Schwanewede / Hals Engineering **Professional Engineering and Land Surveying**

9 Post Road
Suite M11
Oakland, New Jersey 07436

Phone (201) 337-0053
Fax (201) 337-0173
E-mail: halseng@optonline.net

BOROUGH OF UPPER SADDLE RIVER
BERGEN COUNTY, NEW JERSEY

Municipal Stormwater Management Plan

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Upper Saddle River to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations.This plan contains all of the required elements described in N.J.A.C. 7:8 Stormwater Management Rules. The plan addresses groundwater recharge, stormwater quantity, and stormwater quality impacts by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acre of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies.

The plan addresses the review and update of existing ordinances, the Borough's Master Plan, and other planning documents to allow for project designs that include low impact development techniques. The final component of this plan is a mitigation strategy for when a variance or exemption of the design and performance standards is sought. As part of the mitigation section of the stormwater plan, specific stormwater management measures are identified to lessen the impact of existing development.

Goals

The goals of this MSWMP are to:

- reduce flood damage, including damage to life and property;
- minimize, to the extent practical, any increase in stormwater runoff from any new development;
- reduce soil erosion from any development or construction project;
- assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures;
- maintain groundwater recharge;
- prevent, to the greatest extent feasible, an increase in nonpoint pollution;
- maintain the integrity of stream channels for their biological functions, as well as for drainage;
- minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial, and other uses of water; and
- protect public safety through the proper design and operation of stormwater basins.

To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities. The plan also outlines safety standards for stormwater infrastructure to be implemented to protect public safety.

The Borough of Upper Saddle River will use the Public Works Department to monitor all their roads and streets for erosion problems during normal patrols. All identified road erosion problems will be reported to the Public Works Superintendent. During quarterly SPPP Team meetings, identified areas of erosion will be discussed and repairs prioritized. All maintenance personnel will then be assigned to the areas of concern, and the areas identified to have road erosion problems will be repaired in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. All maintenance personnel will maintain an inspection log, and to the Public Works Superintendent will maintain a list of all repairs and the dates completed

The Borough of Upper Saddle River has evaluated all of its streets to determine which areas will need to be swept monthly. These areas have been grouped together into four separate groups, and each group will be assigned a different week each month. Also, the Borough of Upper Saddle River will implement an annual catch basin cleaning program to maintain catch basin function and efficiency. All catch basins will be inspected once a year. If, at the time of inspection, no sediment, trash, or debris is observed in the catch basin, then that catch basin will not be cleaned. All catch basins will be inspected yearly, even if they were found to be "clean" the previous year. At the time of cleaning, the catch basins will also be inspected for proper function.

We will continue an initial physical inspection of all of our outfall pipes. Outfall pipes that are found to have a dry weather flow or evidence of an intermittent non-stormwater flow will be rechecked again to locate the illicit connection. If we are able to locate the illicit connection (and the connection is within the Borough of Upper Saddle River) we will cite the responsible party for being in violation of our Illicit Connection Ordinance, and we will have the connection eliminated immediately. If an illicit connection is found to originate from another public entity, the Borough of Upper Saddle River will report the illicit connection to the Department. When we are doing the illicit connection part of this program, we will be checking all of our outfall pipes for signs of scouring. All sites will be placed on a prioritized list and repairs will be made in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey. In addition, repairs that do not need NJDEP permits for those repairs may be done first.

To control stormwater from new development and redevelopment projects throughout the Borough of Upper Saddle River (including projects we operate) we will do the following:
We are already ensuring that all new residential development and redevelopment projects that are subject to the Residential Site Improvement Standards for stormwater management (including the NJDEP Stormwater Management rules, N.J.A.C. 7:8, referenced in those standards) are in compliance with those standards. Our planning and zoning boards ensure such compliance before issuing preliminary or final subdivision or site plan approvals under the Municipal Land Use Law.

Since the Effective Date of the Permit Authorization (EDPA), the Borough of Upper Saddle River has not constructed any new development or redevelopment projects on Borough property. If we decide to construct such a project before our municipal stormwater control ordinance takes effect, we will ensure adequate long-term operation and maintenance of BMPs for that project by requiring a project maintenance plan similar to the maintenance plan described in our draft of that ordinance, and by requiring and funding the

implementation of that plan. We will also require any storm drain inlets that we install to comply with the design standard in Attachment C of our permit. Once that ordinance takes effect, we will ensure such operation and maintenance for any new development or redevelopment projects on our property by complying with the maintenance requirements in that ordinance. In addition, any storm drain inlets we install for such projects will comply with that ordinance's standard for such inlets. All Borough projects since April 1, 2004 involving existing inlets have been designed and constructed to meet the requirements of retrofitting. Inlets were constructed with curb openings with a clear space no bigger than two inches across the smallest dimension, and bicycle safe grates.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (See Figure A-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 storms sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than natural conditions. These increases can create new and aggravate existing downstream flooding and erosion problems and increase the quantity of sediment in the channel. Filtration of runoff and removal of pollutants by surface and channel vegetation is eliminated by storm sewers that discharge runoff directly into a stream. Increases in impervious area can also decrease opportunities for infiltration which, in turn, reduces stream base flow and groundwater recharge. Reduced base flows and increased peak flows produce greater fluctuations between normal and storm flow rates, which can increase channel erosion. Reduced base flows can also negatively impact the hydrology of adjacent wetlands and the health of biological communities that depend on base flows. Finally, erosion and sedimentation can destroy habitat from which some species cannot adapt.

In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal waste, 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 providing shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

Background

Upper Saddle River Borough is primarily a single-family community that occupies 5.29 square miles in northern Bergen County, New Jersey. The Borough lies approximately 17.5 miles northwest of Manhattan, and approximately 12 miles north of Hackensack, the County seat. Main road access is provided by the Garden State Parkway to the east and State Route 17 to the west. Upper Saddle River is a mostly developed municipality.

Public water is supplied by United Water, a water utility company, to approximately 20% of the residents of the Borough. The remainder of residents utilize private wells. United Water has two public wellheads located near Lake Road in the center of the Borough. Currently, there are no Borough ordinances implemented in the protection of the multiple Wellheads located within the Borough. Approximately 2% of Borough residents utilize sanitary sewers, with the remainder on private septic systems. At this time, there is no formal long-range schedule for expanding either water or sewer services to the Borough.

The population of the Borough is 7,741 as of the 2000 census. The resultant change from the census of 1990 was an increase of 7.5%. This reversed the downward population trend from 1970 to 1990, which saw a 9.4% drop in population. The Borough has yet to return to the 1970 population. It should be noted that during the time period from 1970 to 2000, dwelling units increased steadily even as the population dropped.

Year	Population	Dwelling Units
1970	7,949	2050
1980	7,958	2330
1990	7,198	2410
2000	7,741	2560

The recent population history of Upper Saddle River is provided by the data in Table 1 at the end of this report.

Upper Saddle River is an older established community where land use is fairly stable. There are very few properties where larger development can take place, and no significant farmland or agricultural lands that could be developed. Therefore, there is a slight expectation of a large increase in stormwater runoff volumes and pollutant loads to the Borough's waterways.

The major waterways are as follows:

> **Saddle River** – Traverses from the north at the New York State line, heading downstream to the corporate limits of Saddle River Borough, with the main branch running almost directly north-south through the middle of the borough. Many smaller branches of the Saddle River extend throughout the Borough. These include Pleasant Brook, Kroner's Brook, Sparrowbush Creek, Wandell Brook, Oost Val Brook and other unnamed tributaries.

All waterways within the Borough lie within NJ State Watershed Area Number 4. Watershed areas within the state are additionally broken down into smaller sub-watersheds designated as HUC-14s. The HUC-14 watersheds are used to perform build-out analyses for municipalities with greater than one square mile of

developable or agricultural land remaining. Upper Saddle River has less than one square mile of remaining developable land, therefore there is no HUC-14 delineation or build-out analysis included in this report.

