;
11. Retain community character while addressing Council on Affordable Housing (COAH) housing issues;
12. Regulate the stormwater impacts from properties within 300 feet of a C-1 waterway that are unregulated by the Municipal Land Use Law (MLUL) and the Residential Site Improvement Standards (RSIS); and
13. To encourage the use of indigenous vegetation in landscape design.

HYDROLOGIC CYCLE

The hydrologic cycle describes the continuous circulation of water between the oceans, atmosphere and land. Water is supplied to the atmosphere by evapotranspiration. This includes evaporation from water, vegetation, snow, and transpiration from plants. Water is returned to the land through precipitation. Within the hydrologic cycle, water may be stored by vegetation, snowpacks, land surfaces, water bodies, saturated subsurface zones, and unsaturated subsurface zones/soils. Water may be transported between these storage areas

Figure 1



Source : After, M. L. Davis, D. A. Cornwell. **Introduction to Environmental Engineering**, 1991.

via overland runoff, stream flow, infiltration, groundwater recharge, and groundwater flow, among other processes (Figure 1).

Definitions:

Overland runoff – water that travels over the ground surface to a channel

Streamflow – movement of water via channels

Groundwater flow – movement of water through the subsurface

Infiltration – penetration of water through the ground surface

Groundwater recharge – water that reaches saturated zone

People interact with the hydrologic cycle by removing water for agricultural, domestic, and non-residential uses, and returning it as wastewater discharges. Urban development may also interfere with the natural transfers of water between storage components of the hydrologic cycle.

Within a watershed, a water balance may be used to describe the hydrological cycle. A water balance provides for an accounting of water transfers across a watershed's boundaries over a

period of time. Any difference between inflows to the system and outflows from the system during this time period must be balanced by a change of storage within the system.

Changes to the Hydrologic Cycle/Water Balance

An increase in impervious area associated with urbanization increases runoff while it decreases infiltration of water into surrounding soils. Urbanization also results in decreased evapotranspiration. Conventional development practices in an urban watershed stream dramatically change the hydrologic condition of a stream.

Impacts include:

- An increase in the magnitude and frequency of runoff events;
- An increase in the stream’s annual flow as surface storm runoff rather than base flow; and
- Increases in velocity of flow during storms.

The National Oceanographic and Atmospheric Administration (NOAA), the agency that develops statistical estimates of rainfall amounts has increased its estimates for the majority of storm events, particularly the larger events. The following table indicates the old and new twenty-four hour rainfall amounts in inches for Monmouth County.

NRCS 24 Hour Design Storm Rainfall Depth (inches) – September 2004

Storm Period	1 yr.		2 yr.		5 yr.		10 yr.		25 yr.		50 yr.		100 yr.	
	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

Source: NOAA

The decrease in infiltration that occurs with urbanization reduces soil moisture replenishment and groundwater recharge that is the source of stream baseflow, which is important for sustaining aquatic life.

The preservation of the natural hydrologic cycle, to the greatest extent practicable, will maintain groundwater recharge and reduce baseflow impacts. It will also reduce the potential for flooding and erosion, and possibly, the size and cost of stormwater infrastructure.

Lack of proper stormwater management, reduced baseflow, degradation of water quality, and increased flooding and erosion can lead to reduced diversity of aquatic life, fewer opportunities for human uses of water resources, and loss of property and human life.

DEMOGRAPHICS

Population Trends

Table 1 shows the Borough’s historic population trend in comparison to Monmouth County and the State of New Jersey. From 1910 through 2000, the population of Rumson increased every decade until 1970. Since 1980, population has decreased slightly. The largest increases in population occurred prior to 1970 when the Borough had enough remaining vacant land to sustain additional growth. The Master Plan attributes the construction of the Garden State Parkway and other regional highway improvements as having a dramatic effect on the Borough’s growth between 1950 and 1960 resulting in a 60% increase in the population. By the 1970’s, Rumson had all but reached its residential build-out potential.

Year	Rumson		Monmouth		New Jersey	
	Population	% Change	Population	% Change	Population	% Change
1910	1,449		64,734		2,537,167	
1920	1,658	14.4	104,925	62.1	3,155,900	24.4
1930	2,073	25.0	147,209	40.3	4,041,334	28.1
1940	2,926	41.1	161,238	9.5	4,160,165	2.9
1950	4,004	36.8	225,327	39.7	4,835,329	16.2
1960	6,405	60.0	334,401	48.4	6,066,782	25.5
1970	7,421	15.9	461,849	38.1	7,168,164	18.2
1980	7,623	2.7	503,173	8.9	7,364,158	2.7
1990	6,701	-12.1	553,124	9.9	7,730,118	5.0
2000	7,137	6.5	615,305	11.2	8,414,350	8.9

Source: U.S. Census

Housing

Table 2 shows that while there are eleven (11) fewer housing units in the Borough in 2000 as compared to 1990, the number of occupied housing units increased by 58. Thus, the vacancy rate has decreased over the last decade as new homeowners reinvested in existing vacant or abandoned properties. Rental units have been changing ownership and are being purchased by those who intend to use them as owner-occupied units. The number of owner-occupied housing units in 2000 increased by 89 units from 1990. According to the 2000 census, there are 69 fewer vacant units than in 1990. The increase in occupied housing units has almost entirely been family households. Both the number of single-person households and family households increased marginally from 1990.

	1990		2000		Change
	Number	Percent	Number	Percent	
OCCUPANCY STATUS					
Total housing units	2621	100	2,610	100	-11
Occupied housing units	2394	91.3	2,452	93.9	58
Vacant housing units	227	8.7	158	6.1	-69
TENURE					
Occupied housing units	2394	100	2,452	100	58
Owner-occupied housing units	2120	88.6	2,209	90.1	89
Renter-occupied housing units	274	11.4	243	9.9	-31
VACANCY STATUS					
Vacant housing units	227	100	158	100	-69
POPULATION					
	6701	100	7137	100	436
HOUSEHOLDS					
Family Households	1932	80	1989	81	57
1 Person Households	462	20	463	19	1
Persons/Household	2.80		2.91		0.11
Persons/Family Household	3.23		3.36		0.13
Persons/Housing Unit	2.56		2.73		0.17

Source: US Census

When compared to Monmouth County and the State, Rumson Borough has a slightly lower percentage of vacant housing. However, where Rumson has a 90.1% owner-occupancy rate, the County has a rate of 74.6% and the State a rate of only 65.6%. Rumson’s higher than average ownership rate can be attributed to the limited number of rental units and high majority of single-family housing stock.

Figure 2: Waterways
 Borough of Rumson
 Monmouth County, New Jersey

3

0 1,250 2,500 5,000 7,500 Feet



Source: Streams and Open Water, NJDEP (1998).

NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

	Major Roads
	Municipal Boundary
	Streams
	Open Water

BACKGROUND OF THE BOROUGH

General Characteristics

The Borough of Rumson has a land area of 5.2 square miles. It is located between the Shrewsbury and Navesink Rivers in eastern Monmouth County. In addition to the primary and secondary watercourses in the Borough, there are a number of unnamed tributaries and ponds that are identified in Figure 2.

Rumson is a mature community that has established harmonious patterns of land use and satisfactory public facilities and services. The challenge for Rumson is to manage further growth and changes within the Borough to assure that its quality of life is maintained. Rumson is a fully developed community that has developed in a manner consistent with County and State Plans.

The Borough has historically maintained low-density zoning in environmentally sensitive areas of the Borough, particularly along the Shrewsbury River and, in general, along the Navesink, both listed by NJDEP as Category-1 streams. In accordance with the recently adopted NJDEP Stormwater Regulations, a 300-foot buffer is required from a Category-1 stream, as part of any Major Development (i.e., any site plan or subdivision resulting in more than 1 acre of disturbance or more than 1/4 acre of additional impervious coverage). As a result of local market forces, revitalization of existing commercial and residential structures has occurred, and is occurring, in the Borough in a manner consistent with the master plan and existing development. However, size and scale of the majority of this development does not meet the “Major Development” threshold and therefore, the Category -1 buffer requirement will not have a significant impact on future development.

The Borough’s established development pattern, the preservation of which is the Borough’s primary goal, creates and supports a well designed mixed-use community. In addition, the Borough has adopted a mixed-use overlay option in the General Business, Neighborhood Business and Professional Office districts.

The Borough Council adopted a Tree Protection Ordinance and has designated a Tree Ordinance Officer to administer the newly enacted Tree Protection Program. The purpose of the ordinance is to prevent the clear cutting of trees and to restrict the removal of other trees, thereby maintaining the beauty and character, preventing erosion, controlling actions that will substantially change drainage patterns and restricting any action that could create a hazard to persons or property.

NJDEP – Integrated List of Water Bodies

The Navesink River is identified on New Jersey’s 2004 Integrated List of Water Bodies as being impaired or threatened (Sublist 5). Along the Navesink River, NJ Department of Environmental Protection (NJDEP) is monitoring fish tissue for fish-PCB and fish-dioxin. According to NJDEP, impairments for total coliform, dissolved oxygen and fecal coliform have been identified along the Shrewsbury River/Navesink River Estuary.

Both the Navesink River and the Shrewsbury River estuary exceed the state's criteria for the above mentioned pollutants and are classified as impaired waterways upstream of Rumson. NJDEP is required to develop a Total Maximum Daily Load (TMDL) for these pollutants for each waterway. A TMDL is the amount of a pollutant that can be accepted by a water body without causing an exceedance of water quality standards or interfering with the ability for a water body to be used for one or more of its designated uses. Where more than one pollutant is associated with the impairment of a single waterway, the waterway will remain on Sublist 5 until TMDLs for all pollutants have been completed and approved by USEPA. However, while a TDML has not currently been established for the portions of the Shrewsbury and Navesink Rivers adjacent to Rumson's political boundary, future testing may lead to the creation of a TDML, which would require a revision to this Plan.

General Characteristics of the Navesink and Shrewsbury Rivers

The Navesink River drains an area of 95 square miles and includes the following tributaries: Swimming River, Yellow Brook, Big Brook, Mine Brook, and Willow Brook. The Swimming River Reservoir, a major potable water impoundment, is located in this watershed, as are many small ponds. The Navesink estuary supports substantial hard clam (*Mercenaria mercenaria*), soft clam (*Mya arenaria*), and blue crab (*Callinectes sapidus Rathbun*) populations.

The Shrewsbury River drains an area of 27 square miles. Tributaries to the river include Manhasset Creek, Troutman's Creek, Branchport Creek, Turtle Mill Brook, Parkers Creek, Oceanport Creek, Town Neck Creek, Wardell's Creek and Little Silver Creek. The Shrewsbury and Navesink Rivers produce the majority of soft clams in the state. The Oceanic Bridge serves as the boundary line where shell-fishing beds are open/closed to shell fish harvesting.

Impacts from agriculture, horse farms, development and urban runoff are believed to have contributed to non-point sources of pollution in the Shrewsbury and Navesink rivers. These impacts include siltation of rivers, streams and ponds, increased nutrient levels in water bodies and increased bacterial levels. Urban runoff and bacteria specific to wildlife have contaminated many shellfish-harvesting beds in the downstream reaches of the Shrewsbury and Navesink Rivers.

Within the shellfish-harvesting portions of the Navesink River, the major pollution problem is high bacterial loadings from non-point sources, with the highest concentration occurring in the segment of the river near Red Bank. According to NJDEP, water quality improves as one proceeds downstream along the Shrewsbury and Navesink rivers. Significant improvements in water quality in the Navesink River have occurred from reducing non-point source loading into the river that led to the reopening of shellfish harvesting in the late 1990's, which was previously closed for over twenty-five years.

Monmouth County Health Department

Monmouth County Health Department monitors the Navesink and Shrewsbury Rivers at four (4) locations within the Borough of Rumson on a quarterly basis. These approximate locations are located near Lafayette Street, at the north end of Bingham Avenue, at the point of confluence of the two rivers near the Route 520 bridge pier, and near Avenue of Two Rivers South. Each location is monitored for fecal coliform bacteria; total phosphorous, total suspended solids and pH. The

County results show levels of fecal coliform bacteria, total phosphorous, total suspended solids and pH that are slightly above recommended standards. This Plan also recognizes the future need to develop specific strategies to improve water quality for each tributary that flows into the Shrewsbury and Navesink rivers.

Groundwater Recharge

Figure 3 indicates groundwater recharge rates for the Borough. The groundwater recharge GIS layer created by NJDEP utilizes soil characteristics and existing land use information to determine the likely rate of groundwater recharge. Areas with lower groundwater recharge, i.e., impervious areas and soils with poor infiltration, may require additional engineering measures to encourage groundwater recharge.

