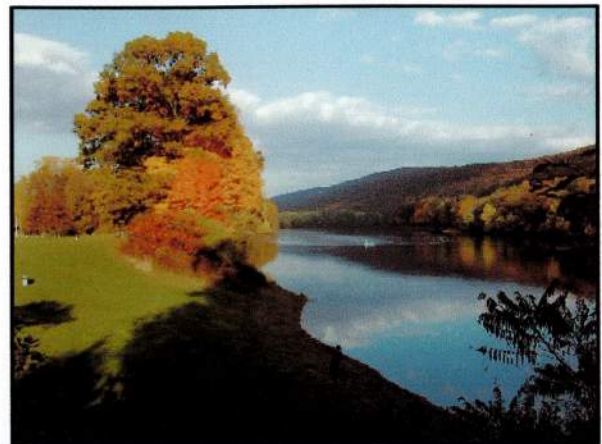


LAFAYETTE TOWNSHIP
STORMWATER MANAGEMENT
PLAN

LAFAYETTE TOWNSHIP, SUSSEX COUNTY, NEW JERSEY
JUNE, 2005



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INTRODUCTION

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for Lafayette Township (“the Township”) 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 and due within twelve months of the effective date of the Township’s stormwater permit authorization. The plan addresses the impacts of groundwater recharge, stormwater quantity, and stormwater quality by incorporating stormwater design and performance standards for new major development, defined as projects that disturb one or more acres of land. These standards are intended to minimize the adverse impacts of stormwater runoff on water quality and water quantity and the loss of groundwater recharge that provides baseflow in receiving water bodies. The plan also describes long-term operation and maintenance measures for existing and future stormwater facilities.

A “build-out” analysis based upon existing zoning, land available for development, open space, and affordable housing is currently being conducted in conjunction with the Township Planner. The complete build-out analysis will be made part of this MSWMP by September 30, 2005. An evaluation of the Township’s ordinances and Master Plan relative to the incorporation of nonstructural stormwater management strategies is also being conducted and will be made part of this plan by the end of 2005. This evaluation will also take into account zoning ordinances being considered for ridgelines and hilltops within the Township. The final component of the MSWMP is a mitigation strategy for instances where a variance or exemption of the design and performance standards is sought. Specific stormwater management measures to offset variances or exemptions are currently in development and will be incorporated into this plan by the end of 2005.

I. GOALS

The goals of this MSWMP are to:

- reduce flood damage, including damage to life and property;
- minimize 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 to protect their biological functions, as well as for proper 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.

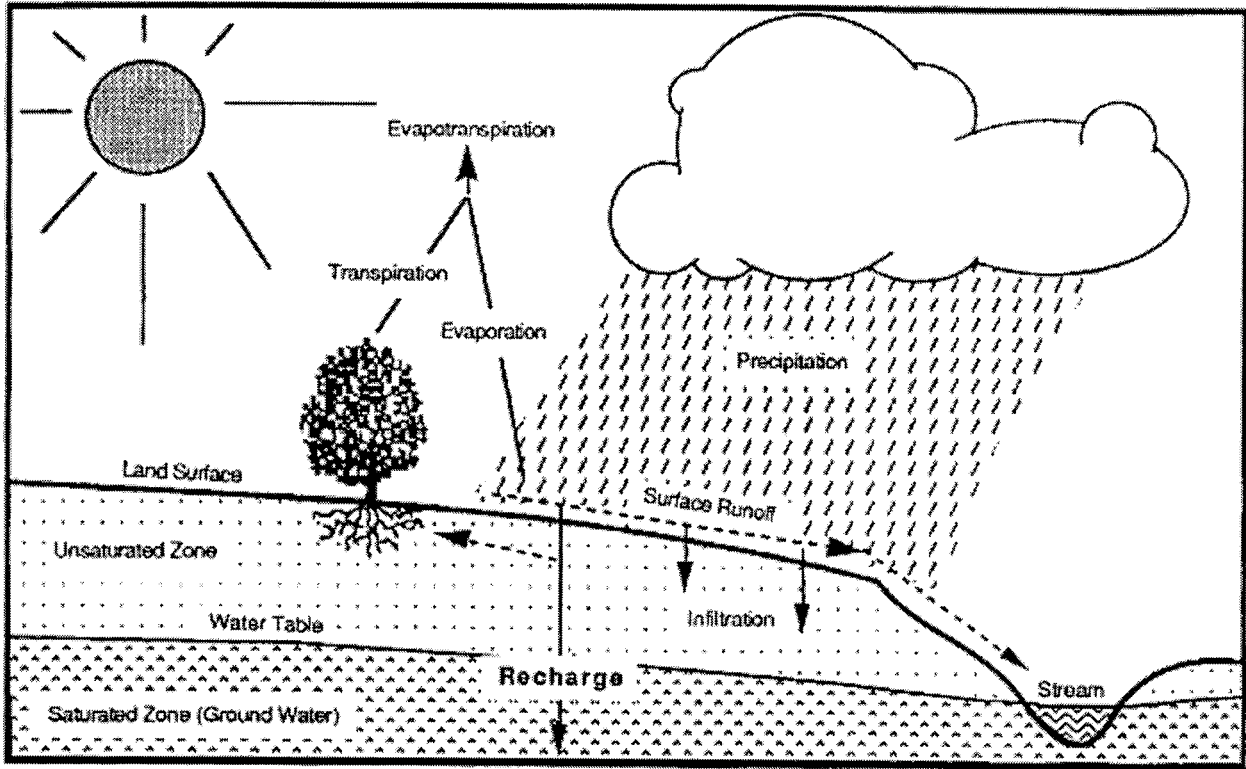
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development. Preventative and corrective maintenance strategies are included in the plan 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.

