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Municipal Stormwater Management Plan

Borough of Hamburg

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1 Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Hamburg 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 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 describes long-term operation and maintenance measures for existing and future stormwater facilities.

A “build-out” analysis has been included in this plan based upon existing zoning and land available for development. The plan also addresses the review and update of existing ordinances, the Borough 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.

It is important to note that this plan will require several updates. Hamburg Borough must reexamine the Stormwater Management Plan at each reexamination of the Borough’s Master Plan in accordance with N.J.S.A 40:55-D89.

2 Stormwater Management Goals

Minimum goals for this Municipal Stormwater Management Plan (MSWMP), as per NJDEP Guidance for Tier A municipalities are as follows:

- 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 non-point 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 in order 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 management basins.

In addition to the minimum goals required by NJPDES General Permit, in accordance with the relevant part of the Hamburg Borough Master Plan (2018 Reexamination), the following goals are set forth in this Stormwater Management Plan:

- Quality of Life Goal – To maintain an environment in Hamburg Borough that is conductive to attracting and retaining a diverse population and a vibrant business community. These elements are essential to maintaining the Borough's "Small town/Village" identity and its historic role as a "center" for the surrounding region.
- Land Use Goal – To encourage a balance and appropriate land use pattern.
- Environmental Protection Goal – To respect the portions of the natural environment still remaining within Hamburg
- Economic Development Goal – To retain and enhance Hamburg Borough's position as a business and historic center and as one of the logical locations for increased business activity in the eastern part of Sussex County.
- Historic Preservation Goal - To protect the key elements of Hamburg Borough's historic architectural fabric so that the unique character of the community is not lost.
- Housing Goal – Provide for a reasonable variety of housing opportunities in appropriate locations.

To achieve the above 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 specific design standards for stormwater infrastructure to protect public safety.

3 Stormwater Discussion

3.1 How Does Stormwater Runoff Affect Us?

Stormwater runoff is one of the largest detrimental impacts to our nation's water resources and is a major component of non-point source pollution. It is estimated that up to 60 percent of existing water pollution problems are attributable to non-point source pollution. Non-point source pollution, and particularly, stormwater runoff is difficult to identify, control, and treat. In natural environments, those undisturbed by anthropogenic activities, native vegetation either directly intercepts precipitation or draws from runoff that has infiltrated into the ground and returns it to the atmosphere through the process of evapotranspiration. A portion of precipitation runs off the land's surface replenishing the surface waters. Further, a portion of the rainfall that lands on the ground's surface infiltrates through the soil to the groundwater table and provides natural recharge of the groundwater and either replenishes aquifers or provides baseflow to rivers and streams. This process, known as the hydrologic cycle (or water cycle), functions in equilibrium, but is extremely susceptible to impacts resulting from changes to the cycle's processes. The hydrologic cycle is illustrated on Figure 3.1: Hydrologic Cycle.

Figure 3.1: Hydrologic Cycle

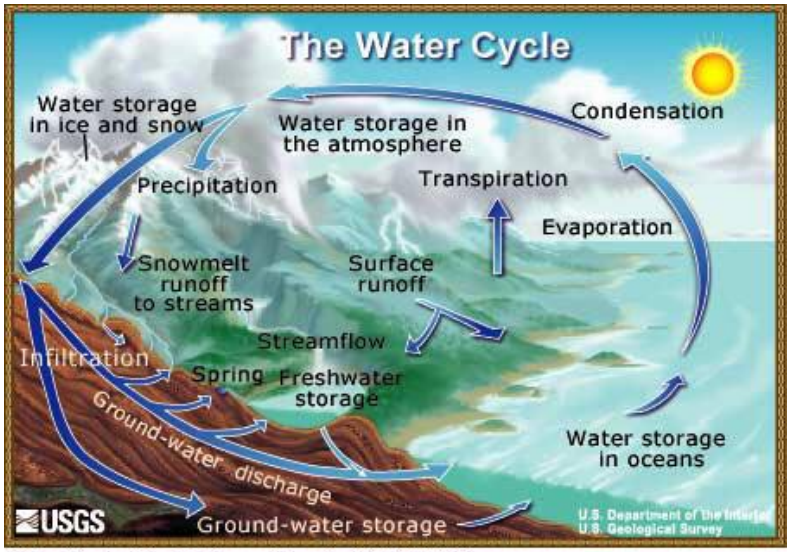


Illustration by John M. Evans, Colorado District, USGS

It has been shown that land development can dramatically impact the hydrology of a watershed if stormwater runoff related impacts are not considered carefully. Development typically alters natural vegetation through replacement of forests and fields with lawns, impervious cover, and motor vehicle surfaces, thereby reducing the watershed's evaporation, transpiration and infiltration rates. Construction activities compact the soil and diminish its infiltration ability, resulting in increased volumes and rates of stormwater runoff from the site. In the past, development typically involved the construction of impervious areas connected to each other through gutters, channels, and storm sewers. These structures can transport runoff more quickly than natural surfaces and cause erosion, water quality and flooding problems in areas downstream of development. Many times, the general public does not know or understand that there are alternatives to the traditional way of managing improved properties. For example, homeowners can have a green lawn without excessive doses of fertilizers and pesticides; pet owners should collect and properly dispose of pet waste and not leave it at the curb. Typically, people are unaware that storm drains often discharge directly to waterbodies. When people allow motor oil, trash, and their pet's waste to enter the storm sewer in their street, they don't realize that it may end up in a lake, a river or a tributary, or in their public drinking water supply. Individually these

acts may seem insignificant, but the cumulative impacts of these activities contribute to stormwater runoff non-point source pollution, and thus reduce water quality.

3.2 Municipal Separate Stormwater Systems (MS4) Program

In response to the United States Environmental Protection Agency (USEPA) National Pollutant Discharge Elimination System (NPDES) Phase II regulations adopted in December 1999, the State of New Jersey developed the Municipal Stormwater Regulation Program. This program addresses pollutants entering our waters from storm drainage systems operated by local, county, state, interstate, and federal government agencies. These systems are referred to as “municipal separate storm sewer systems” or MS4s and are regulated under the New Jersey Pollutant Discharge Elimination System (NJPDES) Rules (N.J.A.C. 7:14A). The NJDEP created four (4) NJPDES Stormwater General Permits for the various Municipal Separate Storm Sewer System (MS4s). These general permits include the Tier A Municipal Stormwater General Permit, Tier B Municipal Stormwater General Permit, Public Complex Stormwater General Permit, and the Highway Agency Stormwater General Permit.

For each General Permit, NJDEP has mandated Statewide Basic Requirements (herein referred to as SBRs), which include minimum standards, measurable goals, and implementation schedules. The minimum standards are one or more actions that must be taken to comply with the requirement of the permit. The measurable goals are the mechanism for reporting to the NJDEP the progress that the Municipality has made to implement the requirements of the permit and are accomplished primarily through the submittal of an Annual Report and Certification. The implementation schedule sets the deadlines for permit compliance.

All municipalities within the State of New Jersey have been reclassified as Tier A communities. Hamburg Borough is regulated under the NJPDES Stormwater Tier A General Permit, NJPDES No. NJ0141861. Tier A Municipalities are generally located within the more densely settled regions of the State or near the Atlantic Ocean.

As part of the permit, several SBRs were mandated and implemented. To satisfy the permit requirements, each Tier A municipality is required to develop, implement, and enforce a Stormwater Program. The stormwater program serves as the mechanism for the implementation of the Statewide Basic Requirements (SBR)s.