Existing Stormwater Facilities

Rumson contains seven municipally owned structural stormwater facilities, which are maintained by the Borough of Rumson Department of Public Works and/or the Board of Education staff. Four of the facilities consist of grass swales within the Willowbrook subdivision. They are located at Block 93, Lots 16.06, 16.09, 16.10 and 16.11. All of the swales terminate into a collection system within Willowbrook Drive. Existing ponds at the Deane-Porter and Forestdale School (Block 44, Lot 15) and across from Borough Hall (Block 39, Lot 13) serve as retention basins for the schools and Lakeview Avenue Neighborhoods respectively. Outfall structures from the pond terminate into the stormwater system at Black Point Road and Narumson Street. Lastly, a detention basin exists in Meadow Ridge Park, which accepts runoff from the park and a County maintained storm sewer system.

In addition to these stormwater facilities, the Borough has approximately five (5) miles of municipally owned and maintained storm sewer pipe ranging in size from 8” to 30”, approximately 600 storm drain inlets and approximately 200 outfall structures. More than half of the existing roadways are curbed. Additional information can be found in the Borough’s Stormwater Pollution Prevention Plan (SPPP).

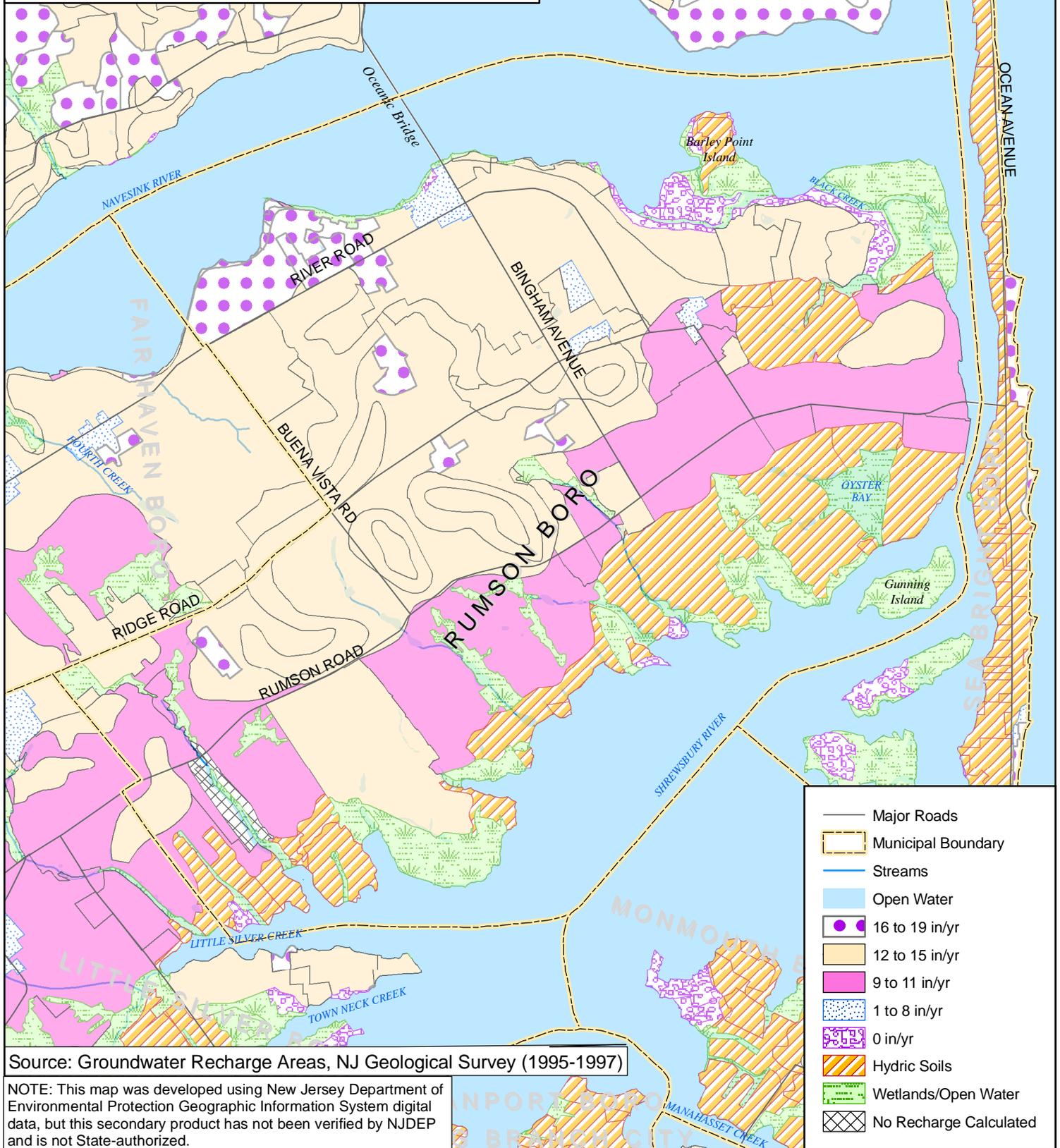
Public Well Heads

There are no public well-heads in Rumson and, therefore, no wellhead protection areas. Although there are no public-well heads there are several private wells, including a high yield well at the golf course.

**Figure 3: Groundwater Recharge Areas
Borough of Rumson
Monmouth County, New Jersey**

3

0 1,250 2,500 5,000 7,500 Feet



Source: Groundwater Recharge Areas, NJ Geological Survey (1995-1997)

NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

Land Use Issues Addressed in this Stormwater Management Plan

There are several land-use issues, which are identified in this Plan as follows:

1. The long-term maintenance of ponds and waterways on private property;
2. Investigate revising the Borough's regulations to require major development unregulated by RSIS to comply with stormwater rules and regulations, i.e., building permit applications not typically regulated by site plan/subdivision approval;
3. Investigate regulating expansions of residential structures and new development in commercial areas;
4. Minimizing mitigation for commercial areas on small lots less than 10,000 square feet in size by balancing policies within points 2 and 3 above;
5. Mitigation techniques for areas of the Borough with a seasonal high water table;
6. Encouraging the use of low phosphorus fertilizers on residential and non-residential properties; and
7. The need for stream protection ordinances and other non-structural stormwater management best management practices (BMP's).

Several of these issues will be addressed in the Borough's Stormwater Ordinance and several of these issues will be addressed long range.

DESIGN AND PERFORMANCE STANDARDS

The Borough should adopt applicable design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to reduce the negative impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The following table indicates actions appropriate for various types of development in Rumson. Ultimately, design and performance standards will be created that contain the necessary language to maintain stormwater management measures consistent with applicable stormwater management rules at N.J.A.C. 7:8-5.8 - Maintenance Requirements. This includes 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 by April 2006. During construction, borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

A number of structural and nonstructural strategies are complicated systems that may increase the promulgation of mosquito breeding habitats. New development and redevelopment should be coordinated with the Monmouth County Mosquito Extermination Commission so these facilities can be designed, constructed and properly maintained to minimize mosquito breeding.

This Plan recommends further study and evaluation of the maintenance of natural stormwater management structures, i.e., ponds, drainage ways, etc. on private property. The current Borough policy of requiring private owners to maintain their portion of a system of interconnected ponds, with outlets discharging to streams and streams crossing numerous lots presents constant conflicts and an unworkable enforcement challenge. This Plan recognizes the need to identify a workable plan with practical implementation for which maintenance can be financed on a long-term basis.

Proper maintenance is critical to the successful performance of a stormwater management system. The Borough has prepared a Stormwater Pollution Prevention Plan (SPPP) that establishes a maintenance schedule for all existing stormwater related maintenance requirements. The Borough will also initiate a local education program to educate property owners on the control of household waste, fertilizers, solids, floatable controls, pesticides and other methods to reduce stormwater pollutants that may adversely affect the Borough's waterways.

For regulated new development and redevelopment projects meeting the NJDEP stormwater management threshold for a Major Development, the Borough will require an operation and maintenance plan in accordance with the DEP BMP manual. Copies of each maintenance plan will be filed with the Borough.

Borough personnel will perform inspections of all stormwater facilities on Borough property or within Borough drainage easement after significant storms to document the functioning of the system and to identify maintenance needs. After this, annual checks should be done to identify maintenance needs. As part of these inspections, blockages may need to be cleared from inlets and outlets. Invasive vegetation may need to be tended or replaced. The design of stormwater management practices for water quality improvement is based primarily on settling of sediment. Therefore, at some point, accumulated material will need to be removed. Borough ordinances should indicate that the inspection of systems is permissible on private property provided the necessary easements are in place upon giving reasonable notice. Ordinances should also indicate a time frame for maintenance procedures to occur upon receiving notice from the Borough that maintenance is required.

TABLE 3 - DESIGN AND PERFORMANCE STANDARDS – POLICY IMPLEMENTATION TABLE

	RESIDENTIAL DEVELOPMENT SUBJECT TO RSIS				Residential Development Not Subject to RSIS				Non-residential Development			
	Major Development		Other		Above Residential Stormwater Management Threshold ¹		Under Residential Stormwater Management Threshold ¹		Above Non-residential Stormwater Management Threshold ¹		Under Non-residential Stormwater Management Threshold ¹	
	Well Drained Soils ²	Poorly Drained Soils ³	Well Drained Soils ²	Poorly Drained Soils ³	Well Drained Soils ²	Poorly Drained Soils ³	Well Drained Soils ²	Poorly Drained Soils ³	Well Drained Soils ²	Poorly Drained Soils ³	Well Drained Soils ²	Poorly Drained Soils ³
Non-structural Strategies⁴												
Protect critical / sensitive areas	☐	☐	☒	☒	☐	☐	☒	☒	☐	☐	☒	☒
Minimize Impervious surfaces	☐	☐	☒	☒	☐	☐	☒	☒	☒	☒	☒	☒
Protect Natural Features	☐	☐	☒	☒	☐	☐	☒	☒	☒	☒	☒	☒
Decrease “reduction in time of concentration”	☐	☐	☒	☒	☐	☐	☒	☒	☒	☒	☒	☒
Minimize land disturbance	☐	☐	☒	☒	☐	☐	☒	☒	☒	☒	☒	☒
Open channel conveyance systems	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Structural Strategies												
Bioretention systems	☐	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Constructed wetlands	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Dry wells	☐	☒	☒	☒	☐	☒	☐	☒	☒	☒	☒	☒
Extended detention Basins	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Infiltration basins	☐	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Manufactured treatment devices	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Pervious paving systems	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒	☐	☒
Sand filters	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
Vegetative filters	☐	☒	☒	☒	☐	☒	☒	☒	☐	☒	☒	☒
Wet ponds	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒

Key: Non-structural Strategies

- ☐ - Appropriate in most cases
- ☒ - May be appropriate, further study necessary
- ☒ - Inappropriate in most cases

Key: Structural Strategies

- ☐ - Usually preferred
- ☒ - Considered on-site specific basis
- ☒ - Not preferred

¹ Residential Stormwater Management Threshold – See Table 3A

Non-Residential Stormwater Management Threshold – See Table 3A

² Well-drained soils – The Borough’s stormwater implementation ordinances will define well-drained soils. However, well-drained soils will generally have groundwater recharge rates of at least 12 inches per year in accordance with Figure 3.

³ Poorly drained soils – The Borough’s stormwater implementation ordinances will define poorly drained soils. However, poorly drained soils will generally have groundwater recharge rates less than 12 inches per year in accordance with Figure 3.

⁴ Additional strategies will apply within 300 feet of a C-1 waterway.

TABLE 3A - STORMWATER MANAGEMENT THRESHOLDS

A. Residential Development

1. Total lot disturbance, including new building and lot coverage, soil disturbance and/or re-grading, exceeds 40,000 square feet in the R-1, R-2 or R-3 Zone District or 7,000 square feet in other zone districts; and/or
2. New impervious surface exceeds 10,000 square feet; and/or
3. A building permit is required and:
 - a. Building coverage or lot coverage exceeds or will exceed 75% of the maximum permitted in the R-1, R-2 or R-3 Zone District or 85% of the maximum permitted in the other zone districts; and
 - b. Building coverage added as a result of the development exceeds 1,200 square feet in the R-1, R-2, or R-3 Zone District or 400 square feet in other zone districts.

B. Non-residential Development

1. The Development is a major development as defined by N.J.A.C. 7:8-1.2 et seq.; and/or
2. Lot coverage exceeds or will exceed 85% of the maximum permitted; and
 - a. Lot coverage added as a result of the development exceeds the greater of 4,000 square feet or 60% of the maximum lot coverage permitted; or
 - b. Lot disturbance exceeds 10,000 square feet.