II. STORMWATER DISCUSSION

Land development can dramatically alter the hydrologic cycle (See Figure 1) of a site and, ultimately, an entire watershed. Prior to development, native vegetation can either directly intercept precipitation or draw that portion that has infiltrated into the ground and return it to the atmosphere through evapotranspiration. Development can remove this beneficial vegetation and replace it with lawn or impervious cover, reducing the site's evapotranspiration and infiltration rates. Clearing and grading a site can remove depressions that store rainfall. Construction activities may also compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. Impervious areas that are connected to each other through gutters, channels, and storm sewers can transport runoff more quickly than natural areas. This shortening of the transport or travel time quickens the rainfall-runoff response of the drainage area, causing flow in downstream waterways to peak faster and higher than 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.

Figure 1: Groundwater Recharge in the Hydrologic Cycle

Source: New Jersey Geological Survey Report GSR-32.



In addition to increases in runoff peaks, volumes, and loss of groundwater recharge, land development often results in the accumulation of pollutants on the land surface that runoff can mobilize and transport to streams. New impervious surfaces and cleared areas created by development can accumulate a variety of pollutants from the atmosphere, fertilizers, animal wastes, and leakage and wear from vehicles. Pollutants can include metals, suspended solids, hydrocarbons, pathogens, and nutrients.

In addition to increased pollutant loading, land development can adversely affect water quality and stream biota in more subtle ways. For example, stormwater falling on impervious surfaces or stored in detention or retention basins can become heated and raise the temperature of the downstream waterway, adversely affecting cold water fish species such as trout. Development can remove trees along stream banks that normally provide shading, stabilization, and leaf litter that falls into streams and becomes food for the aquatic community.

III. BACKGROUND

The Township encompasses approximately 19 square miles in Sussex County, New Jersey. Township population has grown from 1,902 in 1990 to 2,300 in 2000, a 21% increase. The increased population and associated development have more than likely increased stormwater runoff volumes and pollutant loads to the waterways of the municipality. Figure 2 (Appendix) illustrates the waterways in the Township while Figure 3 (Appendix) depicts the Township boundaries on the USGS quadrangle map. Waterways of note in the municipality are a branch of the Paulins Kill located in the west, central portion of the Township and a tributary of Papakating Creek in the northwest corner. A section of the Paulins Kill branch is listed as a Category 1 waterway and, therefore, is subject to a 300 ft. buffer in accordance with the Stormwater Rules. In addition, there are numerous surface water drainage features (i.e. ponds) that are an integral component of the Township's fire protection system. A number of these ponds are equipped with standpipes for firefighting purposes. Therefore, maintaining a satisfactory water level in these ponds is critical for public safety and needs to be considered in stormwater management strategies.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document the health of the state's waterways. There are over 800 AMNET sites throughout the state of New Jersey. These sites are sampled for benthic macroinvertebrates by NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The data is used to generate a New Jersey Impairment Score (NJIS), which is based on a number of biometrics related to benthic macroinvertebrate community dynamics. The New Jersey Integrated Water Quality Monitoring and Assessment Report (305(b) and 303 (d)) (Integrated List) is required by the federal Clean Water Act to be prepared biennially and is a valuable source of water quality information. This combined report presents the extent to which New Jersey waters are attaining water quality standards, and identifies waters that are impaired. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more Total Maximum Daily Loads (TMDLs) are needed. A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for one or more of its designated uses. The allowable load is allocated to the various sources of the pollutant, such as stormwater and wastewater discharges, which require an NJPDES permit to discharge, and nonpoint source, which includes stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs. A review of this Report indicates that the Paulins Kill in Lafayette is listed as an impaired waterway (benthic macroinvertebrates, fecal coliform, and dissolved oxygen). The NJDEP is required to establish TMDL's for these parameters. To date, they have not been established for the Paulins Kill.

