

**MUNICIPAL STORMWATER
MANAGEMENT PLAN FOR THE
BOROUGH OF HARRINGTON PARK
BERGEN COUNTY, NEW JERSEY**

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Introduction

This Municipal Stormwater Management Plan (MSWMP) documents the strategy for the Borough of Harrington Park (“the Borough”) to address stormwater-related impacts. The creation of this plan is required by N.J.A.C. 7:14A-25 Municipal Stormwater Regulations. This plan contains 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 acres of land. These standards are intended to minimize the adverse impact of stormwater runoff on water quality and water quantity and the lost of groundwater recharge that provides base flow in receiving water bodies. The plan describes long-term operation and maintenance measures for future stormwater facilities.

A “build-out” analysis has not been included as the Borough does not have one square mile of agricultural or vacant land. 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.

Goals

The goals of this MSWMP are to:

1. Reduce floor damage, including damage to life and property
Chapter 179 of the Borough’s codes is entitled “Flood Damage Prevention”. This chapter’s purpose is to promote the public health, safety and general welfare and to minimize public and private losses due to floor conditions. Special flood areas are identified on Flood Insurance Rate Maps that are based on 100-Year Storm Event. Further reduction to flood damage is achieved from the consideration of a new section to the above chapter. The new section would require adherence to NJDEP regulations regarding floodplains and riparian buffer requirements. Hackensack River, Tappan Run, Dorotockeys Run and Blanch Brook have all been delineated by NJDEP. Flood hazard areas based on the Department’s regulatory flood has been established for these waterways. By following the NJDEP requirements, the floodplain will cover larger areas. This is due to the fact that the NJDEP regulatory flood is based on 100-year storm under full developed conditions which may also be represented by an increase of 25% to the 100-year flood flow under existing conditions. The NJDEP regulations further require that structures that span the flood plain and/or act as control structures for the watercourse, such as bridges, culverts or low dams, to be designed so that any increase in flood elevations, upstream or downstream, will not subject existing residential or commercial buildings to increased flood damages during this flood and more frequent floods. Furthermore, as noted above herein the waterways within the Borough are under Category One waters. This special water resource protection area requires that a 300 foot buffer zone be

established. Adhering to this requirement, will limit development adjacent to waterways and reduce flood damage.

2. Minimize, to the extent practical, any increase in stormwater runoff from any new development

The Borough currently follows the New Jersey Residential Site Improvement Standards (RSIS) which governs residential development within the State of New Jersey and within the Borough. As indicated herein this plan, the Borough has adopted a Stormwater Control Ordinance. This ordinance allows no increase in stormwater runoff from any new development or re-development that disturbs one or more acre of land. The applicant is required to provide hydrologic and hydraulic calculations demonstrating one of the following:

- Post-construction runoff hydrographs for the two, 10, and 100-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events.
- No increase, as compared to the pre-construction condition, in the peak runoff rate of stormwater leaving the site for the two, 10 and 100-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site.
- Design stormwater management measures so that the post-construction peak runoff rates for the two, 10 and 100-year storm events are 50, 75 and 80 percent, respectively, of the pre-construction peak runoff rates.

3. Reduce soil erosion from any development or construction project

This goal is achieved through adherence to the New Jersey's Soil Erosion and Sediment Control standards. Borough of Harrington Park Stormwater Management Ordinance requires all new development and redevelopment plans to comply with State's Soil Erosion and Sediment Control Standards.

4. Assure the adequacy of existing and proposed culverts and bridges, and other in-stream structures

The adequacy of existing and proposed culverts and bridges, and other in-stream structures is assured by adherence to N.J.A.C. 7:13 "Flood Hazard Area Control Act Rules". The NJDEP regulations under this chapter specify all the requirements needed to assure the adequacy of existing and new structures, without causing any adverse effects upstream or downstream, for the regulatory flood and more frequent events. An NJDEP Land Use Permit for any new bridge or modifications/alterations to existing structures as defined in NJAC 7:13, is required.

5. Maintain groundwater recharge

This goal is achieved through the adoption of the design and performance standards for Stormwater Management Measures as presented in N.J.A.C. 7:8-5. Subsections 7:8-5.4 "Erosion Control, Groundwater Recharge and Runoff Quantity Standards" and 7:8-5.6 "Calculation of Stormwater Runoff and Groundwater Recharge" describe the specific standards and calculation technique to maintain the groundwater

recharge. It is noted that the soils within the Borough are predominately of Hydrologic Soil Group "B" consisting of Dunellen (Duob, Duoc, Duub, Duuc, Duud) and some Riverhead (Rkvc). There are also some Pascack (Pbua) with soil group "C", some Preakness (PrnA) soil group "B/D", and some urban land (Udb, Udbu) with no designated soil group, and a very small strip of Fluvaquents (FN), with soil group "A" Hydrologic soil groups "A", "B" which comprise most of this Borough's soil satisfy the NJDEP minimum requirements of permeability rates for groundwater recharge and water quality storms. Hydrologic soil group "C" also generally satisfies these requirements; however, a percolation test will be required. Figure C-4 illustrates the approximate groundwater recharge rates within the Borough.

6. Prevent, to the greatest extent feasible, an increase in nonpoint pollution

Nonpoint pollution is generally attributed to stormwater runoff from agricultural and residential areas. The Borough contains approximately 258.11 acres of vacant land, and adheres to RSIS regulations for residential development. By requiring residential developments to conform with the RSIS regulations regarding water quality, and by further adopting the design and performance standards for Stormwater Management Measures as presented in N.J.A.C. 7:8-5., Subsection 7:8-5.5 "Stormwater Runoff Quality Standards", which describes the stormwater management measures to achieve water quality and provides guidance to achieve the same, this goal shall be achieved.

7. Maintain the integrity of stream channels for their biological functions, as well as for drainage.

This goal is achieved by adopting the design and performance standards for Stormwater Management Measures as presented in N.J.A.C. 7:8-5. As noted herein, the waterways within the Borough are classified as Category One waters. This special water resource protection area requires that a 300 foot buffer zone be established. It further indicates the terms where exceptions to these 300 feet may apply. However, it indicates that in no case shall the remaining special water resource protection area be reduced to less than 150 feet. Applying Goal 2 and the Category One regulations minimize increase of runoff from new developments, thus maintaining the integrity and function of the watercourse channels for drainage. Applying Goals 6 and 7, and the Category One regulations will maintain the biological functions of the streams. This goal is furthermore achieved by adhering to N.J.A.C. 7:13 "Flood Hazard Area Control Act Rules" regarding the protection of vegetation areas adjacent to watercourses.

8. Minimize pollutants in stormwater runoff from new and existing development to restore, enhance, and maintain the chemical, physical, and biological integrity of the waters of the state, to protect 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.

This goal is achieved through the adoption of the design and performance standards for Stormwater Management Measures as presented in N.J.A.C. 7:8-5, Subsection 7:8-5.5 "Stormwater Runoff Quality Standards". These standards require the reduction of 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 redeveloped/developed site. This subsection includes the list of Best Management Practices, and the TSS Percent Removal Rate achieved through implementation. Since the waterways in the Borough are designated Category One waters, all the requirements of Subsection 7:8-5.5(h) shall apply, thus further minimizing the pollutants in stormwater runoff and enhancing the quality of surface waters in the Borough.

9. Protect public safety through the proper design and operation of stormwater basins.
This goal is achieved through the adoption of the design and performance standards for Stormwater Management Measures as presented in N.J.A.C. 7:8-5, Subsection 7:8-5.8: “Maintenance Requirements”, and Subsection 7:8-6 “Safety Standards for Stormwater Management Basins”. The latter subchapter sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. New developments are required to provide a “Stormwater Management and Maintenance Plan” in which the responsible party for maintenance of the facility is identified and detailed schedules and procedures pursuant to NJAC 7:8-5.8 “Maintenance Requirements” are included therein. The existing facilities maintained by the Borough or privately, will continue to be maintained by same.

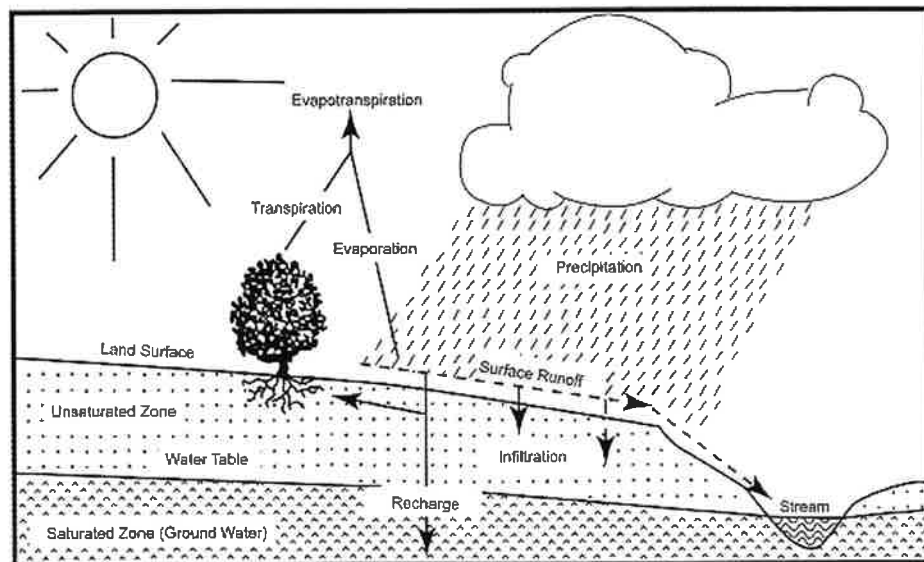
To achieve these goals, this plan outlines specific stormwater design and performance standards for new development. Additionally, the plan proposes stormwater management controls to address impacts from existing development (see Mitigation Plans section). Preventative and corrective maintenance strategies are included in the plan to ensure long-term effectiveness of stormwater management facilities (see Design and Performance Standards section). The plan also outlines safety standards for stormwater infrastructure to be implements to protect public safety.

Stormwater Discussion

Land development can dramatically alter the hydrologic cycle (see Figure C-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 is 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. In addition, these increases can create new flooding conditions and aggravate existing downstream flooding and erosion problems along with increasing 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 C-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 watercourses. 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.

Background

The Borough of Harrington Park encompasses 2.06 square miles (1,318 acres) and is located in the northeast section of Bergen County. Figure C-3 depicts the Borough boundary on the USGS quadrangle maps. The Borough has a relatively stable population. The population of the Borough has increased from 4,532 in 1980; to 4,623 in 1990; to 4,740 in 2000, and to 4,664 in 2010. The number of households also has increased from 1,341 in 1980; to 1,479 in 1990; to

1,563 in 2000; and to 1,592 in 2010. Harrington Park is a predominately single-family residential community, which accounts for over 90% of its housing stock. Recent developments within the Borough include mainly residential developments and a senior housing project which was built in the 1990s. The Borough of Harrington Park is located within the Planning Area 1 (PA-1), Metropolitan Planning Area as identified on the New Jersey State Plan Policy Map.

The Borough is fully serviced by the Bergen County Utilities Authority (B.C.U.A.), providing sewage disposal, solid waste services, and treatment works. Domestic water and fire service flow are provided by the United Water conveyance system. The Borough contains stormwater features which include but are not limited to drainage swales and detention basins. At this time, a detailed list of the individual stormwater features is not available.

The Borough's Master Plan Re-examination Report indicates "*The overall population growth in the 1990s was not substantial, nor can one expect it to be substantial in the next 10 years. This is because little vacant developable land remains in the community to accommodate new dwelling units.*" The Borough follows the RSIS regulations regarding Stormwater Management. Therefore, due to the small increase in impervious area and the Borough's adherence to the RSIS regulations, there has been minimal increase in stormwater runoff rates, volumes and pollutant loads to the Borough's waterways.

In addition, there is no evidence of decrease either in groundwater recharge or base flows in streams during dry weather periods. Lower base flows can have a negative impact on instream habitat during the summer months. Ground-water recharge is estimated using the NJGS methodology from NJ Geological Survey Report GSR-32 "A Method for Evaluation of Ground-Water-Recharge Areas in New Jersey". Land-use/land-cover, soil and municipality-based climatic data were combined and used to produce an estimate of ground-water recharge in inches/year. A map of the groundwater recharge areas is shown in Figure 4. There are no existing groundwater assessments for the Borough.

A Well Head Protection Area (WHPA) in New Jersey is a map area calculated around a Public Community Water Supply (PCWS) within New Jersey that delineates the horizontal extent of ground water captured by a well pumping at a specific rate over a two-, five- and twelve-year period of time. The area of capture over two-, five-, and twelve-years is defined using line boundaries and polygon areas generated with Geographic Information System (GIS). WHPA delineations are conducted in response to the Safe Drinking Water Act Amendments of 1986 and 1996 as part of the Source Water Protection Program (SWPP). There are two public wellheads within the Borough. Figure C-5 depicts the Borough boundary and the location of the public wellheads and their zones of influence. Private wellhead location information is not available.

The Borough does not have a wellhead protection ordinance. To protect contamination of the wellhead area, the Borough has adopted a series of ordinances not limited to Pet Waste, Illicit Connection, and Wildlife Feeding along with a Stormwater Control Ordinance. These ordinances will enhance watercourse and groundwater quality within the Borough.

Harrington Park's waterbodies include Dorotockeys Run, Hackensack River, Blanch Brook, Tappan Run, Oradell Reservoir, and a small pond in the north of the Borough. Dorotockeys Run

crosses through the Borough from north to south, Hackensack River forms a section of the borough's westerly border with River Vale, and Oradell Reservoir is located at the south of the Borough. Tappan Run originates in the Borough of Norwood and runs southerly. After an approximate length of 4500 feet, the brook makes a turn and runs westerly and enters the Borough of Harrington Park. It continues to run westerly until it discharges into Dorotockeys Run. Blanch Brook originates in the northerly section of the Borough and discharges into Hackensack River, which along with Dorotockeys Run, feed the Oradell Reservoir. Figure 2 illustrates the waterways in the Borough. Figure C-3 depicts the Borough boundary on the USGS quadrangle maps.

Tappan Run, Dorotockeys Run and Blanch Brook are part of Hackensack River Watershed, which is further part of Hackensack and Pascack Watershed Management Area (WMA) 5. New Jersey has been divided into 20 Watershed Management Areas. WMA 5 includes parts of Bergen and Hudson Counties and has a drainage area of approximately 165 square miles and contains the Hudson River Watershed, the Pascack Brook Watershed and the Hackensack River Watershed. All the waterbodies and waterways in the Borough are listed under FW2-NTC1, (Freshwater2, Non Trout, Category One Waters).

Category One Waters, also known as "C1 waters" are designated in New Jersey's rules for Surface Water Quality Standards (N.J.A.C. 7:9B-1.4) "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 resources". NJDEP had proposed special water resource protection areas to protect Category One Waters in the Stormwater Management Rules, N.J.A.C. 7:8 as published in the January 6, 2003, New Jersey Register. This special water resource protection area required that a 300 foot buffer zone be established around Category One Waters and perennial or intermittent streams that drain into or upstream of the Category One Waters to the Hydrologic Unit Code (HUC) 14 boundary. Sub-watersheds designated as HUC 14, are the smallest watersheds mapped by the NJDEP and the USGS, with each covering only approximately 3,000 acres. The USGS calls the watersheds Hydrologic Units. Each basic unit is a unique feature, and is given a unique Hydrologic Unit Code (HUC), which is 14 digits long. The HUC is hierarchical. Larger and larger watersheds can be defined using different portions of the 14 digit code to define the watershed boundaries.

On May 19, 2003, the Department adopted amendments to upgrade the antidegradation designations for fifteen waterbodies under Amendment: N.J.A.C. 7:9B-1.15 (R1-C1 Adoption). Of the fifteen, six waterbodies were upgraded to Category 1 based on an integrated ecological assessment conducted by the Department to determine "exceptional ecological significance", while nine water supply reservoirs were designated as Category 1 based on their "exceptional water supply significance". Oradell Reservoir is included among these water supply reservoirs. The USEPA approved these amendments on October 1, 2003. On February 2, 2004, the Department adopted amendments N.J.A.C. 7:9B-1.15 (R3-C1 Adoption), to upgrade the antidegradation designation for seven streams including both named and unnamed tributaries based upon "exceptional ecological significance". These streams include Tappan Run, Dorotockeys Run, the Hackensack River and all its tributaries including Blanch Brook.

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 (bottom dwelling organisms visible to the naked eye) by the NJDEP on a five-year cycle. Streams are classified as non-impaired, moderately impaired, or severely impaired based on the AMNET data. The Hackensack River at Old Tappan Road in the Borough of Old Tappan, Site ID "AN0205" and Dorotockeys Run, at Tappan Road, in the Borough of Harrington Park, Site ID "AN0210" are rated as moderately impaired.