The Saddle River and its tributaries, north of Lake Road, are classified as Category One waterways by the New Jersey Department of Environmental Protection. A Category One designation, in addition to the Surface Water Quality Standards (SWQS), provides additional protection to water bodies that help prevent water quality degradation and discourage development where it would impair or destroy natural resources and environmental quality.

"Category One Waters" are those waters designated in the tables in N.J.A.C. 7:9B-1.15(c) through (h), for purposes of implementing the antidegradation policies set forth at N.J.A.C. 7:9B-1.5(d), for protection from measurable changes in water quality characteristics because of their clarity, color, scenic setting, other characteristics of aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, or exceptional fisheries resource(s). These waters may include, but are not limited to:

1. Waters originating wholly within Federal, Interstate, State, County, or Municipal parks, forests, fish and wildlife lands, and other special holdings that have not been designated as FW1 at N.J.A.C. 7:9B-1.15(h) Table 6;
2. Waters classified at N.J.A.C. 7:9B-1.15(c) through (g) as FW2 trout production waters and their tributaries;
3. Surface waters classified in this subchapter as FW2 trout maintenance or FW2 nontrout that are upstream of waters classified in this subchapter as FW2 trout production;
4. Shellfish waters of exceptional resource value; or
5. Other waters and their tributaries that flow through, or border, Federal, State, County, or Municipal parks, forests, fish and wildlife lands, and other special holdings.

The Surface Water Quality Standards (SWQS) establish the designated uses to be achieved and specify the water quality (criteria) necessary to protect the State's waters. Designated uses include potable water, propagation of fish and wildlife, recreation, agricultural and industrial supplies, and navigation. These are reflected in use classifications assigned to specific waters.

The criteria applicable to different use classifications are numerical estimates of constituent concentrations, including toxic pollutants, protective of the uses. Narrative criteria describe instream conditions to be attained/maintained or avoided. Waters of the State include, but are not limited to, rivers, lakes, streams, wetlands, estuaries and near shore coastal waters.

The current Surface Water Quality designations and uses in all FW2 waters, identified under N.J.A.C. 7:9B, that apply to these waterways are as follows:

1. Maintenance, migration and propagation of the natural and established biota;
2. Primary and secondary contact recreation;
3. Industrial and agricultural water supply;
4. Public potable water supply after conventional filtration treatment (a series of processes including filtration, flocculation, coagulation, and sedimentation, resulting in substantial particulate removal but no consistent removal of chemical constituents) and disinfection; and
5. Any other reasonable uses.

The Saddle River is subject to bank flooding during periods of heavy rain. Figure A-2 illustrates the waterways in the Borough. Flood Hazard Areas for the listed waterways are delineated on Federal Emergency Management Agency FIRM maps. Two (2) of the branches of the Saddle River within the Borough have monitoring stations that are listed on the New Jersey Department of Environmental Protection's Ambient Biomonitoring Network (AMNET). The AMNET documents the health of the state's waterways. Streams are classified as non-impaired, moderately impaired, or severely impaired. Both monitoring stations within the Borough, AN0279 and AN0280, are listed as non-impaired. Figure A-3 depicts the Borough boundary on the USGS quadrangle map.
The New Jersey Integrated Water Quality Monitoring and Assessment Report 305(b) and 303(d) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

Based on the New Jersey 2006 Integrated Water Quality Monitoring and Assessment report, TMDLs have not yet been established for the major waterways within the Borough. Appendix D of the Report, entitled "New Jersey's 2006 Two Year TMDL Schedule", indicates that TMDLs will not be established for the Saddle River or any of its tributaries within the Borough during 2006-2008. At this time, the Borough is not independently conducting any evaluations of TMDLs on any waterways.

Design and Performance Standards

The Borough will adopt the design and performance standards for stormwater management measures by Ordinance 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 months of the effective date of the Municipal Stormwater Management Plan.

During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed.

Plan Consistency

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 to use a water body for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety.

The Borough is not within a Regional Stormwater Management Planning Area and no Total Maximum Daily Loads (TMDLs) have been developed for waters within the Borough; therefore this plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any

TMDLs. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

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

The 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. During construction, Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

Once approved, this ordinance, which will be administered by our planning and zoning boards and code enforcement officer, will control stormwater from non-residential development and redevelopment projects. Where it is necessary to implement the municipal stormwater management plan, the approved ordinance will also control aspects of residential development and redevelopment projects that are not subject to the Residential Site Improvement Standards.

For any BMP that is installed in order to comply with the requirements of our post-construction program, the Borough of Upper Saddle River will ensure adequate long-term operation as well as preventative and corrective maintenance (including replacement) of BMPs. For BMPs on private property that we do not own or operate, the Borough of Upper Saddle River intends to do this by adopting and enforcing a provision in the municipal stormwater control ordinance that requires the private entity to perform the operation and maintenance, with penalties if the private entity does not comply. If, for example, the private entity does not perform the required maintenance, the Borough can perform the maintenance and charge the private entity.

Nonstructural Stormwater Management Strategies

The Borough will be reviewing the master plan (last re-examined in 2001) and ordinances, and will provide a list of the sections in the Borough land use and zoning ordinances that are to be modified to incorporate nonstructural stormwater management strategies. The following are the ordinances identified for revision. Once the ordinance texts are completed, they will be submitted to the county review agency for review and approval within 24 months of the effective date of the Stormwater Management Rules. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapter 126 of the Borough Code, entitled Subdivision and Site Plan Review, was reviewed with regard to incorporating nonstructural stormwater management strategies. Several changes will be made to Article V of this Chapter, entitled Subdivision Design Standards, and Article VI, entitled Site Plan Design Standards, to incorporate these strategies, as follows:

> **Section 126-19: General Standards** requires that natural features, such as trees, brooks, hilltops and views be preserved whenever possible in any development. This section will be amended to expand trees to forested areas, to ensure that leaf litter and other beneficial aspects of the forest are maintained in addition to the trees.

Section 126-20: **Streets** describes the requirements for streets in the Borough. This section will be amended to encourage developers to limit on-street parking to allow for narrower paved widths. Language will be added to this section to reduce the minimum radius of cul-de-sac designs. Cul-de-sacs with landscaped islands will have a minimum paved radius of 40 feet to accommodate larger equipment and emergency vehicles.

Section 126-23: **Easements, Watercourses, Natural Features** describes the use of suitable easements for drainageways that run through subdivisions or development sites, and that natural features, such as trees, brooks, hilltops and views be preserved whenever possible in any development. This section will be amended to encourage the use of natural vegetated swales in lieu of inlets and pipes.

Section 126-25: **Driveways** describes the conditions for placement and location of driveways. This section will be amended to allow for the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge.

Section 126-27: **Access** describes the provisions for ingress, egress, access openings and aisle widths for driveways and parking spaces. This section will be amended to allow for the use of pervious paving materials to minimize stormwater runoff and promote groundwater recharge.

Section 126-28: **Buffer Strips** shall be required as per the requirements of this chapter and the Borough Zoning Ordinance. Buffer strips range from 10 to 75 feet, depending on the zone and application. The landscape requirements for buffer areas as stipulated in the Zoning Ordinance do not recommend the use of native vegetation. Additionally, language will be included to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Section 126-30: **Drainage** requires that safe and adequate drainage of surface runoff waters be provided with a storm drainage system in compliance with New Jersey Department of Environmental Protection regulations. This section will be amended to include all requirements outlined in N.J.A.C. 7:8-5. These changes were presented earlier in this document. This section will be further amended to encourage the use of natural vegetated swales in lieu of inlets and pipes.

Section 126-31: **Fencing and Screening** provides for the protective covering and screening of portions of properties as recommended by the Borough Shade Tree Commission. The language of this section will be amended to require the use of native vegetation, which requires less fertilization and watering than non-native species.