IV. DESIGN AND PERFORMANCE STANDARDS

The Township will adopt the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impacts of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards shall include language for maintenance of stormwater management measures consistent with the stormwater management rules as promulgated under N.J.A.C. 7:8-5.8 Maintenance Requirements, and add language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins. During construction, Township inspectors will observe the construction of the individual projects to ensure that the stormwater management measures are constructed and function as designed and approved by the Township.

V. PLAN CONSISTENCY

The Township is not within a Regional Stormwater Management Planning Area and no TMDLs have been developed for waters within the Township; 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 revised to be consistent with it.

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

The Township's Stormwater Management Ordinance will require that all new development and redevelopment plans comply with New Jersey's Soil Erosion and Sediment Control Standards. During construction, Sussex County Soil Conservation District inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the Sussex County Soil Conservation District. In addition to adopting and implementing a Stormwater Management Ordinance, the Township will also develop and begin implementing Local Public Education and Storm Drain Inlet Labeling Programs by the end of 2005 in fulfillment of its Stormwater Permit requirements.

VI. NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

One of the objectives of this SWMP is to provide the basis for future land development to move away from the historical focus of stormwater management. Stormwater management practices previously focused on collecting and conveying the runoff from an entire site or development through a structural conveyance system to a centralized facility (e.g., detention basin) where it is stored and treated prior to discharge downstream. This practice unfortunately allows for adverse runoff impacts to occur throughout the site and then utilizes remediation and/or restoration measures immediately prior to releasing the runoff downstream.

Moving forward, Lafayette Township will use its SWMP in conjunction with the priorities set forth in its Master Plan, such as “carrying capacity” analysis, as the strategic foundation to develop and adopt new land use ordinances. The focus will be to minimize and prevent adverse stormwater impacts from occurring and then to provide necessary treatment closer to the origin of those impacts. One of the strategies considered for implementation is Low Impact Development (LID). LID seeks to reduce and/or prevent adverse runoff impacts through sound site planning and both nonstructural and structural techniques that are driven to preserve or closely mimic the site’s natural or pre-developed hydrologic response to precipitation. Fundamental to implementing LID and its techniques is its alignment with the SWMP processes to control stormwater runoff and pollutants closer to the source and to provide site design measures that can significantly reduce the overall impact of land development on stormwater runoff. As such, LID promotes the concept of designing with nature.

The Township is currently developing a stormwater management ordinance and is reviewing its existing land use ordinances relative to the incorporation of LID strategies. Once the stormwater management ordinance is adopted and the land use ordinance modifications have been completed and approved by the Township’s governing body, the ordinance will be submitted to the county review agency for review and concurrence. A copy will be sent to the Department of Environmental Protection at the time of submission.