A TMDL is the pollutant amount 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. Provisions may also be made for future sources in the form of reserve capacity. An implantation 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 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. Waterbodies are classified through the use of Sublists. Sublist 1 and 2 waterbodies are unimpaired. Sublist 3 waterbodies have limited assessment or data availability. Sublist 4 waterbodies are impaired due to pollution rather than pollutants or have had a TMDL or other enforceable management measure approved by the EPA expected to achieve Water Quality Standards. Sublist 5 of the Integrated List constitutes the list of waters impaired or threatened by pollutants, for which one or more TMDLs are needed.

The following are watercourses / water bodies which border the Borough, which are tributary to watercourses within the Borough, or which are tributary from watercourses within the Borough with their location, sublist, and sublist constituents:

1. Hackensack River at Old Tappan
It is on Sublist 1 for Phosphorus, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, and Zinc; Sublist 3 for Fecal Coliform and Temperature; Sublist 5 for Arsenic.
2. Hackensack River at Old Tappan Road in Old Tappan.
It is on Sublist 5 for Benthic Macroinvertebrates.
3. Hackensack River at River Vale
It is on Sublist 1 for Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, and Unionized Ammonia; Sublist 3 for Cadmium, Selenium, and Zinc; Sublist 4 for Nickel and Fecal Coliform; Sublist 5 for Arsenic, Chromium, Copper, Lead, and Mercury.

4. Pascack Brook at Westwood
It is on Sublist 1 for Temperature, pH, Dissolved Oxygen, Nitrate, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, and Zinc; Sublist 3 for Dissolved Solids; Sublist 4 for Fecal Coliform; Sublist 5 for Phosphorus, Arsenic, and Mercury.
5. Pascack Brook at Westwood Avenue & Harrington Avenue in Westwood
It is on Sublist 1 for Benthic Macroinvertebrates.
6. Dorotockeys Run at Tappan Road in Harrington Park
It is on Sublist 3 for Benthic Macroinvertebrates.
7. Dorotockeys Run at Old Tappan Road in Old Tappan
It is on Sublist 5 for Arsenic and Mercury.
8. Dwars Kill on Blanch Avenue in Norwood
It is on Sublist 5 for Mercury.
9. Tenakill Brook at Cedar Lane in Closter
It is on Sublist 1 for Phosphorus, Temperature, pH, Dissolved Oxygen, Nitrate, Dissolved Solids, Total Suspended Solids, Unionized Ammonia, Cadmium, Chromium, Copper, Nickel, Selenium, and Zinc; Sublist 4 for Fecal Coliform; Sublist 5 for Benthic Macroinvertebrates.

TMDLs are required for these constituents within these watercourses that are listed on Sublist 5. The Borough is unaware of the status of these TMDLs.

In addition to the above listed Sublist Designations for the above watercourses, TMDLs have been created for watercourses / water bodies which border the municipalities, which are tributary to watercourses within the municipalities, or which are tributary from watercourses within the municipalities. The following TMDLs for the following watercourses have been created:

1. Hackensack River at River Vale – Fecal Coliform

To combat fecal coliform pollution and phosphorus, the TMDLs recommend that a Borough resident properly dispose of pet waste, avoid feeding waterfowl, clean existing catch basins, maintain a street sweeping program maintain the required C-1 Watercourse buffers, and eliminate illicit stormwater sewer connections. To comply with the TMDL recommendations, the Borough has adopted a pet waste, wildlife feeding, and illicit connection ordinance along with a stormwater control ordinance to limit impairment due to fecal coliform and phosphorus. The Borough is adhering to the Municipal Stormwater Program requirements that set forth regulations pertaining to catch basin cleaning and street sweeping. The pet waste ordinance, wildlife feeding ordinance, illicit connection ordinance, street sweeping program, and catch basin cleaning program will limit the production and discharge of fecal coliform and phosphorus, while the stormwater control ordinance through the implementation of certain BMPs will limit flow concentration of fecal coliform and phosphorus through its removal from the flow.

Excluding the low lying areas adjacent to the waterways, the Borough has not experienced any significant flooding. Flood Insurance Rate Maps (FIRM) 34003C113H, 34003C114H, 340003C201H and 340003C202H show the flood hazard areas inundated by a 100-year storm at Blanch Brook, Hackensack River, Tappan Run, and Dorotockeys Run within the Borough. The

100-year Flood Hazard Area in general covers a relatively narrow strip of approximately 200 feet in the vicinity of these waterways. It exceeds this width in the northerly sections of Blanch Brook and Dorotockeys Run and can extend to an approximate maximum width of 800 feet. This flooding plain information is presented on Figures C-10 through Figures C-13.

Design and Performance Standards

The Borough 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. 7:8-5.6 Safety Standards for Stormwater Management Basins. The Stormwater Control Ordinance has been adopted by the Borough and has been approved by Bergen County.

During construction, Borough inspectors will observe the construction of the project to ensure that the stormwater management measures are constructed and function as designed. If the Borough determines that non-compliance is occurring, the Borough shall issue non-compliance citations, stop work orders, and fines to ensure compliance. Penalties are listed within the adopted Borough Stormwater Control Ordinance.

Once construction is completed, long-term maintenance is required for existing and future stormwater facilities to ensure long-term operation for all project governed by the requirements set forth within the Stormwater Control Ordinance. The ordinance will require a maintenance and repair plan that will provide specific preventative maintenance tasks and schedules along with the name of the person or people responsible for preventive or corrective maintenance. The person responsible for maintenance will be required to evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as necessary.

To ensure proper operation and maintenance and facility repair, the Borough will notify the responsible person in writing should a stormwater facility become a danger to public safety, public health, or require maintenance or repair. Upon receipt of the written notice, the responsible person will have fourteen days to effect maintenance and repair of the facility in a manner that is approved by the municipal engineer. The Borough, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or County may immediately proceed to do so and shall bill the cost to the responsible person.

Plan Consistency

The Borough is not within a Regional Stormwater Management Planning Area, but TMDLs have been developed for waters within the Borough; therefore this plan does need to be consistent with the TMDLs. The TMDLs have been developed for fecal coliform due to waterfowl and pet waste. Should a Regional Stormwater Management Planning Area be created, this Plan would be revised to be consistent with the Area requirements.

The Municipal Stormwater Management Plan is consistent with the Residential Site Improvement Standards (RSIS) per 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 updated to the RSIS.

Pursuant to the adopted amendment of N.J.A.C. 7:9B-1.15 on February 2, 2004 by the Department to the regulations on Surface Water Quality Standards N.J.A.C. 7:9B, the Hackensack River, Blanch Brook, Tappan Run, and Dorotockeys Run are included under Category One Waters. This plan is consistent with the existing and adopted amendments to Category One Waters and shall require all regulations on Surface Water Quality Standards N.J.A.C. 7:9B to be applied to these waterways as indicated under Category One Waters in the Stormwater Management Rules.

The Borough's Stormwater Management Ordinance required all new development and redevelopment plans to comply with New Jersey's Soil Erosion and Sediment Control Standards. Projects with limits of disturbance greater than or equal to 5,000 SF require review by the Bergen County Soil Conservation District. During construction, Borough inspectors will observe on-site erosion and sediment control measures and report any inconsistencies to the Bergen County Soil Conservation District.

Nonstructural Stormwater Management Strategies

The Borough of Harrington Park has reviewed the master plan and ordinances, and has provided a list of the sections in the Borough land use and zoning ordinances that are to be considered by the Borough as a means to incorporate additional nonstructural stormwater management strategies. These are the ordinances identified for possible revision if deemed necessary by the Borough. Once the ordinance texts are completed (if they have been revised by the Borough), they will be submitted to the county review agency for review and approval. A copy will be sent to the Department of Environmental Protection at the time of submission.

Chapters 18 "Flood Damage Prevention", 44 "Streets and Sidewalks", 45 "Subdivision", and 52 "Zoning of the Borough Code were reviewed with regard to incorporating nonstructural stormwater management strategies, and the stormwater management rules. Several amendments to these Chapters to incorporate these strategies will be considered. Following is the summary of these potential revisions:

Chapter 179 – Flood Damage Prevention: This chapter will be amended to include adherence to NJDEP requirements. This chapter shall be consistent with all the NJDEP regulations regarding floodplains and near-stream vegetation as stated under NJAC 7:13 "Flood Hazard Area Control Act Rules". It is noted that a large section of floodplains as shown on FIRM maps are included under "Conservation District".

Chapter 150–20. Specifications and procedures for sidewalks: A new section will be added to address where sidewalks are required. This section will also describe the structure of sidewalk and allow pervious sidewalk if feasible. Furthermore, the use of curb cuts or flush curbs with curb stops will be encouraged to allow discharge from impervious surfaces into adjacent vegetated areas.

Chapter 303-13 – Final Approval of Major Subdivision or Site Plan: All Subdivision requirements, including sketch plat and final plat details are included under Chapter 303. Chapter 303 will be amended to address Site Plan requirements, including Site Plan details. All plans and plats (site plan and subdivision) will be required to show all environmentally critical and environmentally constrained areas. This is all features with significant environmental value, such as steep slopes, stream corridors, natural heritage priority sites, and threatened and endangered species habitats, and all environmentally constrained areas that have development restrictions, such as wetlands and floodplains.

Chapter 303- Subdivision Design Standards: Requires subdivisions to conform to design standards that will encourage well planned development patterns within the Borough. Language will be added to discourage clear cutting of the project site and to minimize the disturbed area to a maximum extent possible.

Chapter 303-23 - Streets: Requires subdivisions abutting arterial streets to provide a marginal road or reverse frontage with a buffer strip. The language of this section will be amended to recommend the use of native vegetation in the buffer strip, which requires less fertilization and watering than non-native species. 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.

Chapter 303-23 - Streets – Dead-end Streets: Describes the length and radius requirements for cul-de-sacs. Language will be added to this section to provide cul-de-sacs with landscaped islands where feasible.

Chapter 303-26 – Public Uses and service areas: This section requires that natural features, such as trees, brooks, hilltops, and views, be preserved whenever possible, as part of subdivision design. 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.

Chapter 303-31 – Buffer Strips. The section describes the locations where buffer strips are required and recommended. Additionally, language will be included to utilized native landscaping species and to allow buffer areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Chapter 350-41 Off-street parking Describes parking requirements in office and research and / or senior citizen dwelling unit districts and requires fifteen percent of any open air parking area to be used for landscaping, trees, flowers and shrubs. The language of this section will be amended to recommend the use of native vegetation in this area, which requires less fertilization and watering than non-native species. Additionally, language will be included to allow these

areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.

Chapter 350-41 Off-street parking This section requires all off-street parking facilities, drives and aisles to be paved. This section will be amended to allow the use of pervious paving materials in driveways and access ways to minimize stormwater runoff and promote groundwater recharge, if deemed feasible and warranted by the Borough.

Chapter 350-41 Off-street parking This section describes the off-street parking areas surface cover and requires the parking area to be graded and drained to dispose of all surface water as approved by the Borough Engineer. Language will be added to this section that all off-street parking stormwater management and drainage improvements must conform to the “Design and Performance Standards” described in this plan and to the Borough’s Stormwater Control Ordinance, which will include all requirements outlined in N.J.A.C. 7:8-5, and will be part of the Borough Code.

A new section shall be added to this article. The Borough will evaluate and require the following:

- Landscaping in parking lots in industrial areas. This section will require a certain percentage of the parking lot in industrial areas to be landscaped and will additionally require the use of native vegetation to the maximum extent practicable. Furthermore, language will be included to allow these landscaped areas to be used for stormwater management by disconnecting impervious surfaces and treating runoff from these impervious surfaces.
- Screening between industrial and residential districts. The screening criteria shall require the use of native vegetation to the maximum extent practicable. Section 53, ordinance No.545. This ordinance assigns “the maximum quantity of improvements” as a percentage of the total area of the lot, to all zoning districts. The Borough shall consider amending the definition of Improvement in this section to refer to an area with impervious surface that does not allow groundwater recharge.

Land Use / Build-Out Analysis

As per an analysis of the existing land use per the NJDEP GIS, Harrington Park is a fully developed community and contains less than one square mile (0.40 square miles as per table within appendix) of vacant and agricultural area. For this reason, a land use / building-out analysis is not required for the Borough of Harrington Park.

Mitigation Plans

A Mitigation Plan is provided for proposed developments that are granted a variance or exemption from the stormwater management design and performance standards set forth by the Borough Stormwater Control Ordinance.

Mitigation Project Criteria

The mitigation project shall be implemented in the same drainage area as the proposed development unless deemed not feasible by the Borough. 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 and Stormwater Control Ordinance. The developer must ensure the long-term maintenance of the project, including the maintenance requirements under Chapters 8 and 9 of the NJDEP Stormwater BMP Manual.

The applicant can select one of the following projects listed to compensate for the deficiency from the performance standards resulting from the proposed project. More detailed information on the projects can be obtained from the Borough Engineer, who will prioritize the projects and identify possible additional mitigation projects. Listed below are specific sites that can be used to address the mitigation requirement.

Groundwater Recharge

The open space in the following listed sites may be used for installation of seepage pits, infiltration basins, or other infiltrative BMPs to provide additional annual groundwater recharge. The sites selected are not contaminated and have mainly Type “B” soil that meets the permeability requirements for groundwater recharge. Percolation tests are required to determine the site’s permeability prior to design and implementation.

- Municipal Complex: Borough Hall, Library, and Fire Station at 85 Harriot Avenue
- Police Station at 99 La Roche Avenue
- DPW Garage at Ward Way

Water Quality

The parking areas in the following listed sites may be retrofitted to provide the removal of 80 percent of total suspended solids. Due to site constraints, the BMP is required to be installed underground in order to maintain the existing number of parking spaces. The manufactured treatment device will be selected based on a comparison of past performance, effectiveness, cost of device, and maintenance cost.

- Municipal Complex Parking Lot at 85 Harriot Avenue
- Highland Park Parking Lot at Tappan Road
- Park Side Park Parking Lot at Blanch Avenue

Water Quantity

Stormwater management measures may be installed in the parking area of the following sites to reduce the peak flow from the upstream development on the receiving stream for the 2, 10, and 100 years storms as required. Due to site constraints, the BMP is required to be installed underground in order to maintain the existing number of parking spaces. The manufactured storage device will be selected based on a comparison of past performance, effectiveness, cost of device, and maintenance cost.

- Municipal Complex Parking Lot at 85 Harriot Avenue
- Highland Park Parking Lot at Tappan Road
- Park Side Park Parking Lot at Blanch Avenue

The sites listed above may be used also if they are not located in the same drainage area as the proposed development, as discussed in Option 1. Under this scenario, 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 TSS requirement is not met, the selected project may address water quality impacts due to a fecal coliform impairment.

The municipality may allow a developer to provide finding 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 Management Plan. The Borough, may further allow this finding to be spent towards an overall study of stormwater management facilities, such as culvert capacity analyses, stream bank stabilization, etc. 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 with the long-term maintenance requirements of the mitigation measure.