Section 126-32: **Garbage and Refuse** provides for the indoor or enclosed storage of garbage and refuse. This section will be amended to provide pollution source control, prohibiting materials or wastes to be deposited upon a lot in such form or manner that they can be transferred off the lot, directly or indirectly, by natural forces such as precipitation, evaporation or wind. It also requires that all materials and wastes that might create a pollutant or a hazard be enclosed in appropriate containers.

Section 126-36: **Parking** provides guidance on the size and location of off-street parking spaces. Additionally, with the provisions of the Borough Zoning Ordinance, guidance is provided for the minimum number of parking spaces required. The number of spaces required is based on occupancy, dwelling units or gross floor area. This section will be amended to allow a developer to demonstrate that fewer spaces would be required, provided area is set aside for additional spaces if necessary. This section will also be amended to allow smaller parking stalls, shared parking, and pervious pavement in areas to be used for overflow parking.

Section 126-37: **Pavement and Curbs** details the use of asphalt, bituminous or concrete pavement for parking. Areas shall be adequate in size and location to direct runoff away from neighboring properties and toward approved drainage systems. Concrete curbs shall be provided around all parking areas. This section will be amended to allow for flush curb with curb stops, or curbing with curb cuts to encourage developers to allow for the discharge of impervious areas into landscaped areas for stormwater management. Also, language will be added to allow for the use of natural vegetated swales for the water quality design storm, with overflow for larger storm events into storm sewers.

Section 126-37: **Sidewalks** are provided where needed for the safety of pedestrians. This section will be amended to require developers to design sidewalks to discharge stormwater to neighboring lawns where feasible to disconnect these impervious surfaces, or use permeable paving materials where appropriate.

The Borough will also be considering a new ordinance to provide protection to the lands surrounding the public well fields.

Additionally, several changes will be made to Section 150 of the Borough Code entitled "Zoning". The Borough has six (6) types of residential districts, which includes four (4) affordable housing sites with ample acreage to satisfy the Borough's COAH obligations. Each district has restrictions on total impervious coverage. The Borough also has a commercial district, a commercial and retail district, and an industrial district. A new zone will also be considered for the dedication of conservation land and/or open space.

The Borough Code will be amended to remind developers that satisfying the percent impervious requirements does not relieve them of responsibility for complying with the Design and Performance Standards for Stormwater Management Measures contained in Section 126-30. The Borough is evaluating the maximum allowable impervious cover for each zone to determine whether a reduction in impervious cover is appropriate. The Borough is also evaluating a maximum percent of disturbance for each zone. Also, if a developer is given a variance to exceed the maximum allowable percent imperviousness, the developer must mitigate the impact of the additional impervious surfaces. This mitigation effort must address water quality, flooding and groundwater recharge. A detailed description of how to develop a mitigation plan is included in this Municipal Stormwater Management Plan.

For any BMP that is installed in order to comply with the requirements of our post-construction program, the Borough of Upper Saddle River will ensure adequate long-term operation as well as preventative and corrective maintenance (including replacement) of BMPs. For BMPs on private property that we do not own or operate, the Borough intends to do this by adopting and enforcing a provision in the municipal stormwater

control ordinance that requires the private entity to perform the operation and maintenance, with penalties if the private entity does not comply. If, for example, the private entity does not perform the required maintenance, the Borough can perform the maintenance and charge the private entity.

Code enforcement officers and local police officers will enforce these ordinances. If someone is found to be in violation of an ordinance, they will be issued a written warning for the first time offenses, and penalties will be issued for subsequent offenses

Mitigation Plans

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management designs and performance standards. Presented is a hierarchy of options.

Mitigation Project Criteria

1. The mitigation project must be implemented in the same drainage area as the proposed development. The project must provide additional groundwater recharge benefits, or protection from stormwater runoff quality and quantity from previously developed property that does not currently meet the design and performance standards outlined in the Municipal Stormwater Management Plan. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater Best Management Practices (BMP) Manual.

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

   A. Groundwater Recharge

      - Retrofit existing detention basins to provide additional cubic feet of average annual groundwater recharge.
      - Replace existing deteriorated overflow impervious parking lots with permeable paving to provide additional cubic feet of average annual groundwater recharge.

   B. Water Quality

      - Retrofit existing stormwater management facilities to provide the removal of 80 percent of total suspended solids (TSS) from parking lot.

C. Water Quantity

- Install stormwater management measures in open spaces in various developments to reduce the peak flow from the upstream development on the receiving stream for the 2, 10 and 100-year storms.

2. If a suitable site cannot be located in the same drainage area as the proposed development, as discussed in Option 1, the mitigation project may provide mitigation that is not equivalent to the impacts for which the variance or exemption is sought, but that addresses the same issue. For example, if a variance is given because the 80 percent Total Suspended Solids (TSS) requirement is not met, the selected project may address water quality impacts due to a fecal impairment. Listed below are specific projects that can be used to address the mitigation option.

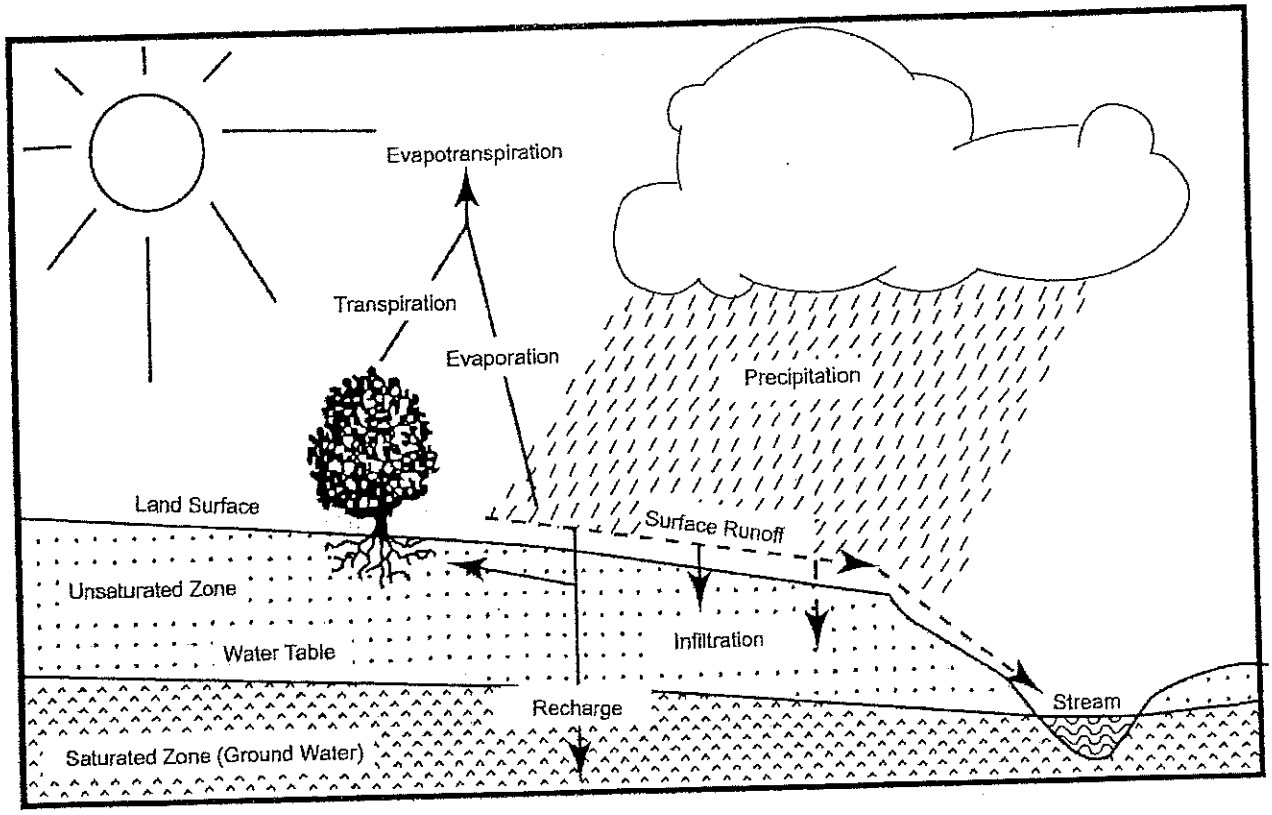
Water Quality

- Re-establish a vegetative buffer (minimum 50 foot wide) along the shoreline of ponds as a goose control measure and to filter stormwater runoff from the high goose traffic areas.