VII. LAND USE/BUILD-OUT ANALYSIS

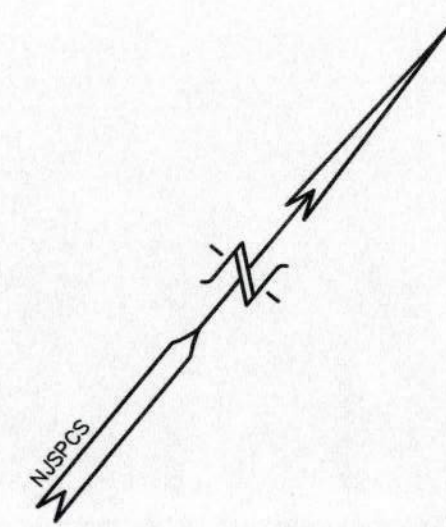
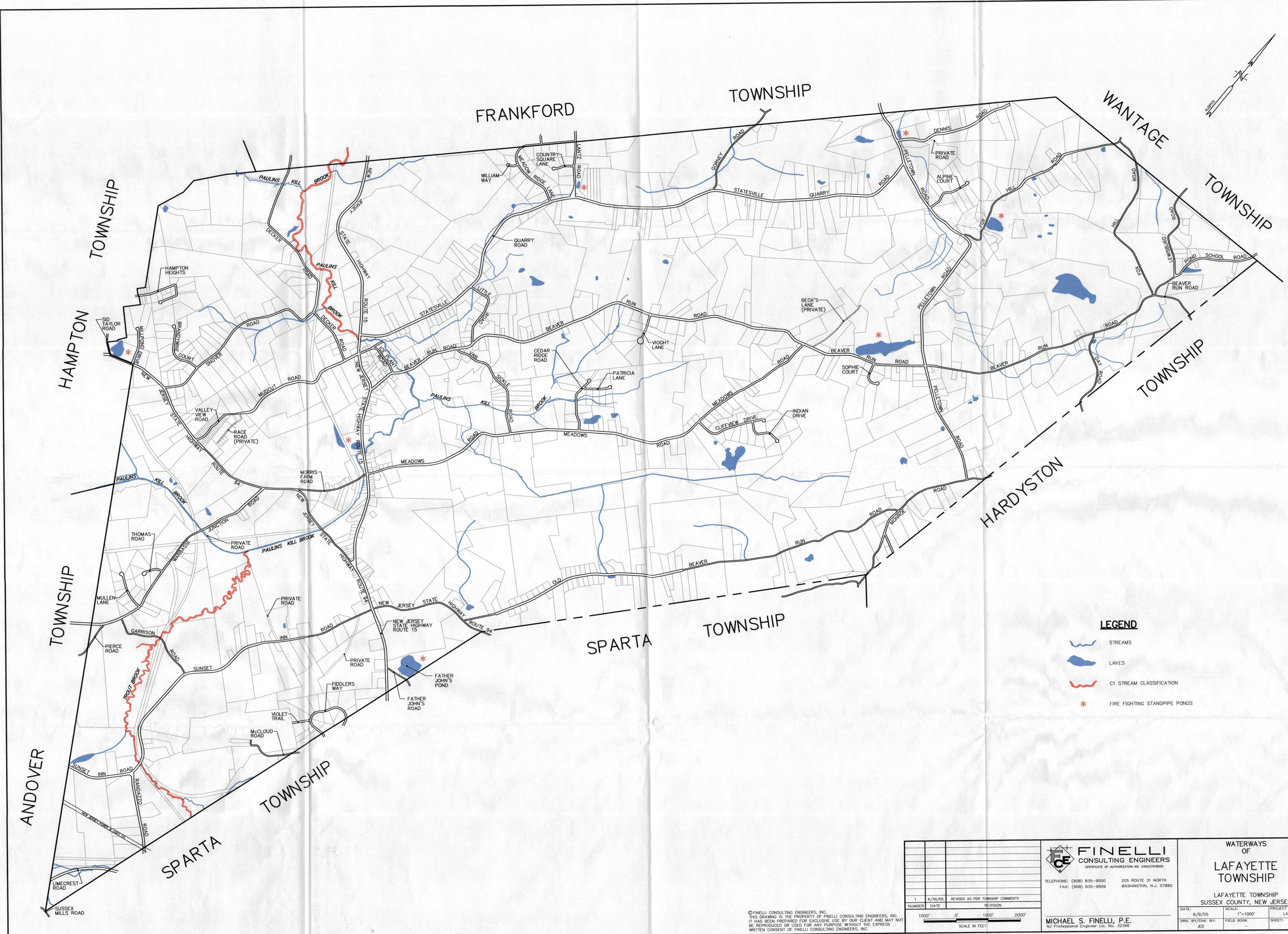
A “build-out” analysis based upon existing zoning and land available for development, open space, and affordable housing is currently being conducted in conjunction with the Township Planner. The complete build-out analysis will be made part of this MSWMP by September 30, 2005.





VIII. MITIGATION PLANS

Prior to the granting of a variance or exemption for any proposed development from the stormwater management design and performance standards, mitigation plans will be developed and made a condition of the variance or exemption.