The following SBRs apply to all Tier A municipalities, including Hamburg Borough:

1. **Minimum Standards for Public Involvement and Participation Including Public Notice** – Municipalities must comply with State and local public notice requirements when providing for public participation in the development and implementation of their stormwater program. Municipalities must make elements of the MS4 program available to the public upon request and post copies of the SPPP, MSWMP & related ordinances on the municipal website. The Municipality shall maintain records necessary to demonstrate compliance with the public participation requirements and the existing permittee shall meet the minimum standards of this permit, and the measurable goals.

2. **Minimum Standards for Local Public Education and Outreach** – Each municipality shall develop a local public education and outreach program that focuses on educational and pollution prevention activities about the impacts of stormwater discharges on surface water and groundwater and to involve the public in reducing pollutants in stormwater and mitigating flow. The Municipality shall annually conduct activities that total at least 12 points and include activities from at least three of the five categories as set forth in Attachment B of the Tier A permit. Records shall be kept necessary to demonstrate compliance with this requirement, including date of activities and any other relevant documentation.
    a. The municipality shall label all storm drain inlets for those drains that do not have permanent wording cast into the structure of the inlet. These labels shall be maintained.

b. The municipality shall advertise public involvement programs pertaining to education and outreach activities on the municipality's website, through a mailing, a newspaper advertisement, or similar.

c. The Tier A Municipality shall meet the minimum standards and measurable goals, including recordkeeping, and implementation schedules for Local Public Education and Outreach specified in the Measurable Goals and Implementation Schedule.

3. **Minimum Standards for Construction Site Stormwater Runoff** - Construction site stormwater runoff activities are authorized under separate NJPDES permit. These are not required to be referenced in the SPPP.

4. **Post Construction Stormwater Management in New Development and Redevelopment** – Municipalities shall develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that discharge into the municipality's small MS4. In it's post construction program, the municipality shall complete the following:

   a. Adopt and reexamine a municipal stormwater management plan (or adopt amendments to and existing municipal stormwater management plan) in accordance with N.J.A.C. 7:8-4.

   b. Adopt and implement a municipal stormwater control ordinance or ordinances in accordance with N.J.A.C. 7:8-4. The ordinance(s) will control stormwater from non-residential development and redevelopment projects.

   c. Ensure that any residential development and redevelopment projects that are subject to the Residential Site Improvement Standards (RSIS) for stormwater management (N.J.A.C. 5:21-7) comply with those standards (including any exception, waiver, or special area standard that was approved under N.J.A.C. 5:21-3).

   d. Where necessary to implement the municipal stormwater management plan, the municipal stormwater control ordinance(s) will also:

      i. Control aspects of residential development and redevelopment projects that are not pre-empted by the RSIS; and

      ii. Set forth special area standards approved by the Site Improvement Advisory Board for residential development or redevelopment projects under N.J.A.C. 5:21-3.5.

   e. Ensure adequate long-term operation and maintenance (O&M) of Best Management Practice (BMPs).

   f. Enforce, through stormwater control ordinance(s) or a separate ordinance, compliance with standards set forth in Attachment C of the permit to control passage of solid and floatable materials through storm drain inlets.

   g. Require compliance with the applicable design and performance standards established under N.J.A.C. 7:8 for major development, unless:

      i. Those standards do not apply because of a variance or exemption granted under N.J.A.C. 7:8; or

      ii. Alternative standards are applicable under an area-wide or Statewide Water Quality Management Plan adopted in accordance with N.J.A.C. 7:15.

5. **Minimum Standards for Pollution Prevention/Good Housekeeping for Municipal Operator**

   a. Each municipality shall adopt and enforce the following community wide ordinances to address improper disposal of waste

      i. Pet Waste – Requires pet owners or their keepers to immediately and properly dispose of their pet's solid waste deposited on their property or any other property, public or private, not owned or possessed by that person.

ii. Wildlife Feeding – Prohibits the feeding in any public park or on any other property owned or operated by the municipality of any wildlife (excluding confined wildlife in zoos, parks, or rehabilitation centers or unconfined wildlife at educational centers).
iii. Litter – Adopt and enforce a litter ordinance or enforce the existing State litter statute (N.J.S.A. 13:1E-99.3).
iv. Improper Disposal of Waste – Prohibits the improper spilling, dumping, or disposal of materials other than stormwater into the small MS4.
v. Containerized Yard Waste Ordinance/Collection Program – Prohibits placing non-containerized yard wastes in the street and/or the municipality shall develop a yard waste collection and disposal system.
vi. Private Storm Drain Inlet Retrofitting Ordinance

b. Each municipality shall develop and continue to implement the following community wide pollution prevention/good housekeeping measures to control solids and floatables:
   i. Street Sweeping - Municipalities shall sweep all municipally owned curbed streets with storm drains that have a posted speed limit of 35 miles per hour (mph) or less in predominantly commercial areas at a minimum of once each month and that are not entrance or exist ramps.
   ii. Catch Basin & Storm Drain Inlet Inspection – Municipalities are required to inspect and clean storm drain inlets once every five years, or more frequently.
   iii. Storm Drain Inlet Retrofit - Municipalities are required to retrofit any existing municipal owned storm drain inlet in direct contact with any repaving, repairing, or resurfacing or in direct contact with any reconstruction or alterations of facilities.

c. Maintenance Yard Operations (Including Maintenance Activities at Ancillary Operations) – Tier A Municipalities are required to implement the best management practices described in Attachment E of the Tier A permit for municipal maintenance yards and ancillary operations which include the following:
   i. Fueling Operations
   ii. Discharging of Stormwater from Secondary Containment
   iii. Vehicle Maintenance
   iv. On-site Equipment and Vehicle Washing and Wash Wastewater Containment
   v. Salt and De-icing Material Storage
   vi. Aggregate Material and Construction Debris Storage
   vii. Street Sweepings, Catch basin clean out, and other material storage
   viii. Yard Trimmings and Wood Waste Management Sites
   ix. Containment of Vehicle Wash Water
   x. Roadside Vegetarian Management

d. Employee Training - Each Tier A municipality shall develop and conduct an annual employee training program. All employees shall receive training on these stormwater topics within three months of commencement of duties and every two years thereafter. Records should be kept and certified annually. The program must include at minimum the following topics:
   i. Yard Waste Collection Program
   ii. Monthly Sweepings of Certain Streets in Predominantly Commercial Areas
   iii. Illicit Connection Elimination and Outfall Pipe Mapping
   iv. Outfall Pipe Stream Scouring Remediation

v. Maintenance Yard operations
vi. Waste Disposal Education
vii. Municipal Ordinances
viii. Stormwater Facility Maintenance
ix. Construction Activity/Post-Construction Stormwater Management in New Development and Redevelopment
x. Tier A Municipalities SPPP
xi. Other stormwater related topics

e. Stormwater Management Design Review Training - Each Tier A municipality shall ensure that all design engineers, municipal engineers, and other individuals that review the stormwater management design for development and redevelopment projects complete the Department approved Stormwater Management Design Review Course once every five years.\

f. Municipal Board & Governing Body Member Related Training - Each Tier A municipality shall ensure that all municipal board and governing body members that review and approve applications for development and redevelopment projects complete the required online training available on the NJDEP website within six months of commencing duties.