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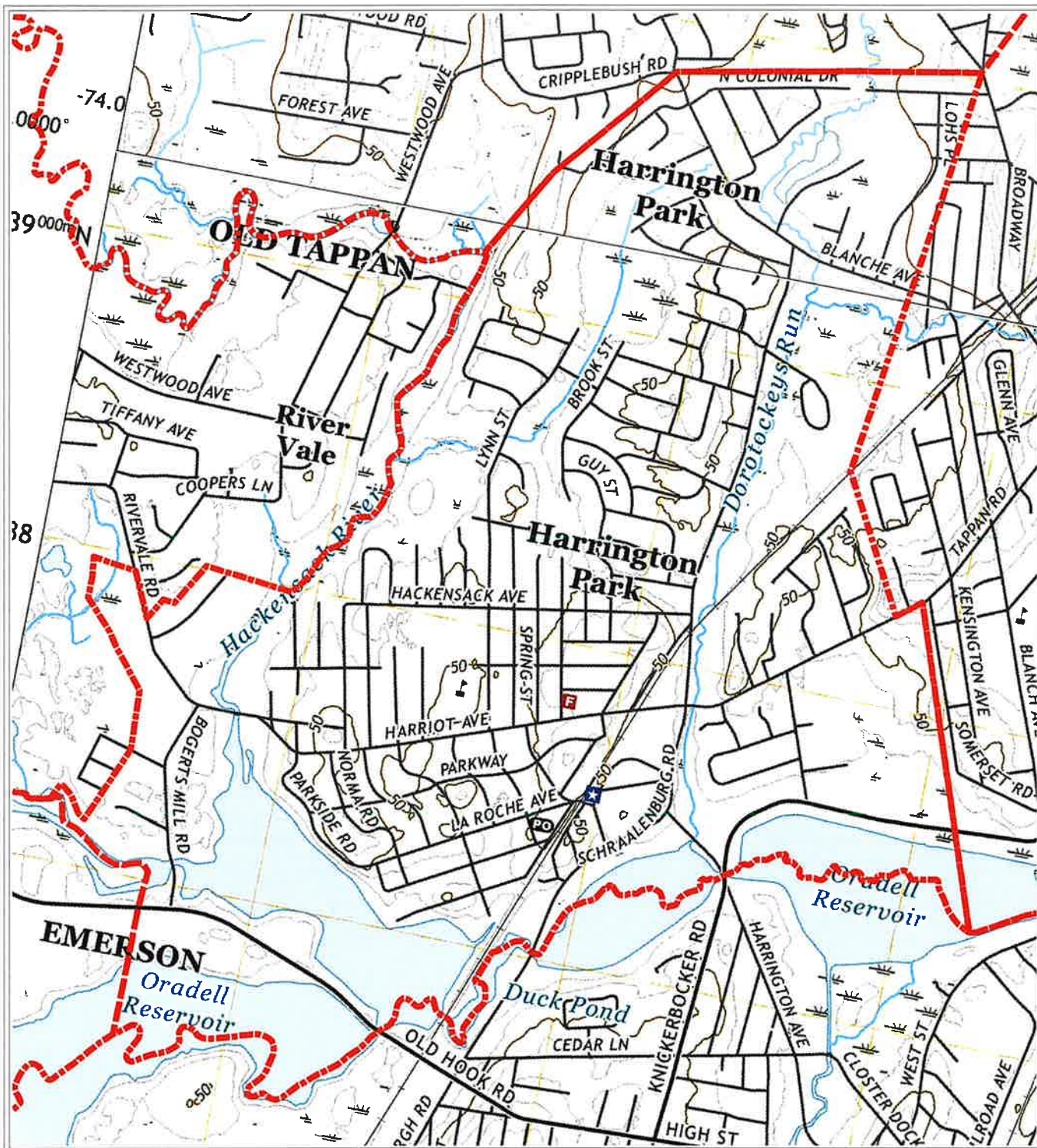


Figure C-2 Waterways Borough of Harrington Park Bergen County, NJ

Legend

- Streams and Waterways
- Borough of Harrington Park

Drawn By: R.K.C.	Checked By: G.P.	Project No:	Sheet No:	Map References:
Designed By: R.K.C.	Page	HAPKMUN20.014	Figure C-2	New Jersey Office of GIS, USGS National Hydrography Dataset 2002, NJDEP
Field Book No:	Date: June 2020			



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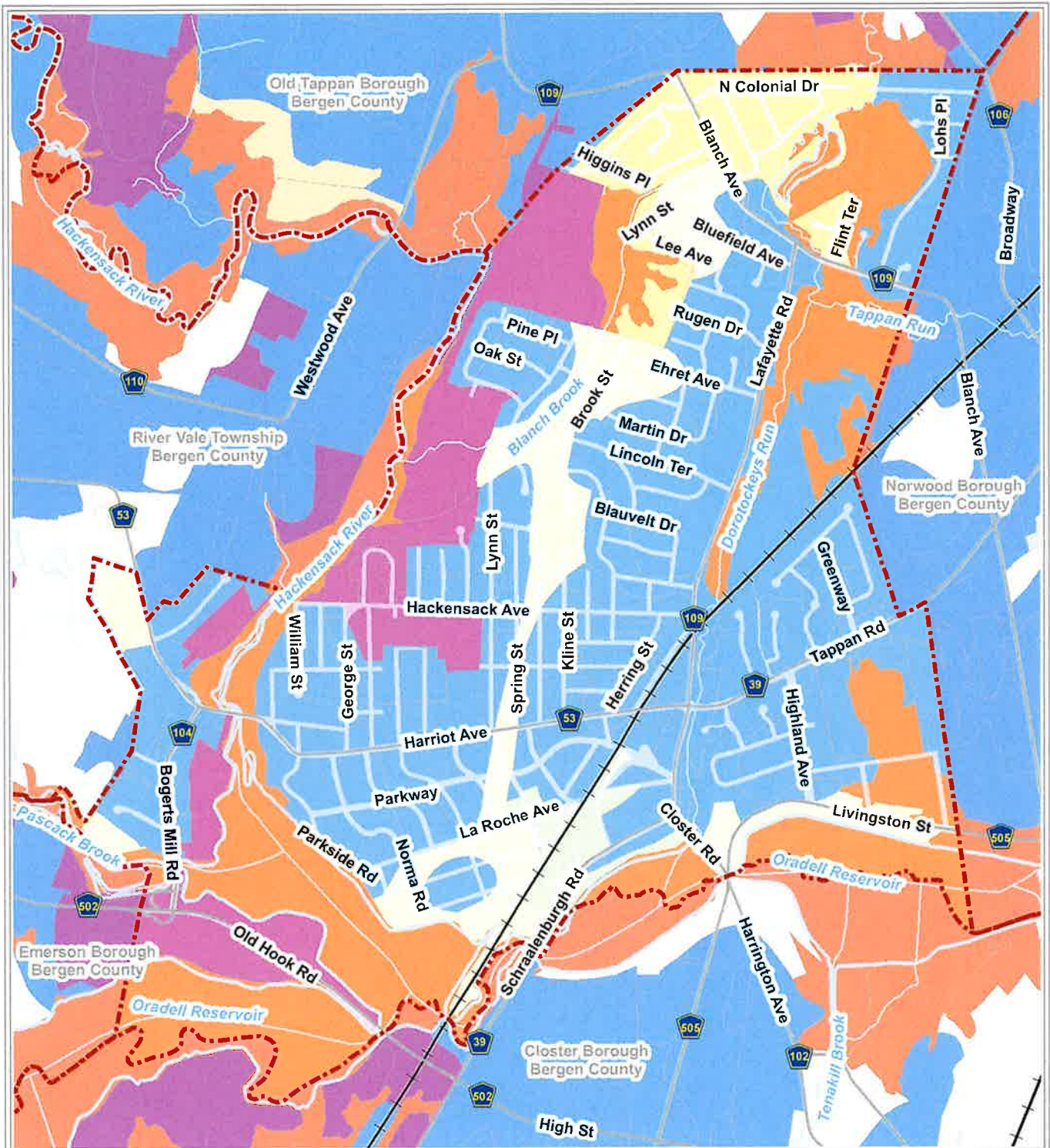
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Figure C-3 **USGS Topographic Map** **Borough of Harrington Park** **Bergen County, NJ**

Legend
 Municipal Boundary

Drawn By: R.K.C.	Checked By: G.P.	Project No:	Sheet No:	Map References:
Designed By: R.K.C.	Page	HAPKMUN20.014	Figure C-3	USGS Nyack, NY Quadrangle 2019
Field Book No:	Date: June 2020			USGS Yonkers, NY Quadrangle 1919
				New Jersey Office of GIS



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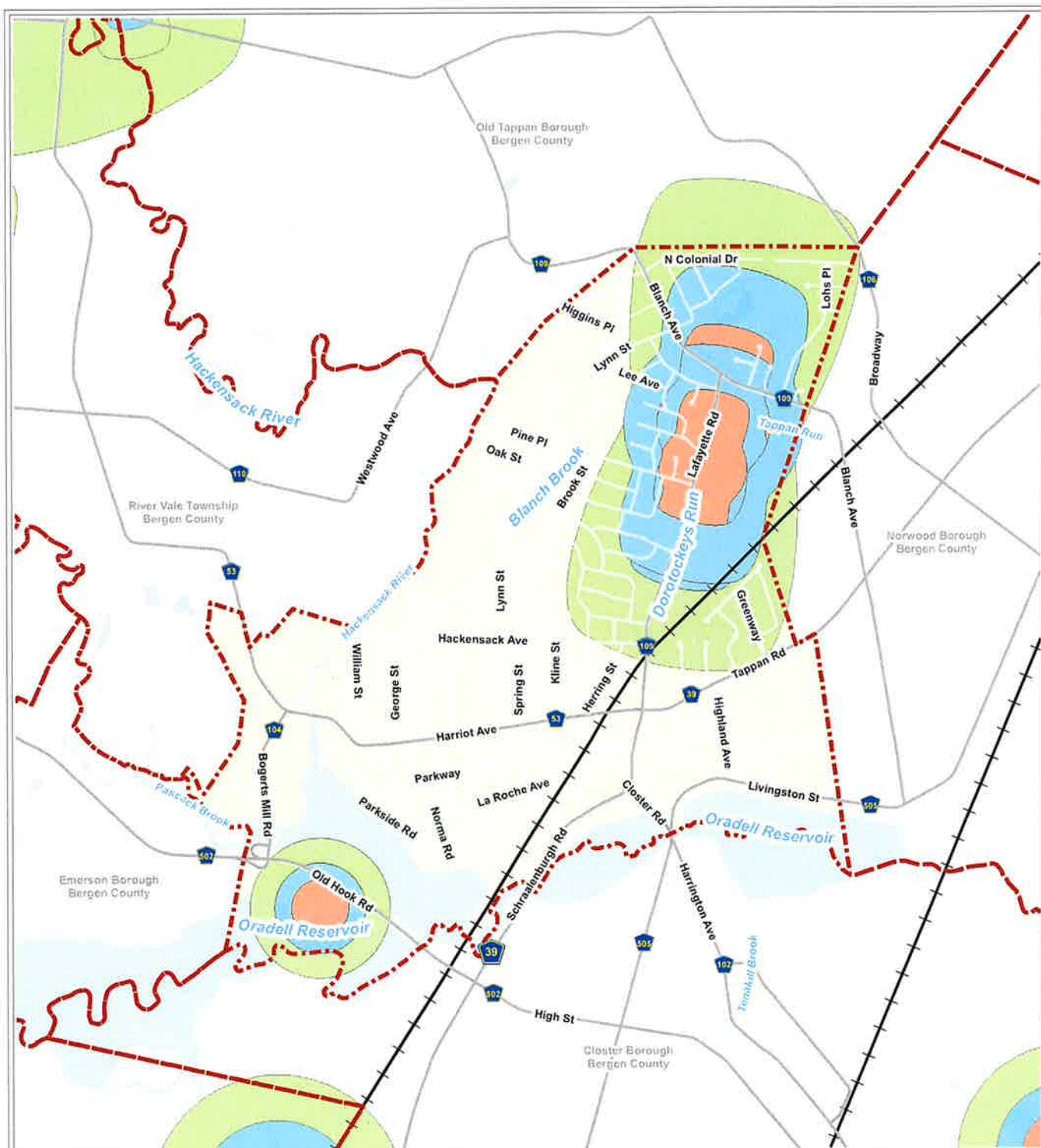


Figure C-4
Groundwater Recharge Areas
Borough of Harrington Park
Bergen County, NJ

Legend

0 in/yr	Hydric Soils - No Recharge
1 to 7 in/yr	Wetlands and Open Water- No Recharge
8 to 10 in/yr	
11 to 15 in/yr	
16 to 23 in/yr	

Drawn By: R.K.C.	Checked By: G.P.	Project No:	Sheet No:	Map References:
Designed By: R.K.C.	Page:	HAPKMUN20.014	Figure C-4	New Jersey Office of GIS, NJDEP
Field Book No:	Date: June 2020			Ground-Water Recharge May 2006



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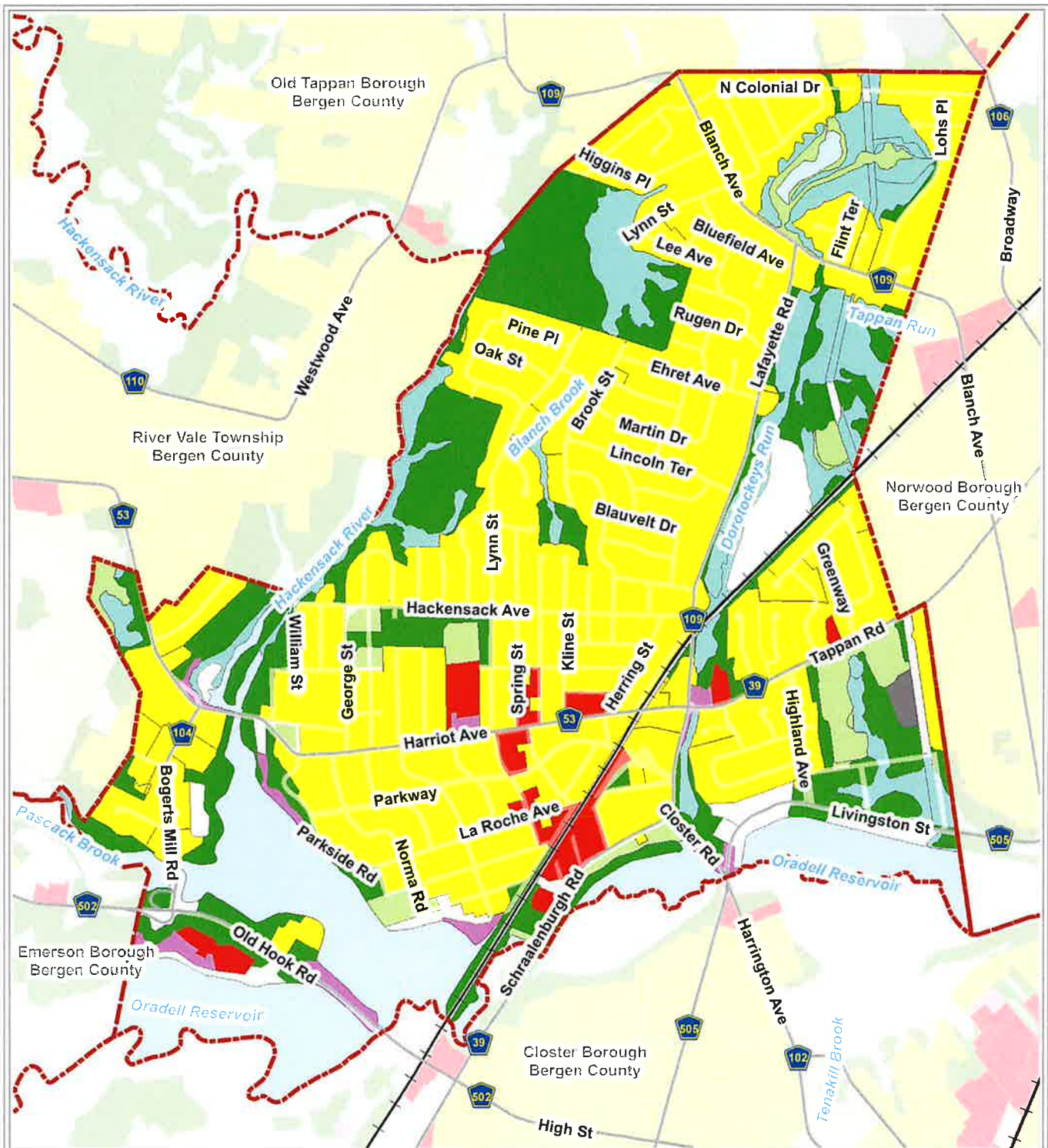
Figure C-5 Wellhead Protection Areas Borough of Harrington Park Bergen County, NJ

Community and Non-Community Wellhead Areas

Water Travel Time to Well

- 2-year
- 5-year
- 12-year

Drawn By: R.K.C	Checked By: G.P.	Project No:	Sheet No:	Map References:
Designed By: R.K.C.	Page:	HAPKMUN20.014	Figure C-5	New Jersey Office of GIS, NJDEP
Field Book No:	Date: June 2020			Well Head Protection Areas May 2018



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Figure C-6 Land Use / Land Cover Borough of Harrington Park Bergen County, NJ

Classified Land Type

Residential	Wetlands
Urban Land	Water
Commercial / Industrial	Barren Land
Forest	Transportation / Utilities
Recreational Land	