APPENDIX

***WATERWAYS OF LAFAYETTE TWP.
(REF. FIGURE 2)***



- LEGEND**
-  STREAMS
 -  LAKES
 -  C1 STREAM CLASSIFICATION
 -  FIRE FIGHTING STANDPIPE PONDS

NUMBER	DATE	REVISION
1	6/30/05	REVISED AS PER TOWNSHIP COMMENTS

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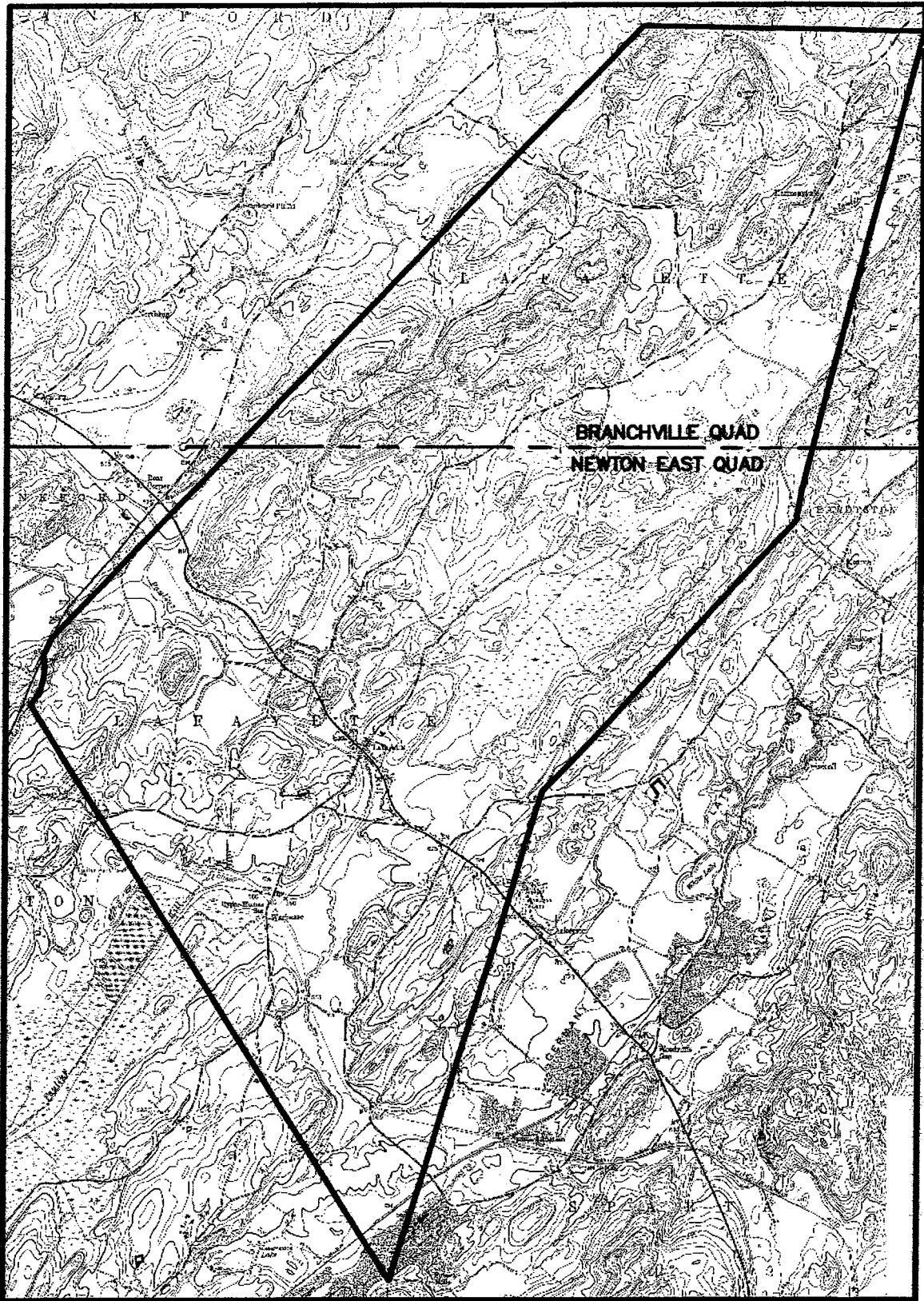
WATERWAYS OF
LAFAYETTE TOWNSHIP
 LAFAYETTE TOWNSHIP
 SUSSEX COUNTY, NEW JERSEY