6. **Minimum Standards for MS4 Outfall Pipe Mapping and Illicit Discharge and Scouring Detection and Control** – Each Tier A Municipality must complete the following requirements:
   a. Develop a map showing the end of all MS4 outfall pipes that are operated by the Municipality, and discharge within the municipality's jurisdiction to a surface water body. The map shall show the location and name of all surface water bodies receiving discharges and each pipe shall be assigned an alphanumeric identifier. A copy of the map shall be provided to the NJDEP annually if revisions have been made.
   b. Develop and implement a program to detect, investigate, and control any localized stream scouring from stormwater outfall pipes. The program, at minimum, must include an initial inspection of all outfall pipes once every five years, and all new pipes. When scour is detected, they should be further investigated, prioritized, scheduled, and remediated.
   c. Each municipality shall adopt and implement a program to detect and eliminate illicit connections into the MS4. The program, at minimum, must include an initial inspection of all outfall pipes, and further investigate any found to have dry weather flow in accordance with Permit A requirements. After the completion of the initial inspection of all outfall pipes, Tier A municipalities shall maintain an ongoing program to detect and eliminate illicit connections.

7. **Minimum Standards for Stormwater Facility Maintenance** - Develop and implement a stormwater facility maintenance program for cleaning and maintaining all stormwater facilities in accordance with permit requirements.
   a. Maintenance must be performed pursuant to any maintenance plans or more frequently as needed.
   b. A maintenance log shall be maintained to demonstrate compliance.
   c. Must certify annually that municipal owned or operated stormwater facilities are properly functioning.
   d. Develop and implement a program to ensure adequate long-term cleaning, operation, and maintenance of stormwater facilities not owned or operated by the Tier A Municipality not subject to the conditions of another NJPDES stormwater permit and constructed after February 7, 1984.

8. **Minimum Standards for Total Maximum Daily Load (TMDL) Information** – Each Tier A Municipality must incorporate the TMDL information into the SPPP and annually review approved or adopted TMDL reports. These reports should also be used to prioritize stormwater facility maintenance including schedules for repairs required.

3.3 Stormwater Management Regulations

On February 2, 2004 the State of New Jersey adopted the revised Stormwater Management Rules (N.J.A.C. 7:8). The revisions to the State's Stormwater Management Rules serve as the first major update to the rules since their inception in 1983 and detail fundamental changes in the management of stormwater runoff in New Jersey. Through the revision of these rules other regulations were modified, including the Residential Site Improvement Standards (RSIS) (N.J.A.C. 5:21), the Freshwater Wetlands Protection Act (N.J.A.C. 7:7A), the Flood Hazard Area Control Act (N.J.A.C. 7:13), the Watershed Management Rules (N.J.A.C. 7:15), and the New Jersey Dam Safety Standards (N.J.A.C. 7:20). The Stormwater Management Rules were most recently amended on March 2, 2020.

The Stormwater Management Rules provide a framework and incentives for managing runoff and resolving non-point source impairment on a drainage area basis for new development, redevelopment and existing developed areas. Additionally, they establish a hierarchy for implementation of BMP stormwater management measures with initial reliance on low impact development (LID) site design techniques to maintain natural vegetation and drainage patterns before incorporating structural measures. These rules also establish runoff control performance standards for groundwater recharge, water quality, and water quantity, establish special protection area measures for pristine and exceptional value waters; provide regulatory consistency among local and State regulatory agencies; and provide safety standards for stormwater management basins.

As of February 2, 2004, the design requirements identified in the Stormwater Management Rules including groundwater recharge, water quality and water quantity must be met for all projects regulated under RSIS. The Stormwater Rules (N.J.A.C. 7:8-4) require that all municipalities within the State of New Jersey adopt a municipal Stormwater Management Plan.

The Department adopted amendments to the Stormwater Management rules , N.J.A.C. 7:8, on March 2, 2020, to replace the current requirement that major developments incorporate nonstructural stormwater management strategies to the "maximum extent practicable" to meet groundwater recharge standards, stormwater runoff quantity standards, and stormwater runoff quality standards, with a requirement that green infrastructure (GI) be utilized to meet these same standards. The adopted amendments clarify and modify the definition of major development, which defines the scope of projects to which these rules apply. The Department adopted changes to apply the total suspended solids (TSS) removal requirement to the runoff from motor vehicle surfaces and to eliminate the TSS removal requirement as it applies to runoff from other impervious surfaces not traveled by automobiles, such as rooftops and sidewalks. The Department also adopted several changes that will improve water quality and stormwater management improvements in communities with combined sewer systems.

Long-term operation as well as preventative and corrective maintenance (including replacement) of the selected stormwater management measures, as well as compliance with Safety Standards for Stormwater Management Basins at N.J.A.C. 7:8-6, will be ensured as per the Borough's Stormwater Control Ordinance (See sections VIII. Safety Standards for Stormwater Management Basins, and X. Maintenance and Repair.)

4 Background

The Borough of Hamburg encompasses 1.17 square miles in Sussex County, New Jersey. Hamburg borders the Sussex County municipalities of Franklin and Hardyston Township. The 2020 United States Census counted 3,266 people, 1,391 households, and 934 families in the Borough. The median age in the Borough is 41.8 years.

The New Jersey Department of Environmental Protection (NJDEP) has established an Ambient Biomonitoring Network (AMNET) to document that 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 the NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. This 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 only major river that borders the Borough is the Wallkill River.

In addition to the AMNET data, the NJDEP and other regulatory agencies collect water quality chemical data on the streams in the State. This data shows elevated levels of dissolved solids, phosphorus, temperatures, oxygen, pH, TSS, arsenic, cadmium, mercury, selenium, zinc and benthic macro-invertebrates within the Wallkill River. This means that the river is an impaired waterway and the NJDEP is in the process of developing a Total Maximum Daily Load (TMDL) for these pollutants.

A TMDL is the amount of a pollutant that can be accepted by a waterbody without causing an exceedance of water quality standards or interfering with the ability to use a waterbody for 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 sources, which include stormwater runoff from agricultural areas and residential areas, along with a margin of safety. Provisions may also be made for future sources in the form of reserve capacity. An implementation plan is developed to identify how the various sources will be reduced to the designated allocations. Implementation strategies may include improved stormwater treatment plants, adoption of ordinances, reforestation of stream corridors, retrofitting stormwater systems, and other BMPs.

The New Jersey Integrated Water Quality Monitory 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 mode TMDLs are needed.

Figures illustrating a regional map, the waterways & wetlands in the Borough, existing zoning, existing land use, and existing steep slope areas are provided in Appendix A.

The Borough has not experienced severe water quality problems.

5 Design and Performance Standards

The Borough has adopted the design and performance standards for stormwater management measures as presented in N.J.A.C. 7:8-5 to minimize the adverse impact of stormwater runoff on water quality and water quantity and loss of groundwater recharge in receiving water bodies. The design and performance standards include the language for maintenance of stormwater management measures consistent with the stormwater management rules at N.J.A.C. 7:8-5.8 Maintenance Requirements, and language for safety standards consistent with N.J.A.C. 7:8-6 Safety Standards for Stormwater Management Basins.

A copy of the Borough's Stormwater Control Code is included in Appendix A of this report. Please note the Borough's Stormwater Control was revised in 2021 for consistency the Department's March 2020 Revisions to the Stormwater Control Regulations at N.J.A.C 7:8.

The Borough will continue to enforce the stormwater control ordinance. The Borough will ensure adequate long-term operation and maintenance of BMPs on property not owned or operated by the municipality; and the Borough will enforce, through the stormwater control ordinances, controlling the passage of solid floatable materials through storm drain inlets for storm drain inlets not installed by the Tier A Municipality.