- Provide goose management measures, including public education at the Municipal Building.

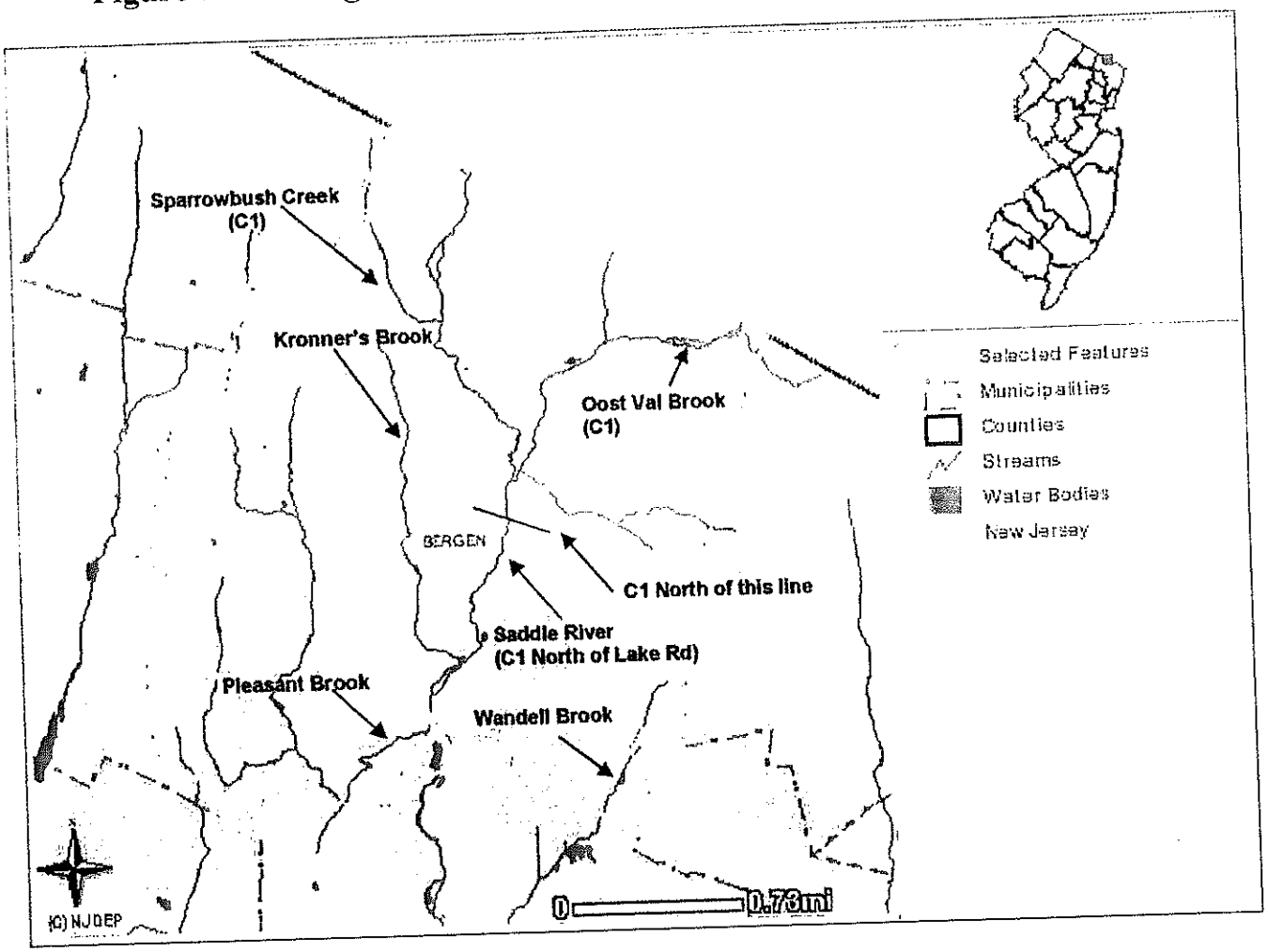
The municipality may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a Municipal Stormwater Management Plan, or towards the development of a Regional Stormwater Plan. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including costs associated with purchasing the property or easement for mitigation, and the cost associated with the long-term maintenance requirements of the mitigation measure.

Figure A-1 Groundwater Recharge in the Hydrologic Cycle



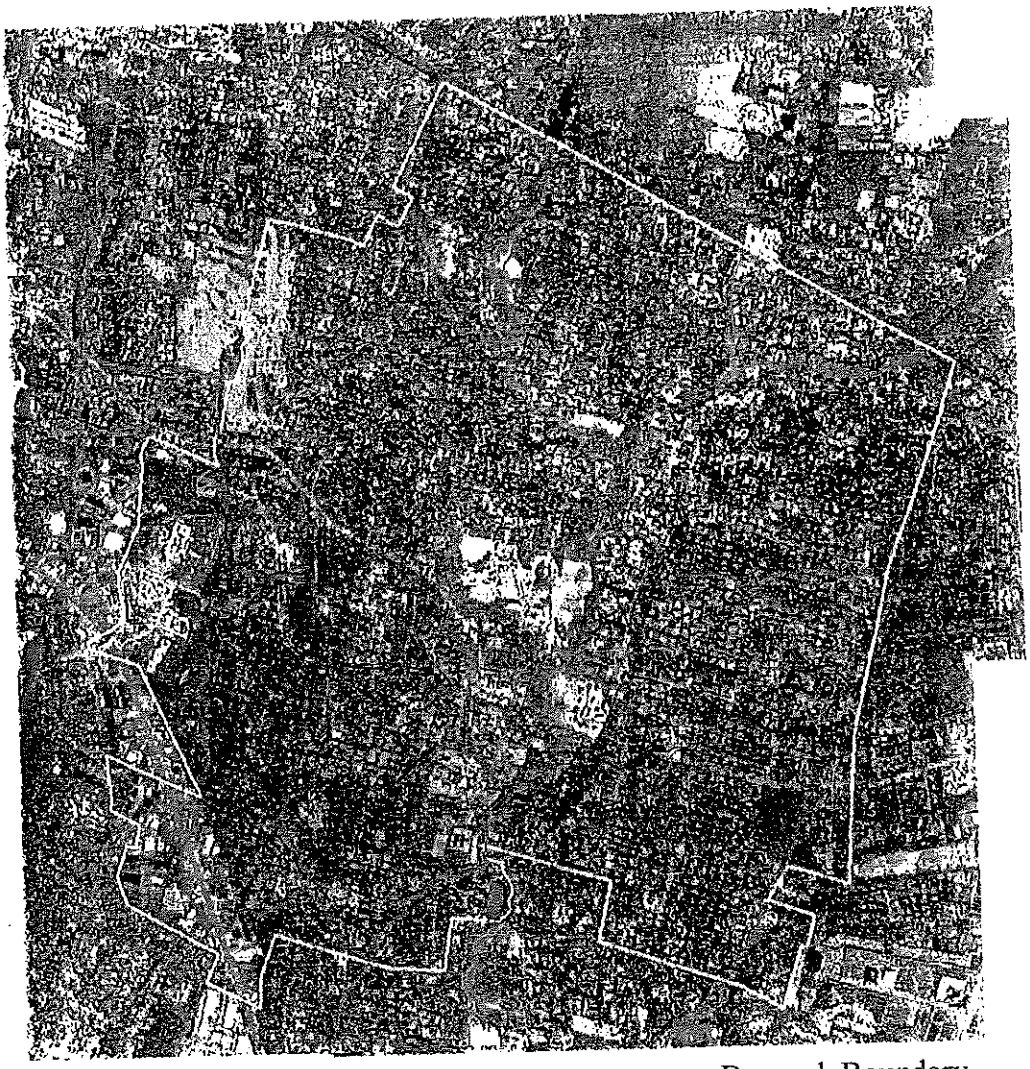
Source: New Jersey Geological Survey Report GSR-32.