MICHAEL S. FINELLI, P.E.
 NJ Professional Engineer Lic. No. 32396

DATE	SCALE	PROJECT NUMBER
6/9/05	1"=1000'	LAF010
DRN. BY/CHK. BY:	FIELD BOOK	SHEET:
JED		1 of 1

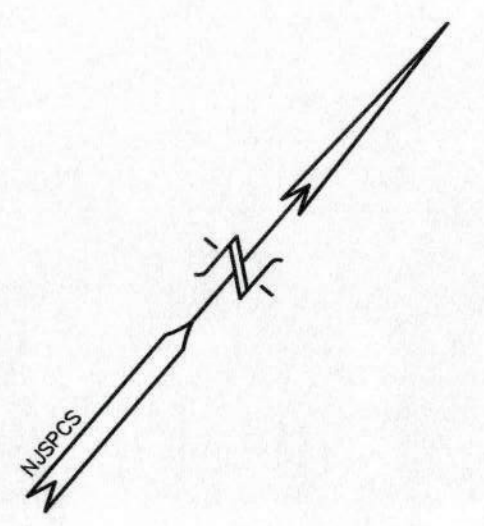
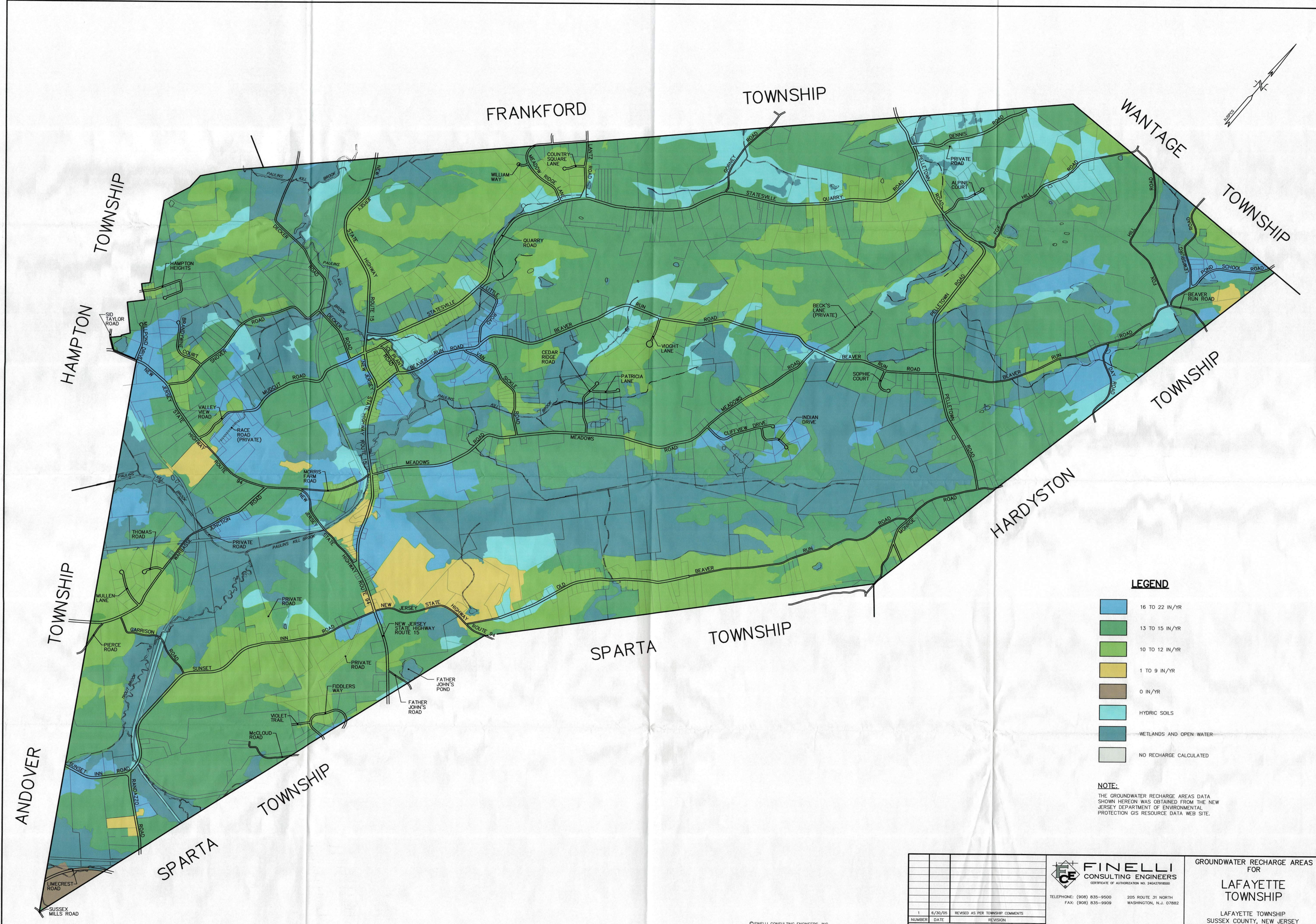
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***USGS QUADRANGLE MAP FOR
LAFAYETTE TWP.
(REF. FIGURE 3)***



USGS QUADRANGLE MAP
FOR
LAFAYETTE TOWNSHIP
SUSSEX COUNTY, NEW JERSEY
NOT TO SCALE

***GROUNDWATER RECHARGE AREAS
FOR LAFAYETTE TWP.
(REF. FIGURE 4)***



LEGEND

- 16 TO 22 IN/YR
- 13 TO 15 IN/YR
- 10 TO 12 IN/YR
- 1 TO 9 IN/YR
- 0 IN/YR
- HYDRIC SOILS
- WETLANDS AND OPEN WATER
- NO RECHARGE CALCULATED

NOTE:
 THE GROUNDWATER RECHARGE AREAS DATA SHOWN HEREON WAS OBTAINED FROM THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION GIS RESOURCE DATA WEB SITE.