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

The Borough will comply with the applicable and meet several different but related requirements. These requirements are concerned with:

- The Department's Stormwater Management rules (N.J.A.C. 7:8), which are implemented in part through the Residential Site Improvement Standards: govern the contents of municipal stormwater management plans and stormwater control ordinances and establish stormwater management design and performance standards for new development and redevelopment.
- The Residential Site Improvement Standards (RSIS) for stormwater management established by the New Jersey Department of Community Affairs (NJDCA) at N.J.A.C. 5:21.
- Municipal stormwater management plans and stormwater control ordinances adopted under the Stormwater Management Act (N.J.S.A. 40:55D-93 to 99), which is a portion of the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.)
- Long-term operation and maintenance of BMPS.
- Storm drain inlets.

The Borough's post-construction program will comply with the applicable design and performance standards for major development established in N.J.A.C 7:8, unless those standards do not apply because of a variance or exemption granted under N.J.A.C. 7:8, or unless alternative standards under a Water Quality Management (WQM) Plan (adopted in accordance with the Department's Water Quality Management Planning rules at N.J.A.C. 7:15) are applicable. The Borough will require such compliance through the RSIS, and through municipal stormwater management plans and stormwater control ordinances.

The requirements in N.J.A.C. 7:8-5.2 AND 5.3 to incorporate the following nonstructural stormwater management strategies into the design.

- Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss;

- Minimize impervious and motor vehicle surfaces and break up or disconnect the flow of runoff over impervious and motor vehicle surfaces;
- Maximize the protection of natural drainage features and vegetation;
- Minimize the decrease in the “time of concentration” from pre-construction to post-construction. “Time of Concentration” is defined as the time it takes for runoff to travel from the hydraulically most distant point of the drainage area to the point of interest within a watershed;
- Minimize land disturbance including clearing and grading;
- Minimize soil compaction;
- Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides;
- Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas; and
- Provide other source controls to prevent or minimize the use or exposure of pollutants at the site in order to prevent or minimize the release of those pollutants into stormwater runoff (see N.J.A.C. 7:8-5.3(a)9 and the New Jersey Stormwater Best Management Practices Manual for examples).

The March 2020 Amendments to the Stormwater Management Rules, N.J.A.C. 7:8, include the use of green infrastructure to replace the prior requirement to incorporate nonstructural stormwater management strategies to the “maximum extent possible”. The selection of green infrastructure BMPs to incorporate into a project should be selected based on a review of the site characteristics and needs. The following green infrastructure structural Best Management Practices should be considered for each project in accordance with N.J.A.C. 7:8-9.

- Bioretention systems;
- Constructed stormwater wetlands;
- Dry wells;
- Extended detention basins;
- Infiltration basins;
- Pervious paving systems;
- Rooftop vegetated cover;
- Sand filters;
- Vegetative filters; and
- Wet ponds.

The standard in N.J.A.C. 7:8-5.5 to encourage and control infiltration and groundwater recharge, including requirements that the design engineer (except in certain specified circumstances) either:

- Demonstrate through hydrologic and hydraulic analysis for stormwater leaving the site, post-construction runoff hydrographs for the two-, 10- and 100-year storm events do not exceed the pre-construction runoff hydrographs for the same storm events; **or**
- Demonstrate through hydrologic and hydraulic analysis that the increase of stormwater runoff volume from pre-construction to post-construction for the two-year storm is infiltrated.
- The “Stormwater runoff quality standards” in N.J.A.C. 7:8-4, including:
    - The requirement that stormwater management measures be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by 80 percent of the anticipated load from the developed site, expressed as an annual average. Table 4-1 in N.J.A.C. 7:8-4 presents the presumed TSS removal rates for certain

BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual.

- The requirement that stormwater management measures be designed to reduce, to the maximum extent feasible, the post-construction nutrient load of the anticipated load from the developed site in stormwater runoff generated from the water quality design storm.
- The requirement that the applicant preserve and maintain 300-foot "special water resource protection areas" along all waters designated "Category One" in the Department's Surface Water Quality Standards at N.J.A.C. 7:9B, and along perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the U.S. Geological Survey (USGS) Quadrangle Maps or in the County Soil Surveys, within the associated hydrologic unit code 14 (HUC14) drainage. The Borough currently does not have a Category One waters within the municipal boundary.

- The maintenance requirements in N.J.A.C. 7:8-5.8

The requirements for "compliance with the applicable design and performance standards established under N.J.A.C. 7:8" pertains to all applicable design and performance standards established under the Stormwater Management rules, not just to the "Stormwater Management Quantity and Quality Standards" in N.J.A.C. 7:8-5. Problems such as human-induced base-flow reduction (due to reduced recharge) and exacerbation of flooding and erosion also present water quality problems because they alter the chemical, physical, or biological integrity of the waters of the State, or otherwise contribute to water pollution.

6 Plan Consistency

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 update 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, County and/or Borough inspectors will observe on-site soil erosion and sediment control measures and report any inconsistencies to the local Soil Conservation District.

The Borough is not currently within a Regional Stormwater Management Planning Area. However, a TMDL study has been undertaken. This plan does not need to be consistent with any regional stormwater management plans (RSWMPs) nor any TMDLs at this time. If any RSWMPs or TMDLs are developed in the future, this Municipal Stormwater Management Plan will be updated to be consistent.

7 Nonstructural Stormwater Management Strategies

The Borough has reviewed the Master Plan and both land use and zoning ordinances to incorporate non-structural stormwater management strategies (also called low impact development techniques). The Borough has revised all ordinances which relate to land development and incorporate NJDEP's nonstructural stormwater management strategies.

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 and motor vehicle surfaces. This mitigation effort must address water quality, flooding, and groundwater recharge.

It is noted that although attempts to mimic pre-existing natural conditions may be adequate to satisfy the State stormwater rules, alteration of land always modifies hydrology. Therefore, some measure (or BMP) will be required for every project qualifying as a major development. The New Jersey Stormwater Best Management Practices Manual ("BMP Manual") April 2004 Revised September 2014, February 2016, September 2016, November 2016, September 2017, November 2018, & March 2020 should be utilized for the development of all stormwater BMPs. A copy of the most current BMP manual can be found at: https://www.njstormwater.org/bmp_manual2.htm

8 Land Use/Build-Out Analysis

The Borough of Hamburg is substantially developed and what little area is undeveloped, is constrained by environmental factors such as flood hazard areas, riparian zones, wetlands, and steep slopes. The number of parcels within the Borough that could be developed or redeveloped that would be classified as a Major Development is very limited.

Appendix A, Exhibit 4 illustrates the existing land use in the Township (dated 2018). The Township zoning map is shown in Appendix A, Exhibit 4. Appendix A, Exhibits 5 & 6 illustrates the environmentally constrained lands within the Borough.

9 Mitigation Plan

This mitigation plan is provided for a proposed development that is granted a variance or exemption from the stormwater management design and performance standards.

Strategies that may be used to mitigate a development project and its impacts include, in the order of their preference, the following:

1. **Equivalent, or "in-kind"** mitigation (as per the requirements of N.J.A.C. 7:8-4.2c(11)) is the most preferred method where a mitigation project is identified within the same drainage area, or HUC-14, within which the subject project is proposed, so that it provides benefits and protection similar to those that would have been achieved if the stormwater and recharge performance standards had been satisfactorily completed. In-kind mitigation must also directly compensate for the projected impact for the performance standard(s) for which the waiver was granted.