PLAN CONSISTENCY

Currently there are no adopted Regional Stormwater Management Plans that include all or portions of Rumson and no TMDL's have been developed for waters within the Borough to date. If a Regional Stormwater Management Plan or a TMDL is developed in the future, this Plan will be updated to be consistent.

According to the North Coast – Environmental Planning Region Ecological Resource Inventory (EPRERI) prepared by the Monmouth County Planning Board and the Monmouth County Environmental Council in 1999, coordinated watershed management planning is conducted throughout Monmouth County. It is promoted and implemented by the County Planning Board, the County Environmental Council and the nine Regional Environmental Planning Councils that were established to focus on watershed planning and management.

Past efforts included the collection of the water resource baseline on County property to access county water resources. Recent initiatives include the creation of watershed modeling and characterization studies that were designed to review potential future impacts of existing zoning. A study by EPRERI approximately 10 to 15 years ago recommended that the North Coast REPC work with the Monmouth County Planning Board to develop a regional stormwater management plan to provide base information that municipalities can use regarding the scale and location of any Best Management Practices that might need to be installed in the Shrewsbury and Navesink River watersheds. As indicated in Figure 4, two of these regions lie within Rumson Borough. The EPRERI regional master plan was not completed nor has it been recognized by the NJDEP. If necessary, this plan will be updated to be consistent with a future Regional Master Plan, which may result from the ongoing study.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS, N.J.A.C. 5:21). Rumson will utilize the current update of the RSIS for stormwater management review of residential areas. This Plan incorporates the statute of RSIS and acknowledges that RSIS is periodically updated.

The Borough's Stormwater Management Ordinance will require all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards.

The Municipal Stormwater Management Plan is also consistent with the County Growth Management Guide and the State Development and Redevelopment Plan. The State Planning Commission adopted the State Development and Redevelopment Plan (SDRP) in June of 1992 and adopted a revised SDRP on March 1, 2001. A new SDRP was released for cross acceptance in 2004. The SDRP contains a number of goals and objectives regarding the future development and redevelopment of New Jersey. The primary objective of the SDRP is to guide development to areas where infrastructure is available or can be readily extended such as along existing transportation corridors, in developed or developing suburbs, and in urban areas. New growth and development should be located in "centers", which are "compact" forms of development, rather than in 'sprawl' development. The

overall goal of the SDRP is to promote development and redevelopment that will consume less land, deplete fewer natural resources and use the State's infrastructure more efficiently. Among these is the redevelopment and revitalization of New Jersey's cities and urban areas.

With the exception of environmentally constrained lands, i.e., wetlands, Rumson is located within Planning Area 1 (PA-1). As documented in the SDRP, the following intent has been documented for PA-1:

- Provide for much of the state's future redevelopment;
- Revitalize cities and towns;
- Promote growth in compact forms;
- Stabilize older suburbs;
- Redesign areas of sprawl; and
- Protect the character of existing stable communities.

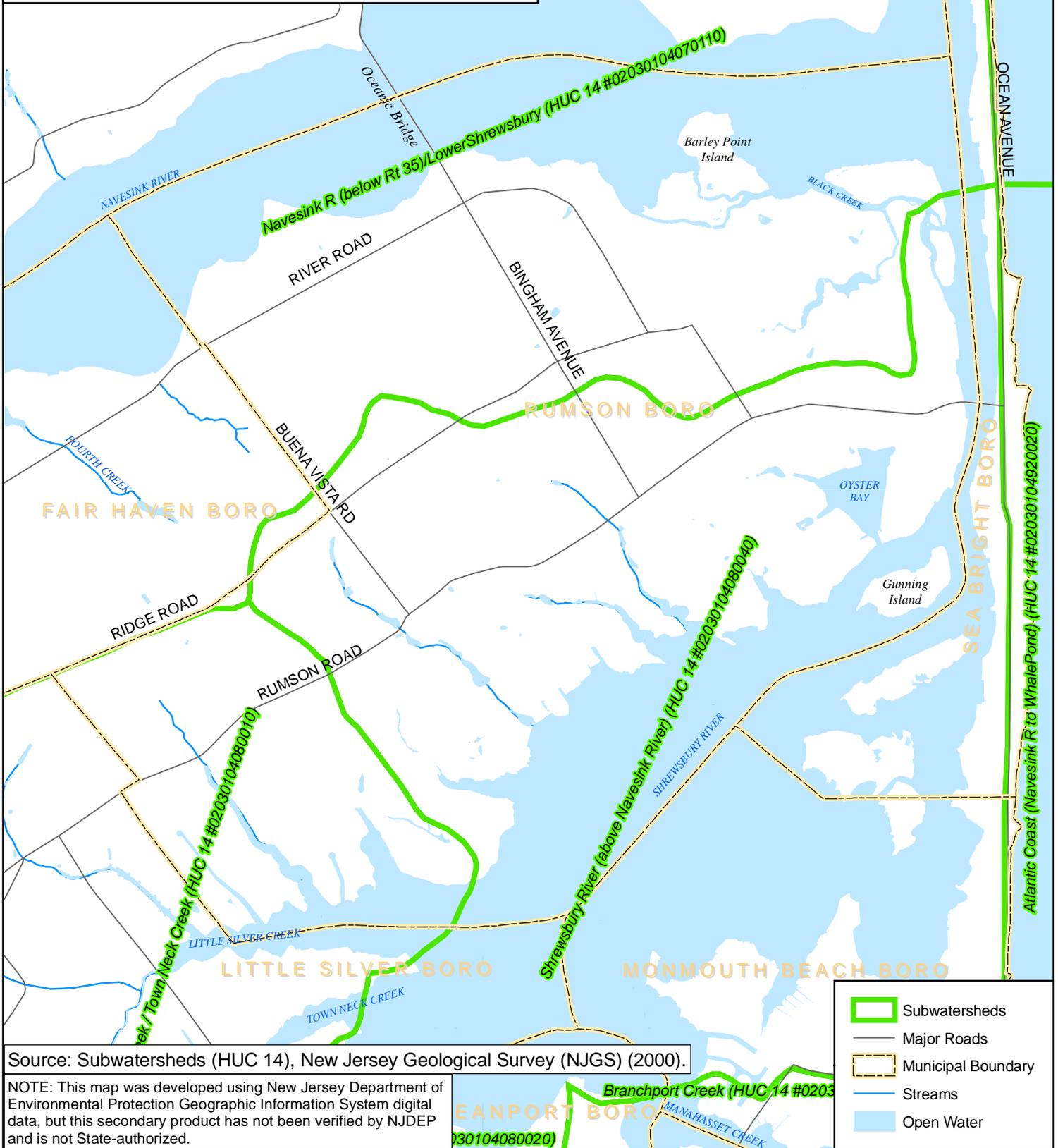
According to the SDRP in the Environmentally Sensitive Planning Area, PA 5, the intention is to:

- Protect environmental resources through the protection of large contiguous areas of land;
- Accommodate growth in Centers;
- Protect the character of existing stable communities;
- Confine programmed sewers and public water services to Centers; and
- Revitalize cities and towns.

Figure 4: Subwatersheds (HUC14) within the Borough of Rumson Monmouth County, New Jersey

3

0 1,250 2,500 5,000 7,500 Feet



Source: Subwatersheds (HUC 14), New Jersey Geological Survey (NJGS) (2000).

NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

- Subwatersheds
- Major Roads
- Municipal Boundary
- Streams
- Open Water

NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

The Borough reviewed the 1988 Master Plan, the 1997 Master Plan Reexamination Report and the 2002 Master Plan Reexamination Report and Borough ordinances pertinent to stormwater management planning. The following narrative indicates recommended revisions for the existing ordinance and new strategies that the Borough should consider if needed. Since the Borough is a fully developed community, minimal new development is anticipated.

Strategies

This Plan specifically recommends the maximum practical use of the following nonstructural strategies for all major developments in accordance with Subchapter 5 of the DEP Best Management Practices manual:

1. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.
2. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.
3. Maximize the protection of natural drainage features and vegetation.
4. Minimize the decrease in the pre-construction “time of concentration.”
5. Minimize land disturbance including clearing and grading.
6. Minimize soil compaction.
7. Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.
8. Provide preventative source controls.

For certain development not subject to RSIS (i.e., commercial development or development not meeting the major development threshold, but meeting the stormwater management thresholds tailored to the Borough), this Plan also recommends the use of the above nonstructural strategies to the maximum extent feasible. In addition, Subchapter 5 further requires an applicant seeking approval for a major development⁵ to specifically identify which and how these nonstructural strategies have been incorporated into the development’s design. Finally, for each of those nonstructural strategies that could not be incorporated into the development’s design due to engineering, environmental, or safety reasons, the applicant must provide an acceptable rationale for this contention.

Recommended Measures

Recommendations in the BMP manual may be implemented through the use of the following:

⁵ Major Development – means any ‘development’ that provides for ultimately disturbing one or more acres of land or increasing impervious surface by one-quarter acre or more. Disturbance for the purpose of this rule is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation. Projects undertaken by any government agency which 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”.

Vegetated Filter Strips

Vegetated filter strips are engineered stormwater conveyance systems that treat small drainage areas. Generally, a vegetated filter strip consists of a level spreader and planted vegetation. The level spreader ensures uniform flow over the vegetation that filters out pollutants, and promotes infiltration of the stormwater.

Vegetated filter strips are best utilized adjacent to a buffer strip, watercourse or drainage swale since the discharge will be in the form of sheet flow, making it difficult to convey the stormwater downstream in a normal conveyance system (swale or pipe).

Stream and Valley Corridor Buffer Strips

Buffer strips are undisturbed areas between development and the receiving waters. There are two management objectives associated with stream and valley corridor buffer strips:

- To provide buffer protection along a stream and valley corridor to protect existing ecological form and functions; and
- To minimize the impact of development on the stream itself (filter pollutants, provide shade and bank stability, reduce the velocity of overland flow).

Buffers only provide limited benefits in terms of stormwater management; however, they are an integral part of a system of best management practices.

The Stabilization of Banks, Shoreline and Slopes

The root systems of trees, shrubs and plants effectively bind soils to resist erosion. Increasing the amount of required plant material for new and redeveloped residential and non-residential sites should be encouraged throughout the Borough. Planting schemes should be designed by a certified landscape architect to combine plant species that have complementary rooting characteristics to provide long-term stability.

Pond Configuration

In Rumson, many estate homes create ponds for aesthetic purposes. In some cases, these ponds are part of interconnected systems. Many of these ponds are shallow and suffer from eutrophic conditions. This leads to a large amount of weed and algae growth that depletes the amount of dissolved oxygen in the water. Through proper design, increases in water temperature during summer months can be minimized.

The configuration of a pond will affect its temperature. The length-to-width ratio should be maximized to prevent the occurrence of large open areas of water that cannot be shaded by vegetation. The positioning of deciduous and coniferous trees along the edges of a pond, channel, or wetland can assist in mitigating undesirable increases in water temperature and contribute to the maintenance of dissolved oxygen levels by inhibiting the growth of algae. It is desirable that ponds should have at least one deep area over 4 to 6 feet in depth to keep the pond waters cool and to maintain an area to sustain a fish population.

Pond Maintenance

In the Design and Performance Standards Section of this Plan, the narrative indicates that the maintenance of stormwater management systems, including ponds, with outfalls discharging to Borough streams and waterways, is the responsibility of private property owners. To date, this has not been an effective way of maintaining ponds. The Borough is exploring new options to determine whether there are viable alternatives to manage this resource. The Borough anticipates including educational materials regarding the impacts of poor pond maintenance in a direct mailing to all residents. The continuing exploration of this issue may change the Borough's policy regarding pond maintenance in the future. The requirement for any new or rehabilitated pond should be consistent with the Category -1 stream requirements.

Deterrence of Geese

Maintaining or planting dense woody vegetation around the perimeter of a pond or wetland is the most effective means of deterring geese from taking over and contaminating local lakes and ponds. Minimizing the amount of land that is mowed will limit the preferred habitat for geese. However, if these actions are not sufficient, the Borough will investigate other actions.