Figure A-2 Bergen County Soil Survey Streams - Upper Saddle River



Source: NJDEP i-Map

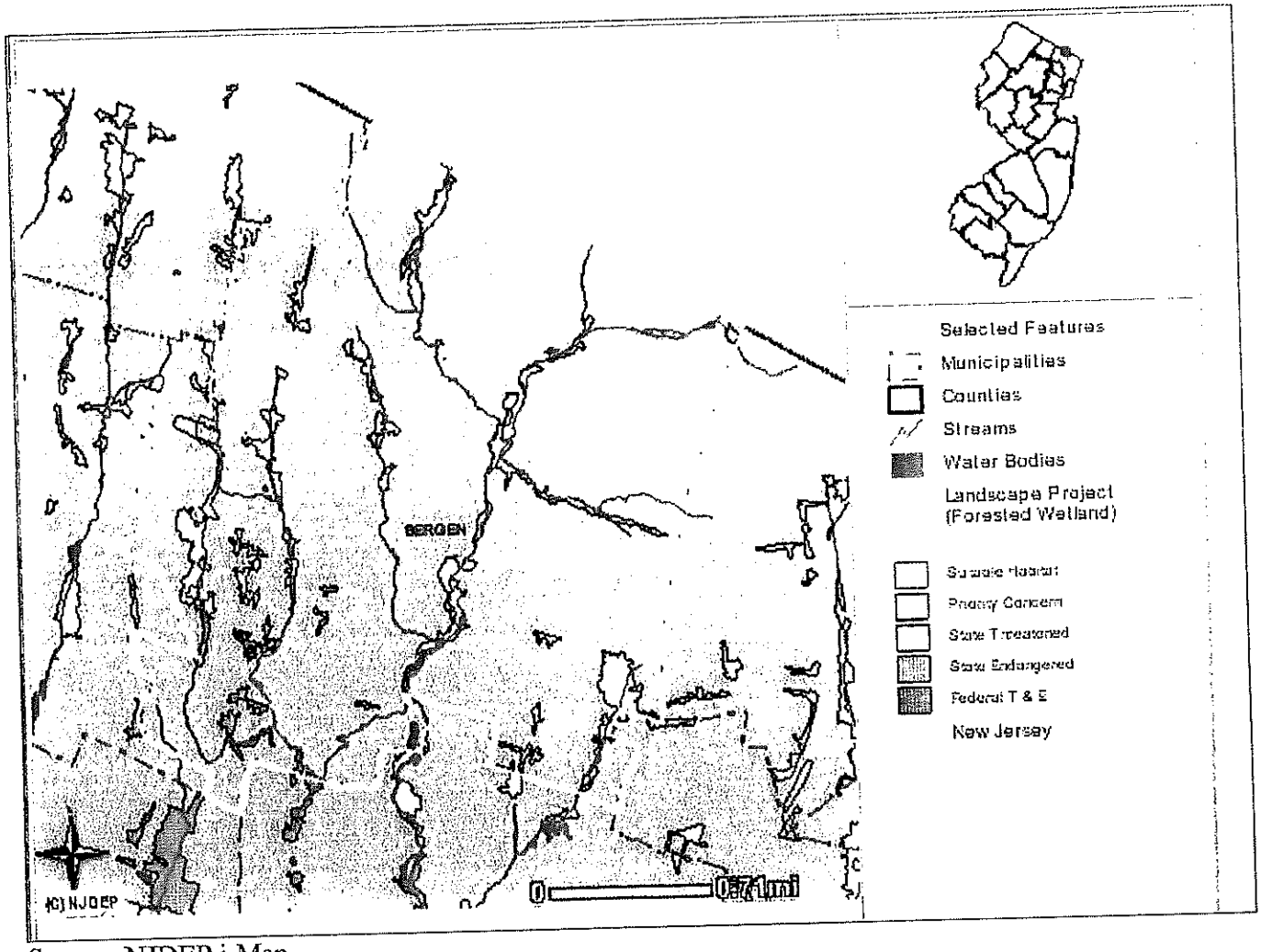
Figure A-3 Upper Saddle River Aerial Photo 2002