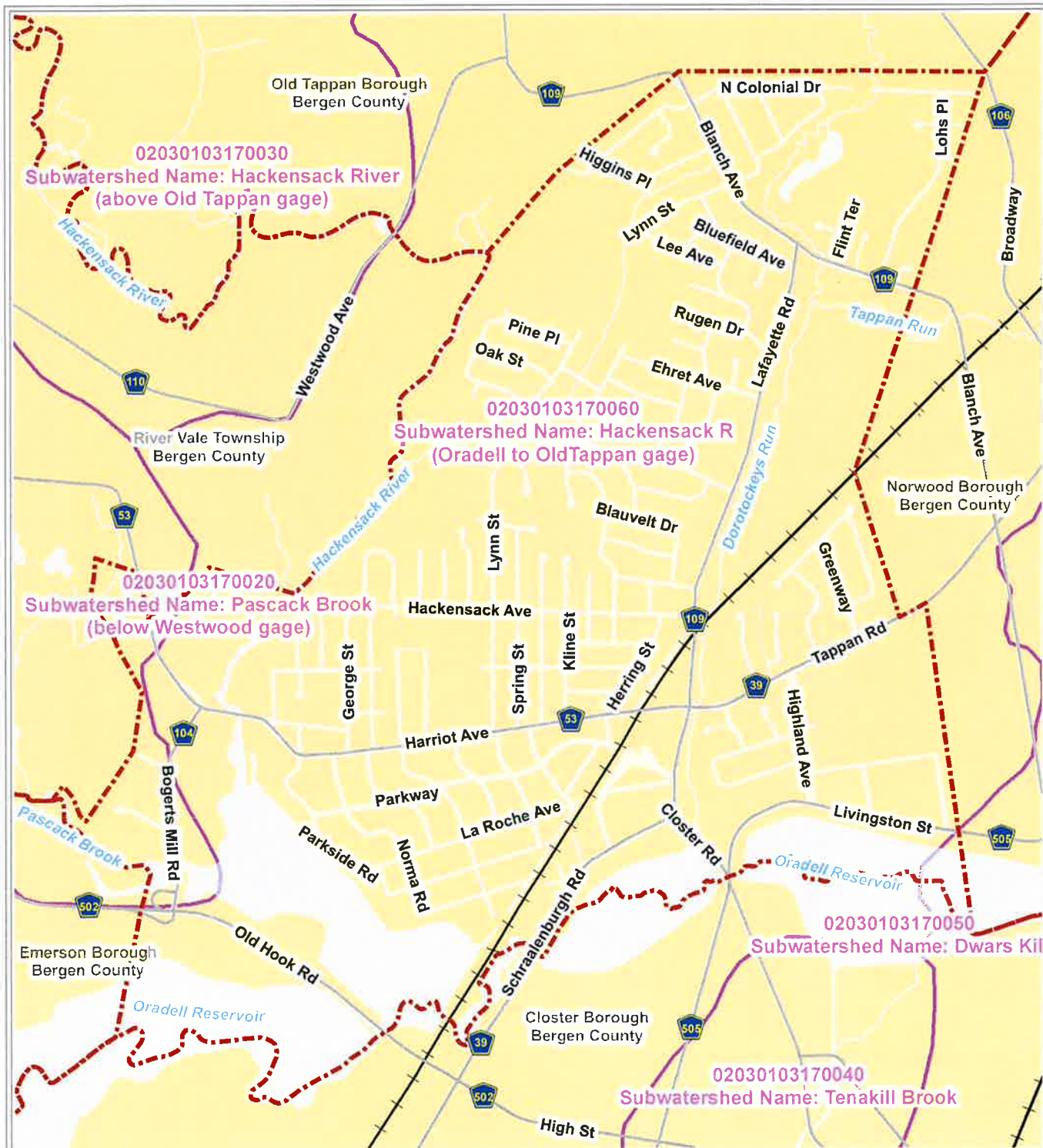
Drawn By: R.K.C.
Designed By: R.K.C.
Field Book No:

Checked By: G.P.
Page:
Date: June 2020

Project No:
HAPKMUN20.014

Sheet No:
Figure C-6

Map References:
New Jersey Office of GIS, NJDEP
Land Use/Land Cover 2015 Dataset
Anderson Classification System



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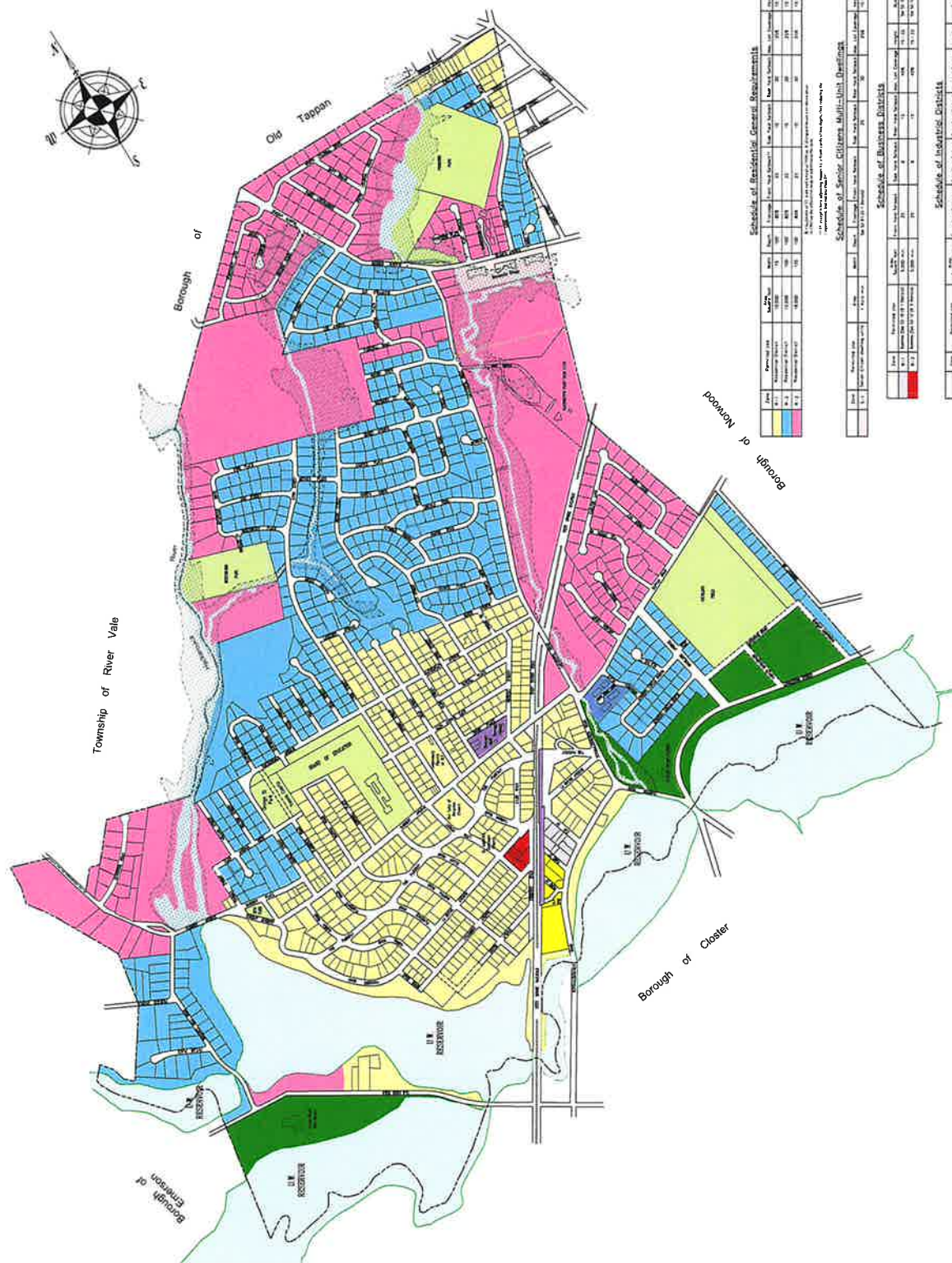
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Figure C-7 **NJDEP HUC14 Watersheds** **Borough of Harrington Park** **Bergen County, NJ**

Legend
 Hackensack, Hudson, and Pascack

Drawn By: R.K.C.	Checked By: G.P.	Project No:	Sheet No:	Map References:
Designed By: R.K.C.	Page:	HAPKMUN20.014	Figure C-7	New Jersey Office of GIS, NJDEP 14-Digit Hydrologic Unit Code Delineations 03/2016
Field Book No:	Date: June 2020			



Schedule of Residential General Requirements

Zone	Residential Single-Family	Residential Medium-Density	Residential High-Density	Residential Medium-Density	Residential High-Density	Residential Medium-Density	Residential High-Density
R-1	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-2	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-3	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-4	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-5	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-6	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-7	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-8	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-9	10,000	10,000	10,000	10,000	10,000	10,000	10,000
R-10	10,000	10,000	10,000	10,000	10,000	10,000	10,000

Schedule of Senior Citizens Multi-Unit Districts

Zone	Senior Citizens Multi-Unit Districts	Senior Citizens Multi-Unit Districts	Senior Citizens Multi-Unit Districts	Senior Citizens Multi-Unit Districts	Senior Citizens Multi-Unit Districts	Senior Citizens Multi-Unit Districts
SC-1	10,000	10,000	10,000	10,000	10,000	10,000
SC-2	10,000	10,000	10,000	10,000	10,000	10,000
SC-3	10,000	10,000	10,000	10,000	10,000	10,000
SC-4	10,000	10,000	10,000	10,000	10,000	10,000
SC-5	10,000	10,000	10,000	10,000	10,000	10,000
SC-6	10,000	10,000	10,000	10,000	10,000	10,000
SC-7	10,000	10,000	10,000	10,000	10,000	10,000
SC-8	10,000	10,000	10,000	10,000	10,000	10,000
SC-9	10,000	10,000	10,000	10,000	10,000	10,000
SC-10	10,000	10,000	10,000	10,000	10,000	10,000

Schedule of Business Districts

Zone	Business Districts	Business Districts	Business Districts	Business Districts	Business Districts	Business Districts
B-1	10,000	10,000	10,000	10,000	10,000	10,000
B-2	10,000	10,000	10,000	10,000	10,000	10,000
B-3	10,000	10,000	10,000	10,000	10,000	10,000
B-4	10,000	10,000	10,000	10,000	10,000	10,000
B-5	10,000	10,000	10,000	10,000	10,000	10,000
B-6	10,000	10,000	10,000	10,000	10,000	10,000
B-7	10,000	10,000	10,000	10,000	10,000	10,000
B-8	10,000	10,000	10,000	10,000	10,000	10,000
B-9	10,000	10,000	10,000	10,000	10,000	10,000
B-10	10,000	10,000	10,000	10,000	10,000	10,000

Schedule of Industrial Districts

Zone	Industrial Districts	Industrial Districts	Industrial Districts	Industrial Districts	Industrial Districts	Industrial Districts
I-1	10,000	10,000	10,000	10,000	10,000	10,000
I-2	10,000	10,000	10,000	10,000	10,000	10,000
I-3	10,000	10,000	10,000	10,000	10,000	10,000
I-4	10,000	10,000	10,000	10,000	10,000	10,000
I-5	10,000	10,000	10,000	10,000	10,000	10,000
I-6	10,000	10,000	10,000	10,000	10,000	10,000
I-7	10,000	10,000	10,000	10,000	10,000	10,000
I-8	10,000	10,000	10,000	10,000	10,000	10,000
I-9	10,000	10,000	10,000	10,000	10,000	10,000
I-10	10,000	10,000	10,000	10,000	10,000	10,000

Schedule of Office & Research Districts

Zone	Office & Research Districts	Office & Research Districts	Office & Research Districts	Office & Research Districts	Office & Research Districts	Office & Research Districts
O-1	10,000	10,000	10,000	10,000	10,000	10,000
O-2	10,000	10,000	10,000	10,000	10,000	10,000
O-3	10,000	10,000	10,000	10,000	10,000	10,000
O-4	10,000	10,000	10,000	10,000	10,000	10,000
O-5	10,000	10,000	10,000	10,000	10,000	10,000
O-6	10,000	10,000	10,000	10,000	10,000	10,000
O-7	10,000	10,000	10,000	10,000	10,000	10,000
O-8	10,000	10,000	10,000	10,000	10,000	10,000
O-9	10,000	10,000	10,000	10,000	10,000	10,000
O-10	10,000	10,000	10,000	10,000	10,000	10,000

Legend

Residential Single-Family	Residential Medium-Density	Residential High-Density	Residential Medium-Density	Residential High-Density	Residential Medium-Density	Residential High-Density
SC-1	SC-2	SC-3	SC-4	SC-5	SC-6	SC-7
B-1	B-2	B-3	B-4	B-5	B-6	B-7
I-1	I-2	I-3	I-4	I-5	I-6	I-7
O-1	O-2	O-3	O-4	O-5	O-6	O-7

Zoning Map Borough of Harrington Park



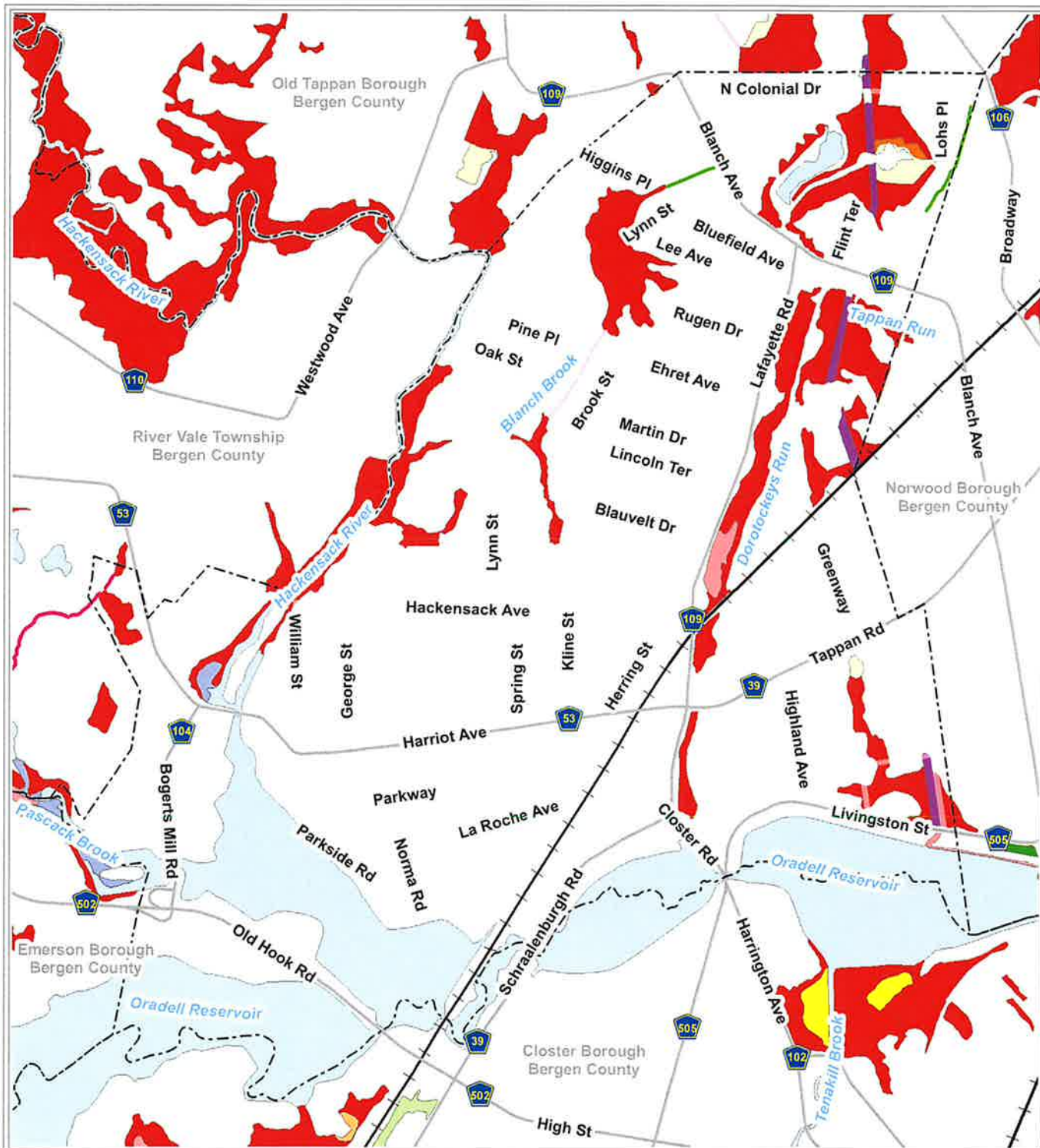
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Figure C-9 Wetlands