NUMBER	DATE	REVISION
1	8/30/05	REVISED AS PER TOWNSHIP COMMENTS

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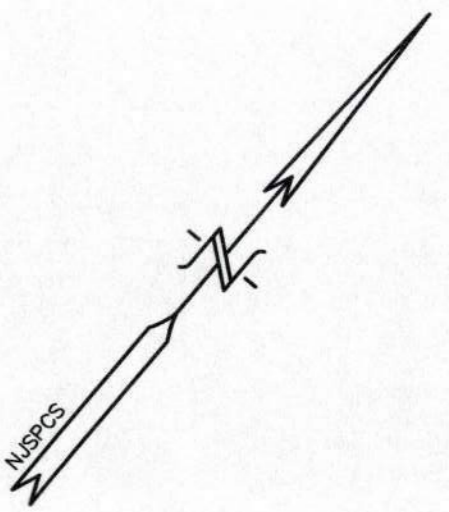
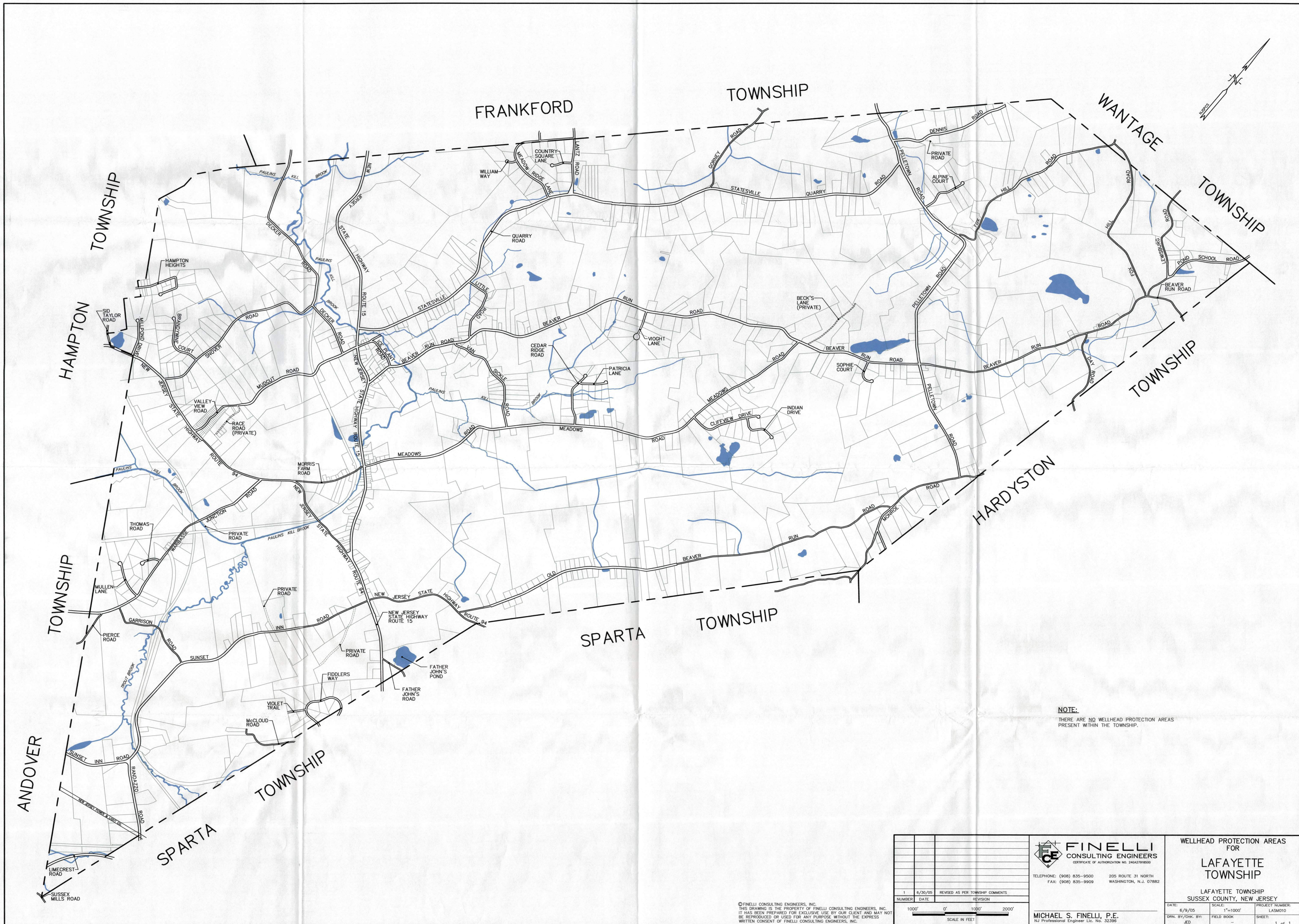
MICHAEL S. FINELLI, P.E.
 NJ Professional Engineer Lic. No. 32396

GROUNDWATER RECHARGE AREAS FOR
LAFAYETTE TOWNSHIP
 LAFAYETTE TOWNSHIP
 SUSSEX COUNTY, NEW JERSEY

DATE: 8/9/05	SCALE: 1"=1000'	PROJECT NUMBER: LASK010
DRN. BY/CHK. BY: JED	FIELD BOOK: -	SHEET: 1 of 1

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***WELLHEAD PROTECTION AREAS FOR
LAFAYETTE TWP.
(REF. FIGURE 5)***



NOTE:
THERE ARE NO WELLHEAD PROTECTION AREAS PRESENT WITHIN THE TOWNSHIP.