Source: NJDEP i-Map

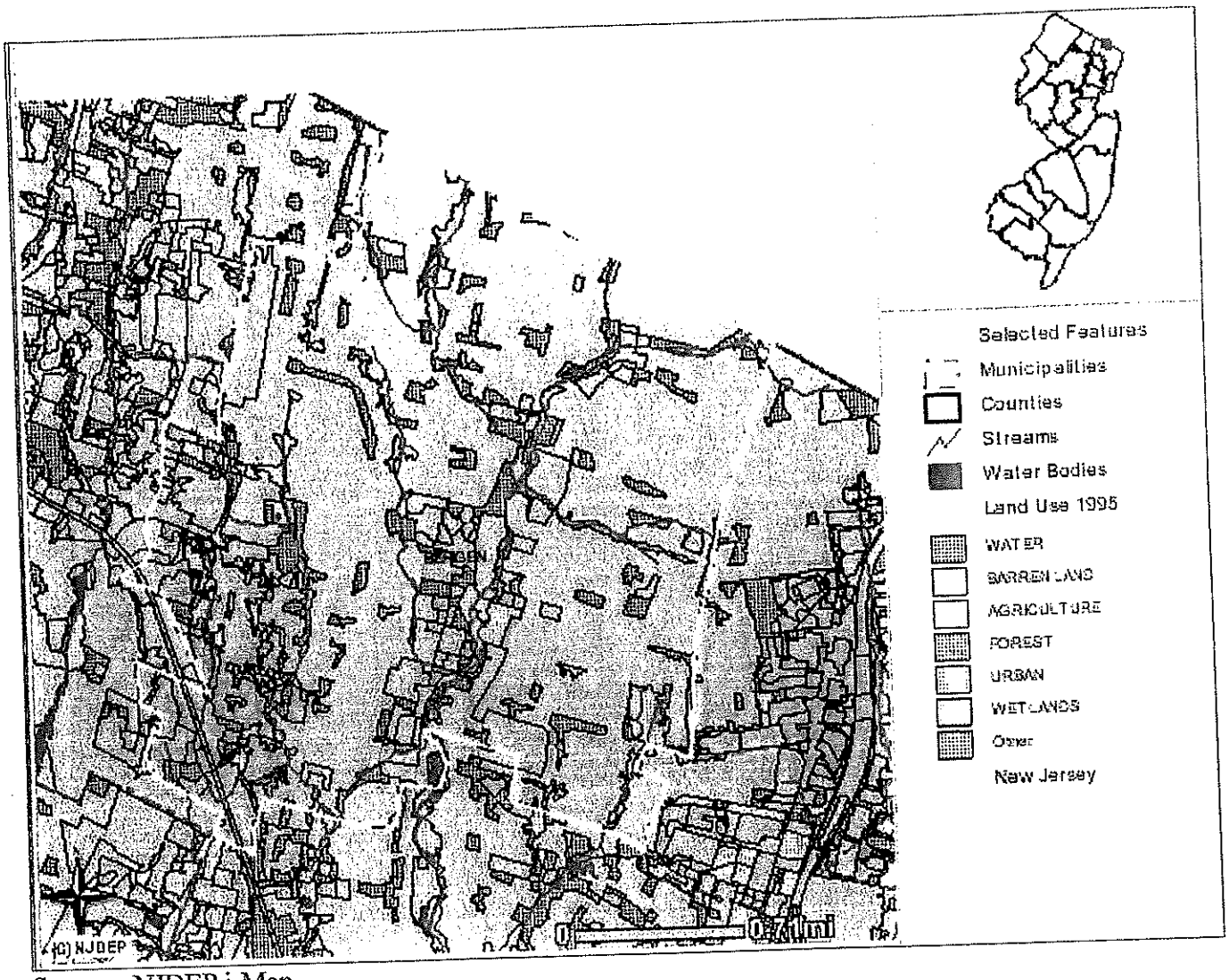
Borough Boundary

Figure A-5 Upper Saddle River Forested Wetlands



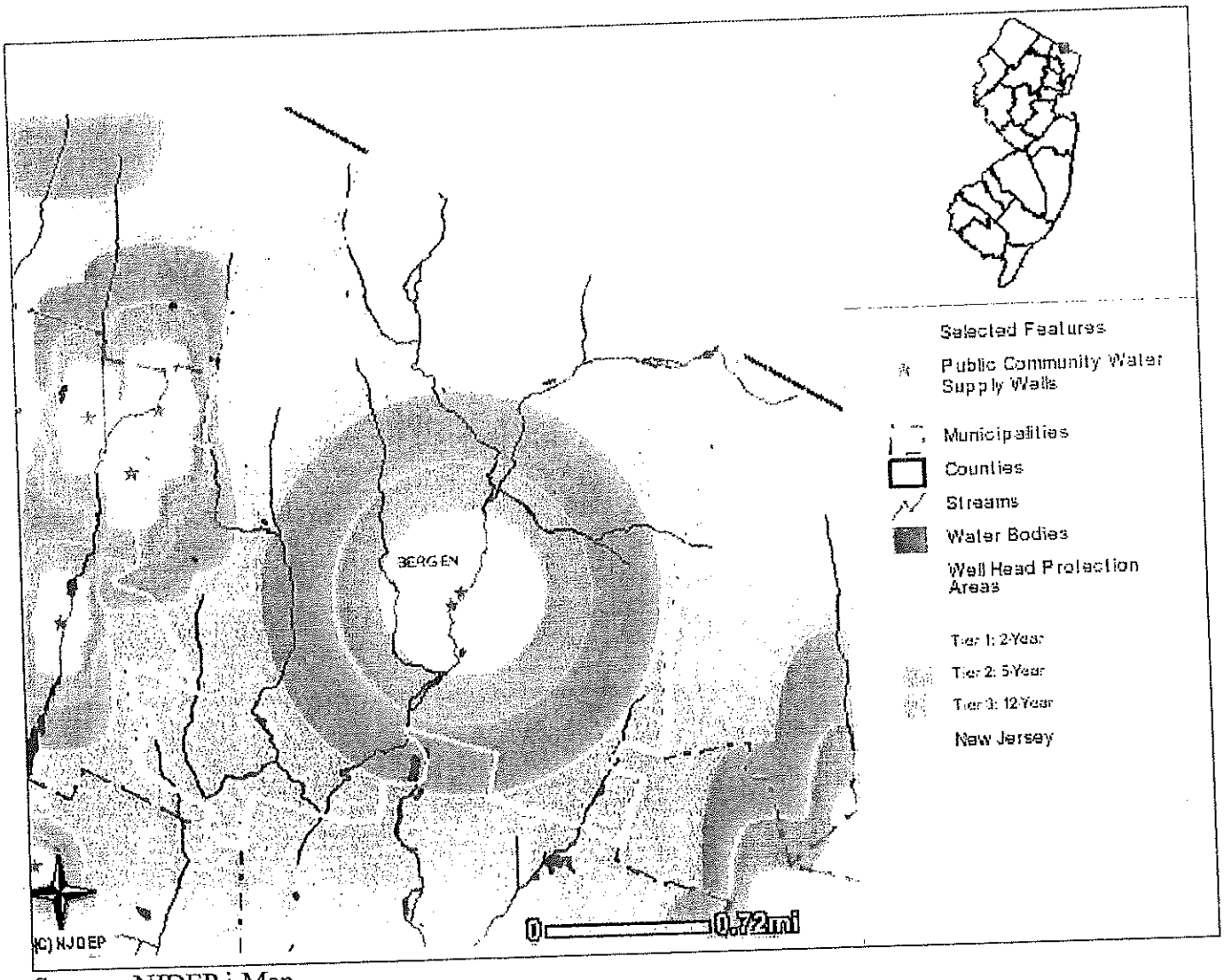
Source: NJDEP i-Map

Figure A-6 Upper Saddle River Existing Land Use



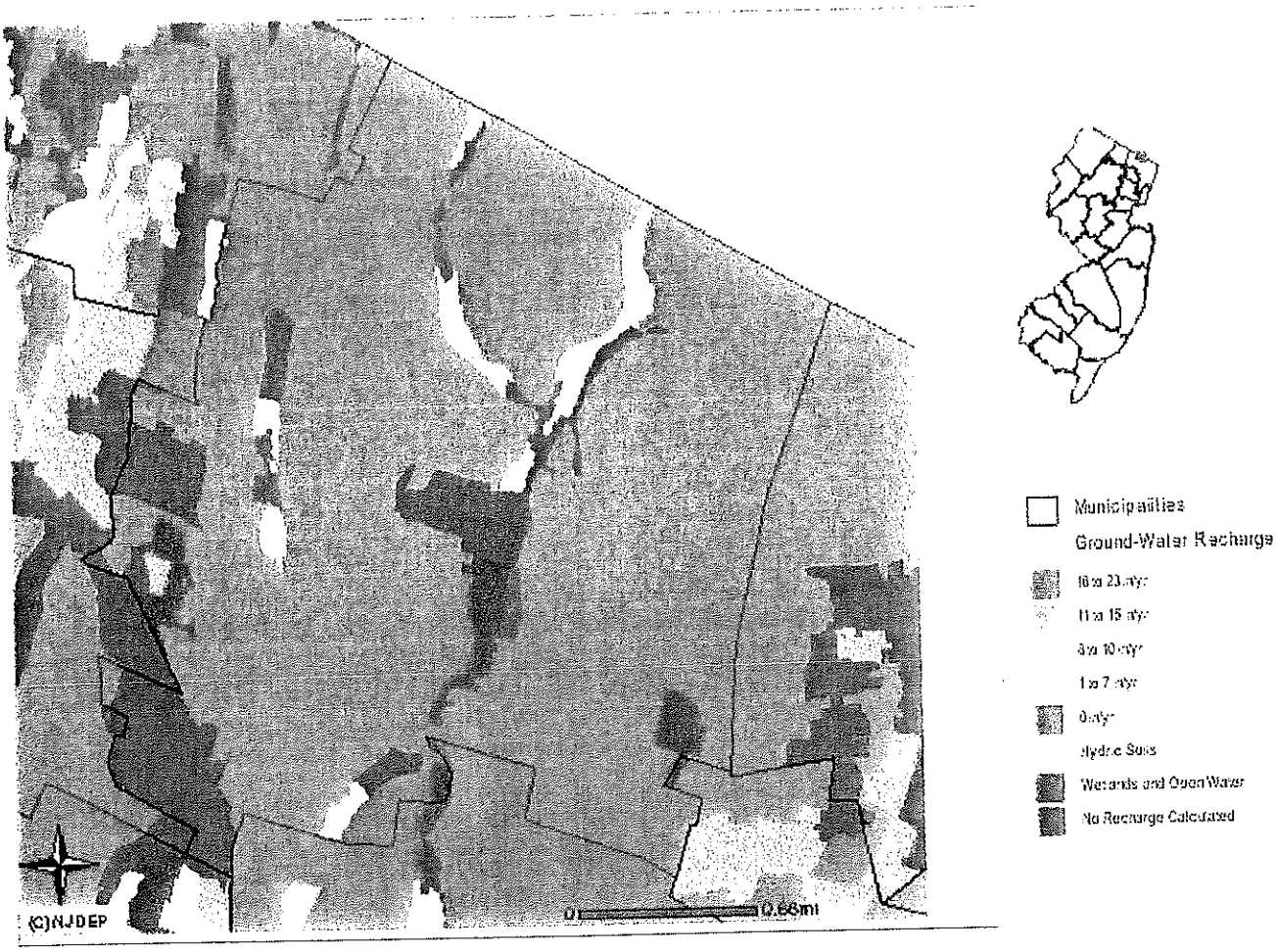
Source: NJDEP i-Map

Figure A-7 Upper Saddle River Wellhead Protection Areas



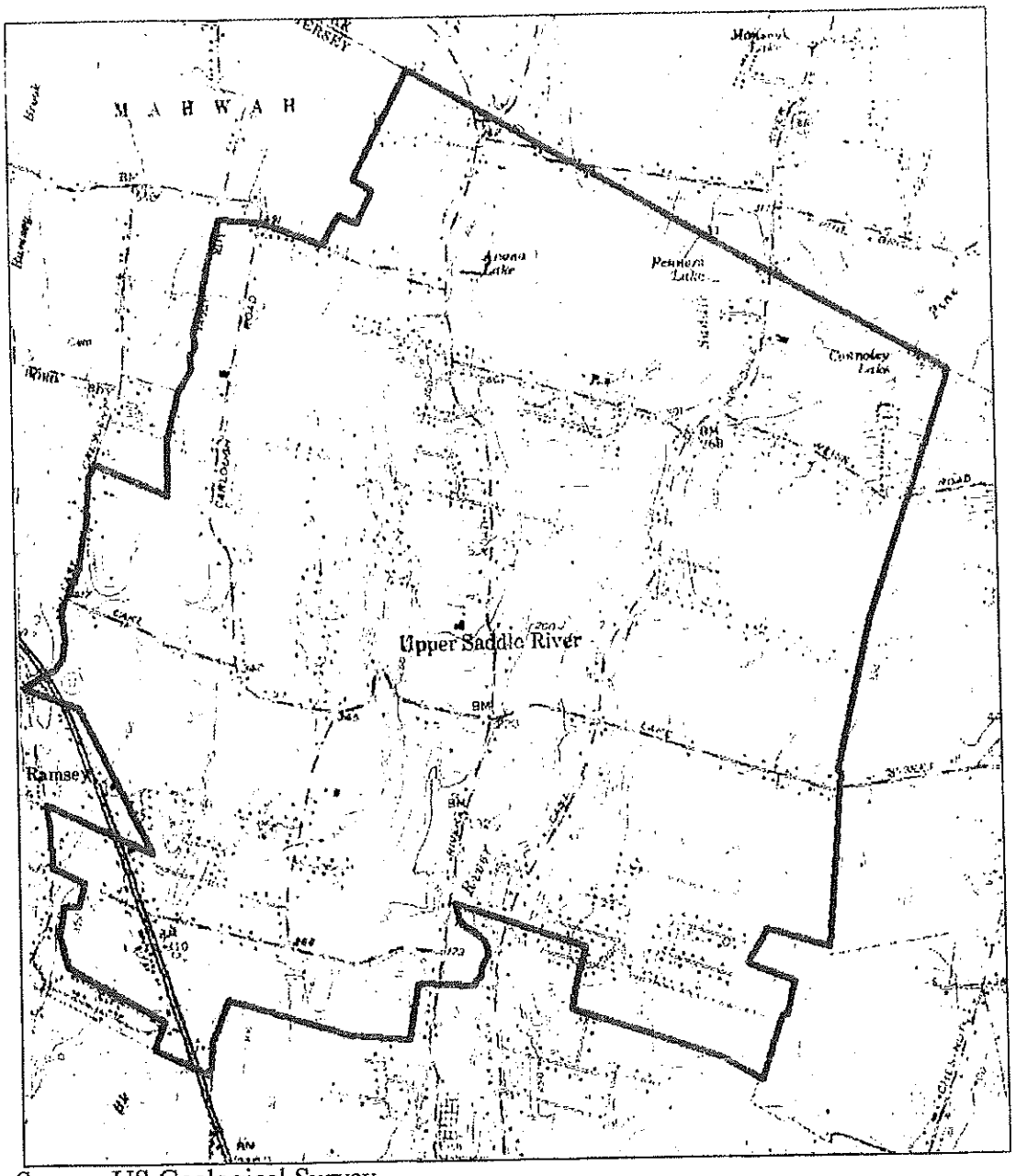
Source: NJDEP i-Map

Figure A-8 Upper Saddle River Groundwater Recharge



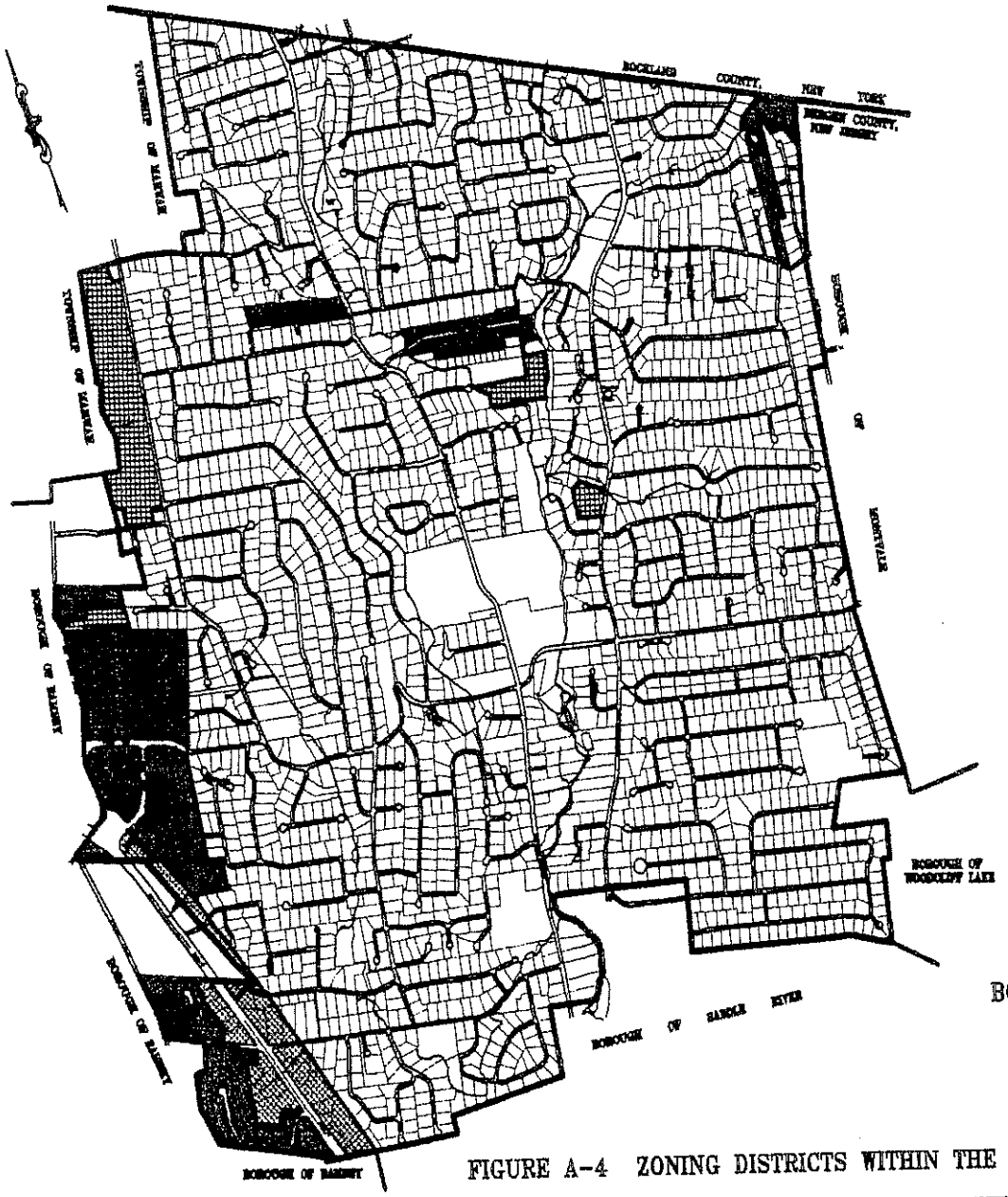
Source: NJDEP i-Map

Figure A-9 Upper Saddle River on USGS Quadrangle Map



Source: US Geological Survey

Borough Boundary



LEGEND

- R-1 RESIDENCE DISTRICT
- R-2 RESIDENCE DISTRICT
- AH-1 AFFORDABLE HOUSING DISTRICT
- AH-2 AFFORDABLE HOUSING DISTRICT
- AH-3 AFFORDABLE HOUSING DISTRICT
- AH-4 AFFORDABLE HOUSING DISTRICT
- LB LIMITED BUSINESS
- HB HIGHWAY BUSINESS
- OR OFFICE RESEARCH
- SCARCE RESOURCES SITE

ZONING MAP

BOROUGH OF UPPER SADDLE RIVER,
BERGEN COUNTY, NEW JERSEY

[illegible] / [illegible]
PROFESSIONAL ENGINEERS & LAND SURVEYORS
9 POST ROAD – SUITE #11 – OAKLAND, N.J. – 07436
(201) 337-0083

NOVEMBER, 2003

FIGURE A-4 ZONING DISTRICTS WITHIN THE BOROUGH

POPULATION: HISTORICAL POPULATION TRENDS IN BERGEN COUNTY (1900 - 2000)

	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
Alpine	268	377	350	521	626	644	921	1,344	1,549	1,716	2,183
Bergenfield	729	1,991	4,667	8,816	10,275	17,647	27,203	26,000	25,568	24,458	26,247
Closter	1,057	1,483	1,840	2,502	2,603	3,376	7,767	8,604	8,164	8,094	8,383
Cresskill	486	550	942	1,924	2,246	3,334	7,290	8,298	7,609	7,558	7,746
Demarest	393	560	654	1,013	1,165	1,786	4,231	5,133	4,963	4,800	4,845
Dumont	645	1,783	2,537	5,861	7,356	13,013	18,382	20,156	18,334	17,178	17,303
Englewood	6,253	9,924	11,627	17,805	18,966	23,145	26,057	24,985	23,701	24,850	26,203