Fertilizers

The use of fertilizers to create the “perfect lawn” is an increasingly common problem in many residential areas. Fertilizer run-off increases the level of nutrients in water bodies and can accelerate eutrophication⁶ in the lakes and rivers and continue on to the coastal areas. The excessive use of fertilizer causes nitrate contamination of groundwater. Good fertilizer maintenance practices can help in reducing the amount of nitrates in the soil and thereby lower its content in the water. Initially, the Borough should work with the NJDEP to educate homeowners of the impacts of the overuse of fertilizers. This discussion should include other techniques to create a “green lawn” without over fertilizing. Almost as important as the use of fertilizer is the combination of over fertilizing and over watering lawns. In many cases, this leads to nutrient rich runoff, which ultimately may discharge into a nearby stream, lake or other water body. If fertilizer is applied correctly, the natural characteristics of the underlying soils will absorb or filter out the nutrients in the fertilizer.

Unpaved Roads

While there are no unpaved public roads in the Borough, there are a few privately maintained unpaved roads or lands serving more than one lot. There is a need to manage the runoff from these roadways. Poorly maintained unpaved roads may contribute to water quality problems and erosion from unpaved roads may increase nonpoint source pollution. This Plan recommends utilizing best management practices (BMP's) to properly manage existing unpaved roads.

⁶ Eutrophication – The normally slow aging process by which a lake evolves into a bog or marsh and ultimately assumes a completely terrestrial state and disappears.

Other Ordinance Recommendations Include:

1. To improve stormwater management and to improve water quality, investigate:
 - a. Reducing the permitted amount of building and impervious coverage limits throughout the Borough; and
 - b. Imposing greater reductions on development exceeding the stormwater management threshold in addition to or as an alternative to structural management strategies.
2. Investigate the creation of a stream buffer ordinance which is consistent with the NJDEP Stormwater Regulations as related to protection of a Category -1 stream.
3. Require conservation easements within environmentally constrained lands, i.e., wetlands and buffer areas.
4. The stormwater implementation ordinance should incorporate requirements to promote groundwater recharge.
5. Ordinances should be updated to indicate when stormwater outfall structures are permitted to cross a buffer area.
6. Ordinances should indicate what types of maintenance activities are permitted within Category-1 stream corridor buffer areas and conservation easements, i.e., removal of fallen trees, lawn cutting, etc.
7. The Borough should consider placing restrictions that limit the allowable disturbance of existing vegetated areas.
8. The Borough should review its wildlife ordinance to include additional species other than geese.
9. Ordinances should be prepared which allow impervious areas to be disconnected by:
 - Allowing the reduction of the runoff volume when runoff from impervious areas are re-infiltrated into vegetated areas;
 - Allowing flush curb and/or curb cuts to allow for runoff to discharge into adjacent vegetated areas as sheet flow; and
 - Permitting an open filter area adjoining a catch basin.

The above ordinances will be based on the NJDEP Model Stormwater Ordinances. The above ordinances will also include a reduced stormwater management threshold for the Borough, in accordance with Tables 3 and 3A, and will include requirements for developments not meeting the Major Development threshold but meeting the stormwater management threshold tailored to the Borough. Upon completion of the ordinance revisions, the adopted ordinances will be submitted to the Monmouth County Planning Board through the Stormwater Technical Advisory Committee (STAC) for review and approval. A copy will also be sent to the Department of Environmental Protection at the time of submission.

INFILL DEVELOPMENT

Applying stormwater management practices in developed areas of Rumson may be a challenge. Limited available vacant land and its cost may limit stormwater management options in infill situations. Stormwater controls are likely to be implemented on private property where owners are responsible for their maintenance. Rumson can generally require

owners to maintain these controls; however, the proliferation of numerous small, scattered facilities may become an enforcement problem from a management and operations perspective.

In Rumson, the most common form of infill development is the demolition of a home and replacement with a home containing a larger building footprint. This Plan does not contemplate the replacement of single-family homes with higher density land uses, i.e., multi-family housing, which would have greater stormwater management impact as a result of increased impervious coverage.

In most instances, infill development creates a more intensive use than previous uses and has higher levels of impervious cover, runoff, and contaminant loading per unit of area. In Rumson, the impacts of expanding large estates on properties greater than two acres in size are significant. In accordance with the Municipal Land Use Law, typically only a building permit is required rather than minor site plan approval, which is granted by the Construction Official rather than the Planning Board.

In many cases, areas surrounding the new infill development were built before the need for stormwater controls was recognized and may be experiencing stormwater management problems. While the development of single, individual infill sites may not have significant stormwater impacts, the development of many individual sites can have cumulative effects and exacerbate existing problems or create new stormwater problems by increasing flooding, erosion, or water quality degradation.

On residential properties, infill development is often limited by lot-level controls. In most cases, having residential roof leaders that discharge to ponding areas is the prevalent practice, e.g., lawn. However, there are additional opportunities to increase groundwater recharge and reducing runoff by using structural stormwater systems, such as a drywell or pervious pavement. Other options to improve stormwater quality and to reduce stormwater quantity include:

- Creating of shrubby rain gardens;
- Promoting awareness of problems associated with soil compaction; and
- Promoting resident awareness of stormwater impacts through public education.

To properly regulate infill development, this Plan specifically recommends the creation of regulations that require stormwater improvements for construction that substantially increase the building footprint. Revising the Borough's grading and disturbance requirements can regulate this.

Commercial Infill Development

There are fewer opportunities to improve stormwater management on small-scale commercial infill development sites than on surrounding residential properties in the Borough. Many commercial properties are located on smaller parcels than surrounding residential properties with greater percentages of permitted building coverage as well as increased ordinance requirements, e.g., number of parking spaces, etc. This Plan recognizes

this and recommends increasing requirements on residential properties rather than commercial properties in the Borough. This will help to encourage local businesses in a manner that will retain community character.

Surface stormwater facilities, such as wet ponds, constructed wetlands and infiltration basins, are not viable options because of the relatively large amount of surface area required. However, the following low impact options should be encouraged:

- Redirecting roof gutters to lawns or dry wells;
- Requiring additional tree plantings; and
- Disconnecting impervious surfaces.
- Encouraging the use of pervious pavement surfaces.

Marinas⁷

Marinas and recreational boating are increasingly popular uses along the New Jersey shore. The growth of recreational boating, along with coastal development, has led to the need to protect waterways. While Marinas are not permitted uses in the Borough, there are two active marinas located on Washington and First Streets.

Of the two marinas, one could be better classified as a restaurant with accessory boat slips, while the other marina offers services typically associated with a marinas, i.e., fueling, repair, sales, etc. Despite having a full-service marina in the Borough, this Plan does not anticipate substantial impacts associated with its use.

State and federal regulations require permits for stormwater discharge for certain types of marinas. Under the NJDEP Pollution Discharge Elimination System (NJDPES) Storm Water Program, discharge permits are required for point source discharges of storm water from certain types of marinas. A point source discharge of storm water is a flow of rainfall runoff in some kind of discrete conveyance (a pipe, ditch, channel, swale, etc.).

According to the above referenced EPA web site, “if a marina is primarily in the business of renting boat slips, storing boats, cleaning boats, and repairing boats, and generally performs a range of other marine services, it is classified under the storm water program (using the Standard Industrial Classification (SIC) system developed by the Office of Management and Budget) as a SIC 4493. Marinas classified as SIC 4493 are the type that may be regulated under the storm water program and may be required to obtain a storm water discharge permit.

A marina that is classified as a SIC 4493 is required to obtain an NJDPES stormwater discharge permit if vehicle maintenance activities such as vehicle (boat) rehabilitation, mechanical repairs, painting, fueling, and lubrication or equipment cleaning operations are conducted at the marina. The stormwater permit will apply only to the point source discharges of storm water from the maintenance areas at the marinas. Operators of these types of marinas should consult the water pollution control agency of the State in which the marina is located to determine how to obtain a stormwater discharge permit.”

⁷ Information obtained from <http://www.epa.gov/owow/nps/MMGI/Chapter5/ch5-1.html#Practices>

The Borough should continue to monitor state and federal requirements for marinas and encourage marinas within the Borough to become a part of the New Jersey Clean Marina Program.

The Clean Marina Program is a voluntary program, which encourages marina owners, yacht clubs, boatyards and boaters to voluntarily adopt practices that help prevent adverse impacts to water quality, sensitive habitats, and living resources in proximity to marinas and to protect the critical habitat areas that are home to a variety of species including algae, plankton, shellfish and finfish.

The program helps to prevent harmful environmental practices through education and outreach to boaters and marina owners. It provides assistance and guidance to enable marinas and other recreational boating facilities to reduce the sources and impacts of non-point source pollution. Some examples include sewage facility management, fueling operations, fish and solid waste management and boat cleaning

STRUCTURAL STORMWATER MANAGEMENT⁸

The Department of Environmental Protection in Chapter 9 of its Stormwater Management Best Management Practices (BMP) manual identifies several structural stormwater management options. The Borough recommends utilizing the following structural devices in accordance with the Borough's Design and Performance Standards – Policy Implementation Table located on Page 12 of this Plan. Specifically, the Borough encourages the use of structural stormwater management systems in a manner that maximizes the preservation of community character.

Bioretention Systems

A bioretention system consists of a soil bed planted with native vegetation located above an underdrained sand layer. It can be configured as either a bioretention basin or a bioretention swale. Stormwater runoff entering the bioretention system is filtered first through the vegetation and then the sand/soil mixture before being conveyed downstream by the underdrain system. Runoff storage depths above the planting bed surface are typically shallow. The adopted Total Suspended Solid (TSS) removal rate for bioretention systems is 90 percent.

Constructed Stormwater Wetlands

Constructed stormwater wetlands are wetland systems designed to maximize the removal of pollutants from stormwater runoff through settling and both uptake and filtering by vegetation. Constructed stormwater wetlands temporarily store runoff in relatively shallow pools that support conditions suitable for the growth of wetland plants. The adopted removal rate for constructed stormwater wetlands is 90 percent.

⁸ Definitions provided in the NJDEP – Stormwater Best Management Practices Manual at: http://www.njstormwater.org/tier_A/bmp_manual.htm

Dry Wells

A dry well is a subsurface storage facility that receives and temporarily stores stormwater runoff from roofs of structures. Discharge of this stored runoff from a dry well occurs through infiltration into the surrounding soils. A dry well may be either a structural chamber and/or an excavated pit filled with aggregate. Due to the relatively low level of expected pollutants in roof runoff, a dry well cannot be used to directly comply with the suspended solids and nutrient removal requirements contained in the NJDEP Stormwater Management Rules at N.J.A.C. 7:8. However, due to its storage capacity, a dry well may be used to reduce the total stormwater quality design storm runoff volume that a roof would ordinarily discharge to downstream stormwater management facilities.

Extended Detention Basins

An extended detention basin is a facility constructed through filling and/or excavation that provides temporary storage of stormwater runoff. It has an outlet structure that detains and attenuates runoff inflows and promotes the settlement of pollutants. An extended detention basin is normally designed as a multistage facility that provides runoff storage and attenuation for both stormwater quality and quantity management. The adopted TSS removal rate for extended detention basins is 40 to 60 percent, depending on the duration of detention time provided in the basin.

Infiltration Basins

An infiltration basin is a facility constructed within highly permeable soils that provides temporary storage of stormwater runoff. An infiltration basin does not normally have a structural outlet to discharge runoff from the stormwater quality design storm. Instead, outflow from an infiltration basin is through the surrounding soil. An infiltration basin may also be combined with an extended detention basin to provide additional runoff storage for both stormwater quality and quantity management. The adopted TSS removal rate for infiltration basins is 80 percent. It should be noted that a dry well is a specialized infiltration facility intended only for roof runoff.

Manufactured Treatment Devices

A manufactured treatment device is a pre-fabricated stormwater treatment structure utilizing settling, filtration, absorptive/adsorptive materials, vortex separation, vegetative components, and/or other appropriate technology to remove pollutants from stormwater runoff. The TSS removal rate for manufactured treatment devices is based on the NJDEP certification of the pollutant removal rates on a case-by-case basis. Other pollutants, such as nutrients, metals, hydrocarbons, and bacteria can be included in the verification/certification process if the data supports their removal efficiencies.

Pervious Paving Systems

Pervious paving systems are paved areas that produce less stormwater runoff than areas paved with conventional paving. This reduction is achieved primarily through the infiltration of a greater portion of the rain falling on the area than would occur with conventional paving. This increased infiltration occurs either through the paving material itself or through void spaces between individual paving blocks known as pavers. Pervious

paving systems are divided into three general types. Each type depends primarily upon the nature of the pervious paving surface course and the presence or absence of a runoff storage bed beneath the surface course. Porous paving and permeable pavers with storage bed systems treat the stormwater quality design storm runoff through storage and infiltration. Therefore, these systems have adopted TSS removal rates similar to infiltration structures. The use of pervious paving systems should be required for any developments, which does not meet the Major Development threshold but meets the reduced Borough stormwater management threshold noted in Table 3A.