NUMBER	DATE	REVISION
1	6/30/05	REVISED AS PER TOWNSHIP COMMENTS

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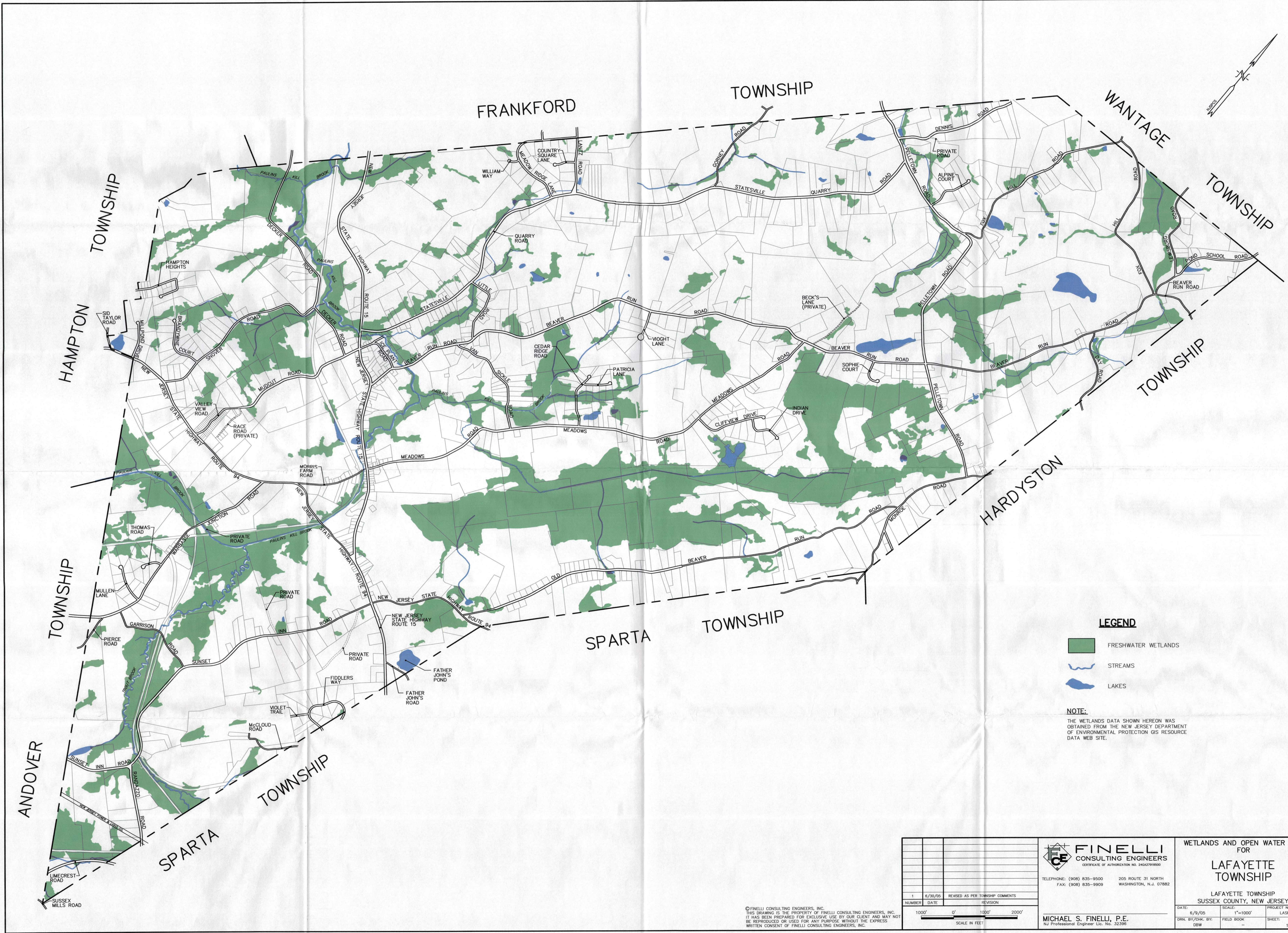
MICHAEL S. FINELLI, P.E.
 No. Professional Engineer Lic. No. 32396

WELLHEAD PROTECTION AREAS FOR LAFAYETTE TOWNSHIP
 LAFAYETTE TOWNSHIP
 SUSSEX COUNTY, NEW JERSEY

DATE: 6/9/05 SCALE: 1"=1000' PROJECT NUMBER: LASM010
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***WETLANDS AND OPEN WATER MAP
FOR LAFAYETTE TWP.
(REF. FIGURE 6)***



LEGEND

- FRESHWATER WETLANDS
- STREAMS
- LAKES

NOTE:
 THE WETLANDS DATA SHOWN HEREON WAS OBTAINED FROM THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION GIS RESOURCE DATA WEB SITE.

NUMBER	DATE	REVISION
1	6/30/05	REVISED AS PER TOWNSHIP COMMENTS

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WETLANDS AND OPEN WATER MAP FOR
LAFAYETTE TOWNSHIP
 LAFAYETTE TOWNSHIP
 SUSSEX COUNTY, NEW JERSEY

DATE: 6/9/05 SCALE: 1"=1000' PROJECT NUMBER: LASM010
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