Borough of Harrington Park Bergen County, NJ



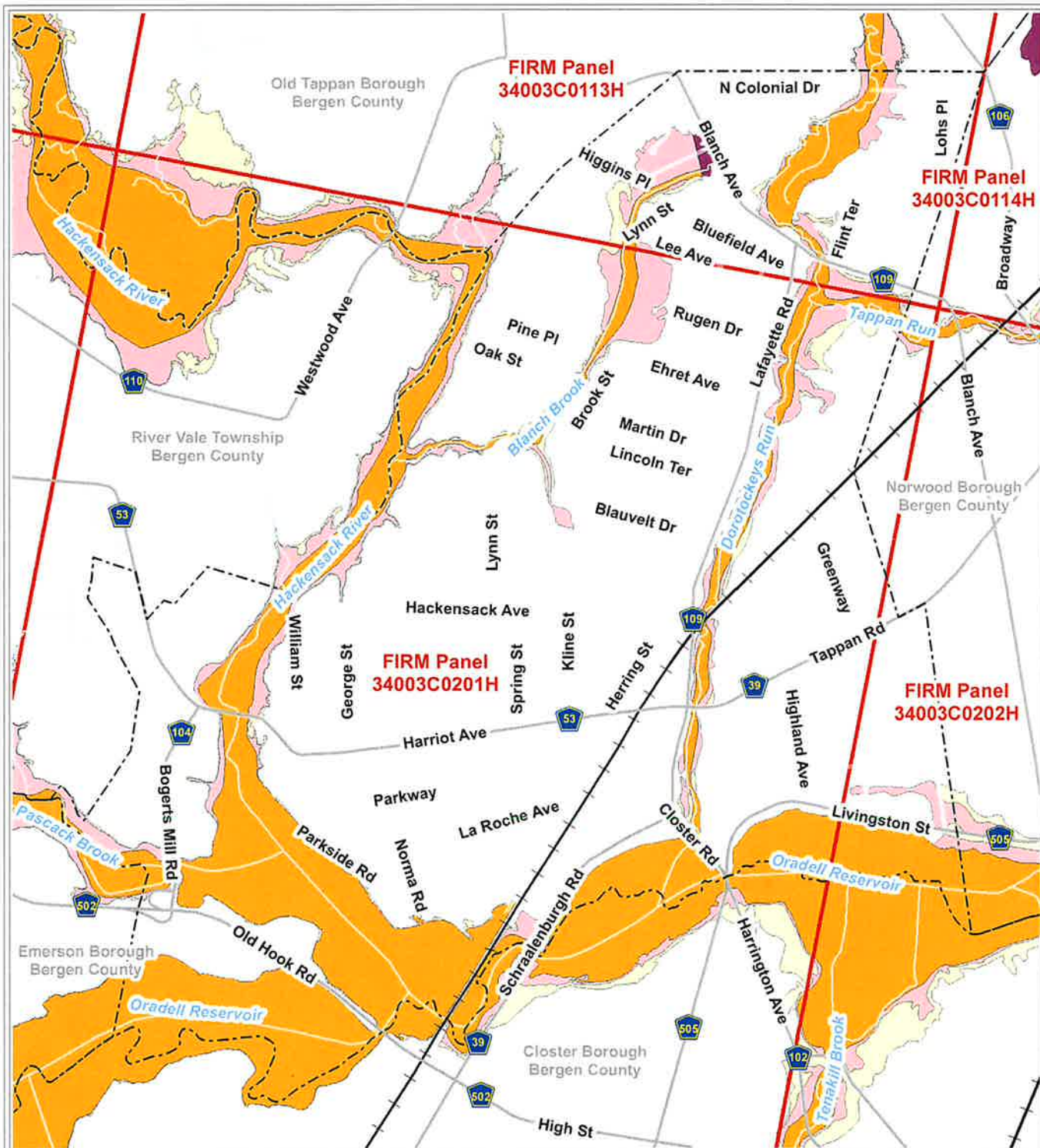
Wetlands and Water Land Use

- | | | |
|--|---|--|
| Water - Artificial Lakes, Streams and Canals | Wetlands - Deciduous Scrub/Shrub Wetlands | Wetlands - Managed Wetland in Built-up Maintained Rec Area |
| Water - Bridge over Water | Wetlands - Deciduous Wooded Wetlands | Wetlands - Mixed Scrub/Shrub Wetlands (Deciduous Dom.) |
| Water - Tidal Mud Flat | Wetlands - Disturbed Wetlands (Modified) | Wetlands - Right of Way |
| Wetlands - Agricultural Wetlands (Modified) | Wetlands - Herbaceous Wetlands | |
| Wetlands - Coniferous Wooded Wetlands | | |

Linear Wetlands - 1986 Dataset

- | | | |
|---------------------------|-----------------------------|---------------------|
| Deciduous Wooded Wetlands | Managed Wetlands (Modified) | Herbaceous Wetlands |
|---------------------------|-----------------------------|---------------------|

Drawn By: R.K.C.	Checked By: G.P.	Project No:	Sheet No:	Map References:
Designed By: R.K.C.	Page:	HAPKMUN20.014	Figure C-9	New Jersey Office of GIS, NJDEP
Field Book No:	Date: June 2020			Land Use/Land Cover 2015 Dataset, Linear Non-Tidal Wetlands, 1986



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Figure C-10 FEMA Flood Hazard Areas Borough of Harrington Park Bergen County, NJ

- FEMA FIRM Panels
- Zone A, Special Flood Hazard
- Zone AE, Special Flood Hazard
- Zone AE - Special Flood Hazard Area, Floodway
- Zone X - 0.2% Annual Chance Flood Hazard

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Designed By: R.K.C.	Page:	HAPKMUN20.014	Figure C-10	New Jersey Office of GIS, FEMA National Flood Hazard Layer (NFHL) 08/28/2019
Field Book No:	Date: June 2020			

[illegible]

NGS Information Services
 NOAA PMS372
 National Oceanic and Atmospheric Survey
 SSAC3.3 #902
 1315 East-West Highway
 Suite 3003, Maryland 20810 282
 1301 713 2626

To obtain current, detailed description, and/or location information for French
 marks shown on this map, please contact the Information Services Branch
 of the National Oceanic and Atmospheric Survey at 1301 713-2626, or visit its website at
<http://www.noaa.gov>

Base map information shown on the FIRM was provided in digital format by the State of New Jersey Office of Information Technology. This information was derived from digital orthophotos produced at a scale of 1:24,000 with a 1-foot pixel resolution from photography dated 2012.

This map shows more detailed and up-to-date stream channel configuration than the map from the previous FIRM for the same catchment. The floodplain and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the flood extent and boundaries that are shown on this map may differ from those shown on the previous FIRM. The flood insurance study report (which contains more information about the map) may also differ from the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes exist to the municipalities or the municipalities may have changed their corporate limits, the map may not reflect the most current corporate limits. Corporate limits are not intended to be used as a legal reference. For more information about corporate limits, contact the local government or the state's Department of Transportation.

Please refer to the separately printed Map Index for an overview map of the county, showing the layout of most panels, community maps necessary addresses, and a Listing of Communities with Containing National Flood Insurance Program data for each community as well as a listing of the panel's on which each community is located.

For information on available products associated with this FIRIA visit the Map Service Center (MSC) website at www.fema.gov/mcs. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report and/or digital versions of this map. Many of these products can be purchased or obtained directly from the MSC website.

[illegible][illegible][illegible]

1. *Red of America and Africa*

[illegible]

OX5510 ✕

● M15

Size: 140

Weight: 100g

Material: 100% Cotton

Color: White

Pattern: Plain

Length: 10cm

Width: 10cm

Thickness: 1mm

Surface: Smooth

Texture: Soft

Finish: Matte

Edges: Finished

Details: Clean

Assembly: Easy

Disassembly: Easy

Storage: Compact

Portability: High

Durability: High

Flexibility: High

Strength: High

Stability: High

Reliability: High

Accuracy: High

Precision: High

Resolution: High

Contrast: High

Clarity: High

Detail: High

Definition: High

Sharpness: High

Focus: High

Depth: High

Range: High

Scope: High

Area: High

Volume: High

Capacity: High

Quantity: High

Amount: High

Level: High

Grade: High

Class: High

Rank: High

Order: High

Priority: High

Importance: High

Significance: High

Value: High

Worth: High

Benefit: High

Advantage: High

Merit: High

Quality: High

Standard: High

Criterion: High

Measure: High

Indicator: High

Signal: High

Alert: High

Warning: High

Notice: High

Announcement: High

Declaration: High

Statement: High

Assertion: High

Claim: High

Allegation: High

Charge: High

Accusation: High

Imputation: High

Attribution: High

Assignment: High

Designation: High

Appointment: High

Selection: High

Choice: High

Decision: High

Resolution: High

Settlement: High

Agreement: High

Deal: High

Transaction: High

Exchange: High

Trade: High

Commerce: High

Business: High

Industry: High

Enterprise: High

Company: High

Organization: High

Institution: High

Agency: High

Authority: High

Power: High

Influence: High

Control: High

Command: High

Direction: High

Guidance: High

Leadership: High

Management: High

Administration: High

Operation: High

Execution: High

Implementation: High

Application: High

Usage: High

Employment: High

Utilization: High

Application: High

Use: High

Operation: High

Function: High

Performance: High

Efficiency: High

Effectiveness: High

Productivity: High

Output: High

Result: High

Outcome: High

Consequence: High

Effect: High

Impact: High

Influence: High

Contribution: High

Participation: High

Involvement: High

Engagement: High

Commitment: High

Dedication: High

Devotion: High

Loyalty: High

Fidelity: High

Allegiance: High

Fealty: High

Obedience: High

Compliance: High

Conformity: High

Adherence: High

Observance: High

Observation: High

Monitoring: High

Surveillance: High

Inspection: High

Examination: High

Investigation: High

Research: High

Study: High

Analysis: High

Interpretation: High

Explanation: High

Justification: High

Defense: High

Argument: High

Reasoning: High

Logic: High

Reason: High

Cause: High

Effect: High

Result: High

Consequence: High

Impact: High

Influence: High

Contribution: High

Participation: High

Involvement: High

Engagement: High

Commitment: High

Dedication: High

Devotion: High

Loyalty: High

Fidelity: High

Allegiance: High

Fealty: High

Obedience: High

Compliance: High

Conformity: High

Adherence: High

Observance: High

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Monitoring: High

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Inspection: High

Examination: High

Investigation: High

Research: High

Study: High

Analysis: High

Interpretation: High

Explanation: High

Justification: High

Defense: High

Argument: High

Reasoning: High

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Reason: High

Cause: High

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Result: High

Consequence: High

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Investigation: High

Research: High

Study: High

Analysis: High

Interpretation: High

Explanation: High

Justification: High

Defense: High

Argument: High

Reasoning: High

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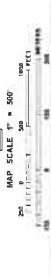
Cause: High

Effect: High

Result: High

Consequence: High

For connectivity to other network hardware, the 100BASE-FX module requires a fiber optic transceiver. Consult the 100BASE-FX module's documentation for details on supported transceivers.



FIRM
FLOOD INSURANCE RATE MA
BURGEN COUNTY

NEW JERSEY
(ALL JURISDICTIONS)
PAGE 112 OF 122

PANEL 110 OF 332

SEE MAPPING PAGE FOR FIRM PANEL LAYOUT

COUNTY: TABLE: 220A U.S.

COMMUNITY: 1980-1989 1990

REVISIONS BY DATE: JUNE 1990

MSNI

values to user. The Map Number shown for each road and even such "road data" as Community Name should also be used for reference applications by diligent researchers.

MAP NUMBER
34003C0113

MAP REVISED
AUGUST 28, 2017

 Federal Emergency Management Agency

This issue is for use in administering the National Flood Insurance Program. It may be necessary to identify all flood zones that are subject to flooding, particularly from the sea, and to determine the extent of the flood hazard. This information is then used to calculate rates for insured properties and to establish additional flood hazard information.

It is important to consider special problems in areas where flood elevations are not available. Flood elevations are not available for the coastal areas of the United States, and the Flood Insurance and Floodway Data Summary of the National Oceanic and Atmospheric Administration (NOAA) is the only source of flood elevation information available for the United States. The NOAA Floodway Data Summary provides information on flood elevations and floodway data for the United States. This information is used to determine the extent of the flood hazard and to establish additional flood hazard information.

Coastal flood elevations shown on the map are only one indication of the flood hazard. Flood elevations are not available for the United States, and the Flood Insurance and Floodway Data Summary of the National Oceanic and Atmospheric Administration (NOAA) is the only source of flood elevation information available for the United States. The NOAA Floodway Data Summary provides information on flood elevations and floodway data for the United States. This information is used to determine the extent of the flood hazard and to establish additional flood hazard information.

the following addresses:

NGS Information Services
NGS & NGS-IT
2034 N. Winesap
National Genetic Survey
SSNLC-3 #9202
1315 East-West Highway
Silver Spring, Maryland 20910-2282
[(301) 713-3342]

To obtain current elevation data, please contact the National Survey of Landmarks Survey at [(301) 713-3342] or visit its website at <http://www.ngs.gov>.

Base map information shown on this FIRM was provided in digital format by the State of New Jersey Office of Information Technology. This information was derived from digital orthophotos produced at a scale of 1:24,000 with a 1-foot pixel resolution from photography dated 2012.

This map reflects more detailed and up-to-date stream channel configurations than the map shown on the previous FIRM for the jurisdiction. The hydrographer and the team have used the selected FIRM for the jurisdiction to determine the flood footprint that were transformed from the previous FIRM. As a result, the flood footprint that was determined from the stream channel configurations has been adjusted to reflect the more detailed stream channel configurations. The flood footprint that was determined from the stream channel configurations may not reflect stream channel distances that consumers, authoritative hydrologic data may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because corporate limits do not always align or correspond exactly with political boundaries, corporate limits may not always align with political boundaries. Corporate limits may not always align with political boundaries. Corporate limits may not always align with political boundaries.

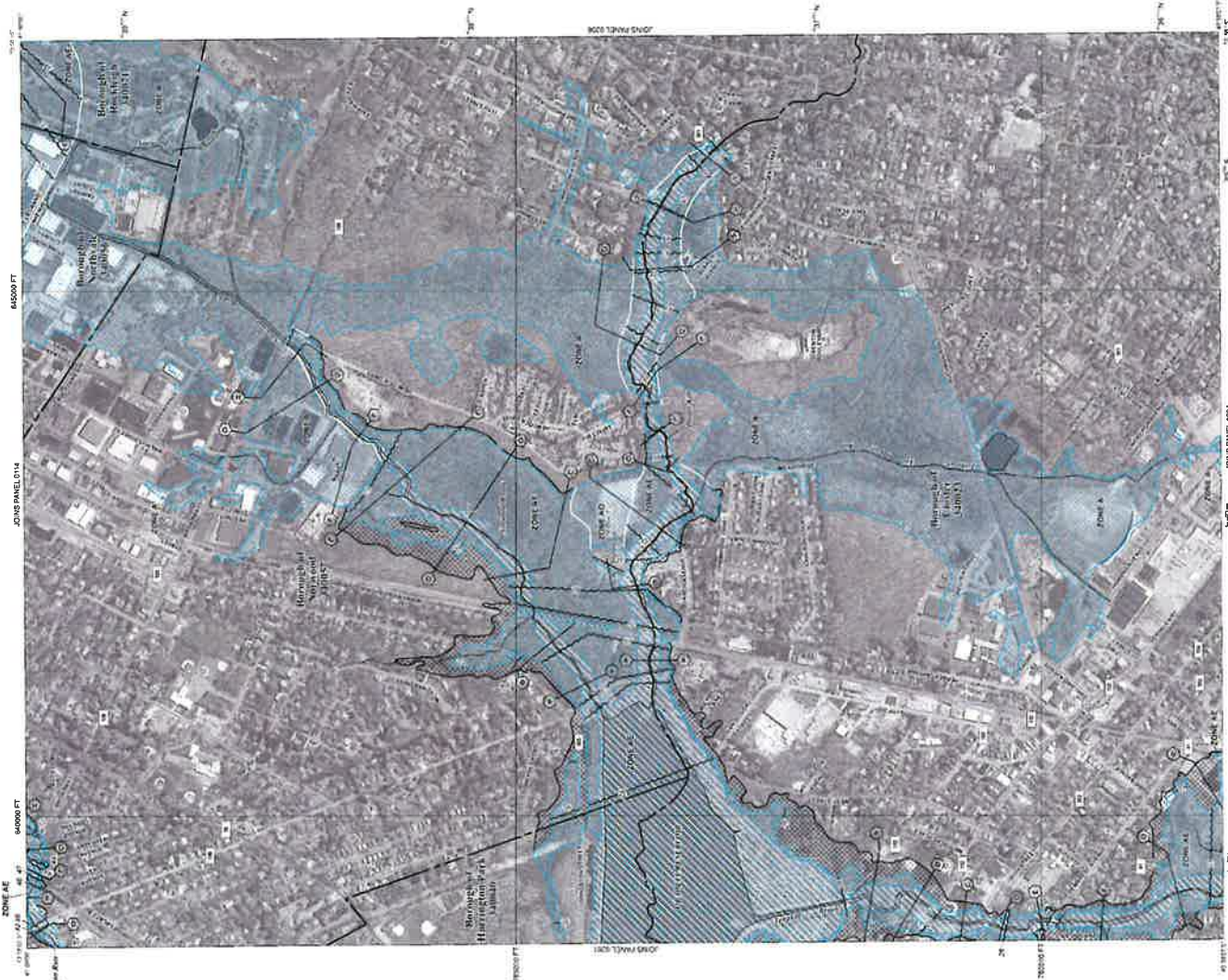
Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each

For information on available products associated with the FEMA relief, the Map of the United States, the National Flood Insurance Program (NFIP), and the Federal Emergency Management Agency (FEMA) website, please visit the FEMA website at www.fema.gov. You can also contact FEMA's National Flood Insurance Program in general, always call the FEMA Map Information exchange (FEMA) at 1-877-FEMA-MAP (1-877-324-2671) or visit the FEMA website at www.fema.gov. If you have questions about the map, how to order products or the National Flood Insurance Program in general, always call the FEMA Map Information exchange (FEMA) at 1-877-FEMA-MAP (1-877-324-2671) or visit the FEMA website at www.fema.gov.