   If there are no "in-kind" mitigation options available within the same HUC-14 drainage area, the Township may consider implementation of a similar compensating measure to mitigate the same impact(s) of the proposed project, but within a different watershed.
2. **Non-equivalent**, or alternative mitigation options may be considered by the Township if equivalent or "in-kind" mitigation measures for the projected environmental impact(s) is not feasible. In this case, the Township may consider implementation of an alternative compensating measure at a designated municipal site or as part of an adopted regional stormwater management plan.
3. **Funding, or "in-lieu"** mitigation is the least preferred option. In this case, an applicant may provide contributions in the form of funding to the Township for future or alternative stormwater management projects. In this case, 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 costs associated with the long-term maintenance requirements of the mitigation measure.

9.1 Hamburg Borough Mitigation Plan:

If the applicant for a proposed development demonstrates to the satisfaction of the reviewing Board that on-site compliance with the stormwater performance standards as outlined in this MSWMP is not practical, the Board will entertain a request for a waiver or exemption from said standards. In order to obtain the waiver or exemption from strict compliance with the groundwater recharge, stormwater quantity and/or stormwater quality requirements as outlined in this Municipal Stormwater Management Plan and ordinances, the applicant must provide mitigation in accordance with the following:

1. A 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 applicant can select a project listed in the Municipal Stormwater Management Plan to compensate for the deficit from the performance standards resulting from the proposed project. The MSWMP will be amended from time to time to include these projects as they are identified by the various entities and programs performing land use and watershed studies including Hamburg Borough. The applicant, in configuring a mitigation proposal should utilize water resources information included in the Natural Resources Inventory and Conservation Elements of the municipal master plan.
   - The applicant must demonstrate the ability to obtain the necessary agreements to create a project to compensate for the deficit from the performance standards resulting from the proposed project.

- The applicant must ensure the long-term maintenance of the project including the maintenance requirements under the relevant chapters of the most current version of the NJ Stormwater BMP Manual.

2. If a suitable mitigation site cannot be located in the same drainage area as the proposed development, as discussed under Option 1, the municipality may allow the applicant to provide funding to the municipality for an environmental enhancement project that has been identified in this Municipal Stormwater Management Plan as amended. The funding must be equal to or greater than the cost to implement the mitigation outlined above, including the costs associated with purchasing the property or easement for mitigation and the costs associated with the long-term maintenance requirements of the mitigation measure.

Adequate documentation must be provided by applicants for evaluation of proposals for mitigation projects. Information must include, but not be limited to the following:

1. Detailed technical justification for the waiver request, including relevant site-specific soils, hydrologic, hydrogelogic, topographic and other environmental data based on in-situ testing. The information must be presented in a technical report format suitable for review by reviewing Board members and Board professionals.
2. Description of opportunities for acquisition of or deed restriction of nearby (within same drainage area) private land, preferably adjacent to State Open Waters that would be dedicated for preservation or reforestation to offset shortfall in recharge. The report must also include documentation that the waiver, if granted, will not result in near-field soil erosion or sedimentation, or negative impacts on wetlands or other critical areas.
3. Evaluation of options for retrofit of public or private property nearby (within same drainage area) with equivalent water resource value to “avoided” project.
4. Documentation that the mitigation project is sized based at a minimum on the monetary value of avoided project assuming average constraints.
5. Determination of the water resources value of the proposed mitigation project to ongoing regional or other stormwater planning must be provided.

The Borough may allow a developer to provide funding or partial funding to the municipality for an environmental enhancement project that has been identified in a future addendum to this Municipal Stormwater Management Plan or towards the development of a Regional Stormwater Management 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.

In those cases where an applicant has demonstrated the inability or impracticality of strict compliance with the stormwater management requirements set forth in this plan, and in N.J.A.C. 7:8-5, a waiver from strict compliance may be granted by Hamburg Borough. In such cases, the applicant must submit a mitigation plan detailing how the project’s failure to strictly comply will be compensated.