Sand Filters

A sand filter consists of a forebay and underdrained sand bed. It can be configured as either a surface or subsurface facility. Runoff entering the sand filter is conveyed first through the forebay, which removes trash, debris, and coarse sediment, and then through the sand bed to an outlet pipe. Sand filters use solids settling, filtering, and adsorption processes to reduce pollutant concentrations in stormwater. The adopted TSS removal rate for sand filters is 80 percent.

Vegetative Filters

A vegetative filter is an area designed to remove suspended solids and other pollutants from stormwater runoff flowing through a length of vegetation called a vegetated filter strip. The vegetation in a filter strip can range from turf and native grasses to herbaceous and woody vegetation, all of which can either be planted or indigenous. It is important to note that all runoff to a vegetated filter strip must both enter and flow through the strip as sheet flow. Failure to do so can severely reduce and even eliminate the filter strip's pollutant removal capabilities. The TSS removal rate for vegetative filters will depend upon the vegetated cover in the filter strip.

Wet Ponds

A wet pond is a stormwater facility constructed through filling and/or excavation that provides both permanent and temporary storage of stormwater runoff. It has an outlet structure that creates a permanent pool and detains and attenuates runoff inflows and promotes the settlement of pollutants. A wet pond, also known as a retention basin, can also be designed as a multi-stage facility that also provides extended detention for enhanced stormwater quality design storm treatment and runoff storage and attenuation for stormwater quantity management. The adopted TSS removal rate for wet ponds is 50 to 90 percent, depending on the permanent pool storage volume in the pond and, where extended detention is also provided, the duration of detention time provided in the pond.

Each of these structures has advantages and disadvantages to manage stormwater. As previously noted Rumson is a fully developed community and anticipates the majority of new construction as residential infill development. The Design and Performance Standards – Policy Implementation Table indicates the appropriateness of these structural stormwater management structures in Rumson.

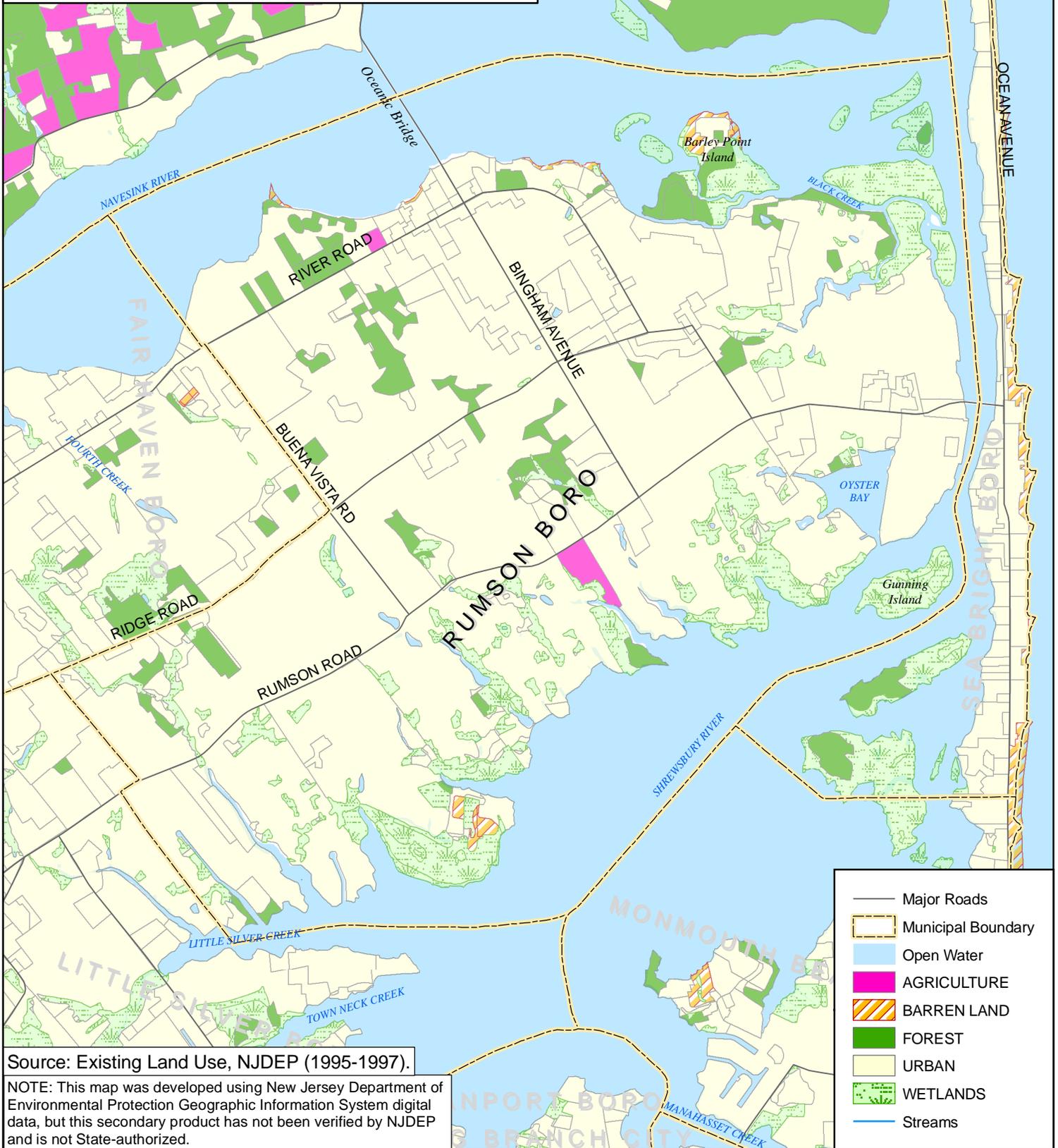
LAND USE/BUILDOUT ANALYSIS

In August 2003, the Borough prepared a Vacant Land Inventory and Analysis Report in accordance with the Council on Affordable Housing (COAH) Standards that indicated that the Borough contains virtually no privately owned vacant land. A copy of the Vacant Land Analysis is located within Attachment A. Figures 4, 5, 6 and 7 complement the Vacant Land Inventory by identifying existing land use, subwatersheds, zoning and environmental constraints in the Borough.

Figure 5: Existing Land Use
Borough of Rumson
Monmouth County, New Jersey

3

0 1,250 2,500 5,000 7,500 Feet



Source: Existing Land Use, NJDEP (1995-1997).

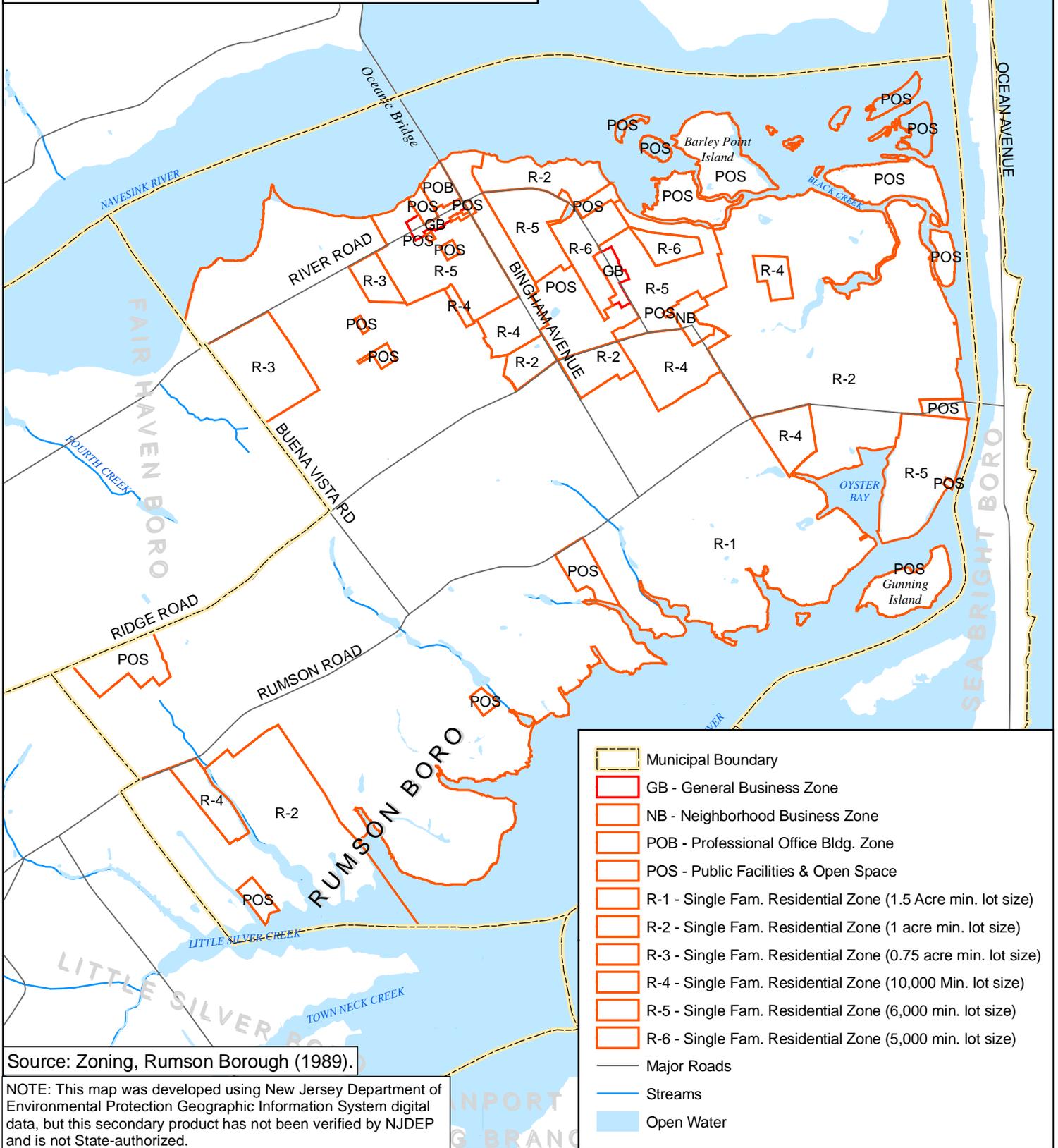
NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

- Major Roads
- - - Municipal Boundary
- Open Water
- AGRICULTURE
- BARREN LAND
- FOREST
- URBAN
- WETLANDS
- Streams

Figure 6: Zoning Districts
Borough of Rumson
Monmouth County, New Jersey

3

0 1,250 2,500 5,000 7,500 Feet



Source: Zoning, Rumson Borough (1989).

NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

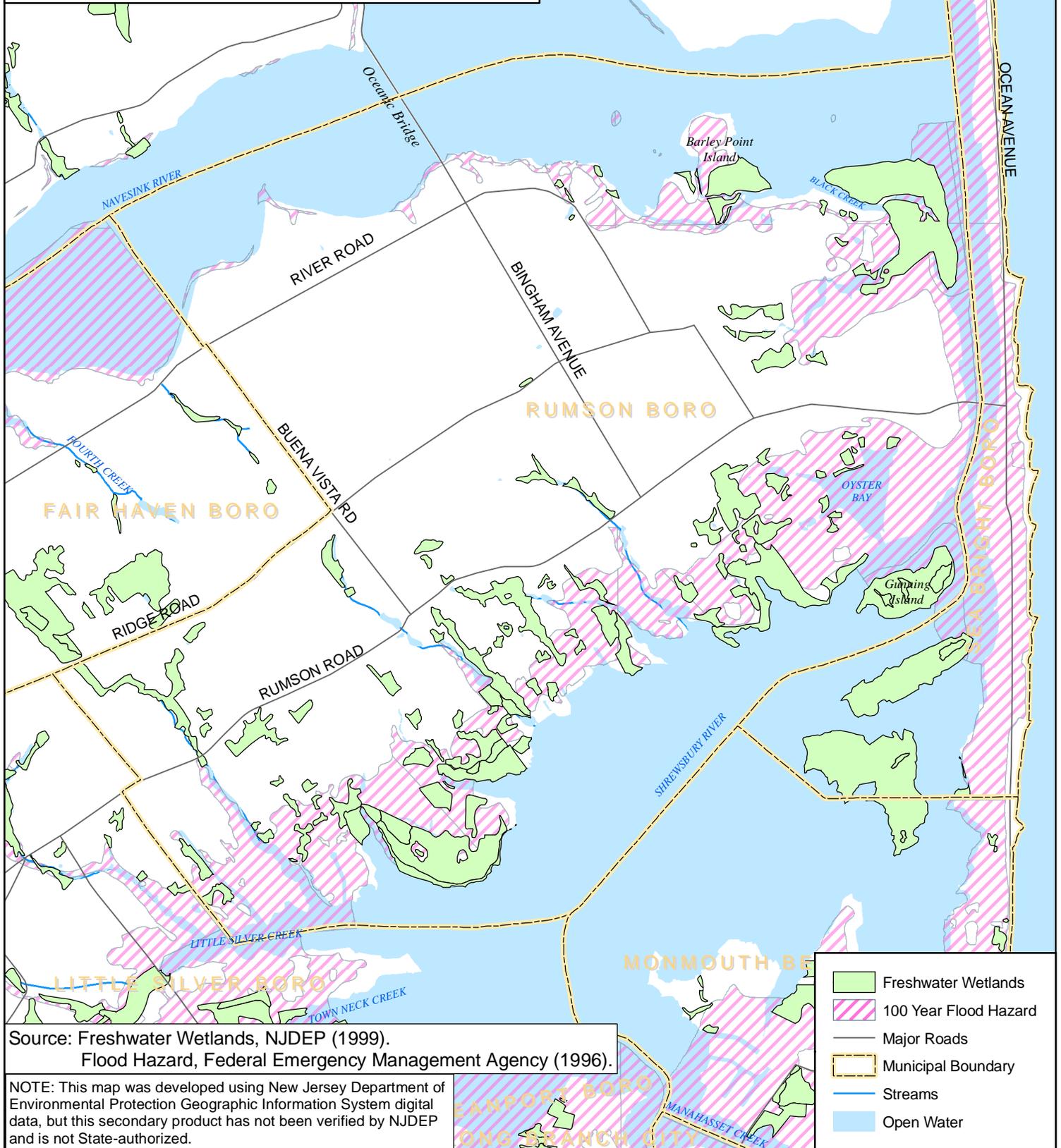
Figure 7: Environmental Constraints

Borough of Rumson

Monmouth County, New Jersey

3

0 1,250 2,500 5,000 7,500 Feet



Source: Freshwater Wetlands, NJDEP (1999).
Flood Hazard, Federal Emergency Management Agency (1996).

NOTE: This map was developed using New Jersey Department of Environmental Protection Geographic Information System digital data, but this secondary product has not been verified by NJDEP and is not State-authorized.

	Freshwater Wetlands
	100 Year Flood Hazard
	Major Roads
	Municipal Boundary
	Streams
	Open Water

MITIGATION PLANS

Mitigation is intended to provide potential solutions to offset stormwater related impacts on groundwater recharge, stormwater quantity control, and/or stormwater quality control for proposed development and establishes the criteria to grant a variance or exemption from the stormwater management design and performance standards.

Mitigation for major development as defined by N.J.A.C. 7:8 – 1.2 et seq. must be implemented in the same drainage area as the proposed development and must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property. Performance standards must ensure the long-term maintenance of the project, which include the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual. The Borough does not anticipate granting variances or exemptions for “major development” until a detailed mitigation plan is developed and approved. This Plan recommends a local stormwater management threshold substantially less than the “major development” threshold in the NJDEP Stormwater Regulations. A greater number of small development projects will be subject to some degree of regulation. When strict compliance cannot be achieved, the commensurate mitigation will consist of a large number of small contributions and will have to be aggregated to form a technically and economically practical mitigation project. The Borough will investigate granting variances or exemptions for development subject to the local stormwater management threshold subject to:

1. Demonstrating that alternate measures proposed by the developer achieve substantially similar benefits to the required measures, or
2. Showing that literal compliance is technically impractical or presents a substantial economic hardship; and
3. Providing mitigation by implementing stormwater management improvements identified by the Borough elsewhere in the basin, which achieve substantially similar stormwater management benefits (i.e. quality for quality and quantity for quantity), or
4. If no specific improvements are identified by the Borough or applicable in the basin and/or the equivalent mitigation obligation is too small to support a mitigation project, a fair-share contribution shall be required to a mitigation bank.

The Borough is investigate using the mitigation bank concept in connection with developing a plan to improve stormwater quality in the sub-basins, which contain privately owned ponds and water courses (see pages 19 & 20).

Due to the lack of vacant land and development potential in the Borough, it is anticipated that the majority of stormwater mitigation will result in retrofitting existing stormwater facilities and natural infrastructure or improving the layout and designing of nonstructural stormwater management techniques. However, this Plan recognizes that other projects may be identified in the future that are subject to the approval of the Planning Board or Borough Engineer.

The following two strategies were identified by the Borough as possible structural mitigation strategies:

1. Install new inlet castings and heads on existing Borough streets, in roadways not proposed for resurfacing, for solids and floatable control;
2. Investigate improving of any of the seven (7) existing stormwater management facilities in the Borough

According to NJDEP Best Management Practices Manual⁹, the following are structural and non-structural strategies that can be utilized to retrofit existing stormwater management deficiencies or structures.

1. Roofs are a large source of concentrated runoff from development. Clean roof runoff can be directed by downspouts to a dry well, disconnecting a portion of the runoff from the storm sewer system and both reducing runoff volume and restoring groundwater recharge.
2. Vegetative filters can be incorporated into existing developments where runoff from paved or intensely managed turf areas can be discharged across the filters. This may require the removal or slotting of existing curbs along the edge of parking lots or roads. Parking lots with vegetated aisle dividers may be particularly amendable to this type of filter strip application.

The Borough will continue to evaluate possible mitigation projects and will develop a more specific concept that will be submitted to Monmouth County and the NJDEP as part of future stormwater control ordinances as concepts are developed. Additionally, as future concepts are developed, the Borough will update and finalize mitigation section of this plan.

⁹ New Jersey Stormwater Best Management Practices Manual, February 2004, Chapter 8 - Maintenance and Retrofit of Stormwater Management Measures

ATTACHMENT A

VACANT LAND INVENTORY AND ANALYSIS
REPORT

Vacant Land Inventory and Analysis Report

Prepared for

Borough of Rumson
Monmouth County, New Jersey

August 7, 2003

Prepared by:



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- C Vacant Land Inventory Maps
 - Vacant Land Inventory Map*
 - Environmental Constraints: Wetlands*
 - Environmental Constraints: Flood Prone Areas*

VACANT LAND INVENTORY

COAH regulations permit municipalities to request an adjustment from their housing need due to a lack of available vacant and developable land. Pursuant to N.J.A.C. 5:93-4.2, municipalities requesting an adjustment of their fair share obligation due to lack of available land must submit an inventory of vacant and undeveloped parcels by lot and block, with property ownership and acreage. All privately-owned parcels identified as vacant in the Borough's tax assessment records are listed in the accompanying Vacant Land Inventory Table in Appendix A. Where two or more contiguous vacant lots are in common ownership, the parcels have been combined into a single tract on the inventory. Property owned by the Borough is listed in the Municipal Lands Table in Appendix B. Vacant and municipally owned sites have been mapped in the accompanying Vacant Land Inventory Map in Appendix C.

PERMITTED EXCLUSIONS

COAH regulations also establish the criteria by which sites or portions of sites in a municipal vacant land inventory may be excluded from the calculation of the municipality's RDP. Environmentally sensitive areas may be excluded from consideration, including flood hazard areas, wetlands, and areas characterized by steep slopes (defined in COAH's regulations as slopes with a grade of greater than fifteen percent) that render a site or portion of a site unsuitable for low and moderate income housing. In addition, small isolated lots having an insufficient acreage to generate an affordable housing setaside as part of an inclusionary development may be excluded. Vacant lots under development as part of an approved subdivision or that received site plan approval for development may also be excluded. Landlocked parcels or sites with limited or no access may also be excluded from the calculation of the RDP.

The Vacant Land Inventory Table in Appendix A provides a parcel by parcel description of the exclusions that have been made pursuant to COAH's guidelines. The general categories of exclusions are summarized as follows:

1. **Small and Isolated Sites.** Several sites listed in the vacant land inventory consist of small and isolated vacant lots that are too small to be realistically developed with an inclusionary development and have been eliminated pursuant to N.J.A.C. 5:93-4.2(c)2. In a number of cases, these lots are associated with an adjacent residential use and are in common ownership. They are used as yards for these dwellings.

COAH's minimum presumptive density in calculating the RDP is six units per acre with a twenty percent setback. At six units per acre, at least 0.8 acres must be present to yield one affordable unit at a 20 percent setback. Consequently, properties with less than 0.8 acres have been excluded. A field investigation was undertaken to confirm that the larger of these small isolated lots (0.5 to 0.8 acres) are not in areas where the application of a higher presumptive density would be appropriate. As a result of this investigation, these lots also were eliminated.

2. **Environmental Constraints.** Environmentally constrained lands may be eliminated pursuant to N.J.A.C. 5:93-4.2(e)2. Environmental constraints fall into the following three categories:

- a) **Wetlands.** A number of lots have been eliminated in part due to the presence of wetlands. Wetlands areas and their relationship to the vacant land inventory sites are mapped in the accompanying Environmental Constraints Map, which also includes floodplain data. In many cases these wetland areas are located within or are coterminous with the flood hazard areas on the site.

- b) **Flood Hazard Areas.** COAH regulations permit flood hazard areas as defined in N.J.A.C. 7:13 and mapped by the NJDEP to be eliminated from the developable land acreage of properties included in the vacant land inventory. If there is no state study of the flood hazard area and the flood drainage is fully developed, then the municipality may use the most recent flood insurance maps to determine the flood hazard area. Consequently, Rumson has used FEMA Flood Insurance Rate Map data to map the flood hazard areas within the Borough. These areas are shown in the accompanying Environmental Constraints Map. Where more detailed data is available, this information is shown. Many sites within the southern portion of the Borough near the Shrewsbury River are impacted by flood hazard areas and have been eliminated in whole or in part due to this constraint. In addition, several "sedge" islands have been eliminated from the inventory.

- c) **Steep Slopes.** COAH regulations allow slopes of greater than 15 percent to be excluded from the calculation of the RDP. However, if a municipality has a steep slope ordinance that allows development within steep slopes, these areas can only be excluded to the extent that they are regulated in the steep slope ordinance. The Borough has taken no exclusions for steep slopes but will consider steep slopes in analyzing particular sites.
3. **Access.** Sites with inadequate access have been eliminated. Typically, these are land-locked lots or lots where access is constrained due to limited lot frontage or other constraints, including environmental constraints.
 4. **Association Owned Properties and Dedicated Open Space.** Parcels owned by property associations as common areas, dedicated open space, or used for drainage basins and similar drainage facilities have been eliminated.
 5. **Approved Site Plans.** Consistent with COAH practice, properties that have an approved subdivision or site plan have been eliminated.
 6. **Incompatible Land Uses.** Sites that are adjacent to or located in areas with incompatible land uses have been determined to be not suitable for low and moderate income housing in accordance with the provisions of N.J.A.C. 5:93-4.2(e)6 and the definition of suitable site as set forth in N.J.A.C. 5:93-1.3, and may be eliminated. No sites on the vacant land inventory were eliminated due to incompatible land uses.
 7. **Municipal Sites.** Municipally owned sites are listed in the Municipal Sites Table in Appendix B and shown in the Municipal Sites Map in Appendix C. No municipally owned sites are included in the calculation of the Borough's RDP. Existing municipally owned parcels include Borough offices, public safety facilities, as well as public parks, playgrounds recreation and conservation areas listed in the Borough's Green Acres Recreation and Open Space Inventory (ROSI). Lands on the ROSI account for approximately 90 acres of parks and open space areas. (Parcel information shown in the vacant land inventory tables was provided by the Borough Tax Assessor.)

- a) **Active Recreation Sites.** Municipalities may reserve up to three (3) percent of their total "developed and developable acreage" for active municipal recreation and exclude this acreage from consideration as potential sites for low and moderate income housing and the calculation of the RDP. Developable acreage is the total vacant and undeveloped lands in the municipality minus historic and architecturally important sites, agricultural lands, and environmentally sensitive lands excluded from the vacant land inventory by COAH's rules. Also excluded from the calculation of total vacant and undeveloped lands are those owned by nonprofit organizations, counties and the State or Federal government that are precluded from development. Existing active municipal recreation areas are then subtracted from the three percent calculation of total developed and developable acreage to determine additional land that may be reserved for active municipal recreation.