This digital PIRM was produced through a unique cooperative partnership between the New Jersey Department of Environmental Protection (NJDEP) and E-RAA. As part of the effort NJDEP has passed as a Cooperative Incentive Partnership.

agreement to practice and maintain a flood hazard reduction project.

[illegible]

Base found Elevation value where uniform within zone; elevation is feet.
 (CL 067)
 Referred to the North American Vertical Datum of 1929

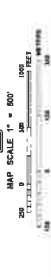
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 Geographic coordinates refer to the North American Datum of 1983 (NAD 83). Unknown hemisphere
 Transverse Mercator
 United States National Geospatial Intelligence Agency
 United States National Geospatial Intelligence Agency

DXSS 10 X

● MMS

Square hole
ELECTROPHORESIS

Search made (see insertions in boxes to others section of this page)

[illegible]

NFIP

FLOOD INSURANCE RATE MAP

FIRM

BERGEN COUNTY,
NEW JERSEY
(ALL JURISDICTIONS)

PANEL 202 OF 352

DATE MAP MADE: 4 FOR MAP PANEL SET:

EXEMPT	UNEXEMPT	PANEL	GROUP
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2	2	2	2
3	3	3	3
4	4	4	4
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99	99	99	99
100			

APPENDIX



NEGLIA ENGINEERING ASSOCIATES
- CONSULTING ENGINEERS & LAND SURVEYORS -
CIVIL • MUNICIPAL • LAND SURVEYING • PLANNING
NJDEP LANDUSE/LANDCOVER 2002
BOROUGH OF HARRINGTON PARK ~ COUNTY OF BERGEN ~ NEW JERSEY

LANDUSE/LANDCOVER - AVAILABLE FOR DEVELOPMENT		
NJDEP LAND LABEL	AREA (ACRES)	AREA (SQ.MI.)
DECIDUOUS FOREST	199.50	0.31
MIXED FOREST	10.37	0.02
DECIDUOUS BRUSHLAND/SHRUBLAND	0.96	0.00
UPLAND R.O.W. UNDEVELOPED	3.83	0.01
DISTURBED WETLANDS	1.79	0.00
PLANTATION	18.78	0.03
WETLANDS RIGHT-OF-WAY	6.59	0.01
ALTERED LANDS	2.19	0.00
OLD FIELD	14.10	0.02
TOTAL LAND AREA	258.11	0.40
HARRINGTON PARK LAND AREA	1318.44	2.06
PERCENTAGE OF AVAILABLE LAND		19.6%

LANDUSE/LANDCOVER - DEVELOPED OR UNDEVELOPABLE AREA		
NJDEP LAND LABEL	AREA (ACRES)	AREA (SQ.MI.)
INDUSTRIAL	1.24	0.00
COMMERCIAL	36.49	0.06
RECREATIONAL LAND	32.05	0.05
MANAGED WETLANDS	3.98	0.01
RESIDENTIAL, SINGLE UNIT, MEDIUM DENSITY	585.45	0.91
RESIDENTIAL, SINGLE UNIT, LOW DENSITY	45.13	0.07
RESIDENTIAL, HIGH DENSITY, MULTIFAMILY	15.57	0.02
RESIDENTIAL, RURAL, SINGLE UNIT	17.71	0.03
ATHLETIC FIELDS	3.02	0.00
DECIDUOUS SHRUB/SHRUB WETLANDS	6.30	0.01
DECIDUOUS WOODED WETLANDS	106.52	0.17
HERBACEOUS WETLANDS	1.79	0.00
ARTIFICIAL LAKES	159.54	0.25
STREAMS AND CANALS	9.19	0.01
TRANSITION AREAS	3.01	0.00
MIXED URBAN OR BUILT-UP LAND	29.53	0.05
CEMETARY	1.03	0.00
TRANS/COMM/UTILITY	2.78	0.00
TOTAL LAND AREA	1060.33	1.66
HARRINGTON PARK LAND AREA	1318.44	2.06
PERCENTAGE OF OCCUPIED LAND		80.4%

Borough of Harrington Park, NJ
Monday, August 17, 2020

Chapter 286. Stormwater Control

§ 286-1. Scope and purpose.

- A. Policy statement. Flood control, groundwater recharge, and pollutant reduction through nonstructural or low-impact techniques shall be explored before relying on structural BMPs. Structural BMPs should be integrated with nonstructural stormwater management strategies and proper maintenance plans. Nonstructural strategies include both environmentally sensitive site design and source controls that prevent pollutants from being placed on the site or from being exposed to stormwater. Source control plans should be developed based upon physical site conditions and the origin, nature, and the anticipated quantity or amount of potential pollutants. Multiple stormwater management BMPs may be necessary to achieve the established performance standards for water quality, quantity, and groundwater recharge.
- B. Purpose. It is the purpose of this chapter to establish minimum stormwater management requirements and controls for major development, as defined in § 286-2.
- C. Applicability.
 - (1) This chapter shall be applicable to all site plans and subdivisions for the following major developments that require preliminary or final site plan or subdivision review:
 - (a) Nonresidential major developments; and
 - (b) Aspects of residential major developments that are not preempted by the Residential Site Improvement Standards at N.J.A.C. 5:21.
 - (2) This chapter shall also be applicable to all major developments undertaken by the Borough of Harrington Park.
- D. Compatibility with other permit and ordinance requirements. Development approvals issued for subdivisions and site plans pursuant to this chapter are to be considered an integral part of development approvals under the subdivision and site plan review process and do not relieve the applicant of the responsibility to secure required permits or approvals for activities regulated by any other applicable code, rule, act, or ordinance. In their interpretation and application, the provisions of this chapter shall be held to be the minimum requirements for the promotion of the public health, safety, and general welfare. This chapter is not intended to interfere with, abrogate, or annul any other ordinance, rule or regulation, statute, or other provision of law, except that where any provision of this chapter imposes restrictions different from those imposed by any other ordinance, rule or regulation, or other provision of law, the more restrictive provisions or higher standards shall control.

§ 286-2. Definitions.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application. The definitions below are the same as or based on the corresponding definitions in the stormwater management rules at N.J.A.C. 7:8-1.2.

CAFRA CENTERS, CORES OR NODES

Those areas within boundaries accepted by the Department pursuant to N.J.A.C. 7:7E-5B.

CAFRA PLANNING MAP

The geographic depiction of the boundaries for coastal planning areas, CAFRA Centers, CAFRA Cores and CAFRA Nodes pursuant to N.J.A.C. 7:7E-5B.3.

COMPACTION

The increase in soil bulk density.

CORE

A pedestrian-oriented area of commercial and civic uses serving the surrounding municipality, generally including housing and access to public transportation.

COUNTY REVIEW AGENCY

An agency designated by the County Board of Chosen Freeholders to review municipal stormwater management plans and implementing ordinances. The county review agency may be either:

- A. A county planning agency; or
- B. A county water resource association created under N.J.S.A. 58:16A-55.5, if the ordinance or resolution delegates authority to approve, conditionally approve, or disapprove municipal stormwater management plans and implementing ordinances.

DEPARTMENT

The New Jersey Department of Environmental Protection.

DESIGNATED CENTER

A State Development and Redevelopment Plan Center as designated by the State Planning Commission, such as urban, regional, town, village, or hamlet.

DESIGN ENGINEER

A person professionally qualified and duly licensed in New Jersey to perform engineering services that may include, but not necessarily be limited to, development of project requirements, creation and development of project design and preparation of drawings and specifications.

DEVELOPMENT

The division of a parcel of land into two or more parcels; the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or structure; any mining excavation or landfill; and any use or change in the use of any building or other structure, or land or extension of use of land, by any person, for which permission is required under the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq. In the case of development of agricultural lands, "development" means any activity that requires a state permit; any activity reviewed by the County Agricultural Board (CAB) and the State Agricultural Development Committee (SADC); and municipal review of any activity not exempted by the Right to Farm Act, N.J.S.A. 4:1C-1 et seq.

DRAINAGE AREA

A geographic area within which stormwater, sediments, or dissolved materials drain to a particular receiving water body or to a particular point along a receiving water body.

EMPOWERMENT NEIGHBORHOOD

A neighborhood designated by the Urban Coordinating Council in consultation and conjunction with the New Jersey Redevelopment Authority pursuant to N.J.S.A. 55:19-69.

ENVIRONMENTALLY CRITICAL AREA

An area or feature which is of significant environmental value, including but not limited to stream corridors; natural heritage priority sites; habitat of endangered or threatened species; large areas of contiguous open space or upland forest; steep slopes; and wellhead protection and groundwater recharge areas. Habitats of endangered or threatened species are identified using the Department's Landscape Project as approved by the Department's Endangered and Nongame Species Program.

EROSION

The detachment and movement of soil or rock fragments by water, wind, ice or gravity.

IMPERVIOUS SURFACE

A surface that has been covered with a layer of material so that it is highly resistant to infiltration by water.

INFILTRATION

The process by which water seeps into the soil from precipitation.

MAJOR DEVELOPMENT

Any development that provides for ultimately disturbing one or more acres of land. Disturbance, for the purpose of this rule, is the placement of impervious surface or exposure and/or movement of soil or bedrock or clearing, cutting, or removing of vegetation.

MUNICIPALITY

Any city, borough, town, township, or village.

NODE

An area designated by the State Planning Commission concentrating facilities and activities which are not organized in a compact form.

NUTRIENT

A chemical element or compound, such as nitrogen or phosphorus, which is essential to and promotes the development of organisms.

PERSON

Any individual, corporation, company, partnership, firm, association, the Borough of Harrington Park and any political subdivision of this state subject to municipal jurisdiction pursuant to the Municipal Land Use Law, N.J.S.A. 40:55D-1 et seq.

POLLUTANT

Any dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, refuse, oil, grease, sewage sludge, munitions, chemical wastes, biological materials, medical wastes, radioactive substance [except those regulated under the Atomic

Energy Act of 1954, as amended (42 U.S.C. § 2011 et seq.)), thermal waste, wrecked or discarded equipment, rock, sand, cellar dirt, industrial, municipal, agricultural, and construction waste or runoff, or other residue discharged directly or indirectly to the land, groundwaters or surface waters of the state or to a domestic treatment works. "Pollutant" includes both hazardous and nonhazardous pollutants.

RECHARGE

The amount of water from precipitation that infiltrates into the ground and is not evapotranspired.

SEDIMENT

Solid material, mineral or organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water or gravity as a product of erosion.

SITE

The lot or lots upon which a major development is to occur or has occurred.

SOIL

All unconsolidated mineral and organic material of any origin.

STATE DEVELOPMENT AND REDEVELOPMENT PLAN METROPOLITAN PLANNING AREA (PA1)

An area delineated on the State Plan Policy Map and adopted by the State Planning Commission that is intended to be the focus for much of the state's future redevelopment and revitalization efforts.

STATE PLAN POLICY MAP

The geographic application of the State Development and Redevelopment Plan's goals and statewide policies, and the official map of these goals and policies.

STORMWATER

Water resulting from precipitation (including rain and snow) that runs off the land's surface, is transmitted to the subsurface, or is captured by separate storm sewers or other sewage or drainage facilities or conveyed by snow removal equipment.

STORMWATER MANAGEMENT BASIN

An excavation or embankment and related areas designed to retain stormwater runoff. A stormwater management basin may either be normally dry (that is, a detention basin or infiltration basin), retain water in a permanent pool (a retention basin), or be planted mainly with wetland vegetation (most constructed stormwater wetlands).

STORMWATER MANAGEMENT MEASURE

Any structural or nonstructural strategy, practice, technology, process, program, or other method intended to control or reduce stormwater runoff and associated pollutants or to induce or control the infiltration or groundwater recharge of stormwater or to eliminate illicit or illegal nonstormwater discharges into stormwater conveyances.

STORMWATER RUNOFF

Water flow on the surface of the ground or in storm sewers, resulting from precipitation.

TIDAL FLOOD HAZARD AREA

A flood hazard area which may be influenced by stormwater runoff from inland areas but which is primarily caused by the Atlantic Ocean.

URBAN COORDINATING COUNCIL EMPOWERMENT NEIGHBORHOOD

A neighborhood given priority access to state resources through the New Jersey Redevelopment Authority.

URBAN ENTERPRISE ZONE

A zone designated by the New Jersey Enterprise Zone Authority pursuant to the New Jersey Urban Enterprise Zones Act, N.J.S.A. 52:27H-60 et seq.

URBAN REDEVELOPMENT AREA

Previously developed portions of areas:

- A. Delineated on the State Plan Policy Map (SPPM) as the Metropolitan Planning Area (PA1), Designated Centers, Cores or Nodes;
- B. Designated as CAFRA Centers, Cores or Nodes;
- C. Designated as Urban Enterprise Zones; and
- D. Designated as Urban Coordinating Council Empowerment Neighborhoods.

WATERS OF THE STATE

The ocean and its estuaries, all springs, streams, wetlands, and bodies of surface water or groundwater, whether natural or artificial, within the boundaries of the State of New Jersey or subject to its jurisdiction.

WETLANDS or WETLAND

An area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as "hydrophytic vegetation."

§ 286-3. Design and performance standards.

- A. Stormwater management measures for major development shall be developed to meet the erosion control, groundwater recharge, stormwater runoff quantity, and stormwater runoff quality standards in § 286-4. To the maximum extent practicable, these standards shall be met by incorporating nonstructural stormwater management strategies into the design. If these strategies alone are not sufficient to meet these standards, structural stormwater management measures necessary to meet these standards shall be incorporated into the design.
- B. The standards in this chapter apply only to new major development and are intended to minimize the impact of stormwater runoff on water quality and water quantity in receiving water bodies and maintain groundwater recharge. The standards do not apply to new major development to the extent that alternative design and performance standards are applicable under a regional stormwater management plan or water quality management plan adopted in accordance with Department rules.

§ 286-4. Requirements for major development.

Stormwater management requirements for major development are as follows:

- A. The development shall incorporate a maintenance plan for the stormwater management measures incorporated into the design of a major development in accordance with § 286-10.
- B. Stormwater management measures shall avoid adverse impacts of concentrated flow on habitat for threatened and endangered species as documented in the Department's Landscape Project or Natural Heritage Database established under N.J.S.A. 13:1B-15.147 through 13:1B-15.150, particularly *Helonias bullata* (swamp pink) and/or *Clemmys muhlenbergii* (bog turtle).
- C. The following linear development projects are exempt from the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Subsections **F** and **G**:
 - (1) The construction of an underground utility line, provided that the disturbed areas are revegetated upon completion;
 - (2) The construction of an aboveground utility line, provided that the existing conditions are maintained to the maximum extent practicable; and
 - (3) The construction of a public pedestrian access, such as a sidewalk or trail with a maximum width of 14 feet, provided that the access is made of permeable material.
- D. A waiver from strict compliance with the groundwater recharge, stormwater runoff quantity, and stormwater runoff quality requirements of Subsections **F** and **G** may be obtained for the enlargement of an existing public roadway or railroad, or the construction or enlargement of a public pedestrian access, provided that the following conditions are met:
 - (1) The applicant demonstrates that there is a public need for the project that cannot be accomplished by any other means;
 - (2) The applicant demonstrates, through an alternatives analysis, that, through the use of nonstructural and structural stormwater management strategies and measures, the option selected complies with the requirements of Subsections **F** and **G** to the maximum extent practicable;
 - (3) The applicant demonstrates that, in order to meet the requirements of Subsections **F** and **G**, existing structures currently in use, such as homes and buildings, would need to be condemned; and
 - (4) The applicant demonstrates that it does not own or have other rights to areas, including the potential to obtain through condemnation lands not falling under Subsection **D(3)** above within the upstream drainage area of the receiving stream, that would provide additional opportunities to mitigate the requirements of Subsections **F** and **G** that were not achievable on site.
- E. Nonstructural stormwater management strategies.
 - (1) To the maximum extent practicable, the standards in Subsections **F** and **G** shall be met by incorporating nonstructural stormwater management strategies set forth at Subsection **E** into the design. The applicant shall identify the nonstructural measures incorporated into the design of the project. If the applicant contends that it is not feasible for engineering, environmental, or safety reasons to incorporate any nonstructural stormwater management measures identified in Subsection **E(2)** below into the design of a particular project, the applicant shall identify the strategy considered and provide a basis for the contention.
 - (2) Nonstructural stormwater management strategies incorporated into site design shall:
 - (a) Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.