A. Figures

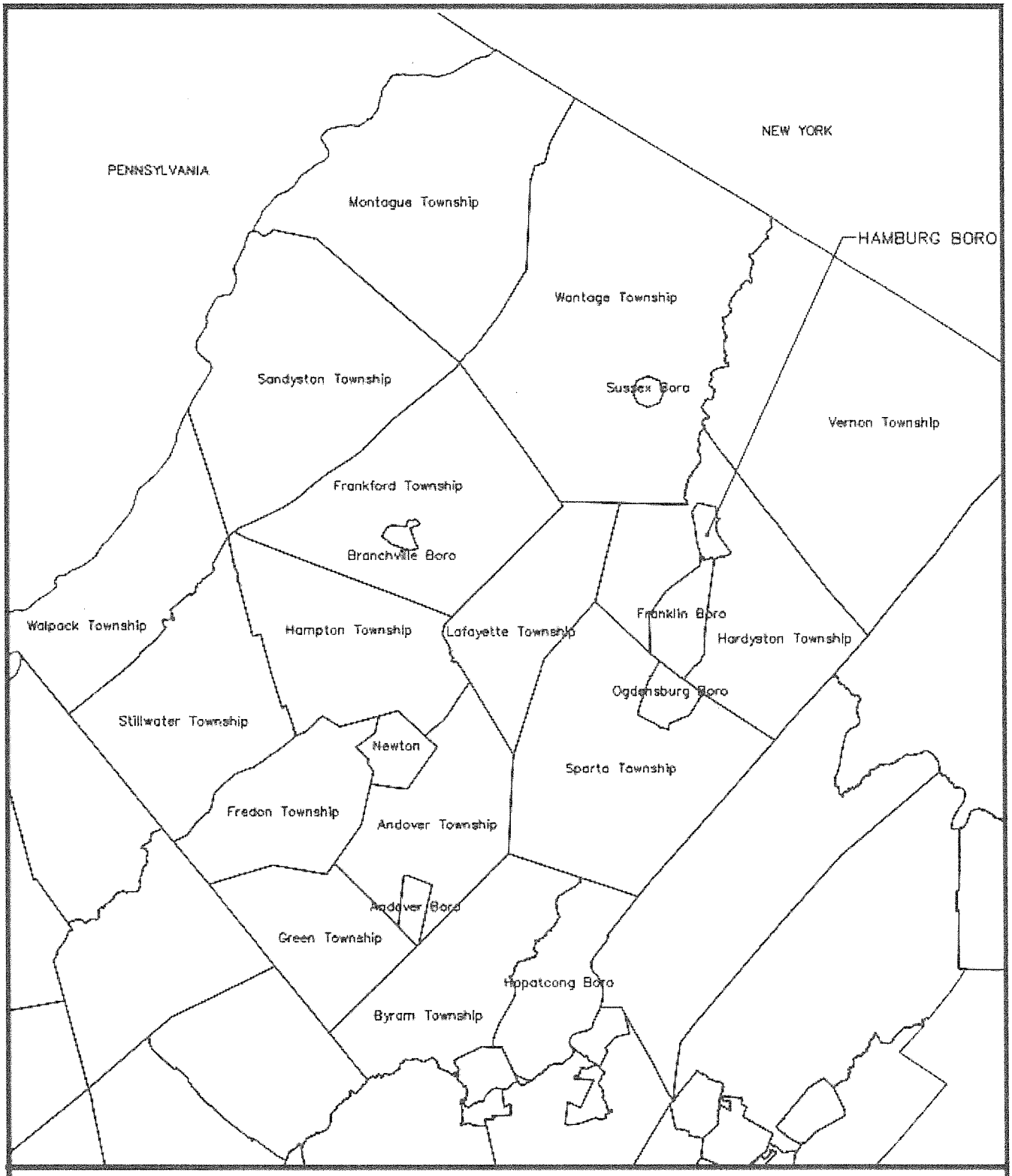
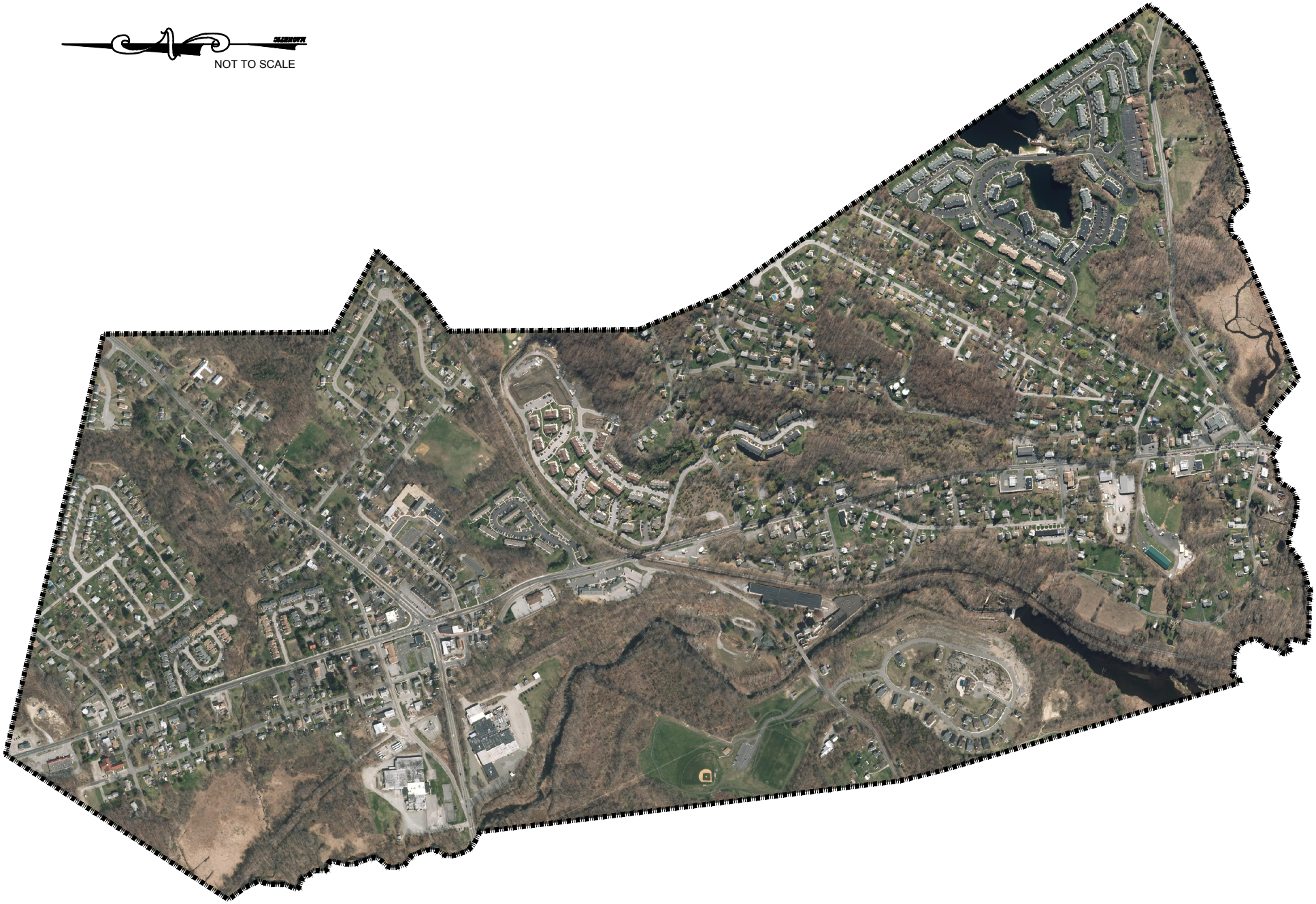


EXHIBIT 1:

REGIONAL AREA MAP OF HAMBURG BORO

Not to Scale

NOT TO SCALE



AERIAL MAP

BOROUGH OF HAMBURG
SUSSEX COUNTY, NEW JERSEY

MOTT MACDONALD

ZONING LEGEND

RR	RESIDENTIAL - MEDIUM DENSITY	RO	RESIDENTIAL OFFICE
PR	PLANNED RESIDENTIAL - HIGH DENSITY	P	PUBLIC USE
PD	PLANNED DEVELOPMENT	I	LIGHT INDUSTRIAL
PC	PLANNED COMMERCIAL	C	CONSERVATION
HC	HIGHWAY COMMERCIAL	AAPR	ACTIVE-ADULT PLANNED RESIDENTIAL
BC	BOROUGH CENTER	HO	HISTORIC OVERLAY LANDMARK DISTRICT PURSUANT TO APPROPRIATE ORDINANCE

NORTH

SCALE: 1"=600'