Rumson has a total of 3,029.2 acres of developed and developable lands in the Borough. Based on the calculation of developed and developable acreage, the Borough may reserve up to 90.9 acres of active recreation lands. Currently, the Borough has approximately 44.2 acres of property used for active recreation. (See Municipal Lands Inventory Table in Appendix B.) The Borough may reserve up to 46.7 additional acres for active recreation.

- b) **Future Conservation/Passive Recreation/Open Space.** A municipality may reserve up to three (3) percent of its total land area for conservation, parklands, or open space. Based on a total land area of 3,252.2 acres, Rumson may reserve up to 97.6 acres for conservation, parklands or open space. Currently, the Borough has 45.79 acres of municipally owned land reserved for "conservation, parklands and open space." (See Appendix B.) The Borough may reserve up to 51.8 additional acres for open space purposes.

REPEAL OF OBLIGATION

Based on analysis of the Borough's vacant land inventory, all of the sites listed in the inventory may be excluded from the calculation of the Borough's RDP. The reasons for the exclusions are listed in the table in Appendix A. Consequently, the Borough of Rumson's RDP is zero. In the event that it is determined that the Borough has an RDP, the Borough shall—consistent with N.J.A.C. 5:93-4.2(g)—select a method that it deems appropriate to address this RDP.

SUMMARY AND CONCLUSION

The vacant land analysis reveals that the Borough of Rumson does not have sufficient acreage to accommodate its 268-unit new construction obligation. After following the procedures for undertaking a vacant land adjustment analysis described in COAH's regulations, it has been determined that, the Borough of Rumson has an RDP of zero units.

APPENDIX A

Vacant Land Inventory Table

APPENDIX A: VACANT LAND INVENTORY 2003: PRIVATE LANDS

BOROUGH OF RUMSON, NEW JERSEY

Site ID No.	Site Identification				Owner	Site Area (acres)	Environmentally Sensitive				Area Exclusions as per N.J.A.C. 5:93-4.2(e)	Exclusion Codes & Remarks	Developable Acres
	Block	Lot	Location	Net Area Remaining			Wetlands	Steep Slopes		Net Area Remaining			
								Floodplain	Steep Slopes				
1	93	16.06	1 Willowbrook Road	2.39	0.22	0.00	0.00	2.17	Developed with single-family dwelling	0.00			
2	93	16.10	5 Willowbrook Road	3.46	0.46	0.00	0.00	3.00	Part of previously approved residential subdivision. Pond in rear of property. Undersized parcel.	0.00			
3	113	11	Conover Lane	4.66	1.86	2.80	0.00	0.00	In flood plain. Wetlands. Subdivision [?]	0.00			
4	121	2	End of Broadmoor	7.59	0.00	7.59	0.00	0.00	In flood plain. Subdivision application under review by Planning Board.	0.00			
5	121	1	End of Broadmoor	8.02	4.49	3.54	0.00	0.00	In flood plain. Wetlands. Subdivision application under review by Planning Board.	0.00			
6	123	2.02	105 Rumson Road	1.58	0.41	0.21	0.00	0.95	Pond. Wetlands. Part of adjacent residential property.	0.00			
7	124	18	172 Bingham Avenue	1.98	1.44	0.54	0.00	0.00	Flood plain & wetlands.	0.00			
8	126	14	87 Rumson Road	3.02	1.96	0.58	0.00	0.48	Part of adjacent residential property. Wetlands in rear of site.	0.00			
9	128	10.1	Oyster Bay Drive	0.45	0.00	0.45	0.00	0.00	In flood plain. Undersized parcel.	0.00			
10	135	7	S. Shrewsbury Drive	0.53	0.35	0.18	0.00	0.00	In flood plain. Wetlands. Undersized parcel.	0.00			
11	138	3	Warren Street	0.10	0.00	0.10	0.00	0.00	In flood plain. Part of adjacent residential property. Undersized parcel.	0.00			
12	142	4	15 Rumson Road/ CR WA	0.17	0.00	0.12	0.00	0.05	Undersized parcel. Part of adjacent residential property.	0.00			
13	144	13	Waterman Avenue	0.26	0.00	0.26	0.00	0.00	In flood plain. Undersized parcel. Part of adjacent residential property.	0.00			
14	144	27.01	River Place	0.26	0.00	0.26	0.00	0.00	In flood plain. Undersized parcel. Part of adjacent residential property.	0.00			
15	150	1	Gunning Island	15.37	1.83	13.55	0.00	0.00	Sedge island	0.00			
16	163	1	Island W. of Barley Point	3.24	0.00	3.24	0.00	0.00	Sedge island	0.00			
17	164	1	Islands W. of Barley Point	11.32	0.00	11.32	0.00	0.00	Sedge island	0.00			
18	164	2	Island	5.32	0.00	5.32	0.00	0.00	Sedge island	0.00			
19	168	1	Island	1.01	0.00	1.01	0.00	0.00	Sedge island	0.00			
20	11	21	East River Road	0.79	0.13	0.65	0.00	0.02	Wetlands. Part of adjacent residential property. Narrow, irregularly shaped lot.	0.00			
21	33	35.01	31 Allen Street	0.11	0.00	0.00	0.00	0.11	Undersized parcel. Part of adjacent residential property.	0.00			
22	38	10	16 Forrest Avenue	0.20	0.00	0.00	0.00	0.20	Undersized parcel. Part of adjacent residential property.	0.00			
23	55	9	76 Blackpoint Road	0.12	0.00	0.00	0.00	0.12	Undersized parcel. Part of adjacent residential property.	0.00			
24	61	25	166 E. River Road	0.19	0.00	0.00	0.00	0.19	Developed with single-family dwelling	0.00			
25	69	6	28 Holly Street	0.12	0.00	0.00	0.00	0.12	Undersized parcel. Part of adjacent residential property.	0.00			
26	70	5.01	Ridge Road	2.03	0.93	0.15	0.00	0.95	Part of adjacent residential property. Wetlands.	0.00			
27	76	6	6 North Ward Avenue	1.93	0.00	1.93	0.00	0.00	Flood plain.	0.00			
28	85	13	162 Rumson Road	1.84	0.00	0.00	0.00	1.84	Single family dwelling under construction	0.00			
29	45	15.01	49 Forrest Avenue	0.11	0.00	0.00	0.00	0.11	Developed with single-family dwelling	0.00			
30	45	15.02	51 Forrest Avenue	0.16	0.00	0.00	0.00	0.16	Developed with single-family dwelling	0.00			
31	100	9.01	15 Ridge Road	2.53	0.00	0.14	0.00	2.40	Residential subdivision.	0.00			
32	100	9.03	129 Avenue of Two Rivers	1.22	0.00	0.00	0.00	1.22	Residential subdivision.	0.00			
33	100	9.02	127 Avenue of Two Rivers	1.50	0.00	0.00	0.00	1.50	Residential subdivision.	0.00			
34	88	7	Ridge Rd. & Bellevue Ave.	1.29	0.00	0.00	0.00	1.29	Part of adjacent residential property.	0.00			
						84.87	53.93	14.07	16.87		0.00		
						TOTAL ACREAGE						0.00	