Englewood Cliffs	218	410	534	809	888	966	7,913	5,938	5,698	5,634	5,632
Harrington Park	269	377	627	1,251	1,389	1,634	3,581	4,841	4,532	4,623	4,740
Haworth	413	588	748	1,042	1,419	1,612	3,215	3,760	3,509	3,384	3,390
Northvale	387	544	769	1,144	1,159	1,455	2,892	5,177	5,046	4,563	4,460
Norwood	400	564	820	1,358	1,512	1,792	2,852	4,598	4,413	4,838	5,761
Old Tappan	269	305	404	600	609	828	2,330	3,917	4,168	4,254	5,482
Rockleigh	35	44	28	86	79	110	450	308	185	270	391
Tenafly	1,746	2,756	3,585	5,669	7,413	9,651	14,264	14,827	13,552	13,326	13,806
Northern Valley Total	13,568	22,256	29,182	50,401	57,905	81,193	124,828	140,685	130,998	129,575	136,452
Emerson	456	767	973	1,394	1,487	1,744	6,849	8,428	7,793	6,930	7,197
Hillsdale	891	1,072	1,720	2,959	3,438	4,127	8,734	11,768	10,495	9,750	10,085
Montvale	416	522	779	1,243	1,342	1,856	3,699	7,327	7,318	6,946	7,034
Park Ridge	870	1,401	1,481	2,229	2,510	3,180	6,420	8,709	8,515	8,102	8,708
River Vale	266	450	583	871	1,112	1,699	5,616	8,883	9,489	9,410	9,449
Washington Township	60	100	194	402	391	1,208	6,623	10,577	9,850	9,245	8,338
Westwood	828	1,870	2,597	4,861	5,388	6,766	9,046	11,105	10,714	10,446	10,999
Woodcliff Lake	582	1,043	1,923	5,156	5,739	6,283	7,964	8,611	7,929	7,506	7,644
Pascack Valley Total	4,369	7,225	10,250	19,118	21,516	26,872	54,951	75,108	71,803	68,335	70,056
Allendale	694	937	1,165	1,730	2,058	2,409	4,092	6,240	5,901	5,900	6,699
Franklin Lakes	375	445	383	893	1,203	2,021	3,316	7,550	8,769	9,873	10,422
Glen Rock	613	1,055	2,081	4,369	5,177	7,145	12,896	13,011	11,497	10,883	11,848
Ho-Ho-Kus	316	488	586	925	1,626	2,254	3,988	4,348	4,129	3,935	4,060
Mahwah	1,220	1,881	2,081	5,536	5,908	4,880	7,376	10,800	12,127	12,905	24,062
Midland Park	1,348	2,001	2,243	3,638	4,525	5,164	7,543	8,159	7,381	7,047	6,947