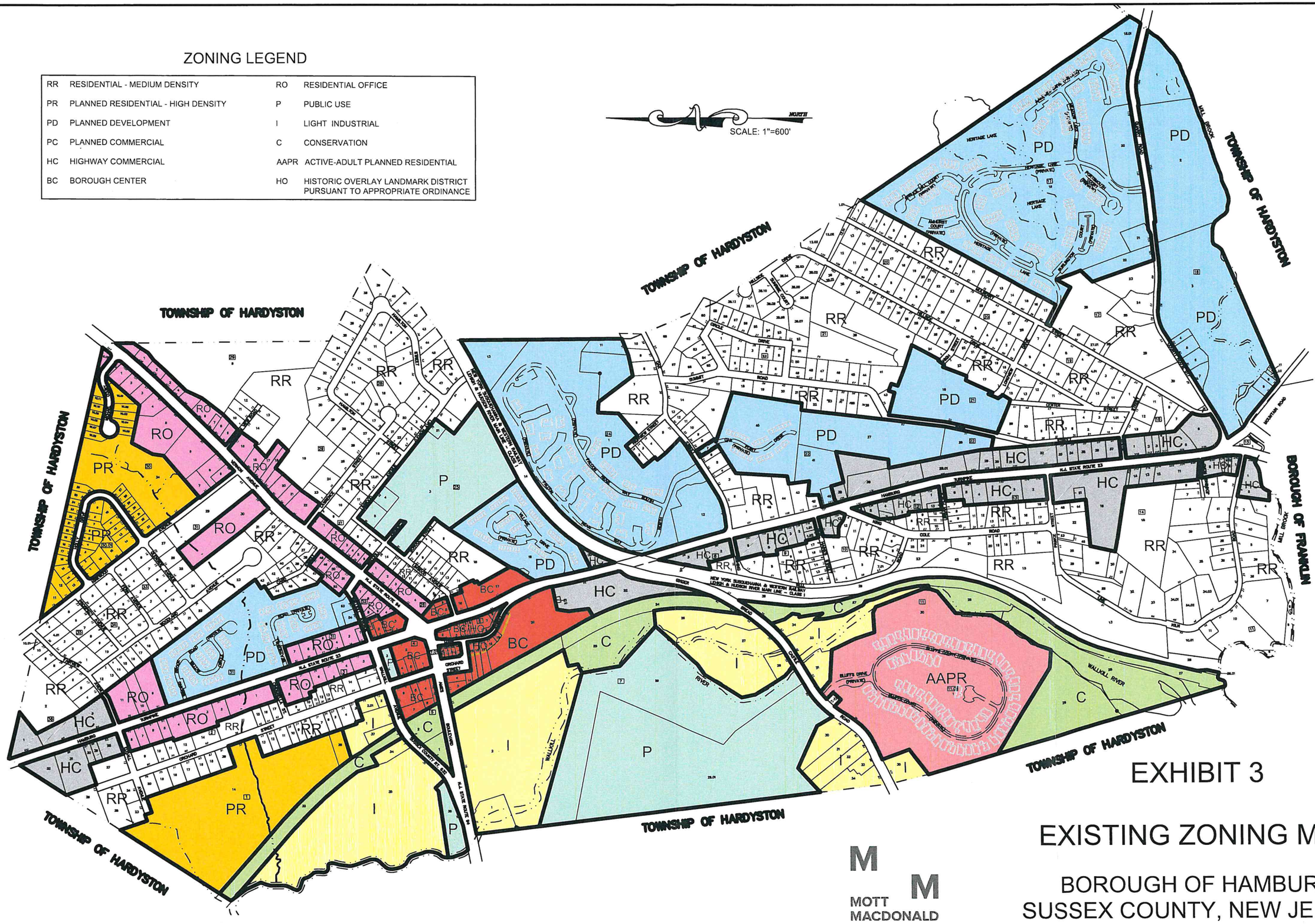


EXHIBIT 3

EXISTING ZONING MAP

BOROUGH OF HAMBURG
SUSSEX COUNTY, NEW JERSEY

MOTT MACDONALD

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LEGEND

LAND USE DISTRICTS

- R-1 - LOW DENSITY SF RESIDENTIAL
- R-2 - MODERATE DENSITY SF RESIDENTIAL
- RPR - LOW DENSITY CLUSTER SF RESIDENTIAL
- PR - PLANNED MF RESIDENTIAL
- PD - PLANNED DEVELOPMENT - MIXED USE
- RO - RESIDENTIAL/OFFICE
- HC - HIGHWAY COMMERCIAL
- BC - BOROUGH CENTER
- LI - LIGHT INDUSTRIAL/PROPOSED REDEVELOPMENT AREA
- P - PUBLIC USE
- CR - CONSERVATION/RECREATION
- WALKILL VALLEY HERITAGE TRAIL

NORTH

SCALE: 1"=600'