APPENDIX B

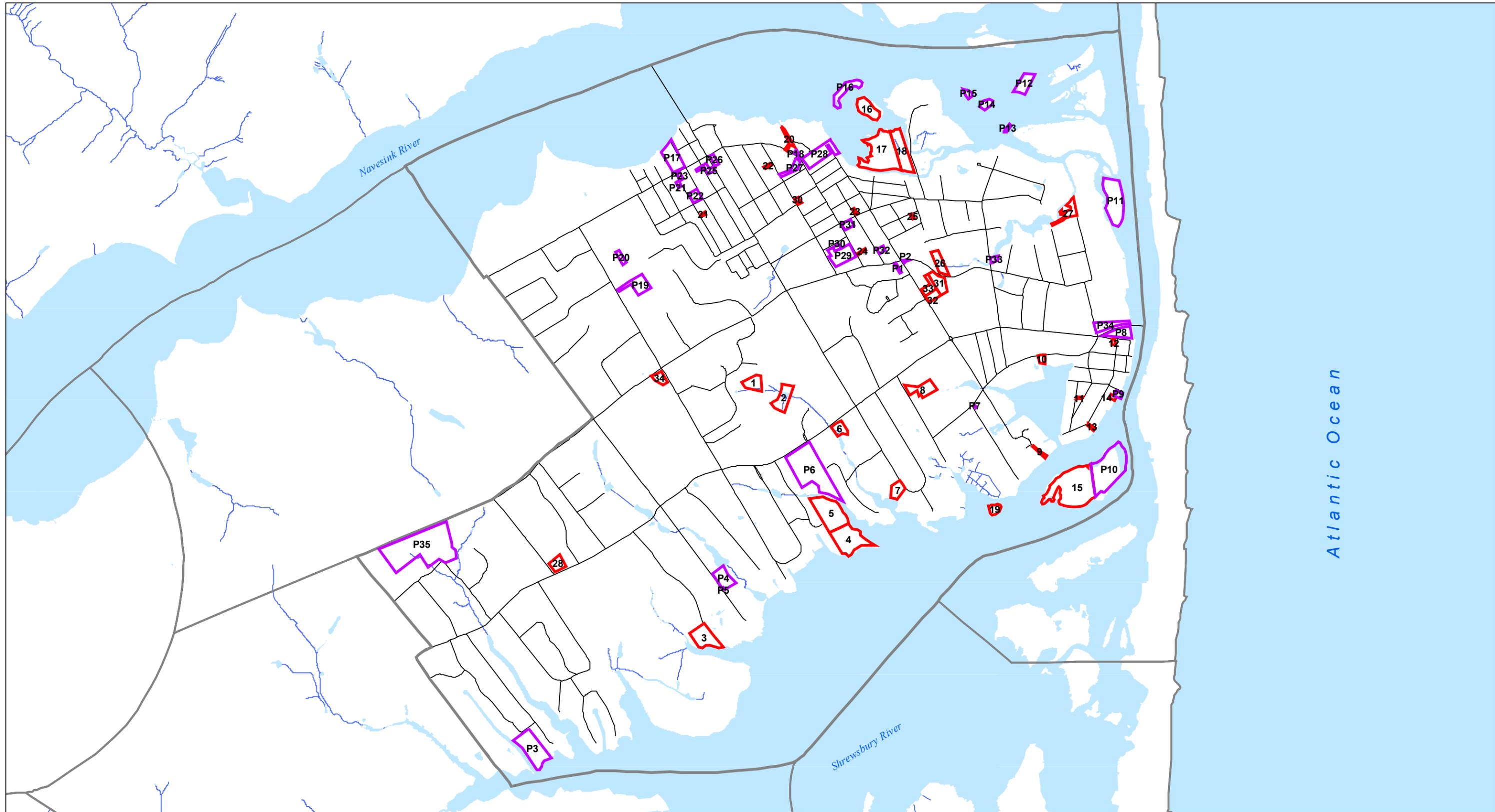
Municipal Lands Table

APPENDIX B: MUNICIPAL LANDS TABLE
BOROUGH OF RUMSON, NEW JERSEY

Site ID No.	Block	Lot	Location	Area Name (if known)	Site Area (acres)	Area Exclusions as per N.J.A.C. 5:93-4.2(e)			Comments
						Environmentally Sensitive		Net Area Remaining	
						Wetlands	Floodprone		
P-1	99	13	Ridge Road	Parking Lot	0.17	0.00	0.00	0.17	Other
P-2	100	13	Ave. of Two Rivers & Ridge	Oceanic Public Library Trust	0.13	0.00	0.00	0.13	Other
P-3	105	28	Riverside Drive	Riverside Park	7.09	0.00	7.09	0.00	Active
P-4	115	23.01	Buena Vista Avenue	Disposal Area	3.00	1.41	1.59	0.00	Other
P-5	115	23.02	Buena Vista Avenue	Pumping Station	0.05	0.00	0.05	0.00	Other
P-6	122	1	Rumson Road	Open Space	14.47	2.33	8.50	3.64	Passive
P-7	128	2	Shrewsbury Drive	Sewage Pumping Station	0.05	0.03	0.02	0.00	Other
P-8	143	1	Rumson Road & Ward Ave.	Pocket Park	2.26	0.00	0.84	1.42	Active
P-9	144	30	Grant Avenue	Main Pumping Station	0.48	0.00	0.48	0.00	Other
P-10	150	2	Gunning Island	Sedge Island	12.15	2.54	9.61	0.00	Passive
P-11	151	1	Island-Ward Avenue	Sedge Island	7.71	0.00	7.71	0.00	Passive
P-12	155	1	Island E of Barley Point	Sedge Island	2.54	0.00	2.54	0.00	Passive
P-13	156	1	Island E of Barley Point	Sedge Island	0.27	0.00	0.27	0.00	Passive
P-14	157	1	Island	Sedge Island	0.99	0.00	0.99	0.00	Passive
P-15	158	1	Islands E of Barley Point	Sedge Island	0.55	0.00	0.55	0.00	Passive
P-16	162	1	West of Barley Point	Sedge Island	2.73	0.00	2.73	0.00	Passive
P-17	5	4	West River Road	Victory Park	4.17	0.00	0.97	3.20	Active
P-18	11	25	East River Road	Pocket Park	0.18	0.09	0.08	0.01	Active
P-19	18	15	Bellevue Avenue	Bird Sanctuary	3.26	0.00	0.00	3.26	Passive
P-20	18	18	Bellevue Avenue	Pocket Park	0.68	0.00	0.00	0.68	Active
P-21	27	5	Allen Street	Borough of Rumson	0.23	0.00	0.00	0.23	Active
P-22	28	11	Church & Lafayette	Rogers Park	1.18	0.00	0.00	1.18	Active
P-23	28	1	25 W. River Road & Allen St.	Oceanic Hook & Ladder	0.26	0.00	0.00	0.26	Other
P-24	29	6	Washington Street	Parking Lot	0.16	0.00	0.00	0.16	Other
P-25	30	5	40 Bingham Avenue	Community Center & Parking Lot	0.62	0.00	0.00	0.62	Other
P-26	36	1	River Road	Parking Lot	0.56	0.00	0.00	0.56	Other
P-27	39	13	East River Road	Pond	1.12	0.40	0.00	0.72	Passive
P-28	49	9	East River Road	Borough Hall shed & First Aid	4.49	0.31	4.10	0.09	Other
P-29	60	5	East River Road	Piping Rock Park	3.84	0.00	0.00	3.84	Active
P-30	60	2	Carlton Street	Garage	0.35	0.00	0.00	0.35	Other
P-31	61	1	East River Road	Rumson Fire Co.	0.89	0.00	0.00	0.89	Other
P-32	62	30	Center Street	Police Headquarters	0.37	0.00	0.00	0.37	Other
P-33	73	17	Navesink Avenue	Sewage Pumping Station	0.40	0.00	0.40	0.00	Other
P-34	80	1	Rumson Road	Pocket Park	2.26	0.00	0.22	2.04	Active
P-35	81	7.00	Ridge Road	Park	22.34	2.21	0.00	20.13	Active
TOTAL ACREAGE					101.99	9.32	48.73	43.95	

APPENDIX C

Vacant Land Inventory Maps



Vacant Land Inventory Map

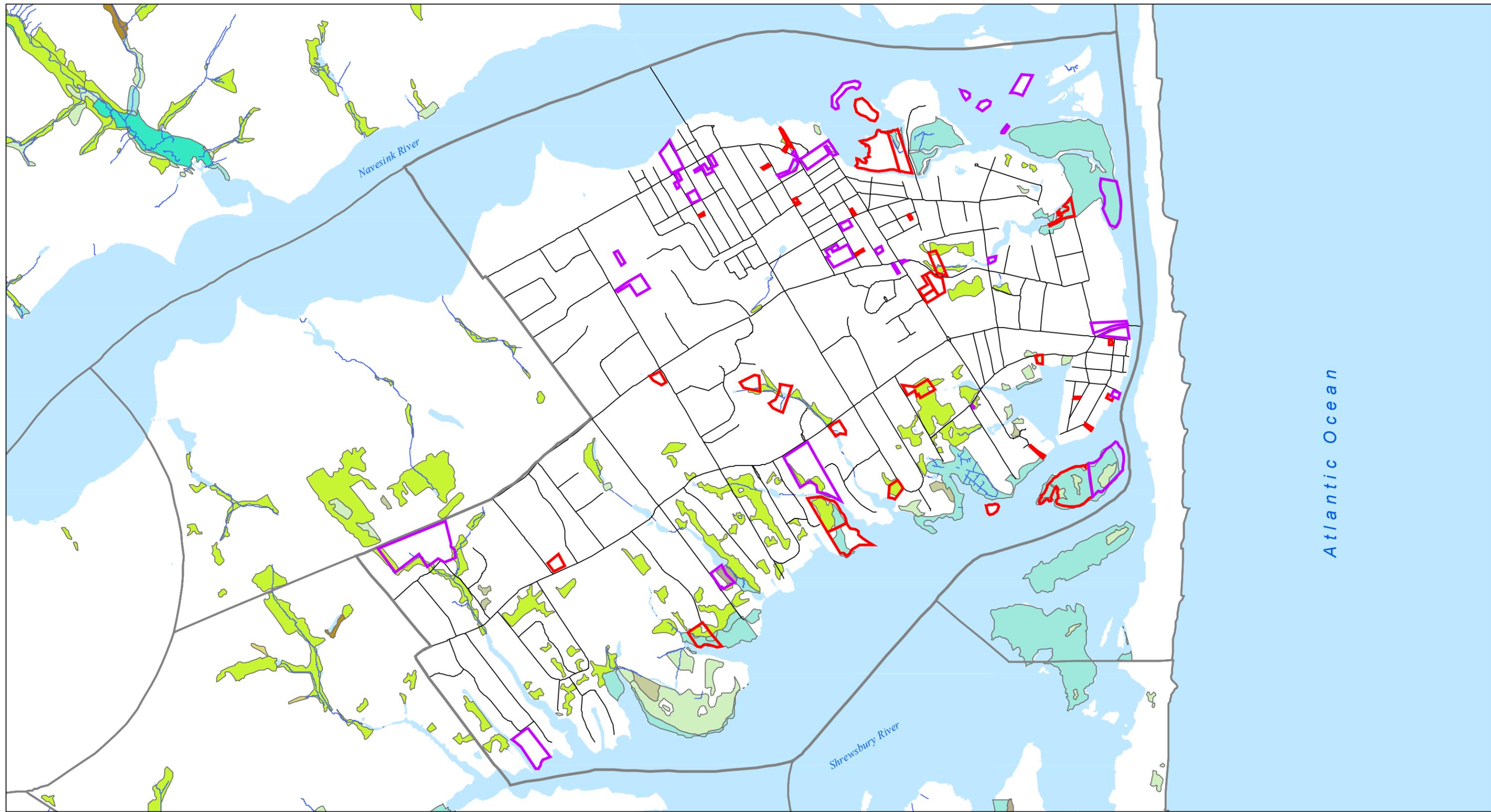
Borough of Rumson

Monmouth County, NJ

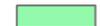
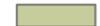
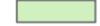
- Municipal Property
- Vacant, Private
- Municipal Boundaries
- Roadways
- Streams
- Water Bodies



NOTE: This map was developed, in part, using Monmouth County Geographic Information System digital data, but this secondary product has not been verified by MCGIS and is not warranted by the County.

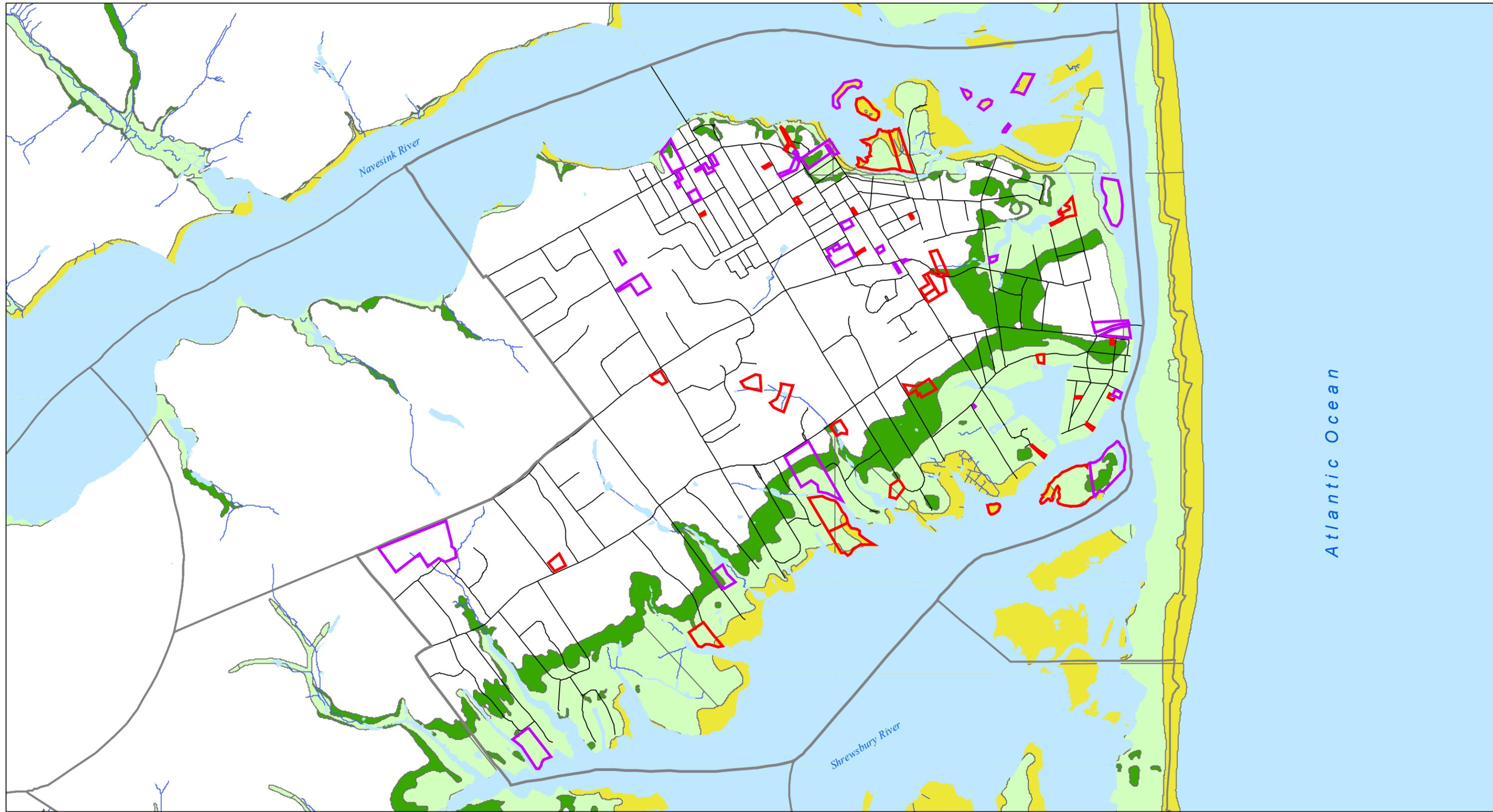


Environmental Constraints: Wetlands Borough of Rumson Monmouth County, NJ

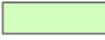
- | | | |
|--|--|--|
|  AGRICULTURAL WETLANDS (MODIFIED) |  MANAGED WETLANDS (MODIFIED) |  Municipal Property |
|  ATLANTIC WHITE CEDAR WETLANDS |  MIXED FORESTED WETLANDS (CONIFEROUS DOM.) |  Vacant, Private |
|  CONIFEROUS SCRUB/SHRUB WETLANDS |  MIXED FORESTED WETLANDS (DECIDUOUS DOM.) |  Municipal Boundaries |
|  CONIFEROUS WOODED WETLANDS |  MIXED SCRUB/SHRUB WETLANDS (DECIDUOUS DOM.) |  Roadways |
|  DECIDUOUS SCRUB/SHRUB WETLANDS |  MIXED SCRUB/SHRUB WETLANDS (CONIFEROUS DOM.) |  Streams |
|  DECIDUOUS WOODED WETLANDS |  SALINE MARSHES |  Water Bodies |
|  DISTURBED WETLANDS (MODIFIED) |  VEGETATED DUNE COMMUNITIES | |
|  FRESHWATER TIDAL MARSHES |  WETLAND RIGHTS-OF-WAY (MODIFIED) | |
|  HERBACEOUS WETLANDS | | |



NOTE: This map was developed, in part, using Monmouth County Geographic Information System digital data, but this secondary product has not been verified by MCGIS and is not warranted by the County.



**Environmental Constraints:
Flood Prone Areas
Borough of Rumson
Monmouth County, NJ**

- | | | | |
|--|-----------------|---|----------------------|
|  | 100-Year Flood |  | Municipal Property |
|  | 500-Year Flood |  | Vacant, Private |
|  | Velocity Hazard |  | Municipal Boundaries |
|  | Undetermined |  | Roadways |
| | |  | Streams |
| | |  | Water Bodies |



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