- (b) Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.
- (c) Maximize the protection of natural drainage features and vegetation.
- (d) 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 watershed to the point of interest within a watershed.
- (e) Minimize land disturbance, including clearing and grading.
- (f) Minimize soil compaction.
- (g) Provide low-maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers and pesticides.
- (h) Provide vegetated open-channel conveyance systems discharging into and through stable vegetated areas.
- (i) 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. Such source controls include, but are not limited to:
 - [1] Site design features that help to prevent accumulation of trash and debris in drainage systems, including features that satisfy Subsection **E(3)** below;
 - [2] Site design features that help to prevent discharge of trash and debris from drainage systems;
 - [3] Site design features that help to prevent and/or contain spills or other harmful accumulations of pollutants at industrial or commercial developments; and
 - [4] When establishing vegetation after land disturbance, applying fertilizer in accordance with the requirements established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., and implementing rules.
- (3) Site design features identified under Subsection **E(2)(i)[2]** above shall comply with the following standard to control passage of solid and floatable materials through storm drain inlets. For purposes of this subsection, "solid and floatable materials" means sediment, debris, trash, and other floating, suspended, or settleable solids. For exemptions to this standard see Subsection **E(3)(c)** below.
 - (a) Grates.
 - [1] Design engineers shall use either of the following grates whenever they use a grate in pavement or another ground surface to collect stormwater from that surface into a storm drain or surface water body under that grate:
 - [a] The New Jersey Department of Transportation (NJDOT) bicycle-safe grate, which is described in Chapter 2.4 of the NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines (April 1996); or
 - [b] A different grate, if each individual clear space in that grate has an area of no more than seven square inches or is no greater than 0.5 inch across the smallest dimension.
 - [2] Examples of grates subject to this standard include grates in grate inlets, the grate portion (non-curb-opening portion) of combination inlets, grates on storm sewer manholes, ditch grates, trench grates, and grates of spacer bars in slotted drains. Examples of ground surfaces include surfaces of roads (including bridges), driveways, parking areas, bikeways, plazas, sidewalks, lawns, fields, open channels, and stormwater basin floors.
 - (b) Whenever design engineers use a curb opening inlet, the clear space in that curb opening (or each individual clear space, if the curb opening has two or more clear spaces) shall have an area of no more than seven square inches or be no greater than two inches across the smallest dimension.
 - (c) This standard does not apply:
 - [1] Where the review agency determines that this standard would cause inadequate hydraulic performance that could not practicably be overcome by using additional or larger storm drain inlets that meet these standards;
 - [2] Where flows from the water quality design storm as specified in Subsection **G(1)** are conveyed through any device (e.g., end-of-pipe netting facility, manufactured treatment device, or a catch basin hood) that is designed, at a minimum, to prevent delivery of all solid and floatable materials that could not pass through one of the following:
 - [a] A rectangular space 4 5/8 inches long and 1 1/2 inches wide (this option does not apply for outfall netting facilities); or
 - [b] A bar screen having a bar spacing of 0.5 inch.
 - [3] Where flows are conveyed through a trash rack that has parallel bars with one-inch spacing between the bars, to the elevation of the water quality design storm as specified in Subsection **G(1)**; or

- [4] Where the New Jersey Department of Environmental Protection determines, pursuant to the New Jersey Register of Historic Places Rules at N.J.A.C. 7:4-7.2(c), that action to meet this standard is an undertaking that constitutes an encroachment or will damage or destroy the New Jersey Register listed historic property.

- (4) Any land area used as a nonstructural stormwater management measure to meet the performance standards in Subsections **F** and **G** shall be dedicated to a government agency, subjected to a conservation restriction filed with the appropriate County Clerk's office, or subject to an approved equivalent restriction that ensures that measure or an equivalent stormwater management measure approved by the reviewing agency is maintained in perpetuity.
- (5) Guidance for nonstructural stormwater management strategies is available in the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in § **286-7** or found on the Department's website at <http://www.njstormwater.org>.

F. Erosion control, groundwater recharge and runoff quantity standards.

- (1) This subsection contains minimum design and performance standards to control erosion, encourage and control infiltration and groundwater recharge, and control stormwater runoff quantity impacts of major development.
- (a) The minimum design and performance standards for erosion control are those established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq. and implementing rules.
- (b) The minimum design and performance standards for groundwater recharge are as follows:
- [1] The design engineer shall, using the assumptions and factors for stormwater runoff and groundwater recharge calculations at § **286-5**, either:
- [a] Demonstrate through hydrologic and hydraulic analysis that the site and its stormwater management measures maintain 100% of the average annual pre-construction groundwater recharge volume for the site; or
- [b] 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.
- [2] This groundwater recharge requirement does not apply to projects within the urban redevelopment area or to projects subject to Subsection **F(1)(b)[3]** below.
- [3] The following types of stormwater shall not be recharged:
- [a] Stormwater from areas of high pollutant loading. High pollutant loading areas are areas in industrial and commercial developments where solvents and/or petroleum products are loaded/unloaded, stored, or applied; areas where pesticides are loaded/unloaded or stored; areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the United States Environmental Protection Agency (EPA) at 40 CFR 302.4; areas where recharge would be inconsistent with a Department-approved remedial action work plan or landfill closure plan; and areas with high risks for spills of toxic materials, such as gas stations and vehicle maintenance facilities; and
- [b] Industrial stormwater exposed to source material. "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing or other industrial activities, which could be a source of pollutants in any industrial stormwater discharge to groundwater. Source materials include, but are not limited to, raw materials; intermediate products; final products; waste materials; by-products; industrial machinery and fuels; and lubricants, solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to stormwater.
- [4] The design engineer shall assess the hydraulic impact on the groundwater table and design the site so as to avoid adverse hydraulic impacts. Potential adverse hydraulic impacts include, but are not limited to, exacerbating a naturally or seasonally high water table so as to cause surficial ponding, flooding of basements, or interference with the proper operation of subsurface sewage disposal systems and other subsurface structures in the vicinity or downgradient of the groundwater recharge area.
- (c) In order to control stormwater runoff quantity impacts, the design engineer shall, using the assumptions and factors for stormwater runoff calculations at § **286-5**, complete one of the following:
- [1] Demonstrate through hydrologic and hydraulic analysis that for stormwater leaving the site, post-construction runoff hydrographs for the two-, ten-, and one-hundred-year storm events do not exceed, at any point in time, the pre-construction runoff hydrographs for the same storm events;
- [2] Demonstrate through hydrologic and hydraulic analysis that there is no increase, as compared to the pre-construction condition, in the peak runoff rates of stormwater leaving the site for the two-, ten-, and one-hundred-year storm events and that the increased volume or change in timing of stormwater runoff will not increase flood damage at or downstream of the site. This analysis shall include the analysis of impacts of existing land uses and projected land uses assuming full development under existing zoning and land use ordinances in the drainage area;

- [3] Design stormwater management measures so that the post-construction peak runoff rates for the two-, ten-, and one-hundred-year storm events are 50%, 75% and 80%, respectively, of the pre-construction peak runoff rates. The percentages apply only to the post-construction stormwater runoff that is attributable to the portion of the site on which the proposed development or project is to be constructed. The percentages shall not be applied to post-construction stormwater runoff into tidal flood hazard areas if the increased volume of stormwater runoff will not increase flood damages below the point of discharge; or
- [4] In tidal flood hazard areas, stormwater runoff quantity analysis in accordance with Subsection **F(1)(c)[1], [2] and [3]** above shall only be applied if the increased volume of stormwater runoff could increase flood damages below the point of discharge.

- (2) Any application for a new agricultural development that meets the definition of major development at § **286-2** shall be submitted to the appropriate Soil Conservation District for review and approval in accordance with the requirements of this section and any applicable Soil Conservation District guidelines for stormwater runoff quantity and erosion control. For the purposes of this section, "agricultural development" means land uses normally associated with the production of food, fiber and livestock for sale. Such uses do not include the development of land for the processing or sale of food and the manufacturing of agriculturally related products.

G. Stormwater runoff quality standards.

- (1) Stormwater management measures shall be designed to reduce the post-construction load of total suspended solids (TSS) in stormwater runoff by 80% of the anticipated load from the developed site, expressed as an annual average. Stormwater management measures shall only be required for water quality control if an additional 1/4 acre of impervious surface is being proposed on a development site. The requirement to reduce TSS does not apply to any stormwater runoff in a discharge regulated under a numeric effluent limitation for TSS imposed under the New Jersey Pollutant Discharge Elimination System (NJPDES) rules, N.J.A.C. 7:14A, or in a discharge specifically exempt under a NJPDES permit from this requirement. The water quality design storm is 1.25 inches of rainfall in two hours. Water quality calculations shall take into account the distribution of rain from the water quality design storm, as reflected in Table 1. The calculation of the volume of runoff may take into account the implementation of nonstructural and structural stormwater management measures.

Table 1: Water Quality Design Storm Distribution

Time (minutes)	Cumulative Rainfall (inches)	Time (minutes)	Cumulative Rainfall (inches)
0	0.0000	65	0.8917
5	0.0083	70	0.9917
10	0.0166	75	1.0500
15	0.0250	80	1.0840
20	0.0500	85	1.1170
25	0.0750	90	1.1500
30	0.1000	95	1.1750
35	0.1330	100	1.2000
40	0.1660	105	1.2250
45	0.2000	110	1.2334
50	0.2583	115	1.2417
55	0.3583	120	1.2500
60	0.6250		

- (2) For purposes of TSS reduction calculations, Table 2 below presents the presumed removal rates for certain BMPs designed in accordance with the New Jersey Stormwater Best Management Practices Manual. The BMP Manual may be obtained from the address identified in § **286-7** or found on the Department's website at www.njstormwater.org. The BMP Manual and other sources of technical guidance are listed in § **286-7**. TSS reduction shall be calculated based on the removal rates for the BMPs in Table 2 below. Alternative removal rates and methods of calculating removal rates may be used if the design engineer provides documentation demonstrating the capability of these alternative rates and methods to the review agency. A copy of any approved alternative rate or method of calculating the removal rate shall be provided to the Department at the following address: Division of Watershed Management, New Jersey Department of Environmental Protection, P.O. Box 418, Trenton, New Jersey 08625-0418.
- (3) If more than one BMP in series is necessary to achieve the required eighty-percent TSS reduction for a site, the applicant shall utilize the following formula to calculate TSS reduction:

$$R = A + B - (A \times B)/100$$

Where:

- R = Total TSS percent load removal from application of both BMPs.
 A = TSS percent removal rate applicable to the first BMP.

$$R = A + B - (A \times B)/100$$

Where:

- R = Total TSS percent load removal from application of both BMPs.
 A = TSS percent removal rate applicable to the first BMP.
 B = TSS percent removal rate applicable to the second BMP.

Table 2: TSS Removal Rates for BMPs

Best Management Practice	TSS Percent Removal Rate
Bioretention systems	90%
Constructed stormwater wetland	90%
Extended detention basin	40% to 60%
Infiltration structure	80%
Manufactured treatment device	See § 286-6C
Sand filter	80%
Vegetative filter strip	60% to 80%
Wet pond	50% to 90%

- (4) If there is more than one on-site drainage area, the eighty-percent TSS removal rate shall apply to each drainage area, unless the runoff from the subareas converges on site, in which case the removal rate can be demonstrated through a calculation using a weighted average.
- (5) Stormwater management measures shall also 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. In achieving reduction of nutrients to the maximum extent feasible, the design of the site shall include nonstructural strategies and structural measures that optimize nutrient removal while still achieving the performance standards in Subsections **F** and **G**.
- (6) Additional information and examples are contained in the New Jersey Stormwater Best Management Practices Manual, which may be obtained from the address identified in § 286-7.
- (7) In accordance with the definition of FW1 at N.J.A.C. 7:9B-1.4, stormwater management measures shall be designed to prevent any increase in stormwater runoff to waters classified as FW1.
- (8) Special water resource protection areas shall be established along all waters designated Category One at N.J.A.C. 7:9B and perennial or intermittent streams that drain into or upstream of the Category One waters as shown on the USGS Quadrangle Maps or in the County Soil Surveys, within the associated HUC14 drainage area. These areas shall be established for the protection of water quality, aesthetic value, exceptional ecological significance, exceptional recreational significance, exceptional water supply significance, and exceptional fisheries significance of those established Category One waters. These areas shall be designated and protected as follows:
 - (a) The applicant shall preserve and maintain a special water resource protection area in accordance with one of the following:
 - [1] A three-hundred-foot special water resource protection area shall be provided on each side of the waterway, measured perpendicular to the waterway from the top of the bank outwards or from the center line of the waterway where the bank is not defined, consisting of existing vegetation or vegetation allowed to follow natural succession.
 - [2] Encroachment within the designated special water resource protection area under Subsection **G(8)(a)[1]** above shall only be allowed where previous development or disturbance has occurred (for example, active agricultural use, parking area or maintained lawn area). The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable. In no case shall the remaining special water resource protection area be reduced to less than 150 feet as measured perpendicular to the top of bank of the waterway or center line of the waterway where the bank is undefined. All encroachments proposed under this subsection shall be subject to review and approval by the Department.
 - (b) All stormwater shall be discharged outside of and flow through the special water resource protection area and shall comply with the Standard for Off-Site Stability in the Standards for Soil Erosion and Sediment Control in New Jersey, established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq.
 - (c) If stormwater discharged outside of and flowing through the special water resource protection area cannot comply with the Standard for Off-Site Stability in the Standards for Soil Erosion and Sediment Control in New Jersey, established under the Soil Erosion and Sediment Control Act, N.J.S.A. 4:24-39 et seq., then the stabilization measures in accordance with the requirements of the above standards may be placed within the special water resource protection area, provided that:

- [1] Stabilization measures shall not be placed within 150 feet of the Category One waterway;
 - [2] Stormwater associated with discharges allowed by this section shall achieve a ninety-five-percent TSS post-construction removal rate;
 - [3] Temperature shall be addressed to ensure no impact on the receiving waterway;
 - [4] The encroachment shall only be allowed where the applicant demonstrates that the functional value and overall condition of the special water resource protection area will be maintained to the maximum extent practicable;
 - [5] A conceptual project design meeting shall be held with the appropriate Department staff and Soil Conservation District staff to identify necessary stabilization measures; and
 - [6] All encroachments proposed under this subsection shall be subject to review and approval by the Department.
- (d) A stream corridor protection plan may be developed by a regional stormwater management planning committee as an element of a regional stormwater management plan or by a municipality through an adopted municipal stormwater management plan. If a stream corridor protection plan for a waterway subject to Subsection **G(8)** has been approved by the Department of Environmental Protection, then the provisions of the plan shall be the applicable special water resource protection area requirements for that waterway. A stream corridor protection plan for a waterway subject to Subsection **G(8)** shall maintain or enhance the current functional value and overall condition of the special water resource protection area as defined in Subsection **G(8)(a)[1]** above. In no case shall a stream corridor protection plan allow the reduction of the special water resource protection area to less than 150 feet as measured perpendicular to the waterway subject to this subsection.
- (e) Subsection **G(8)** does not apply to the construction of one individual single-family dwelling that is not part of a larger development on a lot receiving preliminary or final subdivision approval on or before February 2, 2004, provided that the construction begins on or before February 2, 2009.

§ 286-5. Calculation of stormwater runoff and groundwater recharge.