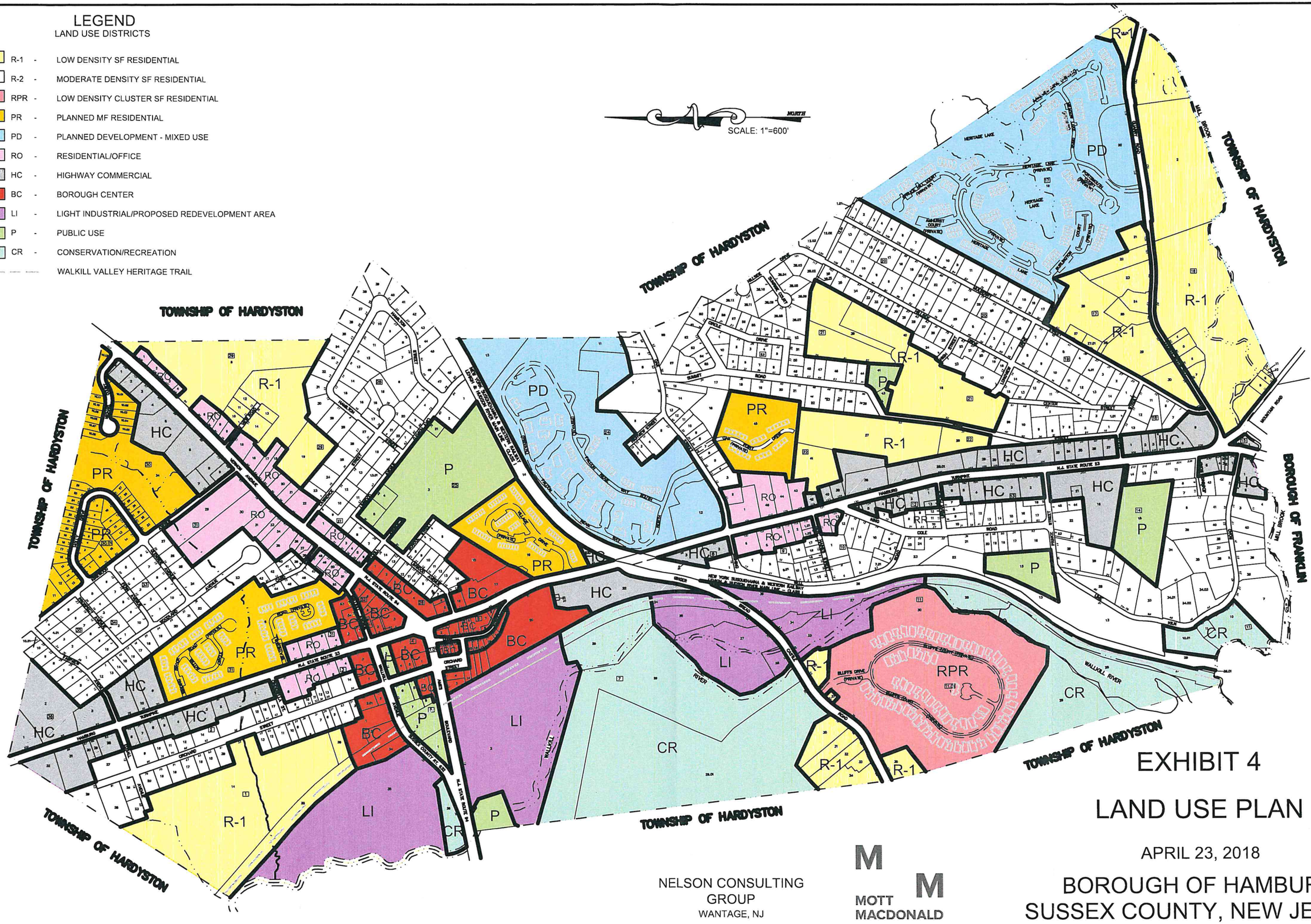

EXHIBIT 4

LAND USE PLAN

APRIL 23, 2018

BOROUGH OF HAMBURG
SUSSEX COUNTY, NEW JERSEY

NELSON CONSULTING GROUP
WANTAGE, NJ

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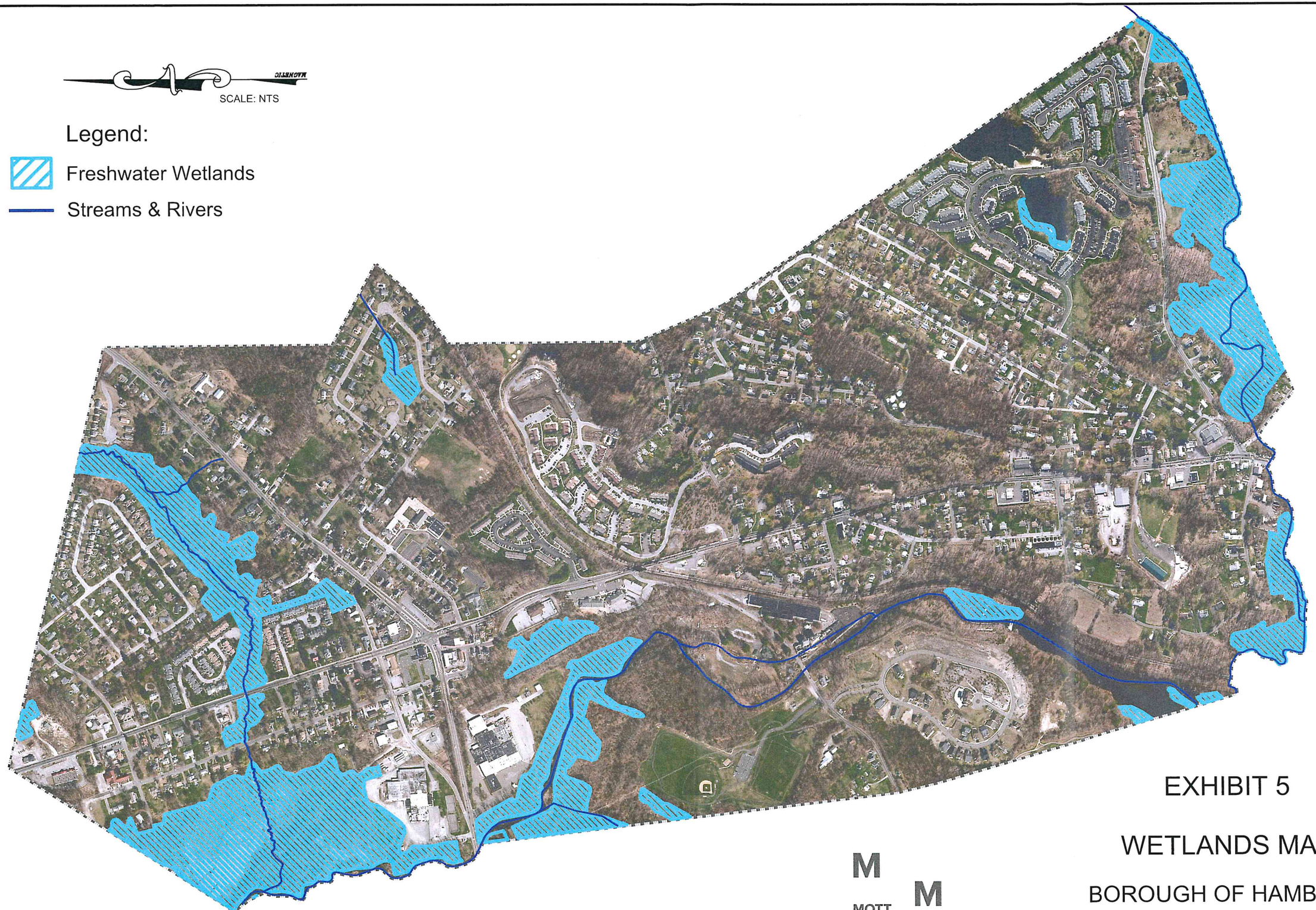
MAGNETIC

SCALE: NTS

Legend:

Freshwater Wetlands

Streams & Rivers



*FRESHWATER WETLANDS & WATERWAYS PER NEW JERSEY HIGHLANDS COUNCIL GIS DATABASE

MOTT MACDONALD

EXHIBIT 5

WETLANDS MAP

BOROUGH OF HAMBURG
SUSSEX COUNTY, NEW JERSEY

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NORTH

SCALE: NTS

Slope Legend:

- 15% - 24.99% Slopes
- 25% and Greater Slopes

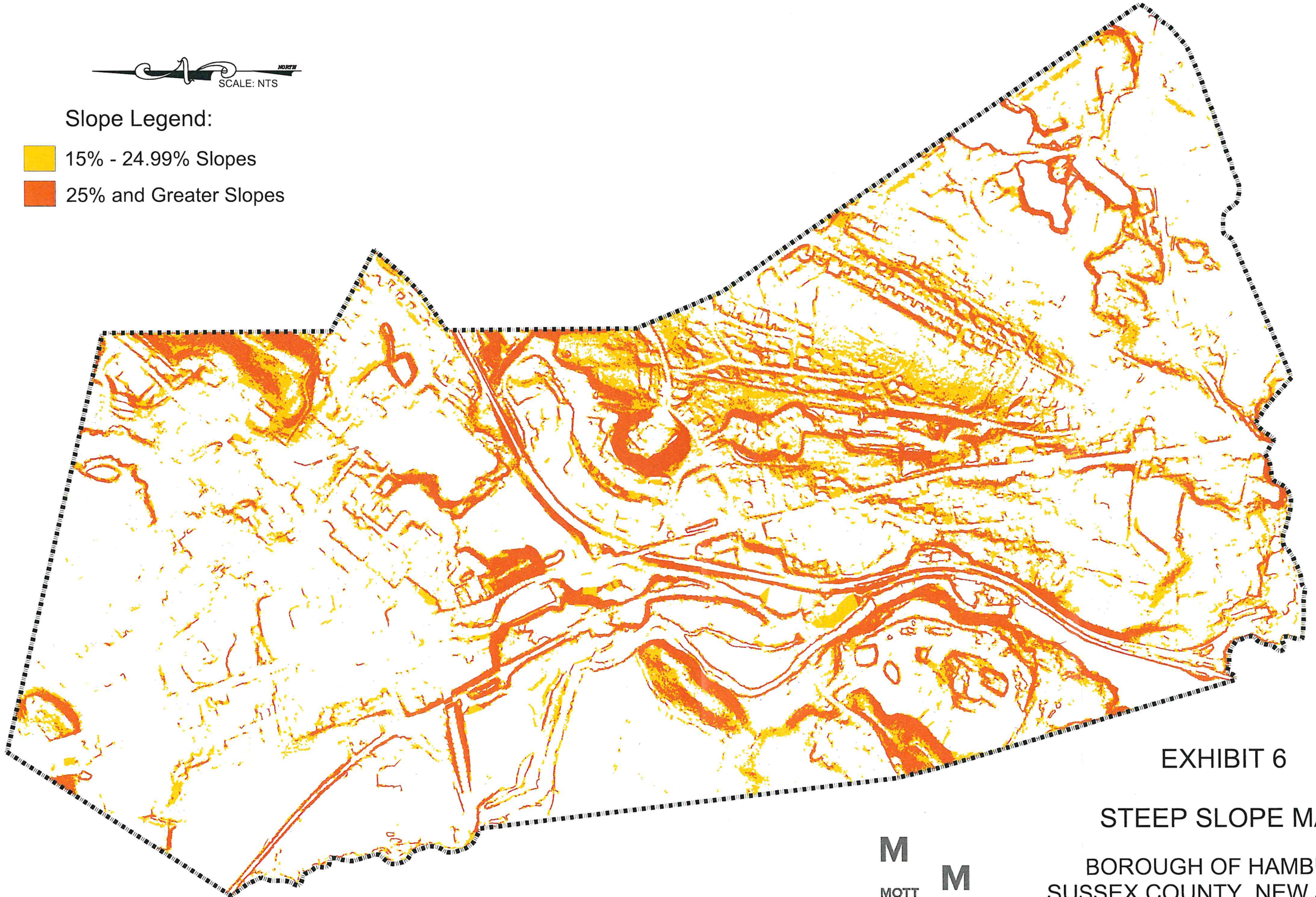

EXHIBIT 6

STEEP SLOPE MAP

BOROUGH OF HAMBURG
SUSSEX COUNTY, NEW JERSEY

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B. Ordinances