Oakland	479	568	497	735	932	1,817	9,446	14,420	13,415	11,997	12,466
Ramsey	1,074	1,667	2,090	3,258	3,566	4,670	9,527	12,571	12,899	13,228	14,351
Ridgewood	2,685	5,116	7,580	12,188	14,948	17,481	25,391	27,547	25,208	24,132	24,936
Saddle River	415	483	506	657	816	1,003	1,776	2,437	2,763	2,950	3,201
Upper Saddle River	326	273	951	147	510	706	3,370	7,949	7,958	7,198	7,411
Waldwick	1,207	970	1,296	1,728	2,475	3,963	10,495	12,313	10,802	9,757	9,622
Wyckoff	1,285	1,309	1,288	8,001	3,347	5,890	11,205	16,039	15,500	15,372	16,508
Northwest Bergen Total	12,037	17,693	22,147	37,005	45,591	59,103	110,621	143,384	138,377	140,197	152,561
COUNTY TOTAL	78,441	138,002	210,643	364,977	409,646	539,139	780,255	897,148	845,385	825,380	884,118

Source: US Bureau of the Census. Tabulated by the Bergen County Department of Planning & Economic Development, 2001

BOROUGH OF UPPER SADDLE RIVER

RESOLUTION # 42-05

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#42-05

WHEREAS, the Borough of Upper Saddle River is required to prepare and adopt a Municipal Stormwater Management Plan in accordance with N.J.A.C. 7:8-4 and the Borough is identified as a Tier A community in the Municipal Stormwater General Permit; and

WHEREAS, Schwanewede/Hals Engineering has prepared a Municipal Stormwater Management Plan, dated January 2005, for the Borough of Upper Saddle River and the plan has been submitted to Bergen County Planning Board for review.

NOW, THEREFORE, BE IT RESOLVED, the Borough of Upper Saddle River adopts the Municipal Stormwater Management Plan, prepared by Schwanewede/Hals Engineering, dated January 2005 as the Municipal Stormwater Management Plan for the Borough.

I hereby certify that the above resolution was approved by the Mayor and Council at a meeting held on March 9, 2005.

Rose Vido

Rose Vido, RMC