A. Stormwater runoff shall be calculated in accordance with the following:

- (1) The design engineer shall calculate runoff using one of the following methods:
 - (a) The USDA Natural Resources Conservation Service (NRCS) methodology, including the NRCS Runoff Equation and Dimensionless Unit Hydrograph, as described in the NRCS National Engineering Handbook Section 4, Hydrology, and Technical Release 55, Urban Hydrology for Small Watersheds; or
 - (b) The Rational Method for peak flow and the Modified Rational Method for hydrograph computations.
- (2) For the purpose of calculating runoff coefficients and groundwater recharge, there is a presumption that the pre-construction condition of a site or portion thereof is a wooded land use with good hydrologic condition. The term "runoff coefficient" applies to both the NRCS methodology at Subsection **A(1)(a)** and the Rational and Modified Rational Methods at Subsection **A(1)(b)**. A runoff coefficient or a groundwater recharge land cover for an existing condition may be used on all or a portion of the site if the design engineer verifies that the hydrologic condition has existed on the site or portion of the site for at least five years without interruption prior to the time of application. If more than one land cover has existed on the site during the five years immediately prior to the time of application, the land cover with the lowest runoff potential shall be used for the computations. In addition, there is the presumption that the site is in good hydrologic condition (if the land use type is pasture, lawn, or park), with good cover (if the land use type is woods), or with good hydrologic condition and conservation treatment (if the land use type is cultivation).
- (3) In computing pre-construction stormwater runoff, the design engineer shall account for all significant land features and structures, such as ponds, wetlands, depressions, hedgerows, or culverts, that may reduce pre-construction stormwater runoff rates and volumes.
- (4) In computing stormwater runoff from all design storms, the design engineer shall consider the relative stormwater runoff rates and/or volumes of pervious and impervious surfaces separately to accurately compute the rates and volume of stormwater runoff from the site. To calculate runoff from unconnected impervious cover, urban impervious area modifications as described in the NRCS Technical Release 55, Urban Hydrology for Small Watersheds, and other methods may be employed.
- (5) If the invert of the outlet structure of a stormwater management measure is below the flood hazard design flood elevation as defined at N.J.A.C. 7:13, the design engineer shall take into account the effects of tailwater in the design of structural stormwater management measures.

B. Groundwater recharge may be calculated in accordance with the following: the New Jersey Geological Survey Report GSR-32A Method for Evaluating Ground-Water Recharge Areas in New Jersey, incorporated herein by reference as amended and supplemented. Information regarding the methodology is available from the New Jersey Stormwater Best Management Practices

Manual; at <http://www.state.nj.us/dep/njgs/>; or at New Jersey Geological Survey, 29 Arctic Parkway, P.O. Box 427, Trenton, New Jersey 08625-0427; (609) 984-6587.

§ 286-6. Standards for structural stormwater management measures.

A. Standards for structural stormwater management measures are as follows:

- (1) Structural stormwater management measures shall be designed to take into account the existing site conditions, including, for example, environmentally critical areas; wetlands; flood-prone areas; slopes; depth to seasonal high water table; soil type, permeability and texture; drainage area and drainage patterns; and the presence of solution-prone carbonate rocks (limestone).
- (2) Structural stormwater management measures shall be designed to minimize maintenance, facilitate maintenance and repairs, and ensure proper functioning. Trash racks shall be installed at the intake to the outlet structure as appropriate and shall have parallel bars with one-inch spacing between the bars to the elevation of the water quality design storm. For elevations higher than the water quality design storm, the parallel bars at the outlet structure shall be spaced no greater than 1/3 the width of the diameter of the orifice or 1/3 the width of the weir, with a minimum spacing between bars of one inch and a maximum spacing between bars of six inches. In addition, the design of trash racks must comply with the requirements of § 286-8B.
- (3) Structural stormwater management measures shall be designed, constructed, and installed to be strong, durable, and corrosion-resistant. Measures that are consistent with the relevant portions of the Residential Site Improvement Standards at N.J.A.C. 5:21-7.3, 5:21-7.4, and 5:21-7.5 shall be deemed to meet this requirement.
- (4) At the intake to the outlet from the stormwater management basin, the orifice size shall be a minimum of 2 1/2 inches in diameter.
- (5) Stormwater management basins shall be designed to meet the minimum safety standards for stormwater management basins at § 286-8.

B. Stormwater management measure guidelines are available in the New Jersey Stormwater Best Management Practices Manual. Other stormwater management measures may be utilized, provided that the design engineer demonstrates that the proposed measure and its design will accomplish the required water quantity, groundwater recharge and water quality design and performance standards established by § 286-4 of this chapter.

C. Manufactured treatment devices may be used to meet the requirements of § 286-4 of this chapter, provided that the pollutant removal rates are verified by the New Jersey Corporation for Advanced Technology and certified by the Department.

§ 286-7. Sources for technical guidance.

A. Technical guidance for stormwater management measures can be found in the documents listed at Subsection A(1) and (2) below, which are available from Maps and Publications, New Jersey Department of Environmental Protection, 428 East State Street, P.O. Box 420, Trenton, New Jersey 08625; (609) 777-1038.

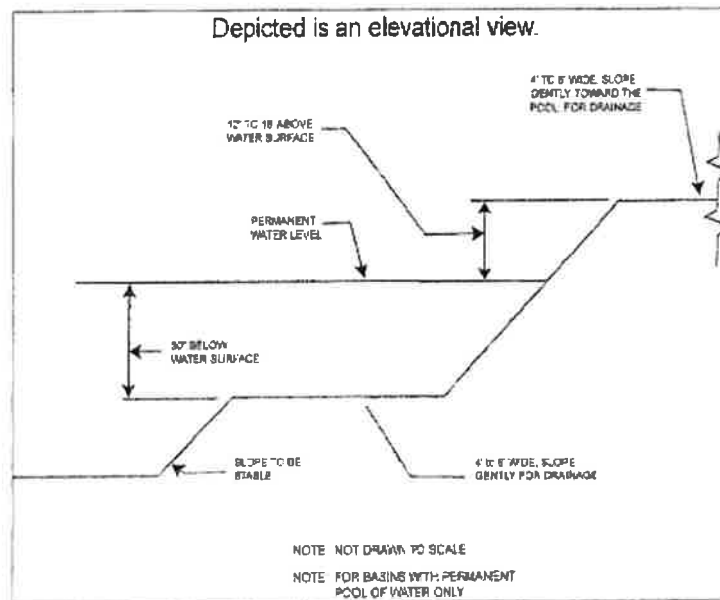
- (1) Guidelines for stormwater management measures are contained in the New Jersey Stormwater Best Management Practices Manual, as amended. Information is provided on stormwater management measures such as bioretention systems, constructed stormwater wetlands, dry wells, extended detention basins, infiltration structures, manufactured treatment devices, pervious paving, sand filters, vegetative filter strips, and wet ponds.
- (2) The New Jersey Department of Environmental Protection Stormwater Management Facilities Maintenance Manual, as amended.

B. Additional technical guidance for stormwater management measures can be obtained from the following:

- (1) The Standards for Soil Erosion and Sediment Control in New Jersey, promulgated by the State Soil Conservation Committee and incorporated into N.J.A.C. 2:90. Copies of these standards may be obtained by contacting the State Soil Conservation Committee or any of the Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)3. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625, (609) 292-5540;
- (2) The Rutgers Cooperative Extension Service, (732) 932-9306; and
- (3) The Soil Conservation Districts listed in N.J.A.C. 2:90-1.3(a)3. The location, address, and telephone number of each Soil Conservation District may be obtained from the State Soil Conservation Committee, P.O. Box 330, Trenton, New Jersey 08625, (609) 292-5540.

§ 286-8. Safety standards for stormwater management basins.

- A. This section sets forth requirements to protect public safety through the proper design and operation of stormwater management basins. This section applies to any new stormwater management basin.
- B. Requirements for trash racks, overflow grates and escape provisions.
- (1) A trash rack is a device designed to catch trash and debris and prevent the clogging of outlet structures. Trash racks shall be installed at the intake to the outlet from the stormwater management basin to ensure proper functioning of the basin outlets in accordance with the following:
 - (a) The trash rack shall have parallel bars, with no greater than six-inch spacing between the bars.
 - (b) The trash rack shall be designed so as not to adversely affect the hydraulic performance of the outlet pipe or structure.
 - (c) The average velocity of flow through a clean trash rack is not to exceed 2.5 feet per second under the full range of stage and discharge. Velocity is to be computed on the basis of the net area of opening through the rack.
 - (d) The trash rack shall be constructed and installed to be rigid, durable, and corrosion-resistant and shall be designed to withstand a perpendicular live loading of 300 pounds per square foot.
 - (2) An overflow grate is designed to prevent obstruction of the overflow structure. If an outlet structure has an overflow grate, such grate shall meet the following requirements:
 - (a) The overflow grate shall be secured to the outlet structure but be removable for emergencies and maintenance.
 - (b) The overflow grate spacing shall be no less than two inches across the smallest dimension.
 - (c) The overflow grate shall be constructed and installed to be rigid, durable, and corrosion-resistant and shall be designed to withstand a perpendicular live loading of 300 pounds per square foot.
 - (3) For purposes of this Subsection **B(3)**, "escape provisions" means the permanent installation of ladders, steps, rungs, or other features that provide easily accessible means of egress from stormwater management basins. Stormwater management basins shall include escape provisions as follows:
 - (a) If a stormwater management basin has an outlet structure, escape provisions shall be incorporated in or on the structure. With the prior approval of the reviewing agency identified in Subsection **C**, a freestanding outlet structure may be exempted from this requirement.
 - (b) Safety ledges shall be constructed on the slopes of all new stormwater management basins having a permanent pool of water deeper than 2 1/2 feet. Such safety ledges shall be comprised of two steps. Each step shall be four feet to six feet in width. One step shall be located approximately 2 1/2 feet below the permanent water surface, and the second step shall be located one foot to 1 1/2 feet above the permanent water surface. See Subsection **D** for an illustration of safety ledges in a stormwater management basin.
 - (c) In new stormwater management basins, the maximum interior slope for an earthen dam, embankment, or berm shall not be steeper than three horizontal to one vertical.
- C. Variance or exemption from safety standards. A variance or exemption from the safety standards for stormwater management basins may be granted only upon a written finding by the appropriate reviewing agency (municipality, county or Department) that the variance or exemption will not constitute a threat to public safety.
- D. Illustration of safety ledges in a new stormwater management basin.



§ 286-9. Site development stormwater plan.

A. Submission of site development stormwater plan.

- (1) Whenever an applicant seeks municipal approval of a development subject to this chapter, the applicant shall submit all of the required components of the checklist for the site development stormwater plan at Subsection **C** below as part of the submission of the applicant's application for subdivision or site plan approval.
- (2) The applicant shall demonstrate that the project meets the standards set forth in this chapter.
- (3) The applicant shall submit 18 copies of the materials listed in the checklist for site development stormwater plans in accordance with Subsection **C** of this section.

B. Site development stormwater plan approval. The applicant's site development project shall be reviewed as a part of the subdivision or site plan review process by the municipal board or official from which municipal approval is sought. That municipal board or official shall consult the engineer retained by the planning and/or zoning board (as appropriate) to determine if all of the checklist requirements have been satisfied and to determine if the project meets the standards set forth in this chapter.

C. Checklist requirements. The following information shall be required:

- (1) Topographic base map. The reviewing engineer may require upstream tributary drainage system information as necessary. It is recommended that a topographic base map of the site be submitted which extends a minimum of 200 feet beyond the limits of the proposed development, at a scale of one inch equals 200 feet or greater, showing two-foot contour intervals. The map, as appropriate, may indicate the following: existing surface water drainage, shorelines, steep slopes, soils, erodible soils, perennial or intermittent streams that drain into or upstream of the Category One waters, wetlands and floodplains along with their appropriate buffer strips, marshlands and other wetlands, pervious or vegetative surfaces, existing man-made structures, roads, bearing and distances of property lines, and significant natural and man-made features not otherwise shown.
- (2) Environmental site analysis: a written and graphic description of the natural and man-made features of the site and its environs. This description should include a discussion of soil conditions, slopes, wetlands, waterways and vegetation on the site. Particular attention should be given to unique, unusual, or environmentally sensitive features and to those that provide particular opportunities or constraints for development.
- (3) Project description and site plan(s): a map (or maps) at the scale of the topographical base map indicating the location of existing and proposed buildings, roads, parking areas, utilities, structural facilities for stormwater management and sediment control, and other permanent structures. The map(s) shall also clearly show areas where alterations occur in the natural terrain and cover, including lawns and other landscaping, and seasonal high groundwater elevations. A written description of the site plan and justification of proposed changes in natural conditions may also be provided.
- (4) Land use planning and source control plan. This plan shall provide a demonstration of how the goals and standards of §§ 286-3 through 286-6 are being met. The focus of this plan shall be to describe how the site is being developed to meet the objective of controlling groundwater recharge, stormwater quality and stormwater quantity problems at the source by land management and source controls whenever possible.

- (5) Stormwater management facilities map. The following information, illustrated on a map of the same scale as the topographic base map, shall be included:
 - (a) Total area to be paved or built upon, proposed surface contours, land area to be occupied by the stormwater management facilities and the type of vegetation thereon, and details of the proposed plan to control and dispose of stormwater.
 - (b) Details of all stormwater management facility designs, during and after construction, including discharge provisions, discharge capacity for each outlet at different levels of detention and emergency spillway provisions, with maximum discharge capacity of each spillway.
- (6) Calculations.
 - (a) Comprehensive hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms specified in § 286-4 of this chapter.
 - (b) When the proposed stormwater management control measures (e.g., infiltration basins) depend on the hydrologic properties of soils, then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soils present at the location of the control measure.
- (7) Maintenance and repair plan. The design and planning of the stormwater management facility shall meet the maintenance requirements of § 286-10.
- (8) Waiver from submission requirements. The municipal official or board reviewing an application under this chapter may, in consultation with the Municipal Engineer, waive submission of any of the requirements in Subsection C(1) through C(6) of this section when it can be demonstrated that the information requested is impossible to obtain or it would create a hardship on the applicant to obtain and its absence will not materially affect the review process.

§ 286-10. Maintenance and repair.

- A. Applicability. Projects subject to review as in § 286-1C of this chapter shall comply with the requirements of Subsections B and C.
- B. General maintenance.
 - (1) The design engineer shall prepare a maintenance plan for the stormwater management measures incorporated into the design of a major development.
 - (2) The maintenance plan shall contain specific preventative maintenance tasks and schedules; cost estimates, including estimated cost of sediment, debris, or trash removal; and the name, address, and telephone number of the person or persons responsible for preventative and corrective maintenance (including replacement). Maintenance guidelines for stormwater management measures are available in the New Jersey Stormwater Best Management Practices Manual. If the maintenance plan identifies a person other than the developer (for example, a public agency or homeowners' association) as having the responsibility for maintenance, the plan shall include documentation of such person's agreement to assume this responsibility, or of the developer's obligation to dedicate a stormwater management facility to such person under an applicable ordinance or regulation.
 - (3) Responsibility for maintenance shall not be assigned or transferred to the owner or tenant of an individual property in a residential development or project, unless such owner or tenant owns or leases the entire residential development or project.
 - (4) If the person responsible for maintenance identified under Subsection B(2) above is not a public agency, the maintenance plan and any future revisions based on Subsection B(7) below shall be recorded upon the deed of record for each property on which the maintenance described in the maintenance plan must be undertaken.
 - (5) Preventative and corrective maintenance shall be performed to maintain the function of the stormwater management measure, including repairs or replacement to the structure; removal of sediment, debris, or trash; restoration of eroded areas; snow and ice removal; fence repair or replacement; restoration of vegetation; and repair or replacement of nonvegetated linings.
 - (6) The person responsible for maintenance identified under Subsection B(2) above shall maintain a detailed log of all preventative and corrective maintenance for the structural stormwater management measures incorporated into the design of the development, including a record of all inspections and copies of all maintenance-related work orders.
 - (7) The person responsible for maintenance identified under Subsection B(2) above shall evaluate the effectiveness of the maintenance plan at least once per year and adjust the plan and the deed as needed.
 - (8) The person responsible for maintenance identified under Subsection B(2) above shall retain and make available, upon request by any public entity with administrative, health, environmental, or safety authority over the site, the maintenance plan and the documentation required by Subsection B(6) and (7) above.

- (9) The requirements of Subsection **B(3)** and **(4)** do not apply to stormwater management facilities that are dedicated to and accepted by the municipality or another governmental agency.
- (10) In the event that the stormwater management facility becomes a danger to public safety or public health, or if it is in need of maintenance or repair, the municipality shall so notify the responsible person in writing. Upon receipt of that notice, the responsible person shall have 14 days to effect maintenance and repair of the facility in a manner that is approved by the Municipal Engineer or his designee. The municipality, in its discretion, may extend the time allowed for effecting maintenance and repair for good cause. If the responsible person fails or refuses to perform such maintenance and repair, the municipality or county may immediately proceed to do so and shall bill the cost thereof to the responsible person.
- C. Nothing in this section shall preclude the municipality in which the major development is located from requiring the posting of a performance or maintenance guarantee in accordance with N.J.S.A. 40:55D-53.

§ 286-11. Violations and penalties.

Any person who erects, constructs, alters, repairs, converts, maintains, or uses any building, structure or land in violation of this chapter shall be subject to the following penalties: \$500 for the first offense; subsequent offenses shall carry a fine of \$1,000 for each and every day that the offense continues to exist thereafter.

§ 286-12. When effective.

This chapter shall take effect immediately upon the approval by the county review agency, or 60 days from the receipt of the chapter by the county review agency if the county review agency should fail to act.